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BELLSOUTH TELECOMMUNICATIONS, INC.

DIRECT TESTIMONY OF ALPHONSO J. VARNER

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 990649-TP

AUGUST 11, 1999

Q. PLEASE STATE YOUR NAME, YOUR POSITION WITH BELLSOUTH TELECOMMUNICATIONS, INC. ("BELLSOUTH") AND YOUR BUSINESS ADDRESS.

A. My name is Alphonso J. Varner. I am employed by BellSouth as Senior Director for State Regulatory for the nine-state BellSouth region. My business address is 675 West Peachtree Street, Atlanta, Georgia 30375.

Q. PLEASE GIVE A BRIEF DESCRIPTION OF YOUR BACKGROUND AND EXPERIENCE.

A. I graduated from Florida State University in 1972 with a Bachelor of Engineering Science degree in systems design engineering. I immediately joined Southern Bell in the division of revenues organization with the responsibility for preparation of all Florida investment separations studies for division of revenues and for reviewing interstate settlements.

Subsequently, I accepted an assignment in the rates and tariffs organization with responsibilities for administering selected rates and tariffs including

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preparation of tariff filings. In January 1994, I was appointed Senior Director of Pricing for the nine-state region. I was named Senior Director for Regulatory Policy and Planning in August 1994, and I accepted my current position as Senior Director of Regulatory in April 1997.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. My testimony provides BellSouth's policy position regarding the pricing of unbundled network elements ("UNEs"), particularly deaveraging of UNEs. Additionally, I specifically address issues 1a, 1b, 1c, 1d, 1f, 2, 3b, 3c, and 3d as identified by the Florida Public Service Commission's ("Commission") Tentative List of Issues contained in its Procedural Order dated July 20, 1999 (PSC-99-1937-PCO-TP).

Q. PLEASE IDENTIFY THE OTHER WITNESSES FILING DIRECT TESTIMONY FOR BELLSOUTH IN THIS DOCKET.

A. In addition to my testimony, BellSouth presents the direct testimony of the following witnesses and the topics covered:

Ms. Daonne Caldwell	BellSouth's cost methodology
Mr. Walter Reid	Appropriate methodology for including shared and common costs in cost studies
Mr. David Cunningham	Appropriate economic lives for use in cost studies
Dr. Randall Billingsley	Appropriate cost of capital in cost studies
Dr. Richard Emmerson	Economic theory supporting cost studies
Mr. Jerry Hendrix	Pricing issues, i.e. deaveraging methodology

Issues 1a, 1b, 1c, 1d and 2

Q. PLEASE IDENTIFY THE RECENT EVENTS THAT IMPACT THE ISSUES IN THIS PROCEEDING?

A. On January 25, 1999, the Supreme Court issued a ruling in *the Iowa Utilities Board* Case finding that the Federal Communications Commission ("FCC") has jurisdiction over pricing of interconnection and UNEs under Section 252(d) of the Telecommunications Act of 1996 (the "Act"). The Supreme Court, however, remanded the FCC's pricing rules to the Eighth Circuit Court to review the merits of those rules. As such, the FCC's pricing rules, i.e., forward-looking cost methodology, geographic deaveraging, etc. are subject to change upon review by the Eighth Circuit. In addition, the Supreme Court vacated the FCC's Rule 51.319, which established the initial set of UNEs. It is this action by the Court that creates the greatest impact upon the issues in this proceeding.

Q. PLEASE DISCUSS BELLSOUTH'S POSITION ON THE PROVISION OF UNES BASED ON THE SUPREME COURT'S JANUARY 25, 1999 DECISION.

A. In its decision of January 25, 1999, the Supreme Court vacated the FCC's rule 51.319 which established the initial set of UNEs. Because that rule is vacated, there is no required set of UNEs that must be made available either individually or on a combined basis. The Supreme Court noted that the FCC

"did not adequately consider the §251(d)(2) 'necessary and impair' standards when it gave requesting carriers blanket access to network elements..." ." 525 U.S.___, 142 L. Ed. 2d 834, 854. The Court also rejected, as not in accord with the ordinary and fair meaning of the terms of the Act, the FCC's assumption that any increase in cost or decrease in quality that results from an ILEC's denial of a network element "renders that element 'necessary' and causes the failure to provide that element to 'impair' the entrant's ability to furnish its desired services..." ." 525 U.S.___, 142 L. Ed. 2d 834, 855. Further, Section 251(d)(2), "requires the Commission to determine on a rational basis which network elements must be made available, taking into account the 1996 Act's objectives and giving some substance to the 'necessary' and 'impair' requirements." ." 525 U.S.___, 142 L. Ed. 2d 834, 857. For these reasons, the Supreme Court sent the FCC back to the drawing board with instructions to draw from Section 251(d)(2) a rational limiting standard on network element unbundling.

Q. WHAT IS THE RELEVANCE OF THE 319 PROCEEDING TO THIS DOCKET?

A. The FCC's 319 proceeding is relevant to this docket because the 319 proceeding will ultimately determine the list of UNEs that BellSouth will be required to provide to CLECs. Thus, the pricing standards of the Act and the FCC's pricing rules for UNEs will only apply to those capabilities that the FCC determines should be unbundled.

Q. WHAT DOES THE FCC HAVE TO CONSIDER TO DETERMINE THE LIST OF UNES?

A. The Supreme Court instructed the FCC to reform its list of UNEs to give substance to the requirements of Section 251(d)(2) of the Act. This decision requires the FCC to consider whether "(A) access to such network elements as are proprietary in nature is necessary and (B) the failure to provide access to such network elements would impair the ability of the telecommunications carrier seeking access to provide the services that it seeks to offer." 525 U.S.___, 142 L. Ed. 2d 834, 854. To clarify the above, the Supreme Court's ruling interprets item (B) above to apply to all UNEs, not just those that are considered proprietary. Incorporating these requirements into the FCC's consideration should reduce the number of required UNEs. The FCC will also have to develop standards for evaluating whether these "necessary and impairment" requirements were met. Until these standards are developed by the FCC, a state Commission must apply the law without the benefit of more specific standards. However, any state decision must ultimately conform to the FCC's rules when they are promulgated. Consequently, a final required list of UNEs cannot be developed for certain until after the FCC's rules are effective.

Q. PLEASE SUMMARIZE BELLSOUTH'S POSITION CONCERNING THE APPLICATION OF THE NECESSARY AND IMPAIR STANDARDS ON NETWORK ELEMENTS.

A. BellSouth believes that the FCC must use a logical process in establishing

UNEs that includes an assessment of competitive alternatives and the ability of firms to self-provision the requested capabilities. BellSouth advocates a market approach where it is only within properly defined markets that competitive effects can be evaluated. Market data is essential to the proper application of the necessary and impair test. In order to make a determination as to whether an element qualifies as a UNE, market data must be gathered. In urging the FCC to adopt a market approach to unbundling, in its Comments and Reply Comments before the FCC in CC Docket 96-98, BellSouth explains how transport and loops should be defined and viewed as local market offerings, while switching, Directory Assistance/Operator Services and Signaling should be defined as national markets. BellSouth urges the FCC to view markets in terms of geographic areas similar to the manner already established for special access and switched transport. I have attached the following exhibits to my testimony filed in the FCC's 319 proceeding (CC Docket 96-98) that provide the full details of BellSouth's position and the data supporting its conclusions: Exhibit AJV-1 is BellSouth's Comments and Reply Comments in CC Docket 96-98 dated May 26, 1999 and June 10, 1999, respectively; Exhibit AJV-2 is the Joint Reply Comments of Ameritech, BellSouth, SBC Communications, Inc. and the United States Telephone Association on the Limiting Standards of Section 251(d)(2) dated June 10, 1999; and Exhibit AJV-3 is the Comments of the United States Telephone Association dated May 26, 1999. In addition, I have attached as Exhibit AJV-4, the *Florida Fact Report* which demonstrates the significant level of competition and alternative sources of UNEs that are available to Alternative Local Exchange Carriers ("ALECs") in Florida.

Q. DOES BELLSOUTH BELIEVE ADVANCED SERVICES MEET THE NECESSARY AND IMPAIR STANDARDS?

A. No. BellSouth has demonstrated that advanced services represent a new market where incumbent local exchange carriers ("ILECs") such as BellSouth have no competitive advantage. In fact, ALECs have installed more digital subscriber line access multiplexers ("DSLAM") than ILECs. ILECs are not the incumbent providers in the advanced services market. Both cable and wireless providers are ahead of ILECs in rolling out advanced services and market facts referred to in BellSouth's Comments demonstrate that advanced services may be provided equally well, or better, over other networks. The FCC in its *Advanced Services Report* suggested that cable providers are farthest ahead followed by wireless providers, then ALECs.

Further, any requirement to unbundle advanced services would apply to BellSouth's investment dollars and not to existing networks and equipment. If BellSouth invests in advanced services only to have to unbundle that investment at cost-based prices, such action destroys the incentive to further invest in innovative advanced services. On the other hand, it discourages other potential providers of such services from investing in networks and equipment because they can get a free-ride on the ILEC. This surely is not the outcome intended by the 1996 Act. Justice Breyer said it best when he stated, "A totally unbundled world...is a world in which competitors would have little, if anything, to compete about. Such a world is not what the Act envisions." 525

U.S.___, 142 L. Ed. 2d 834, 880.

Q. PLEASE IDENTIFY THE ELEMENTS THAT THE FCC ORIGINALLY ESTABLISHED AS UNES.

A. In its First Report and Order in CC Docket No. 96-98 and in its Second Further Notice of Proposed Rulemaking, the FCC identified the following list of network elements that ILECs were required to unbundle including the operations support systems that support network element unbundling.

- Interoffice transport facilities
- Switching
- Loops
- Network Interface Device
- Signaling networks and databases
- Operator Services and Directory Assistance

There is a significant amount of self-provisioning and a significant number of competitive alternatives that exist primarily in urban areas and to a lesser extent in rural areas with respect to these capabilities. One of the attachments to Exhibit AJV-3, the *UNE Fact Report* provides comprehensive documentation on the significant number of alternative sources for ALECs and the growing level of self-provisioning that exists in the nation and in the BellSouth region today. The contents of Exhibit AJV-3 build a strong case that there are abundant alternative sources for most network elements and that there is significant self-provisioning activity as well. In addition, the *Florida Fact*

Report, Exhibit AJV-4, provides overwhelming evidence of the alternatives for several UNEs that exist in Florida and demonstrates, not only significant self-provisioning, but also the extensive variety of alternative sources of network capabilities for ALECs. The information contained in this report is the source of the Florida specific data used in the following summaries outlining the competitive nature of local transport, switching, loops, signaling and operator services and directory assistance services.

Q. PLEASE SUMMARIZE BELLSOUTH'S VIEWS WITH RESPECT TO INTEROFFICE TRANSMISSION FACILITIES.

A. Interoffice transmission facilities provide transmission paths among end offices, tandem switches, interexchange carrier points of presence and between end offices and ALEC premises. Interoffice transmission facilities which are inherently local facilities serving local markets may be either dedicated to a particular carrier or shared among a group of carriers. As early as 1992, the FCC found that DS1 and DS3 special access services were subject to competition. Due to the growth of competition, particularly in urban areas, the FCC found that geographic zones would properly reflect competition and the underlying competitive economics. BellSouth believes the FCC's prior findings and geographic approach are directly applicable to local transport.

BellSouth presently has about 1,000 collocation arrangements (Comments at p. 52) in its central offices, which is a good indicator of the presence of competitive transport facilities. As of June 1999, 31 ALECs have requested

collocation arrangements in 104 different BellSouth central offices in Florida. Currently, 96 virtual and 114 physical collocation arrangements have been completed and accepted by ALECs. An additional 39 virtual and 154 physical collocation arrangements have a firm order and are in progress. BellSouth has received applications for an additional 11 virtual and 126 physical collocation arrangements in Florida.

In many urban areas in BellSouth's service territory there are at least three or more ALEC fiber networks in place with more planned (Comments at p. 53). In the South Florida Miami area alone, there are seven ALECs providing extensive fiber routes with tremendous capacity for local transport (Reply Comments, Attachment C). With fiber networks in place and ALEC wireless networks in many of the same areas, transport alternatives are readily available to ALECs in urban areas, therefore unbundling should not be required. Though there are generally fewer alternatives in rural areas, alternatives do exist and are expanding. For rural areas, whether the use of wireless facilities or self-provisioning would actually impair an efficient ALEC is uncertain. BellSouth suggested to the FCC that it collect factual information from ALECs to support a conclusion in rural areas. Imposing an unbundling obligation, particularly in urban areas, would not benefit competition or consumer welfare. It would, instead, create a disincentive to investment in facilities that would benefit consumers.

Q. PLEASE SUMMARIZE BELLSOUTH'S VIEWS WITH RESPECT TO SWITCHING.

A. The local switching element includes line-side and trunk-side facilities and the features, functions and capabilities of the switch. BellSouth suggests that given the reach of a switch, the amount of ALEC switch deployment and the ease of entry and expansion, the market for switching is a national one. As an alternative, switching could be viewed under the same geographic zone concept described in BellSouth's Comments in the 319 proceeding.

With respect to available alternatives, there are approximately 140 ALEC switches (Reply Comments, Attachment D) in BellSouth's region alone. The following list identifies operational ALEC switches in Florida:

Miami	13
Orlando	9
Jacksonville	7
Fort Lauderdale	4
West Palm	3
Daytona	3
Gainesville	1
Pensacola	1
Total	**41**

At least 26 additional ALEC switches are planned or are in progress in Florida.

In addition, as of June 1999, 40 wireline facilities-based ALECs are providing approximately 75,000 local exchange service lines in Florida utilizing their own networks (*Florida Fact Report* at p. 5). Further, the attachments to this testimony also demonstrate that 33% of BellSouth's exchange areas are served by one or more ALEC switches *(UNE Fact Report* at p. I-7). Specifically, 80% of the exchange areas in the Miami Metropolitan Statistical Area (MSA), 60%

of exchanges in the Orlando MSA and 100% of the exchange areas in the Fort Lauderdale MSA are served by 4 or more ALEC switches. *(UNE Fact Report* at p. I-11).

Because switch manufacturers are targeting smaller ALECs, an ALEC can purchase a switch for as little as $100,000. Additionally, manufacturers can provide remote switches that extend the reach of host switches plus all features to distances of 500 to 600 miles. Finally, switch installation intervals are now in terms of weeks or months, not years. (Exhibit AJV-1 Comments at pps. 57-58).

BellSouth concludes that for switching in urban areas, ALECs have demonstrated that they can successfully deploy switches and self-provision switching services. Further, ALEC competitive opportunities would not be impaired without mandatory unbundling of switching in those areas. BellSouth suggests the FCC view evidence of specific ALEC impairment against the relative ease with which switching facilities can be extended to, or be installed in, rural areas.

Q. PLEASE SUMMARIZE BELLSOUTH'S VIEWS WITH RESPECT TO LOOPS.

A. Loops are defined as providing a transmission path connecting the network interface device at a subscriber's premises to the main distribution frame located in an ILEC's central office. There are many types of loops and

BellSouth believes the FCC must define markets for loops that reflect demand and the substantial variation in competition in different areas. BellSouth believes there are basically two markets for loops; the larger business market and the mass market. In addition, there is market evidence that geography is also a factor in loop availability, making distinctions between urban and rural areas. Currently, over 10,000 ALEC lines are in service utilizing BellSouth provided unbundled network elements to connect the customer's location to the ALEC's wireline switch. (*Florida Fact Report*, p. 2). BellSouth's Comments point out that ALECs are successfully connecting larger business customers to their networks without incumbent loops. In fact, ALEC local loops reach into nearly 15 percent of all commercial office buildings in the country. (Comments at p. 65). With respect to the mass market, at page 66, BellSouth's Comments point out that cable telephony networks coupled with cable operators' commitments to expansion provide virtually all consumers in their franchise areas with competitive choice.

BellSouth concludes that failing to unbundle local loops will not impair service offerings to larger businesses in urban areas or to mass market customers where cable telephony is offered. Therefore, loops in those areas should not be unbundled.

Q. PLEASE SUMMARIZE BELLSOUTH VIEWS WITH RESPECT TO SIGNALING NETWORKS AND DATABASES.

A. Signaling networks and databases facilitate the routing of telephone calls

between switches. BellSouth points to market evidence that there are alternatives to ILEC signaling networks and that there are no impediments to self-provisioning. Where an ALEC uses BellSouth's local switching, BellSouth provides signaling, using its databases over its network. Where an ALEC uses its own local switch there are several alternative signaling networks that the ALEC can link to. BellSouth's comments suggest that there are at least six signaling network alternatives that provide facilities-based service nationwide. BellSouth concludes that an efficient ALEC has a meaningful opportunity to compete without access to ILEC signaling where switching is not obtained from the incumbent.

Q. PLEASE SUMMARIZE BELLSOUTH'S VIEWS WITH RESPECT TO OPERATOR SERVICES (OS) AND DIRECTORY ASSISTANCE (DA).

A. The FCC describes Operator Services as "any automatic or live assistance to a consumer to arrange for billing or completion, or both, of a telephone call." Directory Assistance is described as allowing a subscriber to retrieve the telephone number of another subscriber. The market for these services is nation-wide where service providers frequently deliver OS/DA from national calling centers. In this market, if one provider raises its prices above competitive levels, its customers (ALECs in this case) would go to a competitor. ALECs often self-provision OS/DA or use any of several national wholesalers of these services. AT&T, MCI and Sprint all provide operator services on a nation-wide basis. In addition, Internet-based services and CD-ROM based services provide additional alternatives.

BellSouth concludes that OS/DA services are readily available to ALECs through self-provisioning or through numerous alternative suppliers. Therefore, OS/DA do not meet the necessary and impair standards and should not be unbundled.

Q. HOW DOES THE TIMING OF THIS PROCEEDING RELATE TO THE FCC'S PROCEEDING TO REDEFINE THE REQUIRED UNES IN ACCORDANCE WITH THE SUPREME COURT'S DECISIONS?

A. This proceeding is very timely in relation to the FCC's proceeding to revise its UNE rules in the 319 proceeding. Although the outcome of the FCC's proceeding is not known, this Commission will play a significant role in redefining the required UNEs and, by extension, the required currently combined UNEs. As set forth by the Supreme Court, an ILEC can be required to offer only those UNEs that meet the necessary and impair test.

This proceeding provides this Commission with an opportunity to get a significant head start on the 319 process by gathering market data to address the necessary and impair standards for individual UNEs. This Commission can also gain a head start on developing a pricing methodology and identifying costs for UNEs and currently combined UNEs through this proceeding. These activities give the Commission the ability to rapidly apply the FCC's rules resulting from its 319 proceeding when that proceeding is concluded. Current indications are that the FCC may rule in the 319 proceeding prior to this Commission completing this docket. Therefore, BellSouth recognizes that it

may be necessary to amend this testimony in accordance with the outcome of the 319 proceeding.

Q. WHAT SHOULD THE COMMISSION DO TO POSITION ITSELF TO CONFORM THE OUTCOME OF THIS PROCEEDING TO THAT OF THE FCC's 319 PROCEEDING?

A. Principally, the Commission needs cost and market data to prepare itself to implement the FCC's decision in the 319 proceeding. In addition, the Commission needs to adopt a pricing methodology for UNEs and currently combined UNEs.

An essential component of the necessary and impair test is market data concerning the availability of UNEs in various areas of the state. This proceeding is an excellent opportunity to gather such data, which might include the quantity and geographic scope of ALEC switches, the extent of alternative sources for transport and loops, availability of alternative suppliers for database services and the impact of alternative technologies that ALECs plan to use to compete. Such data needs to be obtained for various geographic, (i.e. urban and rural) areas of Florida. Obviously, ALECs are in the best position to provide this data.

In addition, ALEC cost data concerning the ability of ALECs to utilize UNEs and to utilize alternatives to UNEs also would be necessary. Such data would allow this Commission to determine whether an ALEC is impaired if a UNE is

not offered by BellSouth. As stated in Footnote 11 of the Supreme Court's January 25, 1999 decision in *Iowa Utilities Board*, "We similarly disagree with Justice Souter that a business can be impaired in its ability to provide services--even impaired in that ability 'in an ordinary, weak sense of impairment,' ibid., at 4--when the business receives a handsome profit but is denied an even handsomer one." 525 U.S.___, 142 L. Ed. 2d 834, 856. To determine whether these conditions exist, ALECs should provide appropriate cost data. Because the Commission already has costs for the previously required UNEs, new costs for those UNEs are not needed.

Third, the Commission can develop a pricing methodology for UNEs and currently combined UNEs. Because currently combined UNEs affect the marketplace differently from individual UNEs, the pricing considerations are different.

Finally, the Commission will require ILEC cost data for currently combined UNEs. In that regard, any cost studies which would be provided in Phase II of this proceeding must be consistent with the outcome of Phase I, this immediate proceeding.

Q. WILL PRICES SET IN THIS PROCEEDING AFFECT THE DEVELOPMENT OF LOCAL COMPETITION?

A. Yes. In order to create an environment in which efficient competition will occur and provide the maximum benefit to consumers, local competition must

be implemented in a fair and balanced manner. The Act provides for such an environment. There are no provisions of the Act that, on their face, are intended to advantage or disadvantage any provider or group of providers.

Because cost provides the basis for prices, it is extremely important that costs be developed fairly. If costs result in prices being set either too high or too low, the development of efficient competition in the local market will not be encouraged as intended by Congress. Prices that are set either too high or too low will, in the long run, not benefit the consumer. Prices must be set to cover, at a minimum, the actual costs incurred by the Local Exchange Company ("LEC").

Setting prices too low would discourage an ALEC from building its own facilities even when that would be the correct economic decision. Setting prices that only cover incremental cost, i.e., not compensating the LEC for a portion of its shared, common and historical costs, would enable an ALEC to avoid making any capital investment and incurring all the related costs. It would make no economic sense for the ALEC to build facilities. In other words, there would still be no competition for the infrastructure. In addition, such uneconomic pricing may also discourage entry into the market by those ALECs who initially intend to resell BellSouth's retail services until they establish a customer base that is sufficient to produce and support the capital necessary to build facilities.

Moreover, costs/prices must be established that enable the incumbent LEC to

be compensated adequately for the use of its ubiquitous network. BellSouth should receive just compensation for its services. A portion of all of the costs of doing business must be included in such compensation. Setting prices for unbundled network elements and interconnection at incremental cost would force other services to absorb the other related costs. ALECs, as well as end-users, benefit from the facilities that caused these other costs to be incurred and, therefore, should contribute to their recovery.

Likewise, setting prices for UNEs too high will also not create the result envisioned by Congress. Although setting prices too high will not encourage ALECs to purchase the elements from the LEC, it would give the ALEC the maximum incentive to build its own facilities and, in the long run, infrastructure competition will develop sooner. What Congress envisioned, however, will not come to fruition.

In both of these examples the prices charged for services offered will not be the most efficient, and it is the consumer that stands to lose. For a further discussion of cost and pricing principles, please see the direct testimony of Dr. Richard Emmerson.

Q. YOU MENTIONED THE TELECOMMUNICATIONS ACT OF 1996 IN YOUR PREVIOUS ANSWER. WHAT STANDARDS ARE ADDRESSED IN THE ACT?

A. The Act addresses the pricing of unbundled elements and interconnection.

Section 252 (d)(1) of the Act states that the just and reasonable rate for interconnection of facilities and equipment and the just and reasonable rate for network elements:

> "(A) shall be--
>
> (i) based on the cost (determined without reference to a rate-of-return or other rate-based proceeding) of providing the interconnection or network element (whichever is applicable); and,
>
> (ii) nondiscriminatory, and
>
> (B) may include a reasonable profit."

Q. DOES THE ACT REQUIRE A SPECIFIC COST STANDARD?

A. No. The Act does not prescribe any specific cost standards. Implicit in its language, however, is the requirement that full actual costs may be recovered. If full actual costs were not intended to be recovered, there would be no reason to provide an opportunity for prices to include a reasonable profit. A profit cannot be realized until the full actual costs of the item are recovered.

Q. HAS THE FLORIDA COMMISSION ADOPTED A COST METHODOLOGY?

A. Yes. In Order No. PSC-96-1531-FOF-TP, issued December 16, 1996 (BellSouth/MFS arbitration), the Commission stated ". . . the appropriate cost methodology to determine prices for unbundled elements should approximate

TSLRIC. This is the pricing policy we adopted in our state proceeding on unbundling and resale." Order at p. 6. Additionally, in establishing permanent rates in the AT&T/MCI/ACSI consolidated arbitration proceedings, the Commission stated in Order No. PSC-96-1579-FOF-TP dated December 31, 1996 "[W]e find it appropriate to set permanent rates based on BellSouth's TSLRIC cost studies." [Emphasis added] Order at p. 33.

However, whether the Commission continues to use Total Service Long Run Incremental Cost ("TSLRIC") or Total Element Long Run Incremental Cost ("TELRIC"), BellSouth should be able to recover its actual costs including shared and common costs.

Q. WHAT AFFECT SHOULD EXISTING FCC PRICING RULES HAVE ON THIS COMMISSION'S POLICY FOR UNE AND UNE COMBINATION PRICES?

A. With respect to policy, this Commission should develop its pricing policy for UNEs and UNE combinations to enhance the development of facilities-based competition with its attendant benefits for economic development. Such a policy requires, at a minimum, that UNE prices cover the full actual costs of the elements and that prices for preexisting combinations of UNEs be set at full market value.

With regard to individual UNEs, BellSouth recognizes that the appropriate policy cannot be implemented until the FCC's pricing rules are changed. The

merits of those rules are currently being reviewed by the Eighth Circuit Court of Appeals which will, hopefully, permit appropriate prices for UNEs to be established. However, the limitations of existing rules should not deter this Commission from establishing the appropriate policy. Implementation of that policy may be delayed by the FCC's rules. But this Commission should ensure that it has a clear identification of the appropriate objective so that it can achieve that objective when the rules permit it to do so.

With regard to preexisting combinations of UNEs, this Commission is free to establish the appropriate prices. The FCC does not currently have any pricing rules applicable to combinations of UNEs. Consequently, this Commission can set those prices at an appropriate level as permitted by the 1996 Act.

Q. IN GENERAL, HOW SHOULD PRICES BE ESTABLISHED FOR UNBUNDLED NETWORK ELEMENTS?

A. Prices should be established based on cost and should consider market conditions and regulatory requirements as necessary. Costs are only one input to the price setting process. In order to prevent arbitrage, prices for new services must be established in appropriate relationship to existing services. In addition, where regulatory requirements exist, prices must meet those requirements.

To encourage the development of competition, BellSouth would propose this Commission adopt a policy of establishing prices for individual UNEs to be

equal to full actual costs. These are the lowest prices that can be charged and still recover costs. Setting prices lower than these levels would have BellSouth subsidize its competitors. These costs clearly establish a price floor, not a price ceiling. As noted above, this Commission is free to set the appropriate prices for combinations of currently combined UNEs.

Q. IS IT APPROPRIATE TO SET RATES FOR UNBUNDLED ELEMENTS EQUAL TO TSLRIC?

A. No. Aside from the fact that it is not a requirement of the Act or the FCC's Order (First Report and Order in CC Docket 96-98), a company would not stay in business long if it set all rates equal to TSLRIC. More specifically, BellSouth, as well as any multiservice company, has shared and common costs that must be recovered by pricing services, i.e., UNEs, above incremental cost. Although BellSouth acknowledges that competition will appropriately drive prices toward actual cost, competition will not drive prices to TSLRIC. BellSouth submits that prices will move toward a point where all valid costs, including shared, common and historical costs, are recovered. If one group of services is exempt from the requirement to cover these costs, other services must be priced higher to make up the difference, forcing the prices for those services to be inflated.

Setting prices that do not cover actual costs establishes a vicious cycle that harms consumers. If the prices of the services provided to competitors do not cover cost, BellSouth will be subsidizing its competitors. BellSouth must then

attempt to recover this shortfall in retail prices. However, this purported solution would not work because the competitor who is using subsidized facilities would not have to recover this shortfall in its prices. Consequently, the competitor could simply undercut BellSouth's retail prices. The result is that this subsidy to competitors would ultimately be borne by those end users who have the least competitive options, e.g., rural residential customers.

In addition, by creating a high price umbrella for the competitor, all retail customers would pay higher prices than they would otherwise. The competitors benefit, but the end user loses. This does not seem fair when both the end-user and the ALEC are benefiting from, and share in, the use of BellSouth's network. BellSouth must recover all of its costs to continue to be a viable concern, and all of the users of the network should contribute toward that recovery.

The Commission agreed that contribution above TSLRIC is appropriate, stating in Order No. PSC-96-1579-FOF-TP, that "[t]he rates cover BellSouth's TSLRIC costs and provide some contribution toward joint and common costs." (Order, page 33).

Q. SHOULD PRICES BE SET EQUAL TO ECONOMIC COSTS?

A. No, for several reasons. First, it is inappropriate to establish a rigid rule for prices to equal any specific cost standard. In this case, economic costs are defined as TSLRIC plus an allocation of shared and common costs. Pricing

must account for the cost of the element plus the market, regulatory and competitive conditions that exist. Further, pricing is not so simplistic that it can be narrowed to an exact numerical exercise. Prices for UNEs must be based on cost, but that is not the only factor to consider. Another consideration is that prices must also be functional in the marketplace and be consistent with prices for similar services.

Second, prices should be set so sellers and buyers make correct economic choices. Finally, prices must cover total costs. This requirement is necessary for a firm to remain in business and for a firm to make efficient investment.

Q. WHAT ARE THE CONSEQUENCES OF SETTING PRICES THAT DON'T COVER TOTAL COST?

A. One consequence of setting prices that don't cover total cost is that such pricing creates an incentive for inefficiency. It deters the ILEC from undertaking investments because it guarantees that the costs of those investments will not be recovered. ALECs will over-consume the ILEC's facilities and under-invest in their own facilities, even when investing in their own facilities is the efficient choice.

Another consequence is that such pricing invites inefficient entry of ALECs by placing all of the risks of building and maintaining a network on the ILEC. As previously discussed, ALECs don't commit to use ILEC facilities over their economic life, but they have the option to do so. If prices don't cover costs,

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the ALECs don't bring to the marketplace anything more than an arbitrage mechanism that allows them to avoid paying the costs they would otherwise have to pay in a competitive marketplace. End user customers are the losers in this arrangement.

Q. DOES PRICING AT TSLRIC PROVIDE FOR A REASONABLE PROFIT AS PERMITTED BY THE ACT?

A. It certainly does not. Proponents of this theory equate economic profit with cost of capital which is not an appropriate comparison. Cost of capital is a cost like any other cost of doing business. It is well accepted that a profit cannot be realized until all costs, including cost of capital, have been recovered. Although pricing at TSLRIC would provide for the cost of capital attributable to the investments directly related to the specific element involved, it would not provide for any contribution to shared or common costs or any cost of capital on investment not related to a specific service. Until BellSouth recovers all of its costs, and cost of capital on its total operations is a cost, BellSouth does not make a profit.

Issue 1f: What other factors or policy considerations, if any, should be considered in determining deaveraged UNE rates?

Q. WHAT ARE THE PRIMARY POLICY CONSIDERATIONS IN DETERMINING WHEN DEAVERAGING SHOULD OCCUR?

A. There are three primary policy considerations that must accompany any discussion of deaveraging UNE prices. First, as I have described in detail earlier in this testimony, this Commission cannot, with any degree of certainty, establish which UNEs should be deaveraged until the FCC has completed its 319 proceeding and the list of required UNEs, and associated currently combined UNEs is known. Second, it is imperative that an appropriate universal service funding mechanism be implemented in Florida at least coincident with the implementation of deaveraging. Third, because of the relationship of UNE prices to retail services, deaveraging should not occur until BellSouth is able to accomplish some level of rebalancing of its basic local exchange service rates. The universal service and rate rebalancing issues are discussed in detail below.

Q. PLEASE DESCRIBE THE UNIVERSAL SERVICE AND RATE REBALANCING POLICY CONSIDERATIONS ASSOCIATED WITH GEOGRAPHIC DEAVERAGING OF UNES.

A. Historically, it has been the intent and practice of regulators to maintain statewide average rates for basic service. Such pricing practices served both regulatory and political purposes and incorporated subsidies to ensure affordable local service for all urban and rural customers. Although the FCC's Rule 51.507(f) requires at least three geographic rate zones for UNEs and interconnection that reflect cost differences, the FCC acknowledged in its Stay Order released May 7, 1999 that the three-zone rule may not be appropriate in all states. The Order allows a state to file a waiver request seeking relief from

the general rule based on the state's particular circumstances. Further, rates for UNEs are not permitted to vary based on the class of customer served.

Deaveraging and the inability to draw distinctions based on class of service are inconsistent with the existing pricing practices for retail rates for basic local exchange service as established by this Commission. The present rate structure in Florida incorporates long standing policies of purposefully pricing some services markedly above costs in order to price other services at or below cost such that Florida's residential customers would have access to low priced basic local exchange service. Further, basic local exchange service rates have been established according to the number of lines in an exchange's local calling area – the greater the number of lines in a particular exchange's local call area, the higher the price. Deaveraging will create loop prices that vary in the opposite direction from the prices for retail services. This is important because the unbundled loop will be used by ALECs to compete for these retail customers. Deaveraging loop prices would mean that, in urban areas where retail prices are highest, the retail prices will be higher relative to unbundled loop prices than they would be if loop prices were not deaveraged. In rural areas, the reverse would be true. In rural areas, however, high unbundled loop prices would be irrelevant because the ALEC could simply resell the low priced retail service to rural customers. As a result, deaveraging, without concomitant rate rebalancing, simply creates another opportunity for ALECs to engage in inappropriate arbitrage of the pricing schedule. This arbitrage will ultimately lead to higher prices for rural customers as ALECs usurp the contribution contained in the prices charged in urban areas that currently make lower rural

prices possible.

It is very important to recognize that unbundled loops will be used to compete with residence and business local exchange services. As such, the pricing implications of deaveraging the loop cannot be divorced from the price of local exchange services. While BellSouth believes that rate rebalancing should be considered in another proceeding, the Commission must consider the implications that deaveraging of unbundled loop prices would have on the current pricing of retail local exchange service.

In fact, on May 7, 1999 the FCC released an order in CC Docket No. 96-98 issuing a stay of Rule 51.507(f). The stay will remain in effect until six months after the FCC issues its order in CC Docket No. 96-45 finalizing and ordering implementation of high-cost universal service support for non-rural local exchange carriers. Therefore, any application of Rule 51.507(f) would be inappropriate at this time. Furthermore, geographic deaveraging of UNEs should not be considered until the issues of universal service funding and rate rebalancing are adequately addressed.

Q. WHY SHOULD THE COMMISSION REFRAIN FROM IMPLEMENTING GEOGRAPHIC DEAVERAGING UNTIL INTRASTATE UNIVERSAL SERVICE ISSUES AND RATE REBALANCING HAVE BEEN ADDRESSED?

Since the FCC issued its First Report and Order following the passage of the

Act, BellSouth has contended that geographic deaveraging should not precede the implementation of an appropriate universal service support mechanism or the implementation of adequate rate rebalancing. Both are necessary to counterbalance the impact of deaveraging UNEs for ALECs. Even the FCC recognized the importance of delaying geographic deaveraging until the Federal universal service support mechanism is in operation. As long as ILECs such as BellSouth have a continuing universal service obligation, there must be a mechanism in place to compensate ILECs for providing service to high cost areas.

With respect to rate rebalancing, BellSouth currently is operating under a price regulation plan outlined in Florida Statutes. This plan, while allowing some flexibility to meet competition as it develops in Florida, does not provide the flexibility necessary to timely move basic local exchange rates more toward the cost of providing the service. Until BellSouth can adjust these retail rates to better match their underlying costs, deaveraging will simply increase ALECs' profit margins in urban areas without increasing the level of competition in urban or other areas of Florida. If geographic deaveraging were to be implemented before an appropriate universal service fund and before some degree of rate rebalancing can be accomplished, ALECs will have an unreasonable advantage created by regulatory fiat in pricing their services to high revenue, low cost customers in urban areas. What LECs like BellSouth will be left with is an increased percentage of the low revenue, high cost customers who ultimately will bear the majority of BellSouth's network costs. Though BellSouth believes rate rebalancing should happen concurrent with or

before deaveraging, the most important issue is to insure deaveraging does not occur in Florida before implementation of an appropriate permanent universal service fund.

Q. HOW CAN THIS COMMISSION DEAL WITH THE TIMING ISSUE RELATED TO THE ESTABLISHMENT OF A UNIVERSAL SERVICE FUND IN FLORIDA?

A. Implementation of an appropriate universal service fund in Florida is complicated by the timing established in current Florida Statutes. Presently, Florida Statutes allow the Legislature until January 1, 2001 to establish a permanent universal service fund. However, based on the FCC's current timetable, which calls for geographic deaveraging of UNEs to occur six months after the FCC releases its universal service order, a permanent universal service fund will not likely be in place in Florida when the federal requirement for geographic deaveraging goes into effect. Further, it is unlikely that the Legislature will be able to address the permanent fund much sooner than January 1, 2001. There is, however, a way by which this Commission can insure that deaveraging does not occur before an appropriate state fund is implemented. This Commission may petition the FCC for a waiver of its deaveraging rule. In its Stay Order dated May 7, 1999, the FCC noted that "[s]tates may file waiver requests with the Commission seeking relief from the general rule in light of their particular facts and circumstances." Footnote 16 associated with that statement allows the FCC to "waive any provision of its rules based on a petition if good cause is shown." Therefore, this Commission

can address the FCC's requirements while insuring that the policy considerations surrounding deaveraging are also addressed.

Issue 1a: Which UNEs, excluding combinations, should be deaveraged?

Once the issues described above have been addressed, only then would it be appropriate to apply geographic deaveraging to any UNE prices. At that time, BellSouth recommends that, in the markets it is deemed to be required, only the unbundled loop be considered for geographic deaveraging. As Ms. Caldwell notes in her testimony, the unbundled loop is the only UNE that possesses characteristics that create a significant variation in cost within different geographic areas, i.e. urban and rural. There is little, if any, geographic variation in costs of other UNEs. Mr. Hendrix discusses the methodology by which BellSouth recommends loops be deaveraged at such time as the Commission determines it is appropriate to proceed with geographic deaveraging.

Issue 1b: Which UNE combinations, if any, should be deaveraged?

Q. WHAT IS BELLSOUTH'S POSITION ON THIS ISSUE?

The Supreme Court's vacating of the FCC's Rule 51.319 and its reinstatement of other rules directly impacts the network elements BellSouth is required to provide. In accordance with the FCC's Rule 51.315(a), BellSouth is obligated to provide unbundled network elements in a manner that allows requesting

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telecommunications carriers to combine them in order to provide a telecommunications service. Though requesting telecommunications carriers may combine unbundled elements in any manner they choose, BellSouth is not required to combine unbundled elements for those carriers. The Eighth Circuit vacated the FCC's rules that purported to impose such a requirement (§§ 51.315(c)-(f)). The Eighth Circuit's decision vacating these rules was not challenged by any party, and because those rules are not in effect, BellSouth is not required to combine network elements.

The impact of the Supreme Court's decision is such that, for the moment, no one knows for certain exactly *what* network elements must be made available to competing carriers. Even though the Eighth Circuit has simply reinstated the FCC's Rule 51.315(b) prohibiting ILECs from separating already-combined network elements before leasing them to competitors, that rule has no meaning without a determination of what elements meet the "necessary" and "impair" standards under the Act.

As explained previously, the Supreme Court's vacating of FCC Rule 51.319 was based on the FCC's failure to apply the necessary and impair standards when deciding which UNEs were required. In short, there is no reasonable way this Commission can address combinations of network elements and deaveraging of elements associated with such combinations unless and until it is clear what those elements are. As such, it is premature, if not impossible, to identify any UNE combinations involving loops which should be priced on a geographically deaveraged basis until such time as the FCC issues its decision

regarding the remand of Rule 51.319. Based on the final outcome of the FCC's 319 proceeding, and when the issues surrounding the proper timing of geographic deaveraging are resolved, BellSouth will provide any required currently combined UNEs involving loops on a geographically deaveraged basis.

Issue 2: How can one determine which UNEs a LEC "currently combines" (51.315(b)), versus those which are "not ordinarily combined in the incumbent LEC's network" (51.315(c))?

Q. PLEASE SUMMARIZE BELLSOUTH'S POSITION ON THIS ISSUE.

A. Once the FCC's 319 proceeding is completed and it is clear what UNEs ILECs must provide, it will also be clear what UNEs must remain connected. It is important to clarify that Rule 51.315(c) was vacated by the Eighth Circuit and was not appealed to the Supreme Court. That rule remains vacated today and it does not have a role in this proceeding. Further, vacated rule 51.315(c) is in no way related to rule 51.315(b); one is not the opposite or reverse of the other. Rule 51.315(b) addresses currently combined UNEs that an ILEC must not separate unless requested to do so. Rule 51.315(c) addresses a requirement that the ILEC combine UNEs even if those elements are not ordinarily combined in the ILEC's network. One has no bearing on or relationship to the other.

Q. WHAT IS MEANT BY THE TERM "CURRENTLY COMBINED"?

A. Currently combined refers to the FCC's rule 51.315(b), reinstated by the Supreme Court, that prohibits ILECs from separating elements that are already currently combined in its network. Currently combined elements are those that are physically in a combined state as of the time the ALEC requests them and which can be converted to UNEs on a "switch as is" or "switch with changes" basis. Thus, currently combined would only include loops, ports, transport, etc. that are currently installed for the existing customer that the ALEC wishes to serve.

The FCC's view of currently combined is the same as BellSouth's view as reflected in its Reply Brief for Federal Petitioners 23 in *Iowa Utilities Board,* and referenced in the Supreme Court's January decision. In that decision, the Court noted that in reinstating Rule 315(b), "[a]s the Commission explains, it is aimed at preventing incumbent LECs from 'disconnect[ing] previously connected elements, over the objection of the requesting carrier, not for any productive reason, but just to impose wasteful reconnection costs on new entrants'." 525 U.S.___, 142 L. Ed. 2d 834, 858.

The primary complaint by ALECs that desire the loop/port combination (often referred to as the "platform") is that BellSouth should not be allowed to physically "rip-apart" currently combined elements. In a recent filing with the Georgia Public Service Commission in Docket Nos. 6863-U and 7253-U, on March 4, 1999, several ALECs ("Joint Movants") reiterated this position by stating that "[n]ow that the Supreme Court has reinstated the FCC rule that prohibits incumbents from physically separating network elements before

providing them to ALECs, BellSouth may not calculate nonrecurring charges by including costs that would be incurred only if individual network elements were separated." [Emphasis added]. The Joint Movants further noted that, "[t]he Commission should require BellSouth to recalculate its costs and propose new prices for UNEs taking into account BellSouth's obligation to provide ALECs access to already existing combinations in the BellSouth network." [Emphasis added]

From the evidence above, it should be clear that currently combined refers to combinations that physically exist in BellSouth's network for the existing customer that the ALEC wishes to serve. Importantly, any cost studies filed by BellSouth would be based on this premise and would not be valid for any other combination of UNEs.

On the other hand, newly installed loops, ports and transport elements are not currently combined and are therefore not subject to being "ripped-apart". For example, when an ALEC desires to provide service to a customer for which neither retail nor resale service currently exists, the ALEC does not have the option to obtain "currently combined UNEs". In such instances, the ALEC may serve the customer: (1) with its own or another provider's facilities, (2) by reselling BellSouth's service, (3) by obtaining UNEs from BellSouth which the ALEC may combine, or (4) by entering into a commercial agreement with BellSouth pursuant to which BellSouth would perform the combining function. This same situation holds true for an ALEC that wishes to provide a combination of a loop with dedicated transport. If the loop and transport do

not already exist for a specific customer, the ALEC does not have the option to switch the customer to a currently combined UNE combination.

Q. CAN THE COMMISSION REQUIRE BELLSOUTH TO PROVIDE UNE COMBINATIONS THAT ARE NOT "CURRENTLY COMBINED"?

A. No. In accordance with the FCC's Rule 51.315(a), BellSouth is obligated to provide unbundled elements in a manner that allows requesting telecommunications carriers to combine them in any manner in order to provide a telecommunications service. Though requesting telecommunications carriers may combine unbundled elements in any manner they choose, BellSouth is not required to combine unbundled elements for those carriers. In October, 1997, the Eighth Circuit Court vacated the FCC's rules that attempted to impose such a requirement (§§ 51.315(c)-(f)). As I explained earlier, the Eighth Circuit's decision vacating these rules was not challenged by any party, and because those rules are not in effect, BellSouth is not required to combine network elements on behalf of ALECs. Nevertheless, BellSouth is willing to perform this function upon execution of a commercial agreement that is not subject to the 1996 Act. BellSouth has entered into such a commercial agreement with ALECs operating in the state of Florida.

Q. PLEASE EXPLAIN HOW POLICY CONSIDERATIONS ARE IMPORTANT IN SETTING PRICES FOR CURRENTLY COMBINED UNES.

A. With respect to the provision of any currently combined UNEs, this

Commission should consider whether the underlying UNEs meet the necessary and impair standards of the 1996 Act. When applying the necessary and impair standards, the FCC will likely establish some type of market criteria to determine the UNEs that ILECs are required to offer and in what areas. Whether the FCC adopts BellSouth's market approach described earlier in this testimony or it adopts some other type of market approach to the provision of UNEs, it should be expected that not all UNEs will be required in all markets. As such, this Commission should expect that not all previously required UNEs will be required in all geographic areas.

In addition, the Commission should consider the impact of pricing for currently combined UNEs on the present and future development of facilities-based local competition. Because the decisions in this docket will impact the level of investment in Florida's telecommunications infrastructure, the prices established here must ensure that the pricing policy for currently combined UNEs continues to promote telecommunications investment in Florida, rather than stifling it.

Q. WHAT IS BELLSOUTH'S RECOMMENDED APPROACH TO SETTING PRICES FOR CURRENTLY COMBINED UNES?

BellSouth recommends that prices for currently combined UNEs reflect the goal of encouraging facilities-based competition. Setting prices too low would discourage an ALEC from building its own facilities even when that would be the correct economic decision. BellSouth recommends that prices for currently

combined UNEs be set at market levels. The Commission has the latitude to price currently combined UNEs at market levels because such pricing is allowed by the Act and it does not conflict with the FCC's pricing rules. The FCC was very specific to establish pricing rules for the provision of individual UNEs. The FCC did not establish pricing rules to govern the provision of currently combined UNEs.

This Commission has already recognized that pricing at market levels may be appropriate as noted in previous decisions. For example, in addressing combinations of UNEs in the AT&T, MCI and ACSI arbitration dockets, the Commission stated, "we note that we would be very concerned if recombining network elements to recreate a service could be used to undercut the resale price of the service." Order PSC-97-0298-FOF-TP at p. 8. Subsequently, in Order No. PSC-98-0810-FOF-TP (Docket No. 971140-TP), the Commission stated, "[w]e continue to find it troublesome that a service provisioned through unbundled access would have all the attributes of service resale but not be priced based on the Act's resale price standard." Order at p. 25. Further, on the same page of that Order, the Commission determined that UNE combinations should be priced at the sum of the UNE prices "except when the network elements are combined in a way to recreate an existing BellSouth retail service." [Emphasis added]. Order at p. 25.

Issue 3b: For which UNEs should the ILEC submit cost studies sufficient to deaverage those UNEs identified in Issues 1(a) and 1(b)?

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Q. WHAT IS BELLSOUTH'S POSITION ON THIS ISSUE?

A. As I previously discussed, geographic deaveraging of UNEs should not be considered until the Commission addresses the issues of funding for universal service and rate rebalancing and the FCC concludes its 319 proceeding. Assuming the FCC concludes that ILECs are required to provide local loops on an unbundled basis, cost studies should be filed to support geographic deaveraging of the unbundled loop based on the methodology outlined by Mr. Hendrix in his testimony. Again, however, implementation of geographically deaveraged loop rates should necessarily be deferred until such time as the Commission addresses the critical issues of universal service funding and rate rebalancing.

Issue 3c: To the extent not included in Issue 3(b), should the ILECs be required to file recurring cost studies for any remaining UNEs, and combinations thereof, identified by the FCC in its forthcoming order on the Rule 51.319 remand?

Issue 3d: To the extent not included in Issue 3(b), should the ILECs be required to file nonrecurring cost studies for any remaining UNEs, and combinations thereof, identified by the FCC in its forthcoming order on the Rule 51.319 remand?

Q. WHAT IS BELLSOUTH'S POSITION ON THESE ISSUES?

A. The provision of currently combined UNEs is directly tied to the individual UNEs that ILECs are required to offer ALECs. As previously discussed, the

specific UNEs that ILECs will be required to offer are currently the subject of the FCC's 319 proceeding. In the 319 proceeding, the FCC will establish a minimum set of required UNEs where access to the UNEs by ALECs is determined to be "necessary" and where failure to provide such access "impairs" the ability of an efficient ALEC to provide telecommunications services. If it is determined that a capability is not a UNE because it does not meet the necessary and impair standards of the Act, an ILEC will not be required to provide such capability to ALECs either alone or in combination to fulfill its obligations under Section 251 of the 1996 Act. Importantly, should an ILEC elect to offer such a capability, it would be on a voluntary basis, and any such offering is not bound by the Section 252(d)(1) pricing standard of the 1996 Act.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

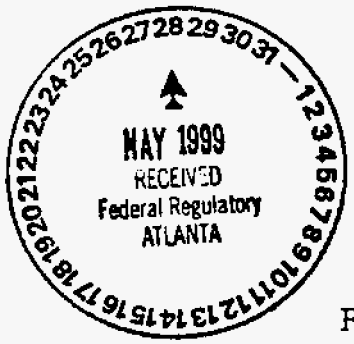
A. Yes.

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EXHIBIT AJV-1

BellSouth Comments and attachments Dated May 26, 1999 And BellSouth Reply Comments and attachments Dated June 19, 1999

CC Docket No. 96-98



PLEASE DATE-STAMP AND RETURN

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Implementation of the Local Competition Provisions in the Telecommunications Act of 1996	)	CC Docket No. 96-98
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BELLSOUTH'S COMMENTS

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SUMMARY

The Supreme Court has sent the Commission back to the drawing board with some specific instructions on how to approach section 251(d)(2). Those instructions require the Commission to draw from section 251(d)(2) a rational limiting standard on network element unbundling. The Court also instructed the Commission that in applying its limiting standard it *must* look beyond incumbent LEC networks in assessing the availability of present alternatives and the ability of CLECs to create alternatives through self-provisioning. The Court's instructions were informed by the fact that forced sharing may in fact displace competition with regulation rather than the reverse.

The Commission must focus its test on maximizing benefits to consumers. Creating entitlements for competitors to unbundled network elements under the Commission's current TELRIC pricing scheme cannot be the focus of a rational limiting standard on network element unbundling. The Commission could take an important initial step towards this goal by adopting a test it has already applied to network elements as the standard. Thus, the test under section 251(d) should relate to whether an element is necessary to, or whether the failure to unbundle would impair, an efficient CLEC's meaningful opportunity to compete.

The presence of competitive alternatives, the possibility of entry through self-provisioning and whether an efficient CLEC has a meaningful opportunity to compete can only be assessed by looking at properly defined product and geographic markets. The Commission practice when assessing competitive alternatives has been to define markets as the first step in its analysis. This proceeding requires the same approach.

When markets are defined and examined, one inescapable fact emerges -- local conditions vary to the extent that no single one-size-fits-all national list can reflect this variation. Constructing a one-size regulatory straight-jacket would be contrary to the Commission's own attempts to "move away from 'one size fits all' regulation and reduce the regulatory requirements on incumbent carriers as competition develops in discrete geographic areas," *Local Competition Survey* at 4, let alone Congress's pro-competitive de-regulatory goals for the 1996 Act.

The Commission has adopted a three zone approach to aggregating local markets in its *Special Access* and *Switched Transport* orders discussed below. These zones were drawn by the Commission to reflect competition and underlying economic forces that influence competition in local markets. This three zone approach provides one way to develop national lists for local elements that adequately reflect the presence of alternatives to incumbent LEC facilities and the ability of CLECs to self-provision.

CLECs have raised billions of dollars of capital and have invested that capital in alternative facilities. Thousands of miles of local fiber and hundreds of switches have been deployed in the last two years. CLECs have concentrated on using these facilities to serve the business market. The Commission has recognized that competition for larger businesses has been a fact for some time, and that CLEC competition for those customers continues to grow rapidly. Cable telephony presents a rapidly growing direct and complete substitute for residential local exchange servie delivered over incumbent LEC networks. The Commission must account for the role of cable telephony facilities as an alternative to incumbent LEC networks.

The Commission's lists must reflect the market realities set out in great detail below. The facts show that for many incumbent LEC network elements in many geographic areas there are

more than adequate alternatives to incumbent LEC elements. The ease of self-provisioning some elements means that CLECs could create alternatives in sufficiently short order that unbundling would not meet section 251(d)(2)'s standards.

The Commission should simply disclaim any interest in unbundling new network elements that incumbent LEC's are investing in to provide advanced services. Advanced services competition and competitive alternatives come from other networks as well the current ability of CLECs to compete effectively using incumbent local loops and collocation. There are no "incumbents" in this market and there is no incumbent LEC network to unbundle. Because incumbents have just begun deploying the new equipment necessary for them to provide advanced services, any unbundling requirement would unbundle incumbent LEC investment dollars rather than existing equipment. The Commission should be encouraging investment in advanced services equipment, not handicapping it. Any requirement that incumbent LECs invest in new equipment only to turn it over to CLECs once a profit opportunity has been established would create a substantial investment disincentive.

Heeding the Court's advice to develop and apply a rational, limiting unbundling will result in a list that reflects the many alternatives available to CLECs in the market.

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Implementation of the Local Competition Provisions in the Telecommunications Act of 1996	)	CC Docket No. 96-98
	)	
	)	

BELLSOUTH'S COMMENTS

BellSouth Corporation, on behalf of itself and BellSouth Telecommunications (BellSouth), hereby files these Comments in connection with the Commission's Second FNPRM in CC Docket Nos. 96-98 and 95-185.[1]

I. INTRODUCTION

The Commission's *First Report and Order* misapplied section 251(d)(2)'s standards for unbundling network elements. The Supreme Court has required the Commission to begin entirely anew.[2] BellSouth's comments set out a framework for implementing the Court's directive that the Commission develop and apply section 251(d)(2)'s necessary and impair standard in a way that creates a rational "limiting standard" on unbundling network elements. In applying this limiting standard, the Commission must look to the availability of competitive alternatives outside incumbent networks and to the ability of competitive local exchange carriers (CLECs) to self-provision network elements. Assessing competitive alternatives for particular

[1] *In the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, CC Docket Nos. 96-98. *Second Further Notice of Proposed Rulemaking*, FCC 99-70, released April 16, 1999 ("*Second FNPRM*").

[2] *In the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, CC Docket No. 96-98, *First Report and Order*, 11 FCC Rcd 15499 (1996)("*First Report and Order*"), *modified on reconsideration*, 11 FCC Rcd 13042

elements will require the Commission to define product and geographic markets for network elements and to identify all sources of alternative facilities. BellSouth proposes a single approach the Commission can use to assess whether incumbent LEC network elements meet section 251(d)(2)'s standard.

Although a single national standard is appropriate, a single national list of unbundled elements is not. As Commissioner Powell points out in his statement attached to the *Second FNPRM*, the results of applying a national standard to local markets will yield results that depend on local conditions. Providing local exchange service is a local business. The Commission cannot blind itself to the fundamental fact that local competitive and economic conditions vary widely across the country. The Commission's desire for a national list is achievable only if the list reflects the great variation in local conditions. A one-size fits all list would be inherently arbitrary, anti-consumer and contrary to the Court's instructions. Any such list would conflict with the Commission's goal, consistent with the Telecommunications Act of 1996 (Act) and the Court's opinion, "to move away from 'one size fits all' regulation and reduce the regulatory requirements on incumbent carriers as competition develops in discrete geographic areas." *Local Competition Survey* at 4.

The Commission has, in the past, grouped geographic markets based on the competitive similarity of choices available to consumers in each of the markets. BellSouth believes that for elements supplied in local geographic markets, such as loops and transport, the Commission should apply its national standard to the three zone approach it has used to grant incumbent's special access and switched transport pricing flexibility. These zones reflect competition and the

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(1996), *vacated in part, Iowa Utilities Bd v. FCC*, 120 F.2d 753 (8th Cir. 1997), *aff'd in part and rev'd in part sub nom. AT&T Corp. v. Iowa Utilities Board*, 119 S. Ct. 721 (1999).

basic economics that influence construction of competitive facilities. The zones reflect a basic distinction between large cities, smaller urban areas and rural areas. For local market elements, the Commission could easily establish a three zone national list. For elements that are provided in national markets, like operator services and directory assistance, a single national decision is appropriate.

This approach would allow the Commission to develop a workable list of network elements that must be provided at cost-based prices. The list will reflect local conditions for local elements. State commissions would then be free to apply the Commission's national analytic approach to assessing whether peculiar local market features are significant enough to warrant a change in the Commission's list. Based on a thorough fact-based record that reflects local market conditions, a state commission could add to or subtract from the Commission's list.

II. SUPREME COURT'S OPINION

The Supreme Court singled out two overarching mistakes in the Commission's original approach to unbundling network elements. First, the Commission mistakenly presumed that Congress intended that network elements were to be unbundled wherever technically feasible. This mistaken presumption was the linchpin for the *First Report and Order's* analysis of unbundling. By removing this linchpin, the Court's ruling requires the Commission to start entirely afresh and approach unbundling and the necessary and impair standard with a blank slate. The Court's second lesson is its conclusion that the Commission had failed to draw from the Act's necessary and impair language the rational limiting standard on unbundling that Congress intended. Unbundling without *meaningful* limits is contrary to Congress's basic pro-competitive, deregulatory goal for the Act.

A. Technical Feasibility and Unbundling

The Court identified a fundamental mistake underlying the Commission's entire original approach to network element unbundling. In the section of its *First Report and Order* addressing unbundling, the Commission began "with the premise that an incumbent was obliged to turn over as much of its network as was 'technically feasible,' and viewed [the statutory necessary and impair language] as merely permitting it to soften that obligation." *Id.* This incorrect premise led the Commission to misinterpret the Act as imposing a general duty on incumbent local exchange carriers (LECs) to unbundle whenever technically feasible. The Court held that the Commission's "premise was wrong." Rather, the Act's "technically feasible" language in section 251(c)(3) relates to "*where* unbundled access must occur, not *which* [network] elements must be unbundled." *Id.* quoting 120 F. 3d, at 810 (emphasis in original).

Correcting this flaw will require the Commission to reverse its presumptions on unbundling and reconsider the basic competitive wisdom of regulatory unbundling. *Iowa Utilities Board*, 119 S. Ct. 736. This will require the Commission to justify unbundling requirements on an element-by-element basis. Doing so will put the Commission back in touch with Congress's pro-competitive intent. Reversing course will also put the Commission on the same pro-competitive wavelength as the antitrust law, and will put it in accord with economic thinking on regulation.

The Act requires the Commission to assess whether network elements should be unbundled on an element-by-element basis. Unbundled access to an element may be required *only* if the element meets section 251(d)(2)'s standard. The Act creates no general presumption in favor of unbundling as the Commission mistakenly concluded. The Court has required the Commission to reverse its mistaken course of presuming that the Act mandates unbundling unless proven otherwise. *Id. Compare First Report and Order*, ¶¶ 281("a determination of

technical feasibility would then create a presumption in favor of requiring an incumbent LEC to provide the element"); 286 ("we conclude that the statute does not require us to interpret the 'impairment' standard in a way that would significantly diminish the obligation imposed by section 251(c)(3)"). Similarly, the Act can not be read to suggest that more unbundling is better than less, as the Commission's original approach seemed to read it. *Iowa Utilities Board*, 119 S. Ct. 754 (Breyer, J.).

Unbundling is permissible only where it furthers Congress's intent, and Congress intended unbundling to occur only when the facts demonstrate that section 251(d)(2)'s necessary and impair standard is satisfied.

B. The Court's Requirement That "Necessary and Impair" Serve As A Limiting Principle

The Court also held that the meaning the Commission gave to the necessary and impair standard in the *First Report and Order* did not match the terms of the statute or Congress's intent. . The Court explained that "if Congress had wanted to give blanket access to incumbents' networks on a basis as unrestricted as the scheme the Commission has come up with, it would not have included § 251(d)(2) in the statute at all." *Iowa Utilities Board*, 119 S. Ct. at 735. The Court then held that section 251(d)(2) was intended to impose a limiting standard on unbundling, and that the Commission must "apply *some* limiting standard, rationally related to the goals of the Act, which it has simply failed to do." *Id.* at 734-735 (emphasis in original).[3]

The Court singled out two of the Commission's positions on necessary and impair for discussion. Each independently supplied grounds for the Court's holding that the Commission's

[3] The Commission's freedom to consider "other factors" in addition to the necessary and impair tests is discussed below. Whatever "other factors" the Commission may choose to consider, they must be consistent with the Court's instruction that section 251(d)(2) provide a limiting standard.

approach conflicted with the basic thrust of the Act's limits on unbundling. First, the Commission refused to consider the availability of elements outside incumbent networks in assessing whether unbundling was necessary or the failure to unbundle would impair the ability to provide service. The Court held that the "Commission cannot, consistent with the statute, blind itself to the availability of elements outside the incumbent's network." *Id.* at 735. Echoing the antitrust laws, the Court specifically pointed to self-provisioning as an additional source of competitive supply that the Commission must evaluate. *Id.* at 734-735.

Second, the Court held that the Commission's conclusion that *any* increase in cost (or decrease in quality) from failing to unbundle an element of an incumbent's network was sufficient to support an unbundling requirement was contrary to the plain language of the statute. *Id.* at 735. The Commission's approach is "simply not in accord with the ordinary and fair meaning of " necessary and impair. Taking a cost increase (or quality decrease) that simply reduces a new entrant's profits as creating an impairment does not supply the rational limiting standard that the Act requires. *Id.*, n. 11.

III. DEFINING AN APPROACH TO THE NECESSARY AND IMPAIR STANDARD

The Commission must now articulate a reasoned approach to implementing section 251(d)(2)'s necessary and impair standard that resonates with Congress's pro-competitive deregulatory goals for the Act. As the Court made very clear, the Commission's prior approach did not do so.

A. The Court's Rules For Necessary and Impair

Other factors that would expand unbundling beyond that available under the necessary and impair standard would conflict with the Court's opinion and the Act, as discussed below.

The Court has supplied the Commission with guidance on how to properly approach the necessary and impair standard. First, section 251(d)(2)'s necessary and impair standard must supply a limiting principle on network unbundling that is rationally related to the Act's pro-competitive goals. This will require the Commission to give the statute's words -- "necessary" and "impair" -- the weight their "ordinary and fair meaning" requires. *Id.* at 735. "Necessary" and "impair" are strong words. Second, the Commission must look outside incumbent networks when assessing whether unbundling a network element meets the standard. This examination of competitive alternatives must include the ability of carriers to self-provision facilities. Third, the Commission may not order unbundling based on any increase in cost (or decrease in quality). It must articulate some rational standard for assessing the importance of the costs involved. At a minimum, the Commission's approach must include each of these requirements set out by the Court.

1. Necessary and Impair Must Supply A Limiting Principle

The Court provided an essential insight by establishing that necessary and impair must supply a limiting standard on unbundling. *Id.* at 734-735. The essential reason for Congress's limiting standard is that the blanket sharing of incumbent networks is fundamentally inconsistent with Congress's "pro-competitive, de-regulatory" Act.

Justice Breyer supplied the reasoning behind the Court's requirement that section 251(d)(2)'s necessary and impair language limit the sharing of elements of incumbent networks.

> Increased sharing by itself does not automatically mean increased competition. It is in the *un*shared, not in the shared, portions of the enterprise that meaningful competition would likely emerge. Rules that force firms to share *every* resource or element of a business would create, not competition, but pervasive regulation, for the regulators, not the marketplace, would set the relevant terms.

Id. at 754 (Breyer, J.).[4] Pervasive unbundling, as previously ordered by the Commission, limits the potential for competition and maximizes the need for regulation. Both directly conflict with Congress's basic goal for the Act. "A totally unbundled world ... is a world in which competitors would have little, if anything, to compete about. Such a world is not what the Act envisions." *Id.*[5]

The principal cost of forced unbundling will spring from reduced investment by incumbents and new entrants alike, and therefore reduced real competition.[6] *Id.* at 31 (Breyer, J.). These costs are discussed in more detail below.

Justice Breyer also spelled out that unbundling carries with it "significant" administrative costs. *Id.* at 753. These costs increase as the complexity of the elements and their importance to the incumbent firm increase. *Id.* at 753-754. One reason for this is the need for increasingly complex administrative proceedings to set the terms and conditions for sharing.[7] For example,

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[4] The unbundled network element platform nicely illustrates Justice Breyer's point. As envisioned by at least some CLECs, the platform would have the incumbent supply all the elements for CLECs to provide service in a single bundle. This bundle would be provided at TELRIC prices without CLEC investment or risk. This platform would reduce or eliminate the need for CLECs to build competitive facilities, and thus reduce competition. Although it provides for some form of retail arbitrage, this arbitrage hinders competition by sacrificing normal, unregulated market incentives to invest in competitive facilities. The platform is sharing every resource and leads to exactly Justice Breyer's result -- pervasive regulation substituting for competition. The platform and other combinations are discussed in more detail below.

[5] The *Jorde, Sidak and Teece* affidavit, discussed in more detail below, expands upon Justice Breyer's thinking. As Justice Breyer explained, a sharing requirement reduces incentives to invest. The affidavit spells out just how serious a reduction in investment by both incumbent ILECs and CLECs can occur. Mandatory unbundling is not itself a route to competition.

[6] The Commission's TELRIC pricing methodology maximizes the disincentives from cost-based unbundling by minimizing the potential for obtaining market-based rewards for investment.

[7] One example of how administrative complexity rapidly increases is the requirement that local switching be unbundled. Although the Commission may view this requirement as creating a single required element offering, in fact it has spawned many. BellSouth's price lists include 8 different unbundled switch port offerings. Each much be separately priced and administered. BellSouth's unbundled element price list includes 61 primary offerings. The regulatory literature does not support the notion regulators can set prices in such detail across such a broad range of technologically complex products and services without harming consumer welfare. The

BellSouth's unbundled network element price list contains 18 densely packed pages of prices. These regulatory proceedings create the delay and uncertainty that the Commission hopes to avoid. *Second FNPRM* at ¶ 13. A rational limiting principle will account for both the competitive and administrative costs of unbundling and the unnecessary delay and dependence on regulatory proceedings that it occasions.

> Regulatory rules that go too far, expanding the definition of what must be shared beyond that which is essential to that which merely proves advantageous to a single competitor, risk costs that, in terms of the Act's objectives, may make the game not worth the candle.

119 S.Ct. 754 (Breyer, J.).

These cautions against pervasive unbundling underlie Congress's choice of "necessary" and "impair" as the measures of its standard. Both are strong words that were intended to create a high threshold that parties must satisfy to claim an entitlement to unbundled elements. They must be interpreted and applied consistent with the Court's requirement that section 251(d)(2) supply a limiting standard. Congress created less restrictive standards for mandating incumbent LEC actions where it judged them, *e.g.* broad interconnection and resale requirements. Congress's desire for "rapid deployment" of advanced services provides another illustration of a standard not inserted into section 251(d)(2).

Congress's sharp distinction between resale and unbundling obligations, and the establishment of a high standard for unbundling, reflects a reasoned decision based on the economic realities set out by Justice Breyer that mandatory unbundling at prices set by regulators has substantial, concrete costs that can easily outweigh any supposed consumer welfare benefits. The Court's opinion makes it clear that Congress's procompetitive, deregulatory plan requires

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rapid pace of change in the industry, both technological and in corporate alliances, magnifies the potential harm of the Commission's previous central-planning approach.

that section 251(d)(2) be applied to create opportunities for competition rather than opportunities for regulation.

2. The Commission Must Look Outside Incumbent Networks To Alternative Facilities And Self-Provisioning

The Commission's original approach to the necessary and impair standards concluded that the availability of network elements outside incumbent networks was irrelevant to the need for a sharing requirement. The Court rejected this and required the Commission to weigh the ability of new entrants to self-provision an element or purchase access to it from a provider other than the incumbent LEC. *Id.* at 735. In doing so, the Court discussed and dismissed the Commission's underlying reasoning that "'requiring new entrants to duplicate unnecessarily even a part of the incumbent's network'" justified imposing an unbundling requirement. *Id.* quoting *First Report and Order*, ¶283.

The Court's message is that having new entrants duplicate incumbent networks is to be sought rather than avoided. Certainly the Commission's prior approach of requiring unbundling at cost-based prices in order to minimize CLEC investment in local facilities makes little policy sense. Investment in local facilities by CLECs and incumbents benefits consumers. By providing CLECs risk-free access to elements at TELRIC prices, the Commission's policy provides a substantial disincentive to CLEC investment in facilities.

Limiting unbundling so that free-riding does not interfere with normal incentives to invest in competitive facilities is a fundamental goal of section 251(d)(2)'s limiting principle and should be a fundamental goal of the Commission. Where competitive facilities can coexist with incumbent facilities, the Commission should not be providing incentives to CLECs to depend on

regulation rather than their own investment.[8] Simply put, the Commission may not justify an unbundling requirement because it saves CLECs from constructing network facilities. Sacrificing competition in the unshared portions of the network for sharing would contravene the Act and the Court's opinion.

3. Any Increase In Cost Must Be Substantial To Meet The Necessary And Impair Standard

The Court explicitly rejected the notion that any increase in cost justifies a sharing requirement. *Id.* The Court found that an increase in cost from obtaining an alternative to an incumbent element that only reduces a CLECs profit could not justify an unbundling requirement. Any cost increase must be material enough to have some ultimate effects on consumers, as discussed below.

The Court's analogy was that as long as the light bulb could still be changed, the incumbent's longer ladder was neither necessary nor would its absence impair the CLEC. By encouraging CLECs to substitute an incumbent's ladder when their own could be made to work, the Commission tipped the balance away from CLECs investing in their own facilities, and the resulting competition in the unshared facilities, to pervasive regulation of the shared facilities. The Court's opinion requires the Commission to base an unbundling requirement only on meaningful cost increases.

Comparing the costs of CLEC facilities to incumbent facilities must be done on an apples-to-apples basis. TELRIC prices set under the Commission's rules cannot be the standard

[8] Following through on the Court's mandate to look outside incumbent LECs' networks will give the Commission information on where, and what type of, CLEC facilities are currently operating and what capabilities CLECs have for self-provisioning. For example, during the three years since passage of the Act, CLECs have installed many switches and miles of transport. Commission examination of CLEC build-out plans would doubtless magnify this trend and remove any factual basis for unbundling of advanced services, transport and switching elements.

for comparison. For example, a CLEC claim that the costs of its own element so substantially exceeds the costs of an incumbent element priced at TELRIC that it cannot offer service is not probative of anything. TELRIC is a hypothetical price and does not reflect the incumbent's actual costs. As long as the CLEC seeks to compare its actual cost to something, that something must be the incumbent's actual cost. The Court did not appear interested in comparing hypothetical ladders.

IV. SOURCES OF PRACTICAL GUIDANCE FOR DEVELOPING A FRAMEWORK FOR APPLYING THE NECESSARY AND IMPAIR STANDARD

The Commission need not reinvent the wheel to develop a framework for applying the necessary and impair standards in a way that meets the Act's requirements. Although the necessary standard creates a higher hurdle, the analytical approach outline below applies to both. There is a large body of precedent at the Commission and developed under the antitrust laws that addresses how to implement Congress's procompetitive goal for the Act. Whether under the necessary or the impair standard, the ultimate goal of creating entitlements to network elements at cost-based prices is to maximize competition and the consumer welfare benefits competition creates. *See generally*, 3A P. Areeda and H. Hovenkamp, *Antitrust Law*, ¶¶ 771-77 (1996); *Hausman and Sidak Affidavit*, ¶¶ 45-47 attached to USTA Comments filed in this proceeding. (*Hausman and Sidak Affidavit*). Creating benefits for particular competitors alone will not benefit competition or consumers, and thus can never meet Congress's procompetitive goals for the Act.

Commission and antitrust precedent set out below outline a clear and well-established approach to evaluating competitive alternatives and the ability of firms to self-provision, as required by the Act and the Court. These precedents create a logical process for assessing

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competitive alternatives and competition. The process requires that markets be defined, competitors identified and the possibility for new entry and expansion be assessed. The final assessment of competition also requires examination of alternative avenues to compete for end user customers.

A. Defining Product And Geographic Markets

Competition occurs within markets and it is only within properly defined markets that the competitive effects of business and policy choices can be evaluated. Providing local exchange and exchange access is fundamentally a *local* business, and the network elements used to provide local service are often tied to these local markets. In order to determine whether unbundling a network element would benefit competition and consumers, the Commission must understand local market conditions. Antitrust analysis of essential facility claims is always performed within a defined market.[9] This can only be done within the context of properly defined economic markets.[10]

The Commission has adopted the market definition principles set out in the *Merger Guidelines*. *LEC Regulatory Treatment Order* at 15773-15774. The *Merger Guidelines* require that both a product market and a geographic market be defined. Product markets are defined by assessing whether a hypothetical monopolist of a particular product or service could profitably raise price above competitive levels. If enough consumers would shift to an alternative product

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[9] *See, e.g., Blue Cross & Blue Shield United of Wisconsin v. Marshfield Clinic*, 65 F.3d 1406-10 (7th Cir. 1995); 3A P. Areeda & H. Hovenkamp, *Antitrust Law*, ¶ 773 (1996).

[10] *See, e.g., In the Matter of Regulatory Treatment of LEC Provision of Interexchange Services Originating in the LEC's Local Exchange Area and Policy and Rules Concerning the Interstate, Interexchange Marketplace*, CC Docket Nos. 96-149 and 96-61, *Second Report and Order in CC Docket No. 96-149 and Third Report and Order in CC Docket No. 96-61*, 12 FCC Rcd 15756 (1997) (LEC Regulatory Treatment Order) at 15800 ("a relevant geographic market must be defined in order to conduct an accurate assessment of market power").

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or service to make the price increase unprofitable, the alternative must be included in the market, and the analytic process repeated. *Id.* at 15775-6, 15782 (demand-side considerations determine product market definition).

Geographic markets are defined similarly by assessing whether a hypothetical monopolist in a narrow geographic area could profitably raise prices above competitive levels. If enough consumers would shift to suppliers in other areas to make the price increase unprofitable, the alternative areas must be included in the geographic market, and the analytic process repeated. *Id.*

The Commission must place each network element it is evaluating in a defined product and geographic market. It is only within properly defined markets that competitive alternatives to a particular network element, or any other competitive asset, can be assessed. Geographic markets for some elements like loops and transport are likely to be local. However, geographic markets for other elements -- operator services and directory assistance as examples -- are likely to be national.

Some network element markets are likely to be provided on an essentially point-to-point basis.[11] The Commission has established criteria for grouping individual point-to-point markets into larger geographic markets. Where consumers in a larger area face "the same competitive alternatives for a product," that entire area can be treated as a single geographic market. *Bell Atlantic/NYNEX* Order at 20016-7. Thus, the Commission has used LATAs and MSAs as geographic markets for local exchange and exchange access. *Id.* at 20017-8. The Commission

[11] *In the Application of NYNEX Corporation, as transferor, and Bell Atlantic Corporation, as Transferee, For Consent to Transfer Control of NYNEX Corporation and Its Subsidiaries*, File No. NSD-L-96-10, *Memorandum Opinion and Order*, 12 FCC Rcd 19985, 20016-7 (1997) (*Bell Atlantic/NYNEX Order*).

may similarly group point-to-point-type network elements and other elements delivered in local geographic markets.

In the sections below, dealing with individual network elements, BellSouth suggests appropriate product and geographic market definition and market groupings.

B. Identifying Market Participants And Their Significance

Once a market for a particular network element is defined, the Commission can identify the competitors in that market and the competitive alternatives available to the network element under consideration. Competitors include all those currently producing or selling in the market. *Merger Guidelines* § 1.31. This includes the output of vertically integrated firms, *id.*, and firms that have committed to enter the market. *Id.* at n. 27. Firms or facilities not currently in the market but which could enter within a year without the expenditure of significant sunk costs are counted as current market participants.[12] *Id.* The Commission has recognized the importance of supply substitution responses. *LEC Regulatory Treatment Order* at 15782, n. 121 ("supply substitutability identifies all productive capacity that can be used to produce a particular good, whether it is currently being used to produce that good or to produce some other, even unrelated, good"); *AT&T Reclassification Order*, 11 FCC Rcd 3271, 3303-05.

In assessing competitive alternatives, self-provisioning or ease of entry may trump any seeming limits on competitive alternatives. *Merger Guidelines* § 3; *Areeda & Turner.* The government's expert competition agencies have set a two year time horizon for assessing the competitive benefits of entry. *Merger Guidelines* § 3.2. The judgment is that entry within two

[12] This may be particularly relevant to the consideration of competition in switching. The evidence indicates that switches may be installed in well under a year. Switch capacity already in the market may be substantially expanded in that time. Wireless and long distance may be converted at least partially to local use within a year through software upgrades. Sunk costs vary among these different routes, but may not be "substantial" under any of them.

years is timely enough to prevent consumer harm, and that governmental intervention in that market would not produce consumer benefits. Although the Commission may not be bound by this two year time horizon for assessing competitive alternatives, it would do well to adopt the same pro-competitive judgment as the expert competition agencies.

C. Assessing Competition

In assessing competitive alternatives to incumbent network elements and the consumer effects of forced unbundling, the Commission has already established a number of useful guideposts. The Commission has recognized that end user markets, "where a final product or service is sold to end-user customers," are distinct from input markets, "where the product or service is sold to firms that use it as an input in producing other products or services."[13] Network elements are inputs that are used to produce telecommunications services. As antitrust analysis makes clear, a "monopoly" of an input may not create any monopoly power to raise prices to end users. Thus, the essential facilities doctrine requires that the firm controlling the essential facility be a monopolist of some end user service. *MCI Communications v. AT&T Corp.*, 708 F.2d 1081, 1132-33 (7th Cir. 1982), *cert. denied*, 464 U.S. 891 (1983). Similarly, an input patent may carry with it no power to raise prices if there are alternative ways to reach end users.[14]

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[13] *In re Application of Teleport Communications Group, Inc., Transferor, and AT&T Corp., Transferee, for Consent to Transfer Control of Corporation's Holding Point-to-Point Microwave Licenses and Authorizations to Provide International Facilities-Based and Resold Communications Services*, CC Docket No. 98-24, *Memorandum Opinion and Order*, 13 FCC Rcd 15236, 15245 (1998) (*AT&T/Teleport Order*).

[14] "Although the intellectual property right confers the power to exclude with respect to the *specific* product, process, or work in question, there will often be sufficient actual or potential close substitutes for such product, process, or work to prevent the exercise of market power." *1995 Department of Justice and Federal Trade Commission Antitrust Guidelines for the Licensing of Intellectual Property* § 2.2. A natural gas pipeline may be the only gas pipeline to a particular customer, but if that customer is a large industrial firm it can substitute among natural gas, coal or other energy sources or justify extension of a competing gas pipeline to its facilities.

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The Commission must carefully consider the impact of unbundling what may seem on the surface to be "essential" input facilities where there are alternative routes to compete for end users. For example, in many locations local exchange service or advanced services can be delivered to consumers over cable or wireless facilities. Where the local telephone loop no longer provides the potential to determine consumer prices, subjecting the local telephone loop to unbundling at cost-based prices would serve no pro-competitive or pro-consumer purpose. 3A P. Areeda & H. Hovenkamp, *Antitrust Law* ¶ 773.

A final Commission competition finding is of general applicability here. The Commission's orders defining local service markets have recognized that demand for local service can be separated into distinct markets based on demand characteristics. In the *Bell Atlantic/NYNEX Order*, the Commission found that residential and small business customers, medium-sized businesses and large businesses/government users were sufficiently distinct to require separate examination. *Bell Atlantic/NYNEX Order* at 20016 ("[b]undles of services that appeal strongly to one segment ... are often not acceptable substitutes for the services preferred by the other segments). More recently the Commission has determined that the three categories could be combined into two: mass market and larger businesses. *AT&T/Teleport Order* at 15247. However, it may be on closer examination that a three-part division more accurately reflects market dynamics.

The different demands exhibited by these different groups has given rise to varying levels of service competition and varying levels of competitively supplied alternatives to incumbent network elements. The Commission has found that entry into the larger business market is

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Hartigan v. Panhandle E. Pipe Line Co., 730 F. Supp. 826, 866 (C.D. Ill. 1990), *affirmed, State of Illinois v. Panhandle E. Pipe Line Co.*, 933 F.2d 1469 (7th Cir. 1991).

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relatively easier than into the mass market, and that numerous new entrants are rapidly entering the larger business market. *Id.* at 15250.

V. A BALANCED APPROACH TO APPLYING SECTION 251(d)(2)'s STANDARD TO NETWORK ELEMENTS

This section provides an approach to further defining and applying the Act's unbundling standard to network elements. The suggested approach is informed by traditional competitive analysis, consumer welfare principles and the Act's essential pro-competitive, deregulatory goals.

As an initial matter, and before applying section 251(d)(2)'s standard, the Commission should determine whether unbundling the network element in question is technically feasible. If unbundling is not technically feasible, it cannot be required.[15]

A. The Necessary Standard

Section 251(d)(2)(A) requires the Commission to consider whether unbundling of proprietary network elements is "necessary" to offer a service. Consistent with the high degree of legal protection normally accorded intellectual property, the Act requires consideration of whether a proprietary element is "necessary."

The necessary standard should apply to what is traditionally thought of as intellectual property. The Department of Justice Intellectual Property Guidelines treat as intellectual property work subject to patent, copyright, trade secret or similar protections. *See* U.S. Department of Justice and Federal Trade Commission, *Antitrust Guidelines for the Licensing of Intellectual Property* Section 1 (1996). A network element is proprietary if it contains

[15] The essential facilities doctrine contains a similar limitation. *See MCI Communications Corp. v. AT&T Co.*, 708 F.2d. 1081, 1132-33 (7th Cir. 1982), *cert. denied*, 464 U.S. 891 (1983)(essential facilities plaintiff must show "the feasibility of providing the facility").

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"proprietary protocols or elements containing proprietary information." *First Report and* Order at 15641-2.

Intellectual property is subject to extensive protection under patent law, statute and common law because preserving incentives to invest in the creation of intellectual property creates large social benefits. The Department of Justice's broad definition of intellectual property is tailored with a view towards maximizing the consumer benefits of competition and minimizing regulation. As such, it is in harmony with Congress' goals for the Act and should be adopted by the Commission.

Forced sharing of intellectual property at cost-based prices is antithetical to the well-recognized consumer benefits of investing in the development of intellectual property.[16] A patent, for example, grants to the patent holder a right of exclusive use of his or her invention. 35 U.S.C. §§ 101, 154, 161, 171 (1994). This right includes the right not to use or license a patent. *Id.* Patent and other intellectual property laws protect the rights of inventors to maximize the profits from their labor and risk-taking. *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 480-81, 484 (1974).

To ensure that forced sharing of intellectual property is necessary, the burden of proof must be placed on parties seeking access. These parties should be required to demonstrate that the benefits of forced access to the intellectual property at issue at cost-based prices clearly outweighs the costs. Forced sharing promises significant social costs in reduced investment as inventors are denied the benefits of their labor and competitors are free to reduce investment in certain areas knowing that they can ride on the incumbents innovation at cost. *See Jorde, Sidak*

[16] "[A] sharing requirement may diminish the original owner's incentive to keep up or to improve the property by depriving the owner of the fruits of value-creating investment, research, or labor." *Iowa Utilities Board*, 119 S.Ct. 753 (Breyer, J.).

and Teece Affidavit attached to USTA Comments filed in this proceeding (*Jorde, Sidak and Teece Affidavit*).

Consistent with the Commission's past competitive practices and the antitrust laws, the only cognizable benefits to be weighed in this analysis are benefits to consumers. The fact that a CLEC could profit from cost-based access to an incumbent LEC's intellectual property cannot alone justify a sharing obligation. The patent and antitrust laws both protect the right to exclusive use of intellectual property laws in order to ensure that innovators have an opportunity to reap a reward for the risk they have undertaken.[17]

The Commission must avoid any definition or application of the necessary standard that would create a perception that incumbent LEC investment in innovation would be freely available to all at cost-based prices.[18] Doing otherwise would risk dampening incentives to create innovative offerings. The Commission should take two steps to accomplish this. First, since CLECs, incumbent LECs and other firms are equally free to invest in innovative advanced or enhanced local offerings, and various competitive outlets for such innovations now exist, there is no reason to require forced sharing of innovative intellectual property in these areas.[19] Second, the Commission should require parties seeking cost-based sharing of intellectual property to demonstrate that the intellectual property at issue is necessary to provide basic local exchange or exchange access service. This would limit forced sharing to those intellectual property inputs that are necessary to basic service and the development of local competition as it

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[17] U.S. Department of Justice and Federal Trade Commission, *Antitrust Guidelines for the Licensing of Intellectual Property* Section 1 (1996).

[18] This reduction in investment, and consequent consumer harm, from cost-based unbundling mandates must be considered before unbundling is ordered. BellSouth suggests that this is best done explicitly, as set out below.

[19] The Department of Justice recognizes that markets for innovation are generally highly competitive.

was understood at the time the Act was passed. Innovation aimed at new and advanced services should be free from the investment damper created by the prospect of forced sharing. The Commission should clearly state that no such sharing will be compelled in order to maintain market incentives provided by the intellectual property and antitrust laws to invest in innovation.

The Commission's application of section 252's pricing rules to shared intellectual property should not destroy the social benefits of investment in innovation and intellectual property.

B. The Impair Standard

Section 251(d)(2)(B) contains a second standard that requires the Commission to consider whether failure to unbundle any network element would impair the ability of a requesting carrier to offer telecommunications service. In developing and applying a test, the Commission must identify a goal that is consistent with Congress' pro-competitive, deregulatory intent. As outlined earlier, the right goal is maximizing consumer welfare. Assessing impairment against a consumer welfare standard allows the Commission to ensure that its standard and the application of that standard is aimed at protecting competition, not competitors. The steps to properly developing and applying a test are set out below.

1. Defining The Impair Standard

"Impair" should require an important or material reduction in an efficient CLEC's meaningful opportunity to compete. In the *First Report and Order*, the Commission used a phrase that provides the proper context for applying "impair" in the context of unbundling. Section 251(c)(3) requires that incumbent LECs provide "any requesting carrier" access to unbundled elements in a "just [and] reasonable" manner. The Commission interpreted this to mean that network elements must be provided in a way that "would provide an efficient

competitor with a meaningful opportunity to compete."[20] *First Report and Order* at 15660. By using an "efficient competitor" as the standard, the Commission properly focused the test on competition instead of particular competitors. The Commission also avoided the quagmire of a CLEC-by-CLEC opportunity test that would have set an incumbent's provisioning requirements by the ability or inability of each CLEC to manage its own business.

The Commission's test also properly stressed that the measure is "meaningful opportunity" to compete rather than some guarantee of competitive success. This test well serves consumer welfare and Congress' pro-competitive deregulatory goals by providing efficient competitors the opportunity to compete, and then letting the market decide success or failure.

If failing to unbundle a network element takes away an "efficient" competitor's "meaningful opportunity to compete," the impairment standard is properly met because competition and consumer welfare may well suffer.[21] As noted above, the Commission has already used this standard to determining *how* network elements must be provided. The standard fits equally well for defining *which* elements must be unbundled. This standard also meets the Court's requirement that the Commission assess competitive alternatives and the relative costs of those alternatives. These are best measured by determining if an efficient competitor has a meaningful competitive opportunity to compete without those facilities.

Assessing whether a meaningful opportunity to compete has been impaired requires a point of comparison, a norm or baseline situation against which to measure. AT&T presents one

[20] No objection to this interpretation has been lodged at the Commission or with the courts.

[21] The reduction in investment, and consequent consumer harm, from cost-based unbundling mandates must also be considered before unbundling is ordered. BellSouth suggests that this is best done as proposed below.

extreme at which the baseline could be located. *AT&T Ex Parte*, Docket No. 96-98 "Remand Proceeding on Rule 319" at 37. In essence, AT&T argues that the baseline should be a universal, instant, problem-free rollout of the broadest possible line of local service at maximum convenience to the CLEC. *AT&T Ex Parte* at 11. If failing to unbundle a network element would have a negative effect measured against that benchmark, AT&T would have the Commission declare the impair standard met and require unbundling at cost-based prices. (For whatever reason, the prospect of unbundling the other wireline network into the home draws from AT&T a radically different answer. Apparently, AT&T believes that no degree of impairment of the breadth, timing or convenience of competitors rolling out competitive advanced services over the cable network could even begin to justify an unbundling requirement.)

Of course, AT&T's suggested benchmark is ludicrous. It certainly violates the Court's requirement of a rational, limiting standard and the goal of the Court's requiring the Commission to decide whether unbundling meets the requirements of section 251(d)(2) rather than essentially delegating that decision to CLECs. *Iowa Utilities Board*, 119 S.Ct. 736. Creating some other worldly CLEC utopia where work, risk and investment are reduced to a minimum by entitlements to incumbent network elements was not Congress' goal.

Congress specified that impairment results from the inability to offer service, *not* the inability to roll out service in a way that no business ever has. The proper standard against which to measure impairment is a realistic business plan for service rollout that would create competitive benefits for consumers. BellSouth has substantial experience rolling out service, whether it involves enhancements to its wireline network or construction from the ground-up of

new cellular, PCS networks and networks in foreign countries. No business plan for creating a new service offering is built on universal, instant, problem-free rollout of the broadest possible line of local service at maximum convenience.

2. Applying The Impair Standard

Determining whether the lack of access to a particular element would impair an efficient CLEC's meaningful opportunity to compete requires a fact-based analysis of competitive alternatives and the possibility of entry or self-provisioning. As noted above, the Commission must also analyze end user competition to determine if unbundling would create competition that benefits consumers or that just benefits particular firms. Mandatory unbundling at cost-based prices will always create potentially lucrative possibilities for arbitrage, especially given the historical end user pricing of local service. The Commission's goal should be to determine that impairment relates to "meaningful opportunities to compete" instead of to opportunities to profit from arbitrage that creates no real consumer benefits.

The Commission and the antitrust agencies analyze competition by defining markets, identifying the competitors and the competitive facilities in the market and then assessing entry possibilities. Then the competitive situation can be meaningfully assessed. *Bell Atlantic/NYNEX Order* at ¶ 37; *LEC Regulatory Treatment Order*, 12 FCC Rcd 15756; *Merger Guidelines*. The Commission should follow those same steps in applying the impair standard. That analysis will require facts on competitive facilities and competitive options, including installation of new facilities and expansion of old, and the costs and benefits to CLECs from investing in alternative facilities. Facts about alternatives routes to competition for end users must be gathered to assess the potential consumer benefits or harms from unbundling.

C. Other Factors

Section 251(d)(3) allows the Commission to "consider" other factors. Fidelity to Congress's intent and basic rules of statutory construction require that any other factors that the Commission considers be consistent with those Congress wrote into this section and the "limiting" standard on unbundling that the Court held Congress intended.

Congress's inclusion of the phrase "at a minimum" in Section 251(d)(2) indicates that the Commission may establish principles for unbundling that go beyond the necessary and impair standards. But because "agency discretion . . . does not encompass the authority to contravene statutory commands," any additional factors that the Commission considers may not override the necessary and impair tests expressly set forth in Section 251(d)(2).[22]

Specifically, the Commission permissibly might determine that a network element should not be subject to mandatory unbundling even if it passes the necessary and impair standards. Such a determination might be based on a judgment that requiring cost-based unbundling would, on balance harm consumer welfare due to the disincentives it creates to investment, or simply because of the administrative burden it may create. But the Commission may not require unbundling of an element that fails the necessary or impair tests. Otherwise – if the Commission could use additional factors to trump the necessary and impair tests – it could nullify the Supreme Court's command that the Commission must "giv[e] some substance to the 'necessary' and 'impair' requirements." AT&T Corp. v. Iowa Utils. Bd., 119 S. Ct. 721, 736 (1999). Indeed, the Supreme Court made clear that the statutory necessary and impair tests are "standard[s] [that

[22] Farmworker Justice Fund, Inc. v. Brock, 811 F.2d 613, 622 (D.C. Cir. 1987); see also Robbins v. Reagan, 780 F.2d 37, 48 (D.C. Cir. 1985) (per curiam) (Congress intends agencies to make decisions "based on factors solely related to the goal of implementing the stated statutory purposes in a reasonable fashion, rather than taking irrelevant or impermissible factors into account").

must] be[] met," not simply considerations that might be relevant to the Commission's analysis. See 119 S. Ct. at 735.

Reducing the statutory tests to subordinate "considerations" also would violate the dictate that the Commission should "tak[e] into account the objectives of Act" when applying Section 252(d)(2). Id. at 736. Section 251(d)(2) implements Congress's judgment that efficient, facilities-based entry is the key to local telecommunications competition.[23] To encourage that competition, Congress placed a "limitation upon network-element availability." 119 S. Ct. at 734. Congress designed the 1996 Act to maximize incentives for investment and the welfare of consumers, not the profits of competitors. Thus, Congress did not want new entrants to have a mandatory right of access to the incumbent's network when they are able to compete without such access. Any attempt to evade this statutory limitation, and thereby extend regulation to areas where Congress wanted unfettered competition, would slow or stop the deployment of new facilities by incumbents and CLECs alike.

The social costs of creating a CLEC entitlement to incumbent LEC assets at cost-based prices set by regulators must be considered in the Commission's analysis. Otherwise, no reasoned judgment on the consumer welfare effects of forced unbundling could be made. Although this essential analytical factor could be considered within the necessary and impair

[23] See, e.g., AT&T Corp. v. Iowa Utils. Bd., 119 S. Ct. at 753 (Breyer, J., concurring in part, dissenting in part) ("[t]he unbundling requirement seeks to facilitate the introduction of competition where practical, i.e., without inordinate waste"); S. Conf. Rep. No. 104-230, at 1 (1996) (Act "designed to accelerate rapidly private sector deployment of advanced telecommunications and information technologies"); id. at 148 (drafters contemplated that Act would promote facilities-based, "local residential competition"); Notice of Proposed Rulemaking, Order on Remand, and Waiver Order, Amendment of the Comm'n's Rules to Establish Competitive Serv. Safeguards for Local Exchange Carrier Provision of Commercial Mobile Radio Servs., 11 FCC Rcd 16639, 16678-79, ¶ 80 (1996) ("[t]he interconnection provisions of the Act, Section 251 and 252, are designed to promote facilities-based local exchange competition").

analysis, the Commission and consumers would be best served by making it a third, explicit factor.

The substance of this third factor is to require the introduction of facts concerning, and explicit analysis of how, unbundling and access under whatever the Commission's then-current pricing standard is likely to affect CLEC investment in competitive facilities and incumbent LEC investment in new and improved facilities. This factor should be a necessary component of any evaluation of mandatory unbundling because forcing unbundling at cost-based prices has substantial and far-reaching affects on competition and consumers.

Unbundling an incumbent LEC network element and requiring its provision at cost-based prices creates disincentives to CLEC investment in competing facilities. *Jorde, Sidak and Teece Affidavit* at ¶¶ 47-54; *Hausman and Sidak Affidavit* at ¶¶ 78, 86-88. Potential access to unbundled incumbent facilities at cost-based price introduces a new element into any CLEC's investment decision. Access to those elements "substantially decreases a CLEC's incentives to make a sunk investment." *Jorde, Sidak and Teece Affidavit* at ¶ 47. Where risky investments are involved, unbundling "tips the balance of the CLEC's calculus in favor of waiting" because the CLEC can simply wait until the ILEC makes the investment to see if the investment will succeed. The CLEC can then use the incumbent asset at a cost-based price. *Id.* at ¶ 49.

Mandatory unbundling at cost-based prices will obviously reduce incumbent LECs' investment incentives. Justice Breyer explained that "[n]or can one guarantee that firms will undertake the investment necessary to produce complex technological innovations knowing that any competitive benefits deriving from those innovations will be dissipated by the sharing requirement." *Iowa Utilities Board*, 119 S. Ct. at 753 (Breyer, J.).

> Regulatory use of cost-based rates (such as TELRIC) creates negative economic incentives for new investment and for innovation in telecommunications. If the new investment succeeds, the CLEC can purchase the ILEC's unbundled element at cost, as set by TELRIC. If the new investment does not succeed, the CLEC competitor does not bear any of the cost.... If the cost-based rate of the unbundled elements corresponding to the new service were set exactly at the cost of providing the new service, with no return to R&D costs and no reward to uncertainty, then regulation would completely eliminate the economic incentive to provide the new service, because the expected return to the ILEC would *always* be negative.

Hausman and Sidak Affidavit at ¶¶ 75, 77 (footnotes omitted, emphasis in the original).

The results of analyzing this factor may lead the Commission to refrain from unbundling particular elements that it might otherwise have ordered unbundled. Such a result would be consistent with consumer welfare and the Court's insistence that Congress intended a limiting standard rather than an expansive one.

D. The Burden Of Proof

Unbundling is not always, or even usually likely to increase consumer welfare. *Jorde, Sidak and Teece Affidavit.* Mandatory unbundling, particularly at cost-based prices, will always have social costs, by reducing investment and imposing administrative costs on society. It may have social benefits (and will have, if done properly) in a narrower set of circumstances. As Justice Breyer explained in his opinion in *Iowa Utilities Board*, competition will occur in the *un*shared parts of the network, not in the shared parts. The social costs of unbundling suggest that the burden of proof be placed on the parties seeking unbundling.

Section 251(d)(2) contemplates placing the burden of proof on the same parties. It requires a positive demonstration that a network element is necessary or that failure to unbundle it would impair before unbundling the element can be justified.

Finally, the burden of proof should also be placed on CLECs because the information is most directly in their hands and they may have little incentive otherwise to produce it. BellSouth does not have direct access to internal CLEC information and the Commission has not gathered the information from CLECs that would support a conclusion that any network element meets section 251(d)(2)'s standard for unbundling.[24]

E. The Role Of The State Commissions

The Commission can and should articulate a single national approach to defining a section 251(d)(2) test and a methodology for applying it. The Commission can and should determine a list of unbundled network elements that reflects the diversity in local conditions. As described in detail below, BellSouth believes that local markets can be grouped into three zones. The Commission's national list of these local markets would simply distinguish unbundling obligations among the zones, as required by market facts.

State commissions, applying the Commission's national test and methodology, would then play two important roles where they could bring their knowledge of local market conditions to bear. First, carefully applying the Commission's standards for applying section 251(d)(2), they could modify the Commission's three-zone national list where local market peculiarities require. This would be limited to adding or removing network elements previously identified by the Commission from the list of unbundled elements in a particular zone. As discussed above, the burden of proof must ultimately be borne by the party seeking entitlement to an element

[24] *Local Competition Survey* at 1, 6("[t]he voluntary surveys do not provide comprehensive information about the number of switched lines CLECs provide to their customers solely over their own facilities. This is the missing piece of information that is required"). Even as to unbundling local loops, the Commission cannot simply assume that unbundling meets the statutory standard given the dynamism inherent in today's market. Cable telephony, fixed wireless loops and cellular and PCS offerings require, at a minimum, careful consideration as alternatives to the local telephony loop.

under section 251(d)(2).[25] The party would have to show that the local market is substantially different from other markets in its geographic grouping and that the element met the Commission's section 251(d)(2) standard. Given the rapid pace at which CLECs are deploying competitive facilities, the Commission should mirror market realities and establish a strong presumption against modifying its list through additions of elements it has not included on its list of unbundled elements While reducing the list is consistent with Congress's de-regulatory goals, adding to it is not. A party seeking to add an element should be required to demonstrate by clear and convincing evidence that section 251(d)(2) is satisfied.

Second, state commissions would consider CLEC requests for creating new network elements -- that is, requests for elements that have not previously been defined as such by this Commission. Such requests will fall into two categories, only one of which should be open to consideration. Requests in the other category should be precluded by Commission rule.

Some requests will be for elements that are present in incumbent LEC networks, but which CLECs have not sought to unbundle yet. As set out above, given the rapid pace at which CLECs are deploying competitive facilities and Congress's de-regulatory intent, requests for new elements should be required to demonstrate by a clear and convincing margin that the new element meets section 251(d)(2)'s requirements.

The Commission should adopt a rule precluding the unbundling of elements that are new to incumbent LEC networks. Such elements can be deployed effectively by CLECs. The investment disincentives created by the possibility of unbundling new investment are very substantial.

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[25] The ultimate burden of proof must remain on the party seeking entitlement to unbundled element even where removing an element is at issue. However, when an incumbent seeks to remove an element from the list, it should bear the initial burden of going forward.

VI. ANALYSIS OF SPECIFIC NETWORK ELEMENTS

The following sections analyze whether the Commission should order that particular elements be unbundled and provided at cost-based prices. The best place to look for evidence of the possibility that an efficient CLEC's meaningful opportunity to compete may have been impaired is the market. CLECs are competing successfully across the country without using incumbent LEC network elements. Much of the existing marketplace evidence is presented below.

A key common thread that emerges is that because the competitive situation for elements varies so enormously by geographic market, the Commission must examine specific markets (or groups of markets) in order to properly apply the necessary and impair standards. A single national treatment of transport or loops, for example, could never be justified under the Commission's well-established market definition precedents because the alternatives to network elements and the overall competitive situation in major urban areas differs so greatly from rural areas.

The elements analyzed below include all of the elements the Commission subjected to unbundling under its original analysis as well as "new" elements discussed in the *Second FNPRM*.[26] Operations support systems should be provided to support network elements that must be unbundled. Where an element is not subject to unbundling, unbundling of OSS for that element is not required by the section 251(d)(2).

Consistent with the approach outlined above, and the Commission's traditional approach to competitive analysis, each of the following sections defines a product and geographic market

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[26] The Commission must approach each of these elements with a blank slate. *Iowa Utilities Board*, 119 S.Ct. 736-737.

(and, where appropriate, sets out the proper way to aggregate individual geographic markets across the country to make analysis both accurate and manageable). Each section then describes the current competitive facts. Next, the analysis compares facts to the Act's standards, and includes a specific discussion of the likely consumer effect of mandatory unbundling at cost-based prices. Finally, each section includes a conclusion as to whether a particular element can legally be unbundled.

A. Network Elements Used In The Provision Of Advanced Services

The *Second FNPRM* seeks comment on whether network elements used in the provision of advanced services should be unbundled. *Second* FNPRM, ¶ 35 (citing the *Advanced Services NPRM*). The Commission singles out the incumbent LEC digital subscriber line access multiplexer (DSLAM) and packet switch in particular for comment. *Id.* As described below, both these elements are used to provide advanced service over the networks of incumbent LECs. The Commission has previously defined advanced services by their speed, rather than their method of delivery -- transmission at speeds in excess of 200 kbps are, at least today, considered to be advanced services whether delivered over cable, wireless, satellite or traditional wireline telephony facilities.[27]

It would be extraordinary for the Commission to order unbundling in the advanced services arena. This is a market that is just being created. An unbundling requirement here would apply essentially to investment dollars, not existing networks or equipment. BellSouth has deployed fewer than 150 DSLAMs. For perspective, BellSouth has about 1,600 central

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[27] *In the Matter of Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996*, CC Dkt. No. 98-146, Report FCC 99-5, released February 2, 1999, ¶ 20 (*Advanced Services Report*).

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offices. CLECs have installed more DSLAMs than "incumbents," and there is no shortage of capital that would stop them from continuing to do so. The Commission should be encouraging investment by all parties in this market. Unbundling incumbent LEC investment dollars does not do this, as AT&T has so vigorously, and successfully argued concerning the directly analogous investment it is making in upgrading its cable networks. C. Michael Armstrong, *Telecom and Cable TV: Shared Prospects for the Communications Future,* delivered to the Washington Metropolitan Cable Club (Nov. 2, 1998) available at <<www.att.com/speeches/98/981102.maa.html.

Unbundling is doubly unnecessary because the market facts demonstrate competitive advanced services may be provided equally well, or better, over other networks. In fact, both cable and wireless providers are ahead of incumbent LECs in rolling out advanced services.[28] As discussed more fully below, competition from alternative networks "opens the possibility of intermodal competition, like that between trucks, trains, and planes in transportation." *Advanced Services Report,* ¶ 48 (footnotes omitted). Competition between networks promises a "competitive 'broadband market.'" *Id.* ¶ 48 n. 46.

Unbundling the wireline network while leaving directly competing networks free of unbundling obligations would be a short-sighted, fundamentally anti-consumer and anti-Congress act because it would substitute regulation for competition instead of the reverse. Ignoring "intermodal" competition is exactly the shortsighted regulatory mistake that led to the deterioration of the nation's railroads, which labored under regulatory burdens not imposed on competitive forms of transportation. The Commission's analysis of unbundling in the advanced

[28] *Advanced Services Report,* ¶¶ 53-58.

services area must specifically account for the competitive discipline imposed by competing methods of delivering advanced services.

1. DSLAMs and Packet Switches in the Wireline Network

As detailed in the *UNE Fact Report: Advanced Services*,[29] high-speed services can be delivered over traditional wireline networks. Doing so requires a digital modem at the subscriber's premises and a DLSAM at the end of the subscriber's copper loop, generally the nearest central office. The DSLAM separates the xDSL subscriber's voice and data traffic.[30] Voice traffic is routed to a traditional circuit switch while data traffic is routed to its destination through a packet switch.[31] The transport media used between the subscriber and the central office is the same twisted pair loop as that used for today's purely voice service.

To offer xDSL service to a particular subscriber, an incumbent LEC and a CLEC must go through exactly the same steps. First, a DSLAM must be purchased and located in the particular central office at which the subscriber's copper loop terminates. Because xDSL is a copper loop technology, the DSLAM cannot be located beyond the central office. Traffic beyond the central office is generally digitized and transported on fiber facilities. xDSL technology will not function in those circumstances. This technological fact means that enhanced extended links, for

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[29] P. Huber and E. Leo *UNE Fact Report*, Prepared for Ameritch, Bell Atlantic, BellSouth, GTE, SBC, and US West, attached to the comments of the United States Telephone Association, filed in this proceeding (May 26, 1999).

[30] *In the Matter of Deployment of Wireline Services offering Advanced Telecommunications* Capability, CC Docket No. 98-147, *First Report and Order and Further Notice of Proposed Rulemaking*, FCC 99-48, released March 31, 1999, ¶¶ 11-12 (*Advanced Services Order*).

[31] The packet switch can be a frame relay or ATM switch. Both provide the same basic functionality. The choice between them is driven by economics and quality of service needs. Both switches are also used for a broad array of other data services.

example, cannot be used by any carrier to provide xDSL service. All carriers, CLECs and incumbents alike, have to place DSLAMs at the end of the copper loop. [32]

As far as purchasing, DSLAMs are available equally to incumbents and CLECs from several vendors. *UNE Fact Report: Advanced Services* at 24-26. There are no standards or manufacturer relationships that advantage Bell companies over CLECs. *Id.* To date, CLECs have purchased more DLSAMs than Bell companies, making CLECs the larger buyers. *Id.* CLEC relationships with well funded strategic partners, including the major IXCs, show that they are very unlikely to be at any disadvantage to incumbent LECs when it comes to purchasing DSLAMs.[33] *Id.*

DSLAMs are essentially modular. Once purchased, they can be installed in racks as demand warrants. Each central office DSLAM installed by BellSouth serve 576 lines. Remote terminal DSLAMs serve 192 lines. This allows both CLECs and incumbents to tailor deployment based on demand. Large start-up investments or traffic volumes are not necessary to cost-effectively deploy DSLAMs, and service can be efficiently added in relatively small increments. No CLEC has introduced evidence in any of the Commission's proceedings suggesting that they were at any disadvantage in purchasing DSLAMs.

Once purchased, by either a CLEC or an incumbent, a DSLAM must be installed. Installation of a CLEC DSLAM in an incumbent LEC's central office hardly impairs a CLEC's ability to offer services. There are about 1,000 CLEC collocation arrangements completed or

[32] Current xDSL technology is designed to provide advanced service over copper facilities. In order to provide service to a particular subscriber, the DSLAM must connect directly to the copper loop serving the subscriber. Where a subscriber's copper loop is connected through digital loop carrier to fiber facilities before the central office, a DSLAM must be located in the field where the digital cross connect is made. A DSLAM must be located where subscriber copper facilities end. BellSouth provides CLECs the ability to locate DSLAMs in the field.

underway in BellSouth facilities. A cost analysis of CLEC collocation under the Commission's previous rules is attached. Attachment A. This analysis supports the market reality that collocation expenses are not impairing efficient CLECs' meaningful opportunities to compete.

The Commission's recent *Advanced Services Order* provides a broad new range of advantageous collocation opportunities for CLECs, further reducing their costs. The *Advanced Services Order* provides CLECs with, among many other things, claims to shared and cageless collocation in incumbent central offices, which provide opportunities to reduce collocations expenses.[34] BellSouth provides all these options. In addition, BellSouth provides CLECs and state commissions with detailed performance data on its provision of collocation. State commissions closely monitor BellSouth's provision of collocation.

Next, subscriber loops must be individually tested to determine if the loop can support advanced service. If the loop can support service, a modem must be available at the subscriber's premises.[35] In some cases, the local loop may need to be "conditioned" for service by removing equipment that would interfere with an xDSL signal.[36] BellSouth will condition loops for CLECs in a nondiscriminatory manner for a fee. In fact, under the Commission's rules, incumbents must "take affirmative steps to condition existing loop facilities to enable" CLEC provision of xDSL service. *Advanced Services Order*, ¶ 53. However, in some cases, the loop

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[33] If any particular CLEC did not have sufficient purchase volumes to justify lower prices, it could pool its volume with other CLECs to get the lowest prices.

[34] A CLEC-to-CLEC market for shared collocation expense will quickly emerge if collocation does in fact represent a financial burden. If no market develops, that would suggest that CLECs with current collocation arrangements do not view the expense as substantial, otherwise they would seek to share the expense and the space.

[35] *Advanced Services Order* at ¶ 10.

[36] Standard equipment to provide voice service such as bridge taps and load coils may have to be removed to provide xDSL service.

simply cannot support the technology, and xDSL service cannot be provided by any carrier over the incumbent LEC network.[37]

The next task is to connect the potential xDSL subscriber's loop to the DSLAM. This process is identical, whether the DSLAM is a CLEC's or an incumbent's. If voice service is being provided by the incumbent before xDSL service is initiated, the incumbent will disconnect the subscriber's loop from the MDF and provide a cross-connect to the DSLAM. The loop must then be connected to the DSLAM.

Transport facilities to the CLEC voice and packet switches are available from numerous CLECs in urban areas as set out in the Transport section below. BellSouth transport facilities will be available under 251(d)(2) where that standard is met, or under section 271 at market rates.

Finally, any CLEC offering xDSL service must be able to route data traffic to a packet switch to provide data service. Packet switches are available from several manufacturers. CLECs have deployed many packet switches. Because BellSouth cannot provide service across LATA boundaries, BellSouth must locate packet switches within each of its LATAs. CLECs are under no such obligation, and can locate switches to maximize network efficiency. Transport costs for data traffic are very low, and packet switches can effectively serve a very broad area. The provision of data services using packet switching is a new and rapidly growing market. *UNE Fact Report: Switching at 32*-34. Incumbent local providers trail the interexchange carriers by a very substantial margin in this market, in large part because this market demands national, not local, service. *See* Frost & Sullivan, U.S. Markets for ATM, Frame Relay, SMDS and X.25 Public Data Services, at 1-5 (1998) (AT&T, MCI and Sprint account for about 75% of

[37] For example, loops over 18,000 feet long generally cannot support xDSL technology. Of course, cable, wireless or satellite networks are not restrained by xDSL limitations, and can provide advanced service.

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business data services and over 90% of more advanced ATM and frame relay services); *UNE Fact Report: Switching* at 32-34.

2. Competitive Provision of Advanced Service

As set out in Commission reports and orders and the *UNE Fact Report: Advanced Services*, advanced services are provided over competing cable, wireless, satellite and telephony networks.[38] The Commission has suggested that cable providers are farthest ahead in the race to provide advanced services, followed by wireless providers and CLECs. *Advanced Services Report*, ¶¶ 53, 57, 58. Incumbent LECs and satellite providers follow. *Id.* The Commission's conclusions were informed by market and technological facts. Incumbent LECs are not incumbents in the advanced services market. Inter-network competition in this market promises to be vigorous. "Numerous companies in virtually all segments of the communications industry are starting to deploy, or plan to deploy in the near future, broadband to the consumer market." *Advanced Services Report*, ¶ 12. These plans include enormous investment in facilities to provide service over the last mile to the home. *Id.*, ¶ 34.

a. Cable Providers

Cable providers are perceived to enjoy three key advantages over incumbent LECs in the advanced service race. These advantages may translate into permanent control of the advanced services market. As detailed in the *UNE Fact Report: Advanced Services*, advanced services are now available over cable networks to over 20 million homes, roughly 20 percent of the U.S. market. *UNE Fact Report: Advanced Services* at 7. Comparing the maps of cable and

[38] Advanced services are sometimes delivered over local elements like telephone or cable company wires to houses, and sometimes delivered over elements that can serve the entire nation, like satellites. Defining a geographic market for advanced services would be complex. Given the newness of the market and the fact that consumers are expected to face the same types

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incumbent LEC advanced service deployment makes cable's present lead clear. *Id.* at 4, Maps 1 and 2. Cable providers add to this present advantage aggressive deployment plans. Cable advanced service will be available to over 30 million homes by the end of this year, while xDSL service is predicted to be available over no more than 1 million lines. *Id.* at 9.

Cable's broader rollout and other advantages has allowed it to develop a commanding lead. Industry observers predict that cable's "first mover" advantage is likely to translate into a commanding long-term position. *See, e.g.* Paul Kagan Associates, Inc., Cable TV Technology, *U.S. High-Speed Access Cable & ADSL Projection Model*, 1997-2006 (Feb. 28, 1998) (predicting three quarters of U.S. households using advanced services will obtain service over cable networks); *UNE Fact Report: Advanced Services* at 11, n. 49 (collecting other citations).

Cable's perceived second advantage is the fact that its "broadband platform makes cable an optimal medium for transmitting large amounts of digital information - data, graphics, and video - at high speeds. *See*, B. Esbin, Office of Plans and Policy, FCC, *Internet Over Cable: Defining the Future in Terms of the Past* at 76, OPP Working Paper No. 30 (Aug. 1998); *see also UNE Fact Report: Advanced Services* at 11, n.49. That is, cable's last mile hybrid-coaxial cable infrastructure is generally perceived to be superior for advanced service to the twisted pair of the telephony network.[39]

Cable's perceived third key advantage is its freedom from FCC imposed restrictions that hamper incumbent LEC investment in providing advanced services. Cable providers reject even the prospect of allowing competitors access to their network, through unbundling or otherwise.

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of competitive choices in essentially every market, no particular geographic market is defined here.

[39] Of course, cable also has substantial advantages in constructing the long distance part of their networks because they are free of interLATA prohibitions.

"No company would invest billions of dollars ... if competitors which have not invested a penny of capital nor taken an ounce of risk can come along and get a free ride in the investments and risks of others." C. Michael Armstrong, *Telecom and Cable TV: Shared Prospects for the Communications Future,* delivered to the Washington Metropolitan Cable Club (Nov. 2, 1998) available at <<www.att.com/speeches/98/981102.maa.html.

b. Wireless Providers

Advanced services are also being provided over wireless networks. *UNE Fact Report: Advanced Services* at 11-15. Providers are using a variety of spectrum allocations to provide service and have aggressive rollout plans. *Id.* Wireless spectrum serves as a complete substitute for incumbent LEC last mile facilities. In fact, the Commission has ranked wireless providers ahead of incumbent LECs in the deployment of broadband facilities that serve the last mile. *Advanced Services Report* at ¶¶ 53, 57, 58. MCI WorldCom and Sprint have been investing in wireless providers to provide advanced services. *UNE Fact Report: Advanced Services* at 13. Wireless providers have forged alliances with many major firms and have access to substantial capital to fund additional service rollouts. *Id.* at 13-14 and Table 4.

c. Satellite Providers

Satellite networks are already providing advanced services nationwide. *Applications for Consent to the Transfer of Control of Licenses and Section 214 Authorizations from Tele-Communications, Inc. to AT&T Corp.*, Memorandum Opinion and Order, CS Dkt. No. 98-178, FCC 99-245, ¶ 74 (rel. Feb. 18, 1999)(Direct TV provides nationwide Internet access at speeds up to 400 kbps). Satellite service avoids the incumbent LEC network completely. Satellite providers are rapidly deploying and upgrading facilities. *UNE Fact Report: Advanced Services*

at 15-16. AOL has recently signed with Direct TV to offer satellite access to AOL's huge subscriber base.

d. CLECs

The market facts set out in the *UNE Report: Advanced Services* at pp. 18-24 show that the process for CLECs to deliver advanced services over incumbent networks is working. CLEC business plans predict that it will continue to work. CLECs have used incumbent loops and central office collocation to provide advanced service using their own DSLAMs and packet switches to such an extent that the Commission recently ranked CLECs ahead of "incumbents" in providing xDSL service.[40] *Advanced Services Report* ¶ 53, 56, 58. ALTS claims, on behalf of facilities-based CLECs, that CLECs using incumbent loops and collocation are leading incumbents in providing advanced services. *UNE Report: Advanced Services* at 20. In fact, these CLECs offered advanced services to over five million homes as of December, 1998, and expect that number to quadruple by the end of 1999. *Id.* A CLEC study claims that CLECs have also used the current process to outstrip incumbent deployment of DSLAMs to provide advanced services in rural areas. Economics and Technology, Inc., "*Building a Broadband America: The Competitive Keys To The Future Of The Internet*," at iv. Aggressive CLEC service rollout suggests that the process is working.[41]

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[40] It is misleading to suggest that there are "incumbents" in the race to provide advanced services. Incumbent LECs do have local loop and central office assets that CLECs may not have. But these assets are available on a nondiscriminatory basis to CLECs as ordered by the Commission. Thus, no incumbency advantage remains, and, if any did, the Commission could remedy directly. In the other areas, there is no advantage. Incumbent LECs are not "incumbents" in the deployment of DSLAMs and packet switching. Instead, they are behind other providers of advanced services.

[41] To the extent collocation or other issues are raised as handicapping CLEC rollout of xDSL service, the Commission should address the issues directly, consistent with the Act and Commission rules on such concerns, rather than bootstrap an unbundling requirement.

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3. Will An Efficient CLEC's Meaningful Opportunity To Compete Be Impaired Without Access to Incumbent LEC DSLAMs and Packet Switches at Cost-Based Prices?

Efficient advanced services competitors have more than meaningful opportunities to compete in the provision of advanced services without the Commission creating investment disincentives for both CLECs and incumbents by mandating cost-based access to incumbent LEC DSLAMs and packet switches. The answer to the question of whether consumers are likely to benefit from forced unbundling of incumbent LEC advanced services network elements is hardly theoretical. To-date, there has been no requirement that incumbents unbundle DSLAMs or packet switches and "there are, or likely will soon be, a large number of actual participants and potential entrants in this market." *Advanced Services Report*, ¶ 48 (footnotes omitted). As the Commission has noted, competition among cable, wireless, satellite and telephony networks mean that "the preconditions for monopoly appear absent in the 'last mile' of the advanced services market.... There is no indicat[ion] that the consumer market is inherently a natural monopoly." *Id.* If the last mile for advanced services is not subject to monopoly, DSLAMs and packet switches readily available for purchase can hardly be an impediment to competition. Competition is serving consumers today without unbundling.

Advanced services competition comes from several sources. Cable networks appear to have the lead and are predicted to translate their earlier start, network topography into a long-term commanding lead in subscribers. The Commission has also ranked wireless providers ahead of incumbent LECs in deploying service. Today's market leaders have no need for incumbent LEC elements to provide advanced services over their networks. The lack of availability of those elements has not impaired, and could not impair, their opportunity to compete.

The Supreme Court's requirement that the Commission look outside incumbent LEC networks when considering whether not making an element available would impair competition dictates that the Commission give great weight to this evidence of actual competition between networks. This competition guarantees consumer welfare. By rights, the Commission should go no further. Antitrust precedent would end the analysis once it became apparent that firms could successfully compete without the facility. Requiring access to a facility that is "essential" or important simply to benefit one set of competitors bound to a particular business plan will not create any consumer benefits when competition already exists. Unbundling in these circumstances will have only negative consequences -- reduced investment and administrative cost burdens.

Even should the Commission seek to turn the impair test into a test of whether a particular sort of competitive strategy should be favored over competition-- by substituting a test of whether a "CLEC using an incumbent LEC's loops has a meaningful opportunity to compete without the incumbents DSLAMs and packet switches" test, the evidence shows that such CLECs are competing successfully today, without unbundled DSLAMs and packet switching.

CLECs have been collocating their own DSLAMs and using their own packet switches to provide advanced services over incumbent local loops. CLECs have been so successful at doing this that the Commission has ranked them ahead of incumbents in deploying advanced services. *Advanced Services Report*, ¶¶ 53, 56, 58. CLECs themselves claim that they provide advanced services to over five million homes, that they lead the incumbents in providing advanced services, and that their services will continue to be rolled out on an aggressive schedule. *UNE Fact Report: Advanced Services* at 20 (collecting citations).

In effect, the Commission has conducted an experiment and the results are in. CLECs have very successfully competed using their own DSLAMs and packet switching. Announced CLEC plans for continued aggressive service roll out, in both urban and rural areas, show that lack of access to unbundled DSLAMs and packet switches is not impairing tomorrow's CLEC advanced service. Without competitive impairment, there is no justification for unbundling these elements.

4. What Effect On Investment In DSLAMs And Packet Switches Will An Unbundling Obligation Have?

Given advanced service competition from other networks and from CLECs using basic elements of incumbent networks, there is no competitive or consumer benefit to be entered on the positive side of the ledger from unbundling incumbent DSLAMs and packet switches. However, unbundling these particular elements would give rise to some especially substantial negatives. As set out in the *Jorde, Sidak and Teece Affidavit*, unbundling reduces investment. Given a no-risk no-cost option to use incumbent DSLAMs and packet switches at cost-based prices, CLECs will exercise that option and forego investing in their own equipment in at least some circumstances. This effect will be especially pronounced in areas where CLECs can avoid risky investments in new technology by relying on incumbent LEC investments.

In addition, as set out in the *Jorde, Sidak and Teece Affidavit*, incumbent LEC investment in advanced services technology will suffer from imposing obligations to share the technology at cost-based prices. This effect will be especially pronounced in this innovative, relatively risky technology.[42] That the reduction in investment is likely to be major is supported not just by

[42] This results from the relatively high risks of deploying facilities to offer untried advanced services. Consumers may not accept the technology or may select alternative network providers, so incumbent LEC investments may not prove profitable in the market. If the investments are successful, forced unbundling at cost-based prices limits the investor's returns to a

academic analysis. AT&T, which is engaged in similarly upgrading its cable networks warns that "no company will invest billions of dollars to become a facilities-based ... services provider if competitors who have not invested a penny of capital nor taken an ounce of risk can come along and get a free ride on the investments and risks of others." Remarks of C. Michael Armstrong, Chairman and CEO, AT&T, delivered to Washington Metropolitan Cable Club, Washington, D.C. (Nov. 2, 1998).

5. Loop Spectrum May Not Be Unbundled Under Section 251(d)(2)

The Commission has raised the prospect of requiring unbundling of spectrum on incumbent LEC loops in another proceeding.[43] *Second Advanced Services Order* at ¶ 99. The Commission appears to be interested in spectrum unbundling based on the interests of a particular subset of CLECs. These CLECs would prefer to pay for only a "part of the loop to deliver advanced services, rather than the entire loop, as incumbents and CLECs now do. Spectrum unbundling may not be ordered under section 251(d)(2).

The Commission has rejected similar proposals on their merits in the past because they were not in the interests of competition. In rejecting those proposals, the Commission concluded correctly that "[g]iving competing providers exclusive control over network facilities dedicated to particular end users provides such carriers the maximum flexibility to offer new services to such end users." *First Report and Order*, 11 FCC Rcd at 15,693 ¶ 385.

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governmentally-set cost of capital. The investment examples presented in the *Jorde, Sidak and Teece Affidavit* demonstrate how incumbent LEC investment in new technology will be reduced.

[43] Initially, loop spectrum is not likely to qualify as a network element under the Act. And, providing access to unbundled spectrum is unlikely to prove technically feasible. The operational problems alone of managing different carriers using the same loop are likely to rise to the level of technical infeasibility. BellSouth will detail the technical and operational issues with spectrum unbundling in its comments in the Commission's advanced services docket.

Loop spectrum will not pass section 251(d)(2)'s impair test because there are alternative facilities to unbundled spectrum on the local loop that are being used to compete in the provision of advanced services. As set out above, these alternative facilities include cable loops, wireless and satellite access and the use of the incumbent's local loop. Cable and wireless providers, using their own facilities, lead incumbents in deploying advanced services. As described above, CLECs have been able to provide advanced services over incumbent loops to the extent that they can also claim to be ahead of incumbents in rolling out service. The availability of these alternative facilities precludes a finding that failure to unbundle spectrum could impair an efficient CLEC's meaningful opportunity to compete.

Unbundling incumbent loop spectrum can have no consumer benefits because the advanced services market is already competitive.[44] Even CLECs that wish to provide only advanced services over the telephone local loop have competitive options open to them -- they can ally with CLECs that offer voice services and offer voice and data separately or in a bundle over a loop. In this case, the loop would be taken in its entirety, then shared depending on the responsible CLEC's plans. Thus, CLECs have the same competitive options open to them as do the incumbent LECs. Forcing the incumbent to unbundle loop spectrum would create only a special advantage for particular CLECs.[45] Consumers benefit from rules that benefit competition not from rules that benefit only particular competitors.

Although there are no consumer benefits from spectrum unbundling, it would have substantial real costs. Unbundling under the Commission's TELRIC pricing scheme would

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[44] Any benefit that could be advocated at this stage would be premature until after the industry and the Commission have gained experience with the Commission's recently changed collocation rules.

[45] Pricing unbundled spectrum under the Commission's TELRC pricing scheme, given the cost allocation issues, is certain to create a fertile field for profitable arbitrage. The Commission should not mistake requests to create the potential for arbitrage based on regulated prices with competition.

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create a significant disincentive to incumbent LEC and CLEC investment in advanced services. *Jorde, Sidak and Teece* at ¶ 57, 65 (calculating no net public benefits from spectrum unbundling). The operational and regulatory costs to administer a spectrum unbundling scheme would also be extremely high.

6. Conclusion

Failure to unbundle incumbent LEC DSLAMs and packet switches would not impair the opportunities for efficient competitors to compete in the provision of advanced services. Cable, wireless and satellite providers have rolled out service broadly and successfully without these elements. In fact, incumbent LEC DSLAMs and packet switches have no place in these alternative networks. CLECs have competed successfully to-date without unbundled DSLAMs and packet switches and continue to publicly announce their future success. Thus, the impairment standard is not satisfied. On the other hand, forced unbundling of those elements would reduce investment in the provision of advanced services by incumbents and CLECs alike.

Similarly, the unbundling of loop spectrum cannot be justified under section 251(d)(2).

B. Interoffice Transmission Facilities

The Commission's *First Report and Order* recognized that "there are alternative suppliers of interoffice facilities in a few areas." *First Report and Order* at 15718. Although there have been competing providers of local transport for years,[46] the Commission ordered that these incumbent facilities be unbundled and provided at cost-based prices throughout the entire United States because it felt that competitors would be better off with more rather than fewer options. *Id.* The closer attention to competitive alternatives required by the Court and the

[46] *UNE Fact Report: Interoffice Transport Section* at 1. In fact, both MCI and Sprint argued at divestiture that local transport was not part of the local monopoly and should be opened to competition. *Id.* at 2.

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passage of three years during which CLECs have been installing fiber at a tremendous pace will reveal that competitive interoffice transport is readily available in many areas. At least in these areas, the failure to unbundle incumbent LEC interoffice transport facilities could not impair meaningful opportunities to compete.[47]

1. The Market For Interoffice Transmission Facilities

Interoffice transmission facilities provide transmission paths among end offices, tandem switches and interexchange carrier Points of Presence (POP). *First Report and Order* at 15718. Of course, transport is also provided between end offices and CLEC premises. Transport facilities may be dedicated to the traffic of a particular carrier, or shared among a group. *Id.* Transport facilities are inherently local. They connect particular local points. Transport in one city cannot be substituted for transport in another city, thus the geographic market in which to assess transport competition and the availability of alternative facilities is local.

In similar circumstances (involving local service) the Commission has aggregated point-to-point markets based on the similarity of the competitive situation facing consumers. *See, e.g., Bell Atlantic/NYNEX Order* at 20016-7 (Commission found it appropriate to treat as a separate relevant geographic market "an area in which all customers in that area will likely fact the same competitive alternatives for a product"); *LEC Regulatory Treatment Order* at 15794 (recognizing that interstate, long distance calling is a point-to-point geographic market that could properly be geographically aggregated into single national market because of "sufficiently similar

[47] The fact that section 271 requires Bell companies to provide unbundled transport to obtain long distance relief is hardly evidence that transport should be unbundled under section 251(d)(2)'s necessary and impair standard. Unlike section 251, section 271 does not mandate unbundling at cost-based prices. Congress clearly intended that an additional CLEC entitlement to cost-based prices could be created only after the separate section 251(d)(2) requirements were met. Also, since all section 251 UNEs must be unbundled under checklist item 2, checklist item 5 would be redundant if Congress had intended a particular outcome for transport under section 251(d)(2).

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competitive characteristics" facing purchasers). In the *Bell Atlantic/NYNEX Order*, the Commission grouped local service customers into a LATA wide market and into a New York City MSA market. *Bell Atlantic/NYNEX Order* at 20017-9.

Under these well-established Commission precedents, geographic markets for point-to-point local transport can be aggregated based on the considerable similarity of competitive situations across defined geographic areas. Although MSAs, LATAs or other areas could be useful foundations for this grouping, BellSouth suggests that the most focused approached would be to adopt the three-zone approach the Commission established for special access and switched transport service pricing flexibility.[48]

The Commission found that DS1 and DS3 special access services were subject to competition in 1992. *Special Access Order* at 7454-55, n. 412. The Commission also recognized that competitive pressure was growing rapidly. *Special Access Order* at ¶¶ 7451, 7452 (recognizing that in 1992 "competition is already developing relatively rapidly in the urban markets and will only accelerate with the implementation of expanded interconnection"); *Switched Transport Order* at 7423. This growing competition was occurring especially in urban areas where costs are lower and traffic density higher, making the economics of competitive transport particularly attractive. The Commission found that three geographic zones would properly reflect competition and the underlying competitive economics. *Special Access Order* at 7454-55, n. 413.

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[48] *See, In the Matter of Expanded Interconnection with Local Telephone Company Facilities and Amendment of the Part 69 Allocation of General Support Facility Costs*, CC Docket Nos. 91-141 and 92-222, *Report and Order and Notice of Proposed Rulemaking*, 7 FCC Rcd 7369, 7451-55 (1992) (*Special Access Order*); *In the Matter of Expanded Interconnection with Local Telephone Company Facilities*, CC Docket No. 91-141 (*Transport Phase I*), *Second Report and Order and Third Notice of Proposed Rulemaking*, 8 FCC Rcd 7374, 7423-25 (1993) (*Switched Transport Order*).

The same economics drive the competitive provisioning of local transport, making these zones and the Commission's prior findings directly applicable to local transport.[49] The three zone approach results in narrowly tailored urban zones and larger geographic zones reflecting rural areas, as reflected on the maps of BellSouth's region attached as Attachment B. Because these zones have been drawn based on the economics of transport competition, they better reflect competitive realities than MSAs or similar areas.

As might be expected, the competitive choices available in different areas within these zones are also similar, making these zone groupings appropriate under the Commission's geographic market aggregation orders outlined above. For example, each of the sixteen Zone 1 areas in BellSouth's region has multiple CLEC fiber networks. The minimum number of separate alternative networks in Zone 1 areas ranges is three.[50] There are generally fewer in Zone 2 cities.[51]

2. Competitive Providers and Facilities

The number and variety of CLECs with transport facilities jumps out from even a quick glance at Appendixes A and B of the *UNE Fact Report: Interoffice Transport*, which lists CLEC fiber routes city-by-city. The carriers listed are large and small, old and new. They include IXCs, start-up CLECs and cable companies. There is enough CLEC fiber and wireless capacity

[49] The Commission noted that several IXCs "say that special access is identical to dedicated transport and directly related to common transport, and argue that consistent pricing guidelines should be applied to all the services." *Special Access Order* at 7450. The cost elements of special access described by the Commission match up with the cost elements of local transport. *Id.* at7452.

[50] Given the difficulty in determining CLEC transport buildouts, and the pace with which new networks are being installed, these numbers are likely to understate CLEC facilities.

[51] Similar results could be obtained starting with MSA or other geographic areas and then drawing reasonable distinctions based on the competitive choices available.

to lead some to conclude that there is a CLEC fiber capacity glut.[52] The Commission has long recognized that transport was likely to become competitive quickly. *Special Access Order* at 7380, n.37. In 1997, the Commission found that "there are already a number of competitors offering [transport] services." *Bell Atlantic/NYNEX*, 12 FCC Rcd at 20042.

Competitive transport facilities are generally fiber-based or provided over wireless links. Fiber facilities can carry very large amounts of traffic and that amount can be greatly increased by substituting more powerful electronics along the fiber path. At a bare minimum, CLECs account for "at least 11% of the total fiber optic system capacity potentially available to carry calls within *local* telecommunications markets." *Local Competition Survey* at 8; *UNE Fact Report: Dark Fiber* at 28 (pointing out "vast understatement" in FCC estimates of CLEC fiber). CLEC fiber generally provides interoffice transport between incumbent LEC wire centers, CLEC offices, private switches and interexchange carrier POPs. *Local Competition Survey* at 6. CLEC fiber facilities can generally be extended economically to locations such as central offices or business customer locations. *Id.* at 14-15. Central offices in Zone 1 and Zone 2 areas are quite close together. CLECs have access to incumbent LEC poles, ducts and conduits to connect central offices to their fiber facilities.

CLECs are installing fiber at a rapid pace. "CLECs tripled fiber deployment from 0.4 million miles fiber miles at the end of 1994 to 1.3 million fiber miles ... at the end of 1996." *AT&T/Teleport Order* at 15250-15251. More recent figures on CLEC fiber builds are provided in the *UNE Fact Report: Interoffice Transport* at 4-5.

[52] Royce Holland, CEO of Allegiance Telecom, states "In Tier I markets today there is a tremendous glut of capacity." W.T. Scott, et al, ING Baring Furman Selz LLC, Investext Rpt. No. 2787890, Telecommunications/Fiber vs. Fiberless (Sept. 30 1998).

The extent and breadth of competitive transport offerings is supported by the amount of collocation occurring in BellSouth's region. BellSouth presently has about 1,000 CLEC collocation arrangements in its central offices. Collocation is a good indicator of the presence of CLEC transport facilities. *Id.* at 7.

In addition, wireless spectrum can be, and is being, used to provide local transport alternatives. There are at least five firms with essentially nationwide wireless coverage in the 28 and 38 GHz range. *UNE Fact Report: Interoffice Transport* at 14 Table 3. These firms include AT&T, WinStar, Teligent and NextLink. These wireless services can provide large volumes of service on short notice. *Id.* at 13, n.35. The Commission has previously acknowledged that these wireless services are used to bypass incumbent LEC service.[53]

Where CLECs have transport facilities a CLEC-to-CLEC market for transport services has arisen, as one would expect. For example, e.spire and Hyperion have contracted for capacity on each others' networks. Hyperion obtained capacity on e.spire networks in fourteen cities, including eight cities in BellSouth's region. "E.spire, Hyperion Agee on Fiber Swap", *Telecommunications Reports*, April 19, 1999 at 6. Dark fiber, which is carrier inventory that can be used to provide transport services, has become a commodity that is bought and sold by CLECs on an open market. *Advanced Services Report: Interoffice Transport* at 4-5. Wireless transport is also provided in a CLEC-to-CLEC market. *See, e.g.,* WinStar, *Carrier Services* www.winstar.com/indexCarrServ.htm> (WinStar's Wireless Fiber offers other carriers "a quick and cost-efficient solution for extending the reach of an existing fiber ring providing local

[53] *See, e.g., In the Matter of Expanded Interconnection with Local Telephone Company Facilities*, RM 7249, ENF-87-14, *Notice of Proposed Rulemaking and Notice of Inquiry*, 6 FCC Rcd 3259, n.3 (1991).

transport"). This wholesale market provides CLECs the ability to aggregate traffic volumes efficiently and to replicate incumbent LEC shared transport service.

3. Will An Efficient CLEC's Meaningful Opportunity To Compete Be Impaired Without Access to Incumbent LEC Interoffice Transport at Cost-Based Prices

By using pre-existing access pricing zones, the Commission can answer the question of whether to unbundle incumbent LEC transport facilities in a way that meets the Act's goals and the Court's requirement that it consider the presence of alternative facilities. The Commission's original approach made no attempt to delineate geographic markets or examine the competitive facts in those markets. *First Report and Order* at 15718-9. Given the competitive facts outlined above, where alternative facilities are present, CLECs cannot show that their opportunity to compete would be impaired without access to incumbent LEC facilities at cost-based prices.

In Zone 1 areas in BellSouth's serving territory, there are at least three and often many more CLEC fiber networks in the ground now, with more planned. CLEC wireless networks are operating in many of these areas as well. The number of CLEC transport alternatives to incumbent facilities readily available in Zone 1 areas shows that CLECs can self-provide or obtain transport outside of incumbent networks in those areas.

In Zone 2 areas, there are generally fewer CLEC fiber alternatives. Wireless transport provides additional alternatives. *UNE Fact Report: Interoffice Alternatives* at 14, Table 3. Given these alternatives, and the ability of CLECs to enter and expand, the Commission should also find that incumbent Zone 2 transport facilities should not be unbundled.

Other market facts support these conclusion. A market for CLEC transport already exists. CLEC fiber and wireless networks have substantial capacity, perhaps excess capacity,

and that capacity can easily be expanded.[54] CLECs are also installing new fiber at a rapid rate. *Id.* at 2-5. Entry is relatively easy given the need only to connect points where substantial traffic is aggregated. Based on the presence of these alternatives and the relative ease of entry and expansion, the Commission must conclude that CLECs will be unimpaired without cost-based incumbent LEC transport facilities in these areas. The Commission should not include interoffice transport in Zone 1 or Zone 2 on its list of UNEs.[55]

In Zone 3, the lack of competitive networks suggests that CLECs would have to use wireless facilities or self-provision fiber facilities. Whether the use of wireless facilities or self-provisioning would actually impair an efficient CLEC will require the Commission to collect factual information from CLECs supporting that conclusion.[56]

4. What Effect Will Mandatory Unbundling at Cost-Based Prices Have on Investment in Interoffice Transport Facilities

As set out in the affidavits attached to USTA's Comments in this proceeding, , mandated unbundling at cost-based prices significantly reduces consumer welfare costs. Creating a CLEC entitlement to cost-based transport on incumbent LEC facilities will inevitably reduce CLEC investment in creating and maintaining competitive facilities. *Jorde, Sidak and Teece Affidavit.* This effect is likely to be particularly serious as it will also reduce CLEC demand for transport

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[54] In determining that AT&T was no longer a "dominant" carrier in the interexchange market, the Commission placed heavy reliance on the effectiveness of competitive *capacity* as a restraint. *AT&T Reclassification Order* at 3303-3305.

[55] BellSouth would, of course, have to provide access to transport under section 271. However, that access would be at market prices rather than at section 252's cost-based prices.

[56] The Commission requested comments on unbundling dark fiber. *Second FNPRM* at ¶ 34. Even if "dark fiber" could be classified as a network element, despite the plain language of section 3(29) of the Communications Act, given the huge amounts of CLEC fiber currently deployed and planned, imposing any sort of blanket requirement that incumbent LEC dark fiber be unbundled could not comport with section 251(d)(2) and the Court's requirement that the Commission consider alternatives and self-provisioning. CLECs can self-provision fiber as

alternatives from other CLECs. This may affect the viability of existing CLEC networks and will discourage additional CLEC build outs. An unbundling requirement will also reduce incumbent incentives to invest in transport networks. *Id.* BellSouth, for one, makes substantial on-going investment in maintaining and upgrading its transport networks. The value of this investment will be reduced by a cost-based unbundling requirement.

5. Conclusion

Given the presence of substantial competitive alternatives in Zone 1 and Zone 2 (or urban areas generally, if the Commission prefers a different geographic measure), ease of entry and expansion and the presence of a CLEC-to-CLEC transport market, the Commission cannot find that an efficient CLEC's meaningful opportunity to compete could be impaired without access to incumbent transport at cost-based prices. Imposing an unbundling obligation would not benefit competition or consumer welfare, but would create an important disincentive to investment in facilities that would benefit consumers. In Zone 3, the Commission must balance the investment disincentives against any concrete evidence of impairment submitted by CLECs.

C. Switching

After very cursory analysis, the Commission found that incumbent switches should be unbundled and priced based at cost because there was no evidence that other elements of incumbent networks could substitute for the switching element. *First Report and Order* at 15710-11. The Commission must now assess the competitive availability of switching and

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efficiently as incumbents and can, and are, buying dark fiber from one another. Thus, CLEC opportunities are not impaired.

weigh the costs and benefits of unbundling.[57] This section is limited to traditional voice, circuit switching. Packet switching is dealt with in the Advanced Services section above.

1. The Market for Switching

The local switching element includes line-side and trunk-side facilities and the features, functions and capabilities of switch. *First Report and Order* at 15706. Switching provides the functionality needed to connect lines and trunks. Determining the correct geographic market for switching is complex. The geographic market is a function of the reach of a switch. The reach of a switch is determined by its technical capabilities and the economics of transport. The *UNE Fact Report: Switching* makes a compelling case that given today's technology for extending the reach of switches, the breadth and depth of CLEC switch deployment, and the ease of entry and expansion, that the most accurate geographic market may be the entire United States. Based on the similarity of the competitive facilities choices available, the Commission could treat the geographic market for switching as a national one.

An alternative approach to defining the geographic market for switching is also explored here. This approach would tailor the geographic market by using the zones prescribed for special access and switched transport pricing flexibility. As discussed in detail in the Interoffice Transport section above, these zones reflect basic economics of providing telecommunications service. The zones reflect telecommunications costs and traffic densities that affect the economics of providing competitive transport. These same factors affect the economics of

[57] The fact that section 271 requires Bell companies to provide unbundled switching to obtain long distance relief is hardly evidence that switching should be unbundled under section 251(d)(2)'s necessary and impair standard. Unlike section 251, section 271 does not mandate unbundling at cost-based prices. Congress clearly intended that an additional CLEC entitlement to cost-based prices could be created only after the separate section 251(d)(2) requirements were met. Also, since all section 251 UNEs must be unbundled under checklist item 2, checklist item 5 would be redundant if Congress had intended a particular outcome for transport under section 251(d)(2).

deploying competitive switches. The pattern of CLEC switch deployment, which focuses on more urban areas demonstrates this. *UNE Fact Report:* Switching. These zones also reflect the availability of competitive transport options that allow CLECs to obtain transport from sources other than the incumbent.

2. Competitive Providers and Facilities

Switches are available from numerous manufacturers. *UNE Fact Report: Switching* at 27. Switch prices have been falling for years. On a per-line basis, prices have declined 60 percent from 1986 to 1996 and are projected to fall another 12 percent by 2000. *Id.* at 27. CLECs installing switches now benefit from much improved switch pricing and technology and the consequent cost advantage over older incumbent LEC switching.

Switch manufacturers are actively competing for business from CLECs of all sizes. The largest switch manufacturers specifically tailor switches for small CLECs, reducing their entry costs and promising quick paybacks. *Id.* at 27-28. New, smaller manufacturers are targeting the smaller CLEC market specifically. These manufacturers are providing CLECs access to new technology such as server-based switching solutions that further lowers costs and provides additional flexibility and efficiency. *Id.* at 28-29. CLECs can purchase switches for as little as $100,000. *Id.* at 28.

In addition to installing new switches, CLECs can look to other sources of switching. Long distance and wireless switches can be upgraded to perform local switching functions and PBX systems can substitute for Centrex services. AT&T has been upgrading 4ESS switches to offer bundled local and long distance services in at least 45 states. *Id.* at 30. There are approximately 2,500 wireless switches owned by carriers *other* than the Bell companies and GTE. *Id.* at 31. These switches can substitute for wireline switches. *Id.* The Commission, state

commissions and industry analysts agree that PBX systems provide yet another competitive alternative to incumbent LEC switches. *Id.* at 33-34.

Manufacturers are also tailoring switches to allow CLECs to extend their geographic reach greatly. Remote switches extend the reach of host switches, and all their features, for distances of 500 to 600 miles. *Id.* at 22. By using simple digital loop carrier technology, the range of a single switch can be extended substantially. CLECs regularly serve customers at much greater distances using digital loop carrier than incumbents do under their current architecture. *Id.* at 21. AT&T claims that using digital loop carrier extends the range of a switch to a 125 mile radius around the switch. *See, Petition of AT&T Corp. to Deny Application, GTE Corp. Transferor, and Bell Atlantic Corp. Transferee, Application For Consent to Transfer of Control*, CC Dkt No. 98-184, filed Nov. 23, 1998.

The evidence is clear that today CLEC switches can be installed in weeks or months. Speed of installation is an area of competition among switch manufacturers, and as a result, installation times have been decreasing. Lucent can manufacture and install a prefab central office and deploy service in 40 days. E.spire states that its typical switch installation takes "[n]o longer than 28 weeks from" order to the time service is turned up. *Id.* at 29-30 (citing e.spire press release and information from other CLECs and manufacturers). Because they now have switches installed across BellSouth's region, many CLECs can extend their switching capability by deploying remote switches, as described above. Remote switches can be put into operation even more quickly. *Id.* at 30.

CLECs have been aggressively deploying switches across the country and in BellSouth's region. In August, 1996, when the *First Report and Order* was released, CLECs had fewer than 100 switches deployed nationwide. Today, there are nearly 100 CLEC switches in BellSouth's

region alone. By March, 1999, CLECs had added more than 600 new switches.[58] As of March of this year, CLECs had deployed over 700 switches. *Id.* at 17. CLECs continue to plan aggressively, deploying switches in BellSouth's region. *Id.* at 27, Table 3. Where CLECs have installed switches, a market for shared CLEC switching has developed. ICG, for one, markets a "virtual switch service" that "allows ICG's switch to act as your switch."

CLECs have deployed between 2 and 20 switches in Zone 1 areas in BellSouth's region. There are 20 operational CLEC switches in Atlanta, with 6 more planned. Miami has 13 CLEC switches now in operation, with 9 planned. There are seven operational switches in New Orleans, with 5 more planned. In Zone 2 installed CLEC switches range from 4 down to zero. CLECs have plans to install more switches in zone 2 cities. Current deployed and planned switches for Baton Rouge, for example, total 7. Zone 3 covers relatively large amounts or primarily rural territory. Nonetheless, CLECs have deployed switches in Zone 3 and are planning more. Although Zone 3 areas in some states have no deployed switches, Zone 3 areas in Mississippi have 3 currently deployed switches and 10 more planned. Louisiana Zone 3 areas will have a total of 8 switches based on current plans.

Of course, given the ability of CLECs to extend the range of their switches through digital loop carrier and remotes, the switches in each Zone could serve a much broader geographical area than the Zone they happen to be in. The *UNE Fact Report: Switching* provides the results of such an analysis.

3. Will An Efficient CLEC's Meaningful Opportunity To Compete Be Impaired Without Access to Incumbent LEC Switching at Cost-Based Prices

[58] CLECs of all sizes have deployed and plan to deploy switches. Even very small CLECs are able to effectively deploy switches. *UNE Fact Report: Switching* at 17-18.

Resolving the question of whether lack of access to unbundled incumbent LEC switching impairs an efficient CLEC's meaningful opportunity to compete requires the Commission to look at what CLECs have done in the switching arena. In order to provide local service, CLECs need some way to perform local switching. Do market facts show that CLECs' ability to compete rests on unbundled access to incumbent switches, or do the facts show otherwise?

The facts show that CLECs have chosen to install their own switches rather than rely on incumbent switching. Dozens of CLECs have installed nearly a hundred switches in BellSouth's region alone. Over 700 hundred switches have been installed across the United States. These switches can serve broad geographic areas using digital loop carrier or remote switching modules. CLECs are purchasing these switches at continually falling per-line costs, and they have substantially more flexibility in deploying them than incumbents do. The speed of CLEC entry into local switching, and the lack of barriers to expansion of installed switches and the installation of new ones shows that by self-provisioning, CLECs would not be impaired by lack of access to unbundled incumbent switching.

CLECs are not ordering switching from BellSouth, even though unbundled switching is available. This cements the conclusion that CLECs would not be impaired without unbundling. As of January, 1999, BellSouth supplied about 50,000 local loops to CLECs and about 90 switch ports. In Tennessee, for example, BellSouth supplies about 22,000 local loops and *no* switch ports. This shows that CLECs that have collocated in BellSouth central office have chosen to send their loop traffic to their own switches rather than BellSouth's. CLECs have demonstrated that they can exercise a meaningful opportunity to compete without using incumbent LEC unbundled switching.

4. What Affect Will Mandatory Unbundling at Cost-Based Prices Have on Investment in Switching

Unbundling incumbent switching would be expected to reduce both CLEC and incumbent LEC investment in switching. *Jorde, Sidak and Teece Affidavit.* Yet, CLECs have been investing aggressively in switching despite the availability of unbundled incumbent switching. This is happening for at least two reasons. One is that switching is a key source of competitive service advantage. The second is that falling switch costs and increasing flexibility in the geographic reach of switches has made the investment payoff attractive.

These facts and the CLEC investment they favor would be radically altered if the Commission should proceed to order unbundled switching under rules that would require the switch to be provided combined with a loop. This is the aim of an AT&T *Ex Parte* that argues that without unbundled access to incumbent switches CLECs would be impaired by having to engage in "hot cuts" of local loops to their switches. AT&T *Ex Parte*, Dkt No. 96-98 "Remand Proceeding on Rule 319" at 36-38.[59] By avoiding "hot cuts" when using incumbent switches, AT&T intends to leave incumbent local loops connected to incumbent switching. "Hot cuts" would still be required to connect incumbent loops to CLEC switches. This proposal would have the Commission raise a barrier to competitive switching. To the extent "hot cuts" are a problem today, as AT&T argues, they are a problem shared equally whether a competing provider selects a CLEC or an incumbent switch. AT&T would have the problem borne solely by CLECs that have invested in competitive switching facilities.

[59] AT&T also argues that collocation constitutes an impairment. Given the approximately 1,000 collocation arrangements in BellSouth's region, it is difficult to view collocation as an impediment. To the extent it may be, the Commission has lowered the costs of collocation substantially, and could continue to take action to solve any legitimate collocation issues. *Advanced Services Order.*

Mandating that incumbent LECs provide loop-port combinations at cost-based prices would be likely to harm current CLEC switch providers significantly. It also would be likely to reduce substantially CLEC switch investment in the future. Where CLECs have proven that competitive switches can be successfully deployed, the Commission would risk significant consumer harm by adopting policies that would deter additional investment.

5. Conclusion

As noted above, drawing the geographic boundaries of switch markets is complex, especially given the innovations that have greatly increased the geographic reach of switches. The ease with which switches can be acquired and installed indicate that self-provisioning is an option throughout the country.

At a minimum, it is clear that in at least Zones 1 and 2, CLECs have demonstrated that they can successfully deploy switches and self-provision switching services. CLEC competitive opportunities would not be impaired without mandatory unbundling of switching in these areas. The potential harm to continued investment in competitive facilities from unbundling is substantial. There is no pro-consumer reason for the Commission to mandate cost-based pricing of incumbent LEC switching in these areas.

In Zone 3, the Commission must carefully weigh any specific evidence of CLEC impairment against the relative ease with which switching facilities can be extended to those areas or installed in those areas.

D. Loops

In the *First Report and Order*, the Commission established a blanket requirement that incumbent LEC loops of all types in all locations be provided at cost-based prices. The Commission reached this result by limiting its examination to whether there were alternatives to

incumbent LEC loops within the incumbent LEC network. *First Report and Order* at 15694-95. The Court has required the Commission to look beyond incumbent LEC networks. When the Commission does so, it will discover that alternatives to incumbent loops do exist. These alternatives vary across geographic markets and customers. The only way to meaningfully evaluate these competitive alternatives is on a market-by-market basis.[60]

This section deals only with traditional local loop products. Loops for advanced services are dealt with in the Advanced Services section above.

1. The Markets for Loops

The Commission defined loops as providing a transmission path connecting the network interface device at a subscriber's premise to the main distribution frame located in an incumbent LEC central office.[61] *First Report and Order* at 15691. However, not all loops are equal and they do not belong in the same product market. The Commission did not address geographic market definition at all. As all loops are not equal, neither are all geographic areas. The Commission must define markets for loops that reflect demand and the substantial variation in competition across the country.

a. Loop Product Markets

[60] The *Second FNPRM* raises the issue of subloop unbundling "at the remote terminal or at other points in the incumbent LEC's network. *Second FNPRM* at ¶ 33. Unbundling related to the provision of advanced services is addressed above in the Advanced Services section. Without a context to address other sub-loop unbundling, BellSouth will reserve its comments for the reply cycle.

[61] Adopting this definition of a local loop obviously excludes other ways to provide the identical functionality of connecting subscribers to switches. A wireless local loop or telephony-capable cable loop do not, and never will, "provide a transmission facility between a distribution frame, or its equivalent, in an incumbent LEC central office" and a consumer's premises. The Commission may continue to use this definition only as long as it fully weighs the competitive alternatives to the incumbent local loop. These would include at least wireless fixed local loop technology, cellular and PCS service and cable telephony facilities.

Loops vary from the most basic 2-wire analog loop used to provide traditional residential voice service to DS1 and higher capacity loops serving large business users. Transmission capabilities of loops range from basic 56 kpbs analog loops to 1.544 Mbps DS1 and higher. The *Merger Guidelines* test for defining product markets would clearly separate 2-wire analog loops from 4-wire loops. Larger businesses tend to use high capacity loop products. Mass market customers generally use traditional 2-wire analog loops.

The Commission has consistently recognized a distinction between larger businesses and mass market telecommunications needs. *AT&T/Teleport Order* at 15247; *Bell Atlantic/NYNEX Order* at 20016; *UNE Fact Report: Local Loops* at 2, n. 8(collecting citations). Incumbents are "facing increasing competition from numerous new entrants ... that are building facilities as they seek to provide services to larger business customers." *AT&T/Teleport Order* at 15250 and n. 85 (recognizing that it is easier for CLECs to enter the larger business market).

Demand considerations and competitive reality require the Commission to translate this local service distinction into the loop facilities that underlie the service. Although the line may fairly be drawn in more than one place, it must continue the Commission's long-established separation between larger businesses and the mass market. Perhaps the best approach would be to draw the line to separate 2-wire loops from 4-wire and higher capacity loops. This would generally separate larger businesses from small business and residential users that rely almost exclusively on 2-wire loops.[62]

Consistent with Commission practice, these two markets will be referred to as the larger business market and the mass market.

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[62] This facility-based distinction would not stand in the way of providing increased capacity over the 2-wire loops through xDSL technology. The loop would remain a 2-wire loop. To the

b. Loop Geographic Markets

The market evidence is compelling that geography matters in addition to type of cutomer in the provision of alternative facilities to incumbent local loops. It appears to be universally recognized that CLECs are successfully connecting larger business customers to their networks without incumbent loops. CLECs can and do extend fiber facilities directly to customer premises. *UNE Fact Report: Local Loops* at 3, n. 12 (collecting examples). Within the top 30 MSAs, CLECs have deployed nearly 30,000 miles of fiber. *Id.* CLECs are present in all but one of the top 150 MSAs, and serve in excess of 350 Basic Trading Areas. *Id.* CLEC local loops reach into nearly 15 percent of all commercial office buildings in the country. *UNE Fact Report: Local Loops* at 3. Just as businesses are clustered in urban areas and business parks, CLEC have built and extended local loops in those areas and anywhere else business customers are concentrated. *Id.* at 3-9.

Local loops provide a point-to-point service connecting a customer to a particular network. As noted earlier, the Commission's practice is to aggregate point-to-point markets into larger geographic areas based on the similarity of the competitive choices available within those areas. Geographic market distinctions between large urban, small urban and rural areas would provide a reasonably accurate line.

BellSouth would again suggest that the best approach would be to adopt and apply the three zone approach the Commission adopted in the *Special Access Order* and the *Switched Transport Order*, as discussed in detail in the Transport section above. These three zones generally correspond to big city, small city and rural areas. Attachment B (State maps with

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extent DSL technology is used to deliver high capacity services to larger businesses in place of traditional higher capacity service, the Commission can revisit this distinction.

Zones). The Commission has already found that these zones reflect competitive telecommunication realities and the underlying costs and traffic densities that drive them.[63] Adopting these zones would provide the basis for consistent approach to determining where local elements should be unbundled.

The presence today of cable telephony networks coupled with cable operators' public commitments to its broad and rapid deployment across the country raise an additional geographic market definition issue. In areas where cable telephony is offered, essentially all consumers within the cable operator's franchise have or will have that competitive choice available to them.[64] In Atlanta, all 850,000 homes passed by Media One's cable facilities will be able to choose cable telephony service by January of 2000.[65] Cable telephony will be broadly available throughout the country in short order.

Under its traditional approach to defining geographic markets, the Commission must treat as a geographic market the franchise area of cable operators offering cable telephony service. Cable offerings are bounded by franchise areas. Within those areas, consumers share two of the same choices for local telephony. Cable franchise areas where cable telephony service is offered meet the *Merger Guidelines'* test for constituting a separate geographic market.

2. Competitive Providers And Facilities

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[63] *In the Matter of BellSouth Telecommunications, Inc. Revised Zone Density Pricing Plan*, Order, 11 FCC Rcd 13806 (1996).

[64] Upgrading cable facilities is generally done on a piecemeal basis. During the upgrading process, cable telephony services are available only in discrete parts of an operator's territory.

[65] Cable telephony is available in various other large and small metro areas throughout BellSouth's territory as discussed below.

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The following subsections discuss competitive providers and facilities based on the product and geographic market conclusions reached above. The sections are grouped by product market. The business market is treated first, then the mass market.

a. Larger Business Market Competitive Providers And Facilities

Many firms are competing today for the *local* telecommunications dollars of larger businesses. *AT&T/Teleport Order* at 15257-8 (larger business market "has a large number of market participants"). The Commission has chosen not to attempt to gather facts on the number of business lines CLECs serve over their own facilities.[66] Although market shares are hardly determinative, the market share ranges presented in the *UNE Fact Report: Local Loops* put CLEC shares in the areas where they have chosen to focus at impressive levels. The competitive reality is that "CLECs as a group [have] achieve[d] in less than two years after the Telecom Act what it took MCI and other alternative long-distance carriers over 10 years to achieve during the 1970s and 1980s." *See,* J. Grubman, et al., Salomon Smith Barny, *CLECs Surpass Bells in Net Business Line Additions for First Time*, May 6, 1998.

CLECs are providing local connections to larger business customers over both fiber and wireless facilities. CLECs have installed thousands of miles of local fiber connections, reaching all but one of the top 150 MSAs and 350 BTAs. *UNE Fact Report: Local Loop* at 3-10. Once installed, fiber capacity can be upgraded by installing electronics to carry huge amounts of traffic as demand warrants. CLECs often connect fiber facilities directly to business customer premises. *Id.* at 3.

Wireless technology provides a quick and cheap alternative to fiber connections. *UNE Fact Report: Local Loop* at 10-14. Wireless local loop (WLL) systems can be activated within

[66] *Local Competition Survey* at 3.

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90-120 days. *Id.* at 10 and notes 21-23 (collecting cites). WLL also supports high capacities. *Id.* at 11 n.26. A key advantage of WLL technology is that it does not involve large sunk costs. Lucent explains that "[w]ireless allows you to redeploy access facilities on a large scale without losing a large share of embedded investment." F. Dawson, *Are Clouds Clearing Over Wireless Local Loop?,"* Inter@ctive Week, Mar. 2, 1998; *Third CMRS Report* at App. F, F-1 ("WLLs can be launched in much smaller segments than wireline systems"). One WLL provider has estimated that it "has to sell only 10 lines to breakeven on a point-to-multipoint system," W. Schaff, *Taking Stock: No Strings Attached*, Information Week, Feb. 22, 1999, while its average customer orders 20 lines. J. Dix, *High Fliers*, Network World, Apr. 26, 1999.

WLL spectrum covers the country, at minimum reaching throughout every Zone 1 and Zone 2 area in BellSouth's serving territory. *UNE Fact Report: Local Loop* at 12 Table 1. An active "wholesale" market for local loops provided over wireless systems has emerged. Carriers like WinStar and Advance Radio Telecom have signed various agreements to provide local loop services to other CLECs in markets across the country. *UNE Fact Report: Local Loop* at 12 Table 1. Other carriers have chosen to simply acquire smaller firms that have wireless spectrum lock, stock and barrel, endorsing the technology with their investment dollars.[67]

b. Mass Market Competitive Providers And Facilities

Competitive provision of alternatives to residential loops is not so advanced, but is catching up rapidly as cable telephony comes on line. Cellular and PCS service have been steadily marching towards direct competition with the wireline network. If still not there today,

[67] AT&T acquired BizTel, giving it coverage 95 of the top 100 markets. *UNE Fact Report: Local Loop* at 12, Table 1. Sprint has several hundred million dollars in WLL spectrum. *Id.* MCI WorldCom acquired CAI Wireless and other wireless carriers giving MCI WorldCom enough spectrum to cover 50 percent of the country. R. Blumenstein, "*MCI, Seeking Deals, Doubles Allowed Stock,*" Wall Street Journal, May 21, 1999.

they will be there shortly as prices continue to fall. Wireless local loops are already being market tested in some areas.

The Commission has found that "numerous" cable MSOs are making cable telephony "available to a large number of customers in many markets" today. *Annual Assessment of the Status of Competition in Markets for the Delivery of Video Programming*, Fifth Annual Report, CS Docket No. 98-102, FCC 98-335, ¶ 59 (rel. Dec. 23, 1998)(*Fifth Annual Report*); *UNE Fact Report: Local Loop* at 17-20 and Table 7. In Atlanta, all 850,000 homes passed by Media One's cable facilities will be able to choose cable telephony service by January of 2000. In BellSouth's region, cable telephony is currently being offered in dozens of cities, including Atlanta, Georgia and Birmingham, Alabama. Attachment C provides a partial list of cities in several states in BellSouth's region that have cable telephony offerings today or that will have by the end of this year. Consumers in these areas have a substitute to the wireline telephony loop today.

Far more will have a substitute tomorrow or soon thereafter. AT&T's cable investments are a $90 billion endorsement of cable telephony. AT&T is actively involved in upgrading cable facilities to carry telephony and can reach at least 25% of the country's households through directly controlled systems. Alliances with Time Warner and Comcast expand that reach dramatically -- beyond the reach of any two of today's Bell companies.

Digital technology allows cellular and PCS services to provide a functional equivalent to wireline service. The sole remaining question today is when the continuing downward trend in wireless pricing will put it in full head-to-head competition with wireline local service. At this point, wireless connections will provide a complete substitute for the wireline local loop. The Commission has already found that "wireless and wireline technologies are increasingly competing for a single pool of minutes-of-use.... [W]ireless providers can compete for local

access by creating pricing plans that encourage their customers to use mobile phones as substitutes for wireline phones."[68] Wireless providers are aggressively selling pricing plans that compete for today's single pool of minutes-of-use. *UNE Fact Report: Local Loop* at 22-25 (describing pricing plans described by AT&T as aimed at "mak[ing] your wireless phone your only phone"). This is occurring not just in large cities, but in smaller ones as well.[69]

3. Will An Efficient CLEC's Meaningful Opportunity To Compete Be Impaired Without Access to Incumbent LEC Loops at Cost-Based Prices

Given the distinctions between the larger business market and the mass market, whether unbundling of the local loop is necessary to avoid impairing an efficient CLEC's meaningful opportunity to compete is considered separately for each.[70]

a. Business Loops and Impairment

The competitive reality in the business market is that CLECs are successfully competing by using alternatives to incumbent loops. Many CLECs are competing in the market and CLECs have gained a substantial share in a short time. Local competition, at least in the larger business

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[68] *In the Matter of Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993 and Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services*, Third Report, 13 FCC Rcd 19746, 19817 (1998) (*Third CMRS Report*).

[69] "Fixed Wireless Service Launched in South Carolina," *Telecommunications Reports*, April 19, 1999 at 25 (Hargray Communications Group launched wireless local loop service in Beaufort, S.C.)

[70] The fact that section 271 requires Bell companies to provide unbundled transport to obtain long distance relief is hardly evidence that transport should be unbundled under section 251(d)(2)'s necessary and impair standard. Unlike section 251, section 271 does not mandate unbundling at cost-based prices. Congress clearly intended that an additional CLEC entitlement to cost-based prices could be created only after the -separate section 251(d)(2) requirements were met. Also, since all section 251 UNEs must be unbundled under checklist item 2, checklist item 5 would be redundant if Congress had intended a particular outcome for transport under section 251(d)(2). BellSouth will continue to make unbundled local loops available under section 271's requirements even where the Commission does not order unbundling the loop at cost-based prices under section 251(d)(2).

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market, is ahead of the pace at which long distance competition developed. There is no better evidence than this that CLEC opportunities to compete would not be impaired without access to the incumbent local loop at cost-based prices, at least in Zones 1 and 2.

CLECs are using both fiber and WLL technology to connect larger businesses to their networks. Both present competitive alternatives to incumbent LEC loops used to provide service to larger businesses today. The fact that CLECs have installed thousands and thousands of miles of fiber in 149 out of the top 150 MSAs and are present in 350 of the country's 487 BTAs and have connected nearly 15 percent of the commercial buildings in the country to their networks suggests that there are no impediments to installing fiber and hooking up larger business customers.

The Court directed the Commission to also consider the ability of firms to self-provision alternative facilities. The evidence presented here shows that self-provisioning in this market is routine. The government's *Merger Guidelines* adopt a two year time horizon for assessing the ability to self-provision (entry). The *Merger Guidelines* judge that entry or expansion that occurs within two years is timely enough to prevent competition from being impaired. Looking ahead two years, CLEC alternatives to incumbent loop facilities will be even more widespread. Given the pace of their fiber builds over the last two years, two years from now CLEC fiber could reach a very substantial percent of larger business customers in Zones 1 and 2.

The competitive implications of WLL deserve close analysis. As outlined earlier, competition analysis considers firms that can enter a market within a year without substantial fixed costs as being in the market, and the facilities they could install as offering present competitive alternatives. *Merger Guidelines* at § 1.32. WLL systems can be activated in 90-120 days, well under a year. Substantial fixed costs are not incurred because the systems are

"modular, scalable, movable." *UNE Fact Report: Local Loop* at 10-11 (footnotes omitted).[71] WLL spectrum essentially covers the country. The government's standard competition analysis would conclude that WLL spectrum provides a present competitive alternative to incumbent loops for larger businesses. The fact that a CLEC-to-CLEC wholesale market for WLL capacity exists supports the competition analysis.

At least in Zones 1 and 2, CLECs turn to their own fiber and WLL facilities to provide service to larger business customers. WLL and fiber have been and can be deployed in a timely enough fashion to avoid impairing an efficient CLECs "meaningful opportunity to compete." The lack of larger business customers in Zone 3 areas has contributed to reduced CLEC fiber build outs. If the evidence shows that WLL technology cannot provide an alternative to incumbent loops for the larger business market in Zone 3 areas, the Commission may find that CLEC opportunities to compete have been impaired without unbundled access to incumbent loops for larger business customers (4-wire and higher capacity loops).

b. Mass Market Loops And Impairment

CLECs have two potential alternatives to the incumbent mass market local loop. Where cable facilities have been upgraded to provide telephony, there can be no doubt that there is an alternative to the incumbent local loop and consumers are benefiting from the competition Congress expected. Mandating access to the incumbent local loop in these areas is not appropriate under the impair standard and will not benefit consumers.

First, failing to unbundle the loop will not impair a CLEC's meaningful opportunity to compete. Two competing wires into the home provide competing alternatives to CLECs wishing

[71] Nextlink illustrates one way this works. Nextlink establishes initial connections to larger business connections over WLL because of its speed. It then connects fiber to the facility, and

to provide residential service. The possibility that cable operators may adopt closed systems and refuse to provide facilities to other CLECs is a private business decision. If cable operators take that path, CLECs may argue that the decision impairs their opportunity to compete, and they might be right. However, it is not a failure to unbundle the telephone loop that might impair the ability of CLECs to compete, it is the business and regulatory strategy of the cable operators that might. There is no sense in allowing cable companies to create the potential for impairment by refusing to sell access, then rewarding them for their refusal by imposing a costly regulatory handicap on their facilities-based competitors.[72]

The second reason not to require cost-based unbundling of the local loop where cable telephony provides an alternative is that the consumer benefits of providing such access are far from certain. The focus of imposing any unbundling requirement under section 251 must be consumer, not competitor, welfare. Antitrust law acknowledges that unless the owner of an essential facility is also a monopolist in an end user market, establishing a legal sharing requirement is more likely to benefit competitors than consumers and so is not consistent with consumer welfare goals.[73] *MCI Communications Corp. v. AT&T Corp.*, 708 F.2d 1081, 113-33 (7th Cir. 1982), *cert. denied*, 464 U.S. 891 (1983); *Hausman and Sidak Affidavit* at ¶ 96. Any objection that this could lead to only two firms competing for residential telephony subscribers is

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shifts the WLL to the next customer. W. Schaff, *Taking Stock: No Strings Attached*, Information Week, Feb. 22,

[72] Where the local loop is not unbundled under section 251, CLECs would continue to have access to Bell company unbundled loops at market prices under section 271.

[73] Although cost-based unbundling of the local loop might allow more firms to provide residential service, the possibility seems decidedly theoretical. CLECs have not demonstrated any interest in serving the residential market despite the availability of cost-based local loops today. The very substantial costs of the investment disincentives created by cost-based unbundling and administering the unbundling regime seem very likely to outweigh the theoretical competitive benefits of unbundling in areas where competition from cable telephony exists.

simply a competitor not a consumer welfare complaint. The Commission has found that two-firm markets for residential telephony service perform competitively. *AT&T Reclassification Order*, 11 FCC Rcd at 3271, 3356 (AT&T and MCI were the presubscribed long distance carriers for nearly 90 percent of residential access lines). At a minimum, wireless service presents a vibrant competitive fringe equivalent to the competitive long distance fringe that existed at the time AT&T was declared non-dominant.

In addition, the Commission has already found that "wireless and wireline technologies are increasingly competing for a single pool of minutes-of-use." *Third CMRS Report*, 13 FCC Rcd at 19817. Wireless service is available throughout BellSouth's serving territory. Wireless prices continue to fall. Innovative one-rate-type pricing plans bundle local, intraLATA toll and long distance service with calling features in ways that provide offerings as attractive as any wireline phone service. Entry analysis conducted under a *Merger Guidelines*-type analysis would highlight the ability of wireless firms to further compete by lowering prices and building and expanding facilities. Just as WLL for larger business provides a fast vehicle for entry that does not carry with it substantial fixed costs, wireless service provides the same for the mass market. A thorough analysis of wireless service may require wireless providers to be counted as present market participants under the government's *Merger Guidelines*.

Should the record in this proceeding demonstrate that wireless alternatives to the mass market loop do not yet provide efficient CLECs a meaningful opportunity to compete, the established trend in wireless pricing suggest that it will provide an alternative in the not-too-distant future. In light of this trend, any mass market loop unbundling requirement should come with a clear sunset provision. The unbundling requirement should expire at the end of two years,

or upon evidence of additional that wireless service is providing an alternative to incumbent loops, at least in Zone 1 and Zone 2 urban areas, whichever occurs sooner.

4. The Effect Of Mandatory Unbundling at Cost-Based Prices On Investment in The Local Loop

As set out in the *Jorde, Sidak and Teece Affidavit*, cost-based unbundling under section 251(d)(2) creates disincentives to both CLEC and incumbent LEC investment in the unbundled facility and assets that compete with it. Creating a CLEC-entitlement to a cost-based incumbent LEC local loop will reduce CLEC incentives to invest in alternatives. This seems likely to especially affect the development of wireless alternatives to the local loop.

A cost-based unbundling obligation will also reduce incumbent incentives to invest in upgrading the local loop. The potential effect of this disincentive on consumers is especially troubling in light of the need to invest in local loop technologies to compete with cable providers. Under the Commission's current cost-based pricing rules, incumbents would shoulder all the risk of investing in the local loop but enjoy none of the potential benefits. *Id.* This disincentive to investment establishes a regulatory obstacle to providing advanced services over the local telephony loop. Given the freedom from similar unbundling requirements of cable operators offering directly competing services, this policy also tilts the playing field. None of this serves consumers.

5. Conclusion

Failing to unbundle incumbent local loops will not impair CLEC service offerings to larger businesses in Zones 1 and 2 or to mass market users where cable telephony is offered. Because larger businesses are generally served by 4-wire or higher capacity loops and mass market users are served by 2-wire loops, the Commission should find that in Zones 1 and 2, 4-

wire and higher capacity loops would not be unbundled, and that in areas served by cable telephony, 2-wire analog loops would not be unbundled.

E. Signaling Networks And Databases

Signaling networks and databases facilitate the routing of telephone calls between switches. *First Report and Order* at 15723-24. Signaling networks, including incumbent signaling networks, interconnect. *First Report and Order* at 15738. However, current switch technology requires each local switch to link to one signaling network. Incumbent LEC switches are connected to their own signaling networks. Thus, when a CLEC takes unbundled local switching from an incumbent, the incumbent LEC provides signaling, using its databases, over its network. In its earlier analysis of signaling, the Commission did not look outside incumbent LEC networks to determine if alternatives were available. *First Report and Order* at 15740.

A look at the market shows that there are alternatives to incumbent LEC signaling networks and that there are no impediments to self-provisioning. Signaling and databases are provided in a nationwide market. *UNE Fact Report: Signaling And Call-Related Databases* at V-1. Where a CLEC uses its own local switch, it is free to link its switch with any of several alternative signaling networks. There are at least eleven signaling network alternatives to connecting to incumbent LEC networks, at least six of which provide facilities-based service nationwide. *Id.* at 2-4 and Table 1. Several of these network providers aggressively market signaling services and database services including LIDB, customized databases and local number portability, to CLECs. *Id.* at 3-6. There are no significant barriers to further entry into this market. *Id.* at 5-6.

An efficient CLEC would have a meaningful opportunity to compete without unbundled access to incumbent LEC signaling where switching is not obtained from the incumbent. CLECs

with their own switches can self-provision their own signaling networks and databases or obtain access to alternatives providers.

F. Operator Services and Directory Assistance

The Commission made no attempt to examine whether there were competitive alternatives to incumbent LEC operator services, directory assistance services and their associated databases. *First Report and Order* at 15774. The fact that several CLECs, including AT&T, MCI and Frontier, and the Department of Justice insisted that Operator Services (OS) and Directory Assistance (DA) services be separated from the incumbent's local switch so that CLECs could provide their own OS and DA services strongly suggested that alternatives to incumbent LEC services were available in 1996. *Id.* at 15772-73. The facts show that CLECs are looking to competitive suppliers rather than incumbent LECs for OS and DA services. A decision not to unbundle these services could in no way impair an efficient CLECs meaningful opportunity to compete.

1. The Markets for Operator Services and Directory Assistance

Operator services are "any automatic or live assistance to a consumer to arrange for billing or completion, or both, of a telephone call." *Implementation of the Local Competition Provisions of the Telecommunications Act of 1996*, Second Report and Order and Memorandum Opinion and Order, 11 FCC Rcd 19, 392, 19,448 ¶ 110.

Directory assistance service "allows subscribers to retrieve telephone number of other subscribers." *Application of BellSouth Corporation, et al. for Provision of In-Region, InterLATA Services in Louisiana*, Memorandum Opinion and Order, 13 Fcc Rcd 20,599.

Both of these products are provided in a nation-wide geographic market. Service providers routinely deliver operator services and directory assistance from national calling

centers. *UNE Fact Report: Operator Services And Directory Assistance* at IV-9-10. If a provider in one region of the country attempted to raise price above competitive levels, buyers (CLECs in this case) could simply to turn to providers located in other regions.

2. Competitive Providers And Facilities

Many CLECs in BellSouth's region have not ordered operator services or directory assistance services from BellSouth. CLECs have been obtaining these services from alternatives sources. CLECs regularly self-provision operator services and directory assistance services, or turn to any of several national wholesalers of such services. AT&T and MCI, the largest CLECs, provide their own national directory assistance service through a combination of self-provisioning and outsourcing. *Id.* at IV-1-2. AT&T, MCI and Sprint provide operator services on a nation-wide basis using a variety of toll-free access numbers. *Id.* Smaller CLECs either provide their own operator services and directory assistance services, *UNE Fact Report: Operator Services And Directory Assistance* at IV-2 Table 1, or purchase wholesale services from alternative providers, *Id.* at IV-5 Table 3. Internet-based services and CD-ROM based services provide additional sources of alternative supply. *Id.* at IV-3 Table 2.

There are several independent alternative providers of substitutes for incumbent LEC operator services and directory assistance services. Teltrust, for one, can "supply nationwide origination and termination services with a variety of live agent and automated network platform services, configured to each client's needs. Teltrust Website <www.teltrust.com/network /index.htm>. InfoNXX provides "a true alternative to telephone company directory assistance." InfoNXX Website <www.inofnxx.com/national.htm>. *See UNE Fact Report: Operator Services and Directory Assistance* at IV-4.

These firms all have access to current databases. They can obtain directory listing information from a variety of independent sources. *Id.* at IV-8-9. Aside from listing information, the key ingredients operator services and directory assistance providers need are employees, a call center location, computers and telephone lines. These assets are easily obtained in the open market. One of the leading independent providers of operator services and directory assistance services states the obvious when it explains that there is an "absence of substantial barriers to entry in the call completion, national directory assistance, third-party verification and calling card services markets." Teltrust, Inc., SEC Form S-1 A, July 8, 1998.

The upshot is that alternative providers now provide many competitive alterntives to incumbent LEC operator services and directory assistance services across the nation. *UNE Fact Report: Operator Services and Directory Assistance* at IV-6-7. AT&T, MCI WorldCom, Sprint, Excell and TelTrust are leading providers of these services.

3. Will An Efficient CLEC's Meaningful Opportunity To Compete Be Impaired Without Access To Incumbent LEC Operator Services and Directory Assistance Services At Cost-Based Prices?

There is no case to be made that incumbent LEC operator services and directory assistance services meet section 251(d)(2)'s impair standard. CLECs have turned to alternatives, and have competed successfully with those alternatives. CLECs can and do self-provision operator services and directory assistance services. CLECs can and do turn to independent alternative providers of the services. There are no barriers to entry into the market. Competition is flourishing among a broad range of market providers.

There are no grounds on which to base a finding that an efficient CLEC's meaningful opportunity to compete would be impaired without access to unbundled incumbent LEC operator

services and directory assistance services. CLECs would still have a guarantee of access to incumbent LEC directory listings under section 251(b)(3).

4. Conclusion

Operator services and directory assistance services should not be unbundled under section 251(d)(2).

F. Advanced Intelligent Network Platforms And Software

BellSouth's advanced intelligent network (AIN) platform and the application software BellSouth develops to run on that platform should not be subject to unbundling under section 251(d)(2). AIN platforms are available from several suppliers in the open market. Any CLEC can acquire an AIN platform and the service creation environment tools that allow the development of customized software applications. Because CLECs are free to invest in obtaining AIN platforms and self-provision AIN services, efficient CLECs have a meaningful opportunity to compete without access to an unbundled BellSouth platform.

BellSouth has invested heavily in developing proprietary applications software that runs on its AIN platform. This software provides advanced calling and network operations features. This application software is generally developed internally at BellSouth. The software is all proprietary, and BellSouth has received patents on many developments.

Although the facts suggest that there is no reason to allow CLECs unbundled access to BellSouth's AIN platform at all, if any such access is permitted, access to BellSouth's internally developed applications software should not be mandated. Unbundled access to proprietary elements should be granted only if the element is necessary. The market for telecommunications innovation is broad and deep. Equipment manufacturers, software developers and carriers are all free to invest in innovation, including innovation on AIN platforms. Forced sharing of

innovative offerings would simply dampen incentives to invest in developing new services. *Jorde, Sidak and Teece* at ¶¶ 30-40, 47-50.

VII. COMBINATIONS OF NETWORK ELEMENTS

The Commission's requirement that network elements combined in an incumbent network be provided in a combined fashion applies only where the combined network elements have all met the standards of section 251(d)(2). Thus, the Commission's rule would not require, and could not require, incumbents to provide a combination of a section 251(d)(2) element with a piece of the network that did not meet that standard.

The Court clearly understood this to be the case when it concluded that its remand of Rule 319 with explicit instructions to the Commission to impose a "limiting" standard on unbundling "may render the incumbents' concern on [combinations] academic." Slip Op. at 26.

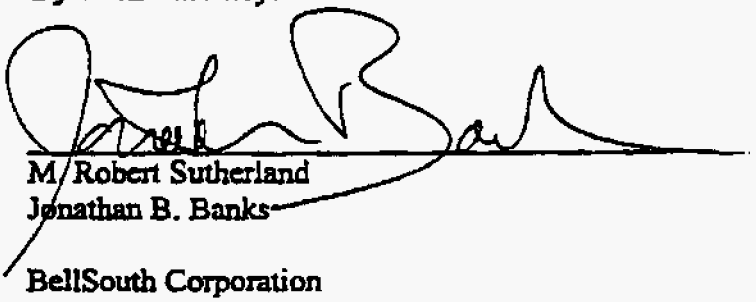
VIII. CONCLUSION

Through careful, fact-based application of section 251(d)(2)'s rational, limiting standards the Commission can craft a pro-consumer approach to unbundling that will be consistent with Congress's pro-competitive, deregulatory intent for the Act. By carefully limiting unbundling, the Commission can ensure that competition will flourish instead of regulation and that CLEC and incumbent LEC incentives to invest will in providing telecommunications and advanced services will not be reduced by regulation.

Respectfully submitted,

BELLSOUTH CORPORATION
BELLSOUTH TELECOMMUNICATIONS, INC.

By Their Attorney:



M. Robert Sutherland
Jonathan B. Banks

BellSouth Corporation
Suite 1800
1155 Peachtree Street, N.E.
Atlanta, GA 30309-3610
(404) 249-2207

Date: May 26, 1999

Collocation Costs per Wire Center

Collocation Space:

Non-recurring Charges:

$ 3,850.00	Application Fee	
$ 60,000.00	Space Preparation Fee	
$ 9,000.00	Space Enclosure	200 sq. ft.
$ 800.00	Additional Engineering Fee	
$ 2,750.00	Cable Installation	1 Entrance Cable
$ 76,400.00	Total non-recurring	

Recurring Charges:

$ 1.500.00	Floor Space	200 sq. ft. in Zone A
$ 250.00	Power	50 A
$ 13.35	Cable Support Structure	
$ 1,763.35	Total recurring	

	DS0	DS1	DS3	Total
Typical Collocation Space (low):	1200	30	3	
Equivalent DS0:	1200	720	2016	3936
Equivalent DS1:	50	30	84	164
Typical Collocation Space (high):	1200	84	5	
Equivalent DS0:	1200	2016	3360	6576
Equivalent DS1:	50	84	140	274

Recurring:

$ 0.45	Collocation Space / DS0 (low)
$ 0.27	Collocation Space / DS0 (high)

Non-Recurring converted to recurring:

$ 0.16	Collocation Space / DS0 (low)	@10 yrs over 12 mths
$ 0.10	Collocation Space / DS0 (high)	@10 yrs over 12 mths

Collocation Equipment:

			Qty	
$ 4,500.00	Lucent R2-84-R	DSX-1 Panel	3	1500
$ 13,000.00	NEC RC-28D	M13 Multiplexer	5	2600
$ 6,200.00	ADC 4H-24	DSX-3 Panels	1	6200
$ 2,500.00	DPS KDA864	Remote Alarm Unit	1	2500
$ 300.00	Lucent LSC2U-24	LG-X Panel	1	300
$ 1,200.00	Lucent DDM2000	OC-12 ADM	1	1200
$ 5,000.00	Lucent Lineage	BDFB	1	5000
$ 96,000.00	Nortel ntzh11dc	Access Node DLC	4	24000
$ 128,700.00				

Non-Recurring converted to recurring:

$ 0.27	Collocation Eqpt / DS0 (low)	@10 yrs over 12 mths
$ 0.16	Collocation Eqpt / DS0 (high)	@10 yrs over 12 mths

Collocation Costs per Wire Center

Collocation Cross Connects:

Recurring Charges:

$	0.50	4-wire (1st cross connect) @ $.50	1
$	8.00	DS1 (1st cross connect) @ $8.00	1
$	72.00	DS3 (1st cross connect) @ $72.00	1

Non-recurring Charges:

$	19.20	4-wire (1st cross connect) @ $19.20	1
$	155.00	DS1 (1st cross connect) @ $155.00	1
$	155.00	DS3 (1st cross connect) @ $155.00	1

Non-Recurring converted to recurring:

$	0.16	4-wire/X-conn ($19.20/10 yrs/12 mths)
$	1.29	DS1/X-conn ($155.00/10 yrs/12 mths)
$	1.29	DS3/X-conn ($155.00/10 yrs/12 mths)

POT Bay Charges:

Recurring Charges:

$	1.20	4-wire @ $1.20	1
$	1.20	DS1 @ $1.20	1
$	8.00	DS3 @ $8.00	1

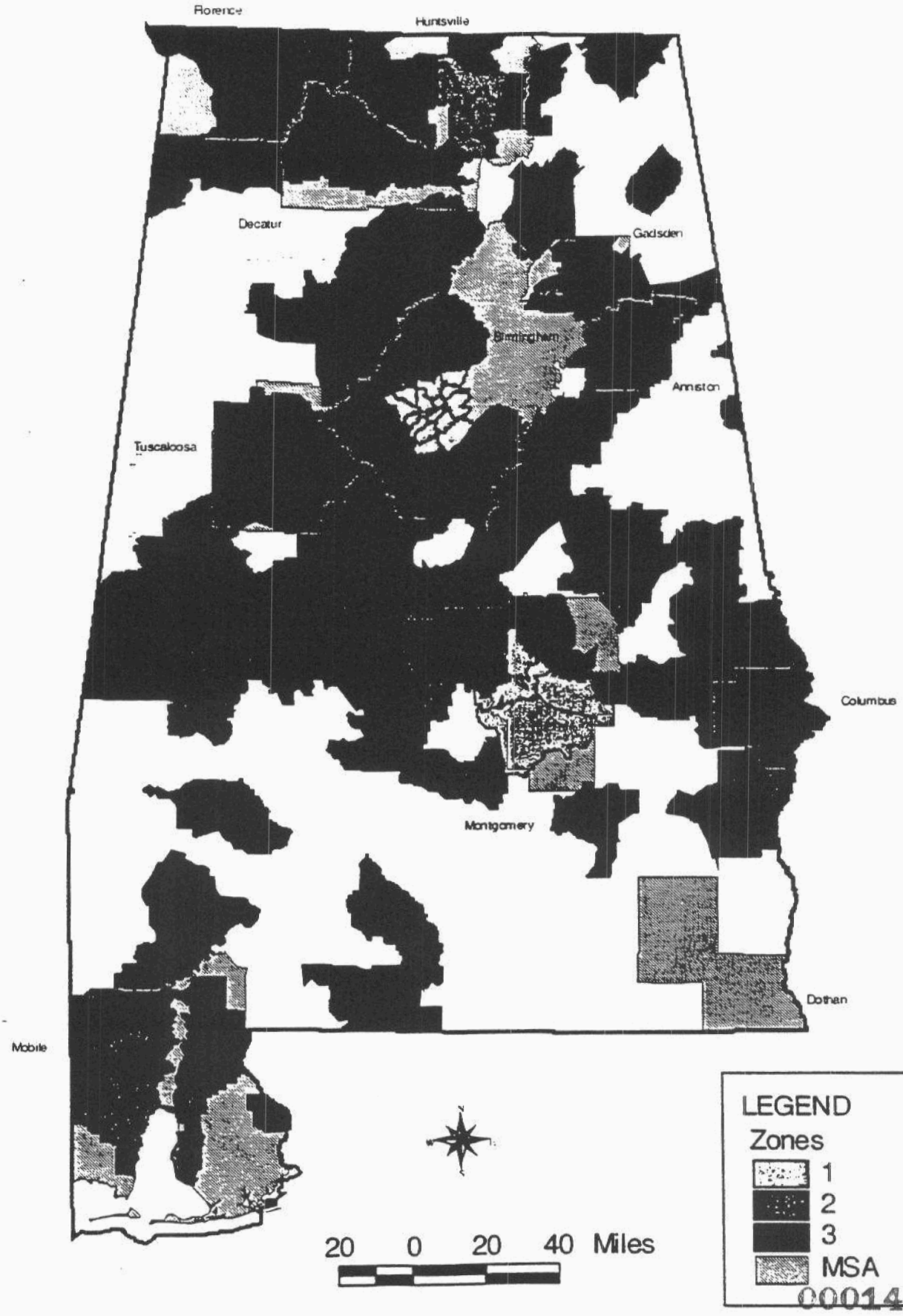
COLLOCATION

	Recurring	NRC
Collocation Space:		
Application Fee		$3,850
Space preparation fee		$60,000
Space enclosure		$9,000
Add'l Engr. Fee		$800
Cable Installation		$2,750
Floor space	$1,500	
Power	$250	
Cable Structure	$ 13.35	
TOTAL	$1,763	$76,400
Per DS1 Total	$10.75	$465.85
Collocation Equipment:		$128,700
Per DS1		$784.76
Collocation cross connects:	$8.00	$155.00
add'l		
POT Bay charges:	$1.20	
Per Line	**$19.95**	**$1,406**
NRC spread over 5 yrs. @ 11.25%	**$30.74**	
TOTAL PER Line	**$50.69**	

164

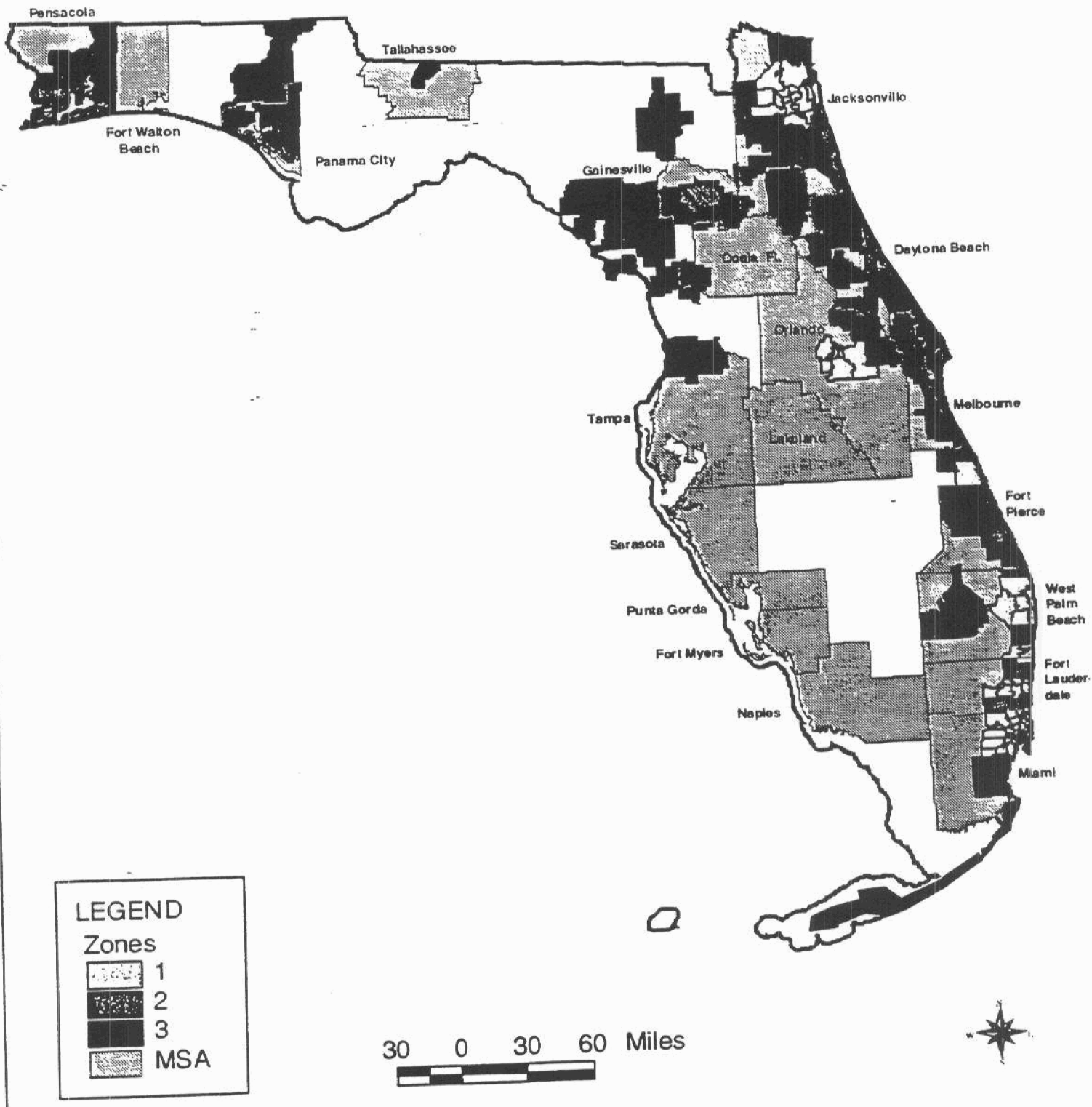
ALABAMA

Zone Distribution in Relation to MSAs



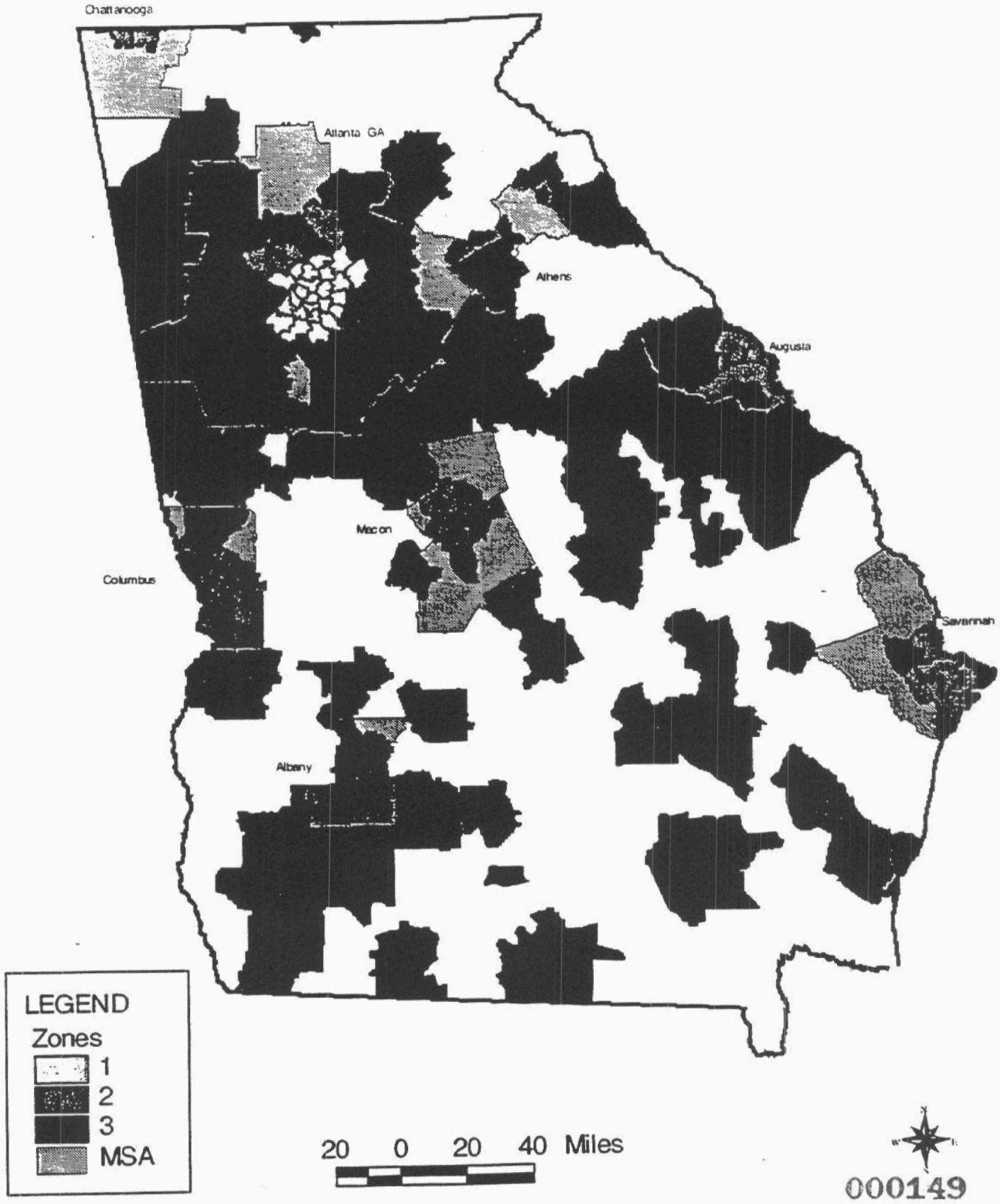
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Zone Distribution in Relation to MSAs



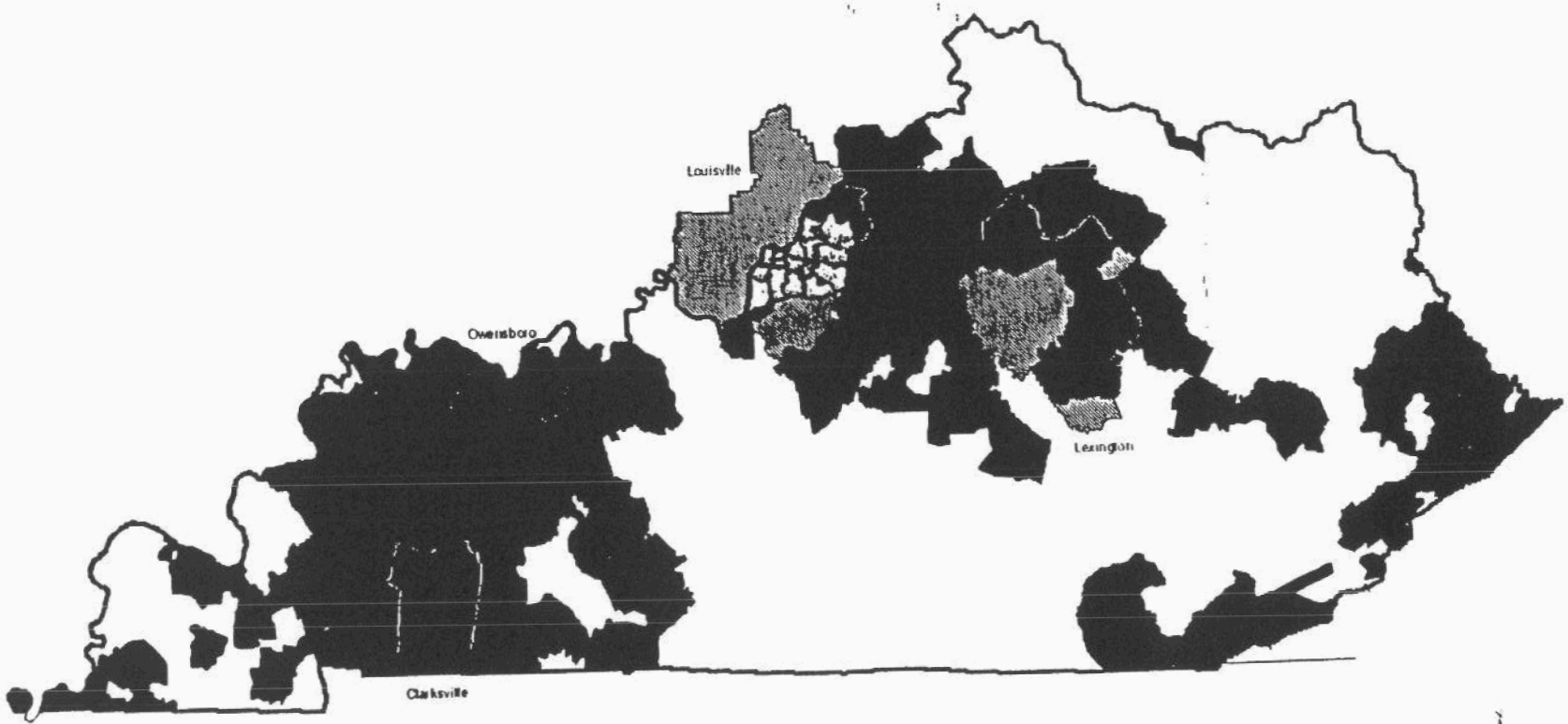
GEORGIA

Zone Distribution in Relation to MSAs



KENTUCKY

Zone Distribution in Relation to MSAs



LEGEND

Zones

1
2
3
MSA

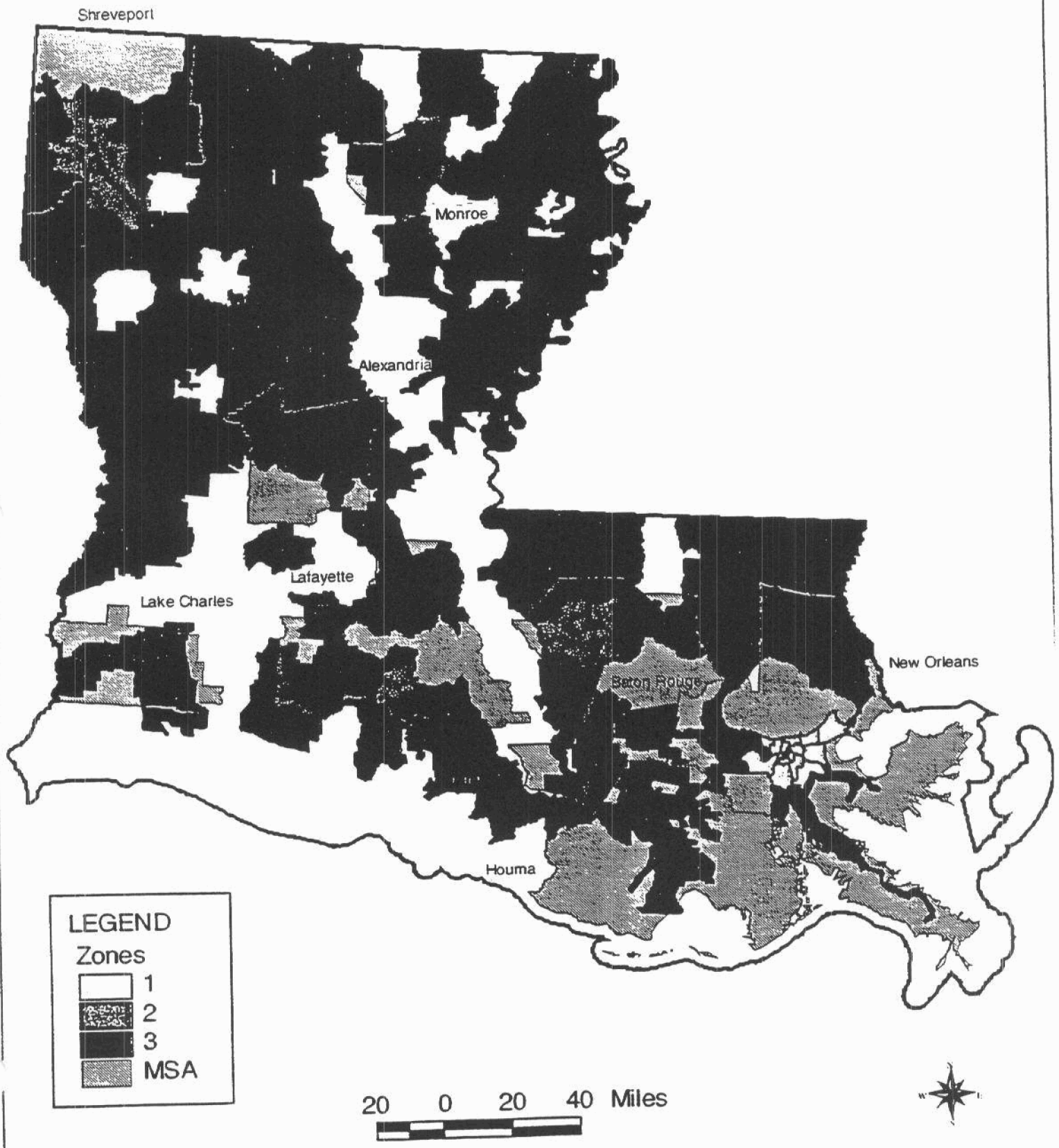
60 0 60 120 Miles

ATTACHMENT B
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LOUISIANA

Zone Distribution in Relation to MSAs



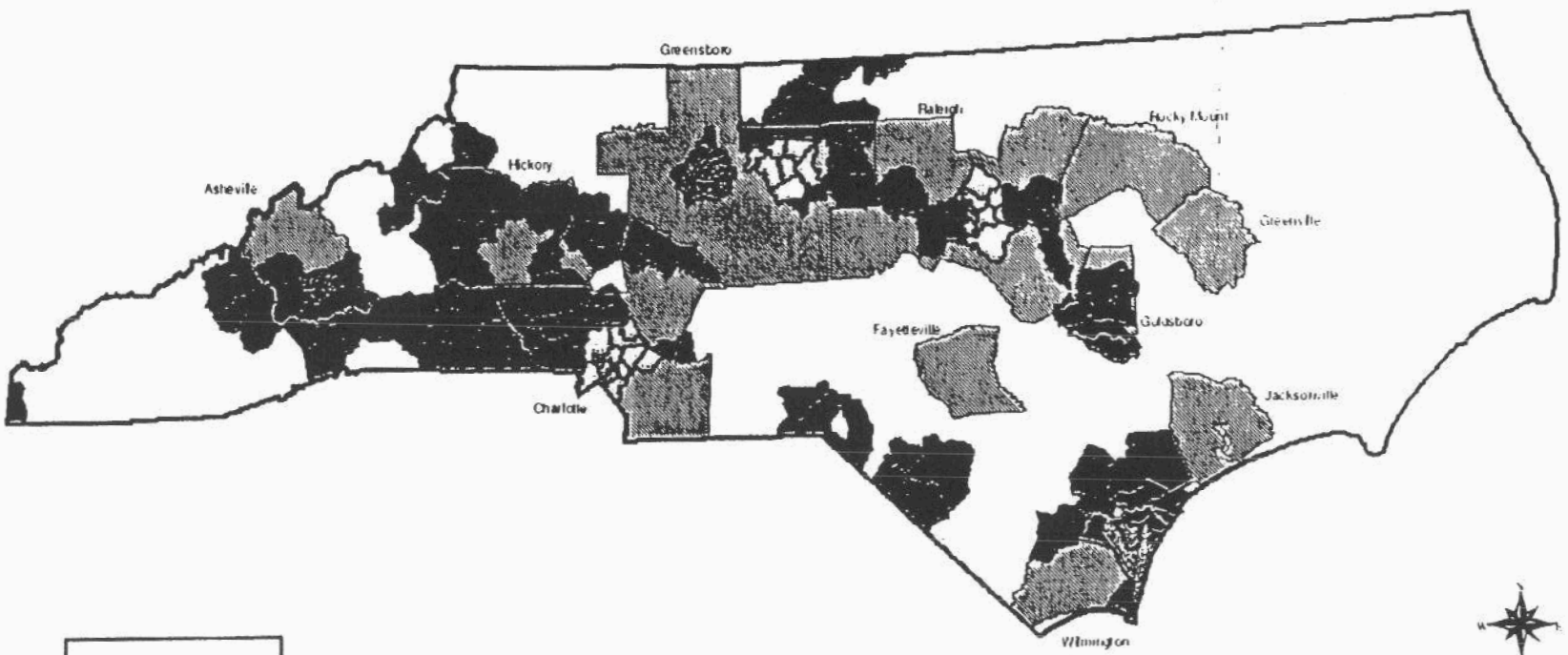
MISSISSIPPI

Zone Distribution in Relation to MSAs



NORTH CAROLINA

Zone Distribution in Relation to MSAs



LEGEND

Zones

1
2
3
MSA

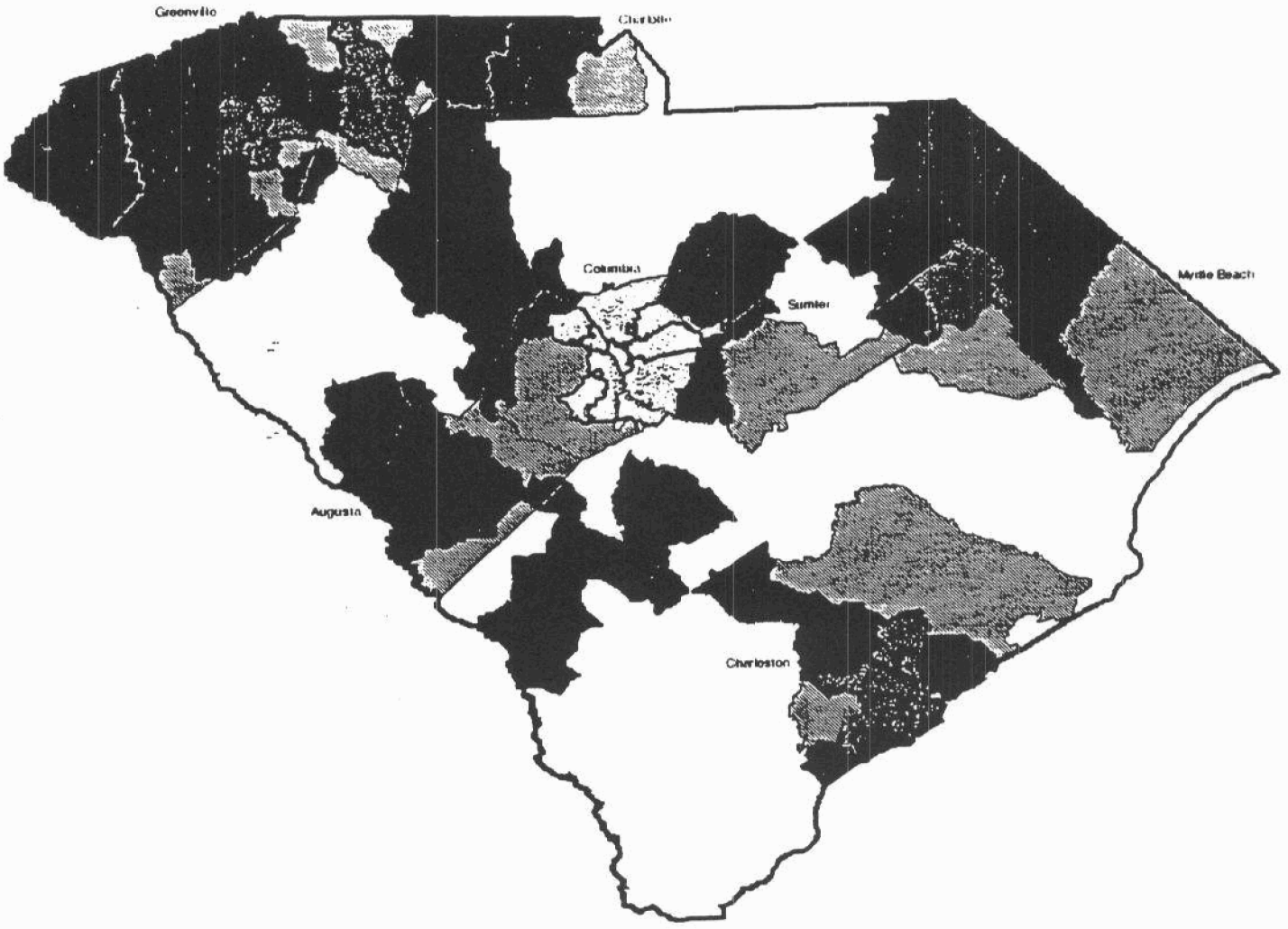
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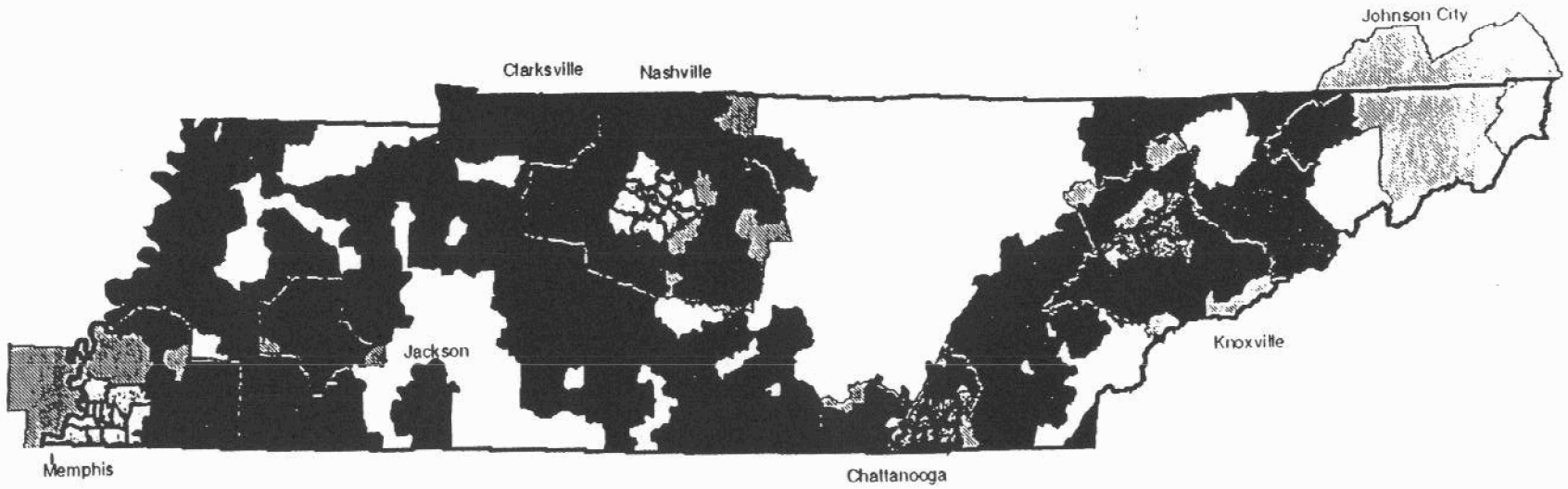
SOUTH CAROLINA

Zone Distribution in Relation to MSAs



TENNESSEE

Zone Distribution in Relation to MSAs



LEGEND

Zones

1
2
3
MSA

60 0 60 120 Miles

ATTACHMENT B
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Cable Telephony Available by EOY 1999
Alabama

CITY
Athens
Birmingham
Birmingport
Cordova
Dora
Ensley
Forestdale
Fort Deposit
Gardendale
Graysville
Gurley
Homewood
Hoover
Hueytown
Huntsville
Irondale
Madison
McCalla
Meridianville
Mobile
Montgomery
Pinson
Prattville
Prichard
Saraland
Semmes
Tarrant
Theodore
Theodore
Tuscaloosa
Vestavia Hills
West Blocton

Cable Telephony Available by EOY 1999
Florida

POST OFFICE NAME
Atlantic Beach
Gainesville
Green Cove Springs
Jacksonville
Jacksonville Beach
Middleburg
Neptune Beach
Orange Park
Panama City
Panama City Beach
Saint Augustine

Cable Telephony Available by EOY 1999
Georgia

POST OFFICE NAME
Acworth
Atlanta
Avondale Estates
Clarkston
Decatur
Duluth
Kennesaw
Lithonia
Marietta
Norcross
Smyrna
Stone Mountain
Tucker

Cable Telephony Available by EOY 1999
Louisiana

CITY
Avondale
Bastrop
Benton
Blanchard
Calhoun
Chalmette
Columbia
Coushatta
Delacroix
Downsville
Doyline
Dubach
Farmersville
Greenwood
Gretna
Haughton
Kenner
Lafitte
Lake Catherine
Laplace
Logansport
Luling
Mansfield
Metarie
Minden
Monroe
New Orleans
Oil City
Pointe a la Hache
Poydras
Ruston
Shreveport
Sterlington
Ysclosky

Cable Telephony Available by EOY 1999
South Carolina

CITY
Charleston
Charleston Heights
James Island
John's Island
North Charleston
Summerville

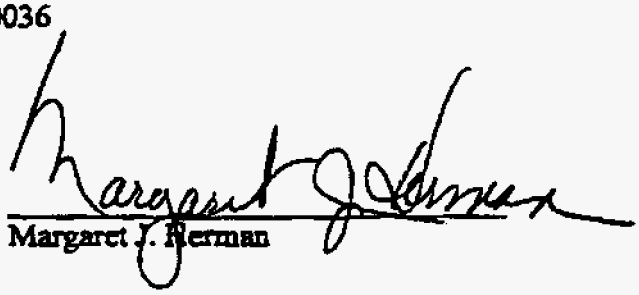
CERTIFICATE OF SERVICE

I hereby certify that I have this 26th day of May, 1999, caused a copy of the foregoing **COMMENTS** to be served by hand-delivery to all parties to this action addressed to the following:

Magalie Roman Salas
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Janice M. Myles
Common Carrier Bureau
Federal Communications Commission
445 12th Street, S.W.
Room 5-C327
Washington, D.C. 20554

ITS
1231 20th Street, N.W.
Washington, D.C. 20036



Margaret J. Herman

PLEASE DATE-STAMP AND RETURN



Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

RECEIVED
JUN 10 1999
FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of	)	
	)	
Implementation of the Local Competition Provisions in the Telecommunications Act of 1996	)	CC Docket No. 96-98
	)	
	)	

REPLY COMMENTS OF BELLSOUTH CORPORATION

BELLSOUTH CORPORATION

William B. Barfield
Jonathan Banks

Its Attorneys

1155 Peachtree Street
Suite 1800
Atlanta, Georgia 30309
(404) 249-2207 Telephone
(404) 249-5901 Facsimile

June 10, 1999

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EXECUTIVE SUMMARY

Applying section 251(d)(2) as a rational, limiting standard g· ·ing unbundling incumbent LEC network elements requires the Commission to analy·· ·e ability of CLECs to obtain network elements from alternatives to incumbent L· and the ability of CLECs to self-provision network elements. Incumbent LECs hav· en the Commission a factual record on which to do this. CLECs have chose· · ignore the facts and pound the table instead.

BellSouth is filing joint reply comments with Ameritech, SBC ·mmunications, Inc. and the United States Telephone Association that address CLECs' ·· splaced objections that section 251(d)(2) is not the rational, limiting standard that the Court expressly held it was. In these Reply Comments, BellSouth replies to more particular CLEC claims that every element of the incumbent LEC network should be unbundled under section 251(d)(2).

As an initial matter, BellSouth shows that there is no factual record that would support an unbundling obligation founded on perceived incumbent LEC economies of scope, density and connectivity. Even the HAI model created by AT&T and MCI shows that CLECs can achieve economies that place them on at least level footing with incumbent LECs. CLECs need not build large networks to realize these efficiencies. In fact, the limited urban areas they now serve are of sufficient scale.

BellSouth also demonstrates that the contentions of CLEC economists regarding the disincentives to investment -- both CLEC and incumbent LEC -- from an unbundling are misplaced, as are their measures of impairment.

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CLECs that focus on deploying DSLAMs and offering xDSL service do not advocate that incumbent LEC DSLAMs be unbundled. The competition between different networks to provide advanced services creates the alternatives and self-provisioning possibilities that make a finding of impairment without access to unbundled incumbent LEC network elements used to deliver advanced services impossible.

CLECs admit that there are alternatives to incumbent LEC transport services in particular areas. AT&T, for one, acknowledges that it has substantial alternatives, to the extent that 20 percent of its local transport is provided through alternative facilities. BellSouth provides fiber maps that, although they cannot capture all the alternatives available to CLECs, demonstrate that sufficient alternatives exist across the larger cities in BellSouth's region that CLECs could not be impaired without access to unbundled incumbent LEC transport.

As to switching, there can hardly be any debate. Some facilities-based CLECs argue affirmatively that switching should not be unbundled except in a few locations. ALTS and other facilities-based CLECs do not attempt to make a case that switching can be legitimately unbundled under section 251(d)(2). Other CLECs have provided no factual information that would contradict the factual record supplied by the incumbent LECs. BellSouth provides additional information demonstrating that CLEC switch deployment is proceeding rapidly. CLECs are fast approaching the number of BellSouth switches deployed on a city-by-city basis in large and medium sized cities across BellSouth's entire region. The loop cutover process is no barrier to CLEC switch deployment. That process is working well today in BellSouth's region.

CLECs have simply refused to step up to the plate with factual information on local loop alternatives. Incumbents LECs have demonstrated what the Commission has long acknowledged, CLECs can, and are, creating alternatives to the incumbent LEC loop for larger business customers. Where telephony is being offered over cable services, there is an alternative to the incumbent LEC local loop, and the loop no longer meets 251(d)(2) requirements. Wireless service is provides a second alternative to the incumbent LEC local loop.

CLEC contentions that alternative providers of operator services and directory assistance are not adequate do not reflect the facts.

The Commission's merger and non-dominance orders provide the analytical tools to conduct a pro-competition, pro-consumer analysis of the costs and benefits of unbundling under section 251(d)(2). Incumbent LECs have supplied the necessary factual record. Applying those analytical tools to conduct a market-by-market analysis of unbundling will result in the limited amount of unbundling that will best serve consumers and competition.

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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Implementation of the Local Competition Provisions in the Telecommunications Act of 1996	)	CC Docket No. 96-98
	)	
	)	

REPLY COMMENTS OF BELLSOUTH CORPORATION

BellSouth Corporation, on behalf of itself and BellSouth Telecommunications, Inc. (BellSouth) hereby files these Reply Comments in connection with the Commission's recent Notice in CC Docket No. 96-98.[1] These Reply Comments address the application of section 251(d)(2) to individual network elements. BellSouth is also filing joint reply comments with Ameritech, SBC Communications, Inc. and the United States Telephone Association addressing the overall limiting standard of section 251(d)(2).

I. INTRODUCTION

BellSouth's specific comments on whether particular network elements can properly be unbundled under section 251(d)(2) are set out, element-by-element, below. The two sections immediately following this introduction address more general issues raised by CLECs. Section II shows that vague contentions that incumbent LEC

[1] *In the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, CC Docket Nos. 96-98. *Second Further Notice of Proposed Rulemaking*, FCC 99-70, released April 16, 1999 ("*Notice*").

economies of scale can provide a basis for unbundling are wrong. Section III refutes various contentions made by certain CLEC economists.

II. THE COMMISSION CANNOT RELY ON THEORETICAL INCUMBENT LEC EFFICIENCIES TO UNBUNDLE NETWORK ELEMENTS UNDER SECTION 251(d)(2)

The Commission's Notice sought comment on incumbent LEC economies of "density, connectivity and scale." Notice at ¶ 26. A number of commenters responded with unsupported assertions that incumbent LECs enjoy "tremendous" economies that CLECs could not duplicate. *See, e.g.*, AT&T Comments at 19; MCI WorldCom Comments at 48-49. The Commission previously relied on similar generalized notions of incumbent LEC network efficiencies to justify unbundling requirements. In fact, the *First Report and Order*[2] assumed that the Act required the sharing of incumbent LEC economies of "density, connectivity and scale." *First Report and Order* at ¶ 11.

There are at least three problems with concluding that economies provide a basis for required unbundling under section 251(d)(2). First, there is no evidence in the record to demonstrate the amount of these economies, the geographic areas they might be tied to, and whether they attach to any particular network element. Just as the network elements under consideration here vary tremendously, from loops provided in a myriad of different local geographic markets to signaling provided in a single national market, so economies of density, connectivity and scale are likely to vary tremendously.

---

[2] *In the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, CC Docket No. 96-98, *First Report and Order*, 11 FCC Rcd 15499 (1996)("*First Report and Order*"), *modified on reconsideration*, 11 FCC Rcd 13042 (1996), *vacated in part, Iowa Utilities Bd v. FCC*, 120 F.2d 753 (8th Cir. 1997), *aff'd in part and rev'd in part sub nom. AT&T Corp. v. Iowa Utilities Board*, 119 S. Ct. 721 (1999).

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Second, even where economies exist, the Court has rejected the Commission's original assumption that the Act generally requires sharing. *AT&T v. Iowa Utilities Board*, 119 S. Ct. 735. Section 251(d)(2) imposes a rational, limiting standard on unbundling. Sharing economies may be required only where failing to share would impair an efficient CLEC's meaningful opportunity to compete, or where sharing a proprietary element is necessary. No CLEC has made any attempt to demonstrate that denying them an entitlement under section 251(d)(2) to share in incumbent LEC efficiencies in the operation of any particular network element would equate to a denial of an efficient CLEC's opportunity to compete.

Finally, as the attached affidavit of Jamshed K. Madan and Michael D. Dirmeier makes clear, there is every reason to believe that CLECs are capable of matching or exceeding incumbent LEC economies by building out their own facilities. They conclude that "CLECs can match or exceed ILEC economies over the areas that CLECs typically are serving" and that the evidence "does not support general unbundling of ILEC network elements on any premise that the economies of ILEC networks cannot be matched by the economies of CLEC facilities." Attachment A, Declaration of Jamshed K. Madan and Michael D. Dirmeier at ¶ 2.

By using the HAI model, to which AT&T and MCI have long subscribed, it is possible to estimate the costs of an efficient CLEC network.[3] In order to make the estimation particularly relevant, the model was applied to areas where CLECs are today competing for customers and installing their own switches, transport and loops. Thus, the

[3] BellSouth does not subscribe to the fundamental accuracy of the model or the HAI default inputs used in this analysis. *See* Madan and Dirmeier Affidavit at ¶ 8. However, the model should be useful to illustrate any relative difference in economies of scale and scope that come from serving smaller versus larger geographic areas.

model was run for the Atlanta metro area, and areas representing northern, central and southern Atlanta. The HAI model produces separate cost estimates for each of the Commission's original unbundled network elements.

The HAI model demonstrates that network efficiencies can generally be realized without serving an entire state, or even an entire large city. That is, a CLEC using its own modern network to serve just parts of the metro Atlanta area will enjoy operations that are as efficient or more efficient than a forward-looking network covering the entire city or the entire state. Madan and Dirmeier Affidavit and Affidavit Attachment 1 (comparing cost estimates element-by-element). Thus, whether the network element is transport, switching, signaling or loops, CLECs can self-provision elements and networks that are as efficient as forward-looking incumbent LEC networks, if they have not done so already in urban areas.

These comparisons based on the HAI Model may understate CLEC advantages considerably. The comparisons above compare a forward-looking most efficient CLEC network to a forward-looking most efficient incumbent LEC network. While modern CLEC networks probably approximate forward-looking networks, incumbent LEC networks may not. CLECs are not limited by historical wire centers, LATA boundaries or circuit switched technology. In fact, AT&T and MCI regularly argue that incumbent LEC networks contain embedded elements that make them models of inefficiency. Of course, given competition from other networks, like cable telephony, wireless and Internet Protocol networks, an inquiry into only the relative economies of traditional circuit-switched wireline networks would not fully address whether an efficient CLEC could be impaired without a sharing entitlement. An inquiry limited to solely the

wireline would also absolutely fail to reflect the competitive realities of telecommunications markets today.

There is no evidence that suggests that incumbent LEC economies of "density, connectivity, and scale" relating to any network element rise to the level that an efficient CLEC would be impaired without an entitlement to share those elements under section 251(d)(2).

III. THE HAUSMAN AND SIDAK REPLY AFFIDAVIT

The Hausman and Sidak reply affidavit, Attachment B to these Reply Comments, rebuts several CLEC arguments concerning the standard and presumptions the Commission should bring to bear on analysis under section 251(d)(2). These CLECs arguments are generally summed up in the Hubbard, Lehr, and Willig affidavit (Hubbard Affidavit) attached to AT&T's Comments. The Hausman and Sidak reply affidavit explains how the thinking of AT&T's economists runs afoul of the Act, the Court's opinion, and basic tenets of economic analysis.

Perhaps the two most important points made in the Hausman and Sidak affidavit are the following. First, unbundling, especially under the Commission's TELRIC price model will affirmatively discourage investment in telecommunications facilities by both CLECs and incumbent LECs. Hausman and Sidak Reply Affidavit at ¶¶ 10-14 . Second, the Hubbard Affidavit gives no substantive economic meaning to section 251(d)(2) "impair" standard because it depends on an unrealistically one dimensional analysis. Thus, the Hubbard Affidavit would assume a CLEC is impaired by a higher-priced alternative to an incumbent LEC element even though the alternative element may be of a

higher quality or may have some other attribute that allows the CLEC to compete effectively despite the higher price.

> A CLEC's ability to compete is, at a minimum, two-dimensional: It makes no sense to ask whether restriction of a UNE would raise the CLEC's cost in and of itself or lower the CLEC's quality in and of itself.

Hausman and Sidak Reply Affidavit at ¶ 20. Thus, a CLEC, like any firm, can trade off inputs along "production possibility frontier." Less of one input may be remedied by more of another. Thus, evaluating whether a CLEC is impaired without an incumbent LEC network element depends on evaluating the whole range of options available to the CLEC. Hausman and Sidak Reply Affidavit at ¶ 21.

In addition, the Hubbard Affidavit gives no way to measure the impairment that a CLEC may suffer.

> A CLEC must be impaired relative to a predetermined set of options. Again, without specifying what options are available to the CLEC and hence what it could achieve without mandatory unbundling, it is meaningless to ask whether a CLEC's inability to lease a particular network element at a TELRIC price would impair the CLEC's ability to compete.

Hausman and Sidak Reply Affidavit at ¶ 22 . Without attempting to measure the degree of impairment in some way, no conclusion can be made as to whether the impairment could harm competition or consumers. Certainly, without an impairment yardstick, no conclusion of impairment could pass muster under the Court's explicit instructions that a simple reduction in CLEC profits could not meet section 251(d)(2)'s impair test.

IV. ADVANCED SERVICES ELEMENTS

BellSouth's Comments and the *UNE Fact Report* spelled out just how new and how competitive the market for providing high-speed, advanced services is. BellSouth Comments at 32-47; *UNE Fact Report: Advanced Services* at VI. By rights, and aiming at regulatory parity, the Commission should not even consider unbundling network elements used to deliver advanced services.

No one has stated the case better than AT&T that regulating this market is likely to harm investment, competition and consumers. As AT&T explains, the market is highly competitive now—the market leading cable companies face competition from "RBOCs, CLECs, ISPs, wireless providers, satellite companies and others, who are investing billions of dollars to deploy broadband facilities and compete for customers."[4] AT&T's and TCI's economists state that "it is impossible to predict from today's vantage point who the leading competitors will be and how the competitive uncertainties concerning technologies, qualities and design of services, availabilities and prices will resolve."[5]

AT&T and TCI take the position that the "[c]ompetition between [cable companies] and ILECs will promote consumer welfare."[6] The competition between these

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[4] *In the Matter of Joint Application of AT&T Corp. and Tele-Communications, Inc. for Transfer of Control to AT&T of Licenses and Authorizations Held by TCI and its Affiliates Or Subsidiaries*, AT&T's and TCI's Joint Reply To Comments And Joint Oppostion To Petitions To Deny Or To Impose Conditions, CS Docket No. 98-178, at 34-35 (Nov. 13, 1998)(*AT&T-TCI Joint Reply*)(footnotes omitted).

[5] Ordover and Willig Affidavit, Attached to *AT&T-TCI Joint Reply* at ¶ 23.

[6] *Id.* at ¶ 27.

two networks is sufficient to ensure access to "broadband networks," presumably of any type, "so long as that access is efficient and consistent with consumers' demands[7]

Given the degree of competition to provide advanced services, AT&T concludes that

> far from promoting the widespread availability of advanced services, subjecting new entrants such as TCI [and incumbent LECs are even newer entrants] to the unbundling and other obligations" would thwart competition. Forced unbundling with its attendant regulatory uncertainty would likely slow down investment in the development of broadband last mile data transport.[8]

The entire cable industry echoes this advanced services refrain. Although cable providers have a substantial lead in deploying advanced services capabilities, they are confident that any regulatory mandate of access to advanced service elements will discourage or eliminate the prospect of further investment, reduce innovation and harm consumers.

> requiring a particular provider of Internet access to make its facilities available to other Internet service providers would only stifle innovation, the development of facilities-based alternatives and the growth of the Internet....Mandating access to an Internet service provider's facilities, however, would not encourage competition because it would reduce substantially the incentives for competitors to develop additional facilities-based alternatives.

Cox Communications, Inc. 706 Comments at 3-4.[9]

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[7] *Id.* at ¶ 50.

[8] *Id.* at ¶ 49. AT&T and TCI doubt whether it is even administratively possible to regulate access to advanced services facilities. *AT&T-TCI Joint Reply* at 49.

[9] Comments of Cox Communications, Inc., *In the Matter of Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996*, CC Dkt No. 98-146 (filed October 8, 1998). Cites to other comments filed in this round of the 706 proceeding are referred to by the name of the commenter followed by "706 Comments."

> Imposing unbundling and resale obligations on cable operators for the benefit of entities that chose not to construct their own networks would turn section 706 on its head by suppressing cable's incentives to invest in new broadband capability.

National Cable Television Association 706 Comments at 25.

> One of the most durable barriers to new entry into telecommunications markets is the prospect that new entrants will be subject to burdensome regulation.

Comcast Corporation 706 Comments at 12.

Of course, AT&T's and the cable industry's comments set out above were made in other proceedings. Only AT&T has reversed course.

A. Section 251(d)(2) Can Be Stretched No Farther Than To Require Incumbent LECs To Provide Local Loops And Collocation To Aid CLECs In Providing Advanced Services Through xDSL Technology

The debate over whether to unbundle network elements used by incumbent LECs to provide advanced services cannot go beyond collocation and loops.[10] Where collocation is available to allow CLEC xDSL competition over incumbent LEC local loops, an entitlement to free ride on incumbent LEC investment in DSLAMS could never meet section 251(d)(2)'s limiting standard. As described by AT&T and cable companies above, any such requirement could never be in the interests of competition or consumers. No such decision could be squared with the absence of an unbundling requirement for network elements used to provide the same advanced services over cable networks. Regulatory parity is a simple goal that would ennable greater competition.

CLECs are using incumbent LEC local loops and collocation to compete very successfully today. "As a general matter, the collocation of DSLAMs in an ILEC central office is not an expensive, capital intensive exercise." Information Technology Industry Council Comments at 7. As set out in BellSouth's Comments, the process has worked well enough that CLECs can claim to have a substantial advanced services lead over incumbent LECs. CLECs predict that this lead will continue. BellSouth Comments at 41. In fact, "ILECs have no legacy advantage with respect to the installation and use of advanced services electronics ... ILECs must now acquire and install new equipment just like their advanced services competitors." Information Technology Industry Council Comments at 6-7.

[10] Of course, cable operators are not required to offer, and do not provide, similar access to their facilities.

CLECs focusing on the advanced services market agree that the availability of collocation and loops is all that is required from incumbent LECs. Unbundled DSLAMs and packet switching are not. Northpoint sums this up.

> To date, all of the competitive LECs have entered the advanced services market by installing their own DSLAMs in central office collocation cages purchased from the incumbent LECs. Where competitive LECs enjoy access to loops and collocation, any competitive LEC can provide the necessary infrastructure (DSLAMs and packet switches) required to provide advanced services.

Northpoint Comments at 18; Rhythms Comments at 12; Covad Comments at III; Information Technology Industry Council Comments at 6-8.

Northpoint concludes that only where "loops and collocation are unavailable" should the incumbent LEC "be required to provide competitive LECs with access to unbundled DSLAMs. Northpoint Comments at 19; Information Technology Industry Council Comments.

Of course, whether there is competition between xDSL providers should not be the issue. As described above, competition between advanced services networks exists. Focusing only on one technology is not the genuine look at alternatives that the Court ordered. Focusing on competition among DSL providers to the exclusion of competition from other networks is fundamentally identical to excluding PCS carriers from the wireless service market.[11]

Nonetheless, BellSouth provides loops and collocation. Where conditioned loops are available, BellSouth makes them available to CLECs. Where they are not, BellSouth will condition them for CLECs. There are about 1,000 CLEC collocation arrangements already in place or in progress in BellSouth's region. Of BellSouth's approximately

[11] The Commission does not define wireless markets so narrowly. *Third CMRS Report.*

1,600 central offices, 251 have at least one completed collocation, and 99 more offices have arrangements in progress. Shortly, 350 BellSouth offices will have at least one collocation arrangement. Of course, CLEC collocation is occurring in the central offices that serve disproportionately high numbers of lines, so the competitive reach of CLEC collocation is very substantial.

The *Advanced Services Order*[12] provides CLECs more flexibility in collocating and creates additional options for reducing collocations costs substantially. BellSouth provides CLECs the ability to collocate DSLAMs in the field. For example, BellSouth allows CLECs to collocate DSLAMs adjacent to BellSouth remote terminals.

To the extent collocation could possibly be still viewed as impairing CLEC opportunities to compete, the right approach is to address the collocation issue, not to unbundle DSLAMs. In markets depending on risky, new investment unbundling requirements are all but certain to reduce investment and harm innovation and consumers.[13]

Some CLECs, particularly AT&T and MCI WorldCom, argue that they should be allowed to free ride on new incumbent LEC investment in new DSLAMs.[14] AT&T

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[12] *In the Matter of Deployment of Wireline Services offering Advanced Telecommunications* Capability, CC Docket No. 98-147, *First Report and Order and Further Notice of Proposed Rulemaking*, FCC 99-48, released March 31, 1999, (*Advanced Services Order*).

[13] *See, e.g.*, Kahn Declaration at ¶ 7.g. Information Technology Industry Council Comments at 8 ("the elimination of unbundling obligations for ILEC advanced service equipment would encourage ILECs to deploy advanced services technologies").

[14] BellSouth's Comments pointed out that BellSouth has just begun deploying DSLAMs. Only 147 had been installed by the end of March. Thus, any unbundling requirement will in fact apply principally to future incumbent investment. Unbundling investment dollars is not the goal of section251(d)(2). The potential return of that new investment would be

makes no mention of its directly opposing views on unbundling cable network elements used to provide advanced services. This is not a matter of different statutory contexts. AT&T is arguing exactly opposite policy points -- unbundling incumbent LEC advanced service elements will be pro-competitive while unbundling cable network advanced service elements will be anti-competitive. Or, in the alternative, market forces are strong enough to guarantee that cable providers will grant access to their facilities where it would benefit consumers, but those same competitive forces will have no effect on incumbent LECs. AT&T's arguments here are so directly counter to its cable positions that they cannot carry any weight.

MCI WorldCom chooses to argue that it needs unbundled incumbent LEC DSLAMS at risk-free TELRIC prices even though DSLAMs are "affordable." MCI WorldCom Comments at 50 (DSLAMs cost $8,000-20,000 apiece and serve from 200-300 lines). It argues that collocation costs make deployment of DSLAMs "uneconomic." MCI WorldCom Comments at 50. This unsupported assertion not only runs counter to the actual experience of CLECs that are deploying DSLAMs (and CLECs have deployed DSLAMS in urban and rural areas),[15] and to BellSouth's analysis of collocation costs attached to its Comments, but also gives no credit to the Commission's recent *Advanced Services Order*, which will further reduce collocation costs.[16] That order "further

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severely limited by an unbundling requirement at TELRIC prices. *See* Kahn Declaration at ¶ 7.g; Hausman and Sidak Reply Affidavit; *T&T-TCI Joint Reply*, Ordover and Willig Affidavit at ¶ 49.

[15] *See, e.g.*, Information Industry Technology Council Comments at 7 ("collocation of DSLAMs in an ILEC central office not an expensive, capital intensive exercise").

[16] MCI WorldCom's argument illustrates the Court's caution that a return lower than one a CLEC could imagine cannot support a finding of that a CLEC's opportunities to compete would be impaired. No doubt providing advanced services over an incumbent

erode[s] arguments for requiring ILECs to offer the electronics associated with their advanced services." Information Industry Technology Council Comments at 9.

MCI WorldCom also argues that it should get unbundled access to DSLAMs because in rural areas revenue opportunities would make deployment by MCI WorldCom "difficult to justify." MCI WorldCom Comments at 50-51. This argument is belied by the market fact that other CLECs can justify rural deployment, as evidenced by their deploying in rural areas. The deployment by these CLECs shows that an efficient CLEC can operate in rural areas too.

MCI WorldCom's argument demonstrates the dangers of unbundling described by Professor Kahn and in the Jorde, Sidak and Teece Affidavit attached to USTA's Comments. In MCI WorldCom's example, a CLEC is free to make a risky investment in providing advanced services in rural areas, but does not view it as likely to be sufficiently profitable. An incumbent LEC may weigh the situation differently, and decide to invest. The CLEC could then claim the right to use the incumbent LEC's investment at TELRIC prices. This illustrates nicely the point that unbundling obligations reduce CLEC incentives to invest and will discourage incumbent incentives as well. The example also illustrates how unbundling obligations create regulation rather than competition. That, is real facilities-based competition that could have existed in MCI WorldCom's example is replaced with regulated access to the incumbent LEC's DSLAM. CLECs that have the opportunity to invest in providing services are not impaired if they choose not to.

LEC's network would be more profitable if collocation were free or DSLAMs grew on trees, but that is hardly the point.

V. TRANSPORT

The *UNE Fact Report* presented the Commission with a detailed factual record on the presence of transport alternatives in local geographic markets and the ability of CLECs to self-provision. Unfortunately, CLECs have not stepped up to the plate with the detailed factual information that would further inform the analysis of alternatives and self-provisioning. The "facts" CLECs have provided to-date on local transport could not support any factual finding that incumbent LEC transport should be unbundled.[17]

As a general matter, CLECs admit the presence of transport alternatives. They have chosen to stake their claim to impairment on an argument that because there may be no alternative to incumbent LEC transport in some areas, the Commission should order incumbent LEC transport unbundled in all areas. CLECs have opted for this approach rather than submit facts that pinpoint where and how they might be impaired without unbundled incumbent LEC transport. The Commission has a factual record that demonstrates the presence of transport alternatives in many local markets and that allows it to distinguish areas where there are transport alternatives from areas where there may not be any.

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[17] Covad argues that the absence of reliable factual information from CLECs on their facilities should lead the Commission to adopt a "high presumption" that CLECs have no alternative facilities to an incumbent LEC's. Covad Comments at II.B. The information that is lacking is information from CLECs like Covad. Adopting any sort of presumption like Covad's would simply guarantee that CLECs would continue to refrain from providing real information about their facilities, as they have done here and in the past. *Local Competition Survey* at 3. Market facts are necessary to perform the analysis of necessary and impair set out in the Court's opinion. The Commission should adopt evidentiary presumptions that create incentives for parties to provide market facts, not hide them. Thus, unless CLECs can show how and where they might be impaired without access to an incumbent LEC network element at cost-based prices, the element should not be unbundled. BellSouth Comments at 28-29.

The Court rejected turning a blind eye to the presence of alternatives to incumbent LEC facilities once already. This, however, is exactly what CLECs would have the Commission do by urging a one-size fits all national approach despite the considerable variation among local markets. Ignoring market differences would substitute regulation for competition in markets where competition is working, contrary to the Court's opinion and Congress's intent. The decision for the Commission is not "all or nothing." Rather, the Commission must responsibly choose and apply an approach that acknowledges competitive market alternatives, fits the markets involved and meets section 251(d)(2)'s impair standard.

A. All Parties Agree That There Are Alternatives To Incumbent LEC Transport Facilities

The parties agree that there are alternatives to incumbent LEC transport. Cable company CLECs profess no need at all for unbundled incumbent LEC transport. Media One Comments at 11; Cox Communications Comments at 5. Most CLECs simply admit that transport is available in some areas, but not everywhere else. ALTS Comments at 51; CoreComm Comments at 44-45 ("some" alternatives available); Nextlink Comments at 32(incumbent LECs source of "most" transport).

MCI WorldCom provides a little more "detail" when it notes that it can self-provision transport to 400 incumbent LEC end offices and use other CLEC transport facilities to reach another 1,200. MCI WorldCom Comments at 64. For perspective, there are about 1,600 end offices in BellSouth's entire serving territory. Given that the 1,600 end offices MCI WorldCom is reaching will be clustered in urban areas, transport alternatives in those areas are almost certainly adequate.

AT&T grudgingly admits that CLECs have deployed transport between "some" incumbent LEC end offices. AT&T Comments at 121. "Some" turns out to mean that about 20% of AT&T's local transport is provided by alternative providers. AT&T Comments at 122.[18] AT&T provides no explanation of how it arrived at this figure, although it appears to be a national one. A national transport number will far understate the amount of transport AT&T procures from non-incumbent LECs in particular markets. AT&T's acquisition of Teleport, for example, gave AT&T in 1998 local CLEC assets in

[18] Covad, a relatively small and new entrant, currently obtains about 15 percent of its local transport from incumbent LEC alternatives. Covad Comments at III.B.

66 major markets, over 9,000 fiber route miles and 41 local switches."[19] AT&T further predicted that by early 1999 those 66 major markets would grow to 100 and over 300 communities would be served.[20] In those cities, AT&T use of alternative transport is likely to be far greater than 20 percent. Without AT&T's submitting more detailed, verifiable information, the Commission could legitimately conclude that at least in urban areas, AT&T obtains very substantial amounts of transport from non-incumbent LECs.[21] Where transport alternatives are not present, AT&T states that it takes an average of 10 to 12 months to self-provision local transport. AT&T Comments at 115. This is well under the *Merger Guidelines'* two year standard for judging competitive entry to be timely.[22]

AT&T also admits that where other CLECs have excess local capacity, "they have offered to lease that capacity to other carriers." AT&T Comments at 122. There is enough CLEC local transport capacity today to lead at least one CLEC CEO to conclude

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[19] AT&T Press Release, issued July 23, 1998, available at <http://www.att.com/press/0798/980723.chb.html>.

[20] *Id.*

[21] AT&T also provides a list of horribles suggesting that building local transport is all but impossible. The facts simply belie this. As set out in the *UNE Fact Report*, many CLECs have built local transport facilities in urban areas across the country. All but one of the top 150 MSAs have at least one alternative sources of local transport. The largest MSAs generally have several. AT&T and MCI are using these alternative facilities every day.

[22] Department of Justice and Federal Trade Commission Horizontal Merger Guidelines, Issued April 2, 1992 (*Merger Guidelines*) at § 3.1.

that there is a capacity "glut" in Tier One cities.[23] A wholesale market for local transport alternatives exist now.[24]

AT&T's complaints that dedicated transport made available by alternative providers cannot be sufficient because they are not subject to sections 251 and 252 are symptomatic of AT&T's Comments. AT&T Comments at 111. Of course, *all* LECs are subject to the requirements of section 251(a) and (b). And, AT&T's approach would mean that no number of alternatives to incumbent LEC transport would ever be adequate until they were all price-regulated under section 252. This invitation to regulation instead of competition is antithetical to the Act and to the Court's opinion.

B. The Commission Cannot Turn A Blind Eye To Alternative Transport Facilities Given The Record In This Proceeding

Those CLECs arguing for transport unbundling have staked their claim that they are impaired without access to unbundled incumbent LEC transport on general allegations that incumbent LECs are the only transport providers present in every market. This argument is founded on an implicit admission that alternatives exist in particular markets. Arguments that incumbent LECs collectively may be the only source of ubiquitous local transport are not relevant to assessing whether there are competitive alternatives to incumbent LEC transport facilities in particular markets. As set out in

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[23] Royce Holland, CEO of Allegiance Telecom, W.T. Scott, et al, ING Baring Furman Selz LLC, Investext Rpt. No. 2787890, Telecommunications/Fiber vs. Fiberless (Sept. 30, 1998)

[24] *UNE Fact Report:Transport* at II-4. AT&T complains that it can take from two months to two years, or even more to reach an agreement with an alternative provider. AT&T Comments at 123. This should help put AT&T's complaints about alleged incumbent LEC foot-dragging in some perspective.

BellSouth's *Comments* at pp. 13-15, the Court's opinion, Commission precedent and antitrust law principles all require that assessing local transport alternatives be done on a geographic market basis. *See. e.g.* Declaration of Alfred E. Kahn at ¶¶ 12-18, attached to Bell Atlantic's Comments ("[t]he assessment of competition and of the availability of necessary inputs from sources other than the ILEC clearly requires an assessment element-by-element and market-by-market (or group of markets)").

The facts in the record and the competitive reality they reflect preclude the Commission from treating all local transport markets alike. BellSouth has developed additional information responsive to CLEC comments on the presence of CLEC local transport alternatives. Attachment A contains maps showing CLEC fiber facilities in 12 BellSouth cities. Although these maps are accurate as far as they go, BellSouth does not believe that these maps completely capture the competitive dynamic.[25] The maps do not always include cable company fiber facilities that are either telephony ready or in the process of being up-dated for telephony or utility company fiber that may be very broadly deployed.

The tremendous pace at which CLECs have been placing fiber means that any map will soon be outdated. Also, these maps also do not reflect the use of any wireless facilities to provide local transport. As detailed in the *UNE Fact Report*, wireless facilities already provide real alternatives to incumbent LEC transport facilities. *UNE*

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[25] One CLEC highlights the fact that CLECs are deploying local fiber at a fast rate by noting that "attempting to identify interoffice transport competition on a city-by-city basis is a moving target." Rhythms Comments at 20. CLECs have the information to fill out the record of transport alternatives, but have chosen not to provide it.

Fact Report: Transport at II-16-18. AT&T's recent acquisition of a 40 percent interest in Teligent for $3 billion is just the latest vote of confidence in this technology.

Despite these understatements, these maps show a substantial amount of CLEC fiber alternatives in the ground. Atlanta and Miami, with multiple installed CLEC fiber networks are not comparable to rural cities with no CLEC fiber. CLEC fiber extends well beyond the very largest markets in BellSouth's region. For example, Birmingham, Nashville, Memphis, New Orleans, Orlando and Raleigh all have broad CLEC fiber networks. CLEC wireless transport facilities provide additional competitive alternatives to incumbent LEC transport or to fill in gaps in existing CLEC networks.

The real question before the Commission is how best to acknowledge the presence of the local transport alternatives that all parties admit exist. Commission precedent supplies the way to reflect these variations in a workable format. The Commission's competitive analysis precedents group markets based on the competitive similarity of the choices available in those markets.[26] Under that standard approach, markets with CLEC alternatives would be grouped together and treated one way, while markets without alternatives would be treated another.

The Commission has already laid the groundwork for a transport solution in its *Special Access* and *Switched Transport* orders.[27] Those orders found that a three zone

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[26] *In the Application of NYNEX Corporation, as transferor, and Bell Atlantic Corporation, as Transferee, For Consent to Transfer Control of NYNEX Corporation and Its Subsidiaries*, File No. NSD-L-96-10, *Memorandum Opinion and Order*, 12 FCC Rcd 19985, 20016-7 (1997) (*Bell Atlantic/NYNEX Order*).

[27] *In the Matter of Expanded Interconnection with Local Telephone Company Facilities and Amendment of the Part 69 Allocation of General Support Facility Costs*, CC Docket Nos. 91-141 and 92-222, *Report and Order and Notice of Proposed Rulemaking*, 7 FCC Rcd 7369, 7450 (1992) (*Special Access Order*); *In the Matter of Expanded*

approach for special access and switched transport reasonably reflected the availability of competitive transport. Those zones were based on the same cost and traffic density factors that directly influence the construction of competitive local transport. Several interexchange carriers argued in the *Special Access* proceeding that "special access was identical to dedicated transport and directly related to common transport." BellSouth attached state maps to its Comments showing these zones and MSAs.

The fact that these zones also reasonably reflect competitive local transport alternatives, as predicted by the interexchange carriers, is demonstrated by the maps in Attachment A. In Zone 1 cities in BellSouth's region generally have multiple CLEC fiber transport alternatives. These networks generally extend throughout the applicable zone. For example, BellSouth has been able to map 5 separate CLEC fiber networks in Atlanta. Among CLEC transport alternatives in Atlanta not mapped are Media One's fiber network that extends throughout Atlanta. Other CLECs have fiber in Atlanta, or are planning to build new facilities. *UNE Fact Report* at Appendix B: CLEC Fiber. Of course, wireless transport is another available transport option. Memphis, Nashville, South Florida and other cities have extensive CLEC fiber networks in the ground.

In Zone 1 areas competitive alternatives are clearly present and, based on the success of multiple CLECs of varying sizes in constructing local fiber facilities, it is evident that self-provisioning is economically feasible and practically possible. Self-provisioning may take the 10-12 months estimated by AT&T for constructing fiber facilities, or the considerably shorter time to install wireless facilities, but in either case,

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Interconnection with Local Telephone Company Facilities, CC Docket No. 91-141 (*Transport Phase I*), *Second Report and Order and Third Notice of Proposed Rulemaking*, 8 FCC Rcd 7374, 7423-25 (1993) (*Switched Transport Order*).

entry would occur in substantially less time than the two year threshold that the *Merger Guidelines* use to gauge whether competitive entry is timely.

Zone 2 cities like Huntsville, Alabama also have CLEC local fiber facilities in the ground. Doubtless, there is additional CLEC fiber, and, of course, wireless alternatives provide additional local transport options. Certainly, in any Zone 2 city in which CLECs have fiber facilities, CLECs would be unimpaired without an entitlement to unbundled incumbent LEC transport.

By one way of comparison, AT&T's interstate long distance services were deregulated when its market share fell below 70%. Using FCC Telecommunications Relay Service data for 1997, CLEC/CAP announced revenue growth rates for 1998, and conservative assumptions about incumbent LEC DS1 and higher revenues, it can be shown that incumbent LEC's share of the DS1 and higher special access market is below 70% nationwide. By the same standard by which AT&T was deregulated, DS1 and higher interoffice transport is a competitive market today nationwide. Obviously CLEC growth would not be impaired without unbundled transport if CLECs are able today on a nationwide basis to turn to self-provision interoffice transport services to this degree. Mandating that incumbent LECs provide DS1 and DS3 interoffice transport services under the Commissions TELRIC pricing principle would not remedy any impairment.

The Commission should pay special attention to wireless local transport alternatives. Although fiber facilities receive most of the attention, wireless facilities represent a technology that creates viable competitive alternatives to incumbent LEC transport. There are at least five firms with essentially nationwide wireless coverage in

the 28 and 38 GHz range.[28] Wireless local systems can be activated in 90 to 120 days. Because wireless systems are moveable, the sunk costs of deploying on particular routes are low. The spectrum supports high capacities. Wireless carriers are offering wholesale services to extend the reach of local transport rings. The Commission has acknowledged that this spectrum is used to bypass incumbent LEC service.[29]

As a competitive entry vehicle wireless technology is powerful. The *Merger Guidelines* would view wireless technology as providing a present market alternative to incumbent LEC transport facilities. Wireless could quickly fill in any gaps in CLEC networks, or quickly create an alternative transport network. The availability of wireless transport alone should weigh heavily against any claim to impairment without access to unbundled incumbent LEC transport facilities.

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[28] *UNE Fact Report:Transport* at II-16-18 and III-10-12.

[29] *See, e.g., In the Matter of Expanded Interconnection with Local Telephone Company Facilities*, RM 7249, ENF-87-14, *Notice of Proposed Rulemaking and Notice of Inquiry*, 6 FCC Rcd 3259, n.3 (1991).

C. Transport Does Not Generally Meet Section 251(d)(2)'s Requirements For Unbundling

The factual record demonstrates that in many markets there are alternatives to incumbent LEC transport. CLECs agree that transport alternatives exist and that they are using them, but have refused to identify where those alternatives exist. The question CLECs have chosen to present is whether the Commission should unbundle all incumbent LEC transport because CLECs may be impaired without access to it in some areas.

Unbundling at cost-based prices has costs, as spelled out in BellSouth's Comments at pages 7-10. *See also* Declaration of Alfred E. Kahn at ¶ 22 (unbundling at TELRIC prices substantially discourages incumbent LEC and CLEC investment and innovation). Shoehorning transport markets with multiple alternative transport networks into a box with markets that have no alternatives makes no sense. It would depart from past Commission practice, and would not be faithful to the Court's requirement that the Commission look to the presence of alternative facilities in making its judgments under section 251(d)(2). A three zone approach is one way to reasonably reflect the presence of competitive alternatives and the ability of CLECs to self-provision local transport in at least some geographic markets. Analyzing whether CLECs would be impaired without unbundled incumbent LEC transport at cost-based prices in each of these zones leads to the conclusion that CLECs would not be impaired in zone 1 and zone 2 areas, but may be in the rural zone 3 areas. Thus, the Commission would order unbundling and create an entitlement to cost-based, TELRIC prices, for local transport in zone 3 areas only.[30]

[30] Of course, under section 271, BellSouth would continue to provide unbundled local transport to CLECs, but would be able to price this transport at market rates. As BellSouth explained in its Comments, section 251 establishes a higher necessary and

VI. SWITCHING

CLECs are also split on whether they would be impaired without access to unbundled incumbent LEC switching at cost-based pricing. Facilities-based CLECs tend not to argue that switching should be unbundled under section 251. Even CLECs that argue that incumbent LEC switching must be unbundled base their argument on the need for unbundled, cost-based switching to serve the "mass market," thereby conceding that CLEC competition for larger businesses would remain unimpaired without cost-based unbundled incumbent LEC switching. The fact that many CLECs see no need for unbundling incumbent LEC switching anywhere suggests that self-provisioning is a real option and that therefore switching does not meet section 251(d)(2)'s impair standard.

The uncontroverted facts about switching set out in the *UNE Fact Report* demonstrate that alternatives to incumbent LEC switching exist throughout the country, and that self-provisioning is relatively quick and easy. Treating section 251(d)(2) as the limiting standard it is would provide for, at most, limited unbundling of incumbent LEC switches in rural areas.

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impair standard that CLECs must meet to obtain the cost-based pricing entitlement in section 252.

A. Facility-Based CLECs Do Not Argue That Incumbent LEC Switching Meets Section 251(d)(2) Requirements For Unbundling

ALTS, the trade association of facilities-based CLECs, does not request that incumbent LEC switching be unbundled. ALTS Comments at 35. Likewise, many facilities-based CLECs have adopted the view that they do not need access to unbundled incumbent LEC switching. *See, e.g.*, Allegiance Comments at 17-20, Media One Comments at 11, Cox Comments at 4-5, Joint Comments of e.spire and Intermedia Communications at 20-21; Covad Comments at 29-30; Rhythms Comments at 27-28 ("it appears that because a new entrant can in many circumstances buy and use electronic switching systems on comparable terms and conditions from several different commercial vendors, a competitor's ability to provide service would, in general, not be materially diminished by an inability to gain access to an ILEC's switch").

MGC, a small CLEC that provides service to residential and smaller business customers "does not need to acquire switching capability from the ILEC." MGC Comments at 31. MGC explains that [c]ompetitors are not dependent on the ILEC for switching," and that switching does not meet section 251(d)(2)'s impair standard.[31] *Id.* Focal Communications is one CLEC that makes an affirmative case that incumbent LEC switches cannot be generally unbundled under section 251(d)(2).

[31] Because MGC has deployed its own switches, it can obtain SS7 signaling in the open market. MGC notes that "SS7 signaling is made generally available on a national basis and in a cost-effective manner. Therefore, MGC believes that competition will not be prejudiced if the Commission decides that SS-7 signaling should no longer be classified as a UNE." MGC Comments at 31. BellSouth Comments made it clear that CLECs that use their own switches, as most do, regularly use alternative signaling providers. BellSouth Comments at 76. These CLECs would not be unimpaired without access to incumbent LEC signaling under section 251(d)(2).

> the Commission should make advancement of facilities-based competitive investment its primary principle ... and it should apply this principle by declaring that unbundled switching will not be available in areas where competitors have demonstrated the ready availability of switching through self-provisioning.

Focal Comments at 1-2. Focal explains that "the very existence of switch-based CLECs suggests that the 'impair' standard may not be met for ILEC switching." Focal Comments at 2. As described below, the fact that 167 CLECs have deployed over 700 switches show that switch-based CLECs are not market outliers. Focal goes on to note that "of equal importance - requiring switch-based CLECs to compete with unbundled ILEC switching would be completely inconsistent with the Act's goal of encouraging facilities-based competition." Focal Comments at 2, 5; Kahn Declaration at ¶ 22.

Focal does suggest that incumbent LEC switching be unbundled where there are no alternatives. Focal Comments at 4. Of course, this would entail defining geographic markets for switching, and requiring unbundling where no CLEC alternative was present. Focal Comments at 2, 4; Qwest Comments at 31(suggesting MTAs be used to define geographic market). Focal would define geographic markets for switching by using LERG coordinates. CLEC presence would be tested by whether a CLEC had an NXX for that area in the LERG. This is a reasonable approach to defining geographic markets for switching and evaluating whether a CLEC can provide switching in that market. [32]

[32] Focal Communications' test for whether CLEC opportunities would be impaired without cost-based access to incumbent LEC switching essentially replicates the rate exchange area test proposed in the *UNE Fact Report*. Focal Communications Comments at 1-2, 4-5; *UNE Fact Report: Switching* at I-3. Those tests are conservative, like BellSouth's, and yield similar results.

B. The UNE Fact Report Demonstrates That Alternatives To Incumbent LEC Switching Exist And That Self-Provisioning Is Competitively Effective

The *UNE Fact Report* presents a compelling story on CLEC switch deployment that explains why facilities-based CLECs do not generally argue that their opportunities to compete would be impaired without cost-based pricing for unbundled incumbent LEC switching. The availability of incumbent LEC switching is not the gate on the business plans of these CLECs.

The *UNE Fact Report* shows that 167 different CLECs had deployed over 700 switches by March, 1999.[33] CLEC switches cover the top 50 MSAs and well beyond. Switch prices continue to fall even as switch technology improves. Manufacturers are actively courting CLEC business, and designing switches specifically to meet their needs. Switches can be purchased for as little as $100,000 and deployed in as little as 40 *days*.[34] There are no technical limitations on the geographic reach of a switch, and AT&T has observed that a switch can certainly reach any customer within a 125 mile radius of the switch location. CLECs are taking advantage of improved switching technology. For

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[33] *UNE Fact Report: Switching* at I-1. This number is supported by ALTS's calculation that as of a few months earlier, December, 1998, CLECs had deployed 667 switches.

[34] In its comments, AT&T suggests 9 to 12 months for switch deployment. AT&T Comments at 91 *citing* Pfau Affidavit at ¶ 14. Unfortunately, the Pfau affidavit contains not a single fact to support its bare assertion that switch deployment takes 9 to 12 months. On the other hand, the *UNE Fact Report* collects a number of examples from manufacturers and CLECs to show that switch deployment takes far less time. For example, e.spire reports that switch deployment takes it "no longer than 28 weeks from the time a competitive provider places an order with its switch vendor to the time the switch is turned up." *UNE Fact Report: Switching* at I-29-30. At a minimum, using AT&T's figures, efforts to speed switch deployment have cut the maximum time to deploy by half since the Commission issued the *First Report and Order*, which assumed nine months to two years for switch deployment. *First Report and Order* at ¶ 411 and n. 911.

example, CLECs are using fewer switches than incumbent LECs to serve the same geographic area.

Focal Communications, for example, was "a start-up company with almost no business three years ago." Focal raised substantial venture capital and now has seven switches installed in seven major metro markets, and has additional facilities planned for the near future. Focal Comments at 4; MGC Comments at 1-2. And, Focal is just one of over 150 CLECs that have deployed switches.

The hallmark of local switching is clearly entry. The amount of entry that has taken place provides current alternatives to incumbent LEC switching and demonstrates that competitively significant self-provisioning can and is occurring.

C. The Arguments Of Certain CLECs That Incumbent LEC Switching Must Be Unbundled For Mass Market Competition To Flourish Are Factually Wrong And Inconsistent With The Act

AT&T, MCI WorldCom and some resellers argue that without unbundled access to incumbent LEC switching, CLECs' ability to compete for the mass market will be impaired. In reality, their argument is not for unbundled switching itself, it is for an entitlement to the entire incumbent LEC network at TELRIC prices via the UNE platform. It is extremely unlikely, for example, that AT&T intends to connect its cable loops to incumbent local switches.

This CLEC argument seems to have two parts, discussed in detail immediately below. It is true that, except for recent advances in cable telephony and wireless service, mass market competition has not advanced as far as competition for larger businesses.

The Commission has repeatedly recognized this fact.[35] The key reason for this, however, has nothing to do with unbundling or loop cut-overs,[36] it has to do with the potential for profit. Historical pricing levels for residential service do not present ready opportunities for substantial profits. This has led CLECs to focus on the lucrative business customers.[37] The relatively slower pace of mass market competition should be addressed directly through the Commission's universal service proceedings. Unbundling incumbent LEC switching or creating an entitlement to the UNE platform at TELRIC does not address the cause, and would not be a cure. The UNE Platform would create the dangers described by Justice Breyer of substituting pervasive regulation for competition.[38]

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[35] *See, e.g. In re Application of Teleport Communications Group, Inc., Transferor, and AT&T Corp., Transferee, for Consent to Transfer Control of Corporation's Holding Point-to-Point Microwave Licenses and Authorizations to Provide International Facilities-Based and Resold Communications Services*, CC Docket No. 98-24, *Memorandum Opinion and Order*, 13 FCC Rcd 15236, 15247 (1998) (*AT&T/Teleport Order*); *Bell Atlantic/NYNEX Order* at 20016; Kahn Declaration at ¶ 35.

[36] Neither AT&T nor MCI WorldCom object that the loop cut-over process impairs competition for larger business customers.

[37] Opening Statement of Michael K. Powell, Commissioner, FCC, Before the Senate Committee on Commerce, Science and Transportation, at 2, May 26, 1999("CLECs have chosen to enter high volume, low cost business markets (where the rates are inflated relative to costs) rather than residential markets").

[38] *See also* Kahn Declaration at ¶ 10.

1. The Total Number Of Incumbent LEC Switches Is Irrelevant To Determining If CLEC Opportunities To Compete Would Be Impaired Without Access To Unbundled Switching Under Section 251

AT&T argues that because incumbent LECs have many more switches than CLECs, a failure to unbundle every incumbent LEC switch in entire country would impair CLEC opportunities to compete. AT&T Comments at 86. A gross comparison of the number of incumbent LEC switches to the number of CLEC switches is not particularly useful to the Commission's statutory mandate to examine alternatives to incumbent LEC facilities and the ability of CLECs to self-provision. Switching alternatives must be examined in defined geographic markets. National numbers do not do this.

As would be expected, a more realistic comparison of the numbers of switches deployed by CLECs and incumbents LECs yields very different results. Attachment D sets out a comparison of the number of CLEC switches to BellSouth switches by cities and zones in BellSouth's serving territory. The zones used are the zones used for special access and switched transport pricing flexibility discussed in detail in BellSouth's Comments. BellSouth Comments at 56-57.

The comparison set out in Attachment D can not support *any* reasonable notion of impairment without the incumbent LEC's switch.[39] BellSouth has 30 operational switches in Atlanta. CLECs have 20 with 6 more planned for the near future. The story is really no different in smaller cities in Georgia, or any other state in BellSouth's region. In Albany, Georgia, BellSouth has 2 switches and CLECs have 1. In Augusta, Georgia, BellSouth has 3 switches and CLECs have 2. In Columbus, Georgia, BellSouth has 5 switches and CLECs have 4. Lumping together all the Zone 1 cities in Florida, yields 81 BellSouth switches, 36 operational CLEC switches and 23 CLEC switches planned for the near future. BellSouth has 16 switches in Charlotte. CLECs have 9 switches today with 6 planned for deployment. Soon there will be 15 CLEC switches in Charlotte and 16 BellSouth switches.

Ratios of CLEC to BellSouth switches like these are representative throughout BellSouth's serving territory, as Attachment D makes very clear. AT&T puts the ratio of incumbent LEC to CLEC switches at about 25 to 1 on a national basis. AT&T Comments at 86. Looking at markets, as rational economics demands, the ratio in BellSouth's region is as low as 1.5 to 1. Attachment D demonstrates that CLECs could not be legitimately viewed as impaired in Zone 1 and Zone 2 cities without unbundling the incumbent LEC switch under section 251(d)(2).

And, as Focal Communications points out, the existence of switch-based CLECs demonstrates that CLECs can self-provision even more local switching. Focal Communications Comments at 1-2. Over 160 CLECs have done so.

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[39] The comparison does not include long distance switches even though these switches can, and are, being used to provide local services. AT&T has claimed that outgoing local service is available in forty-nine states through its Digital Link service. AT&T Press Release available at <http://www.att.com/press/0798/980723.chb.html>.

In addition, switching should not be unbundled at least in part because CLECs "are providing their rapidly growing volume of services that compete with ILEC services by relying predominantly on their own switches." Kahn Declaration at ¶ 29. The flip side of CLEC success in relying on their own switches is that CLECs do not order switch ports from BellSouth even though they order local loops. As described in BellSouth's Comments, BellSouth has supplied CLECs with over 50,000 local loops, while CLECs have ordered less than 80 unbundled switch ports.

The large number of incumbent LEC switches is in part a function of the older technology that existed at the time incumbent LEC networks were designed. Modern networks would utilize far fewer switches to achieve the same coverage. AT&T and MCI WorldCom regularly point out in their state proceedings that an efficient forward-looking network would utilize fewer switches than the incumbent LEC networks do. CLECs routinely use switches to serve areas that incumbents use many switches to serve. *UNE Fact Report:Switching* at I. So comparing sheer numbers can be misleading.

The fact that substantial investment would be necessary for CLECs to provide switching for the entire United States mass market is true but fundamentally irrelevant to the question of whether unbundling incumbent LEC switching at cost-based prices is required to avoid impairing CLEC opportunities to compete in specific geographic markets. CLECs have proved that their ability to deploy switches is limited only by opportunities for profit. Where unbundled incumbent LEC switching is not available, CLECs will deploy their own.

Of course, in many geographic areas, CLECs have installed multiple switches and created alternatives to incumbent LEC switching. Incumbent LEC switching is not used

by those CLECs, and CLEC opportunities in those areas would not be impaired without access to cost-based incumbent LEC switching. Rather than removing an obstacle to competition, a Commission mandate to unbundle switching in those areas would penalize CLECs that have already invested in facilities-based competition, and remove incentives to CLEC investment in creating additional alternatives to the incumbent LEC switch. Focal Communications Comments at 1-2.

In remote rural areas, there may be no CLEC switching alternative today. But, where profits beckon, CLECs have proven that they can obtain funds, purchase and quickly successfully deploy switches.

2. The Loop Cut-Over Process Does Not Impair An Efficient CLEC's Meaningful Opportunity To Compete

AT&T argues that problems with the loop cutover process mean that CLECs cannot be expected to install their own switches to serve the mass market. AT&T Comments at 87. AT&T recites a litany of perceived problems with the "hot cut" process to support its complaint. Other CLECs that serve the mass market, like MGC Communications,, make no such complaints.

As Attachment E, the affidavit of W. Keith Milner demonstrates, BellSouth's loop cutover record shows the opposite of what AT&T claims. BellSouth's processes are quite capable of handling present and forecasted volumes of orders, and can be readily expanded to meet CLEC forecasted increases, whether in urban or rural markets. Milner Affidavit at ¶¶ 10, 12, 13. However, the successful handling of a volume of orders not only requires BellSouth's systems and personnel to be ready, but also those of the CLECs involved. AT&T has not been particularly forthcoming on this score. Milner Affidavit at ¶¶ 6-9.

BellSouth's record of performing loop cutovers is more than sufficient to support mass market offerings. In April, 1999, BellSouth cutover 70% of loop orders within 5 minutes. Over 88% were performed within 15 minutes. All orders were completed in an average of 6.94 minutes. The best CLEC's orders were complete in an average time of 3.30 minutes. Milner Affidavit at ¶ 10.

BellSouth processed four and on-half times as many loop cutovers for the CLEC with the most orders as it did for AT&T. AT&T's relatively small volume of orders limits the ability of their personnel to gain the needed experience to learn either AT&T's or BellSouth's processes well enough to handle orders in an error-free manner. Milner Affidavit at ¶ 10. In addition, AT&T's complaints about "hot cuts" generally involve cutovers of designed loops that are used to provide service to larger business customers. The process for cutting over designed loops is more complex than the process for mass market-type non-designed loops. Milner Affidavit at ¶ 11. It is not valid to assume that cutovers of true mass market customers would encounter the same issues as cutovers of designed loops for larger business customers. *Id.*

The loop cutover issue raised by AT&T is a red herring and cannot justify a requirement to unbundle incumbent LEC switching.

3. CLEC Opportunities To Compete Would Not Be Impaired Without Unbundling Incumbent LEC Switching Under Section 251(d)(2) In Zone 1 and Zone 2 Areas

The facts demonstrate that CLECs would not be impaired without access to incumbent LEC switching in Zone 1 and Zone 2 cities. CLECs generally have substantial numbers of switches in absolute terms in these cities and relative to the

number of switches BellSouth has. Additional self-provisioning is relatively cheap and quick.

The number of alternative switches deployed in these cities shows that CLEC opportunities to compete do not depend today on access to unbundled incumbent LEC switching, if they ever did. The relative ease of self-provisioning switching, as discussed above, and CLEC plans to deploy more switches, provide further proof that access to incumbent LEC switching does not meet any rational, limiting interpretation of section 251(d)(2)'s impair standard.

VII. LOOPS

CLECs have refused to join the issue of how to implement a rational limiting standard that addresses local loop unbundling in way that is faithful to section 251(d)(2). There are two issues here: local loops for larger business customers in urban areas and residential loops in areas where cable telephony is currently being offered.

Markets must be the unit of analysis for determining whether alternatives to incumbent LEC elements exist or can be constructed. *Kahn Declaration* at ¶¶ 12-18. On the large business front, incumbent LECs have presented the Commission with a record that allows a fact-based inquiry into whether CLECs have alternatives to incumbent LEC local loops or can effectively self-provision. These facts show that CLECs have deployed large numbers of local loops to serve business customers in urban areas. BellSouth Comments at 67-68; *UNE Fact Report: Loops* at I. The Commission understands that large businesses in urban areas make up a market separate from the mass market.[40]

[40] *AT&T/Teleport Order* at 15257-8.

The Commission has found that CLECs are entering the larger business markets and deploying their own facilities. AT&T admits that "alternatives now exist" for these customers.[41] AT&T Comments at 15. MCI WorldCom, which trumpets the virtues of its end-to-end network for business customers, represents that it "self-provisions loops to its major business customers." MCI WorldCom Levine/McMurtrie Declaration at ¶ 10.

The argument for unbundling raised by CLECs here deliberately avoids the facts and rational economic analysis. Instead, they attempt to argue that because CLECs would be impaired in offering service to mass market customers in rural areas without unbundled local loops, loops to large businesses in urban areas ought to be unbundled. This makes no logical or economic sense. CLEC have put no facts in the record that would demonstrate that they would be impaired without access to incumbent LEC local loops for large business customers. In contrast, incumbent LECs have shown that CLECs have constructed their own alternative facilities, and can self-provision more. On this record, the Commission cannot find that CLECs would be impaired without incumbent LEC local loops for large business customers.[42]

Cable telephony is available today to many consumers in BellSouth's serving territory and will be even more broadly available by the end of this year.[43] Where telephony is actually being delivered over cable facilities, there can be no question that an

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[41] AT&T recently won a contract through the GSA to provide *local* service to federal agencies in 3 major U.S. cities. The contract is worth up to $680 million. Telecommunications Reports, "AT&T To Offer Federal Agencies Up to $680M of Local Services," May 24, 1999, at 39.

[42] BellSouth's Comments spell out why using 4-wire and higher capacity loops as a proxy for service to larger businesses would be accurate. BellSouth Comments at 63-64.

[43] Attachment C to BellSouth's Comments lists the many cities in BellSouth's region in which cable telephony will be available at least by the end of this year. Cable telephony is already available in a number of these cities, including Atlanta.

alternative to the incumbent LEC local loop exists.[44] Not all cable systems are telephony-ready today. "Only" 26 percent of TCI's systems were upgraded for two-way communications at the end of last year.[45] AT&T is already offering cable telephony.[46]

Where a cable operator has upgraded cable facilities and those facilities are supporting local exchange service, there is unquestionably an alternative to the incumbent local loop. Unbundling under section 251(d)(2) is not appropriate in those circumstances. Regulatory parity also requires that incumbent LEC loops no longer be subject to an unbundling requirement that is not borne by cable loops delivering competing service in the same area.

Although AT&T's Comments also dismiss wireless service as an alternative to the local loop, its One-Rate advertisements say the opposite. The Commission continues to "note growing evidence that some consumers are substituting wireless for wireline service."[47] Where wireless networks provide an alternative to the wireline local loop, the local loop no longer meets section 251(d)(2)'s requirements.

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[44] In what would be something of a revelation on Wall Street, AT&T claims that "cable telephony technology" is not a "realistic alternative[]" to incumbent LEC local service. AT&T Comments at 67. AT&T is attributing very substantial revenue growth to its cable telephony offerings to analysts, and predicts 30% penetration of local telephony within 5 years. *See, e.g.*, Karim Zia, "AT&T Comes to the Table," DLJ Securities (April 23, 1999); Eric Strumingher, "AT&T Reiterate Buy," PaineWebber (April 26, 1999)("Telephony assets account for more than a third of management's growth estimate for the cable assets").

[45] AT&T Comments at 71.

[46] Deborah Solomon, "AT&T Uses Cable Lines to Offer Local Phone Calls in Fremont," S.F. Chronicle, May 20, 1999 at B1.

[47] *In the Matter of Truth-in-Billing and Billing Format*, First Report And Order And Further Notice of Proposed Rulemaking, CC Docket No. 98-170, rel. May 11, 1999, at ¶ 69 (citation omitted).

VIII. OPERATOR SERVICES AND DIRECTORY ASSISTANCE

MGC is a facilities-based carrier that is utilizing over 80,000 unbundled loops to provide service to residential and small business customers in several states. MGC Comments at 4-5. Its experience has led it to conclude that "CLECs may purchase operator services and directory assistance services from a number of vendors offering cost effective national-in-scope alternatives to the ILECS product offering.... Sufficient competitive markets exist for this product and it should therefore be retired as a UNE." MGC Comments at 31; Public Utilities Commission of Ohio at 12. ALTS does not request unbundling of OS/DA. AT&T and Sprint concede that the need to unbundle either operator services or directory assistance is a close call.

A number of CLECs claim that incumbent LEC operator services and directory assistance services must be unbundled until non-discriminatory access to directory listing information is available. The fact is that BellSouth now provides non-discriminatory access to directory listings under FCC rules.

Perhaps more importantly for section 251(d)(2) analysis, CLECs have made absolutely no attempt to address directly the question of whether they are impaired without unbundled access to incumbent LEC operator services and directory assistance services. There are no facts here to support bare assertions that incumbent LEC service is more accurate. Neither is there any analysis to suggest that any quality difference impairs any CLEC.

The market for operator services and directory assistance is competitive and provides alternatives to CLECs that they are using today to compete with incumbent

LECs. *UNE Fact Report: Operator Services and Directory Assistance* at VI. Because the record contains no factual information to suggest otherwise, services and directory assistance services may not be unbundled under section 251(d)(2).

IX. CONCLUSION

The Commission should adopt a rational, limiting approach to evaluating impairment under section 251(d)(2). That approach should be founded on maximizing consumer welfare. To do that, the Commission should apply well-accepted economic principles that require markets to be defined and competition and alternatives to be analyzed, consistent with the Court's opinion. By looking to the actual market facts in the record, the Commission can identify the limited circumstances in which creating an entitlement to unbundled incumbent LEC elements would benefit consumers.

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CERTIFICATE OF SERVICE

I hereby certify that I have this 10th day of June, 1999 served the following parties to this action with a copy of the foregoing **BELLSOUTH'S REPLY COMMENTS** by hand delivery (as indicated by ***) or by placing a true and correct copy of the same in the United States Mail, postage prepaid, addressed to the parties shown on the listing below.

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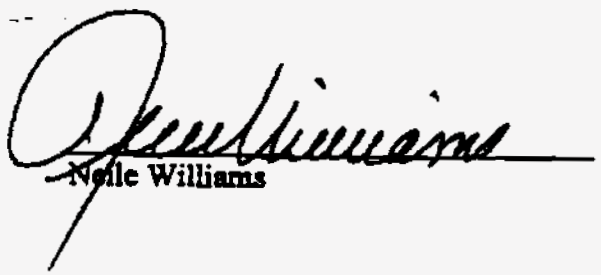
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ATTACHMENT A

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of:	)	
	)	
Implementation of the Local Competition Provisions in the Telecommunications Act of 1996	)	CC Docket No. 96-98
	)	
	)	
	)	

DECLARATION OF JAMSHED K. MADAN AND MICHAEL D. DIRMEIER
On Behalf of BellSouth Corporation

Jamshed K. Madan and Michael D. Dirmeier to hereby affirm and state as follows:

1. Our names are Jamshed K. Madan and Michael D. Dirmeier. We are both principals in the firm of Georgetown Consulting Group, Inc., 456 Main Street, Ridgefield, CT 06877. Over the last two years, Georgetown Consulting Group (GCG) has been retained to appear on behalf of BellSouth Telecommunications, Inc. to present testimony in each of the nine states in which BellSouth operates related to Unbundled Network Elements (UNEs) and issues concerning the appropriate Universal Service Fund (USF) at the state level. In the cases regarding UNEs, GCG rebutted the contention of AT&T and MCI that their application of the HAI model resulted in reasonable UNE prices, showing that the inputs selected by AT&T and MCI fail to reflect local conditions of the territory of BellSouth and fail to be reasonable and forward-looking. In those cases regarding the Universal Service support, GCG also rebutted the contention of AT&T and MCI that their application of the HAI model is reasonable. We evaluated the reasonableness of the AT&T and MCI application of the HAI model by focusing on the nature and quality of the inputs selected. We did not evaluate the logic and structure of the HAI model, except as necessary to determine the use made by the model of the user adjustable inputs.

2. The Commission's Notice in this proceeding invited comment on incumbent LEC economies of "density, connectivity and scale," Notice at ¶ 26. Various parties to this proceeding have suggested that incumbent LECs benefit from tremendous economies

of scale that CLECs could not duplicate. See, *e.g.*, AT&T Comments at 19. The Commission previously relied to some extent on "economies of density, connectivity, and scale" as supporting various unbundling requirements. First Report and Order at ¶ 11.

3. In summary, the HAI Model reveals that CLECs can match or exceed ILEC economies over the areas that CLECs typically are serving. The HAI model does not support general unbundling of ILEC networks on any premise that the economies of ILEC networks cannot be matched by the economies of CLEC facilities.

4. The purpose of our declaration is to present evidence, using the HAI model, to describe the economies of scale density and connectivity for loop, transport, signaling and switching UNEs. We will also provide rebuttal comments to the declaration of Mark T. Bryant, Ph.D. which was presented on behalf of MCI WorldCom, Inc. Finally, we believe that the analysis provided is relevant to comments requested by the FCC in their Second Further Notice of Proposed Rulemaking, in these dockets that was released on April 16, 1999.

HAI MODEL RESULTS FOR SERVING PART OF A GEOGRAPHIC SERVICE AREA

5. We have obtained and present here various loop and switching information for all of the Unbundled Network Elements that are provided by the HAI Model for the following scenarios:

   a. for the Georgia operations of BST;
   b. for the Atlanta Metropolitan operations of BST;
   c. for the northern portion of the Atlanta Metropolitan area;
   d. for the central portion of the Atlanta Metropolitan area; and
   e. for the southern portion of the Atlanta Metropolitan operations.

6. The primary purpose of our analysis was to obtain loop, transport, signaling and switching data from the HAI Model that would compare certain segments of the region with the operations for the Atlanta Metro area and BellSouth operations in the state of Georgia as a whole. The Atlanta Metro area represents approximately 58% of the total lines in the state of Georgia. Each of the three regions that we have modeled, northern, central, and southern regions, represent approximately 20% of the total lines in the state of Georgia. This analysis provides a substantial range over which relevant costs could be determined from the HAI model. For ease of reference, the following table will show the major statistics of the various regions and the CLEC subregions that we have modeled:

	Area	Total Lines	Bus Lines	Total Lines per Sq. Mile	Business Lines per Sq. Mile	Number of CLLIs
BST-Ga	21,351	4,343,728	1,244,635	203	58	178
Atlanta	3,040	2,566,713	800,172	844	263	53
North	787	894,106	303,636	1,136	386	13
Central	226	877,299	371,142	3,878	1,641	11
South	1,444	916,785	274,155	635	190	26

7. The subregions that we have modeled are reasonable surrogates for service areas that a Competitive Local Exchange Carrier (CLEC) would choose. It is likely that competitors initially will serve those areas that have a high density of customers where the greatest economies and efficiencies can be achieved. It is also likely that competitors initially will target business customers where, in most cases, the current price for business services is substantially above cost, thereby increasing competitors' ability to penetrate the market through appropriate price mechanisms and discounts.

8. In undertaking our analysis, we have used the default inputs provided by the HAI model, rather than territory specific inputs that GCG has testified to in various proceedings and believes is appropriate. This in no way suggests that we accept the validity of the default inputs. Rather, since the analysis focuses on the relative values between larger and smaller regions within the BellSouth operations in Georgia, the relative difference between the various scenarios using a consistent set of inputs provides data that is relevant to this proceeding.

9. For each of the scenarios that we present, we created new CLEC entities, each of which would serve only the lines in one of the four CLEC subregions that we created - Atlanta Metropolitan; northern portion of Atlanta Metropolitan; central portion of Atlanta Metropolitan; and the southern portion of Atlanta Metropolitan. These CLEC entities represent efficient CLEC competitors, to which we refer throughout. This meant adjusting the customer and line data to eliminate all the customers and lines not

served by the wire centers under consideration. We adjusted the minutes of use, messages and local call attempts to be consistent with the number of lines in the CLEC subregions that were being modeled. We also adjusted the number of tandem switches and related signaling equipment (STP pairs and SCPs), that would be consistent with the reduced number of lines in each one of the CLEC subregions.

Finally, we made an appropriate adjustment to set the per line network operations expense and network administration expenses, which are included in the model as a fixed expense on a per line basis, at a cost level equal to the overall BellSouth-Georgia per line rate. The HAI Model computes this fixed level of expense as the ARMIS expense for BST-Georgia divided by the number of lines in the study area. Since the study areas that we have fashioned each have only approximately 20% of the lines of BST-Georgia, the resulting fixed per-line expense would be approximately 5 times the level as for BST-Georgia without the adjustment that we have made. As a result, the forward-looking network operations and adminstration expense for the CLEC subregions is the same on a per-line basis as for the HAI Model's application for all of BellSouth-Georgia.

10. A summary of our results is shown on Attachment 1. In this summary, the details and costs of the various network elements are provided in a side-by-side comparison. The results of the analysis show the following:

    a. For the total network elements (i.e., loop and switching elements combined), each of the four CLEC subregions (north, central, south and Atlanta Metro) has costs that are lower ($11.68 to $14.85 for total loop and switching costs) than the total network element cost for BellSouth-Georgia ($17.74 total cost for loop and switching elements).

    b. For each one of the CLEC four subregions (north, central, south and Atlanta Metro) the aggregate cost for the switching elements is lower ($3.74 to $4.08) than the aggregate switching cost for BellSouth-Georgia ($4.10).

    c. For the four CLEC subregions (north, central, south and Atlanta Metro) the total loop cost ($7.60 through $10.95) is lower than the total loop cost for BellSouth-Georgia ($13.64).

This analysis shows that the forward-looking costs of serving customers in a subregion where a CLEC is likely to enter are actually lower than the overall costs faced by the ILEC for the entire region on a forward-looking basis. This analysis shows that the ILEC enjoys no cost advantage over a potential CLEC that undertook to serve specific subregions of the ILEC's territory. In this analysis, a CLEC that undertook to serve subregions that range from approximately 20% of the total lines in the state of Georgia (northern, central and southern Atlanta Metropolitan areas) to serving the total Atlanta Metropolitan area with approximately 58% of the total lines in the state, would have a

cost advantage over the total operations of the ILEC. The significance of this analysis is that it shows a competitive advantage not only with regard to switching and transport, but also when a CLEC serves an area that contains only 20% of the ILEC's customers for the loop. This analysis indicates that the loop should not automatically be considered a UNE that must be offered in all cases, since clearly in the most likely scenario of CLECs providing service in highly targeted areas, the CLEC would have a lower potential forward-looking cost than would the ILEC. To the extent that the loop is provided as a UNE, for whatever reason, we believe that the data suggests strongly that a sunset provision also be set so that the CLECs will understand the period of time over which they need to deploy their own outside plant. The analysis shows that the CLECs will not have a cost disadvantage when they deploy their systems over a reasonable period of time.

11. Attachment 2 provides a refinement of the data referred to in the previous point. Specifically, the HAI Model provides loop UNE costs for each of 9 density zones, from the least dense zone of 0 to 5 lines per square mile up to the highest density zone having in excess of 10,000 lines per square mile. In Attachment 2, we summarize the loop costs for the various CLEC subregions (north, central, south and Atlanta Metro) and for BST-Georgia in three composite density zones (lowest three, middle three, highest three). For each of the CLEC subregions, Attachment 2 reveals that costs are generally in the same range or lower than the costs for the overall operations in Georgia. Specifically:

    a. For the three lowest density zones, the monthly loop cost for the CLEC subregions is $21.38 to $25.76, compared to a monthly loop cost of $30.38 for the overall operations in Georgia in these same density zones.

    b. For the middle three density zones, the cost per loop for the CLEC subregion ranges from $10.44 to $11.55, compared with a loop cost of $11.64 for statewide operations in these zones.

    c. For the highest three density zones, the loop cost for the four CLEC subregions ranges from $6.13 to $7.55 per loop, compared with an overall loop cost of $6.90 for statewide operations in these zones.

This analysis also supports the conclusion that the costs faced by a new entrant CLEC would be comparable to or lower than the cost faced by an incumbent LEC for similar density zone operations. There is nothing to suggest that an ILEC would enjoy significant economies of scale by virtue of having statewide operations as compared with the operations of a CLEC that would serve only a fraction of the existing lines. In fact, the analysis, provided by the operation of the HAI model, would suggest that given the probable course of action of a CLEC first penetrating those areas that have high line densities, and further concentrating on business rather than residential customers, a CLEC would enjoy a significant cost advantage over the incumbent LEC

which, in reality, faces not the efficient forward-looking investments as modeled by HAI, but in many cases its embedded network which could be even higher in cost than new efficient forward-looking technology that was available to its competitors.

12. For each of the four CLEC subregions, we have provided a separate attachment with relevant data. Attachment 3 presents the data for the northern CLEC subregion. This attachment, and each of the following attachments for the various CLEC subregions, consist of five pages as follows:

    a. Page 1 is a map of the various wirecenters that comprise the subregion.

    b. Page 2 lists the particular wirecenters that were chosen for the subregion from the universe of all of the wirecenters in the statewide operation.

    c. Pages 3 and 4 provide the output from the HAI model.

    d. Page 5 provides the scenario inputs with the modifications that we made to appropriately scale the operations for the subregion.

Attachment 4 provides the information for the central CLEC subregion.

Attachment 5 provides the information for the southern CLEC subregion.

Attachment 6 provides the information for the Atlanta CLEC subregion.

COMMENTS ON THE DECLARATION OF MARK. T. BRYANT, Ph.D. ON BEHALF OF MCI WORLDCOM, INC.

13. On paragraph 5, page 3 of his declaration, Dr. Bryant states that the Telecommunications Act's (the Act's) requirement that competitors be provided access to unbundled network components sensibly recognizes that new entrants may not be able to deploy facilities to provide all network elements at once, and that the provision of certain network elements may be subject to constraints on the minimum effective scale at which delivery of each network element is profitable.

While there certainly may be circumstances under which new entrants would not be able to deploy facilities to provide all network elements at once, there has been no showing that gradual deployment of all elements over some reasonable period of time is necessary. This would appear to be a strategy of a CLEC hedging its bets until it determines that it can survive competition, rather than making the investment to compete, especially if it has a forward-looking cost advantage. This forward-looking cost advantage is supported by our analysis, which indicates that the aggregate cost for switching and transport, as well as for loop costs, for CLECs serving 20% to 58% of

all of the lines in a region is comparable to or lower than the cost facing an ILEC for all lines in the region. By bringing in the element of profitability as a reason to access UNEs, Dr. Bryant muddies the concepts even further. There is much more to profitability than the price of a UNE available from an ILEC. The total concept of profitability would include the price to be charged for the service (whether it is residential or business likely would have a profound impact on profitability), the price for other elements required to provide the service and the ability of the CLEC to obtain and retain customers in a competitive world by providing quality service. Consistent with the notion that new entrants may not be able to deploy facilities to provide all network elements at once and, therefore, must have access to an ILEC's UNEs, should be the companion notion that after a reasonable period of time during which CLECs have been able to access ILEC UNEs, a sunset provision should be adopted, after which the ILECs would no longer be required to provide UNEs to CLECs. The duration of time in which ILECs should be required to make UNEs available to CLECs should be determined on the basis of reasonable construction times during which the CLECs should be able to deploy network elements of their own.

14. On paragraph 6, page 3, Dr. Bryant states that if any portion of the local network is subject to natural monopoly market conditions, it is the local loop.

While the local loop may be a natural monopoly in some markets, it is not a monopoly in all markets. The existence of cable television competitors, with the intense aggregation occurring in that industry, and AT&T's merger with TCI and planned acquisition of MediaOne, suggests that cable television facilities, as a substitute for the local loop is a near term reality. As mentioned in the BellSouth comments, there are other economic substitutes, including wireless for the local loop of the ILECs. Also, CAPS provide significant local loop competition for what historically has been the most profitable business segment for the ILECs-business customers in highly concentrated areas (as referenced in paragraph 14, page 7, of Dr. Bryant's affidavit).

15. On paragraph 6, page 3, Dr. Bryant states that loop structures constitute a very large fixed cost because, in order to serve a particular neighborhood, poles must be placed or trenches must be dug regardless of the number of subscribers in that neighborhood.

This declaration by Dr. Bryant directly contradicts some of the key assumptions in the HAI model which MCI has sponsored and to which its expert witnesses have testified in almost every jurisdiction. In numerous state jurisdictions, AT&T and MCI have sponsored witnesses who have testified that the large fixed cost to serve a particular neighborhood, as modeled by HAI, should take into account a substantial amount of structure sharing for these facilities. In some cases it is suggested that these structures could be shared with as many as three additional utilities, thereby reducing these fixed charges by almost 75%. In addition, to the extent that it is the theory that

these fixed structures already exist, then a CLEC would not be faced with huge amounts of initial capital investment, but rather would be able to lease these facilities from their current owners. In presenting his graphs and empirical data, it is difficult to tell whether Dr. Bryant has assumed that ILEC outside plant facilities would be shared while, for the CLEC, facilities would be required "regardless of the number of customers" as suggested in his paragraph 6.

16. On paragraph 8, page 4, Dr. Bryant says that cables frequently must be placed in advance of demand. Further down in paragraph 8, on page 5, he goes on to state that the new entrant must also consider growth that will occur due to its own marketing efforts as it attracts subscribers from the incumbent.

Here once again, are statements from Dr. Bryant that are in direct contradiction to statements made by other AT&T and MCI witnesses in numerous state regulatory proceedings. In each of the state regulatory proceedings involving the HAI model, AT&T and MCI witnesses have argued that the fill factor for cables and other equipment that should be considered appropriate is a fill factor that is specifically not intended to provide for future demand. In this case, where the exercise is to consider the conditions under which a CLEC would undertake investment in loop plant, the position is completely reversed, and a new witness indicates that it is appropriate to consider that equipment would have to be placed in advance of demand. Again, in presenting his charts and data it is difficult to determine whether Dr. Bryant has required additional investment on behalf of the CLEC and limited investment on behalf of the ILEC (as limited by the assumptions in the HAI model).

17. On paragraph 9, page 5, Dr. Bryant states that it will be difficult, if not impossible for new entrants profitably to overbuild the existing telephone network, since the new entrant initially would have very few customers from which the same fixed costs may be recovered.

The scenario painted by Dr. Bryant may not be as simple as he is attempting to portray. The likely scenario is that CLECs, as CAPs have done before them, will attempt to secure customers that are clustered in high density areas as well as business customers who either have very large individual volume or are also clustered in high density areas. Access to an ILEC's network at UNE prices that are based on reasonable input assumptions provides CLECs with a no risk strategy and may discourage CLEC investment in facilities, rather than encourage such investment.

18. In paragraph 13, page 7, Dr. Bryant states that transport facilities operated by CAPS do not constitute a network in the sense of connecting multiple points to and among each other, but are point to point connections carrying a substantial amount of traffic from one point over a specific route to another point.

In its original comments, BellSouth addressed this concern by stating it would be reasonable to require the ILECs to provide transport UNEs on a case-by-case basis, where CLECs demonstrate that service cannot be provided without ILEC-provided transport. We would also point out that there is no requirement for a CLEC to provide service to every area or to every customer and, therefore, they can design and build their networks on a clean slate. The opportunity to provide limited service is not an opportunity available to the ILECs. Here, again, it would be possible for the CLEC to choose those areas in which it could profitably provide service if it had the ability to attract enough customers.

Moreover, the HAI results show that transport costs for efficient CLECs serving subregions of the total service territory generally are less, and frequently are significantly less, than the total transport costs experienced by an ILEC serving the entire service territory. See, *e.g.*, the second page of Attachment 1. Furthermore, since transport consists of a network covering a limited number of specific locations, the time required to construct a CLEC transport network should be significantly less than the time required to build out a feeder and distribution network covering all customers in an area.

19. In paragraph 16, page 8, Dr. Bryant states that within a local exchange area, the ILECs have switches located in each wire center. He goes on to state in paragraph 23, page 11, that in addition to the cost of the switch itself, several items that support the switch also have costs that do not vary with volume (buildings, power, air conditioning, test equipment).

It is not clear that the ILECs have a built in competitive advantage with regard to switches. The HAI Model suggests that they do not. If there were no telephone facilities in existence today, the number and location of telephone wire centers for a newly designed system would probably be fewer and different from those that currently exist. The CLECs have the opportunity to reflect those economies in the incremental networks that they could construct, whereas these opportunities are unavailable to the ILECs.

20. The scenarios that Dr. Bryant has chosen to portray in his declaration, are generally the worst case scenarios for a CLEC. The scenarios assume that a CLEC would be required to make substantial capital investments in advance of obtaining customers and thereby be unable to compete with an ILEC. By painting this worst case scenario, Dr. Bryant suggests that critical UNEs should be available to CLECs on an indefinite basis.

The more probable and likely scenario is the one that we recommend be considered by the Commission. This is a scenario in which the ILEC has in reality made substantial investments to provide an excellent level of service to its customers. The ILECs are now faced with the prospect of setting interconnection rates based upon the efficient, forward-looking costs of a hypothetical system. These hypothetical

costs, in many cases, are lower than the embedded costs that actually have been incurred by the ILECs. Were this to be permitted indefinitely, a CLEC would have the advantage of continuously having a price for interconnection based upon a hypothetical efficient system without having to make any investment or take any financial risk - even in a situation where its forward-looking cost would be less than the ILEC's.

The ILEC's customers are grouped in various density zones. Those customers in the highest density zone afford a lucrative target for a CLEC. The ILECs' business customers with rates that currently, in many cases, subsidize residential rates, are also a lucrative target unless a massive rate restructuring is to take place prior to full competition. Therefore, there are substantial and ready markets available to the CLECs. The analysis that we have provided indicates that on a forward-looking basis using AT&T's model, a CLEC could effectively compete by providing its own investment in facilities in that its long-term forward-looking costs might actually be less than those of the incumbent utility. While in certain cases there could be an argument that it would not be possible for a CLEC to make the investment in facilities all at once, some transition period of time in which the UNEs are offered by the ILEC would be appropriate. In fairness, the concurrent setting of a sunset provision such that the playing field would be leveled in some reasonable period of time should also be adopted.

COMMENTS ON SECOND FURTHER NOTICE OF PROPOSED RULEMAKING

21. In paragraph 11, the Commission seeks comments on an approach that would allow sunset or modification of the unbundling obligations as technology and market conditions evolve over time.

The data that we have provided in this proceeding shows that for the loop, transport, signaling and switching UNE elements, the forward-looking, efficient cost for various subsets of a particular region is equal to or less than the comparable cost of the ILECs. Given that the comparative cost for a CLEC subregion is a surrogate for a competitors' cost, and the CLEC subregion costs are below the ILEC regional total costs, economies of scale do not support competitors' claims that ILEC networks must be unbundled; the only requirement for unbundling should be that CLECs require time in which to deploy facilities with which to compete. This is a strong argument that for all of these UNE elements, a sunset provision should be adopted. The period of time should be reasonable to provide relief, if appropriate at all, for the competitors' arguments that not all network elements could be self-provided all at once.

22. In paragraph 12, the Commission asks parties to comment on the types of evidentiary standards or approaches that should govern application of section 251(d)(2) standards in determining which network elements must be unbundled.

000227

There are various cost proxy models that have been in development over the last several years. We have provided data in this proceeding based upon the results of the HAI model. There exists, in addition, the benchmark cost proxy model and the FCC's own high cost proxy model. As commented on in this proceeding, these models provide a valuable tool to provide data in response to the various arguments made by the parties. The use of a model to provide consistency between the treatment afforded an ILEC in determining its forward-looking cost and those of a CLEC in supporting its costs under various scenarios of competition is fair and equitable. We have pointed out above that various positions taken by AT&T and MCI in state regulatory cost proceedings (in which, for example, structure costs are reduced to a minimum by assuming that the ILEC can share its facilities with many other utilities) are contrary to positions in this proceeding (*e.g.*, Dr. Bryant argues that it would be appropriate for a CLEC to be considered having high fixed costs because it does not have the ability to share structures with other utilities).

23. In paragraph 24, the Commission requests comments to discuss potential alternative sources of network elements from other competing carriers, as well as availability of network elements through self provisioning. The Commission asks commentors to provide information on the cost of alternatives, the length of time it takes to obtain alternatives, and the extent which alternatives to unbundled elements are being utilized now.

The data we have provided from our analysis speaks directly to the cost of the alternatives and has been discussed in detail above. It is interesting to note that the Commission, in its order setting forth the methodology to determine the cost of network elements, has assumed that the price of these network elements must be adjusted immediately to reflect the forward-looking total element long run incremental costs (TELRIC). In many cases, the timeframe to change such factors as the percent of plant that is aerial versus buried versus underground takes a long period of time to achieve. If it is to be argued in this proceeding that a CLEC should obtain a particular network element because it would not have the ability to self provide all of the elements at once, then a level playing field would argue that the pricing of various ILEC elements should also be phased in over some period of time to reflect that it would not be possible for the ILEC to reprovision all of its investments all at once. As stated before, to the extent that these elements are made available, based upon the inability of CLECs to self-provide the elements all at once, a sunset provision should be adopted.

24. In paragraph 27, the Commission seeks comments on the extent to which they should consider the quantity of facilities that may be necessary for competitors to obtain in order to compete effectively. Accordingly, the FCC asks parties to comment on the extent to which such factors as economies of scale, penetration assumptions and the requesting carriers particular market entry strategies should be considered.

The analysis that we have undertaken (and the analysis available to the Commission with the appropriate use of their high cost proxy model), provides relevant data on the factor of economies of scale. The data presented shows that over a large relevant range of operation, economies of scale might actually be in favor of a CLEC. With regard to the issue of the quantity of facilities and the lead time in which the facilities would be installed, we believe that this is an issue that should be evaluated based upon the ability of the CLEC to self-provide such facilities. As stated before, to the extent that the lead time is the factor that results in a network element being made available to a CLEC, a sunset provision should concurrently be set in a reasonable time frame.

Attachment 1

Atlanta - Metro Area Competitors

Overall Loop-Cost Comparisons

Loop elements	North-5	Central-2	South-2	Atlanta-2	GA-BST
NID					
Annual Cost	$ 4,544,856	$ 4,035,735	$ 4,712,182	$ 13,299,372	$ 22,615,788
Unit Cost/month	0.42	0.38	0.43	0.43	0.43
Loop Distribution (DLC)					
Annual Cost	$ 50,714,399	$ 24,931,655	$ 55,763,487	$ 150,475,408	$ 350,081,770
Unit Cost/month	5.99	4.12	6.01	6.78	9.32
	0	0	0	0	
Loop Distribution (non-DLC)					
Annual Cost	$ 8,965,802	$ 11,538,362	$ 15,143,277	$ 32,667,664	$ 62,684,477
Unit Cost/month	3.96	2.56	3.75	3.80	4.30
Loop Distribution (all)					
Annual Cost	$ 59,680,201	$ 36,470,017	$ 70,906,764	$ 183,143,073	$ 412,766,247
Unit Cost/month	5.56	3.46	6.45	5.95	7.92
Loop Concentration (DLC)					
Annual Cost	$ 33,283,789	$ 24,624,838	$ 28,427,744	$ 68,896,849	$ 157,887,285
Unit Cost/month	3.93	4.07	4.08	4.00	4.21
Loop Concentration (non-DLC)					
Annual Cost	$ 219,014	$ 407,420	$ 375,908	$ 817,382	$ 1,377,418
Unit Cost/month	0.10	0.09	0.09	0.10	0.09
Loop Concentration (all)					
Annual Cost	$ 33,502,803	$ 25,032,058	$ 28,803,652	$ 69,714,232	$ 159,264,704
Unit Cost/month	3.12	2.36	2.62	2.91	3.06
Loop Feeder (DLC)					
Annual Cost	$ 9,440,984	$ 6,932,702	$ 9,123,246	$ 26,308,805	$ 92,358,913
Unit Cost/month	1.11	1.14	1.31	1.18	2.46
Loop Feeder (non-DLC)					
Annual Cost	$ 3,677,295	$ 7,505,635	$ 6,925,431	$ 14,482,838	$ 24,145,887
Unit Cost/month	1.63	1.68	1.71	1.68	1.66
Loop Feeder (all)					
Annual Cost	$ 13,118,279	$ 14,438,338	$ 16,048,678	$ 40,791,643	$ 116,504,800
Unit Cost/month	1.22	1.37	1.46	1.32	2.24
Total Loop (DLC)					
Annual Cost	$ 97,062,285	$ 58,949,760	$ 96,512,995	$ 275,578,806	$ 617,084,553
Unit Cost/month	11.46	9.73	13.86	12.41	16.44
Total Loop (non-DLC)					
Annual Cost	$ 13,783,854	$ 21,026,368	$ 23,958,281	$ 51,369,513	$ 94,056,985
Unit Cost/month	6.09	4.70	5.93	5.98	6.45
Total Loop (all)					
Annual Cost	$ 110,846,139	$ 79,976,148	$ 120,471,275	$ 326,948,319	$ 711,151,538
Unit Cost/month	10.33	7.60	10.95	10.62	13.64
Total lines	894,106	877,299	916,765	2,586,713	4,343,728
Total lines served by DLC	705,646	504,795	580,186	1,850,370	3,128,544

	North-5	Central-2	South-2	Atlanta-2	GA-BST
Total network elements	$ 14.26	$ 11.68	$ 14.85	$ 14.36	$ 17.74
Loop cost	10.33	7.60	10.95	10.62	13.64
Aggregate switched elements	$ 3.93	$ 4.08	$ 3.90	$ 3.74	$ 4.10

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Atlanta - Metro Area Competitors
Switching UNE Cost Element Comparison

	NORTH-5	CENTRAL-2	SOUTH-2	ATLANTA-2	BST-GA	
End office switching						
Line Port	$ 0.87	$ 0.91	$ 0.85	$ 0.85	$ 0.85	per line/month
Non-Line Port	$ 0.00109	$ 0.00107	$ 0.00108	$ 0.00108	$ 0.00110	per actual minute
Signaling network elements						
Links	$ 0.57	$ 0.22	$ 1.08	$ 0.82	$ 9.88	per link per month
STP	$ 0.00004	$ 0.00004	$ 0.00004	$ 0.00002	$ 0.00006	per signaling message
SCP	$ 0.00080	$ 0.00068	$ 0.00078	$ 0.00068	$ 0.00089	per query
Transport network elements						
Dedicated						
Sw-Sp Transport	$ 0.62	$ 0.30	$ 0.79	$ 0.62	$ 2.04	per DS-0 equivalent per month
Switched	$ 0.00006	$ 0.00003	$ 0.00008	$ 0.00006	$ 0.00020	per minute
Special	$ 2.19	$ 2.25	$ 2.70	$ 2.81	$ 2.55	per DS-0 equivalent per month
Transmission Terminal	$ 0.00022	$ 0.00022	$ 0.00027	$ 0.00026	$ 0.00025	per minute
	$ 0.00028	$ 0.00025	$ 0.00035	$ 0.00032	$ 0.00046	total per minute
Common						
Transport	$ 0.00007	$ 0.00003	$ 0.00010	$ 0.00008	$ 0.00038	per minute per leg (orig or term)
Transmission Terminal	$ 0.00021	$ 0.00022	$ 0.00028	$ 0.00027	$ 0.00029	per minute
	$ 0.00028	$ 0.00025	$ 0.00037	$ 0.00034	$ 0.00068	total per minute
Direct						
Transport	$ 0.00007	$ 0.00003	$ 0.00010	$ 0.00008	$ 0.00032	per minute
Transmission Terminal	$ 0.00023	$ 0.00023	$ 0.00029	$ 0.00028	$ 0.00029	per minute
	$ 0.00030	$ 0.00026	$ 0.00039	$ 0.00036	$ 0.00062	total per minute
Total cost of switched network elements						
(w/o Public)	$ 14.26	$ 11.68	$ 14.85	$ 14.36	$ 17.74	

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Atlanta - Metro Area Competitors

Loop Summary - Grouped by Density Zones

Density zone	NORTH-5	CENTRAL-2	SOUTH-2	ATLANTA-2	BST-GA
Low three (excl 0-5)	$ 21.38	$ 23.70	$ 25.76	$ 24.01	$ 30.38
Middle three	11.55	10.44	11.86	11.81	11.64
High three	7.55	6.88	6.13	7.10	6.90

Scenario ils

Atlanta Metro with Changes in DEMs, Messages, Tandems and STPs

NOTE: This sheet diplays all user adjustable inputs which vary from HM 5.0a default settings

Workfile Name:	**e:\hm50\WORKFILES\HMWKGA2251922.XLS**
Distribution Module Name:	**e:\hm50\MODULES\R50a_distribution.xls**
Feeder Module Name:	**e:\hm50\MODULES\R50a_feeder.xls**
Switching Module Name:	**e:\hm50\MODULES\R50a_switching_lo.xls**
Expense Module Name:	**e:\hm50\MODULES\R50a_expense_density.xls**

Module/Table	Scenario Input	Scenario Value	Default Value
Switching	Local Call Attempts	9862476	16690573
Switching	IntraLATA Calls Completed	167419	283328
Switching	InterLATA intrastate Calls Completed	175418	296866
Switching	InterLATA interstate Calls Completed	819703	1387208
Switching	Local DEMs, thousands	46642502	78934550
Switching	Intrastate DEMs, thousands	3100723	5247449
Switching	Interstate DEMs, thousands	7824120	13241000

0002234

CENTRAL-2

Loop elements	0-5 lines/sq mi	5-100 lines/sq mi	100-200 lines/sq mi	200-650 lines/sq mi	650-850 lines/sq mi	850-2550 lines/sq mi	2550-5000 lines/sq mi	5000-10000 lines/sq mi	>10000 lines/sq mi	Totals
NID										
Annual Cost	$ -	$ -	$ 973	$ 82,652	$ 34,055	$ 834,993	$ 1,475,568	$ 947,668	$ 659,826	$ 4,035,735
Unit Cost/month	-	-	0 34	0 46	0 53	0 45	0 42	0 38	0 27	0 38
GA-BST				0 46	0 46	0.45	0.41	0 36	0 27	
Loop Distribution (DLC)										
Annual Cost	$ -	$ -	$ 24,578	$ 1,258,399	$ 474,011	$ 7,491,571	$ 9,154,029	$ 5,397,145	$ 1,131,922	$ 24,931,655
Unit Cost/month	-	-	8 67	7.72	7 36	5 25	4 05	3 34	2 17	4 12
GA-BST					7 30		4 03	3 16	2 15	
Loop Distribution (non-DLC)										
Annual Cost	$ -	$ -	$ -	$ 54,663	$ -	$ 1,671,149	$ 4,546,707	$ 2,649,845	$ 2,615,998	$ 11,538,362
Unit Cost/month	-	-	-	3 41	-	3 88	3 61	3 09	1 37	2 58
GA-BST								3 03		
Loop Distribution (all)										
Annual Cost	$ -	$ -	$ 24,578	$ 1,313,062	$ 474,011	$ 9,162,719	$ 13,700,737	$ 8,046,990	$ 3,747,920	$ 36,470,017
Unit Cost/month	-	-	8 67	7 33	7.36	4 93	3.89	3 25	1 54	3 46
GA-BST					7 11			3 10		
Loop Concentration (DLC)										
Annual Cost	$ -	$ -	$ 20,252	$ 709,453	$ 279,836	$ 6,071,308	$ 9,117,048	$ 6,441,033	$ 1,985,709	$ 24,624,638
Unit Cost/month	-	-	7 14	4 35	4 35	4 26	4 03	3 98	3 80	4 07
GA-BST			4 09	4 02	3.99	3.90	3.78	3 73	3 57	
Loop Concentration (non-DLC)										
Annual Cost	$ -	$ -	$ -	$ 1,537	$ -	$ 42,894	$ 125,903	$ 81,339	$ 155,747	$ 407,420
Unit Cost/month	-	-	-	0.10	-	0 10	0.10	0 10	0 08	0 09
GA-BST							0.10	0.09	0 08	
Loop Concentration (all)										
Annual Cost	$ -	$ -	$ 20,252	$ 710,990	$ 279,836	$ 6,114,202	$ 9,242,950	$ 6,522,372	$ 2,141,456	$ 25,032,058
Unit Cost/month	-	-	7.14	3 97	4 35	3 29	2 63	2 64	0 88	2 38
GA-BST			3 75	3 53	3.30	2.84	2.24	2.15	0 80	
Loop Feeder (DLC)										
Annual Cost	$ -	$ -	$ 21,362	$ 254,730	$ 90,562	$ 1,777,997	$ 2,489,673	$ 1,761,587	$ 536,791	$ 6,932,702
Unit Cost/month	-	-	7 54	1 56	1 41	1 25	1.10	1 09	1 03	1 14
GA-BST			2 11	1 24	1 20	1 00	0.98	0 98	0 94	
Loop Feeder (non-DLC)										
Annual Cost	$ -	$ -	$ -	$ 21,189	$ -	$ 787,468	$ 2,081,366	$ 1,469,510	$ 3,166,103	$ 7,505,635
Unit Cost/month	-	-	-	1 32	-	1 78	1 65	1 72	1 66	1 68
GA-BST						1.71	1 52	1.51	1 51	1 66
Loop Feeder (all)										
Annual Cost	$ -	$ -	$ 21,362	$ 275,919	$ 90,562	$ 2,545,465	$ 4,571,039	$ 3,231,097	$ 3,702,894	$ 14,438,338
Unit Cost/month	-	-	7 54	1 54	1 41	1 37	1.30	1 31	1 52	1 37
GA-BST			2 13	1 33	1 36	1 20	1.19	1 20	1 39	
Total Loop (DLC)										
Annual Cost	$ -	$ -	$ 67,166	$ 2,297,834	$ 878,464	$ 15,982,222	$ 21,708,341	$ 14,219,476	$ 3,796,277	$ 58,949,780
Unit Cost/month	-	-	23 70	14 09	13 64	11 21	9 60	8 79	7 27	9 73
GA-BST			20 78		12 95	11 18	9.18	8.22	6 94	
Total Loop (non-DLC)										
Annual Cost	$ -	$ -	$ -	$ 84,789	$ -	$ 2,675,157	$ 7,281,953	$ 4,528,650	$ 8,455,819	$ 21,026,368
Unit Cost/month	-	-	-	5 29	-	6 21	5 78	5 29	3 38	4 70
GA-BST								4 99		
Total Loop (all)										
Annual Cost	$ -	$ -	$ 67,166	$ 2,382,623	$ 878,464	$ 18,657,379	$ 28,990,293	$ 18,748,127	$ 10,252,096	$ 79,976,148
Unit Cost/month	-	-	23 70	13 31	13 64	10 05	8 24	7 58	4 22	7 60
GA-BST			19 96		12 23		7 86	6 82	4 18	
Total lines	-	-	236	14,923	5,366	154,746	293,360	206,170	202,499	877,299
Total lines served by DLC	-	-	236	13,586	5,366	118,858	188,392	134,821	43,535	504,795

000235

SOUTH-2

Loop elements	0-5 lines/sq mi	5-100 lines/sq mi	100-200 lines/sq mi	200-650 lines/sq mi	650-850 lines/sq mi	850-2550 lines/sq mi	2550-5000 lines/sq mi	5000-10000 lines/sq mi	>10000 lines/sq mi	Totals
NID										
Annual Cost	$ -	$ 183,584	$ 217,436	$ 920,378	$ 245,215	$ 1,861,094	$ 666,569	$ 272,132	$ 345,777	$ 4,712,182
Unit Cost/month	-	0 50	0 49	0 48	0 46	0 46	0 43	0 39	0 24	0 43
GA-BST			0 47	0 46	0 46	0 45	0 41	0 36		
Loop Distribution (DLC)										
Annual Cost	$ -	$ 7,176,510	$ 6,823,444	$ 17,765,404	$ 2,864,542	$ 15,834,218	$ 3,738,665	$ 1,329,717	$ 230,987	$ 55,763,487
Unit Cost/month	-	19 47	16 37	10 45	7 30	5 80	4 11	3 74	2 55	8 01
GA-BST			14 11	9 83			4 03	3 16	2 15	
Loop Distribution (non-DLC)										
Annual Cost	$ -	$ -	$ 269,970	$ 1,663,519	$ 825,140	$ 6,997,045	$ 2,836,296	$ 935,007	$ 1,616,300	$ 15,143,277
Unit Cost/month	-	-	11 39	7 77	5 96	5 36	4 40	2 79	1 17	3 75
GA-BST			8 24	7 14		5 10	3 98			
Loop Distribution (all)										
Annual Cost	$ -	$ 7,176,510	$ 7,093,415	$ 19,428,923	$ 3,689,682	$ 22,831,264	$ 6,574,961	$ 2,264,723	$ 1,847,287	$ 70,906,764
Unit Cost/month	-	19 47	16 10	10 15	6 95	5 66	4 23	3 28	1 26	6 45
GA-BST			13 61	9 50		5 62	4 01	3 10		
Loop Concentration (DLC)										
Annual Cost	$ -	$ 1,772,163	$ 1,778,484	$ 7,045,540	$ 1,585,536	$ 10,930,871	$ 3,575,669	$ 1,372,177	$ 367,304	$ 28,427,744
Unit Cost/month	-	4 81	4 27	4 15	4 04	4 01	3 93	3 86	4 05	4 08
GA-BST			4 09	4 02	3 99	3 90	3 78	3 73	3 57	
Loop Concentration (non-DLC)										
Annual Cost	$ -	$ -	$ 2,846	$ 22,717	$ 13,694	$ 134,548	$ 64,550	$ 30,068	$ 107,486	$ 375,908
Unit Cost/month	-	-	0 12	0 11	0 10	0 10	0 10	0 09	0 08	0 09
GA-BST			0 10	0 10		0 10	0 10	0 09	0 08	
Loop Concentration (all)										
Annual Cost	$ -	$ 1,772,163	$ 1,781,330	$ 7,068,258	$ 1,599,230	$ 11,065,418	$ 3,640,219	$ 1,402,245	$ 474,789	$ 28,803,652
Unit Cost/month	-	4 81	4 04	3 69	3 01	2 74	2 34	2 03	0 32	2 62
GA-BST			3 75	3 53			2 24			
Loop Feeder (DLC)										
Annual Cost	$ -	$ 1,645,150	$ 897,190	$ 1,948,298	$ 397,401	$ 2,789,697	$ 939,892	$ 410,715	$ 94,903	$ 9,123,246
Unit Cost/month	-	4 46	2 15	1 15	1 01	1 02	1 03	1 16	1 05	1 31
GA-BST			2 11			1 00	0 96	0 96	0 94	
Loop Feeder (non-DLC)										
Annual Cost	$ -	$ -	$ 75,187	$ 403,364	$ 282,339	$ 2,314,343	$ 1,158,959	$ 822,637	$ 2,068,622	$ 6,925,431
Unit Cost/month	-	-	3 17	1 88	2 04	1 77	1 80	1 86	1 50	1 71
GA-BST			2 33			1 71	1 52	1 51		1 66
Loop Feeder (all)										
Annual Cost	$ -	$ 1,645,150	$ 972,357	$ 2,351,662	$ 679,740	$ 5,104,040	$ 2,098,851	$ 1,033,352	$ 2,163,525	$ 16,048,678
Unit Cost/month	-	4 46	2 21	1 23	1 26	1 27	1 35	1 50	1 47	1 46
GA-BST			2 13			1 20	1 19	1 20	1 39	
Total Loop (DLC)										
Annual Cost	$ -	$ 10,777,407	$ 9,704,855	$ 27,576,590	$ 5,028,765	$ 30,813,537	$ 8,644,566	$ 3,252,719	$ 714,557	$ 96,512,995
Unit Cost/month	-	29 24	23 28	16 23	12 81	11 30	9 49	9 15	7 86	13 86
GA-BST			20 78	15 56		11 16	9 18	8 22	6 94	
Total Loop (non-DLC)										
Annual Cost	$ -	$ -	$ 359,682	$ 2,192,629	$ 1,185,102	$ 10,048,278	$ 4,336,034	$ 1,719,733	$ 4,116,821	$ 23,958,281
Unit Cost/month	-	-	15 18	10 24	8 56	7 70	6 73	5 13	2 99	5 93
GA-BST			11 14	9 66		7 36	6 01	4 99		
Total Loop (all)										
Annual Cost	$ -	$ 10,777,407	$ 10,064,537	$ 29,769,219	$ 6,213,867	$ 40,861,815	$ 12,980,600	$ 4,972,452	$ 4,831,378	$ 120,471,275
Unit Cost/month	-	29 24	22 85	15 56	11 70	10 13	8 35	7 20	3 29	10 95
GA-BST			19 96	14 82		10 10	7 86	6 82		
Total lines	-	30,716	36,710	159,456	44,257	336,115	129,601	57,538	122,371	916,765
Total lines served by DLC	-	30,716	34,735	141,606	32,719	227,331	75,894	29,624	7,560	580,186

000236

ATLANTA-2

Loop elements	0-5 lines/sq mi	5-100 lines/sq mi	100-200 lines/sq mi	200-650 lines/sq mi	650-850 lines/sq mi	850-2550 lines/sq mi	2550-5000 lines/sq mi	5000-10000 lines/sq mi	>10000 lines/sq mi	Totals
NID										
Annual Cost	$ -	$ 299,955	$ 550,906	$ 2,033,242	$ 712,370	$ 5,115,686	$ 2,652,080	$ 1,214,812	$ 720,321	$ 13,299,372
Unit Cost/month	-	0 49	0 50	0 48	0 48	0 46	0 42	0 37	0 27	0 43
GA-BST			0 47	0 46	0 46	0 45	0 41	0 36		
Loop Distribution (DLC)										
Annual Cost	$ -	$ 11,312,207	$ 16,671,977	$ 39,815,943	$ 8,760,970	$ 49,127,327	$ 16,040,898	$ 7,381,356	$ 1,364,933	$ 150,475,408
Unit Cost/month	-	18 62	15 37	10 18	7 33	5 82	3 95	3 24	2 21	6 78
GA-BST			14 11	9 83	7 30			3 18	2 15	
Loop Distribution (non-DLC)										
Annual Cost	$ -	$ -	$ 271,308	$ 2,173,096	$ 1,756,171	$ 13,609,527	$ 8,978,548	$ 3,010,376	$ 2,868,641	$ 32,667,664
Unit Cost/month	-	-	11 45	7 07	6 04	5 08	3 95	3 06	1 41	3 80
GA-BST			8 24					3 03		
Loop Distribution (all)										
Annual Cost	$ -	$ 11,312,207	$ 16,943,284	$ 41,989,039	$ 10,517,141	$ 62,736,853	$ 25,019,242	$ 10,391,731	$ 4,233,574	$ 183,143,073
Unit Cost/month	-	18 62	15 29	9 93	7 08	5 84	3 95	3 19	1 59	5 95
GA-BST			13 61	9 50		5 62		3 10		
Loop Concentration (DLC)										
Annual Cost	$ -	$ 2,853,255	$ 4,577,984	$ 16,121,779	$ 4,831,465	$ 33,760,301	$ 15,778,017	$ 8,706,030	$ 2,268,019	$ 88,896,849
Unit Cost/month	-	4 70	4 22	4 11	4 04	4 00	3 89	3 82	3 66	4 00
GA-BST			4 09	4 02	3 99	3 90	3 78	3 73	3 57	
Loop Concentration (non-DLC)										
Annual Cost	$ -	$ -	$ 2,861	$ 32,395	$ 31,726	$ 273,003	$ 225,450	$ 90,231	$ 161,715	$ 817,382
Unit Cost/month	-	-	0 12	0 11	0 11	0 10	0 10	0 09	0 08	0 10
GA-BST			0 10	0 10	0 10	0 10	0 10	0 09	0 08	0 09
Loop Concentration (all)										
Annual Cost	$ -	$ 2,853,255	$ 4,580,845	$ 16,154,174	$ 4,863,192	$ 34,033,304	$ 16,003,467	$ 8,796,260	$ 2,429,734	$ 89,714,232
Unit Cost/month	-	4 70	4 13	3 82	3 27	3 06	2 53	2 70	0 91	2 91
GA-BST			3 75	3 53		2 84	2 24	2 15	0 80	
Loop Feeder (DLC)										
Annual Cost	$ -	$ 2,496,869	$ 2,080,694	$ 4,685,611	$ 1,387,230	$ 8,708,994	$ 4,095,135	$ 2,254,385	$ 599,888	$ 26,308,805
Unit Cost/month	-	4 11	1 92	1 20	1 16	1 03	1 01	0 99	0 97	1 18
GA-BST						1 00	0 98	0 96	0 94	
Loop Feeder (non-DLC)										
Annual Cost	$ -	$ -	$ 75,555	$ 535,885	$ 617,414	$ 4,639,155	$ 3,752,824	$ 1,632,347	$ 3,229,658	$ 14,482,838
Unit Cost/month	-	-	3 19	1 74	2 12	1 73	1 65	1 66	1 58	1 68
GA-BST			2 33		2 11	1 71	1 52	1 51	1 51	1 66
Loop Feeder (all)										
Annual Cost	$ -	$ 2,496,869	$ 2,156,249	$ 5,221,496	$ 2,004,644	$ 13,348,148	$ 7,847,959	$ 3,886,732	$ 3,829,546	$ 40,791,643
Unit Cost/month	-	4 11	1 95	1 23	1 35	1 20	1 24	1 19	1 44	1 32
GA-BST						1 20	1 19		1 39	
Total Loop (DLC)										
Annual Cost	$ -	$ 16,962,287	$ 23,869,776	$ 62,508,805	$ 15,552,662	$ 95,480,179	$ 37,814,480	$ 19,190,193	$ 4,400,425	$ 275,578,806
Unit Cost/month	-	27 92	22 01	15 94	13 02	11 31	9 26	8 42	7 11	12 41
GA-BST			20 78	15 56	12 95	11 18	9 18	8 22	6 94	
Total Loop (non-DLC)										
Annual Cost	$ -	$ -	$ 361,507	$ 2,889,146	$ 2,544,685	$ 19,753,813	$ 13,908,269	$ 5,099,342	$ 6,812,750	$ 51,369,513
Unit Cost/month	-	-	15 25	9 40	8 76	7 38	6 12	5 18	3 34	5 98
GA-BST			11 14			7 36	6 01	4 99		
Total Loop (all)										
Annual Cost	$ -	$ 16,962,287	$ 24,231,283	$ 65,397,951	$ 18,097,348	$ 115,233,992	$ 51,722,749	$ 24,289,535	$ 11,213,175	$ 326,948,319
Unit Cost/month	-	27 92	21 87	15 47	12 18	10 37	8 14	7 45	4 22	10 62
GA-BST			19 96	14 82		10 10	7 86	6 82	4 16	
Total lines	-	50,635	92,340	352,337	123,781	926,356	527,748	271,829	221,688	2,566,713
Total lines served by DLC	-	50,635	90,365	326,730	99,563	703,240	338,415	189,845	51,576	1,850,370

000237

Attachment 3

NORTH

1 ADAMSVILLE
2 BUCKHEAD
3 CHAMBLEE
4 COLUMBIA DRIVE
5 COURTLAND ST
6 DECATUR(East Lake)
7 DUNWOODY
8 EAST POINT
9 FOREST
10 GRESHAM
11 HOLLYWOOD ROAD
12 INDIAN CREEK
13 LAKEWOOD
14 LITHONIA
15 MARIETTA EAST
16 MORROW
17 NORCROSS
18 PANOLA
19 PEACHTREE PLACE
20 POWERS FERRY
21 RIVERDALE
22 SANDY SPRINGS
23 SMYRNA
24 STONE MOUNTAIN
25 TOCO HILLS
26 TUCKER
27 WEST END
28 WOODLAND HILLS



000239

BellSouth - Atlanta Area Wire Centers, by Density
Northern Atlanta-Metro Competitor

			Total Area	Total lines	Total bus lines	Total density	Bus density	Total lines selected w. centers
1.	ATLNGACS	COURTLAND STREET	10.22	105,293	53,931	10,304	5,278	
2.	ATLNGAPP	PEACHTREE PLACE	11.61	98,241	43,013	8,460	3,704	
3.	NRCRGAMA	NORCROSS	37.50	102,120	41,684	2,724	1,112	102,120
4.	MRTTGAMA	MARIETTA MAIN	111.46	129,857	40,255	1,165	361	129,857
5.	DNWDGAMA	DUNWOODY	23.64	88,037	38,460	3,724	1,627	88,037
6.	ATLNGABU	BUCKHEAD	21.25	88,677	36,993	4,173	1,741	
7.	TUKRGAMA	TUCKER	26.45	83,148	33,488	3,144	1,266	
8.	CHMBGAMA	CHAMBLEE	20.20	69,376	29,519	3,435	1,462	69,376
9.	ATLNGATH	TOCO HILLS	21.06	80,000	27,847	3,799	1,322	
10.	ATLNGASS	SANDY SPRINGS	25.47	65,113	27,449	2,556	1,078	65,113
11.	RSWLGAMA	ROSWELL	59.92	90,341	25,946	1,508	433	90,341
12.	SMYRGAMA	SMYRNA	39.90	85,801	24,529	2,150	615	
13.	SMYRGAPF	POWERS FERRY	15.01	59,283	24,497	3,949	1,632	59,283
14.	ALPRGAMA	ALPHARETTA	111.72	71,174	23,542	637	211	71,174
15.	LLBNGAMA	LILBURN	48.33	81,950	21,908	1,696	453	
16.	ATLNGAEP	EAST POINT	48.27	67,136	21,865	1,391	453	
17.	LRVLGAOS	LAWRENCEVILLE	151.06	77,028	19,648	510	130	
18.	MRTTGAEA	MARIETTA EAST	43.88	64,860	15,271	1,478	348	64,860
19.	DLTHGAHS	DULUTH	47.67	43,930	14,856	922	312	43,930
20.	ATLNGAWD	WOODLAND HILLS	13.79	38,011	14,261	2,756	1,034	
21.	ATLNGAIC	INDIAN CREEK	21.18	54,306	14,063	2,564	664	
22.	ATLNGAAD	ADAMSVILLE	21.07	33,041	12,967	1,568	616	
23.	WDSTGACR	WOODSTOCK	95.50	60,038	12,266	629	128	60,038
24.	CNYRGAMA	CONYERS	133.87	46,072	12,137	344	91	
25.	ATLNGAFP	FOREST PARK	32.56	32,991	11,168	1,013	343	
26.	RVDLGAMA	RIVERDALE	25.75	39,582	10,403	1,537	404	
27.	ATLNGAEL	DECATUR (East Lake)	16.44	39,436	9,822	2,398	597	
28.	SNVLGAMA	SNELLVILLE	68.79	45,512	8,936	662	130	
29.	DGVLGAMA	DOUGLASVILLE	171.43	42,640	8,716	249	51	
30.	JNBOGAMA	JONESBORO	74.50	49,551	8,691	665	117	
31.	PANLGAMA	PANOLA	43.10	39,192	8,254	909	192	
32.	ATLNGABH	BENHILL	42.58	26,364	7,857	619	185	
33.	ATLNGACD	COLUMBIA DRIVE	20.81	35,013	7,379	1,683	355	
34.	SNMTGALR	STONE MOUNTAIN	29.81	32,381	6,959	1,086	233	
35.	PTCYGAMA	PEACHTREE CITY	52.36	25,103	6,671	479	127	
36.	ASTLGAMA	AUSTELL	76.04	40,078	6,640	527	87	
37.	FYVLGASG	FAYETTEVILLE	117.18	25,684	6,319	219	54	
38.	BUFRGABH	BUFORD	108.18	28,374	6,182	262	57	28,374
39.	ATLNGAGR	GRESHAM	32.16	28,580	5,929	889	184	
40.	ATLNGAWE	WEST END	14.97	28,845	5,590	1,927	373	
41.	ATLNGALA	LAKEWOOD	15.06	24,389	5,569	1,620	370	
42.	FRBNGAEB	FAIRBURN	113.20	23,207	5,236	205	46	
43.	MRRWGAMA	MORROW	17.53	19,910	4,916	1,136	280	
44.	MCDNGAGS	MCDONOUGH	187.14	23,104	4,606	123	25	
45.	STBRGANH	STOCKBRIDGE	69.28	23,370	4,538	337	66	
46.	LTHNGAJS	LITHONIA	35.66	14,767	3,886	414	109	
47.	ACWOGAMA	ACWORTH	87.00	21,602	3,708	248	43	21,602
48.	DLLSGAES	DALLAS	180.85	20,712	2,951	115	16	
49.	ATLNGAHR	HOLLYWOOD ROAD	11.78	15,880	2,948	1,348	250	
50.	PWSPGAAS	POWDER SPRINGS	48.24	19,974	2,905	414	60	
51.	LGVLGACS	LOGANVILLE	62.15	8,264	1,253	133	20	
52.	HMPNGAJW	HAMPTON	55.86	5,033	907	90	16	
53.	PLMTGAMA	PALMETTO	69.89	4,341	839	62	12	
54.	Total		3,040.31	2,566,713	800,172	844	263	894,106
55.	Percent of BST-Ga.			59.1%				20.6%
56.	Competitor Data		787.15	894,106	303,636	1,136	386	

COST OF NETWORK ELEMENTS

North - Atlanta Metro with Changes in DEMs, Messages, Tandems and STPs

(North-5.xls)

Georgia

Southern Bell-Ga

Loop elements	0-5 lines/sq mi	5-100 lines/sq mi	100-200 lines/sq mi	200-650 lines/sq mi	650-850 lines/sq mi	850-2550 lines/sq mi	2550-5000 lines/sq mi	5000-10000 lines/sq mi	>10000 lines/sq mi	Totals
NID										
Annual Cost	$ -	$ 85,247	$ 140,693	$ 690,545	$ 207,656	$ 1,807,389	$ 960,448	$ 528,751	$ 144,127	$ 4,544,856
Unit Cost/month	-	0 45	0 49	0.47	0 49	0.44	0.40	0 35	0 32	0 42
Loop Distribution (DLC)										
Annual Cost	$ -	$ 2,041,671	$ 4,346,891	$ 13,449,197	$ 2,561,208	$ 18,212,597	$ 6,213,693	$ 3,286,135	$ 603,007	$ 50,714,399
Unit Cost/month	-	14 16	15 21	9 30	7 49	5.70	3 65	3 08	2 13	5 99
Loop Distribution (non-DLC)										
Annual Cost	$ -	$ -	$ -	$ 105,289	$ 521,952	$ 4,023,660	$ 2,835,832	$ 1,339,870	$ 339,199	$ 8,965,802
Unit Cost/month	-	-	-	4 00	6 11	4.59	3 84	3 15	2 11	3 96
Loop Distribution (all)										
Annual Cost	$ -	$ 2,041,671	$ 4,346,891	$ 13,554,486	$ 3,083,161	$ 22,236,257	$ 8,849,525	$ 4,626,005	$ 942,206	$ 59,680,201
Unit Cost/month	-	14 16	15 21	9 21	7 21	5 46	3.70	3.10	2 12	5 56
Loop Concentration (DLC)										
Annual Cost	$ -	$ 556,120	$ 1,189,731	$ 5,826,322	$ 1,373,384	$ 12,719,620	$ 6,535,959	$ 4,044,089	$ 1,038,563	$ 33,283,789
Unit Cost/month	-	3 86	4 16	4 03	4 01	3.98	3.83	3 80	3 67	3 93
Loop Concentration (non-DLC)										
Annual Cost	$ -	$ -	$ -	$ 2,971	$ 10,137	$ 86,666	$ 68,507	$ 38,061	$ 12,674	$ 219,014
Unit Cost/month	-	-	-	0 11	0 12	0.10	0 10	0 09	0 08	0 10
Loop Concentration (all)										
Annual Cost	$ -	$ 556,120	$ 1,189,731	$ 5,829,293	$ 1,383,521	$ 12,806,286	$ 6,604,466	$ 4,082,150	$ 1,051,237	$ 33,502,803
Unit Cost/month	-	3 86	4 16	3 96	3 24	3.14	2.76	2.74	2 37	3 12
Loop Feeder (DLC)										
Annual Cost	$ -	$ 352,135	$ 500,866	$ 1,753,124	$ 451,384	$ 3,483,045	$ 1,653,120	$ 991,766	$ 255,543	$ 9,440,984
Unit Cost/month	-	2 44	1 75	1 21	1 32	1 09	0.97	0 93	0 90	1 11
Loop Feeder (non-DLC)										
Annual Cost	$ -	$ -	$ -	$ 46,485	$ 166,436	$ 1,496,232	$ 1,091,576	$ 652,329	$ 224,238	$ 3,677,295
Unit Cost/month	-	-	-	1 76	1 95	1.71	1.69	1.53	1 39	1 63
Loop Feeder (all)										
Annual Cost	$ -	$ 352,135	$ 500,866	$ 1,799,609	$ 617,822	$ 4,979,277	$ 2,744,696	$ 1,644,095	$ 479,778	$ 13,118,279
Unit Cost/month	-	2 44	1.75	1 22	1.45	1.22	1.15	1.10	1 08	1 22
Total Loop (DLC)										
Annual Cost	$ -	$ 3,015,174	$ 6,178,181	$ 21,706,834	$ 4,552,141	$ 35,833,860	$ 15,087,224	$ 8,699,841	$ 1,989,031	$ 97,062,285
Unit Cost/month	-	20 92	21 61	15 01	13 31	11.21	8.85	8 17	7 02	11 46
Total Loop (non-DLC)										
Annual Cost	$ -	$ -	$ -	$ 167,100	$ 740,018	$ 5,995,349	$ 4,071,911	$ 2,181,159	$ 628,317	$ 13,783,854
Unit Cost/month	-	-	-	6 34	8 68	6.84	5.92	5 13	3 91	6 09
Total Loop (all)										
Annual Cost	$ -	$ 3,015,174	$ 6,178,181	$ 21,873,934	$ 5,292,159	$ 41,829,209	$ 19,159,135	$ 10,881,000	$ 2,617,348	$ 110,846,139
Unit Cost/month	-	20 92	21.61	14 86	12 38	10 27	8.01	7 30	5 89	10 33
Total lines	-	12,012	23,821	122,684	35,629	339,396	199,311	124,250	37,003	894,106
Total lines served by DLC	-	12,012	23,821	120,489	28,510	266,388	142,036	88,790	23,599	705,646

HAI Model Release 5 0a

5/3/99 8 43 AM

Unit Costs

000241

	Annual Cost	Units		Unit Cost		Loop	Aggregated Switch	Total	Total USF
End office switching	$ 25,640,044					10 33	3 93	14 26	$ 0
Line Port	7,692,013	733,897	switched lines	$ 0 87	per line/month				
Non-Line Port	17,948,031	16,455,229,557	actual minutes	$ 0.00109	per actual minute (for rate per DEM, see "Cost detail" sheet)				
Signaling network elements	$ 1,229,845								
Links	975	143	links	$ 0 57	per link per month				
STP	612,498	14,681,370,234	TCAP+ISUP msgs	$ 0 00004	per signaling message				
SCP	616,372	768,105,600	TCAP queries	$ 0 00080	per query				
Transport network elements									
Dedicated									
Sw+Sp Transport	$ 1,382,890	186,546	trunks	$ 0 62	per DS-0 equivalent per month				
Switched	195,239	26,337	trunks	$ 0 00006	per minute				
Special	1,187,651	160,209	trunks						
Transmission Terminal	4,901,584	186,546	trunks	$ 2 19	per DS-0 equivalent per month				
				$ 0 00022	per minute				
				$ 0 00028	total per minute				
Common									
Transport	$ 64,762	937,686,499	minutes	$ 0 00007	per minute per leg (orig or term)				
Transmission Terminal	195,441	937,686,499	minutes	$ 0 00021	per minute				
				$ 0 00028	total per minute				
Direct									
Transport	$ 338,699	4,536,708,140	minutes	$ 0 00007	per minute				
Transmission Terminal	1,026,338	4,536,708,140	minutes	$ 0 00023	per minute				
				$ 0 00030	total per minute				
Tandem switch	$ 624,936	796,660,022	minutes	$ 0 00078	per minute				
Operator systems	$ 4,586,263								
Public Telephones	$ 3,353,368								
Total (w/ Public)	$ 154,190,309								
Total cost of switched network elements (w/o Public)	$ 14 26	per line/month							

252000

North - Atlanta Metro with Changes in DEMs, Messages, Tandems and STPs

NOTE: This sheet diplays all user adjustable inputs which vary from HM 5.0a default settings

Workfile Name:	**e:\hm50\WORKFILES\HMWKGA2251921.XLS**
Distribution Module Name:	**e:\hm50\MODULES\R50a_distribution.xls**
Feeder Module Name:	**e:\hm50\MODULES\R50a_feeder.xls**
Switching Module Name:	**e:\hm50\MODULES\R50a_switching_lo.xls**
Expense Module Name:	**e:\hm50\MODULES\R50a_expense_density.xls**

Module/Table	Scenario Input	Scenario Value	Default Value
Switching	Local Call Attempts	3435561	16690573
Switching	IntraLATA Calls Completed	58320	283328
Switching	InterLATA intrastate Calls Completed	61106	206866
Switching	InterLATA interstate Calls Completed	285541	1387208
Switching	Local DEMs, thousands	16247760	78934550
Switching	Intrastate DEMs, thousands	1080126	5247449
Switching	Interstate DEMs, thousands	2725506	1324100

000243

Attachment 4

CENTRAL

1 ADAMSVILLE
2 BUCKHEAD
3 CHAMBLEE
4 COLUMBIA DRIVE
5 COURTLAND ST
6 DECATUR(East Lake)
7 DUNWOODY
8 EAST POINT
9 FOREST
10 GRESHAM
11 HOLLYWOOD ROAD
12 INDIAN CREEK
13 LAKEWOOD
14 LITHONIA
15 MARIETTA EAST
16 MORROW
17 NORCROSS
18 PANOLA
19 PEACHTREE PLACE
20 POWERS FERRY
21 RIVERDALE
22 SANDY SPRINGS
23 SMYRNA
24 STONE MOUNTAIN
25 TOCO HILLS
26 TUCKER
27 WEST END
28 WOODLAND HILLS



000245

BellSouth - Atlanta Area Wire Centers, by Density
Central High Density Competitor

			Total Area	Total lines	Total bus lines	Total density	Bus density	Total lines selected w centers
1.	ATLNGACS	COURTLAND STREET	10.22	105,293	53,931	10,304	5,278	105,293
2.	ATLNGAPP	PEACHTREE PLACE	11.61	98,241	43,013	8,460	3,704	98,241
3.	NRCRGAMA	NORCROSS	37.50	102,120	41,684	2,724	1,112	102,120
4.	MRTTGAMA	MARIETTA MAIN	111.46	129,857	40,255	1,165	361	
5.	DNWDGAMA	DUNWOODY	23.64	88,037	38,460	3,724	1,627	88,037
6.	ATLNGABU	BUCKHEAD	21.25	88,677	36,993	4,173	1,741	88,677
7.	TUKRGAMA	TUCKER	26.45	83,148	33,488	3,144	1,266	83,148
8.	CHMBGAMA	CHAMBLEE	20.20	69,376	29,519	3,435	1,462	69,376
9.	ATLNGATH	TOCO HILLS	21.06	80,000	27,847	3,799	1,322	80,000
10.	ATLNGASS	SANDY SPRINGS	25.47	65,113	27,449	2,556	1,078	65,113
11.	RSWLGAMA	ROSWELL	59.92	90,341	25,946	1,508	433	
12.	SMYRGAMA	SMYRNA	39.90	85,801	24,529	2,150	615	
13.	SMYRGAPF	POWERS FERRY	15.01	59,283	24,497	3,949	1,632	59,283
14.	ALPRGAMA	ALPHARETTA	111.72	71,174	23,542	637	211	
15.	LLBNGAMA	LILBURN	48.33	81,950	21,908	1,696	453	
16.	ATLNGAEP	EAST POINT	48.27	67,136	21,865	1,391	453	
17.	LRVLGAOS	LAWRENCEVILLE	151.06	77,028	19,648	510	130	
18.	MRTTGAEA	MARIETTA EAST	43.88	64,860	15,271	1,478	348	
19.	DLTHGAHS	DULUTH	47.67	43,930	14,856	922	312	
20.	ATLNGAWD	WOODLAND HILLS	13.79	38,011	14,261	2,756	1,034	38,011
21.	ATLNGAIC	INDIAN CREEK	21.18	54,306	14,063	2,564	664	
22.	ATLNGAAD	ADAMSVILLE	21.07	33,041	12,967	1,568	616	
23.	WDSTGACR	WOODSTOCK	95.50	60,038	12,266	629	128	
24.	CNYRGAMA	CONYERS	133.87	46,072	12,137	344	91	
25.	ATLNGAFP	FOREST PARK	32.56	32,991	11,168	1,013	343	
26.	RVDLGAMA	RIVERDALE	25.75	39,582	10,403	1,537	404	
27.	ATLNGAEL	DECATUR (East Lake)	16.44	39,436	9,822	2,398	597	
28.	SNVLGAMA	SNELLVILLE	68.79	45,512	8,936	662	130	
29.	DGVLGAMA	DOUGLASVILLE	171.43	42,640	8,716	249	51	
30.	JNBOGAMA	JONESBORO	74.50	49,551	8,691	665	117	
31.	PANLGAMA	PANOLA	43.10	39,192	8,254	909	192	
32.	ATLNGABH	BENHILL	42.58	26,364	7,857	619	185	
33.	ATLNGACD	COLUMBIA DRIVE	20.81	35,013	7,379	1,683	355	
34.	SNMTGALR	STONE MOUNTAIN	29.81	32,381	6,959	1,086	233	
35.	PTCYGAMA	PEACHTREE CITY	52.36	25,103	6,671	479	127	
36.	ASTLGAMA	AUSTELL	76.04	40,078	6,640	527	87	
37.	FYVLGASG	FAYETTEVILLE	117.18	25,684	6,319	219	54	
38.	BUFRGABH	BUFORD	108.18	28,374	6,182	262	57	
39.	ATLNGAGR	GRESHAM	32.16	28,580	5,929	889	184	
40.	ATLNGAWE	WEST END	14.97	28,845	5,590	1,927	373	
41.	ATLNGALA	LAKEWOOD	15.06	24,389	5,569	1,620	370	
42.	FRBNGAEB	FAIRBURN	113.20	23,207	5,236	205	46	
43.	MRRWGAMA	MORROW	17.53	19,910	4,916	1,136	280	
44.	MCDNGAGS	MCDONOUGH	187.14	23,104	4,606	123	25	
45.	STBRGANH	STOCKBRIDGE	69.28	23,370	4,538	337	66	
46.	LTHNGAJS	LITHONIA	35.66	14,767	3,886	414	109	
47.	ACWOGAMA	ACWORTH	87.00	21,602	3,708	248	43	
48.	DLLSGAES	DALLAS	180.85	20,712	2,951	115	16	
49.	ATLNGAHR	HOLLYWOOD ROAD	11.78	15,880	2,948	1,348	250	
50.	PWSPGAAS	POWDER SPRINGS	48.24	19,974	2,905	414	60	
51.	LGVLGACS	LOGANVILLE	62.15	8,264	1,253	133	20	
52.	HMPNGAJW	HAMPTON	55.86	5,033	907	90	16	
53.	PLMTGAMA	PALMETTO	69.89	4,341	839	62	12	
54.	Total		3,040.31	2,566,713	800,172	844	263	877,299
55.	Percent of BST-Ga.			59.1%				20.2%
56.	Competitor Data		226.20	877,299	371,142	3,878	1,641	

Central - Atlanta Metro with Changes in DEMs, Messages, Tandems and STPs

[Central-2.xls]

Georgia

Southern Bell-Ga

Loop elements	0-5 lines/sq mi	5-100 lines/sq mi	100-200 lines/sq mi	200-650 lines/sq mi	650-850 lines/sq mi	850-2550 lines/sq mi	2550-5000 lines/sq mi	5000-10000 lines/sq mi	>10000 lines/sq mi	Totals
NID										
Annual Cost	$ -	$ -	$ 973	$ 82,652	$ 34,055	$ 834,993	$ 1,475,566	$ 947,668	$ 659,826	$ 4,035,735
Unit Cost/month	-	-	0.34	0.46	0.53	0.45	0.42	0.38	0.27	0.38
Loop Distribution (DLC)										
Annual Cost	$ -	$ -	$ 24,578	$ 1,258,399	$ 474,011	$ 7,491,571	$ 9,154,029	$ 5,397,145	$ 1,131,922	$ 24,931,655
Unit Cost/month	-	-	8.67	7.72	7.38	5.25	4.05	3.34	2.17	4.12
Loop Distribution (non-DLC)										
Annual Cost	$ -	$ -	$ -	$ 54,663	$ -	$ 1,871,149	$ 4,546,707	$ 2,649,845	$ 2,815,998	$ 11,538,362
Unit Cost/month	-	-	-	3.41	-	3.88	3.81	3.09	1.37	2.56
Loop Distribution (all)										
Annual Cost	$ -	$ -	$ 24,578	$ 1,313,062	$ 474,011	$ 9,162,719	$ 13,700,737	$ 8,046,990	$ 3,747,920	$ 36,470,017
Unit Cost/month	-	-	8.67	7.33	7.38	4.93	3.89	3.25	1.54	3.46
Loop Concentration (DLC)										
Annual Cost	$ -	$ -	$ 20,252	$ 709,453	$ 279,838	$ 6,071,308	$ 9,117,048	$ 6,441,033	$ 1,985,709	$ 24,624,638
Unit Cost/month	-	-	7.14	4.35	4.35	4.26	4.03	3.98	3.80	4.07
Loop Concentration (non-DLC)										
Annual Cost	$ -	$ -	$ -	$ 1,537	$ -	$ 42,894	$ 125,903	$ 81,339	$ 155,747	$ 407,420
Unit Cost/month	-	-	-	0.10	-	0.10	0.10	0.10	0.08	0.09
Loop Concentration (all)										
Annual Cost	$ -	$ -	$ 20,252	$ 710,990	$ 279,838	$ 6,114,202	$ 9,242,950	$ 6,522,372	$ 2,141,456	$ 25,032,058
Unit Cost/month	-	-	7.14	3.97	4.35	3.29	2.63	2.64	0.88	2.38
Loop Feeder (DLC)										
Annual Cost	$ -	$ -	$ 21,362	$ 254,730	$ 90,562	$ 1,777,997	$ 2,469,873	$ 1,761,587	$ 536,791	$ 6,932,702
Unit Cost/month	-	-	7.54	1.56	1.41	1.25	1.10	1.09	1.03	1.14
Loop Feeder (non-DLC)										
Annual Cost	$ -	$ -	$ -	$ 21,189	$ -	$ 767,468	$ 2,081,366	$ 1,469,510	$ 3,166,103	$ 7,505,635
Unit Cost/month	-	-	-	1.32	-	1.78	1.85	1.72	1.66	1.68
Loop Feeder (all)										
Annual Cost	$ -	$ -	$ 21,362	$ 275,919	$ 90,562	$ 2,545,465	$ 4,571,039	$ 3,231,097	$ 3,702,894	$ 14,438,338
Unit Cost/month	-	-	7.54	1.54	1.41	1.37	1.30	1.31	1.52	1.37
Total Loop (DLC)										
Annual Cost	$ -	$ -	$ 67,166	$ 2,297,834	$ 878,464	$ 15,982,222	$ 21,706,341	$ 14,219,478	$ 3,796,277	$ 58,949,780
Unit Cost/month	-	-	23.70	14.09	13.64	11.21	9.60	8.79	7.27	9.73
Total Loop (non-DLC)										
Annual Cost	$ -	$ -	$ -	$ 84,789	$ -	$ 2,675,157	$ 7,281,953	$ 4,528,850	$ 6,455,819	$ 21,026,368
Unit Cost/month	-	-	-	5.29	-	6.21	5.78	5.29	3.38	4.70
Total Loop (all)										
Annual Cost	$ -	$ -	$ 67,166	$ 2,382,623	$ 878,464	$ 18,657,379	$ 28,990,293	$ 18,748,127	$ 10,252,096	$ 79,976,148
Unit Cost/month	-	-	23.70	13.31	13.64	10.05	8.24	7.58	4.22	7.60
Total lines	-	-	236	14,923	5,366	154,746	293,360	206,170	202,499	877,299
Total lines served by DLC	-	-	236	13,586	5,366	118,658	188,392	134,821	43,535	504,795

002427

Scenario Inputs

Central - Atlanta Metro with Changes in DEMs, Messages, Tandems and STPs

NOTE: This sheet diplays all user adjustable inputs which vary from HM 5.0a default settings

Workfile Name:	**e:\hm50\WORKFILES\HMWKGA2251921.XLS**
Distribution Module Name:	**e:\hm50\MODULES\R50a_distribution.xls**
Feeder Module Name:	**e:\hm50\MODULES\R50a_feeder.xls**
Switching Module Name:	**e:\hm50\MODULES\R50a_switching_io.xls**
Expense Module Name:	**e:\hm50\MODULES\R50a_expense_density.xls**

Module/Table	Scenario Input	Scenario Value	Default Value
Switching	Local Call Attempts	3370929	16690573
Switching	IntraLATA Calls Completed	57223	283328
Switching	InterLATA intrastate Calls Completed	59958	296866
Switching	InterLATA interstate Calls Completed	280173	1387208
Switching	Local DEMs, thousands	15942335	78934550
Switching	Intrastate DEMs, thousands	1059822	5247449
Switching	Interstate DEMs, thousands	2674272	13241000

000248

Attachment 5

SOUTH

1 ADAMSVILLE
2 BUCKHEAD
3 CHAMBLEE
4 COLUMBIA DRIVE
5 COURTLAND ST
6 DECATUR(East Lake)
7 DUNWOODY
8 EAST POINT
9 FOREST
10 GRESHAM
11 HOLLYWOOD ROAD
12 INDIAN CREEK
13 LAKEWOOD
14 LITHONIA
15 MARIETTA EAST
16 MORROW
17 NORCROSS
18 PANOLA
19 PEACHTREE PLACE
20 POWERS FERRY
21 RIVERDALE
22 SANDY SPRINGS
23 SMYRNA
24 STONE MOUNTAIN
25 TOCO HILLS
26 TUCKER
27 WEST END
28 WOODLAND HILLS



000250

BellSouth - Atlanta Area Wire Centers, by Density
Southern Atlanta-Metro Competitor

			Total Area	Total lines	Total bus lines	Total density	Bus density	Total lines selected w. centers
1.	ATLNGACS	COURTLAND STREET	10.22	105,293	53,931	10,304	5,278	105,293
2.	ATLNGAPP	PEACHTREE PLACE	11.61	98,241	43,013	8,460	3,704	98,241
3.	NRCRGAMA	NORCROSS	37.50	102,120	41,684	2,724	1,112	
4.	MRTTGAMA	MARIETTA MAIN	111.46	129,857	40,255	1,165	361	
5.	DNWDGAMA	DUNWOODY	23.64	88,037	38,460	3,724	1,627	
6.	ATLNGABU	BUCKHEAD	21.25	88,677	36,993	4,173	1,741	
7.	TUKRGAMA	TUCKER	26.45	83,148	33,488	3,144	1,266	
8.	CHMBGAMA	CHAMBLEE	20.20	69,376	29,519	3,435	1,462	
9.	ATLNGATH	TOCO HILLS	21.06	80,000	27,847	3,799	1,322	
10.	ATLNGASS	SANDY SPRINGS	25.47	65,113	27,449	2,556	1,078	
11.	RSWLGAMA	ROSWELL	59.92	90,341	25,946	1,508	433	
12.	SMYRGAMA	SMYRNA	39.90	85,601	24,529	2,150	615	
13.	SMYRGAPF	POWERS FERRY	15.01	59,283	24,497	3,949	1,632	
14.	ALPRGAMA	ALPHARETTA	111.72	71,174	23,542	637	211	
15.	LLBNGAMA	LILBURN	48.33	81,950	21,908	1,696	453	
16.	ATLNGAEP	EAST POINT	48.27	67,136	21,865	1,391	453	67,136
17.	LRVLGAOS	LAWRENCEVILLE	151.06	77,028	19,648	510	130	
18.	MRTTGAEA	MARIETTA EAST	43.88	64,860	15,271	1,478	348	
19.	DLTHGAHS	DULUTH	47.67	43,930	14,856	922	312	
20.	ATLNGAWD	WOODLAND HILLS	13.79	38,011	14,261	2,756	1,034	
21.	ATLNGAIC	INDIAN CREEK	21.18	54,306	14,063	2,564	664	
22.	ATLNGAAD	ADAMSVILLE	21.07	33,041	12,967	1,568	616	33,041
23.	WDSTGACR	WOODSTOCK	95.50	60,038	12,266	629	128	
24.	CNYRGAMA	CONYERS	133.87	46,072	12,137	344	91	46,072
25.	ATLNGAFP	FOREST PARK	32.56	32,991	11,168	1,013	343	32,991
26.	RVDLGAMA	RIVERDALE	25.75	39,582	10,403	1,537	404	39,582
27.	ATLNGAEL	DECATUR (East Lake)	16.44	39,436	9,822	2,398	597	39,436
28.	SNVLGAMA	SNELLVILLE	68.79	45,512	8,936	662	130	
29.	DGVLGAMA	DOUGLASVILLE	171.43	42,640	8,716	249	51	42,640
30.	JNBOGAMA	JONESBORO	74.50	49,551	8,691	665	117	49,551
31.	PANLGAMA	PANOLA	43.10	39,192	8,254	909	192	39,192
32.	ATLNGABH	BENHILL	42.58	26,364	7,857	619	185	26,364
33.	ATLNGACD	COLUMBIA DRIVE	20.81	35,013	7,379	1,683	355	35,013
34.	SNMTGALR	STONE MOUNTAIN	29.81	32,381	6,959	1,086	233	
35.	PTCYGAMA	PEACHTREE CITY	52.36	25,103	6,671	479	127	25,103
36.	ASTLGAMA	AUSTELL	76.04	40,078	6,640	527	87	
37.	FYVLGASG	FAYETTEVILLE	117.18	25,684	6,319	219	54	25,684
38.	BUFRGABH	BUFORD	108.18	28,374	6,182	262	57	
39.	ATLNGAGR	GRESHAM	32.16	28,580	5,929	889	184	28,580
40.	ATLNGAWE	WEST END	14.97	28,845	5,590	1,927	373	28,845
41.	ATLNGALA	LAKEWOOD	15.06	24,389	5,569	1,620	370	24,389
42.	FRBNGAEB	FAIRBURN	113.20	23,207	5,236	205	46	23,207
43.	MRRWGAMA	MORROW	17.53	19,910	4,916	1,136	280	19,910
44.	MCDNGAGS	MCDONOUGH	187.14	23,104	4,606	123	25	23,104
45.	STBRGANH	STOCKBRIDGE	69.28	23,370	4,538	337	66	23,370
46.	LTHNGAJS	LITHONIA	35.66	14,767	3,886	414	109	14,767
47.	ACWOGAMA	ACWORTH	87.00	21,602	3,708	248	43	
48.	DLLSGAES	DALLAS	180.85	20,712	2,951	115	16	
49.	ATLNGAHR	HOLLYWOOD ROAD	11.78	15,880	2,948	1,348	250	15,880
50.	PWSPGAAS	POWDER SPRINGS	48.24	19,974	2,905	414	60	
51.	LGVLGACS	LOGANVILLE	62.15	8,264	1,253	133	20	
52.	HMPNGAJW	HAMPTON	55.86	5,033	907	90	16	5,033
53.	PLMTGAMA	PALMETTO	69.89	4,341	839	62	12	4,341
54.	Total		3,040.31	2,566,713	800,172	844	263	916,765
	Percent of BST-Ga.			59.1%				21.1%
56.	Competitor Data		1,444.25	916,765	274,155	635	190	

Loop elements	0-5 lines/sq mi	5-100 lines/sq mi	100-200 lines/sq mi	200-650 lines/sq mi	650-850 lines/sq mi	850-2550 lines/sq mi	2550-5000 lines/sq mi	5000-10000 lines/sq mi	>10000 lines/sq mi	Totals
NID										
Annual Cost	$ -	$ 183,584	$ 217,436	$ 920,376	$ 245,215	$ 1,861,094	$ 666,569	$ 272,132	$ 345,777	$ 4,712,182
Unit Cost/month	-	0 50	0 49	0 48	0 46	0 48	0 43	0 39	0 24	0 43
Loop Distribution (DLC)										
Annual Cost	$ -	$ 7,176,510	$ 6,823,444	$ 17,765,404	$ 2,864,542	$ 15,834,218	$ 3,738,665	$ 1,329,717	$ 230,987	$ 55,763,487
Unit Cost/month	-	19 47	16 37	10 45	7 30	5 80	4 11	3 74	2 55	8 01
Loop Distribution (non-DLC)										
Annual Cost	$ -	$ -	$ 269,970	$ 1,663,519	$ 825,140	$ 6,997,045	$ 2,836,296	$ 935,007	$ 1,616,300	$ 15,143,277
Unit Cost/month	-	-	11 39	7 77	5 96	5 38	4 40	2 79	1 17	3 75
Loop Distribution (all)										
Annual Cost	$ -	$ 7,176,510	$ 7,093,415	$ 19,428,923	$ 3,689,682	$ 22,831,264	$ 6,574,961	$ 2,264,723	$ 1,847,287	$ 70,906,764
Unit Cost/month	-	19 47	16 10	10 15	6 95	5 66	4 23	3 28	1 26	6 45
Loop Concentration (DLC)										
Annual Cost	$ -	$ 1,772,163	$ 1,778,484	$ 7,045,540	$ 1,585,536	$ 10,930,871	$ 3,575,869	$ 1,372,177	$ 367,304	$ 28,427,744
Unit Cost/month	-	4 81	4 27	4 15	4 04	4 01	3 93	3 86	4 05	4 08
Loop Concentration (non-DLC)										
Annual Cost	$ -	$ -	$ 2,846	$ 22,717	$ 13,694	$ 134,548	$ 64,550	$ 30,068	$ 107,486	$ 375,908
Unit Cost/month	-	-	0 12	0 11	0 10	0 10	0 10	0 09	0 08	0 09
Loop Concentration (all)										
Annual Cost	$ -	$ 1,772,163	$ 1,781,330	$ 7,068,258	$ 1,599,230	$ 11,065,418	$ 3,640,219	$ 1,402,245	$ 474,789	$ 28,803,652
Unit Cost/month	-	4 81	4 04	3 69	3 01	2 74	2 34	2 03	0 32	2 62
Loop Feeder (DLC)										
Annual Cost	$ -	$ 1,645,150	$ 897,190	$ 1,948,298	$ 397,401	$ 2,789,697	$ 939,892	$ 410,715	$ 94,903	$ 9,123,246
Unit Cost/month	-	4 46	2 15	1 15	1 01	1 02	1 03	1 16	1 05	1 31
Loop Feeder (non-DLC)										
Annual Cost	$ -	$ -	$ 75,167	$ 403,364	$ 282,339	$ 2,314,343	$ 1,158,959	$ 622,637	$ 2,068,622	$ 6,925,431
Unit Cost/month	-	-	3 17	1 88	2 04	1 77	1 80	1 86	1 50	1 71
Loop Feeder (all)										
Annual Cost	$ -	$ 1,645,150	$ 972,357	$ 2,351,662	$ 679,740	$ 5,104,040	$ 2,098,851	$ 1,033,352	$ 2,163,525	$ 16,048,678
Unit Cost/month	-	4 46	2 21	1 23	1 28	1 27	1 35	1 50	1 47	1 46
Total Loop (DLC)										
Annual Cost	$ -	$ 10,777,407	$ 9,704,855	$ 27,576,590	$ 5,028,765	$ 30,813,537	$ 8,644,566	$ 3,252,719	$ 714,557	$ 96,512,995
Unit Cost/month	-	29 24	23 28	16 23	12 81	11 30	9 49	9 15	7 88	13 86
Total Loop (non-DLC)										
Annual Cost	$ -	$ -	$ 359,682	$ 2,192,629	$ 1,185,102	$ 10,048,278	$ 4,336,034	$ 1,719,733	$ 4,116,821	$ 23,958,281
Unit Cost/month	-	-	15 18	10 24	8 56	7 70	6 73	5 13	2 99	5 93
Total Loop (all)										
Annual Cost	$ -	$ 10,777,407	$ 10,064,537	$ 29,769,219	$ 6,213,867	$ 40,861,815	$ 12,980,600	$ 4,972,452	$ 4,831,378	$ 120,471,275
Unit Cost/month	-	29 24	22 85	15 56	11 70	10 13	8 35	7 20	3 29	10 95
Total lines	-	30,716	36,710	159,456	44,257	336,115	129,601	57,538	122,371	916,765
Total lines served by DLC	-	30,716	34,735	141,606	32,719	227,331	75,894	29,624	7,560	580,186

252000

	Annual Cost	Units		Unit Cost		Loop	Aggregated Switch	Total	Total USF
						10.95	3.90	14.85	$ 516,326
End office switching	$ 26,107,725								
Line Port	7,832,317	772,111	switched lines	$ 0.85	per line/month				
Non-Line Port	18,275,407	16,872,247,760	actual minutes	$ 0.00108	per actual minute (for rate per DEM, see "Cost detail" sheet)				
Signaling network elements	$ 1,239,778								
Links	1,976	153	links	$ 1.08	per link per month				
STP	624,481	15,053,430,895	TCAP+ISUP msgs	$ 0.00004	per signaling message				
SCP	613,321	787,571,200	TCAP queries	$ 0.00078	per query				
Transport network elements									
Dedicated									
Sw+Sp Transport	$ 1,634,844	171,671	trunks	$ 0.79	per DS-0 equivalent per month				
Switched	257,286	27,017	trunks	$ 0.00008	per minute				
Special	1,377,558	144,654	trunks						
Transmission Terminal	5,565,902	171,671	trunks	$ 2.70	per DS-0 equivalent per month				
				$ 0.00027	per minute				
				$ 0.00035	total per minute				
Common									
Transport	$ 94,154	961,449,982	minutes	$ 0.00010	per minute per leg (orig or term)				
Transmission Terminal	263,271	961,449,982	minutes	$ 0.00028	per minute				
				$ 0.00037	total per minute				
Direct									
Transport	$ 473,605	4,651,679,359	minutes	$ 0.00010	per minute				
Transmission Terminal	1,353,074	4,651,679,359	minutes	$ 0.00029	per minute				
				$ 0.00039	total per minute				
Tandem switch	$ 640,067	816,849,667	minutes	$ 0.00078	per minute				
Operator systems	$ 4,787,674								
Public Telephones	$ 3,073,860								
Total (w/ Public)	$ 165,705,230								
Total cost of switched network elements (w/o Public)	$ 14.85	per line/month							

000253

South - Atlanta Metro with Changes in DEMs, Messages, Tandems and STPs

NOTE: This sheet diplays all user adjustable inputs which vary from HM 5.0a default settings

Workfile Name: e:\hm50\WORKFILES\HMWKGA2251921.XLS
Distribution Module Name: e:\hm50\MODULES\R50a_distribution.xls
Feeder Module Name: e:\hm50\MODULES\R50a_feeder.xls
Switching Module Name: e:\hm50\MODULES\R50a_switching_lo.xls
Expense Module Name: e:\hm50\MODULES\R50a_expense_density.xls

Module/Table	Scenario Input	Scenario Value	Default Value
Switching	Local Call Attempts	3522626	16690573
Switching	IntraLATA Calls Completed	59798	283328
Switching	InterLATA intrastate Calls Completed	62655	296866
Switching	InterLATA interstate Calls Completed	292777	1387208
Switching	Local DEMs, thousands	16659520	78934550
Switching	Intrastate DEMs, thousands	1107500	5247449
Switching	Interstate DEMs, thousands	2794577	13241000

000254

Attachment 6

ATLANTA

1 ADAMSVILLE
2 BUCKHEAD
3 CHAMBLEE
4 COLUMBIA DRIVE
5 COURTLAND ST
6 DECATUR(East Lake)
7 DUNWOODY
8 EAST POINT
9 FOREST
10 GRESHAM
11 HOLLYWOOD ROAD
12 INDIAN CREEK
13 LAKEWOOD
14 LITHONIA
15 MARIETTA EAST
16 MORROW
17 NORCROSS
18 PANOLA
19 PEACHTREE PLACE
20 POWERS FERRY
21 RIVERDALE
22 SANDY SPRINGS
23 SMYRNA
24 STONE MOUNTAIN
25 TOCO HILLS
26 TUCKER
27 WEST END
28 WOODLAND HILLS



000256

BellSouth - Atlanta Area Wire Centers, by Density
Atlanta-Metro Competitor

			Total Area	Total lines	Total bus lines	Total density	Bus density	Total lines selected w. centers
1.	ATLNGACS	COURTLAND ST	10.22	105,293	53,931	10,304	5,278	105,293
2.	ATLNGAPP	PEACHTREE PL	11.61	98,241	43,013	8,460	3,704	98,241
3.	NRCRGAMA	NORCROSS	37.50	102,120	41,684	2,724	1,112	102,120
4.	MRTTGAMA	MARIETTA MAIN	111.46	129,857	40,255	1,165	361	129,857
5.	DNWDGAMA	DUNWOODY	23.64	88,037	38,460	3,724	1,627	88,037
6.	ATLNGABU	BUCKHEAD	21.25	88,677	36,993	4,173	1,741	88,677
7.	TUKRGAMA	TUCKER	26.45	83,148	33,488	3,144	1,266	83,148
8.	CHMBGAMA	CHAMBLEE	20.20	69,376	29,519	3,435	1,462	69,376
9.	ATLNGATH	TOCO HILLS	21.06	80,000	27,847	3,799	1,322	80,000
10.	ATLNGASS	SANDY SPRING	25.47	65,113	27,449	2,556	1,078	65,113
11.	RSWLGAMA	ROSWELL	59.92	90,341	25,946	1,508	433	90,341
12.	SMYRGAMA	SMYRNA	39.90	85,801	24,529	2,150	615	85,801
13.	SMYRGAPF	POWERS FERR	15.01	59,283	24,497	3,949	1,632	59,283
14.	ALPRGAMA	ALPHARETTA	111.72	71,174	23,542	637	211	71,174
15.	LLBNGAMA	LILBURN	48.33	81,950	21,908	1,696	453	81,950
16.	ATLNGAEP	EAST POINT	48.27	67,136	21,865	1,391	453	67,136
17.	LRVLGAOS	LAWRENCEVILL	151.06	77,028	19,648	510	130	77,028
18.	MRTTGAEA	MARIETTA EAST	43.88	64,860	15,271	1,478	348	64,860
19.	DLTHGAHS	DULUTH	47.67	43,930	14,856	922	312	43,930
20.	ATLNGAWD	WOODLAND HIL	13.79	38,011	14,261	2,756	1,034	38,011
21.	ATLNGAIC	INDIAN CREEK	21.18	54,306	14,063	2,564	664	54,306
22.	ATLNGAAD	ADAMSVILLE	21.07	33,041	12,967	1,568	616	33,041
23.	WDSTGACR	WOODSTOCK	95.50	60,038	12,266	629	128	60,038
24.	CNYRGAMA	CONYERS	133.87	46,072	12,137	344	91	46,072
25.	ATLNGAFP	FOREST PARK	32.56	32,991	11,168	1,013	343	32,991
26.	RVDLGAMA	RIVERDALE	25.75	39,582	10,403	1,537	404	39,582
27.	ATLNGAEL	DECATUR (East	16.44	39,436	9,822	2,398	597	39,436
28.	SNVLGAMA	SNELLVILLE	68.79	45,512	8,936	662	130	45,512
29.	DGVLGAMA	DOUGLASVILLE	171.43	42,640	8,716	249	51	42,640
30.	JNBOGAMA	JONESBORO	74.50	49,551	8,691	665	117	49,551
31.	PANLGAMA	PANOLA	43.10	39,192	8,254	909	192	39,192
32.	ATLNGABH	BENHILL	42.58	26,364	7,857	619	185	26,364
33.	ATLNGACD	COLUMBIA DRIV	20.81	35,013	7,379	1,683	355	35,013
34.	SNMTGALR	STONE MOUNT	29.81	32,381	6,959	1,086	233	32,381
35.	PTCYGAMA	PEACHTREE CI	52.36	25,103	6,671	479	127	25,103
36.	ASTLGAMA	AUSTELL	76.04	40,078	6,640	527	87	40,078
37.	FYVLGASG	FAYETTEVILLE	117.18	25,684	6,319	219	54	25,684
38.	BUFRGABH	BUFORD	108.18	28,374	6,182	262	57	28,374
39.	ATLNGAGR	GRESHAM	32.16	28,580	5,929	889	184	28,580
40.	ATLNGAWE	WEST END	14.97	28,845	5,590	1,927	373	28,845
41.	ATLNGALA	LAKEWOOD	15.06	24,389	5,569	1,620	370	24,389
42.	FRBNGAEB	FAIRBURN	113.20	23,207	5,236	205	46	23,207
43.	MRRWGAMA	MORROW	17.53	19,910	4,916	1,136	280	19,910
44.	MCDNGAGS	MCDONOUGH	187.14	23,104	4,606	123	25	23,104
45.	STBRGANH	STOCKBRIDGE	69.28	23,370	4,538	337	66	23,370
46.	LTHNGAJS	LITHONIA	35.66	14,767	3,886	414	109	14,767
47.	ACWOGAMA	ACWORTH	87.00	21,602	3,708	248	43	21,602
48.	DLLSGAES	DALLAS	180.85	20,712	2,951	115	16	20,712
49.	ATLNGAHR	HOLLYWOOD R	11.78	15,880	2,948	1,348	250	15,880
50.	PWSPGAAS	POWDER SPRIN	48.24	19,974	2,905	414	60	19,974
51.	LGVLGACS	LOGANVILLE	62.15	8,264	1,253	133	20	8,264
52.	HMPNGAJW	HAMPTON	55.86	5,033	907	90	16	5,033
53.	PLMTGAMA	PALMETTO	69.89	4,341	839	62	12	4,341
54.	Total		3,040.31	2,566,713	800,172	844	263	2,566,713
55.	Percent of BST-Ga.			59.1%				59.1%
56.	Competitor Data		3,040.31	2,566,713	800,172	844	263	

Loop elements	0-5 lines/sq mi	5-100 lines/sq mi	100-200 lines/sq mi	200-650 lines/sq mi	650-850 lines/sq mi	850-2550 lines/sq mi	2550-5000 lines/sq mi	5000-10000 lines/sq mi	>10000 lines/sq mi	Totals
NID										
Annual Cost	$ -	$ 299,955	$ 550,906	$ 2,033,242	$ 712,370	$ 5,115,686	$ 2,652,080	$ 1,214,812	$ 720,321	$ 13,299,372
Unit Cost/month	-	0 49	0 50	0 48	0 48	0 48	0 42	0 37	0 27	0 43
Loop Distribution (DLC)										
Annual Cost	$ -	$ 11,312,207	$ 16,671,977	$ 39,815,943	$ 8,760,970	$ 49,127,327	$ 16,040,696	$ 7,381,356	$ 1,364,933	$ 150,475,408
Unit Cost/month	-	18 62	15 37	10 16	7 33	5 82	3 95	3 24	2 21	6 78
Loop Distribution (non-DLC)										
Annual Cost	$ -	$ -	$ 271,308	$ 2,173,096	$ 1,756,171	$ 13,609,527	$ 8,978,546	$ 3,010,378	$ 2,868,641	$ 32,667,664
Unit Cost/month	-	-	11 45	7 07	6 04	5 08	3 95	3 06	1 41	3 60
Loop Distribution (all)										
Annual Cost	$ -	$ 11,312,207	$ 16,943,284	$ 41,989,039	$ 10,517,141	$ 62,736,853	$ 25,019,242	$ 10,391,731	$ 4,233,574	$ 183,143,073
Unit Cost/month	-	18 62	15 29	9 93	7 08	5 64	3 95	3 19	1 59	5 95
Loop Concentration (DLC)										
Annual Cost	$ -	$ 2,853,255	$ 4,577,984	$ 16,121,779	$ 4,831,485	$ 33,760,301	$ 15,778,017	$ 8,706,030	$ 2,268,019	$ 88,896,849
Unit Cost/month	-	4 70	4 22	4 11	4 04	4 00	3 89	3 82	3 66	4 00
Loop Concentration (non-DLC)										
Annual Cost	$ -	$ -	$ 2,661	$ 32,395	$ 31,728	$ 273,003	$ 225,450	$ 90,231	$ 161,715	$ 817,382
Unit Cost/month	-	-	0 12	0 11	0 11	0 10	0 10	0 09	0 08	0 10
Loop Concentration (all)										
Annual Cost	$ -	$ 2,853,255	$ 4,580,845	$ 16,154,174	$ 4,863,192	$ 34,033,304	$ 16,003,467	$ 8,796,260	$ 2,429,734	$ 89,714,232
Unit Cost/month	-	4 70	4 13	3 82	3 27	3 06	2 53	2 70	0 91	2 91
Loop Feeder (DLC)										
Annual Cost	$ -	$ 2,496,869	$ 2,080,694	$ 4,685,611	$ 1,387,230	$ 8,708,994	$ 4,095,135	$ 2,254,385	$ 599,888	$ 26,308,805
Unit Cost/month	-	4 11	1 92	1 20	1 16	1 03	1 01	0 99	0 97	1 18
Loop Feeder (non-DLC)										
Annual Cost	$ -	$ -	$ 75,555	$ 535,885	$ 617,414	$ 4,639,155	$ 3,752,824	$ 1,832,347	$ 3,229,658	$ 14,482,838
Unit Cost/month	-	-	3 19	1 74	2 12	1 73	1 85	1 66	1 58	1 68
Loop Feeder (all)										
Annual Cost	$ -	$ 2,496,869	$ 2,156,249	$ 5,221,496	$ 2,004,644	$ 13,348,148	$ 7,847,959	$ 3,886,732	$ 3,829,546	$ 40,791,643
Unit Cost/month	-	4 11	1 95	1 23	1 35	1 20	1 24	1 19	1 44	1 32
Total Loop (DLC)										
Annual Cost	$ -	$ 16,962,287	$ 23,869,776	$ 62,508,805	$ 15,552,662	$ 95,480,179	$ 37,814,480	$ 19,190,193	$ 4,400,425	$ 275,578,806
Unit Cost/month	-	27 92	22 01	15 94	13 02	11 31	9 26	8 42	7 11	12 41
Total Loop (non-DLC)										
Annual Cost	$ -	$ -	$ 361,507	$ 2,889,146	$ 2,544,685	$ 19,753,813	$ 13,908,269	$ 5,099,342	$ 6,812,750	$ 51,369,513
Unit Cost/month	-	-	15 25	9 40	8 76	7 38	6 12	5 18	3 34	5 98
Total Loop (all)										
Annual Cost	$ -	$ 16,962,287	$ 24,231,283	$ 65,397,951	$ 18,097,348	$ 115,233,992	$ 51,522,749	$ 24,289,535	$ 11,213,175	$ 326,948,319
Unit Cost/month	-	27 92	21 87	15 47	12 18	10 37	8 14	7 45	4 22	10 62
Total lines	-	50,635	92,340	352,337	123,781	926,356	527,748	271,829	221,688	2,566,713
Total lines served by DLC	-	50,635	90,365	326,730	99,563	703,240	338,415	189,845	51,576	1,850,370

ATTACHMENT B

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Implementation of the Local Competition Provisions in the Telecommunications Act of 1996	)	CC Docket No. 96-98
	)	
Interconnection between Local Exchange Carriers and Commercial Mobile Radio Service Providers	)	CC Docket No. 95-185

REPLY AFFIDAVIT OF

JERRY A. HAUSMAN AND J. GREGORY SIDAK

IN RESPONSE TO

SECOND FURTHER NOTICE OF PROPOSED RULEMAKING

Introduction

Summary of Conclusions

I. Professors Hubbard, Lehr, and Willig Flout the Supreme Court's Decision in *Iowa Utilities Board* by Subordinating Consumer Welfare to Competitor Welfare

II. Contrary to the Claims of Professors Hubbard, Lehr, and Willig, Mandatory Unbundling at TELRIC Prices Will Not Stimulate CLEC Investment in Network Facilities

III. Contrary to the Claims of Professors Hubbard, Lehr, and Willig, Mandatory Unbundling at TELRIC Prices Is Not Necessary to Protect Consumers in Related

Telecommunications Markets

IV. The Hubbard-Lehr-Willig Competitor-Welfare Standard Is Ill-Conceived and Unworkable
- A. Professors Hubbard, Lehr, and Willig Fail to Articulate a Coherent Competitor-Welfare Standard
- B. The Competitive Entry Assumptions of Professors Hubbard, Lehr, and Willig Are Incorrect in Theory and Practice

V. Professors Hubbard, Lehr, and Willig Cannot Reconcile Their Recommendation of Uniform Nationwide Unbundling Outcomes with Consumer Welfare or the Accepted Techniques of Competitive Analysis

Conclusion

INTRODUCTION

Jerry A. Hausman and J. Gregory Sidak, being duly sworn, depose and say:

1. We have been asked by BellSouth Corporation to submit expert reply testimony that analyzes the positions advocated in the affidavit of Professors R. Glenn Hubbard, William H. Lehr, and Robert D. Willig on behalf of AT&T Corp., filed on May 26, 1999 in the initial round of comments in this *Second Further Notice of Proposed Rulemaking*.[1] Our qualifications for submitting this expert testimony are presented in our affidavit on behalf of the United States Telephone Association, also submitted in this proceeding on May 26, 1999.[2]

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1. Affidavit of R. Glenn Hubbard, William H. Lehr, and Robert D. Willig, appended as Exhibit C to Comments of AT&T Corp. (May 26, 1999) [hereinafter *Hubbard-Lehr-Willig Affidavit*].
2. Affidavit of Jerry A. Hausman and J. Gregory Sidak on behalf of the United States Telephone Association

SUMMARY OF CONCLUSIONS

2. Professors Hubbard, Lehr, and Willig advocate an interpretation of the "necessary" and "impair" standards of section 251(d)(2) that tracks—identically, so far as we can ascertain—the reasoning of Justice Souter's dissent in *AT&T Corp. v. Iowa Utilities Board.*[3] As we explain in Part I of this affidavit, although the professors employ the rhetoric of "competition,"[4] they in fact propose that the Commission use a *competitor-welfare* criterion for deciding when to mandate that an incumbent local exchange carrier (ILEC) must unbundle a particular network element at a regulated, TELRIC price. In this respect, Professors Hubbard, Lehr, and Willig advocate an interpretation of "necessary" and "impair" that places section 251(d)(2) on a collision course with the consumer-welfare objective that is the common foundation of antitrust law and the Telecommunications Act of 1996.

3. In addition to having that fundamental shortcoming, the Hubbard-Lehr-Willig affidavit makes arguments that we believe to be incorrect as a matter of economic reasoning and advocates outcomes that we believe would be unsound public policy. As we explain in Part II, Professors Hubbard, Lehr, and Willig argue, implausibly in our view, that the invasive policy of mandatory unbundling that they advocate will provide a greater stimulus for competitive local exchange carriers (CLECs) to invest in network facilities than would a consumer-welfare criterion for interpreting the "necessary" and "impair" standards. To the

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(May 26, 1999) [hereinafter *Hausman-Sidak Affidavit*].

3. AT&T Corp. *v.* Iowa Utils. Bd., 119 S. Ct. 721, 739-40 (1999) (Souter, J., dissenting on "necessary" and "impair").

4. *See, e.g., Hubbard-Lehr-Willig Affidavit* at 6 ¶ 16.

contrary, such mandatory unbundling will reduce CLEC investment.

4. In Part III, we explain how mandatory unbundling at TELRIC prices is not necessary to protect consumers in related telecommunications markets. In Part IV, we demonstrate that the Hubbard-Lehr-Willig impairment standard is ill-conceived and unworkable. Part V shows that the national unbundling prescription of Professors Hubbard, Lehr, and Willig cannot be reconciled with consumer welfare and the accepted economic techniques of competitive analysis. Professors Hubbard, Lehr, and Willig ignore the costs to consumer welfare that would result if the Commission were to accept their advice of needlessly imposing nationwide unbundling outcomes that ignore the competitive differences that exist across relevant geographic markets.

I. PROFESSORS HUBBARD, LEHR, AND WILLIG FLOUT THE SUPREME COURT'S DECISION IN *IOWA UTILITIES BOARD* BY SUBORDINATING CONSUMER WELFARE TO COMPETITOR WELFARE

5. Professors Hubbard, Lehr, and Willig say that the goal of the Telecommunications Act is to "maximize competitive entry and promote maximum feasible competition."[5] That assessment is false. It produces an incorrect standard because it ignores that the legislation's purpose is to maximize *consumer welfare*. Indeed, under the Hubbard-Lehr-Willig approach, the FCC could increase competitive entry and increase this strange version of "competition" by *subsidizing* entrants, through a tax on either ILECs or consumers. Either tax would lead to consumer harm yet would stimulate CLEC entry. Most CLECs, however, would

enter even *without* the FCC subsidy. For example, the CLEC could invest in a network technology with a lower marginal cost than the ILEC's legacy network, differentiate its services (by bundling, for example, local service with long-distance or cable television), or target only low-cost customers (which the ILECs cannot do because it must serve as the carrier of last resort). Thus, Professors Hubbard, Lehr, and Willig cannot claim that, because a *given* CLEC might decide not to enter, there would be any adverse effect on competition or consumer welfare.

6. A consumer-welfare standard will diverge from a competitor-welfare standard whenever the welfare of particular competitors does not reflect the welfare of consumers. As we argued in our original affidavit, there is no necessary relationship between CLEC profits and consumer welfare under an imperfectly competitive outcome.[6] In particular, the two standards will produce different policy prescriptions for mandatory unbundling whenever competition exists at the end-user service level but not at the input level.[7]

7. Professors Hubbard, Lehr, and Willig look to the effect on the *requesting CLEC* rather than the effect on competition.[8] In so doing, they fail to follow even their own so-called "competition-based" approach.[9] A given CLEC might be disadvantaged, but from that fact one cannot infer any effect on consumer welfare or on competition. For instance, another CLEC

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5. *Id.* at 6 ¶ 15.
6. *Hausman-Sidak Affidavit* at 51 ¶ 66.
7. For a detailed description of how consumer-welfare and competitor-welfare impairment standards relate, see *id.* at 115 ¶¶ 157-60.
8. *Hubbard-Lehr-Willig Affidavit* at 6 ¶ 16.
9. *Id.* at 4 ¶ 11.

might be offering a perfect substitute over its own facilities for the service of the requesting CLEC. If the other CLEC knows that the requesting CLEC can free ride or otherwise be given a subsidy by regulation, it will invest less in its own facilities, with all the resulting problems that we discussed in our earlier affidavit.

8. With no support from legislative history, Professors Hubbard, Lehr, and Willig suggest that the Telecommunications Act of 1996 imposes, in section 251(d)(2), standards for mandatory unbundling that "go far beyond those imposed by antitrust standards and other prohibitions of acts of monopolization."[10] Although Professors Hubbard, Lehr, and Willig discuss the implications of the Supreme Court's ruling *before* defining their impairment standard, no trace of the Court's reasoning or holding can be found *within* the statement itself: "The question, therefore, is what regulatory standards will best advance the objectives of assuring that consumers of exchange and exchange access services receive the maximum benefits of competition in both the short and the long term. We conclude that the standard that will best advance these interests is a competitive benchmark."[11] On that basis, Professors Hubbard, Lehr, and Willig disregard the Supreme Court's guidance on how the Commission should develop the appropriate "impairment" standard.

9. At the end of their affidavit, Professors Hubbard, Lehr, and Willig summarize their argument by asserting that "*any* increase in cost or delay, or a decrease in quality

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10. *Id.* at 6 ¶ 15. This assessment is inconsistent with Justice Breyer's belief in the relevance of the essential facilities doctrine to interpretation of section 251(d)(2). *Iowa Utilities Board*, 119 S. Ct. at 753 (Breyer, J., concurring on "necessary" and "impair").

resulting from an incumbent LEC's failure to unbundle a network element will impair a CLEC's ability to offer service."[12] That statement is breathtaking. It encapsulates, virtually verbatim, what the Supreme Court emphatically rejected in *Iowa Utilities Board*. Justice Scalia wrote for seven members of the Court that "the Commission's assumption that *any* increase in cost (or decrease in quality) imposed by denial of a network element renders access to that element 'necessary,' and causes the failure to provide that element to 'impair' the entrant's ability to furnish its desired services is simply not in accord with the ordinary and fair meaning of those terms."[13] Professors Hubbard, Lehr, and Willig, in other words, *do not propose any limiting principle at all* for the Commission's interpretation of "necessary" and "impair." Rather, they invite the Commission to flout the *Iowa Utilities Board* decision by adopting the identical standard for mandatory unbundling that the Court found to be contrary to law. We can only surmise that Professors Hubbard, Lehr, and Willig did not appreciate the legal significance of the remand ordered by the Supreme Court in *Iowa Utilities Board*.

II. CONTRARY TO THE CLAIMS OF PROFESSORS HUBBARD, LEHR, AND WILLIG, MANDATORY UNBUNDLING AT TELRIC PRICES WILL NOT STIMULATE CLEC INVESTMENT IN NETWORK FACILITIES

10. Professors Hubbard, Lehr, and Willig view mandatory unbundling at TELRIC prices as a short-term fix to what they perceive to be the CLEC investment problem. In their view, unbundling will provide a CLEC a "taste" of demand conditions in the relevant market

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11. *Hubbard-Lehr-Willig Affidavit* at 6 ¶ 16.

for which it is considering entry as a facilities-based competitor: "CLECs can mitigate many of these cost and strategic disadvantages by replacing UNEs with their own facilities once they have developed a significant customer base and learned about customer demand and traffic flows. In this respect, UNEs act as a bridge to facilities-based competition."[14] Once a CLEC acquires this knowledge, the argument goes, the risk of its investment decision will diminish and hence investment will appear more attractive to the CLEC.

11. The reasoning supporting this argument crumbles on inspection. First, the Professors Hubbard, Lehr, and Willig admit that a CLEC regards self-provision as more advantageous than leasing unbundled elements from the ILEC's network. If so, then why should a CLEC *wait* to "mitigate this cost disadvantage" by delaying its conversion to a full-fledged, independent, facilities-based competitor?[15] Why would the CLEC not desire to climb this learning curve as quickly as possible? Second, there are ways besides mandatory unbundling for a CLEC to learn about the demand conditions of a particular geographic market. For example, a reseller of minutes could learn about demand just as easily as a CLEC that has chosen to lease an ILEC's elements. Third, the bewildered CLECs of which Professors Hubbard, Lehr, and Willig speak include AT&T, MCI-WorldCom, and Sprint. AT&T owns Teleport, MCI-WorldCom owns MFS, and Sprint provides (as the ILEC) millions of

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12. *Id.* at 21 ¶ 42 (emphasis added).
13. *Iowa Utilities Board*, 119 S. Ct. at 735 (emphasis in original).
14. *Hubbard-Lehr-Willig Affidavit* at 17 ¶ 34.
15. *Id.* at 13 ¶ 27.

local exchange access lines.[16] Professors Hubbard, Lehr, and Willig cannot seriously portray these three prominent CLECs as ignorant and unsophisticated about the nature of demand for local telecommunications services. Many small CLECs have employed switches without this hypothetical inside information.

12. As we discussed in the first round of filings for this proceeding, an overly generous unbundling policy will undermine, not stimulate, CLEC investment in network facilities.[17] First, mandatory unbundling at TELRIC prices encourages CLECs to delay facilities-based entry into the local services market. Mandatory unbundling at TELRIC is equivalent to the government's grant to the CLEC of a *free option* to consume, at incremental cost, the fruits of the ILEC's investment. Facilities-based entry involves sunk costs, which necessarily imply greater risk than UNE-based entry. Thus, a given CLEC will not invest as much in facilities if other CLECs receive free options to unbundle the ILEC's elements at cost because it will not reap the full rewards of its investment. Professors Hubbard, Lehr, and Willig fail to account for the sunk-cost nature of facilities-based investment, even though they earlier state that much network investment is "fixed or sunk."[18]

13. Second, a generous unbundling policy encourages CLECs to demand a "bug free" version of the ILEC's network element and to request, at no cost to the CLEC, the

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16. As of March 1999, Sprint served 7.6 million access lines in 18 states. *See* SPRINT CORP., 1999 SEC FORM 10-K, at 2 (1999)

17. For a detailed review of those effects, see Affidavit of Thomas M. Jorde, J. Gregory Sidak & David J. Teece on behalf of the United States Telephone Association 35-42 (May 26, 1999); *Hausman-Sidak Affidavit* at 57 ¶ 75.

18. *Hubbard-Lehr-Willig Affidavit* at 9 ¶ 20.

offering of unbundled network elements from the ILEC with no intention of actually using them.

14. Third, mandatory unbundling at TELRIC prices diminishes a CLEC's incentive to provide "plain old telephone service" (POTS) by innovative means. For example, an ill-conceived unbundling policy can undermine a CLEC's efforts to deploy POTS over a digital subscriber line (DSL) without the use of any circuit-switching apparatus.

III. Contrary to the Claims of Professors Hubbard, Lehr, and Willig, Mandatory Unbundling at TELRIC Prices Is Not Necessary to Protect Consumers in Related Telecommunications Markets

15. Professors Hubbard, Lehr, and Willig suggest that unbundling is necessary to promote competition (and, presumably, consumer welfare) in related telecommunications markets. For example, they say that unbundling "will be critical to protecting competition in the long distance market and broader emerging market for 'all distance' one-stop shopping services."[19] Do Professors Hubbard, Lehr, and Willig really believe that an ILEC could exercise market power in the *long-distance* market given what they presumably consider to be its current competitive state? Professors Hubbard, Lehr, and Willig then suggest that unbundling "represents the *only* method by which long distance carriers and others can ubiquitously offer their own one-stop shopping alternatives while incurring costs for the local

19. *Id.* at 13 ¶ 27.

components that are even remotely close to those that BOCs incur."[20]

16. Professors Hubbard, Lehr, and Willig overlook that their own client is a long-distance carrier that has invested tens of billions of dollars with the intention of shortly offering one-stop shopping over cable television lines, without any use of the ILEC's unbundled network elements.[21] In addition, several wireless carriers, such as Nextel and Sprint, offer bundled packages that include local service with long-distance service at no extra charge. Certainly, those carriers do not require access to the ILEC's network elements, let alone mandatory access at TELRIC prices.

17. Professors Hubbard, Lehr, and Willig are trapped in a narrow, competitor-welfare framework. That framework blinds them—even as they submit expert testimony on behalf of the firm that bought or is buying McCaw Cellular, Teleport, TCI, and MediaOne and has entered into joint ventures with Time Warner and Microsoft—to any consideration of telecommunications competitors outside the conventional model of ILECs and CLECs.

IV. THE HUBBARD-LEHR-WILLIG COMPETITOR-WELFARE STANDARD IS ILL-CONCEIVED AND UNWORKABLE

18. In our earlier affidavit, we described generically a competitor-welfare standard for mandatory unbundling, not knowing what AT&T's economic experts would actually advocate. It turns out that Professors Hubbard, Lehr, and Willig advocate a much more

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20. *Id.* (emphasis added).

21. For a review of AT&T's plans to offer cable telephony, see Peter Elstrom, Richard Siklos, Roger Crockett, Catherine Yang, & Amy Barrett, *AT&T: What Victory Means*, BUS. WK., May 17, 1999, at 34.

possibility frontier, which also is a function of two or more inputs.[24]

21. To relate this insight back to the matter at hand, it is not meaningful to ask whether the CLEC is worse off simply because it has less of a particular input—namely, the *ILEC's* network element. If, while pursuing an alternative business plan, the CLEC can offer a higher quality of service, then by no means will it be worse off. Alternatively, if a decrease in service quality is offset by a decrease in cost, then the CLEC may not be worse off. For example, an alternative CLEC business plan may involve substitution between switching and transport.[25] Thus, the question of whether a CLEC that was denied access to the ILEC's network element at a TELRIC price would "experience greater delays in offering service, reduce the scope of its services, *or* offer lower quality services"[26] is, as currently posed by Professors Hubbard, Lehr, and Willig, nonsensical.

22. Second, a CLEC must be impaired *relative to a predetermined set of options*. Again, without specifying what options are available to the CLEC and hence what it could achieve in the absence of mandatory unbundling, it is meaningless to ask whether a CLEC's inability to lease a particular network element at a TELRIC price would impair the CLEC's ability to compete. For example, if a CLEC could achieve the same level of profits by self-

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24. *See, e.g.*, HAL R. VARIAN, MICROECONOMIC ANALYSIS 2 (W.W. Norton & Co. 3rd ed. 1992).

25. For a description of the tradeoffs between switching and transport, see Jerry A. Hausman, *Proliferation of Networks in Telecommunications*, in NETWORKS, INFRASTRUCTURE, AND THE NEW TASK FOR REGULATION (D. Alexander & W. Sichel, eds., University of Michigan Press 1996). One of us has made the analogous argument about the production-possibility tradeoffs that exist between spectrum and equipment (including cell sites and transmitters) in wireless telecommunications. *See* J. Gregory Sidak, David J. Teece & Hal J. Singer, *A General Framework for Competitive Analysis in Wireless Telecommunications*, 51 HASTINGS L.J. (forthcoming 1999).

26. *Hubbard-Lehr-Willig Affidavit* at 7 ¶ 16 (emphasis added).

provisioning the network element or provisioning it through a third party, then certainly the CLEC would not be impaired for purposes of section 251(d)(2). By failing to recognize that important aspect of competitive impairment, Professors Hubbard, Lehr, and Willig fail to heed the Supreme Court's instruction to examine the competitive significance of facilities that are supplied outside the ILEC's network.

23. Third, any competitor-welfare impairment standard should ask *to what extent* the CLEC is harmed. According to Professors Hubbard, Lehr, and Willig, however, even the slightest reduction in the quality or scope of services offered represents impairment and hence triggers the Commission's mandatory unbundling of the ILEC's network elements at TELRIC prices. That extreme position fails the Court's requirement in *Iowa Utilities Board* that an impairment standard consider the degree of competitive harm.[27] By the logic of Professors Hubbard, Lehr, and Willig, a demonstration of CLEC harm in the amount of one dollar could trigger mandatory unbundling at TELRIC prices. As shown by Justice Scalia's ladder-and-light-bulb dialogue with Justice Souter in *Iowa Utilities Board,* seven members of the Supreme Court expressly rejected such reasoning.[28]

B. The Competitive Entry Assumptions of Professors Hubbard, Lehr, and Willig Are Incorrect in Theory and Practice

24. According to the Hubbard-Lehr-Willig "razor's edge" view of CLEC entry, there is no continuum between equal profitability with ILECs and zero profits. A CLEC will

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27. 119 S. Ct. at 735.

"enter a particular local services market only if it anticipates that its costs will not exceed those of the incumbent LEC for a similarly desirable product."[29] They base that conclusion on an oversimplified competitive environment in which the CLEC competes with an ILEC á la Bertrand (that is, only on the basis of price) with complete information along a single product dimension. The statement that we quote above by Professors Hubbard, Lehr, and Willig invites the question, What if the CLEC offers a *differently* desirable product? As we noted in our earlier affidavit, CLECs differ in their competitive strategies, their service offerings, the value of their brand names and reputation, and so forth. Given that AT&T has acquired one of the two largest competitive access providers, is acquiring cable television operators, and is expanding its digital one-rate plan for wireless access, it is remarkably *backward-looking* for AT&T's expert economists to ignore product differentiation and instead analyze entry into local telephony under the unrealistic assumption that CLECs and ILECs offer only homogeneous products across identical delivery platforms.

25. Under the Hubbard-Lehr-Willig presumption of no middle ground for CLEC profitability, the Supreme Court (or anyone trying to follow its opinion in *Iowa Utilities Board*) should not be concerned with the *degree* of harm incurred by CLECs—for any cost differential will cause total CLEC annihilation by driving CLEC profits to zero. Moreover, if a CLEC truly has higher costs than the ILEC, then the CLEC should not enter the market.

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28. *Id.* at 735 n.11 (Scalia, J., for the Court) (quoting *id.* at 739 (Souter, J., concurring in part and dissenting in part)).

29. *Hubbard-Lehr-Willig Affidavit* at 8 ¶ 18.

Inefficient entry leads to social waste, which reduces consumer welfare.

26. This simplistic view that Professors Hubbard, Lehr, and Willig have of the CLEC's entry decision is incorrect in both theory and practice. A CLEC will enter a market to provide local service if its expected economic profit (after taking account of its cost of capital) associated with providing service in that market is positive. Whether or not that decision criterion dictates CLEC entry depends on the competitive circumstances of the particular product and geographic market. Even if the CLEC's expected profits associated with providing local service in a given geographic market were negative, it still may enter if its expected profits associated with providing local service *and a complementary service*, such as Internet access, were positive. In short, the CLEC's entry decision is much more complicated than the simple assessment of cost differentials upon which Professors Hubbard, Lehr, and Willig would have the Commission rely.

27. Moreover, not every act of CLEC entry is "marginal entry." Given the "high risks"[30] described by Professors Hubbard, Lehr, and Willig, the CLEC would not enter unless it expected high profits. So slightly higher cost for the CLEC would not affect competition. Thus, most entry is *inframarginal* entry, not the marginal entry that Professors Hubbard, Lehr, and Willig assume. If one marginal entrant declines to enter because of its slightly higher costs, that fact will not impair competition. Using the Hubbard-Lehr-Willig approach, however, the optimal public policy would be to subsidize CLEC entry.

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30. *Id.* at 12 ¶ 25.

28. In addition to suffering from this incorrect application of theory, the Hubbard-Lehr-Willig affidavit is contrary to the observed fact of CLEC entry. At an empirical level, Professors Hubbard, Lehr, and Willig make no attempt to explain the entry by CLECs to date. That omission by AT&T's experts is remarkable in light of the fact that AT&T purchased Teleport well after it had already build state-of-the-art networks in many cities. Assuming that cost differentials between ILECs and CLECs exist in practice, the observed fact of CLEC entry directly contradicts the Hubbard-Lehr-Willig entry criterion.

29. Professors Hubbard, Lehr, and Willig also suggest that the "natural competitive process inevitably propels prices below the costs of the high-cost firm."[31] But this is only true in the case of duopoly competition. Consider a case where *three* firms (one cable television operator, one ILEC, and one CLEC) are competing in the provision of local service in a well-defined geographic market.[32] Suppose further that the marginal costs of the cable television operator are lower than the ILEC's marginal costs, which in turn are lower than the CLEC's marginal costs. The cable television operator could price its service just below the ILEC's (the *second* highest-cost firm) marginal costs. In this case, the CLEC would not affect competition; neither would a mandatory unbundling rule that brought the CLEC's costs in line with the ILEC's costs.

30. Professors Hubbard, Lehr, and Willig further assert that CLECs will continue to be impaired until the prices for UNEs "approach *per-unit* TELRIC rates" with competi-

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31. *Id.* at 8 ¶ 18.

tion.[33] The implications of this assertion are not obvious. It is easier to assess this claim in simple notation. Let MC be marginal costs and Q be output. Thus, under Professor Hubbard, Lehr, and Willig's caveat about per-unit TELRIC prices, mandatory unbundling at TELRIC should (as a first approximation) occur until $(MC/Q)_{CLEC} < (MC/Q)_{ILEC}$. That rule would have several serious implications for economic efficiency and consumer welfare.

31. First, assuming that the CLEC and the ILEC have the *same* marginal costs, the Hubbard-Lehr-Willig prescription would call for mandatory unbundling until the CLEC had eclipsed the ILEC's market penetration. Never mind the fact that, by this point, the CLEC would be well past enduring any impairment. Second, this statement about the conditions for competitor impairment directly contradicts the affidavit that Professor Willig submitted with Professor Janusz A. Ordover to the FCC last fall in the AT&T-TCI merger. In particular, Professor Willig argued there that AT&T would not invest in its cable television facilities if the company could receive only TELRIC prices when selling access to other Internet providers:

> Forced unbundling with its attendant regulatory uncertainty would likely slow down the investment in the development of broadband last mile data transport. Investing under the shadow of uncertain regulatory rules in an *innovative* service only exacerbates the already substantial risks associated with that investment. When an investor can be subjected to unanticipated regulatory constraints on its pricing or be required to sell its services at rates that do not reflect proper economic costs, the incentives to invest are potentially undermined. TCI and other cable companies did not sink hundreds of millions of dollars into upgrading their networks on the assumption that they will be forced to "unbundle"

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32. Such competition is outside the realm of the Hubbard-Lehr-Willig competitive framework.
33. *Hubbard-Lehr-Willig Affidavit* at 7 ¶ 17 n.4 (emphasis added).

transport *if it is not in their private interest to do so*.[34]

In contrast to the suggestion of Professors Hubbard, Lehr, and Willig in this proceeding that telecommunications firms base pricing decisions on "average costs per subscriber,"[35] economists recognize that firms base such decisions on marginal costs. Thus, the Hubbard-Lehr-Willig argument here is incorrect, especially because they claim that price exceeds the efficient level.[36]

32. Professors Hubbard, Lehr, and Willig emphasize the ILEC's incumbency advantage and how that advantage manifests itself in terms of large cost differentials between ILECs and CLECs.[37] The sources of those supposed cost differentials, however, are nonexistent. For example, contrary to the suggestion of Professors Hubbard, Lehr, and Willig, ILECs must pay assemblage costs. Surely Professors Hubbard, Lehr, and Willig do not believe that ILECs can procure those activities for free. Indeed, their own example concerning system integration illustrates a cost faced by both CLECs and ILECs.[38] Again, Professors Hubbard, Lehr, and Willig are essentially asking the Commission to impose a mandatory unbundling standard that effects a subsidy for CLECs.

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34. Declaration of Janusz A. Ordover & Robert D. Willig, appended to AT&T's and TCI's Joint Reply to Comments and Joint Opposition to Petitions to Deny or to Impose Conditions 20 ¶ 49 (emphasis in original) (Nov. 13, 1998), in Joint Application of AT&T Corp. and Tele-Communications, Inc. for Transfer of Control to AT&T of Licenses and Authorizations Held by TCI and Its Affiliates or Subsidiaries, CS Dkt. No. 98-178. It is clear from an earlier passage in the affidavit that, by the phrase "rates that do not reflect proper economic costs," Professor Willig refers to TELRIC-based pricing of inputs. *Id.* at 16-17 ¶¶ 38-40.

35. *Hubbard-Lehr-Willig Affidavit* at 9 ¶ 20.

36. Average cost only influences the entry decision, and we have already seen much CLEC entry. Most entry is an inframarginal decision. It is not taking place at the margin.

37. *Hubbard-Lehr-Willig Affidavit* at 15 ¶¶ 28-29.

38. *Id.* at 10 ¶ 22.

33. Finally, Professors Hubbard, Lehr, and Willig attempt to reconcile their radical approach with the Supreme Court's directive that the Commission look outside the ILEC's network for alternative sources of supply of network elements: "If the CLEC is forced to purchase the network element from another source at a price that exceeds the incumbent LEC's cost (per unit) of self-providing that network elements (*i.e.*, TELRIC per unit), then the CLEC has higher costs than the LEC."[39] The Commission's adoption of such a standard would imply that, even if the CLEC could purchase the network element from another source at less than TELRIC-based rates (but not below the per-unit TELRIC), the CLEC would be sufficiently impaired to justify government intervention in the form of mandatory unbundling. This result will occur because a "reasonable allocation of forward-looking common costs" is included in TELRIC-based rates under the Commission's *Local Competition First Report and Order*.[40] More fundamentally, if the CLEC can purchase the network element from "another source" besides the ILEC, then that element cannot be an input that, if not supplied by the ILEC to the CLEC at a TELRIC price, could impair competition in the supply of telecommunications services to end users.

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39. *Id.* at 11 ¶ 23.

40. Implementation of the Local Competition Provisions in the Telecommunications Act of 1996 and Interconnection Between Local Exchange Carriers and Commercial Mobile Radio Service Providers, First Report and Order, CC Dkt. Nos. 96-98, 95-185, 11 F.C.C. Rcd. 15,499, 15,874 ¶ 682 (1996).

V. PROFESSORS HUBBARD, LEHR, AND WILLIG CANNOT RECONCILE THEIR RECOMMENDATION OF UNIFORM NATIONWIDE UNBUNDLING OUTCOMES WITH CONSUMER WELFARE OR THE ACCEPTED TECHNIQUES OF COMPETITIVE ANALYSIS

34. Professors Hubbard, Lehr, and Willig advocate rules for mandatory unbundling that would have the effect of imposing uniform, nationwide *outcomes*. That recommendation is unsound as a matter of public policy for reasons that we explained in our earlier affidavit. It is also inconsistent with the reliance that Professors Hubbard, Lehr, and Willig place on the concept of a "local telecommunications market" elsewhere in their own affidavit. We address first this logical inconsistency in the Hubbard-Lehr-Willig affidavit.

35. Professors Hubbard, Lehr, and Willig say that the imposition of a meaningful limiting principle on mandatory unbundling would "reduce the viability or scope of a CLEC's service offerings" in a "competitive *local* telecommunication market."[41] Later in their affidavit, they again say that the competitive effects of the presence or absence of a policy on mandatory unbundling at TELRIC prices will manifest themselves at the local level: "In addition, impairment could reveal itself as a delay in entry to *a particular geographic, customer, or product market*."[42] This assessment by Professors Hubbard, Lehr, and Willig of the importance of evaluating competition at the local level supports our own conclusion that the Commission should make specific factual determinations about mandatory unbundling at the level of the relevant geographic market, as that concept is understood in antitrust law and

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41. *Hubbard-Lehr-Willig Affidavit* at 7 ¶ 16 (emphasis added).
42. *Id.* at 13 ¶ 26 (emphasis added).

competitive analysis in regulatory proceedings. It is logically inconsistent, and thus not a sound basis for making policy, to say (as Professors Hubbard, Lehr, and Willig advocate) that uniform national outcomes for mandatory unbundling should be imposed to prevent competitive impairment that would reveal itself in the facts and circumstances of a particular geographic market.

36. Quite apart from producing this logical inconsistency in their argument, Professors Hubbard, Lehr, and Willig cannot find support in economic reasoning for their recommendation that the Commission impose uniform, national unbundling outcomes by Beltway edict. To the contrary, economic reasoning indicates that consumer welfare would suffer as a result of such an interpretation of section 251(d)(2). To the extent that they are present in the ILEC's provision of local telephony, economies of scale and scope are likely to arise overwhelmingly on a local—not national—basis. Despite this location-dependent nature of economies of scale and scope in local telephony, Professors Hubbard, Lehr, and Willig do not ask what will be the effect that mandatory unbundling at TELRIC prices will have *on competition*, because that question presents for them an inconvenient answer: As documented in the initial comments of the ILECs and the United States Telephone Association, competition (both in the supply of network elements and in the supply of telecommunications services to end users) is already extant in certain geographic markets and varies considerably in degree from one geographic market to the next. Instead, Professors Hubbard, Lehr, and Willig ask only what will be the effect that mandatory unbundling at TELRIC prices will have *on CLECs*.

37. In our earlier affidavit, we provided several explanations for why the Commission should apply its rules on mandatory unbundling locally, at the level of the relevant

geographic market.[43] First, without geographic specificity to its mandatory unbundling rules, the Commission would create a body of law in direct conflict with the antitrust principles that the Supreme Court considered relevant to interpreting section 251(d)(2). The references by Justices Scalia and Breyer to the essential facilities doctrine reinforce that the Commission must evaluate competition with respect to a meaningful geographic market.[44] Otherwise, the agency will fail to supply the limiting principle for mandatory unbundling that the Court ordered it to supply.

38. Second, the costs of local exchange telephony (particularly the cost of loops, given differences in loop lengths) vary greatly across different geographic areas of the country. The Commission should expect those differences in costs to lead to differences in competition and, hence, differences in the degree to which the imposition of mandatory unbundling at TELRIC prices could be justified.

39. Third, if the Commission followed the advice of Professors Hubbard, Lehr, and Willig and imposed a nationwide standard that ensured uniform nationwide outcomes, the agency would directly contradict the market definition standards found in the Department of Justice and Federal Trade Commission *Merger Guidelines*,[45] which the FCC has used in its own recent merger reviews under the public interest standard of the Communications Act.[46]

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43. *Hausman-Sidak Affidavit* at 78-83 ¶¶ 105-12.
44. *Iowa Utilities Board*, 119 S. Ct. at 734-35 (Scalia, J.); *id.* at 753 (Breyer, J.).
45. Department of Justice and Federal Trade Commission, Horizontal Merger Guidelines § 1.2 (1992).
46. *See, e.g.*, Application of WorldCom, Inc. and MCI Communications Corporation for Transfer of Control of MCI Communications Corporation to WorldCom, Inc., Memorandum Opinion and Order, CC Dkt. No. 97-211, 13 F.C.C. Rcd. 18,025, 18,048-50 ¶¶ 37-39 (1998) (citing *Merger Guidelines*).

40. Fourth, many of the critical facts needed to assess competitive conditions are likely to be unique to a particular geographic market. The state public utility commissions have valuable expertise and resources with which to assist the FCC as local finders of fact.

41. To summarize, in a given geographic market, the correct question for the Commission to ask is whether an (unregulated) ILEC could exercise market power in the supply of telecommunications services to consumers if it were not required to provide CLECs a particular unbundled element at regulated cost-based rates. It is likely that the outcome of that competitive analysis will differ depending on the particular element and the geographic area under consideration.

CONCLUSION

42. For five reasons, the Commission should reject the policy preferences advocated in the Hubbard-Lehr-Willig affidavit. First, Professors Hubbard, Lehr, and Willig never define impairment in terms of consumer welfare. They explore impairment only in the context of a particular "CLEC's ability to offer service."[47]

43. Second, their analysis is based on a faulty understanding of CLEC investment and entry decisions. Contrary to the arguments of Professors Hubbard, Lehr, and Willig, mandatory unbundling at TELRIC prices not only will fail to stimulate CLEC investment, but also will *undermine* a CLEC's investment incentives. The decline in CLEC investment will

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47. *Hubbard-Lehr-Willig Affidavit* at 21 ¶ 42.

result in fewer choices for consumers and thus will decrease consumer welfare.

44. Third, mandatory unbundling at TELRIC prices is not necessary to protect consumers in related telecommunications markets. Professors Hubbard, Lehr, and Willig are trapped in a narrow, competitor-welfare framework. That framework blinds them to any consideration of telecommunications competitors outside the conventional model of ILECs and CLECs.

45. Fourth, the Hubbard-Lehr-Willig impairment standard is ill-conceived and unworkable. The CLEC's entry decision is much more complicated than the simple assessment of cost differentials upon which Professors Hubbard, Lehr, and Willig would have the Commission rely.

46. Fifth, the national unbundling prescription of Professors Hubbard, Lehr, and Willig cannot be reconciled with consumer welfare and the accepted economic techniques of competitive analysis. Professors Hubbard, Lehr, and Willig ignore the costs to consumer welfare that would result if the Commission were to accept their advice of needlessly imposing nationwide unbundling outcomes that ignore the competitive differences that exist across relevant geographic markets.

47. Under the impairment standard proposed by Professors Hubbard, Lehr, and Willig, mandatory unbundling at TELRIC prices would be triggered "whenever the evidence *reasonably* suggests that a CLEC's ability competitively to offer local service or exchange

access service would be impaired."[48] The standard analysis of competition contained in antitrust law and regulatory economics counsels the Commission to reject the Hubbard-Lehr-Willig impairment standard on the grounds that it lacks the kind of meaningful limiting principle that prompted the Supreme Court in *Iowa Utilities Board* to remand this proceeding to the Commission.

48. *Id.* at 21 ¶ 43 (emphasis added).

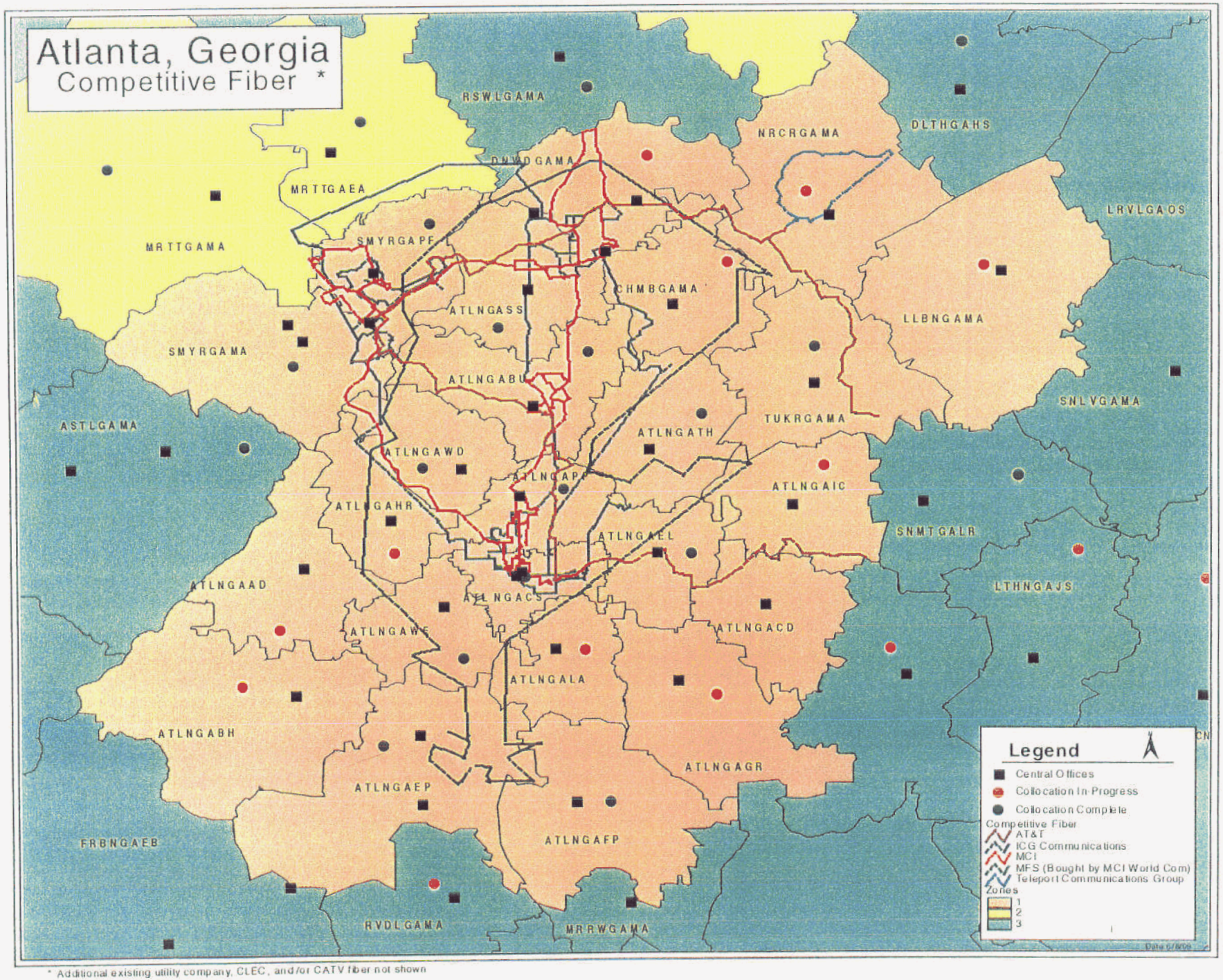
I hereby swear, under penalty of perjury, that the foregoing is true and correct.

J. Gregory Sidak

Executed on this 10th day of June, 1999.

Notary Public

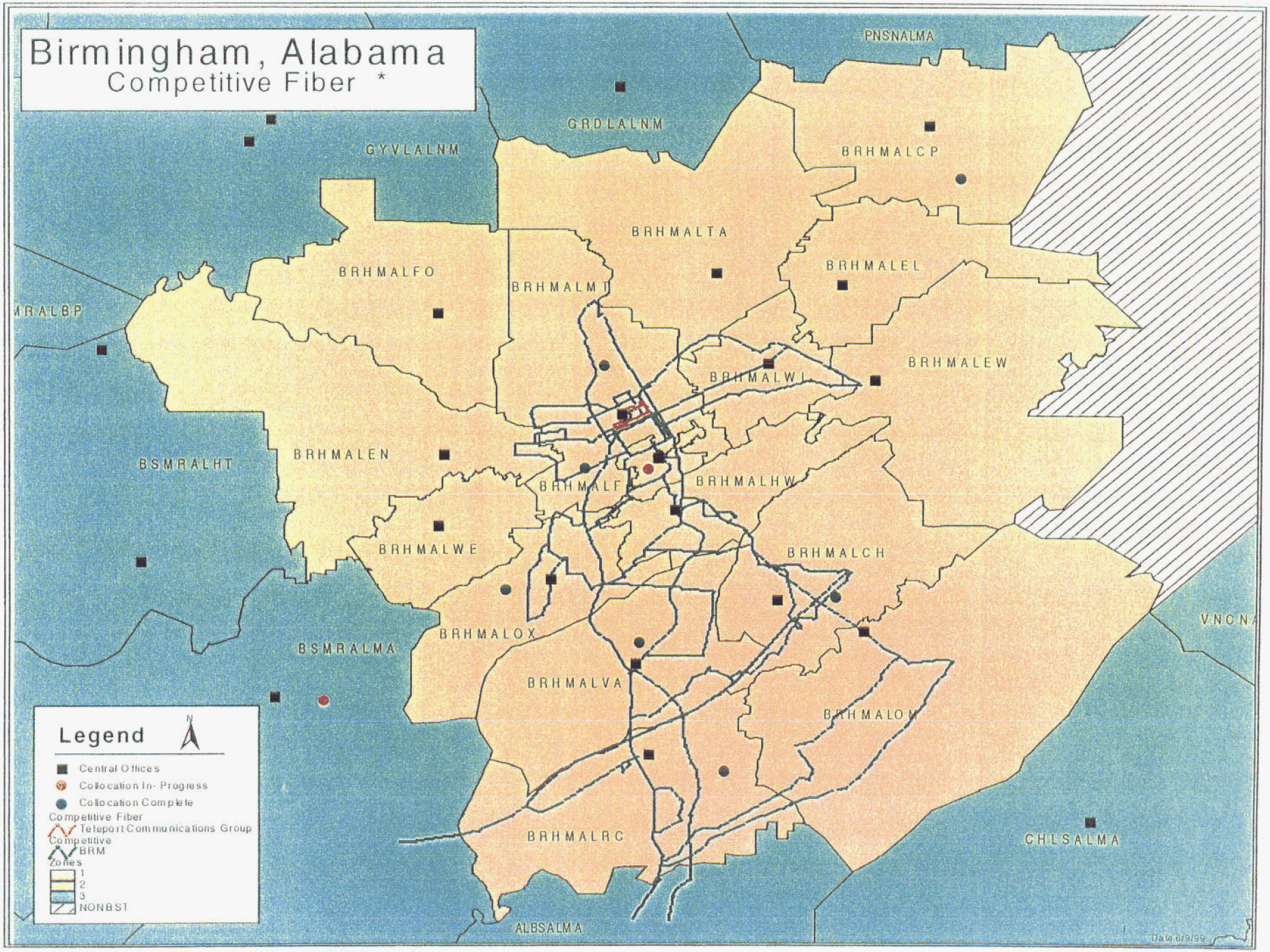
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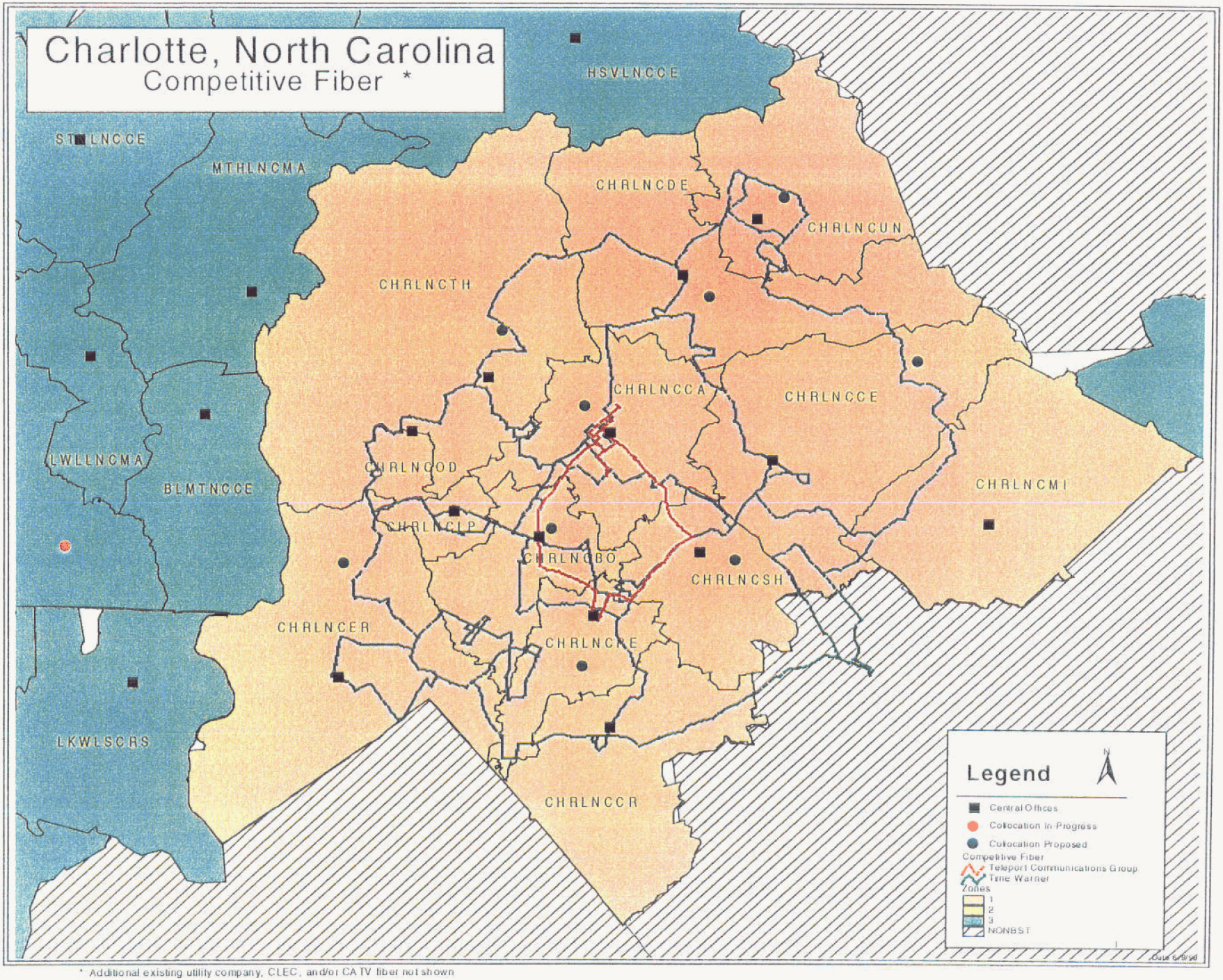
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Attachment C



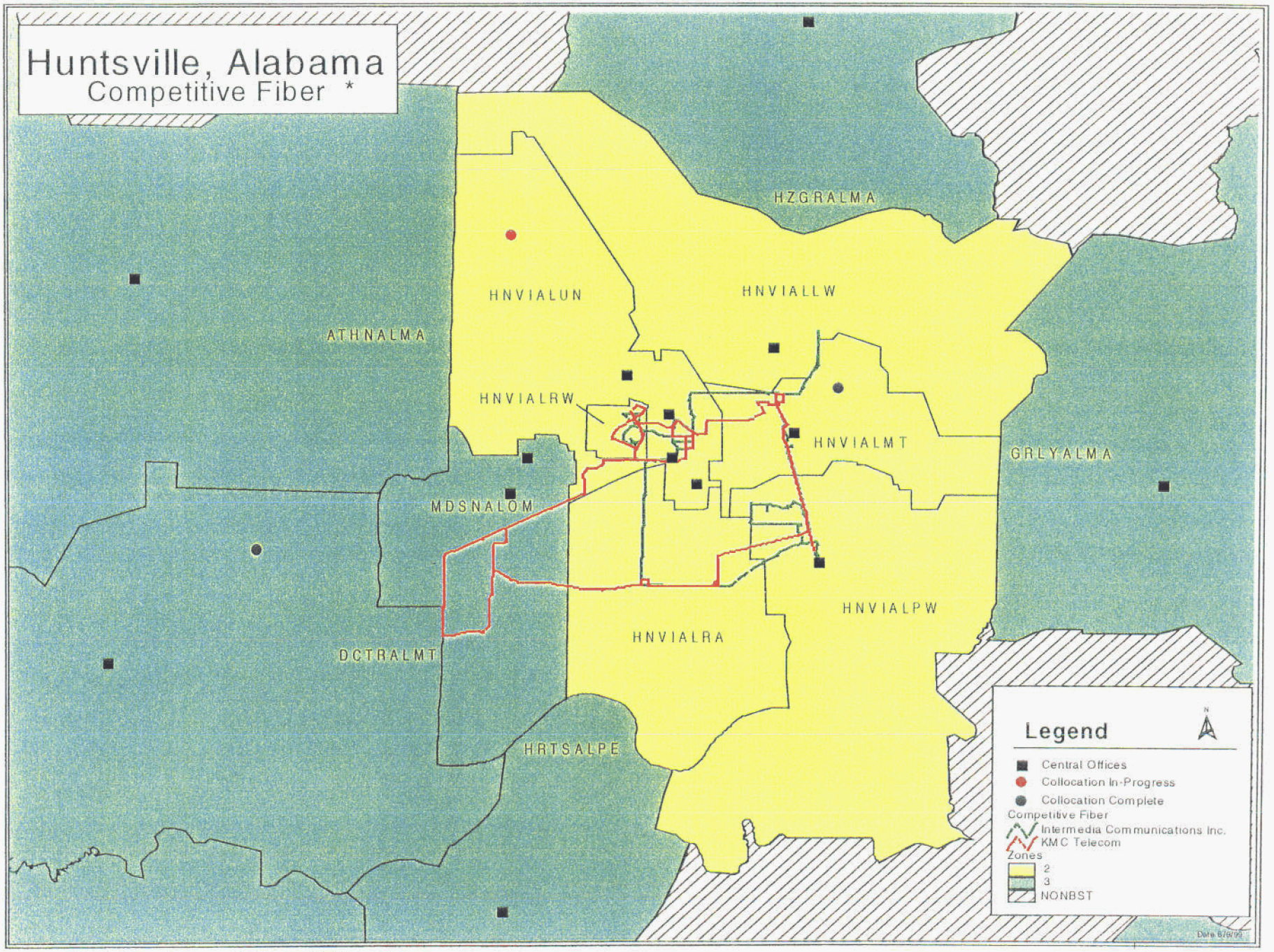
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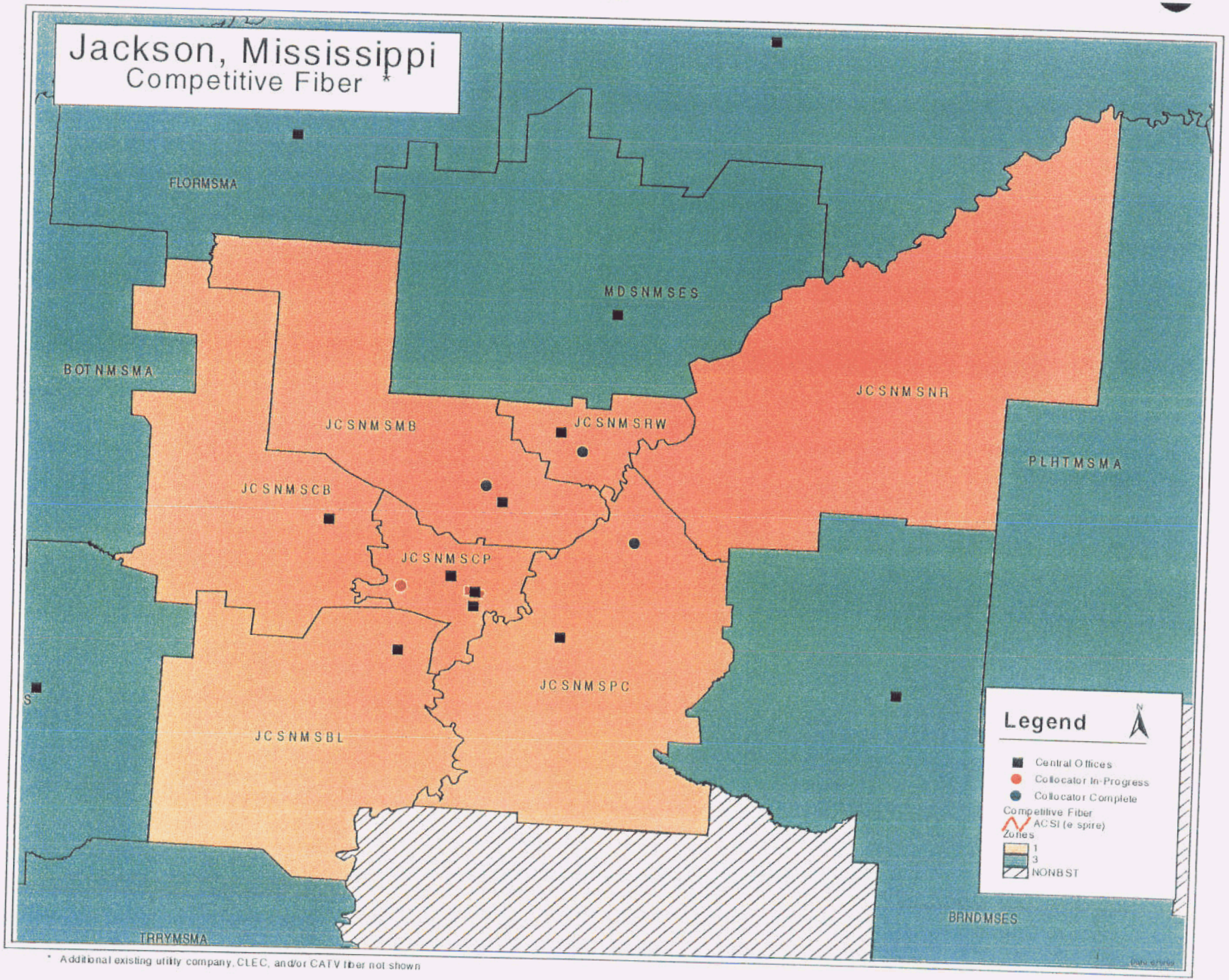
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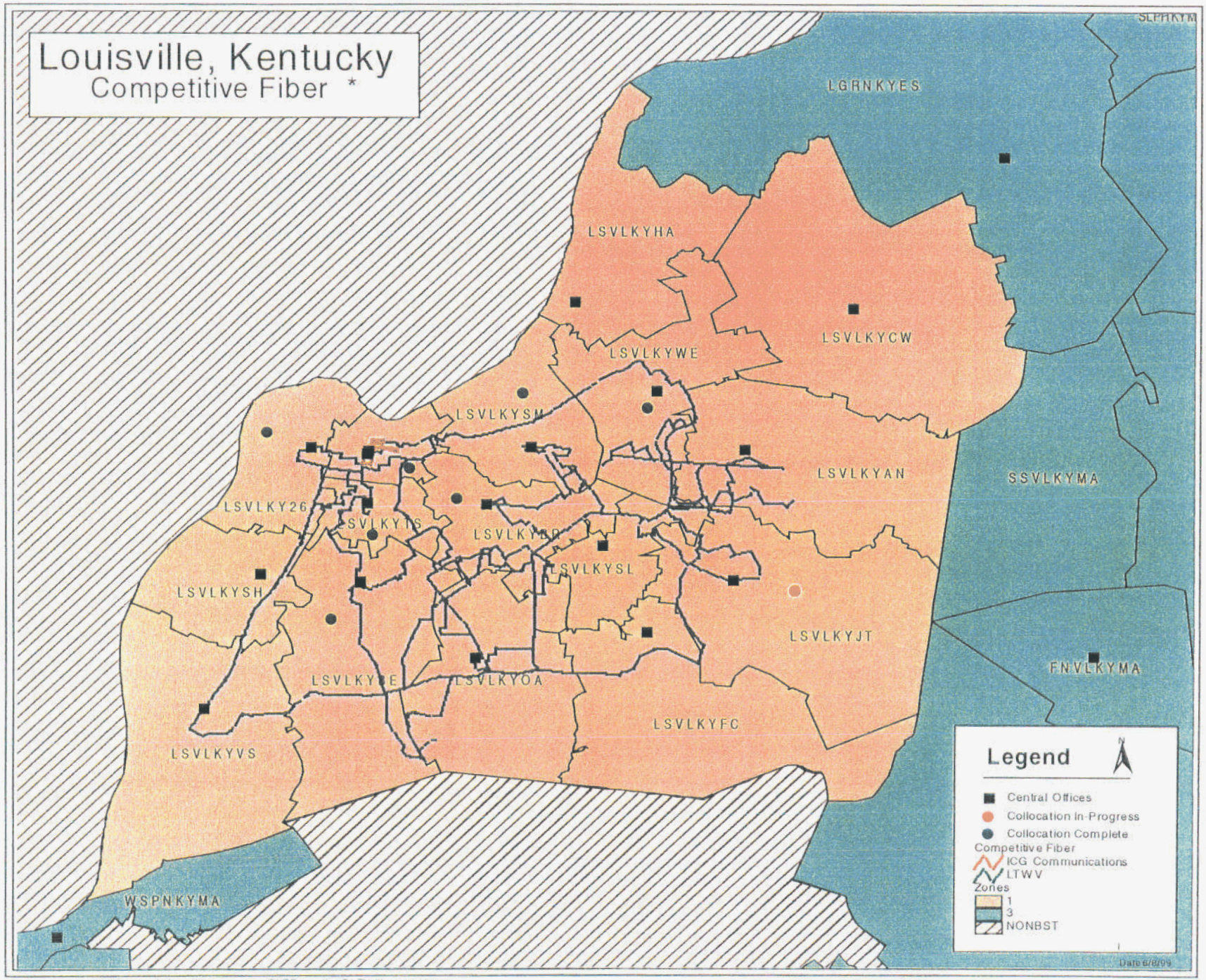


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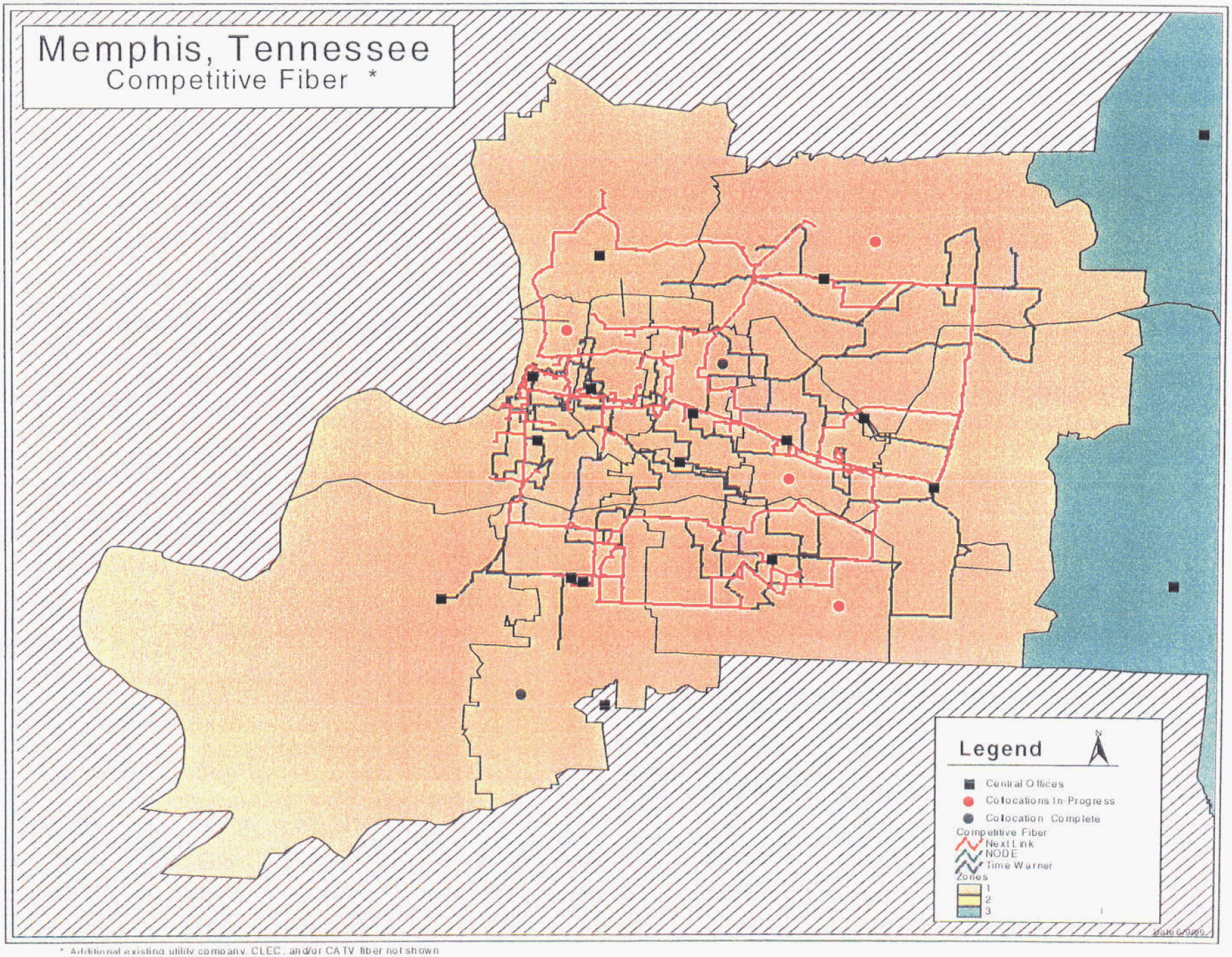
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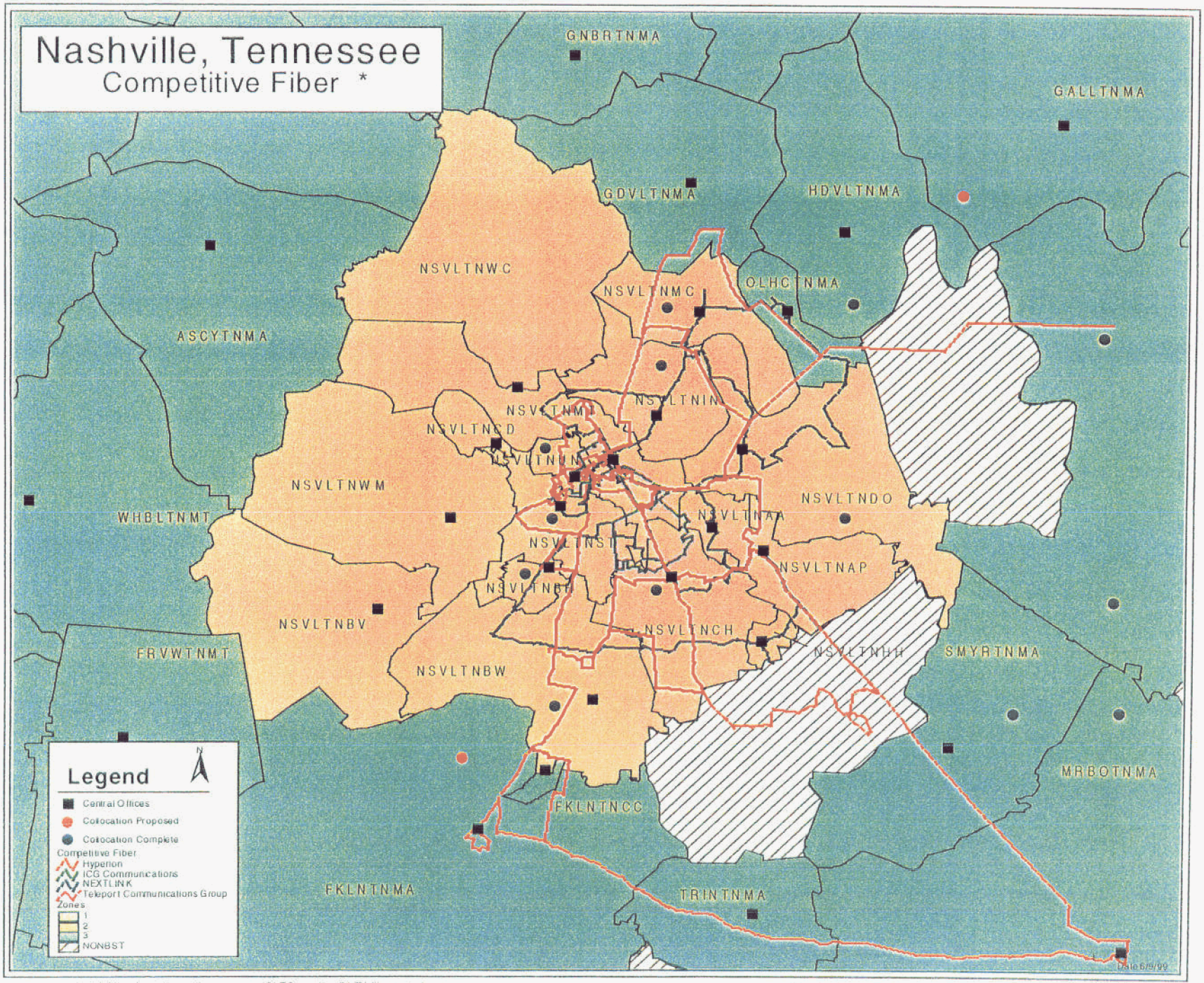


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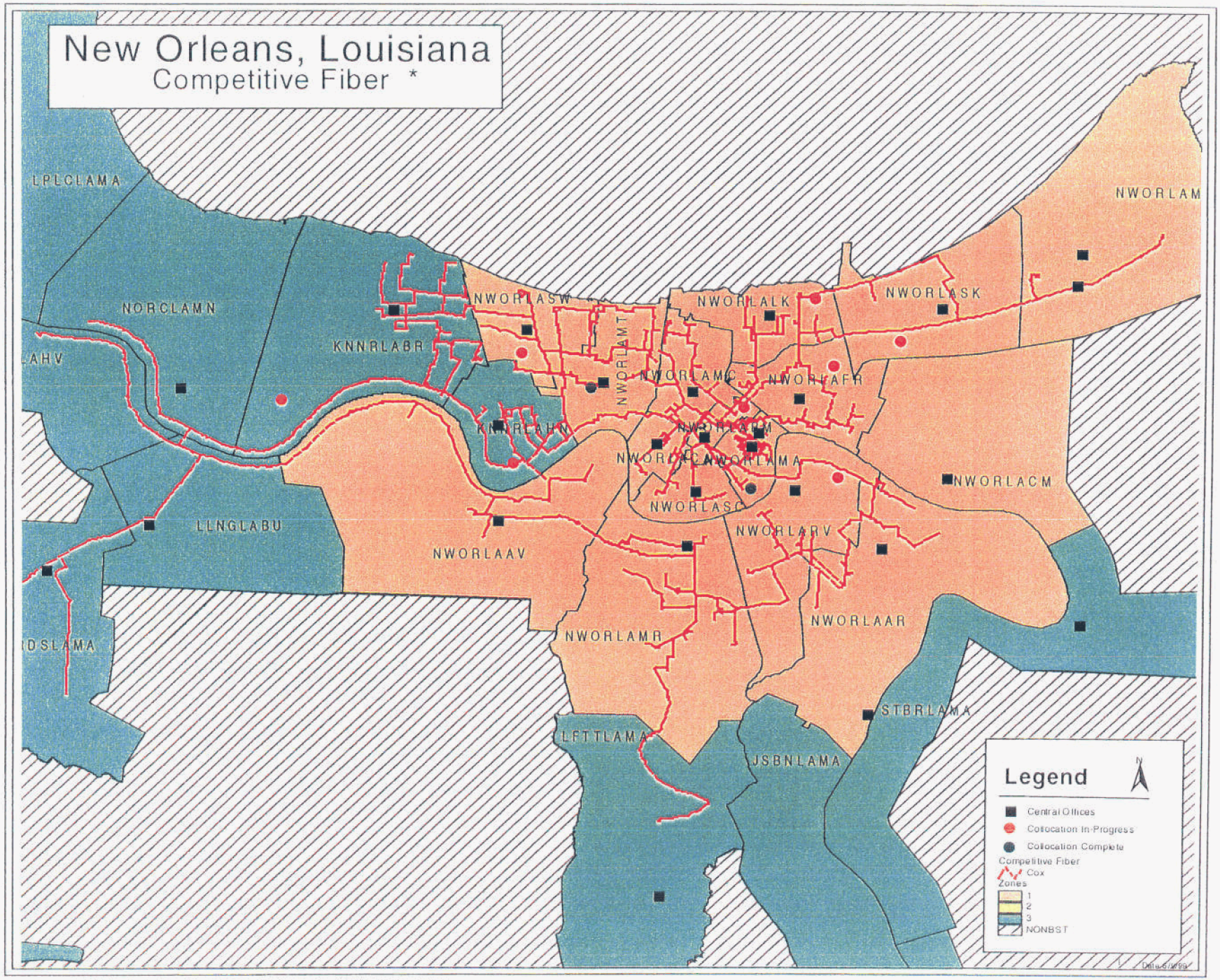
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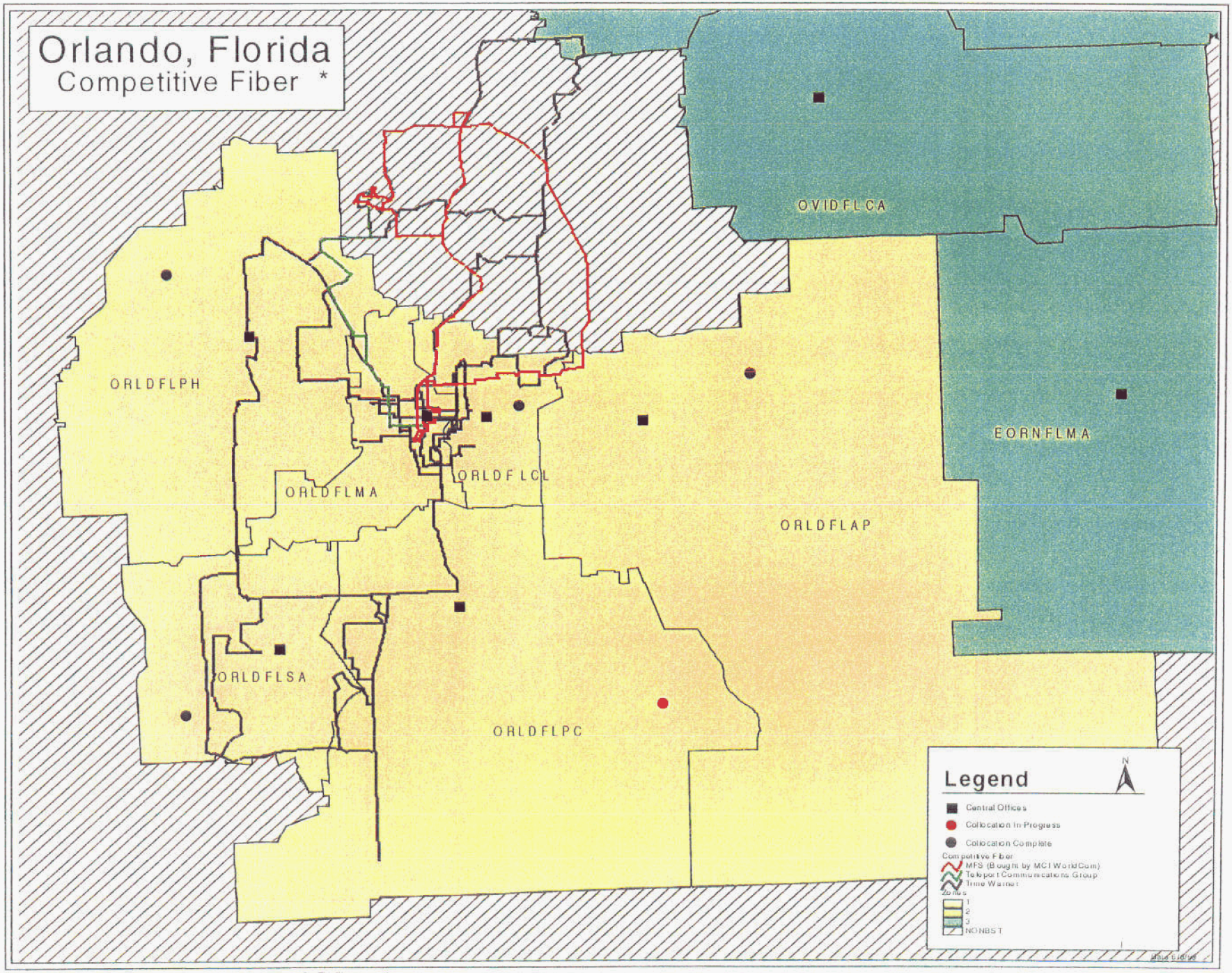
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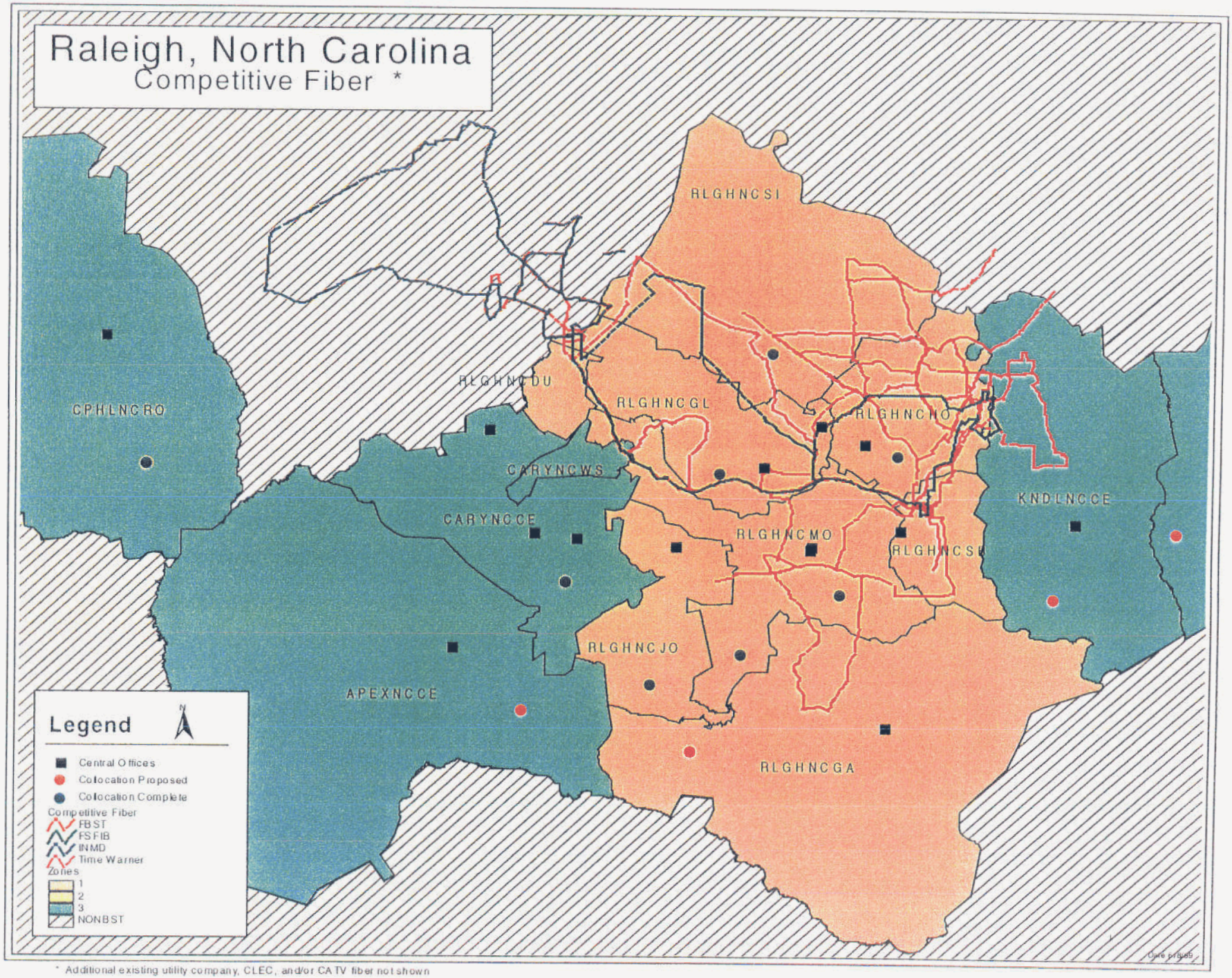
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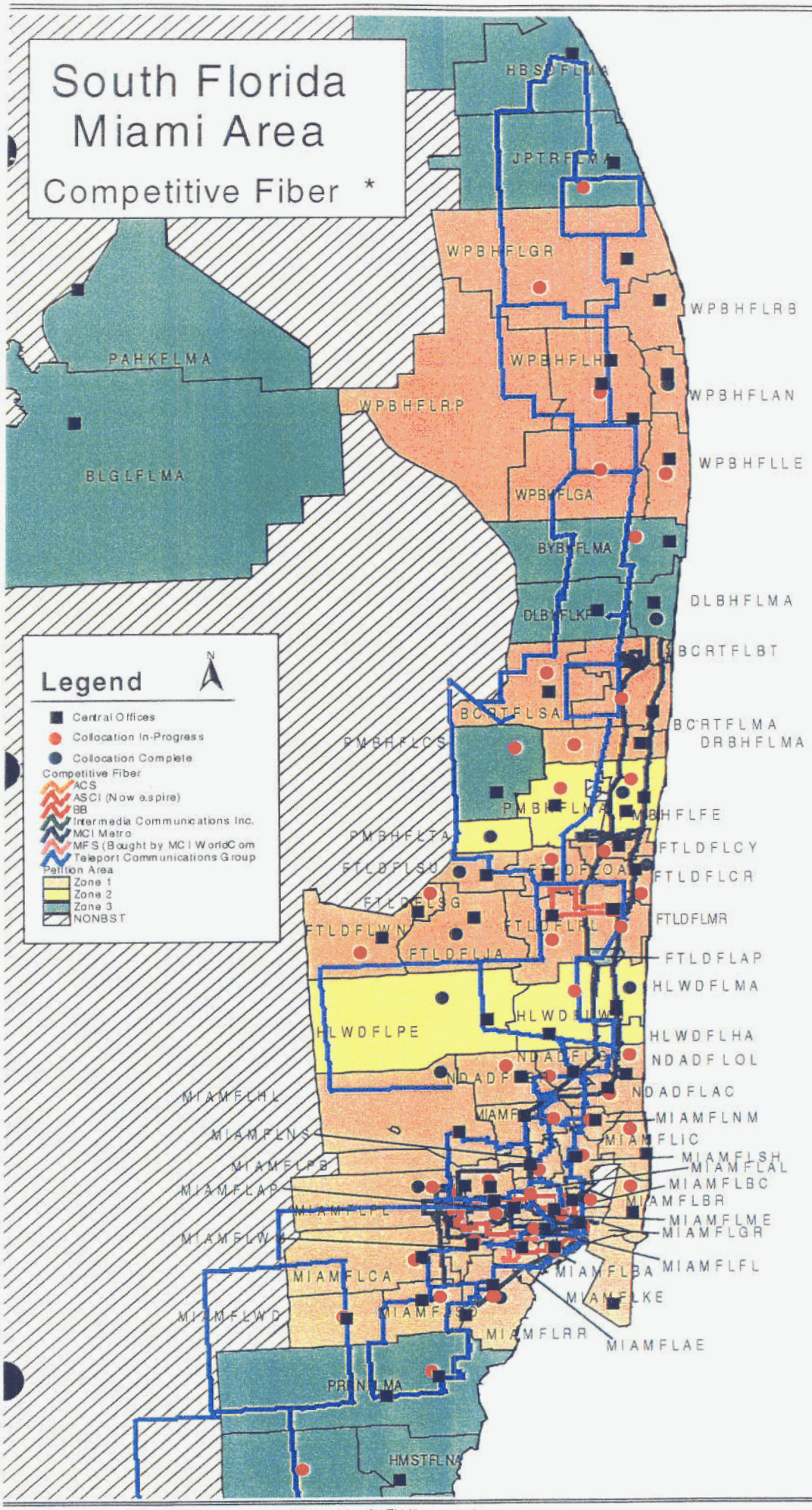
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South Florida
Miami Area
Competitive Fiber *



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Date 8/1

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Attachment D

CLEC and BellSouth Switch
Deployment

BELLSOUTH-ALABAMA

Zone 1

24 Operational BellSouth Switches
- 18 in Birmingham
- 6 in Montgomery

Zone 2

17 Operational BellSouth Switches
- 6 in Huntsville
- 11 in Mobile

CLEC-ALABAMA

Zone 1

7 Operational CLEC Switches
- 5 in Birmingham
- 2 in Montgomery

6 Future CLEC Switches
- 3 in Birmingham
- 3 in Montgomery

Zone 2

2 Operational CLEC Switches
- 1 in Huntsville
- 1 in Mobile

2 Future CLEC Switches
- 1 in Huntsville
- 1 in Mobile

BLS_CLEC.doc

Operational CLEC Switch Data as of April 29, 1999
Future CLEC Switch Data as of April 21, 1999
Operational BellSouth Switch Data as of May, 1999

BELLSOUTH-FLORIDA

Zone 1

81 Operational BellSouth Switches
- 9 in Fort Lauderdale (See also, Hollywood below)
- 19 in Jacksonville
- 32 in Miami
- 7 in Orlando
- 14 in West Palm

Zone 2

23 Operational BellSouth Switches
- 5 in Daytona
- 3 in Gainesville
- 10 in Hollywood (Part of Fort Lauderdale, above)
- 5 in Pensacola

CLEC-FLORIDA

Zone 1

36 Operational CLEC Switches
- 4 in Fort Lauderdale
- 7 in Jacksonville
- 13 in Miami
- 9 in Orlando
- 3 in West Palm

23 Future CLEC Switches
- 3 in Fort Lauderdale
- 6 in Jacksonville
- 9 in Miami
- 5 in Orlando

Zone 2

5 Operational CLEC Switches
- 3 in Daytona
- 1 in Gainesville
- 1 in Pensacola

3 Future CLEC Switches
- 1 in Daytona
- 1 in Gainesville
- 1 in Pensacola

Operational CLEC Switch Data as of April 29, 1999
Future CLEC Switch Data as of April 21, 1999
Operational BellSouth Switch Data as of May, 1999

BELLSOUTH-GEORGIA

Zone 1
30 Operational BellSouth Switches
30 in Atlanta
Zone 2
26 Operational BellSouth Switches
2 in Albany
3 in Atlanta
5 in Augusta
5 in Columbus
4 in Macon
7 in Savannah

CLEC-GEORGIA

Zone 1
20 Operational CLEC Switches
20 in Atlanta
6 Future CLEC Switches
6 in Atlanta
Zone 2
10 Operational CLEC Switches
1 in Albany
3 in Augusta
4 in Columbus
1 in Macon
1 in Savannah
0 Future CLEC Switches

Operational CLEC Switch Data as of April 29, 1999
Future CLEC Switch Data as of April 21, 1999
Operational BellSouth Switch Data as of May, 1999

BELLSOUTH-KENTUCKY

Zone 1

19 Operational BellSouth Switches
19 in Louisville

Zone 2

0 Operational BellSouth Switches

CLEC-KENTUCKY

Zone 1

3 Operational CLEC Switches
3 in Louisville
4 Future CLEC Switches
4 in Louisville

Zone 2

0 Operational CLEC Switches
0 Future CLEC Switches

Operational CLEC Switch Data as of April 29, 1999
Future CLEC Switch Data as of April 21, 1999
Operational BellSouth Switch Data as of May, 1999

BELLSOUTH-LOUISIANA

Zone 1

20 Operational BellSouth Switches
- 20 in New Orleans

Zone 2

22 Operational BellSouth Switches
- 12 in Baton Rouge
- 3 in Lafayette
- 7 in Shreveport

CLEC-LOUISIANA

Zone 1

7 Operational CLEC Switches
- 7 in New Orleans

5 Future CLEC Switches
- 5 in New Orleans

Zone 2

7 Operational CLEC Switches
- 3 in Baton Rouge
- 2 in Lafayette
- 2 in Shreveport

8 Future CLEC Switches
- 4 in Baton Rouge
- 3 in Lafayette
- 1 in Shreveport

Operational CLEC Switch Data as of April 29, 1999
Future CLEC Switch Data as of April 21, 1999
Operational BellSouth Switch Data as of May, 1999

BELLSOUTH-MISSISSIPPI

Zone 1

8 Operational BellSouth Switches
8 in Jackson

Zone 2

0 Operational BellSouth Switches

CLEC-MISSISSIPPI

Zone 1

2 Operational CLEC Switches
2 in Jackson
0 Future CLEC Switches

Zone 2

0 Operational CLEC Switches
0 Future CLEC Switches

Operational CLEC Switch Data as of April 29, 1999
Future CLEC Switch Data as of April 21, 1999
Operational BellSouth Switch Data as of May, 1999

BELLSOUTH-NORTH CAROLINA

Zone 1

32 Operational BellSouth Switches
- 16 in Charlotte
- 7 in Greensboro
- 9 in Raleigh

Zone 2

14 Operational BellSouth Switches
- 3 in Ashville
- 3 in Wilmington
- 8 in Winston-Salem

CLEC-NORTH CAROLINA

Zone 1

17 Operational CLEC Switches
- 9 in Charlotte
- 3 in Greensboro
- 5 in Raleigh

18 Future CLEC Switches
- 6 in Charlotte
- 7 in Greensboro
- 5 in Raleigh

Zone 2

2 Operational CLEC Switches
- 1 in Wilmington
- 1 in Winston-Salem

2 Future CLEC Switches
- 1 in Asheville
- 1 in Wilmington

Operational CLEC Switch Data as of April 29, 1999
Future CLEC Switch Data as of April 21, 1999
Operational BellSouth Switch Data as of May, 1999

BELLSOUTH-SOUTH CAROLINA

Zone 1

12 Operational BellSouth Switches
- 12 in Columbia

Zone 2

21 Operational BellSouth Switches
- 9 in Charleston
- 7 in Greenville
- 5 in Spartanburg

CLEC-SOUTH CAROLINA

Zone 1

3 Operational CLEC Switches
- 3 in Columbia

1 Future CLEC Switch
- 1 in Columbia

Zone 2

4 Operational CLEC Switches
- 1 in Charleston
- 3 in Greenville

4 Future CLEC Switches
- 2 in Charleston
- 1 in Greenville
- 1 in Spartanburg

Operational CLEC Switch Data as of April 29, 1999
Future CLEC Switch Data as of April 21, 1999
Operational BellSouth Switch Data as of May, 1999

BELLSOUTH-TENNESSEE

Zone 1

34 Operational BellSouth Switches
- 16 in Memphis
- 18 in Nashville

Zone 2

17 Operational BellSouth Switches
- 11 in Chattanooga
- 6 in Knoxville

CLEC-TENNESSEE

Zone 1

12 Operational CLEC Switches
- 5 in Memphis
- 7 in Nashville

5 Future CLEC Switches
- 1 in Memphis
- 4 in Nashville

Zone 2

4 Operational CLEC Switches
- 1 in Chattanooga
- 3 in Knoxville

1 Future CLEC Switches
- 1 in Chattanooga

Operational CLEC Switch Data as of April 29, 1999
Future CLEC Switch Data as of April 21, 1999
Operational BellSouth Switch Data as of May, 1999

ATTACHMENT E

Before the

FEDERAL COMMUNICATIONS COMMISSION

Washington, D. C. 20554

In the Matter of	)	
Implementation of the Local Competition Provisions	)	CC Docket No. 96-98
of the Telecommunications Act of 1996	)	

AFFIDAVIT OF W. KEITH MILNER

ON BEHALF OF BELLSOUTH TELECOMMUNICATIONS, INC.

I, W. Keith Milner, being of lawful age, and duly sworn upon my oath, do hereby depose and state:

1. My name is W. Keith Milner. My business address is 675 West Peachtree Street, Atlanta, Georgia 30375. I am Senior Director - Interconnection Services for BellSouth Telecommunications, Inc. ("BellSouth"). I have served in my current role since February 1996 and have been involved with the management of certain issues related to local interconnection and unbundling.

2. I graduated from Fayetteville Technical Institute in Fayetteville, North Carolina in 1970 with an Associate of Applied Science in Business

Administration degree. I graduated with a Master of Business Administration Degree from Georgia State University in Atlanta, Georgia in 1992.

3. My business career spans over 29 years and includes responsibilities in the areas of network planning, engineering, training, administration, and operations. I have held positions of responsibility with a local exchange telephone company, a long distance company, and a research and development company. I have extensive experience in all phases of telecommunications network planning, deployment, and operation in both the domestic and international arenas.

4. The purpose of my affidavit is to reconfirm for the Commission that BellSouth has adequate procedures in place to accommodate the cutover of end-users from BellSouth to CLECS, including AT&T, and to respond to comments filed in this docket by AT&T regarding the cutover process.

5. The requirements necessary to process a local service request (LSR) to establish, change, or disconnect a port/loop combination can be found in the Local Exchange Ordering (LEO) Implementation Guide for electronic ordering. Additionally, BellSouth has provided AT&T with AT&T-specific supplemental information intended to more fully relate BellSouth's processes to AT&T's processes to the degree that AT&T has been willing to share knowledge of their processes. Further, BellSouth has expressed its willingness to modify these guides as CLECs, including AT&T, identify operational gaps or efficiencies which could be achieved.

6. The process of cutovers for end-user services is a complex process requiring the attention of various skilled specialties. Constant attention to

staffing, training, and process conformance is required to assure that cutovers occur without undue disruption to the service being received by end-users. Yet, BellSouth's efforts to discuss possible improvements have often been met with indifference, despite AT&T's professed commitment to quality improvement procedures in all of its processes. For example, AT&T's personnel failed to attend a scheduled meeting of the Ordering and Provisioning Process Improvement Team as recently as Friday, January 29, 1999. This cancellation occurred without prior notification to affected BellSouth personnel and without AT&T offering a satisfactory explanation for its failure to attend.

7. Another example of the adversarial attitude BellSouth often encountered in dealing with AT&T is typified by a training request from AT&T for its ALS (AT&T Local Service) Work Center in Denver. The ALS Work Center requested training from BellSouth in order to improve the Work Center's processes and interactions with BellSouth's centers. BellSouth provided the requested training in early January 1999. Yet on January 26, 1999, AT&T's Carrier Relations Team in Atlanta wrote BellSouth complaining, not about the quality of the training, but rather that the training had occurred at all. BellSouth is mystified as to why AT&T would complain that BellSouth had provided the very training requested by AT&T.

8. In March, BellSouth recommended, and AT&T (ALS) Denver Work Center managers accepted, a joint process improvement initiative. On April 12, 1999, BellSouth received correspondence from Frank Ianna, President-Network Services, AT&T, to Charles Coe, President, BellSouth Telecommunications, Inc. Mr. Ianna requested BellSouth's cooperation in

reviewing all processes and procedures, from order entry through provisioning, with a particular emphasis on the process of cross-connecting a customer's unbundled loop to AT&T's switch and simultaneously porting the customer's local telephone number. BellSouth personnel made previously scheduled trips and attended meetings on April 15-16 and 20-22 with two separate groups in AT&T's Denver Work Center to address the very same ordering and provisioning issues raised in Mr. Ianna's letter. Action items for both companies were developed which pointed toward a truly cooperative effort at process improvement. Following the meeting, BellSouth developed responses to its action items, including specific commitments for BellSouth deliverables aimed at eliminating a major provisioning roadblock, and forwarded them to AT&T's Carrier Relations Team in Atlanta. BellSouth discovered one week later that those responses had not been forwarded by AT&T to its Denver location for review and action by the Work Center personnel knowledgeable in operational issues and affected by any change of operational procedures.

9. As discussed in the preceding paragraph, BellSouth developed a list of action items about BellSouth's process for review by AT&T. The BellSouth Account Team has attempted to gain AT&T's commitment to develop documentation of AT&T's internal process flow for review by BellSouth. To this date, it has not been received. Further, in attempting to develop an agenda for a follow-up meeting, the AT&T representative declined to put AT&T's process on the agenda for discussion and proposed that only BellSouth's process be discussed. Such an attitude

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clearly stifles significant progress in resolving issues. It is common knowledge among those trained in quality measures that process improvement initiatives cannot move forward without all parties understanding and documenting what procedures are currently in place so that gaps, wherever they may be, can be identified and corrected. It is clear that Mr. Ianna's enthusiasm for process improvement efforts have not yet permeated to all levels of AT&T's organization.

10. The improvement review process requested by Mr. Ianna is underway, so BellSouth is disappointed to encounter the negative tone expressed regarding the hot cut process even in the comments AT&T filed in this proceeding. Despite AT&T's assertions, BellSouth's processes are quite capable of handling present and forecasted volumes of orders. However, the successful handling of a volume of orders not only requires BellSouth's systems and personnel to be ready, but also those of affected CLECs, including AT&T. In the month of April 1999, BellSouth processed four and one-half times as many orders for the largest CLEC in BellSouth's region than for AT&T, and three times as many as for the second largest CLEC than for AT&T. Also during April 1999, BellSouth cutover 70% of all CLEC orders requiring conversion within five (5) minutes, over 88% within 15 minutes, and all orders were cutover in an average of 6.94 minutes. For one CLEC's orders (which is not AT&T), 83% were cutover within five (5) minutes, 98% within 15 minutes, and all orders in an average of 3.30 minutes. Three things are revealed from a reading of these numbers. First, a high percentage of all CLEC conversion orders in the BellSouth Region are being satisfactorily

handled. Second, AT&T's relatively small volume of orders may limit the ability of its personnel to gain the needed experience to learn either AT&T's or BellSouth's processes well enough to handle orders in an error-free manner. Third, as the results of the other CLEC cited above indicate, BellSouth's processes can work well when utilized by a CLEC who is active in the market with a significant volume, processes orders daily, and devotes time and attention to process improvement and conformance.

11. Despite AT&T's assertion throughout its comments that it is interested in the "broad-scale mass-market", the hot-cut process assailed by AT&T is really focused on handling the medium to large size business market that typically involves designed loops. Designed loops, as the name implies, involves more complex services than non-designed loops that are more easily handled by routine procedures. Furthermore, given the complexity of transitioning designed loops that serve banks, advertising agencies, automobile dealerships, and governmental entities, it is not surprising that AT&T is able to cite anecdotal cases of unsuccessful cutovers. However, it is not valid to assume that cutovers of true mass-market customers, that is, for example, the residential market, would encounter the same level of difficulty.

12. I take issue with AT&T's assertion that there will be large fluctuations in demand in an environment of widespread geographic competition. The underlying view espoused by Mr. Pfau in his affidavit at paragraphs 69-70 is not supported by any evidence and is contrary to the nature of service order processing as I have experienced it. Customers are won or lost one at a time. Further, effective organizations must hire and train its sales and

support personnel one at a time. As they come on line, volume can increase. So any change in demand will typically occur on a gradual basis. BellSouth is very accustomed to increasing its own staffing as demand increases. Of course, there have been and will continue to be seasonal demand peaks with which BellSouth and other service providers, including AT&T, have contended for years. This is certainly not a new phenomenon of local service competition.

13. Likewise, Mr. Pfau is erroneous in his assumption that BellSouth can not respond to CLEC cutover orders in small or rural offices. Local service requests (LSRs) requiring cutover activity are not a surprise to BellSouth managers. Present procedures require BellSouth to provide CLECS with firm order confirmations (FOCs) showing the due date. Also, end-users with complex services, that is, those most likely to require a coordinated cutover, typically place their orders with CLECs well in advance of their desired due date for reasons of their own preparedness. Given this routine advance information, BellSouth can and has readily dispatched its work forces to those locations where cutover orders are scheduled.

14. On page 95, AT&T asserts that incumbent LEC technicians take steps to electronically reassign or "port" the customer's telephone number from the incumbent LEC's switch to the CLEC's switch. While BellSouth's technicians pass information to NPAC (Number Portability Administration Center) to set up the port, it is the CLEC that has responsibility for sending the final message that completes the cutover. Thus, it is the CLEC's responsibility to assure that everything is in place before sending this final message.

15. AT&T makes an incorrect assumption on page 104 of its comments when it states that ILECs do not typically physically remove facilities when a customer moves from one location to another. End-users often move from one central office service area to another central office serving area. This requires the disconnection of service for the old location, the connection of service to the new location, and the coordination of the activities for both locations in a process comparable to a hot cut. To make the most efficient use of its facilities, BellSouth balances the cost of extra facilities against the expenses of physical disconnection and reconnection. Here again, this practice is certainly not new to the environment of local competition.

16. On pages 97-98 of its comments, AT&T complains about a lack of market information and the difficulty of determining locations for its switches. CLECs interested in entering the communications business must determine their own strategies and market areas. Other CLECs seem to be moving ahead with switch installations with great confidence. As of the end of May 1999, 161 CLEC switches were in operation in the BellSouth Region with another 122 forecasted by the CLECs to be in operation by the end of 1999.

17. AT&T suggests on pages 98-99 of its comments that prior decisions by the Commission regarding shared transport are somehow applicable to issues related to the unbundling of local switching. Regrettably, aside from repeating quotes from the shared transport decisions, AT&T offers no evidence to support its position. The shared transport decisions merely reduced the CLECs need for dedicated transport in some cases.

18. AT&T's footnote at the bottom of page 104 clearly reveals AT&T's strategy of posturing the cutover process as being unmanageable. AT&T is correct that an ILEC would be fully aware of its own upcoming major cutovers. AT&T than states that the ILEC would not know of a CLEC's upcoming major cutovers until a few days in advance. In the situation described in the footnote, the ILEC will know of upcoming CLEC cutovers if the CLEC informs the ILEC of its plans in a timely fashion so that cutover teams or project managers from both companies can plan for the demands such a cutover places on the entire interdependent process. If the CLEC does not approach any cutover with a proactive, positive attitude and process, that CLEC will encounter difficulties regardless of the completeness of any set of methods and procedures developed by ILECs or CLECs.

19. Another example of AT&T's over-dramatization of perceived problems with the hot-cut process is its assumption on page 105 of its comments that all media reports of cutovers encountering problems will be attributed to the CLECs. The reality of modern media reporting is that both ILECs and CLECs might be criticized when end-users encounter out-of-service conditions, regardless of who might be at fault in a particular instance.

20. At paragraph 53 of Mr. Pfau's affidavit and in AT&T's comments on page 106, reference is made to alleged service outage complaints in Florida which AT&T claims were "apparently" caused by BellSouth's hot cut procedures. Since AT&T provided no further details, BellSouth is unable to provide a definitive response. BellSouth's AT&T Account Team was informed that there had been service complaints, but no specific details were offered. No request for a root cause analysis was made as it

typically done in such cases. When an outage is attributable to a gap in procedures, BellSouth's quality reviews ensure a prompt fix to avoid similar occurrences in the future.

21. This concludes my affidavit.

I hereby swear that the foregoing is true and correct to the best of my information and belief.

W. Keith Milner
Senior Director-Interconnection Services
BellSouth Telecommunications, Inc.

Subscribed and sworn to before me this 9th day of June, 1999.

Notary Public

GUY P. DIEZ
NOTARY PUBLIC DEKALB COUNTY GEORGIA
MY COMMISSION EXPIRES FEBRUARY 10, 2003

EXHIBIT AJV-2

Joint Reply Comments of Ameritech, BellSouth, SBC Communications Inc., and the United States Telephone Association on the Limiting Standards of Section 251(d)(2)

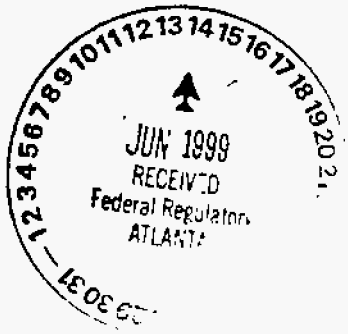
Dated May 26, 1999

CC Docket No. 96-98

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OFFICE OF THE SECRETARY

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Implementation of the Local Competition Provisions in the Telecommunications Act of 1996	)	CC Docket No. 96-98
	)	



JOINT REPLY COMMENTS OF AMERITECH, BELLSOUTH, SBC COMMUNICATIONS INC., AND THE UNITED STATES TELEPHONE ASSOCIATION ON THE LIMITING STANDARDS OF SECTION 251(d)(2)

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EXECUTIVE SUMMARY

A number of CLEC commenters ask the Commission to ignore congressional intent, the plain language of section 251(d)(2), and the Supreme Court's opinion. These commenters would have the Commission readopt – and even expand – its prior list of UNEs without engaging in the careful analysis that, as the Supreme Court expressly held, section 251(d)(2) requires. They would have the Commission ignore the overwhelming evidence of available alternatives to the ILEC network – even though the Court commanded the Commission to consider these options. And they would even have the Commission accept *any* increase in cost or decrease in quality as satisfying section 251(d)(2) – despite the fact that the Court expressly condemned this approach.

It should go without saying that the Commission cannot abdicate its responsibility to comply with the Supreme Court's mandate. The Commission must adopt a meaningful limiting standard that comports with the Court's opinion and furthers the goals of the 1996 Act. The Commission must then reevaluate *each* network element individually in light of that standard as applied to current market facts.

Ameritech Corporation, BellSouth Corporation, SBC Communications Inc., and the United States Telephone Association ("USTA") submit these joint reply comments to discuss seven limiting principles that the Commission must follow in articulating the standard for unbundling under section 251(d)(2). Each of the companies will also file separate reply comments on the application of section 251(d)(2) to individual network elements.

First, and most importantly, the proper focus of the Commission's inquiry must be on consumer welfare. The preamble to the 1996 Act states that any regulation promulgated under the Act must "promote competition and reduce regulation to secure lower prices and higher quality service for American telecommunications consumers and encourage the rapid deployment of new

telecommunications technologies." Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56, at Preamble, *codified at* 47 U.S.C. §§ 151 *et seq.*

To further Congress's goal, then, the Commission must apply a limiting standard that advances consumer welfare, not the welfare of individual competitors. Despite this clear edict, several CLEC commenters ask the Commission to unbundle network elements to maximize the number of competitors, regardless of how inefficient they are or how eccentric their business plans. In the natural course of a competitive market, however, inefficient carriers will lose business to efficient carriers and eventually drop out of the market. Allowing inefficient carriers to set the benchmark for unbundling will distort this process. Under the CLECs' approach, the most inefficient carrier in existence can set the pace by which an entire market is unbundled; an inefficient carrier, which should otherwise be driven from the market, may obtain unbundled access if it would be impaired without it, even though the impairment is caused by the carrier's own inefficiencies. To state the theory is to dismiss it; section 251(d)(2) is hardly a limit if it can be distorted in this fashion.

Congress's stated purpose also requires the Commission to consider the costs of excessive unbundling, particularly in terms of its effect on "the rapid deployment of new telecommunications technologies." An excessive unbundling requirement will chill all carriers' incentives to invest and innovate. A CLEC will not risk a large investment in facilities when it can instead free-ride on the investments of ILECs. And ILECs themselves will lack the incentive to innovate and upgrade their networks because the fruits of that effort must be shared. This chilling effect is particularly severe when applied to new technologies, which involve greater risk. There are also administrative costs associated with unbundling, including the costs of establishing and overseeing the unbundling requirements. Because of these costs, more unbundling does not

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mean more competition; in fact, it means just the opposite. If investment and innovation are hampered, consumers suffer with fewer choices, higher prices, and inferior quality.

These two incontrovertible and fundamental principles require the Commission to implement an unbundling requirement based on the needs of efficient competitors. The Commission has used this benchmark in the past – in devising its nondiscrimination standards and adopting the TELRIC pricing requirement – and it must do so again here to adhere to the 1996 Act and its stated purposes. Focusing on what efficient competitors need to compete is a surrogate for focusing on consumer welfare because competition among efficient competitors drives down prices, improves quality and service, and introduces new and innovative products. This approach also yields the optimal amount of unbundling, which further benefits consumers. An unbundling requirement that looks to what efficient competitors need in order to have a meaningful opportunity to compete will encourage facilities-based investment and innovation where alternatives to entry exist, while at the same time allowing access to network elements where they do not.

Second, and in the same vein, the Commission must reject the attempts by CLECs to compel the unbundling of UNEs even in areas and for services where alternatives are clearly available to efficient competitors. Several commenters ask the Commission to require UNEs ubiquitously as long as they are needed by any CLEC, in any area of the country, for any class of customers. To accept the proposition that UNEs must be available *everywhere*, the Commission must adopt the counterfactual view that there are no efficient providers of non-ILEC network elements *anywhere*. The Commission would therefore have to turn a blind eye to the competitive viability of a multitude of CLECs throughout the country that are successfully self-providing network elements or obtaining them from non-ILEC third parties. The Commission cannot, of course, ignore this factual record. To do so would violate the fundamental tenets of administrative

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law. It would also flout the Supreme Court's opinion and congressional intent. Actual CLEC success using non-ILEC network elements is conclusive proof that an alternative is viable; to mandate unbundling in these markets would flatly violate section 251(d)(2) and thwart the purposes of the Act. Mandating unbundling where it is not necessary will stifle innovation and investment, and consumers will pay the price for the regulatory excess.

Third, the Commission should reject attempts to bootstrap elements on the 319 list based on the alleged desirability of the UNE platform or other combinations. The Supreme Court opinion requires the Commission to evaluate elements for compliance with section 251(d)(2) on an element-by-element basis. Commenters that ask the Commission to evaluate elements in combination with other network elements mock the Court's opinion and the purposes of the Act. Taken to its ultimate conclusion, this approach would impede the evolution of a competitive market for *any* network element until *all* network elements are competitively provided. Thus, even when an element can be self-provided or obtained from non-ILEC sources, these commenters would insist on unbundling as long as some other network element must be unbundled. Under this methodology, competition will never develop because the entire ILEC network will be shared and no carrier (ILEC or CLEC) will have the incentive to innovate and invest. Section 251(d)(2) and the 1996 Act will not condone such a result.

Fourth, the section 271 checklist is irrelevant to the section 251(d)(2) inquiry. Nothing in section 271 absolves the FCC of its responsibility to implement the section 251(d)(2) standard. Indeed, reading section 251 to require unbundling for the same elements listed in section 271 would render the list in section 271 itself meaningless because section 271(c)(2)(B)(ii) already requires that section 251(c)(3) UNEs must be provided under UNE terms.

Fifth, section 251(d)(2) is a minimum threshold that must be met before any network element is unbundled; "other considerations" may not override this plain language or the Court's

interpretation of it. The Supreme Court held that section 251(d)(2) applies a limiting standard, and the Court's holding makes no sense if this limit can be trumped by other factors. Moreover, the purposes of the Act would be undermined by such an approach. Section 251(d)(2) assures that unbundling is required only when doing so advances, not retards, consumer welfare. Debilitating this screening function by allowing other considerations to override it would inhibit innovation and harm consumers. Accordingly, this interpretation must be rejected as inconsistent with the language and purpose of the Act.

Sixth, the Commission must reject commenters' efforts to undercut Congress's special protection of proprietary elements. Although many CLECs campaign for an unbundling rule that would provide access to proprietary elements anytime the proprietary element is not disclosed, section 251(d)(2) says nothing about disclosure. It speaks to "access" and allows that access only when "necessary." To force sharing under the loose standard advocated by CLECs would not only contradict this plain language, it would destroy the incentives of ILECs to develop proprietary elements in the first place, which is certainly at odds with Congress's intent.

Seventh, the Commission cannot reinstate its rules on new network element combinations and/or its rules regarding superior quality interconnection and access. To do so would violate the Eighth Circuit's holding in *Iowa Utilities Board v. FCC*, 120 F.3d 753 (8th Cir. 1997), and that holding remains the law. Neither the Commission nor any other party sought review of the Eighth Circuit's holding in the Supreme Court, and the Supreme Court properly declined to consider a challenge to these rules. And nothing in Supreme Court's ruling calls the Eighth Circuit's decision into question.

Before the
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Washington, D.C. 20554

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JOINT REPLY COMMENTS OF AMERITECH, BELLSOUTH, SBC COMMUNICATIONS INC., AND THE UNITED STATES TELEPHONE ASSOCIATION ON THE LIMITING STANDARDS OF SECTION 251(d)(2)

The Supreme Court's decision requires the Commission, in implementing section 251(d)(2), to establish meaningful limitations on unbundling that are "rationally related to the goals of the Act." *AT&T Corp. v. Iowa Utils. Bd.*, 119 S. Ct. 721, 734 (1999). Despite the importance and clarity of the Court's holding, several commenters have tried to trivialize it. *See, e.g.*, AT&T at 4-6 (characterizing the Court's opinion as "extremely narrow" and "technical"); Sprint at 5 (Court remanded the UNE issue on "very narrow grounds"); MCI WorldCom ("MCI") at i (Commission has a "very narrow task"); *id.* at 2 (Commission's order was vacated on a "narrow ground").

These commenters urge the Commission to reestablish, and even expand, its prior list of UNEs without engaging in any of the analysis that, as the Court expressly held, section 251(d)(2) requires. Thus, AT&T wants the Commission to adopt the very *de minimis* test for unbundling *rejected* by the Supreme Court. *See* AT&T at 9 ("in these industry conditions, *any* increase in the cost of service or decrease in its quality or scope that results from a LECs' denial of access would defeat the objectives of the Act, even if it were certain that CLECs would nonetheless

enter on the same scale and at the same time") (emphasis added). Sprint, without bothering with any test, simply claims that the Court assumed that network elements would be "unconditionally available." Sprint at 7. Other CLECs' comments are to the same effect. *See, e.g.*, GSA at 3-5; KMC at 3-5; Prism at 2-4. They all want the prior list of UNEs readopted, along with a wish list of additional items, but without any serious analysis by the Commission of competitive alternatives.

This way lies reversal. However beguiling, the Commission must stop its ears to the Sirens' song of those who would purport to absolve the Commission of its responsibility to grapple seriously both with the need for a limiting standard and with the application of that standard to complex market facts. The Commission *must* establish a limiting standard that comports with the purposes of the Act and that requires something more than "*any* increase in cost (or decrease in quality)" as a condition of unbundling.[1] And the Commission *must* consider "the availability of elements outside the incumbent's network." 119 S. Ct. at 735. That means, at a minimum, that the Commission must look at the ability of efficient CLECs to compete either through self-provision or by obtaining the required element from a third-party.

It follows that facts are critical to the Commission's remand inquiry. Yet facts are precisely what most CLEC commenters so steadfastly ignore. The ILECs and USTA have

[1] Commenters that simply insert the word "material" before the Commission's prior standard (*i.e.*, a "material increase in cost" or a "material decrease in quality"), *see, e.g.*, CompTel at 2, 9-13; MCI at 4, 23-26; Cable & Wireless at 10-16; Focal at 4, but ask the Commission reflexively to readopt its prior list of UNEs miss the point of the meaningful review the Supreme Court's opinion requires. Whether a decrease in quality or increase is cost is "material" depends on whether an efficient competitor is denied a meaningful opportunity to compete. As discussed *infra*, the efficient competitor must be the benchmark for any standard pursuant to section 251(d)(2) – including a "materiality" standard – because allowing an analysis to be based on any one carrier's impairment would render section 251(d)(2) meaningless. That is, section 251(d)(2) would impose no meaningful limit if it is satisfied as long as one carrier somewhere in the country, no matter how inefficient or idiosyncratic its business practices, is impaired (materially or not). Obviously, at least one such carrier exists in every market, making such a standard as meaningless as the one the Court rejected.

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submitted a detailed factual report that looks at every proposed network element and attempts to show where CLECs are already self-provisioning that element and where they are obtaining it from third parties. The CLECs have not presented anything remotely comparable. Because these very facts are best known to the CLECs themselves, who are actually using these alternative sources of supply, their silence speaks volumes.

The CLECs know that many network elements are freely available from sources other than ILECs, particularly in urban areas. Yet they want the benefits of the UNE platform at TELRIC pricing. So they have ignored the facts and urged upon the Commission a "least common denominator" approach that would mandate unbundling everywhere simply because some CLEC somewhere conceivably might need the element in question. They have also attempted to establish an alleged need for the UNE-platform as a way of bootstrapping all the individual elements within it. Neither approach is sustainable. The Commission, like all agencies, must consider the factual record before it. And those facts unmistakably require the Commission to reject the CLECs' attempts to undermine the Court's opinion.

The Commission must establish a meaningful limiting standard on unbundling that comports with the Act and the Court's opinion. The Commission must then reevaluate *each* network element individually in light of that standard as applied to current market facts. There is no shortcut.

I. The Proper Focus of the Commission's Inquiry Must Be on Consumer Welfare

The Commission must begin its inquiry under section 251(d)(2) by considering the goals of the 1996 Act. *See* 119 S. Ct. at 734 (the FCC must apply a limiting standard "rationally related to the goals of the Act").[2] Those goals are plainly stated in the Act's preamble: to

[2] *See also Director, Office of Workers' Compensation Programs v. Newport News Shipbuilding & Dry Dock Co.*, 514 U.S. 122, 136 (1995) ("Every statute proposes, not only to achieve certain ends, but also to

"promote competition and reduce regulation to secure lower prices and higher quality service for American telecommunications consumers and encourage the rapid deployment of new telecommunications technologies." Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56, at Preamble, *codified at* 47 U.S.C. §§ 151 *et seq.* Congress's express statement of purpose has two implications for a proper interpretation of section 251(d)(2).

First, the Preamble to the 1996 Act makes clear that Congress's goal is to benefit "American telecommunications consumers," not individual competitors. Consumers benefit from competition, which leads to lower prices and more innovation. But the interests of consumers cannot be equated with those of individual competitors, and consumers certainly do not benefit when inefficient competitors are subsidized at the expense of true competition. The focus of the Commission's inquiry has to be on the needs of efficient competitors (who promote competition), not inefficient competitors (who should not be in the market because they cannot offer the same quality, service, or prices as efficient competitors).

Despite this clear purpose, several commenters ask the Commission to interpret section 251(d)(2) to maximize the number of individual competitors, regardless of how inefficient they are or how idiosyncratic their business plans. *See, e.g.*, AT&T at 6-7 (emphasizing that, while elements would only be "required . . . to fill in gaps in [the] networks" of major CLECs, elements would also be necessary "for any other CLECs who wish to offer comparable service"); ALTS at 34 (arguing that "251(d)(2) standards must be applied in a manner that considers and makes possible UNE entry by large and small competitors alike and does not close the door on

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achieve them by particular means."); *Holloway v. United States*, 119 S. Ct. 966, 975 (1999) (Scalia, J., dissenting) ("[E]very statute intends not only to achieve certain policy objectives, but to achieve them by the means specified. Limitations upon the means employed to achieve the policy goal are no less a 'purpose' of the statute than the policy goal itself.").

new local entrants"). Sprint baldly suggests that unbundling should be required as long as *any* carrier (efficient or inefficient) would be impaired without it. Sprint at 22, 25.

Yet, in the natural course of a competitive market, inefficient carriers will lose business to efficient carriers and eventually drop out of the market. Allowing inefficient carriers to set the benchmark for unbundling will distort this process. Under the CLECs' approach, the most inefficient carrier in existence can set the pace by which an entire market is unbundled. That is, an inefficient carrier, which should otherwise be driven from the market, may obtain unbundled access if it would be impaired without it, even though the impairment is caused by the carrier's own inefficiencies. To state the theory is to dismiss it; section 251(d)(2) is hardly a limit if it can be distorted in this fashion. It is hard to imagine a market that does not have at least one inefficient competitor, on the brink of exit because of that inefficiency, that could last a little longer with unbundled access at TELRIC prices.

Such an approach, while helpful to the inefficient competitor, would be harmful to competition and consumers. Because they are inefficient, these competitors are unable to self-provide network elements at TELRIC, which – by definition – is the price at which an ILEC's network could be replicated using its wire center locations and the most *efficient* technology available. Thus, allowing inefficient competitors unbundled access at TELRIC is a form of subsidy that props up an inefficient CLEC that should not be in the market at all because it cannot offer the same quality, prices, or services as efficient competitors. Such subsidies, therefore, extend the market life of these inefficient carriers, which harms consumers by preventing true, efficient competition from developing. *See Marrese v. American Academy of Orthopedic Surgeons*, 706 F.2d 1488, 1497 (7th Cir. 1983) (Posner, J.) ("The policy of competition is designed for the ultimate benefit of consumers rather than of individual

competitors"); 119 S. Ct. at 754 (Breyer, J., concurring in relevant part) ("Regulatory rules that go too far, expanding the definition of what must be shared beyond that which is essential to that which merely proves advantageous to a single competitor, risks costs that in terms of the Act's objectives, may make the game not worth the candle"); Bell Atlantic Kahn Decl. at 3 [¶ 5] ("[T]he Commission must be guided above all other considerations by the goal of promoting efficient and dynamic competition in the service of the consuming public, rather than the fostering or protecting of individual competitors, as such. There is no economic principle, or principle of antitrust policy, more fundamental than the distinction between these two goals, whenever the two conflict.").[3]

Several commenters ask the Commission to "jumpstart" competition and encourage "rapid" entry of competitors. *See, e.g.*, MCI at 24 ("[i]n unbundling network elements, the Commission should also consider whether unbundling will help CLECs jumpstart local competition"); AT&T at 59 (the Commission must advance the Act's objective of "rapidly" fostering competition); CompTel at 1-2 ("The central question for the Commission in determining whether to mandate the availability of a UNE should be whether the UNE will promote the rapid development of competition by a multitude of providers."); Covad at iii (the Commission should promote "the rapid deployment of competitive telecommunications services").

These requests – which the CLECs seek to ground in the goals of the Act – are nothing but a smokescreen. CLECs' desire for "rapid" entry of as many CLECs as possible is simply another way of asking for the advancement of individual competitors, no matter how inefficient they may be. Rapid entry, on its own, does nothing to advance competition. If all the

[3] *See also* USTA Hausman & Sidak Aff. at 44-45, 51 [¶¶ 56-57, 66] (discussing consumer welfare versus competitor welfare).

competitors entering the market are inefficient and lack the incentive to deploy their own facilities and innovate, consumers will not benefit from the influx of carriers. The purpose of the Act is not simply to increase the number of competitors – it is to lower entry barriers and advance competition. This does not take place overnight, but it will take place in short order if the Commission allows the market to operate.[4] Indeed, local competition is already advancing faster than long distance competition. *See* UNE Fact Report at III-17. And no CLEC has demonstrated that it is would expand more rapidly but for UNE availability. Artificially flooding the market with new entrants – no matter how inefficient – does nothing to advance competition or benefit consumers. Instead, it distorts incentives and slows true competition from emerging.

Second, Congress's stated purpose requires the Commission to consider the costs of excessive unbundling, particular in terms of its effect on "the rapid deployment of new telecommunications technologies."

The biggest danger posed by too much unbundling is the chilling effect it has on *all carriers'* incentives to invest and innovate.[5] A CLEC will not risk a large investment in facilities when it can free-ride on the investments of others. *See* 3A Phillip Areeda & Herbert Hovenkamp, *Antitrust Law* ¶ 773c at 209 (1996) (unbundling will reduce an entrant's incentives to enter the market by other means); *id.* ¶ 771b, at 175 (when the government forces a company to "provide [a] facility and regulat[es] the price to competitive levels, then the [prospective entrant's] incentive to build an alternative facility is destroyed altogether"); Brief of *Amici*

[4] Moreover, lowering entry barriers – even without entry itself – constrains incumbents because the threat of entry prevents the exercise of market power. The Commission has already recognized that an incumbent is constrained by market entry that is likely to occur within two years. Memorandum Opinion and Order, *Application of WorldCom, Inc. and MCI Communications Corp. for the Transfer of Control of MCI Communications Corp. to WorldCom, Inc.*, 13 FCC Rcd 18025, 18084-85 [¶ 105] (1998). And MCI's expert economist cites with approval the Department of Justice establishing this same benchmark. MCI Kwoka Decl. at 4 [¶ 10].

[5] *See also* USTA Jorde, Sidak, & Teece Aff. at 35-36 [¶¶ 50-53].

Curiae The Hon. John D. Dingell, *et al.* at 16, *AT&T v. Iowa Utils. Bd.* (filed S. Ct. Nov. 15, 1996) ("As long as they can accumulate risk-free profits with minimal investment, competitors will not build their own networks to provide competing services."). CLECs that have already deployed their own facilities – and there are a multitude of such companies – will be at a competitive disadvantage because other CLECs can secure the same facilities from ILECs at lower regulated prices. Thus, as one such company, Cox, explains, "the Commission should be careful to avoid policies that unintentionally encourage the use of UNEs, which could distort economic incentives and discourage beneficial facilities-based competition." Cox at ii.

And ILECs themselves will lack the incentive to innovate because the fruits of that effort must be shared. 119 S. Ct. at 754 (Breyer, J., concurring in relevant part) ("A sharing requirement may diminish an original owner's incentive to keep up or to improve the property by depriving the owner the fruits of value-creating investment, research, or labor"); Bell Atlantic Kahn Decl. at 3 [¶ 6] (noting that it is an "elementary fact that the more liberal" the definition of unbundling, "both in scope and in time (and the lower the mandated price), the less the incentive for facilities-based entry *and* for creative investment by incumbents and entrants alike").

The potential social costs of unbundling are particularly severe when applied to new technologies, such as broadband facilities. Because the deployment of new technology is inherently more risky, CLECs will have an even greater disincentive to incur the risk of such deployment when they can instead free-ride off ILECs. And the flip-side is that ILECs will lack the incentive to take a risk because they will bear the full brunt of all failures while reaping little, if any, of the reward for their successes. Thus, excessive unbundling of new technologies and facilities plainly conflicts with Congress's intent "to accelerate rapidly private sector deployment

of advanced telecommunications and information technologies."[6] It is for this reason that the Commission has pursued a consistent policy of *not* regulating innovative services offered in competitive markets.

Indeed, AT&T itself has recognized these economic forces. Its own CEO fiercely objected to a cable unbundling requirement on the ground that "[n]o company will invest billions of dollars to become a facilities-based . . . services provider if competitors who have not invested a penny of capital nor taken an ounce of risk can come along and get a free ride on the investments and risks of others."[7] And the company's actions speak even louder than its words. It recently announced that it will not provide its @Home Internet service or other advanced services over its cables in Portland, Oregon because a judge there recently ordered open access to AT&T's cable platform.[8]

The disincentive effect of a forced sharing rule is firmly grounded in economic theory, law, and common sense. Yet some commenters dispute it. For example, AT&T, in flat contradiction to its own behavior and admissions, claims that "the availability of network elements will have *no effect on any CLEC's incentives* to deploy alternative facilities as soon [as] it is technically and economically possible to do so at a cost that is at all close to the LECs' prices for network elements." AT&T at 11-12 (emphasis added). AT&T further believes that "access to [the incumbent] LEC network element can *only* advance and *never retard* the 1996 Act's objectives." *Id.* at 21 (emphasis added). These observations are impossible to square with

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[6] H.R. Conf. Rep. No. 104-458, at 1 (1996).

[7] *Telecom and Cable TV: Shared Prospects for the Communications Future*, Remarks of C. Michael Armstrong, Chairman and CEO, AT&T, delivered to Washington Metropolitan Cable Club, Washington, D.C. (Nov. 2, 1998) (emphasis added).

[8] *Other Cities May Impose Open Access After Portland Decision*, Communications Daily, June 8, 1999, at 3.

economic theory, actual market practice, and AT&T's actions. It may well be that, *all things being equal*, a new entrant would prefer to use its own facilities, but other factors enter the CLEC's calculus. One such factor, as the CLECs themselves admit, is the desire to avoid committing sunk costs. *See* MCI Kwoka Decl. at 4 [¶ 11] (noting that sunk costs present a risk to the CLEC because, "[i]f entry fails, there is no opportunity to deploy such assets usefully elsewhere and thus to cushion the financial loss"). A second factor, as discussed above, is risk. With excessive unbundling, an entrant has the incentive to free-ride on its competitors' facilities, letting its competitor bear the risk of investment, while the entrant sits on the sidelines and waits for one technology or facility to emerge as the winner. Under these circumstances, the entrant will not invest in new facilities and innovation, and the incumbent will lack the incentive to make improvements because it will not reap the rewards. Thus, competition will be hampered and technological innovation will be stifled. Yet another critical factor is cost. Irrespective of whether a CLEC can make a profit with its own facilities, it will not use them if it can make a higher profit with the facilities of its competitors.

The disincentive effect on innovation and investment is not the only cost associated with unbundling. There are administrative costs as well, including the costs of establishing and overseeing the unbundling requirements. *See* 119 S. Ct. at 753-54 (Breyer J., concurring in relevant part) ("Even the simplest kind of compelled sharing . . . means that someone must oversee the terms and conditions of that sharing."). The greater the unbundling, the greater the regulatory oversight that is required to set the terms.

The costs of excessive unbundling, moreover, will not be outweighed by increased competition. "Increased sharing by itself does not automatically mean increased competition. It is in the *un*shared, not in the shared, portions of the enterprise that meaningful competition

would likely emerge. Rules that force firms to share *every* resource or element of a business would create, not competition, but pervasive regulation, for the regulators, not the marketplace, would set the relevant terms." *Id.* at 754 (Breyer, J., concurring in relevant part). CLEC requests for access to the entire ILEC network in order to be as "ubiquitous" as the ILEC, *see, e.g.*, CompTel at 30; Ad Hoc Telecommunications Users Committee at iii, 3; Net2000 at 17, 22, are nothing more than requests to ingrain regulation and stall competition indefinitely.

To be sure, not all unbundling leads to deleterious consequences. Limited unbundling is appropriate when there are no other options for market entry. The point, however, is that *more* unbundling does not mean *more* competition. "A totally unbundled world – a world in which competitors share every part of an incumbent's existing system . . . – is a world in which competitors would have little, if anything, to compete about." 119 S. Ct. at 754 (Breyer, J., concurring in relevant part).

Some commenters seek to dismiss Justice Breyer's discussion of the costs of excessive unbundling because it is contained within a separate opinion. *See, e.g.*, AT&T at 47. But Justice Breyer was not disagreeing with the Court; quite the contrary, he was explaining the rationale behind that portion of the majority's opinion that he joined. A majority of the Court – not just Justice Breyer – interpreted section 251(d)(2) to impose a limiting principle that is consistent with the Act's pro-competitive goals, which include the advancement of consumer welfare and the promotion of innovation. Thus, the effect of unbundling on those goals must – to be consistent with the Court's opinion and the Act – be considered. And while commenters seek to dismiss the messenger, they have no response to his message: excessive unbundling harms competition. This proposition is irrefutable. Indeed, the leading treatise on competition and antitrust law expressly endorses Justice Breyer's opinion and the "inescapable" logic underlying

it: "Competition requires that inputs economically capable of being supplied competitively – that is, by numerous independent sources – be supplied in that manner. Forced sharing of such inputs acts as a disincentive to producing them competitively in the first place and exacerbates and prolongs agency supervision." Areeda & Hovenkamp, *supra*, ¶ 787, at 247 (Supp. 1999).

The Commission's task, then, is to avoid excessive unbundling rules that buttress inefficient carriers and create disincentives to innovation and investment because such results are flatly at odds with the language and purpose of the 1996 Act. *See* Telecommunications Act of 1996, *supra*, at Preamble. Indeed, that is the whole point of section 251(d)(2) – to insure that unbundling is ordered only when "necessary" and/or when competition would be "impair[ed]" without it. Section 251(d)(2) imposes a limit on unbundling because unlimited unbundling would frustrate, not further, competition.

Accordingly, as even some CLECs acknowledge (*see, e.g.*, ALTS at 20), the Commission should, as it has done before, focus on what an *efficient* competitor truly needs in order to compete. The Commission properly focused on the efficient competitor in devising its nondiscrimination standard under section 251.[9] Similarly, it rejected a pricing methodology, in adopting TELRIC, that would have allowed ILECs to recover the cost of network elements based upon their existing network design and technology. According to the Commission, this would result in prices "that reflect *inefficient* or obsolete network design and technology."[10] Instead, by definition, any network element that is priced at TELRIC should be available at that same price from other, efficient sources. The Commission set its sights on the *efficient* competitor

[9] First Report and Order, *Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, 11 FCC Rcd 15499, 15660 [¶ 315] ("*Local Competition Order*"), *modified on reconsideration*, 11 FCC Rcd 13042 (1996), *vacated in part, Iowa Utils. Bd. v. FCC*, 120 F.3d 753 (8th Cir. 1997), *aff'd in part and rev'd in part sub nom. AT&T Corp. v. Iowa Utils. Bd.*, 119 S. Ct. 721 (1999).

[10] *Id.* at 15848 [¶ 684].

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because those competitors spur price decreases and innovation, improve quality and services, and increase consumer choice.

The same impetus that drove the Commission to its prior conclusions applies here as well. Focusing on the efficient competitor will yield the optimal result for consumers because it will encourage facilities-based investment where alternatives to entry exist, while at the same time allowing access to network elements where alternatives do not exist, as determined by the capabilities of efficient CLECs. This will promote competition and lead to lower prices, better products, and more efficient service and production. *See* Bell Atlantic Kahn Decl. at 4 [¶ 7a] (explaining that the public benefits from the quest of efficient competitors to achieve "differential advantage, whether because of the achievement of superior efficiencies or in the offer of superior goods and services to the public"). Thus, this approach strikes the appropriate balance and furthers the goals of the 1996 Act.[11]

II. The Commission Should Reject the Least Common Denominator Approach Advocated by the CLECs

Because the Commission must avoid excessive unbundling rules that hinder the fulfillment of the Act's objectives, the Commission must reject the attempts by CLECs to compel the unbundling of UNEs even in areas and for services where alternatives are clearly available to efficient competitors. For example, MCI WorldCom claims that a UNE must be provided ubiquitously if it is needed by any CLEC, in any area of the country, for any class of

[11] Many CLECs, while not explicitly adopting the "any carrier (efficient or inefficient)" standard, nevertheless propose standards that cannot be reconciled with the Act. For example, CompTel claims that the Commission must apply section 251(d)(2) to aid a hypothetical carrier with various attributes. CompTel at 26-27; *see also* Excel Communications at 6-7. This approach, however, would have the Commission set its policy based on the least efficient carrier with the most ambitious plans – a carrier with no facilities that seeks to serve all customers, everywhere, with no delay. The list of traits provided by CompTel has no basis in competition or the advancement of consumer welfare. Rather, it is a poorly disguised attempt to advance individual competitors at the expense of real competition. A focus on *efficient* competitors, in contrast, is directly linked to competition and consumer welfare.

customers. MCI at I, 18. AT&T makes the same claim by emphasizing the "vast areas of the country" (*i.e.*, less populated rural areas) where elements are not available competitively to provide "mass market" (*i.e.*, residential) services. AT&T at 6.

But these same CLECs implicitly or even explicitly acknowledge that there are alternatives to ILEC network elements in many other areas and for other classes of customers. Even AT&T concedes, for example, that "alternatives now exist" for loops used by large business customers. *Id.* at 15. And AT&T and other CLECs concede, as they must, that CLECs have deployed numerous switches in urban areas and have access to alternative transport in urban areas. *See e.g.*, MCI at 64 ("[W]e can self-provision transport to just over 400 ILEC end offices."); *id.* ("We also can purchase transport from other CLECs and CAPS to reach approximately 1,200 additional ILEC end offices, again often requiring ALEC multiplexing."); MCI Bryant Decl. at 11 [¶ 24] ("MCI WorldCom and other carriers are actively deploying switches in local markets across the country."); AT&T at 122 (conceding that AT&T gets 18 percent of its transport from competitive providers); Sprint Runke Decl. at 3 [¶ 8] (noting that 43% of Sprint LDD's DS3 dedicated access customers, who are able to choose their access provider, have selected a CAP). CLECs obviously do not need ubiquitous facilities to compete in these markets.[12]

What the CLECs are trying to do is deeply cynical. They cite a need for unbundling of elements to serve residential customers in rural areas so that they can obtain those elements, not to serve the rural residential customers, but to serve more lucrative urban business customers. MCI of course does not say anywhere that *it* will serve rural markets, and indeed MCI's own

[12] Indeed, as AT&T has elsewhere observed, "[a]ll firms do not need to be equal in size, quality, and number of customers for a market to be competitive." Reply Comments of AT&T at 22, *Competition in the Interstate, Interexchange Marketplace*, CC Docket No. 90-132 (FCC filed Sept. 20, 1990). The greater size of the ILEC network has no bearing on competition in a particular market.

chairman has on numerous occasions made clear his company's intent to concentrate on high-end business customers and to red-line rural markets.[13] In fact, MCI WorldCom is committed to staying *out* of residential markets. "Our strategy is not in the consumer business," the company flatly declares.[14] Most other CLECs intend to pursue similar strategies.[15] But the answer to the alleged lack of competition in the residential market or select areas of the country is not to implement a national list of UNEs that applies even in markets where there are alternatives. This defies the Supreme Court's requirement of a meaningful limiting standard and leads to excessive unbundling.

To accept the proposition that UNEs must be available *everywhere*, the Commission must adopt the counterfactual view that there are no efficient providers of non-ILEC network elements

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[13] "[N]ot AT&T, not MFS or anyone else, is going to build local telephone facilities to residential customers. Nobody ever will, in my opinion." M. Mills, *Hanging Up on Competition?*, Washington Post, June 1, 1997, at H1 (quoting Bernard Ebbers). "[O]ur focus is primarily on business customers." K. Russell, *Ebbers: WorldCom, Mississippi Paired for the Future*, Mississippi Business Journal, May 12, 1997, at 13 (quoting Ebbers).

[14] M. Mills, *WorldCom Would Shift MCI's Focus, Bidder Plans to Shed Residential Service*, Wash. Post, Oct. 3, 1997, at A1 (quoting John Sidgmore, WorldCom Vice Chairman); G.W. Woodlief, et al., Prudential Securities Inc., Co. Rpt. No. 2539124, WorldCom Inc., at 1 (Mar. 10, 1997). *See also* K. Russell, *supra*, at 13 (quoting Bernard Ebbers: "[O]ur focus is primarily on business customers."); T. J. Mullaney, *Competition Calling: Anyone There?*, Baltimore Sun, Apr. 6, 1997, at 1D (quoting Ron Vidal, WorldCom vice president for new ventures, "We don't play in residential.").

[15] "This relationship [TCG and AT&T] is primarily focused on the business market." Zach Schiller, *TCG Begins Phone Service For Cleveland Business Customers*, The Plain Dealer, Jan. 13, 1998, at 10C (quoting AT&T Chairman Michael Armstrong). "Our targets are the medium and small businesses. Why are we targeting them? Because it turns out a lot of those businesses tend to be in those 97 percent of the buildings or two-thirds of the business lines, where fiber is not there yet. We are price competitive and service competitive with fiber. But clearly we're even more competitive price-wise and service-wise in those areas where there's not fiber today. . . . It is clearly an emphasis. We will compete downtown, and we will go to business buildings downtown. It's a question of emphasis. I mean, you clearly want to go after customers first where you have the best comparative advantage." *Teligent Inc.'s Alex Mandl*, Wash. Post, Feb. 2, 1998, at F10 (quoting Mandl). WinStar's service is "tailored to the needs of business." WinStar, The Business, http://www.winstar.com/indexTheBuiss.htm. "[Intermedia] believes that business and government customers will continue to account for a substantial share of its revenue over the next several years, because of Intermedia's ability to offer such customers integrated, cost-effective telecommunications solutions." New Paradigm Resources Group, 1998 Annual Report on Local Telecommunications Competition, at Intermedia – 3 of 12.

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anywhere. The Commission would therefore have to turn a blind eye to the competitive viability of AT&T, MCI WorldCom, Intermedia, McLeod, ICG, Time Warner, Cablevision, GST, Level 3, Qwest, e.spire, Nextlink, WinStar, Teligent, Hyperion, and over 100 other CLECs. But these competitors do exist – and they show what efficient CLECs are capable of doing. The Commission cannot succumb to the unsupported rhetoric of AT&T and MCI about the lack of competition when all of the factual evidence in the record shows conclusively that efficient competitors are competing without the use of ILEC network elements. Indeed, these CLECs are not just competing, they are thriving. That is why industry giants have invested billions of dollars to gain a stake in these CLECs – and why companies like AT&T and MCI have purchased them outright.[16] A national list of UNEs would be squarely at odds with the competitive reality of the marketplace.

Despite the widespread existence of self-provision, several commenters seek to dismiss it as an inadequate option; they contend that a widespread wholesale market is the only workable alternative to ILEC network elements. *See, e.g.*, CompTel at 15; Allegiance at 8; Covad at 13-18. In fact, as described in the UNE Fact Report, wholesale markets do exist for several of the UNEs, including interoffice transport, signaling, operator services and directory assistance.

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[16] *See, e.g.*, AT&T News Release, *AT&T Completes TCG Merger*, July 23, 1998 (explaining that AT&T merged with TCG "for growth and undisputed leadership in three of the fastest growing segments of the communications industry – consumer, business and wholesale networking services," according to its CEO C. Michael Armstrong). As a result of its $48 billion merger with TCI, AT&T plans to "weav[e] TCI's powerful, broadband cable network with AT&T's Worldwide Intelligent Network . . . to deliver integrated telephony, entertainment and high-speed Internet access services and a host of new communications capabilities to customers." AT&T News Release, *AT&T and TCI Complete Merger*, Mar. 9, 1999. In December of 1996, WorldCom completed its merger with MFS, an acquisition valued at $14.4 billion dollars. MCI WorldCom, Corporate Overview, MCI WorldCom: A New Era Communications Company (visited June 10, 1999) <http://www.wcom.com/pdf/wcom_history.pdf>. Brooks Fiber, CNS, and ANS were acquired by WorldCom to "further enhanc[e WorldCom's] growth in the fastest growing segments of the market with strong year-over-year performance." MCI WorldCom Press Release, WorldCom Reports First Quarter 1998 Results, April 28, 1998, <http://www.wcom.com/about_the_company/press_releases/archive/1998/980423.shtml>.

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Other elements do not lend themselves to wholesale markets because they are scalable and modular. For example, even the smallest CLEC can deploy a switch to serve only a minimal number of customers (*e.g.*, less than 1000 lines). For such elements, there is no reason to expect a widespread wholesale market to develop (and the availability of UNEs at TELRIC would have deterred such a market from emerging). But the lack of a widespread wholesale market does not mean that CLECs will not trade capacity with each other on a contractual basis where it is efficient to do so. In fact, CLECs jointly deploy facilities and swap capacity on each other's networks all the time. *See, e.g.*, UNE Fact Report at II-5 (listing CLECs purchasing dark fiber from other CLECs); *id.* at VI-24 (describing CLECs provisioning of DSL to other CLECs). Most importantly, however, the Supreme Court's opinion expressly conceives of self-provision as a viable option.[17] The Court held that the Commission must consider *all* alternatives to the ILEC network, including "self-provision" and a CLEC's ability to "purchas[e] from another provider." 119 S. Ct. at 735. Thus, commenters' claims that impairment exists without a wholesale market – regardless of other viable alternatives such as self-provision – must be rejected. The Commission must consider all available alternatives – wholesale and self-provision included – and that requires an analysis that recognizes market variation.

Accordingly, the proper – indeed, the only – course is to implement national standards that account for market differences. The ILECs have proposed such standards. For example, the ILECs have proposed a standard for loop unbundling that recognizes that what is economical for an efficient competitor to serve larger business customers in dense wire centers may not be economical to serve single line residential customers in rural areas. These standards recognize that *local* service is not provided on a national basis and that the relevant market for most

[17] Moreover, self-provision is assuredly entry into the market, and the FCC, the Department of Justice, and antitrust law all place great weight on entry in the competitive analysis.

elements (with the exception of signaling and operator services and directory assistance) is not national.

In proposing national standards that reflect market variation, the ILECs heed the words of the Commission, which has already expressed its desire to "move away from 'one size fits all' regulation and reduce the regulatory requirements on incumbent carriers as competition develops in discrete geographic areas." *Local Competition Survey* at 4. Chairman Kennard recently reiterated the same point: "The telecom market is a diverse one. It has different players in different places operating in different environments. *We cannot have a one-size-fits-all solution to a multi-faceted problem.*"[18] Focusing on the relevant market is also the same approach taken by the Commission in its merger reviews.[19]. The Commission has similarly focused on the necessity of distinguishing among zones with different cost characteristics.[20] It is also the same approach taken in every antitrust case that requires an evaluation of market substitutes.[21]

The ILEC approach, moreover, is necessitated by the Supreme Court's opinion. To mandate unbundling where alternatives exist defies the Supreme Court's admonition that the

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[18] "*A Networked Future for all Americans,*" Address of FCC Chairman William E. Kennard at National Telephone Cooperative Association Annual Meeting, Feb. 10, 1999, at 3 (emphasis added).

[19] *See, e.g.*, Memorandum Opinion and Order, *The Merger of MCI Communication Corp. and British Telecomm plc*, 12 FCC Rcd 15351, 15369 [¶ 35] (1997); Memorandum Opinion and Order, *Applications of Teleport Communications Group Inc. and AT&T Corp. for Consent to Transfer Control of Corporations Holding Point-to-Point Microwave Licenses and Authorizations to Provide International Facilities-Based and Resold Communications Services*, 13 FCC Rcd 15236, 15247-48 [¶¶ 20-22] (1998); Memorandum Opinion and Order, *Applications for Consent to the Transfer of Control of Licenses and Section 214 Authorizations from Southern New England Telecommunications Corp., Transferor, to SBC Communications Inc., Transferee*, 13 FCC Rcd 21292, 21299-300 [¶¶ 15-17] (1998).

[20] *See* Report and Order, *Federal State Joint Board on Universal Service*, 12 FCC Rcd 8776, 8912-16 [¶ 250] (1997); *see also Expanded Interconnection with Local Telephone Company Facilities and Amendment of Part 69 Allocation of General Support Facility Costs*, 7 FCC Rcd 7369, 7451-55 [¶¶ 172-79] (1992); Second Report and Order and Third Notice of Proposed Rulemaking, *Expanded Interconnection with Local Telephone Company Facilities*, 8 FCC Rcd 7374, 7423-25 [¶¶ 90-94] (1993).

[21] *See* SBC at 16-17.

Commission must consider the availability of alternatives to the ILEC network to comply with section 251(d)(2). Alternatives only have meaning once the relevant market is defined. To be sure, the relevant market for some elements (such as operator services and directory assistance) is national. But the appropriate market for other elements (such as loops and transport) is much narrower. For these elements, there are significant differences among markets in terms of the alternatives that are available to efficient CLECs. Indeed, the very same commenters that push for a national list recognize that the markets for these services are not uniform. AT&T at 91 ("[CLECs'] switches are located largely in selected urban areas with a high concentration of businesses" (citing Pfau Aff.)); MCI at 54, 64 & Levine/McMurtrie Decl. at 4 [¶ 10] ("MCI WorldCom's local services to date are predominantly offered to high-volume business customers in dense urban areas, where the company can profitably build-out its own facilities . . . [MCI WorldCom] self-provision[s] loops to its major business customers"). To give effect to the Supreme Court's opinion, the Commission must account for these differences in alternatives.

The ILEC approach is just as easily administered as the one-size-fits-all list. National standards that reflect market variations will not promote "case-by-case litigation" or otherwise increase transaction costs as some commenters claim. *See, e.g.*, MCI at 5; AT&T at 42, 44; Prism at 9. The same standard will apply throughout the country; it is only the application of the standard to the facts that will vary. And the delay that AT&T and others fear will not materialize because states will merely make factual findings. There is obviously little room to dispute the states' conclusions on this score: for example, whether a CLEC has collocated or whether a CLEC switch serves a rate center is basically incontrovertible. In fact, the approach endorsed by AT&T is likely to involve more administrative costs and inconvenience, because the Commission will face an onslaught of waiver petitions from ILECs in all the markets where the

conditions for unbundling are not satisfied. *See* AT&T at 45 n.70. And, because the standards proposed by the ILECs and their application are straightforward, CLECs and ILECs alike can formulate and execute business plans knowing in advance the standards that apply to each market.

The ILEC approach has the further advantage of setting a sunset based on market realities. The standards proposed by the ILECs are grounded in particular market conditions that genuinely reflect the evolution of competition. And because these sunsets are directly tied to competition, ILECs will have the incentive to encourage the development of competition to lessen their unbundling obligations. Moreover, these self-executing sunsets eliminate the need for follow-up regulatory proceedings by the Commission, which further reduces administrative costs and uncertainty.

III. The Commission Should Reject Attempts to Bootstrap Elements into Rule 319 Based on the Alleged Desirability of the UNE-P or Other Combinations

Several commenters urge the Commission to evaluate whether a network element satisfies section 251(d)(2) not on its own, but in combination with other network elements, and in particular, as part of the end-to-end combinations of UNEs that would replicate the ILECs' retail services. That is, these commenters seek to bootstrap elements onto the list of UNEs even though those elements do not, independently, meet the section 251(d)(2) threshold.

This approach is completely backwards. The Supreme Court stated that the ILECs' challenges to the "'all elements' rule" and Rule 315(b) may both be "academic" in light of the Court's remand of Rule 319. 119 S. Ct. at 736. In other words, the "UNE platform" may be unavailable because one or more of its constituent parts fails the "necessary" and "impair" tests. The Court, therefore, necessarily assumed that the Commission on remand would evaluate each

element independently under section 251(d)(2). If one element fails to satisfy section 251(d)(2) on its own, that element may not be unbundled – alone or in combination with other elements.

Section 251(c)(3) further undermines the CLEC claims. Under section 251(c)(3), if a network element satisfies section 251(d)(2) and must be unbundled, the ILEC must provide that element "in a manner that allows requesting carriers to combine [that] element[] in order to provide . . . telecommunications service." 47 U.S.C. § 251(c)(3). Thus, it is only *after* an element has satisfied the section 251(d)(2) threshold that the issue of combination comes into play. And, pursuant to section 251(c)(3), a CLEC must be able to combine an element it obtains from an ILEC with elements that it self-provides or obtains from other non-ILEC sources.

Moreover, judging each element independently is the only approach that yields a rational and pro-competitive result. For example, if the Commission concludes that CLECs have no alternatives to residential loops but have many alternatives to ILEC switching, switching cannot be bootstrapped onto the UNE list – as several commenters suggest – by virtue of the fact that it is cheaper or more convenient for CLECs that obtain loops from ILECs to obtain switching from ILECs as well. This method of analysis would impede the growth of the competitive market for switching until there was a competitive market for residential loops. Indeed, taken to its ultimate conclusion, this approach would impede the growth of a competitive market for *any* network element until *all* network elements are competitively provided *everywhere*. In short, this methodology would create a vicious circle whereby the ILEC network would be perpetually unbundled and facilities-based competition would never emerge. Congress intended the 1996 Act to be de-regulatory, not to supplant competition in favor of regulation. *See* Telecommunications Act of 1996, *supra*, at Preamble.

IV. Section 271's Checklist Is Irrelevant to the Section 251(d)(2) Inquiry

Various commenters rely on section 271 to support their argument that the Commission should readopt the same list of unbundled network elements. AT&T at 14, 31-33; MCI at 23; Sprint at 27.

These commenters have offered no explanation, however, for why Congress did not simply list the 271 checklist network elements in section 251 if the standards require the same thing. *See Bates v. United States*, 118 S. Ct. 285, 290 (1997) ("where Congress includes particular language in one section of a statute but omits it in another section of the same Act, it is generally presumed that Congress acts intentionally and purposely in the disparate inclusion or exclusion") (internal quotation marks omitted). The fact that the checklist is only in section 271 – a provision that applies exclusively to BOCs – demonstrates that the checklist is solely a prerequisite to long-distance entry by a BOC, not an unbundling obligation under section 251, which applies to *all* ILECs (including non-BOCs).

The point of including the specific network elements, such as loops, transport, and switching, on the section 271 list was to cover situations, contemplated by Congress, in which a BOC sought 271 relief prior to completion of the Commission's rulemaking on the section 251 UNEs.[22] It does not relieve the Commission of its independent duty – as mandated by the Supreme Court – to make its own determination pursuant to the standards of section 251(d)(2).

Moreover, the reading advanced by these CLECs would render provisions of the Act superfluous. Under Section 271(c)(2)(B)(ii), all the section 251(c)(3) UNEs must be provided under the UNE terms. If Congress intended all the items listed separately in section 271(c)(2)(B) to apply to section 251, there would have been no need for Congress to include the list at all

[22] In that regard, it is noteworthy that the Commission is still in the process of meeting the requirements for UNE implementing rules, after ruling on five section 271 petitions.

because section 271(c)(2)(B)(ii) would have already done the job. It is a well-settled canon of construction that a statute should be construed to give meaning to all its provisions, and readings that render portions of a statute meaningless should be avoided. *See Ratzlaf v. United States*, 510 U.S. 135, 140-41 (1994).

Finally, it is worth noting that if an element does not need to be provided under section 251 but is required pursuant to section 271, market-based prices (and not TELRIC) apply. This reading of the Act – which is the only reading the plain language permits – is consistent with the Act's goal to further competition, not regulation. If unbundling under section 251 is not required, competitive substitutes for that element are, by definition, available to efficient CLECs in the marketplace. TELRIC is nothing more than the price of an element using the most efficient technology available; thus, if efficient competitors have a meaningful opportunity to compete without the ILEC network element, they must have access to the element at the equivalent of TELRIC prices in the market. The market-based price of an element is obviously a better indicator of its true price than the Commission's best guess under TELRIC. Thus, it is entirely consistent for market-based prices to apply under these circumstances.

V. Section 251(d)(2) Is a Minimum Threshold; If an Element Fails That Test, It Cannot Be a UNE Based on "Other Considerations"

The Supreme Court expressly concluded that section 251(d)(2) imposes "a *limiting* standard." 119 S. Ct. at 734 (emphasis added); *id.* at 738 (noting that section 251(d)(2) establishes "clear limits"). Obviously, a limiting standard must impose a limit. It could hardly be said that section 251(d)(2) is a "limit" if the Commission could ignore it and order unbundling even if it is not satisfied. Thus, the Commission must reject the claims by various commenters that, even if section 251(d)(2) is not satisfied, unbundling can be ordered. *See, e.g.*, MCI at 22 ("lack of impairment (or necessity in the case of proprietary elements) does not automatically

mean that ILECs have a right to deny access"); AT&T at 37 (the Commission is not required to give the section 251(d)(2) standards "any weight at all"); Sprint at 26 (the Commission need not attach "any specific weight" to the necessary and impair requirements); ALTS at 32 (arguing that the Commission can require unbundling "even if the necessary or impair standards have not been met or are no longer satisfied"); CompTel at 21 ("it may be necessary for the Commission to require the unbundling of an element even if the necessary and impair standards are not met").

If section 251(d)(2) does not place a limit on the Commission, there is no point in its inclusion in the statute. As the Court held: "We cannot avoid the conclusion that, if Congress had wanted to give blanket access to incumbents' networks on a basis as unrestricted as the scheme the Commission has come up with, it would not have included § 251(d)(2) in the statute at all." 119 S. Ct. at 735. This analysis applies with equal force to a reading of section 251(d)(2) that makes it nothing more than advisory if the Commission wants to unbundle elements for other reasons. Congress mandated that the Commission "shall consider, *at a minimum*," the section 251(d)(2) requirements. Thus, section 251(d)(2) is the minimum threshold all network elements must satisfy for unbundling to be ordered. Even if this minimum standard is satisfied, unbundling may still not be required for other reasons (such as a concern with disincentive effects on innovation and investment) that are consistent with the Act.

In addition, if the Commission could simply ignore section 251(d)(2), the Court's entire holding makes no sense. If the "necessary" and "impair" standards can be trumped by other considerations, the Court could have simply affirmed the Commission's prior order, which considered precisely the sorts of things AT&T, MCI, and others raise in their comments as weightier factors. The Court did not do so, however, because section 251(d)(2) is a real limit –

not superfluous statutory language. It establishes a "minimum" threshold, 47 U.S.C. § 251(d)(2), that every element must satisfy. That is why the Court went to great lengths to discuss its scope.

Indeed, that is why Congress included section 251(d)(2) in the statute. To require unbundling when section 251(2)(d)'s standards are not satisfied would violate the objectives of the 1996 Act. *See* 119 S. Ct. at 736. Congress placed a "limitation upon network-element availability," *id.* at 734, to further the goals of the Act – *i.e.*, to encourage efficient, facilities-based competition that improves consumer welfare and spurs innovation.[23] If Congress wanted unfettered unbundling, it would have commanded it. But Congress recognized the harmful side-effects of excessive unbundling and therefore passed section 251(d)(2) so that new entrants would not have a mandatory right of access to the incumbent's network when they are able to compete without such access. Thus, any attempt to evade this statutory limitation hinders the achievement of the Act's goals.

VI. The Commission Can Only Require Unbundling of Proprietary Elements if *Access* to Them Is *Necessary*

Several commenters ask the Commission to require the unbundling of proprietary elements as long as the proprietary element is not "disclosed" to the UNE buyer. *See, e.g.*, CompTel at 18-19; Cable & Wireless at 18. This request cannot be squared with the plain language of the Act. The Act speaks in terms of "access" to network elements – not disclosure; and access is required only when "necessary." *See* 47 U.S.C. § 251(d)(2)(A).

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[23] *See, e.g., AT&T Corp. v. Iowa Utils. Bd.*, 119 S. Ct. at 753 (Breyer, J., concurring in part, dissenting in part) ("[t]he unbundling requirement seeks to facilitate the introduction of competition where practical, *i.e.*, without inordinate waste"); S. Conf. Rep. No. 104-230, at 1 (1996) (Act "designed to accelerate rapidly private sector deployment of advanced telecommunications and information technologies"); *id.* at 148 (drafters contemplated that Act would promote facilities-based, "local residential competition"); Notice of Proposed Rulemaking, Order on Remand, and Waiver Order, *Amendment of the Comm'n's Rules to Establish Competitive Serv. Safeguards for Local Exchange Carrier Provision of Commercial Mobile Radio Servs.*, 11 FCC Rcd 16639, 16678-79 [¶ 80] (1996) ("[t]he interconnection provisions of the Act, Sections 251 and 252, are designed to promote facilities-based local exchange competition").

In addition to the textual infirmity of these CLECs' arguments under section 251(d)(2), these claims are further unsupportable when the goals of the Act are taken into account. Allowing access to proprietary elements as long as they are not "disclosed" is completely out of step with intellectual property law (the body of law that shares the same goals as the proprietary requirement). If competitors can obtain access to proprietary elements under such a flimsy standard, ILECs will lack the incentive to innovate and develop such elements. But that is the whole goal of patent and copyright laws – to protect an inventor's right to an idea so that he will have the incentive to pursue it. *See SCM Corp. v. Xerox Corp.*, 645 F.2d 1195, 1203 (2d Cir. 1981) ("The patent laws reward the inventor with the power to exclude others . . . [and in] return, the public benefits from the disclosure of inventions . . . and the increased competition the patented product creates in the marketplace"), *cert. denied*, 455 U.S. 1016 (1982).[24]

VII. The Commission Cannot Re-adopt Rules 51.315(c)-(f), or Its Rules Regarding Superior Quality Interconnection and Access, All of Which Were Struck Down by the Eighth Circuit and Not Raised in the Supreme Court

AT&T and other commenters ask the Commission to reinstate its rules on new network element combinations (Rules 315(c)-(f)) and its rules regarding superior quality interconnection and access (Rules 305(a)(4) and 311(c)). AT&T at 17, 136-45; *see also* CompTel at 48 n.110; ALTS at 80.

This request directly conflicts with the Eighth Circuit's holding in *Iowa Utils. Bd. v. FCC*, 120 F.3d 753 (8th Cir. 1997), and that holding remains the law. *See MCI Telecommunications Corp. v. GTE Northwest, Inc.*, No. 97-1687-JE, at 49 (D. Or. Mar. 17,

[24] NorthPoint argues that the proprietary standard should only apply to what is already protected by patent or similar laws. NorthPoint at 3-5. This argument ignores the fact that it often takes years to get a patent approved. And if, in the meantime, the invention must be disclosed, the very purpose of the patent laws is undermined. The Act cannot be interpreted to yield such an absurd result – and a result so plainly at odds with Congress's desire to encourage innovation.

1999) ("the Eighth Circuit's decision vacating paragraphs (c) through (f) of Rule 315 was not appealed, hence those paragraphs continue to be void"); *U S WEST Communications, Inc. v. Garvey*, No. 97-2179 ADM/AJB, at 23 (D. Minn. Mar. 31, 1999) ("[a]lthough the Supreme Court expressly reinstated § 315(b), it did not directly do so with respect to § 315(c)-(f). . . . [A]bsent a clear mandate this Court declines to extend the Supreme Court decision that far." Therefore, "§ 315(c) and (d) remain vacated").

Neither the Commission nor any other party sought review of the Eighth Circuit's holding in its petition for certiorari, and the Supreme Court – in keeping with its well-established procedure of confining itself to matters properly raised in the "questions presented" portion of a party's petition for certiorari, *see* Sup. Ct. R. 24(a)(1); *Taylor v. Freeland & Kronz*, 503 U.S. 638, 646 (1992) – properly declined to consider a challenge to Rules 305(a)(4), 311(c), and 315(c)-(f). In fact, the Supreme Court did not even *allude* to these rules in its opinion.

Nothing in the Supreme Court's jurisdictional ruling called the Eighth Circuit's decision into question; the Eighth Circuit vacated the disputed rules not because of any jurisdictional theory concerning the agency's interpretive authority, but because it determined that each rule violated the plain language and structure of the Act. *See Iowa Utils. Bd. v. FCC*, 120 F.3d 753, 810 (8th Cir. 1997) (presumption that incumbents must provide access to network elements to the extent technically feasible is "contrary to the plain meaning of the Act"), *aff'd in part and rev'd in part sub nom. AT&T Corp. v. Iowa Utils. Bd.*, 119 S. Ct. 721 (1999); *id.* at 813 (FCC's "superior quality" rules "cannot stand in light of the plain terms of the Act"); *id.* (FCC's rules on combining elements not currently linked in the incumbent's network conflicts with the statute's plain meaning).

Nor is the Eighth Circuit's vacatur of these rules affected by the Supreme Court's determination regarding 47 C.F.R. § 51.315(b). The Supreme Court upheld section 51.315(b) based on its view that, in light of section 251(c)(3)'s nondiscrimination requirements, the FCC could rationally prohibit incumbents from "'disconnect[ing] previously connected elements, over the objection of the requesting carrier, not for any productive reason, but just to impose wasteful reconnection costs on new entrants." 119 S. Ct. at 737 (quoting Reply Br. for Federal Petrs. at 23). This conclusion – that under section 251(c)(3) the FCC may rationally prohibit incumbents from disconnecting *already connected* network elements – says nothing about the FCC's rules that had addressed combining ILECs' network elements in new ways or with elements provided by the requesting carriers. Nor does the Supreme Court's endorsement of section 51.315(b) in any way relate to the Eighth Circuit's invalidation of the Commission's "superior quality" rules, which was based on the Eighth Circuit's recognition that section 251(c)(3) "implicitly requires unbundled access only to an incumbent LEC's existing network – not to a yet unbuilt *superior* one." 120 F.3d at 813 (emphasis added and omitted). Thus, this aspect of the Eighth Circuit's holding assuredly remains the law, and its mandate on this issue still governs the Commission.

In any event, however, the effect of the Supreme Court's decision on its holding is strictly for the Eighth Circuit to determine. Indeed, that is why the Commission, AT&T, and others are currently seeking relief in the Eighth Circuit. The Commission – like all other parties in that proceeding – must await the Eighth Circuit's ruling.

CONCLUSION

The Commission should interpret section 251(d)(2) to further the goals of the 1996 Act and should reject requests by commenters that would lead to excessive unbundling in violation of congressional intent, the Supreme Court's holding, and the text of section 251(d)(2).

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June 10, 1999

EXHIBIT AJV-3

Comments of the United States Telephone Association and attachments

Dated May 26, 1999

CC Docket No. 96-98

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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In the Matter of	)	
	)	
Implementation of the Local Competition Provisions in the Telecommunications Act of 1996	)	CC Docket No. 96-98
	)	
	)	
Interconnection between Local Exchange Carriers and Commercial Mobile Radio Service Providers	)	CC Docket No. 95-168

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SUMMARY

The Supreme Court's opinion in *AT&T v. Iowa* instructed the Commission to review its decision to impose mandatory unbundling of ILEC network elements ("UNEs") pursuant to Section 251(c)(3) of the Act because the Commission failed to properly apply the limiting provisions in the necessary and impair standards of Section 251(d)(2). Based upon the principles that competition promotes maximization of consumer welfare, not competitor welfare, should guide the Commission's decision-making. USTA recommends a comprehensive process, consistent with the requirements of the Court's review of how the Commission should apply the necessary and impair standards in determining the network unbundling obligations of incumbent local exchange carriers.

Consistent with established intellectual property law, mandatory unbundling of ILEC proprietary network elements would be required only if absolutely necessary for competitors to compete. Under the impairment test, mandatory unbundling of non-proprietary ILEC network elements would be subject to a five part test, based upon antitrust law essential facilities doctrine, where the potential competitor would establish that mandatory unbundling of a particular ILEC network element is required because: (1) unbundling is technically feasible in the relevant geographic market; (2) the ILEC has denied access to the particular UNE; (3) it would be impracticable and unreasonable to a require potential competitor to acquire the UNE elsewhere; (4) the ILEC is a monopoly provider of the particular UNE; and (5) the ILEC can exercise market power in providing telecommunications services by restricting access to the requested UNE.

Regarding the seven network elements previously identified by the Commission for

mandatory unbundling, it is clear that competitive market conditions create situations in which unbundling of all ILEC network elements is unwarranted. Based upon the findings in the attached Huber/Leo *Report on UNEs,* Hausman/Sidak conclude in their affidavit that mandatory unbundling of ILEC switching is unnecessary given the availability of substitutable non-ILEC switching elements. In some markets, ILEC unbundling of loops may not be required depending on the geographic market in which a potential competitor requests loop unbundling. As with loop unbundling, the Commission and state regulators must undertake a comprehensive, geographically specific, market review of the availability of substitutable non-ILEC network elements for the other network elements previously identified by the Commission for mandatory ILEC unbundling - - network interface devices, interoffice transmission, signaling networks and call-related databases, operator services and directory assistance, and operations support systems -- before requiring ILECs to provide these UNEs on an unbundled basis. The recent decision of the Washington State Commission, in declaring directory assistance to be a competitive service because of available non-ILEC substitutes in the state, underscores the importance of regulators focusing on the relevant, geographically specific, market when determining whether mandatory unbundling of ILEC network elements is required, and the significant role state regulators can play in making such findings. Consistent with the *1992 Merger Guidelines* adopted by the Department of Justice and the Federal Trade Commission, mandatory unbundling of ILEC network elements would sunset in two years, or when a facilities-based competitor enters the market.

The Commission should not impose mandatory unbundling of ILEC advanced broadband networks and services. As the affidavit of Jorde/Sidak/Teece make clear, ILECs lack market

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power over broadband advanced telecommunications services and mandatory unbundling is a disincentive for ILECs to invest in network upgrades and to innovate. In addition, mandatary ILEC unbundling is a disincentive for potential competitors to invest in advanced networks, instead choosing to rely on ILEC investments and innovations, at TELRIC pricing, while bearing no marketplace risks. Consumers benefit when public policy is focused on competition and maximization of consumer welfare, and not the welfare of competitors.

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Implementation of the Local Competition Provisions in the Telecommunications Act of 1996	)	CC Docket No. 96-98
	)	
Interconnection between Local Exchange Carriers and Commercial Mobile Radio Service Providers	)	CC Docket No. 95-168

COMMENTS OF THE UNITED STATES TELEPHONE ASSOCIATION

INTRODUCTION

The United States Telephone Association ("USTA") hereby files its comments in response to the Commission's *Second Further Notice of Proposed Rulemaking*.[1] USTA is the principal trade association of the incumbent local exchange ("ILEC") industry.

On January 25, 1999, the Supreme Court vacated the Commission's network unbundling requirements in Section 51.319[2] of the Commission's regulations promulgated in the *Local*

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[1] *Second Further Notice of Proposed Rulemaking*, released April 16, 1999, 64 Fed. Reg. 20238 (April 26, 1999).

[2] 47 C.F.R. §51.319.

Competition First Report and Order.[3] The Commission had determined, under its prior analysis of necessary and impair in Section 51.139 of the Commission's rules, that ILECs must unbundle the following network elements ("UNEs"): (1) local loops; (2) network interface devices; (3) local switching; (4) interoffice transmission facilities; (5) signaling networks and call-related databases; (6) operations support system; and (7) operator services and directory assistance.[4] The Supreme Court reversed the Commission's decision, ruling that Section 251(d)(2)[5] of the Act requires the Commission to "determine on a rational basis *which* network elements must be made available, taking into account the objectives of the Act and giving some substance to the 'necessary' and 'impair' requirements"[6]

Pursuant to the Supreme Court's opinion, the Commission cannot merely reissue its prior regulations on unbundling. In addition, the Commission may not use this proceeding to arbitrarily expand ILEC network unbundling requirements. As explained in the attached affidavit of Jerry Hausman and Greg Sidak, the Commission should adopt regulations that determine what, if any, ILEC UNEs should be unbundled. According to Hausman/Sidak, the Commission's policy on ILEC unbundling must emphasize consumer welfare and competition

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First Report and Order, Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, 11 FCC Rcd 15499(1996), *modified on recon.*, 11 FCC Rcd 13042 (1996), *vacated in part, Iowa Utils. Bd. v. FCC*, 120 F3d 753 (8th Cir. 1997), *aff'd in part and rev'd in part sub nom. AT&T Corp., v. Iowa Utilities Bd.*, 119 S. Ct. 721 (1999).

Local Competition First Report and Order, 11 FC Rcd at 15683, ¶¶281-83. The Commission's Order also permited states the power to impose additional unbundling requirements consistent with the Commission's interpretation of Section 251(d)(2).

47 U.S.C. §251(d)(2).

AT&T v. Iowa, 119 S.Ct. at 736.

rather than competitor welfare.

In Part I of their affidavit, Hausman/Sidak review the analysis by the Supreme Court of the "necessary" and "impair" standards of section 251(d)(2). Hausman/Sidak reach the conclusion that by enacting the Telecommunications Act of 1996 ("Act"), Congress did not create a conflict in objectives between that statute and the existing body of antitrust jurisprudence. As Hausman/Sidak explain, antitrust law seeks to maximize the well-being of consumers consistent with the stated purpose of the Act to promote competition and reduce regulation in order to secure lower prices and higher quality services for American telecommunications consumers and encourage the rapid deployment of new telecommunication technologies.[3] Thus, the intent of antitrust law and the principles underlying the purpose and intent of the Act is the promotion and protection of the competitive process, not particular competitors or particular market structures.

In Part II of the affidavit, Hausman/Sidak use economic analysis to explain why the Commission, consistent with the Supreme Court's decision in *AT&T v. Iowa*, must establish limiting principles for the mandatory unbundling of ILEC network elements. As Hausman/Sidak explain: (1) unbundling rules should emphasize consumer welfare and competition rather than competitor welfare; (2) the issue before the Commission is not whether the ILECs will unbundle their network elements for use by competitive local exchange carriers ("CLECs"), but whether the Commission will compel the ILECs to do so at regulated prices based on total element long-

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[3] *Telecommunications Act of 1996*, Pub. L. No. 104-104, 110 Stat. 56, Joint Conference Committee Explanatory Statement, Senate Report at 113

run incremental cost ("TELRIC") pricing methodology; (3) the social costs of a particular unbundling regime may outweigh the gains; (4) the Commission should not base its review of the necessary and impair standards on an economic misconception of sunk costs in local telecommunications; and (5) Commission policy, in support of mandatory unbundling, can create uncompensatory pricing of unbundled network elements.

In Part III of the affidavit, Hausman/Sidak examine the limiting principles that are inherent in the essential facilities doctrine and the competitive analysis of demand and supply substitution that are consistent with traditional antitrust analysis of market power which form the basis of their proposal for interpreting necessary and impair standards in Section 251(d)(2). The Commission and state regulators should examine the need for mandatory unbundling in each relevant geographic market for each network element which the Commission proposes that an ILEC unbundle. Any market-power analysis should be based on a specified time horizon, after which time the requirement of unbundling for that network element should sunset unless the CLEC proves that consumer welfare would suffer without the Commission's continuation of such mandatory unbundling. Second, Hausman/Sidak argue that definitions of necessity and impairment should be based upon demand and supply substitution. Accordingly, the necessity of unbundling a proprietary network element, and the extent to which competition would be impaired if a nonproprietary element were not unbundled, should depend on the respective price elasticities of demand and supply in both the input UNE and output (end-user access) markets. As Hausman Sidak explain, their recommended approach comports with the analysis of unilateral effects in the 1992 *Merger Guidelines* adopted by the Federal Trade Commission and

the Antitrust Division of the U.S. Department of Justice ("DoJ").[8] The necessity of unbundling an element, or the likelihood that a failure to provide a network element or elements would impair competition, should be assessed in light of the existence of competition among different bundles of end services. With respect to the impairment test, section 251(d)(2) requires that the focus be on the ability of the telecommunications carrier to provide services. Thus, the interpretation of impair with respect to loops, for example, should reflect the existence of substitution among bundles of services that use different access technologies (such as cable television's coaxial and fiber-optic infrastructure to provide local access for voice telephony, or the wireless one-rate plans that encompass "free" roaming and long-distance calling).

Based upon the Hausman/Sidak analysis, proprietary network elements are protected under well-recognized intellectual property laws. The Commission should limit mandatory unbundling of ILEC proprietary network elements UNE, pursuant to the necessary standard in Section 251(d)(2)(A), to situations in which access to the ILEC UNE is "absolutely essential" for competition. USTA's proposal on how the Commission should conduct its review of access to ILEC proprietary UNEs under the necessary provision of Section 251(d)(2)(A) is a heightened standard of review - - more rigorous than USTA's impairment test under Section 251(d)(2)(B) - - given the importance of intellectual property rights as an incentive to investments leading to innovation, which ultimately enhances consumer welfare.

Regarding the impairment standard for mandatory unbundling pursuant to Section

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[8] Department of Justice and Federal Trade Commission, Horizontal Merger Guidelines (1992) ("Merger Guidelines").

251(d)(2)(B). Hausman/Sidak propose the following five-part test that would apply to the ILEC obligation to provide unbundled network elements:

> The FCC shall mandate unbundling of a network element if and only if
>
> (1) it is technically feasible for the ILEC to provide the CLEC unbundled access to the requested network element in the relevant geographic market:
>
> (2) the ILEC has denied the CLEC use of the network element at a regulated price computed on the basis of the regulator's estimate of the ILEC's total element long-run incremental cost;[9]
>
> (3) it is impractical and unreasonable for the CLEC to duplicate the requested network element through any alternative source of supply:
>
> (4) the requested network element is controlled by an ILEC that is a monopolist in the supply of a telecommunications service to end-users that employs the network element in question in the relevant geographic market: and
>
> (5) the ILEC can exercise market power in the provision of telecommunications services to end-users in the relevant geographic market by restricting access to the requested network element.[10]

In Part IV, Hausman/Sidak apply the impairment test to determine whether a particular network element in a particular geographic market requires unbundling. Demand-side

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[9] The second element of the impairment test proposed by Hausman and Sidak asks whether the ILEC has denied the CLEC use of the network element at a regulated price computed on the basis of the regulator's estimate of the ILEC's TELRIC. Of course, if the Eighth Circuit Court were to strike down the Commission's TELRIC pricing methodology, the second element of the Hausman and Sidak test would be restated to reflect the new standard by which regulated prices would be set for network elements subject to mandatory unbundling.

[10] Hausman/Sidak Affidavit at 17.

constraints on the exercise of market power, such as voice telephony over cable television networks and wireless telephony, affect all UNEs equally. According to Hausman/Sidak, network elements with low fixed costs in geographically dense areas should not likely be subject to mandatory unbundling at TELRIC prices.

In Part V, Hausman/Sidak discuss the procedures the Commission should employ in administering the impairment test. First, the CLEC bears the burden of proof in demonstrating ILEC market power. Second, any order for mandatory unbundling should automatically sunset within two years of the first unbundling decision, or when any facilities-based competitor enters the market. Third, state commissions should administer a market power test that is both location-specific and fact-intensive.

The opinion of the Supreme Court in *AT&T v. Iowa* [1] suggested that essential facilities and market power analysis in antitrust jurisprudence may well serve the Commission in its application of Section 251(d)(2) to the unbundling requirements of Section 251(c)(3). The Commission was encouraged to consider that body of law as a possible approach to determining when a network element would satisfy the necessary and impair standards of Section 251(d)(2). The Hausman/Sidak Affidavit explains how and why economic analysis and antitrust jurisprudence should be adopted by the Commission as the basis for its statutory interpretation of Section 251(d)(2).

Consistent with the Supreme Court's decision, the Commission must devise a limiting principle for the unbundling of proprietary network elements. The Hausman/Sidak five-part

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[1] *AT&T Corp. v. Iowa Utils. Bd.*, 119 S. Ct. 721 (1999).

"impairment" test focuses on whether competition can be effective in the end-user services market rather than whether a particular competitor can earn profits. This test is concerned with consumer welfare, not competitor welfare. Once the CLEC has demonstrated that the UNE meets the four existing requirements of the essential facilities doctrine, the CLEC must then demonstrate that an ILEC could exercise market power in the provision of telecommunications services to end-users in the relevant geographic market by restricting access to the requested network element.

USTA recommends that the term necessary be interpreted to mean that competition in end-user services would be impossible unless the requested element were unbundled at TELRIC prices. This heightened standard will protect the economic incentives to create the intellectual property embodied in elements that are proprietary in nature. USTA's impairment test is in accord with traditional antitrust analysis. The Commission should apply these standards on geographically specific basis. In addition, the Commission should apply these standards for unbundling only were appropriate, keeping in mind that competitive developments in specific geographic markets may render the need for unbundling unnecessary. Based upon the findings of Hausman/Sidak, USTA finds that switches should not be unbundled in any geographic market, while loops may be unbundled in specific geographic markets where a cable-telephony provider, such as AT&T, or any other facilities-based telecommunications service provider has yet to enter.

A second affidavit explains the adverse impacts of mandatory unbundling of ILEC networks on incentives to innovate telecommunications facilities. In the affidavit of Thomas

Jorde. Greg Sidak and David Teece. it is argued that mandatory unbundling of ILEC network elements at prices computed on the basis of TELRIC adversely affects the ILECs incentives to maintain and upgrade existing network facilities. but also to invest in new facilities. Similarly. competitive carriers have no incentive to invest in innovative upgrades or new technologies. preferring instead to cream skim the ILEC network for upgrades or new facilities and elements at below-market rates. In addition to lowering the expected returns of investment in existing and new facilities. mandatory unbundling at regulated TELRIC rates raises the cost of capital for ILECs. For these reasons. the Commission should forebear from mandatory unbundling of ILEC broadband facilities providing advanced telecommunications services. Recent innovations in several network elements including switches. loops. transmission facilities. and digital subscriber line access multiplexers ("DSLAM") would be at risk under Commission regulations that require mandatory unbundling of ILEC network elements at TELRIC rates for deployment of advanced telecommunications services. Only under circumstances in which the Commission's public policy decisions reflect regulatory forbearance can consumers be assured that the stated policy of the Act to encourage the rapid deployment of new telecommunications technologies will be realized.[1]

Also attached is a market-based study assessing the scope of competition in specific markets. the impact of competition on the need for mandatory unbundling at regulated TELRIC rates. and the availability to competitors from sources other than ILECs of the Commission's

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[1] 47 U.S.C. §§ 157 and 706.

seven unbundled network elements.[13] What the Huber/Leo *Report on UNEs* demonstrates is that mandatory unbundling of all ILEC network facilities is unsupportable. In addition, geographically specific unbundling must sunset as competitors like AT&T, MCI/WorldCom, and other competitive LECs provide competition and substitutable UNE alternatives. Equally clear from the Huber/Leo *Report on UNEs* is the need for the Commission to conduct a nationwide review of competition in the local exchange to ensure that adequate data exists for the Commission and state regulators to conduct the necessary and impair review required by Section 251(d)(2) consistent with the Court's instructions that the unbundling requirement in Section 251(c)(3) is tempered by the limits impose by Section 251(d)(2). Until such time as the Commission conducts a comprehensive, nationwide review of competition on a market-by-market basis, and assesses the market for non-ILEC UNEs, the Commission cannot impose mandatory unbundling requirements on ILECs consistent with the Court's opinion. Moreover, the Commission should not mandate unbundling obligations for ILEC investments in advanced broadband networks and services. They do not meet any reasonable and conforming necessary and impair test. Such requirements would only serve as disincentives to future ILEC investments, raise the cost of capital for ILECs, deny ILECs the benefits of first-to-the market advantages from innovation, and discourage CLECs from investing in network facilities, while encouraging CLECs to cream-skim ILEC innovations at below market rates. The public interest demands innovation from the Commission in the form of public policy that promotes

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[13] Peter Huber and Evan LEO *UNE Fact Report*, submitted by USTA and prepared for Ameritech, Bell Atlantic, BellSouth, GTE, SBC and US WEST.

competition, not competitors, which is the only way to insure lower prices, and expanded choices for consumers.

I. THE SUPREME COURT'S "NECESSARY" AND "IMPAIR" REVIEW

The Supreme Court's decision in *AT&T v. Iowa* concluded that the Commission's implementation of the network element unbundling provisions in Section 251(c)(3) of the Act contained in Section 51.319 of the Commission's regulations were arbitrary and capricious. According to the Court, the Commission erroneously interpreted the necessary and impair standards of section 251(d)(2) when enacting its unbundling regulations embodied in Section 51.319 of the Commission's regulations.[14] The Court instructed the Commission, on remand, to "determine on a rational basis *which* network elements must be made available taking into account the objectives of the 1996 Act and giving some substance to the 'necessary' and 'impair' requirements."[15]

Section 251(c)(3) requires ILECs to provide CLECs access to their networks. As Section 251(c)(3) provides, ILECs must:

> provide to any requesting telecommunications carrier ... non discriminatory access to network elements on an unbundled basis at any technically feasible point on rates, terms, and conditions that are just, reasonable, and nondiscriminatory ....

Section 251(d)(2) tempers the application of the unbundling requirements in Section

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[14] *AT&T v. Iowa*, 119 S. Ct. at 733-36.

[15] *Id.* at 736.

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251(c)(3) by requiring the Commission to apply the necessary and impair standards when deciding which ILEC network elements must be unbundled. As Section 251(d)(2) instructs the Commission to determine:

> at a minimum, whether—(A) access to such network elements as are proprietary in nature is necessary; and (B) the failure to provide access to such network elements would impair the ability of the telecommunications carrier seeking access to provide the services that it seeks to offer.

The Supreme Court's opinion acknowledges that Section 251(d)(2) places limits on the scope of network unbundling that ILECs must provide. As the majority concluded, Section 251(d)(2) imposes clear limits on the Commission's authority to determine whether an ILEC must unbundle a particular network element pursuant to section 251(c)(3) and that the Commission's unbundling regulations in Section 51.319 Rule exceeded the bounds of those clear limits. In the Court's opinion, "the FCC did not adequately consider the 'necessary and impair' standards when it gave blanket access to these network elements, and others, in Rule 319." [16] With respect to the application of the essential facilities doctrine in antitrust law as a limiting principle to be adopted by the Commission the Court concluded:

> The incumbents argue that § 251(d)(2) codifies something akin to the "essential facilities" doctrine of antitrust theory ... , opening up only those "bottleneck" elements unavailable elsewhere in the marketplace. We need not decide whether, as a matter of law, the 1996 Act requires the FCC to apply *that* standard; it may be that some other standard would provide an equivalent or better criterion for the limitation upon network-element availability that the statute has in mind. But we do agree with the incumbents that the Act requires the FCC to apply *some* limiting standard, rationally related

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[16] *Id.* at 734.

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to the goals of the Act, which it has simply failed to do.[17]

Regarding the application of the necessary and impair standard of Section 251(d)(2), the Court rejected the Commission's prior definition of necessary under Section 251(d)(2)(A). According to the Court, the Commission ignored whether requesting carriers could obtain the requested proprietary element from a source other than the incumbent, because the Commission erroneously reasoned that "requiring new entrants to duplicate unnecessarily even a part of the incumbent's network could generate delay and higher costs for new entrants," and thereby impede their entry into a specific geographic market in violation of the Act.[18]

The Court also ruled that the Commission had erroneously determined that the impairment standard of Section 251(d)(2)(B) is met if "the failure of an incumbent to provide access to a network element would decrease the quality, or increase the financial or administrative cost of the service a requesting carrier seeks to offer, compared with providing that service *over other unbundled elements in the incumbent LEC's network*."[19] According to the Court, "Since any entrant will request the most efficient network element that the incumbent has to offer, it is hard to imagine when the incumbent's failure to give access to the element would not constitute an 'impairment' under this standard."[20] Moreover, the Court concluded that

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[17] *Id.* at 734–35.

[18] *Id.* at 735 (quoting *Local Competition First Report and Order*, 11 FCC Rcd. at 15,642 ¶ 283).

[19] *Id.* (quoting *Local Competition First Report and Order*, 11 FCC Rcd. at 15,643 ¶ 285).

[20] *Id.*

contrary to the requirements impose upon the Commission under Section 251(d)(2), the Commission's interpretation left CLECs, not the Commission, with the ultimate authority to determine what elements were necessary and how the absence of a particular element would impair competition:

> The Commission asserts that it deliberately limited its inquiry to the incumbent's own network because no rational entrant would seek access to network elements from an incumbent if it could get better service or prices elsewhere. That may be. But that judgment allows entrants, rather than the Commission, to determine whether access to proprietary elements is necessary, and whether the failure to obtain access to nonproprietary elements would impair the ability to provide services.[21]

The Court also criticized the economic reasoning underlying the Commission's interpretation of necessary and impair pursuant to the requirements of Section 251(d)(2). According to the Court, the Commission must consider the availability of network elements outside the incumbent's network:

> The Commission cannot, consistent with the statute, blind itself to the availability of elements outside the incumbent's network. That failing alone would require the Commission's rule to be set aside.[22]

Secondly, the Court emphasized that the impairment standards must embody some threshold of materiality pursuant to Sections 251(c)(3) and 251(d)(2). The Court reasoned:

> [T]he Commission's assumption that *any* increase in cost (or decrease in quality) imposed by denial of a network element renders access to that element "necessary," and causes the failure to provide that element to "impair" the entrant's ability to furnish its desired services

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[21] *Id.*

[22] *Id.*

> is simply not in accord with the ordinary and fair meaning of those terms. An entrant whose anticipated annual profits from the proposed service are reduced from 100% of investment to 99% of investment has perhaps been "impaired" in its ability to amass earnings, but has not *ipso facto* been "impaire[d] . . . in its ability to provide the services it seeks to offer"; and it cannot realistically be said that the network element enabling it to raise its profits to 100% is "necessary."[23]

The Court also emphasized that the statutory right of competing telecommunications carriers to receive unbundled access to an ILEC's network element pursuant to the impairment standard in Section 251(d)(2) was not a guarantee of supra competitive profits:

> We similarly disagree with Justice Souter that a business can be impaired in its ability to provide services—even impaired in that ability "in an ordinary, weak sense of impairment"—when the business receives a handsome profit but is denied an even handsomer one.[24]

Relying on the statutory language as a reflection of Congressional intent, the Court rejected the Commission's expansive reading of the unbundling obligations of Section 251(c)(3):

> We cannot avoid the conclusion that, if Congress had wanted to give blanket access to incumbents' networks on a basis as unrestricted as the scheme the Commission has come up with, it would not have included § 251(d)(2) in the statute at all. It would simply have said (as the Commission in effect has) that whatever requested element can be provided must be provided.[25]

In addition, the Court rejected the Commission's reading of Section 251(c)(3) that an ILEC must unbundle its network wherever technically feasible:

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[23] *Id.*

[24] *Id.* at note 11.

[25] *Id.*

> The FCC was content with its expansive methodology because of its misunderstanding of § 251(c)(3), which directs an incumbent to allow a requesting carrier access to its network elements "at any technically feasible point." The Commission interpreted this to "impos[e] on an incumbent LEC the duty to provide all network elements for which it is technically feasible to provide access," and went on to "conclude that we have authority to establish regulations that are coextensive" with this duty.[26]

As the Court reasoned, "[s]ection 251(c)(3) indicates 'where unbundled access must occur, not which [network] elements must be unbundled.'"[27] The Court ruled that the Commission's "premise was wrong" and that "[s]ection 251(d)(2) does not authorize the Commission to create isolated exemptions from some underlying duty to make all network elements available."[28] The Court ruled that Section 251(d)(2):

> requires the Commission to determine on a rational basis which network elements must be made available, taking into account the objectives of he Act and giving some substance to the "necessary" and "impair" requirements. The latter is not achieved by disregarding entirely the availability of elements outside the network, and by regarding any "increased cost or decreased service quality" as establishing a "necessary" and an "impairment" of the ability to "provide ... services."[29]

The Commission is precluded from adopting regulations that are inconsistent with its obligations under Section 251(d)(2) to determine if unbundling of a particular element is necessary

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[26] *Id.* at 736 (quoting *Local Competition First Report and Order*, 11 FCC Rcd. at 15,640 ¶ 278; see also ¶ 286 ("we conclude that the statute does not require us to interpret the 'impairment' standard in a way that would significantly diminish the obligation imposed by section 251(c)(3)").

[27] *Id.* (quoting *Iowa Utils. Bd. v. FCC*, 120 F.3d at 810).

[28] 119 S. Ct. at 736.

[29] *Id.* at 736.

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and whether the absence of unbundling of an ILEC network element would impair a CLEC's ability to compete. As Hausman/Sidak explain:

> In short, the Court held that the FCC's interpretation of "necessary" and "impair" must reflect the procompetitive goals of the 1996 legislation, that the interpretation must embody an assessment of competitive substitution in the supply of network elements, and that the interpretation must not trigger mandatory unbundling of network element[s] on the basis of insignificant differences between the cost or service quality of the network elements used by the ILEC and the cost of service quality of the network elements that the ILEC supplies an entrant.[30]

Consistent with the Court's opinion, antitrust principles and the requirements of the Act, USTA recommends a reasonable approach that the Commission and state regulators can pursue in determining the scope of unbundling obligations ILECs must provide that comport with the requirements of Sections 251(c)(3) and 251(d)(2), and which recognizes the increased level of competition since the Act was implemented in 1996. By tailoring the unbundling requirements to geographically specific markets, the Commission and state regulators can accurately assess the level of competition in each market, and the potential for future competition from a variety of sources including wire line, terrestrial wireless, and satellite providers of telecommunications services. This market-based, market power review will permit the Commission and state regulators to determine what available substitutes, other than ILEC network elements, exists in a geographically specific market, require ILEC unbundling of network elements consistent with the competitive market conditions, and terminate mandatory ILEC unbundling of network elements under the two year provision in the *Merger Guidelines*, or when a single facilities-based competitor enters a given

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[30] Hausman/Sidak Affidavit at 31.

geographic market. USTA's recommended approach to mandatory unbundling meets the requirements of the Act, recognizes the alternative sources for network elements from other than ILEC networks.[31] and is consistent with the limiting principles on Commission mandated unbundling of ILEC networks set forth in the Court's opinion.

II. THE SCOPE OF MANDATORY ILEC NETWORK UNBUNDLING MUST BE LIMITED AND REFLECT THE INTEREST OF CONSUMER WELFARE

Contrary to the Court's opinion, antitrust principles, and the intent of the Act, the Commission appears to suggest its willingness to continue its protection of competitors at the expense of consumers and consumer welfare. In the *Second Further Notice of Proposed Rulemaking* the Commission asks for comment on whether "the requesting carrier's particular market entry strategies should be considered as part of the 'necessary' and 'impair' analysis."[32] Similarly, the Commission opines "Section 251(d)(2)(B) requires us to consider whether the failure to provide access to an element would 'impair' the ability of a new entrant to provide a service it seeks to offer."[33]

As Hausman/Sidak explain, the Commission's interpretation of the necessary and impair provisions of Section 251(d)(2) must be limited in application and based on standards that are rationally related to the purposes of the Act.[34] Foremost among those limiting principles is the

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[31] *See* Huber/Leo *UNE Fact Report*.

[32] *Second Further Notice of Proposed Rulemaking* at 11, ¶27.

[33] *Id.* at 8, ¶17.

[34] Hausman/Sidak Affidavit, Part II at 43-71.

proposition that the FCC's unbundling rules should regard the public interest as primarily determined by consumer welfare, which in turn is determined by competition rather than competitor welfare. According to Hausman/Sidak:

> Whether it is "necessary" for the FCC to mandate, at TELRIC prices, the unbundling of a particular proprietary network element in a particular location at a particular time should depend on whether such unbundling is necessary to permit the competitive supply of telecommunications services to end users. Similarly, the correct meaning of "impair" for purposes of section 251(d)(2) is whether the ILEC's failure to unbundle, at TELRIC prices, a particular nonproprietary network element in a particular location at a particular time would produce an equilibrium supply of telecommunications services that was, relative to the competitive equilibrium, significantly inferior for consumers. Here, "inferior" can mean not only higher prices, but also lower quality services or less innovation in new telecommunications services, the consumer welfare losses from which have been shown empirically to be enormous.[35]

An emphasis on consumer welfare, over the interest of a single competitor, is consistent with the public interest standard. In addition, the approach to mandatory unbundling proposed by Hausman/Sidak is consistent with antitrust analysis which has the goal of maximizing consumer welfare. Thus, the public interest is consistent with increased competition and innovation. Moreover, an emphasis on economic efficiency and consumer welfare maximization has a related benefit: it harmonizes economic regulation and antitrust law. The benefits of applying this analysis to the Commission's review of ILEC unbundling requirements in Section 251(d)(2) of the Act are clear. As Hausman/Sidak reason:

> First, the same basic tools of microeconomic analysis can be em-

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[35] *Id.* at 43-44.

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> ployed in one as in the other. There can be little disagreement that the economic sophistication of antitrust law has enriched the regulatory analysis of natural monopoly. Second, changes in technology or other circumstances that permit natural monopoly to give way to competition impart continuity to the relationship between economic regulation and antitrust. Third, many of the thorniest problems in antitrust law—such as judicial enforcement of injunctive remedies under the [Modification of Final Judgment] or the essential facilities doctrine—are fundamentally regulatory in nature, involving issues such as entry or the pricing of intermediate goods sold to competitors. Thus, the economic scholarship on regulation can in many instances enrich antitrust jurisprudence.[36]

Clearly, this standard of review regarding the scope of mandatory unbundling proposed by USTA looks to the effect on competition, rather than the interests of a given CLEC, and comports with the Supreme Court's instructions that the Commission must take into account the availability of substitutes for ILEC network elements outside ILEC networks. If substitutes outside the ILEC networks are available, that availability occurs because some firms have made the rational economic decision that they can efficiently provide services that employ those elements. The conclusions which follow from this analysis are self-evident: (1) the element as provided by the ILEC cannot be essential for competition because competition is already occurring without ILEC provision, and the network element, unbundled by government decree at TELRIC prices, cannot be labeled an essential facility, or "necessary" to competition, or an element for which the decision not to mandate unbundling would "impair" the competitive supply of telecommunications services; and (2) competition will not be adversely affected if a given CLEC cannot procure the unbundled

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[36] *Id.* at 45.

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element from the ILEC since other firms are providing substitutes outside the ILEC network.[37] As Hausman/Sidak explain: "the 'limiting principle' demanded by the Court naturally emerges when one uses the effect on competition, rather than the effect on individual competitors as in the Commission's past and present formulations of the "necessary" and "impair" standards." [38]

Commission policy which imposes mandatory ILEC unbundling at TELRIC rates is nothing more than compulsory sharing which serves as disincentives to investment and innovation. According to Hausman/Sidak, "Disincentive effects on incumbents are substantial because those firms are continuing to make large and sunk investments in their existing networks. As ... Justice Breyer explained ... Nor can one guarantee that firms will undertake the investment necessary to produce complex technological innovations knowing that any competitive advantage deriving from those innovations will be dissipated by the sharing requirement."[39] The central principle that should guide the Commission's interpretation of the necessary and impair review required by the Court's opinion is the impact of unbundling on competition and market power, and not how any given network element may impact a particular competitor.

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[37] *Id.* at 46-47.

[38] *Id.* at 46.

[39] Hausman/Sidak Affidavit at 57, *citing* Justice Breyer's Concurring Opinion in *AT&T v. Iowa*, 119 S. Ct at 721.

III. PUBLIC POLICY BASIS FOR LIMITING MANDATORY ILEC UNBUNDLING OF NETWORK ELEMENTS

As described by Hausman/Sidak, USTA's definition of necessary and impair relies on the competitive analysis of demand and supply substitution, essential facilities principles extracted from antitrust litigation, and sound economic principles designed to provide incentives for competition which maximizes consumer welfare.[40] The Commission, must also consider the adverse impact that TELRIC pricing of ILEC UNEs has on competition and innovation. As Hausman/Sidak conclude:

> Regulated prices that are set on the basis of TELRIC confer implicit subsidies to those who purchase unbundled network elements .... Those highly favorable prices encourage the use and reliance on unbundled network elements of the incumbent and discourage the use of and investment in competitor's own facilities. The availability of those UNEs at inefficiently low prices not only attracts firms that could deploy their own facilities, but also introduces firms that could not have efficiently entered or expanded in the marketplace to do so. The subsidized prices shield inefficient entrants from facing the true economic prices they would otherwise be forced to face.[41]

The central tenet of USTA's arguments is that necessary and impair review, conducted by the Commission for the purpose of imposing mandatory network unbundling on ILECs, must be based on defining relevant geographic markets with the intent that unbundling requirements would sunset as competitive developments provide alternative sources for CLECs to purchase

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[40] *Id.* at 71, Part III.

[41] *Id.* at 61; *see also* Jorde/Sidak Teece Affidavit at 15-35 (mandatory unbundling of ILEC broadband networks raises the ILEC cost of capital and debt, while serving as a disincentive to investment and innovation).

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network elements from other than ILECs sources.[42]

Based upon the Hausman/Sidak review of essential facilities doctrine applied in antitrust cases, the competitor must meet a four-part test: (1) control of the essential facility by a monopolist; (2) a competitor's inability practically or reasonably to duplicate the essential facility; (3) the denial of the use of the facility to a competitor; and (4) the feasibility of providing the facility.[43] As Hausman/Sidak explain, the essential facilities doctrine assumes that the owner of the facility "possesses monopoly power".[44] By analogy, as a limiting principle in interpreting the necessary and impair standards of section 251(d)(2) of the Act, the strength of the essential facilities doctrine is that it screens out unmeritorious claims. "In that respect, the doctrine plainly rejects the notion that the public interest is advanced by the simplistic rule that any compulsory sharing that is technically feasible to order shall be ordered."[45] Mandatory unbundling, simply because it is technically feasible, has been rejected by the Court, and cannot serve as the basis for the Commission to mandate unbundling of existing ILEC telecommunications services or advanced telecommunications networks and services provided by ILECs.

Section 251(d)(2) does not mandate the unbundling of a proprietary network element unless it satisfies both the impair standard and the necessary standard. Hausman/Sidak correctly

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42 USTA's proposal in no way limits Section 251(f).

43 *Id.* at 72.

44 *Id.* at 73.

45 *Id.*

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explain that "those two factors are what the Commission shall consider "at a minimum" when deciding whether to mandate unbundling. The Commission's consideration of additional factors in appropriate cases should tighten rather than expand the focus of this authority to mandate unbundling in the public interest."[46] Pursuant to the Court's mandate, and the principles of essential facilities analysis, the Commission should interpret necessary and impair with geographic specificity and with the view that mandatory ILEC unbundling of network elements should sunset in accordance with the continued growth in competition that leads to non-ILEC UNE substitutes for CLECs. The Commission can usefully identify multiple geographic zones for unbundling purposes without imposing a uniform nationwide unbundling rule—let alone a uniform nationwide presumption or outcome. The absence of limiting criteria, such as the geographically specific market assessment and sunset provisions proposed by USTA, would create an interpretation of Section 251(d)(2) that would be inconsistent with the Court's expressed opinion that the necessary and impair review conducted by the Commission must bear a relationship to substitutable UNEs available in each geographic market. Clearly, as Hausman Sidak argue:

> ... a single nationwide standard would be in direct contradiction to market definition standards found in the Department of Justice and Federal Trade Commission Merger Guidelines, which the FCC has used in its own recent merger reviews under the public interest standard of the Communications Act. In terms of geographic market definition, the Merger Guidelines ask whether a hypothetical (unregulated) monopolist could impose a "small but significant and nontransitory" increase in price (that is, raise price above competitive levels). That standard is established by

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[46] *Id.* at 77.

> determining whether the hypothetical monopolist would have market power or, alternatively, would be constrained by firms outside the market.
>
> In a given geographic market, the correct question would be whether an (unregulated) ILEC could exercise market power if it were not required to provide its competitors a given unbundled element at cost-based rates. If other CLEC competitors are already providing competing services using the element, or if the element itself is available from non-ILEC suppliers, then an ILEC could not exercise market power. Provision of the unbundled element by the ILEC would not be necessary for competition in telecommunications services in the given geographic area. Nor would competition be impaired if the ILEC were not required to supply the unbundled element at cost-based rates. It is likely, however, that the outcome of that analysis would differ depending on the particular element and the geographical area under consideration.[47]

The Court has instructed the Commission to undertake a review of the ILEC's obligation to unbundle their networks as required by Section 251(c)(3) pursuant to limiting provisions of the necessary and impair requirements of Section 251(d)(2). The Commission should mandate the unbundling of a particular network element in a particular geographic location at a particular time only if such unbundling is necessary to permit the competitive supply of telecommunications services to end users. The correct meaning of impair for purposes of section 251(d)(2) review is whether the ILEC's failure to unbundle a particular network element, at a TELRIC price, in a particular geographic location at a particular time would produce a supply of telecommunications services that is significantly inferior for consumers.[48]

As Hausman/Sidak explain, the price elasticity of demand for unbundled network

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[47] *Id.* at 81.

[48] *Id.* at 82.

elements must govern the Commission's policy decision when applying the necessary and impair standard in Section 251(d)(2). "In the language of economics, "necessity" and competitive "impairment" are given rigorous economic meaning by deriving the price elasticity of demand for any given unbundled element."[49] According to Hausman/Sidak:

> In the presence of high demand elasticity and high supply elasticity, a firm cannot exercise unilateral monopoly power by attempting to decrease its supply. Demand elasticity is captured by a customer's willingness to switch to competing suppliers as relative prices change. Thus, a broad range of available substitutes would imply a high own-price elasticity of demand. Following the same logic as the market definition criteria, the Merger Guidelines provide a concrete test for evaluating the competitiveness of a market as captured in the idea of market power, which is the ability of a single firm unilaterally to increase price above the competitive level for a significant amount of time. [50]

Market forces are driving competition. These market forces operate to impede the ability of ILECs to engage in anti-competitive pricing. According to Hausman/Sidak:

> First, in the face of higher output prices charged by the ILEC, the CLEC could itself also charge more to end-users, and thus could self-supply switches or purchase switches from the ILEC at above-competitive prices. Second, the ILEC must be concerned about customers' fleeing to alternative forms of access such as cable or wireless. With its acquisition of Media One and TCI and its joint venture with Time-Warner, AT&T has positioned itself to serve 95 percent of all households in the United States. Unless - implausibly - AT&T, MCI WorldCom, and Sprint conspired with the ILEC to keep landline access prices artificially high, the "critical share" of deserting customers would likely be reached. Moreover, falling wireless prices will continue to displace traditional wireline users. Those three constraining forces make it implausible that the ILEC

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[49] *Id.* at 83.

[50] *Id.* at 88-89.

> could exercise market power as defined by the Merger Guidelines. If market forces can protect consumers from the harms of monopolization, then the Commission should not impose mandatory unbundling.[51]

Based upon these conclusions, Hausman/Sidak proposed a five-part test for the impairment standard under Section 251(d)(2)(B) to determine if a particular ILEC UNE in a particular geographic market must be unbundled, and for what period of time the ILEC should be required to provide the UNE. As this five-part test is applied to the original seven core UNEs set forth in Section 51.319 of the Commission's prior regulation, there is no doubt that competitive developments have made nationwide unbundling of ILEC network elements unnecessary and unworkable in geographic markets throughout the country were substitutable alternatives to ILEC unbundling clearly exists consistent with the requirements of Section 251(d)(2) and the decision of the Court in *AT&T v. Iowa*.

The necessary standard in Section 251(d)(2)(A) applies to proprietary elements. By definition, proprietary elements are those elements which are property rights protected under intellectual property laws. Mandatory unbundling of ILEC proprietary network elements should be required only when access to such element is absolutely essential for competition.

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[51] Hausman/Sidak Affidavit at 93.

IV. RECOMMENDATIONS ON APPLYING THE NECESSARY AND IMPAIRMENT TESTS

USTA's proposed standards for Commission review of necessary and impair under Section 251(d)(2) are consistent with the requirements of the Act and the Court's opinion. While USTA's impairment of competition standard is based on the ability of an ILEC to exercise significant market power for a service in the absence of unbundling, in the case of a proprietary element based on intellectual property, USTA recommends a standard that provides for unbundling only if competition is impossible in the absence of unbundling.

As discussed in the Hausman/Sidak Affidavit, "any element embodying a form of legally protected intellectual property, the necessary standard of Section 251 (d)(2) would apply."[52] Consistent with the Department of Justice and Federal Trade Commission *Antitrust Guidelines for the Licensing of Intellectual Property*, USTA defines intellectual property to include patents, copyrights, trade secrets, and know-how agreements.[53] According to the guidelines, "The intellectual property laws and the antitrust laws share the common purpose of promoting innovation and enhancing consumer welfare."[54] In explaining how the Commission should employ this test, Hausman/Sidak conclude:

> While our impairment of competition standard is based on the ability of an ILEC to excise significant market power for a service in the absence of unbundling, in the case of a proprietary element based on intellectual property we recommend a standard that provides for unbundling only if competition is impossible in the

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[52] Hausman/Sidak Affidavit at 93.

[53] *Id.* at 97.

[54] *Id.* at 946, note 207.

> absence of unbundling. Thus, an ILEC might retain some degree of market power based on the intellectual property, as currently happens with respect to intellectual property in the rest of the economy. However, so long as competition is possible without the use of the ILECs intellectual property, economic incentives will exist for ILECs and CLECs to negotiate an agreement over terms, because the ILEC will not be able to control competitive entry into the market for end-user services by means of its control of the intellectual property. We refer to our approach for proprietary elements based on intellectual property as the 'absolute essential' standard because unbundling is appropriate only when the element is truly necessary for competition.[55]

For any element embodying a form of legally protected intellectual property, the necessary standard of section 251(d)(2)(A) would apply. The Commission should recognize that this is a heightened standard of review, beyond impairment of competition, which should apply because of "the importance to consumer welfare of innovation that leads to the creation of intellectual property and because of the uncertainty of successful outcomes that is inherent in the innovative process."[56]

As previously outlined, the Hausman/Sidak impairment analysis involves the following five part test:

> The FCC shall mandate unbundling of a network element if and only if
>
> (1) it is technically feasible for the ILEC to provide the CLEC unbundled access to the requested network element in the relevant geographic market;
>
> (2) the ILEC has denied the CLEC use of the network element at a

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[55] Hausman/Sidak Affidavit at 97.

[56] *Id.* at 95.

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> regulated price computed on the basis of the regulator's estimate of the ILEC's total element long-run incremental cost;[57]
>
> (3) it is impractical and unreasonable for the CLEC to duplicate the requested network element through any alternative source of supply;
>
> (4) the requested network element is controlled by an ILEC that is a monopolist in the supply of a telecommunications service to end-users that employs the network element in question in the relevant geographic market; and
>
> (5) the ILEC can exercise market power in the provision of telecommunications services to end-users in the relevant geographic market by restricting access to the requested network element.

In response to the request for comment, this proposed test for the impairment standard provides the Commission with "a mechanism for removing particular elements from the unbundling requirements" while eliminating mandatory unbundling of particular elements where unbundling should not be required.[58] The order of the requirements are arranged in increasing degree of evidentiary burden. As Hausman/Sidak make clear, the benefits of this approach are unmistakable: "if a CLEC cannot demonstrate that a network element meets the first requirement, then that element is immediately declared inessential, and society is spared the expenditure of the

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[57] As explained earlier, "The second element of the impairment test proposed by Hausman and Sidak asks whether the ILEC has denied the CLEC use of the network element at a regulated price computed on the basis of the regulator's estimate of the ILEC's TELRIC. Of course, if the Eighth Circuit Court were to strike down the Commission's TELRIC pricing methodology, the second element of the Hausman and Sidak test would be restated to reflect the new standard by which regulated prices would be set for network elements subject to mandatory unbundling." *supra* at 6, note 9.

[58] *Second Further Notice of Proposed Rulemaking* at 14, ¶¶36-37.

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resources needed to perform the more intensive analysis required in the subsequent parts of the test."[59]

The Commission sought comment on "when we should deem a substitute sufficiently available so as to render access to the incumbent's network element unnecessary."[60] As Hausman/Sidak explain, "determining whether a particular network element in a particular geographic area actually is an essential facility requires a close empirical investigation based on the specific facts in that geographic market .... [and that] demand-side constraints on market power apply to UNEs in general, while supply-side can be analyzed at a UNE-specific level."[61] In elaborating on the supply-side/demand-side substitution constraints, Hausman/Sidak further explain that "From a supply-side perspective, the correct manner to assess whether an ILEC has the ability to exercise monopoly power is to ascertain the following: If the ILEC attempted to restrict its supply of a given network element to increase the price of end-user services above competitive levels, would other providers increase their supply of that UNE or competing UNEs sufficiently to defeat the attempted price increase?"[62] Under the circumstances, where competitors have no barriers to expansion or can access the network element from an alternative source, the ILEC cannot exercise market power in the end-user service market by restricting the

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[59] *Id.* at 91.

[60] *Second Further Notice of Proposed Rulemaking* at 9, ¶ 21; at 10, ¶ 24 (asking "how the Commission should consider the availability of network elements outside of the incumbent's network").

[61] Hausman/Sidak Affidavit at 98.

[62] *Id.* at 98.

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supply of a given element.[63] According to Hausman/Sidak, " a competitor providing a network element will have no binding capacity constraints, and it will be able economically to increase its supply of a given element at current prices because it already would be supplying the element."[64] Additionally, "Since marginal costs are not increasing for provision of network elements, a firm's current provision of a UNE will demonstrate its ability to expand supply. Thus, for a given UNE in which competitive supply exists, an ILEC will be unable to exercise market power in most situations."[65] Consistent with the Court's opinion that the Commission needed to consider the availability of UNEs from alternative suppliers to the ILEC in determining whether the ILEC's supply of a particular UNE met the necessary and impair standard, "an economic analysis of the expected supply of a given UNE would be required for the Commission to make a reasoned determination."[66] In addition, Hausman/Sidak conclude that "Because of the underlying technology of network elements, where fixed costs are high relative to marginal (or variable) costs, the economic incentives for non-ILECs that have entered the market to expand their supply will be very high. With high supply elasticity from competing firms, the ILEC will not likely exercise market power in the supply of elements."[67]

With respect to supply-side substitution constraints, Hausman/Sidak recommend that the

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[63] *Id.* at 98.

[64] *Id.* at 98-99

[65] *Id.* at 99.

[66] *Id.*

[67] *Id.*

the Commission incorporate two market characteristics.[68] Regulators should examine whether a CLEC is self-supplying the element in question in the relevant geographic market. If at least one CLEC is supplying the element in question, "the ILEC could not exercise market power in the end-user services market by restricting access to that element."[69] Conversely, if a particular element is not competitively supplied, "regulators should next examine the nature of the costs of the UNE to determine whether the element could be competitively supplied in the short term. In particular, if fixed (as opposed to sunk) costs represent a large share of the total costs of the element in question, then the element should not be unbundled." Based on their analysis, Hausman/Sidak concluded "as long as the asset can be redeployed in a different geographic market at little cost, the CLEC will face no exit barriers. Because low exit costs encourage entry, the regulator need not rely on unbundling of that UNE to stimulate competition."[70] Ultimately, as a UNE becomes competitively supplied, TELRIC pricing better reflects the market value of the UNE.[71] Accordingly, Hausman/Sidak concluded:

> The more likely it is that TELRIC accurately approximates the market-determined price of an unbundled network element, the less likely it is that the CLEC will demand mandatory unbundling of that element, because the value of the free option granted to the CLEC by the Commission will be near zero. Conversely, the less likely it is that TELRIC fully compensates the ILEC for the option value of mandatory unbundling of a particular network element when sunk costs are important, the more likely it is that the CLEC

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[68] *Id.* at 97-98.

[69] *Id.* at 98.

[70] *Id.*

[71] *Id.*

> will demand mandatory unbundling of that element at a TELRIC-based price. This perverse effect flows from the FCC's failure to recognize the substantial option value that is associated with the CLEC's right to compel sharing of the ILEC's sunk investments in network infrastructure.[72]

V. THE NECESSARY AND IMPAIR TESTS APPLIED TO UNBUNDLED NETWORK ELEMENTS

Whether to mandate ILEC unbundling is a factual determination that must be made on a geographically specific basis. Regulators must bear in mind the need to sunset any mandatory unbundling of ILEC network facilities in accordance with the necessary and impair tests proposed by USTA. Only by limiting ILEC unbundling where absolutely essential to competition when applying the standard for necessary, or when applying the market-power standard in USTA's impairment test, can the Commission promote competition, investment, and innovation which ultimately maximizes consumer welfare. The results of supply-side analysis of mandatory unbundling of the Commission's previously identified UNEs indicate that the Commission must carefully consider the consequences of imposing such requirements on ILECs.

A. Switching

Based on analysis of available data and application of the Hausman/Sidak impairment test, there is no basis on which the Commission should require mandatory ILEC unbundling of local switching. As Hausman/Sidak explain:

> The nature of costs for switches and the level of competition in their supply indicate that switches should not be unbundled in any

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[72] *Id.* at 101.

> geographic market in the United States. First, switches are already competitively supplied. As of March 1999, over one-third of all RBOC and GTE rate centers in the United States were served by at least one CLEC voice switch, and 17 percent were served by at least two CLEC switches. Even if switches were not competitively supplied, the nature of their costs suggests switches should not be unbundled. In particular, switches are highly substitutable across wide geographic areas. If a local switch is combined with digital loop carrier equipment, the switch can provide service to distant customers. At a certain point, the cost of transporting calls to a distant switch becomes more costly than the benefits achieved from the scale economies of increasing the switch load. According to AT&T, such an arrangement is feasible up to a 125-mile radius from the switch. Consequently, the relevant geographic markets for switching are large. Additionally, it is economical for competitors to self-supply (buy and install) switches across a wide range of geographic areas. As long as a CLEC believes that it can serve the minimum number of access lines needed to operate the switch in an economic fashion, self-supply is a viable alternative. Because there are no barriers to exit in the switch industry, mandatory unbundling of switches would increase competition and therefore could not improve consumer welfare.[73]

B. Local Loops

Regarding local loops, the Commission's stated a presumption that loops must be unbundled: "It is our strong expectation that under any reasonable interpretation of the 'necessary' and 'impair' standards of section 251(d)(2), loops will be generally subject to the section 251(c)(3) unbundling obligations."[74] Hausman/Sidak conclude that loops are "less substitutable than switching because a large portion of the facility is dedicated to an individual customer, or at least a specific street or neighborhood, and is costly to redeploy."[75] Clearly,

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[73] *Id.* at 102-103 (citing the Huber/Leo *UNE Fact Report*).

[74] *Second Further Notice of Proposed Rulemaking* at 13, ¶32.

[75] Hausman/Sidak Affidavit at 103.

however, in many suburban areas there are facilities-based local competitors for business services. As Hausman/Sidak explain, "Supply-side analysis shows that it cannot impair competition to decline to lease unbundled loops to those firms at TELRIC prices. Over time those CLECs should spread to residential customers as well. In some geographic areas, facilities-based competitors already serve residential customers."[76] The Commission's presumption that loops should be unbundled on a nationwide basis fails to consider the impact of competition in each market. According to Hausman/Sidak: "Given the pace of new technology deployment, suburban and even rural markets need to be analyzed on a case-by-case basis to determine whether and where unbundled loops are essential facilities. Only considering the restraints to market power owing to CLEC supply opportunities, unbundled loops may be essential facilities in some markets and not in others."[77]

C. Other Identified UNEs

As with unbundling of any particular ILEC UNE, the Commission must base its decision on a factual determination whether mandatory unbundling of a UNE, in any geographic market, is required to promote competition. For four of the five remaining elements, including network interface devices (NIDs), interoffice transmission facilities, signaling networks, and operations support systems, the Commission should undertake geographically specific fact finding before concluding whether or not those elements are competitively supplied, and if not, whether they could be competitively supplied in a reasonable period of time. Operator

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[76] Hausman/Sidak Affidavit at 103-104.

[77] *Id.* at 104.

services and directory assistance need not be unbundled in any geographic market because they are competitively supplied.[78] Recently, in response to a US WEST petition seeking to have directory assistance declared a competitive service, the Washington Utilities and Transportation Commission granted the relief sought when it determined that: (1) the relevant product market is the directory assistance services market in the state of Washington; (2) there are reasonably available alternative providers of the ... service; (3) there are no regulatory barriers to entry into the relevant market, and entry presently is occurring; and (4) the directory assistance services offered by [US WEST] are subject to effective competition.[79] The geographically specific market analysis conducted by the Washington State Commission is consistent with the approach advocated by USTA.

D. Advanced Services Unbundling

In terms of broadband networks and the services they deliver, market evidence demonstrates that mandatory unbundling of the ILECs' networks is not required to permit competition. ILECs lack market power in the delivery of broadband services. Thus, the network elements that the ILEC uses to supply those services cannot be essential facilities.

The Antitrust Division of the Department of Justice ("DoJ") approved the MCI WorldCom merger only after requiring the largest merger divestiture in history. In mandating that MCI divest its estimated $1.75 billion value Internet business, ultimately

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[78] *Id.* at 104-105.

[79] *In the Matter of Petition of U S WEST Communications, Inc. for Competitive Classification of Directory Assistance Services*, Dkt. UT-990259, Order at 4 (Apr. 29, 1999).

purchased by Cable and Wireless, the DoJ expressed its concern about the worldwide monopoly over the Internet backbone by MCI/WorldCom:

> The merger as originally proposed would have given WorldCom/MCI a significant proportion of the nation's Internet traffic, giving the company the ability to cut off or reduce the quality of Internet services that it provided to its rivals.... This divestiture benefits anyone who relies on the Internet because it preserves competition among major Internet service providers. Consumer will benefit with lower prices, higher quality, and greater innovation ....[80]

As the Commission's report to Congress concluded, competition in broadband services is well underway without any compulsory unbundling of the ILECs' network elements.[81] In its report, the Commission stated: "Numerous companies in virtually all segments of the communications industry are starting to deploy, or plan to deploy in the near future, broadband to the consumer market. Current providers include cable television companies, incumbent LECs, some utilities, and "wireless cable" companies."[82] The Commission acknowledged that:

> Deployment of broadband, both backbone and last mile, is occurring on a major scale, for both business and consumer markets. American business and the capital markets are obviously betting that broadband will be successful in the business and consumer markets and many companies are rushing to seize part of that success. We expect that this sizeable investment by numerous companies will translate in the near future into significant

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[80] Department of Justice Press Release at 1-2, July 15, 1998, http://www.usdoj.gov/atr/public/press_releases/1998/1829.htm .

[81] *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, Report*, CC Dkt. No. 98-146 (February 2, 1999).

[82] *Id.* at 7, ¶12.

deployment of broadband capability.[83]

In the same report to Congress, the Commission determined that cable broadband unbundling was not necessary "see[ing] no reason to take action on this issue at this time."[84] Because ILECs are non-dominant providers of broadband services, there is no reason to mandate ILEC unbundling. As Hausman/Sidak conclude: "Because cable companies currently pass more than 95 percent of U.S. homes, it follows that mandatory unbundling of the ILECs' broadband networks is not necessary for competition in broadband services, nor would competition be impaired if the ILECs' broadband networks were not unbundled."[85] As USTA stressed in a recent letter to Commission Chairman Bill Kennard, AT&T's direct acquisition of cable broadband local loops, in conjunction with other cable alliances, will allow AT&T to reach about 61 percent of all households.[86] Yet, the Commission does not require AT&T to unbundle its broadband network facilities, while AT&T is adamant about not permitting access to its facilities, while demanding that ILECs unbundle their networks on demand.[87] As AT&T has publicly argued "it shouldn't have to open its network to rivals that aren't taking the multibillion-dollar risk of buying and upgrading it."[88]

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[83] *Id.* at 18, ¶36.

[84] *Id.* at 52, ¶101.

[85] *Id.* at 103-104.

[86] Letter from Roy Neel, President & CEO of USTA to Bill Kennard, Chairman Federal Communications Commission at 3 (May 4, 1999).

[87] *Id.* at 6.

[88] *Id.* at 6, note 14.

Chairman Kennard has recognized the importance of removing barriers to ILEC investments in new technology and benefitting from innovations which lead to first-to-market advantages. As the Chairman stated:

> ***I want to get rid of any regulations that are not necessary to promote competition or protect consumers .... I am particularly interested in eliminating barriers to innovation and investment.***
>
> ***I, for one, am not afraid of seeing wireline telephone providers have a first mover advantage -- if you make the investments to get to market first ....***[89]

For the same reasons that AT&T asserts that it should not be required to unbundle its cable-based broadband network, an ILEC is unlikely to invest in the deployment of new broadband networks and services if it knows that the Commission will compel it to sell to its competitors at TELRIC prices the network elements used to supply that service if it proves to be commercially successful. The Commission, however, appears indifferent to the impact that TELRIC pricing would have on ILEC investment in new technologies: As Hausman/Sidak noted, the Commission's belief that "nothing in the statute or the Court's opinion that would preclude us from requiring that loops that must be unbundled must also be conditioned in a manner that allows requesting carriers supplying the necessary electronics to provide advanced telecommunications services, such as digital subscriber line technology ("DSL")"[90] is contrary to the Court's opinion regarding the limits imposed on the Commission's authority to mandate ILEC unbundling.

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[89] Remarks of Chairman Kennard to *USTA's Inside Washington Telecom*, Washington, D.C. (April 27, 1998).

[90] Hausman/Sidak Affidavit at 107, quoting the Commission's statements in the *Second Further Notice of Proposed Rulemaking* at 13, ¶ 2.

The Commission's shortsighted statement ignores the intent of the Act and the mandate from the Court. Mandatory unbundling of ILEC networks, absent the fact-based review of competitive alternatives in each geographic market, will create disincentives for ILECs to invest in new technologies that lead to the kind of innovation intended by the Act. Chairman Kennard has championed USTA's bedrock belief in free market forces as the only driver for competition:

> ***I have an abiding and unabashed faith in the power of the free market to deliver the best, most innovative and cheapest communications services. We cannot legislate or regulate to stop technological change. And we cannot legislate or regulate the power of the market to drive change.***[91]

In a companion affidavit, the authors further explain how mandatory unbundling requirements imposed on ILECs deploying advanced telecommunications networks and services create disincentives for investments in network upgrades and innovations.[92] In explaining the detrimental impacts of Commission policy favoring ILEC unbundling of broadband networks and services, Jorde/Sidak/Teece conclude:

> Mandatory unbundling of network elements at total element long-run incremental cost (TELRIC) prices will diminish the incentives of both ILECs and CLECs to invest in existing facilities and new technologies. The Commission must therefore carefully weigh that cost against the putative benefits of any limiting principle that it promulgates to implement the "necessary" and "impair" standards of section 251(d)(2) of the Telecommunications Act. A firm's investment decisions are based on its careful weighing of the expected returns from the investment against the firm's weighted-average cost of

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[91] Remarks of William E. Kennard, Chairman, Federal Communications Commission before the Congressional Economic Leadership Institute, June 17, 1998. http://www.fcc.gov/Speeches/Kennard/spwek817.html.

[92] Jorde/Sidak/Teece Affidavit.

> capital. The mandatory unbundling rules that the Commission tentatively adopts, or hints in the Second Further Notice of Proposed Rulemaking that it will adopt, would decrease the incentives of both ILECs and CLECs to invest in existing facilities and new technologies by lowering the expected returns and increasing the weighted-average cost of capital for each group of firms.[93]

On August 12, 1998, USTA made an *ex parte* filing in CC Docket Nos. 98-146, and 98-147 in which an exhaustive report by Robert Crandall and Charles Jackson entitled *Eliminating Barriers to DSL Service* was entered into the record.[94] In their study, Crandall and Jackson discuss current and future competition in Internet access through cable modems, cellular-based Internet service providers, CLECs, through high-speed satellite Internet access and packet radio Internet access. With respect to ILECs deploying DSL, the authors concluded:

> Applying retail or universal service regulation to DSL service makes it virtually certain that such investments would become unattractive. Moreover, if wholesale unbundling or resale were allowed in the first six or seven years, the ILEC would find it much more difficult to recover its investment. Indeed, the availability of unbundled copper loops may, by itself, require the ILEC to recover its DSL investment more rapidly than our model allows....
>
> One key step in bringing ... [competition] ... to local telecommunications is to ensure that LECs have the proper incentives to invest in the new data transmission technologies.[95]

Mandatory unbundling of ILEC broadband networks and services leads CLECs to make

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[93] Jorde/Sidak/Teece Affidavit at 10.

[94] *Ex parte* letter from USTA's Vice President and General Counsel Lawrence E. Sarjeant to FCC Secretary Margalie Roman Salas, August 12, 1998 in which was attached a letter and the Crandall and Jackson study addressed to Commission Chairman William E. Kennard and Commissioners Susan Ness, Michael K. Powell, Harold Furchgott-Roth, and Gloria Tristani.

[95] Crandall & Jackson *Eliminating Barriers to DSL Service* at 56 (July 1998).

business decisions that rely on the technological advancements derived from ILEC risk-taking, investments and innovations. By imposing mandatory unbundling of ILEC broadband networks and services at TELRIC prices, CLECs are most likely to "prefer unbundling to building facilities, even if building facilities has a higher net present value."[96] Moreover, CLECs are more likely to game the regulatory process for RBOC in-region long distance relief by demanding "bug-free"UNEs, particularly operational support systems, which when unmet leads to complaints that the RBOC has not fulfilled its Section 271 requirements.[97]

With respect to unbundling of switching, loops, DSLAMS and transmission facilities, including fixed and wireless, USTA recommends that the Commission not require mandatory unbundling at TELRIC prices because to do so would jeopardize the continuation of innovations. As Jorde/Sidak/Teece elaborate, investments by ILECs in more efficient routing tables and vertical features, development of loop technology such as DSL, DSLAMs, and wireless transmission facilities would be at risk if ILECs were required to provide access to these network elements on an unbundled basis at TELRIC prices.[98]

E. Combined Elements

The Commission asserts that the "[t]he ability of requesting carriers to use unbundled network elements, including combinations of unbundled network elements, is integral to achieving Congress'

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[96] *Id.* at 37.

[97] *Id.* at 38-41.

[98] *Id.* at 51-57.

objective of promoting rapid competition in the local telecommunications market."[99]

USTA's impairment test is designed to be conducted on a "stand-alone basis."[100] Should any element fail the test, the Commission should not require unbundling of that element at TELRIC pricing. With respect to UNE platforms, the impairment test is applied simultaneously, when each element in the combined UNE platform fails the impairment test, the Commission should not require unbundling of the set of UNEs comprising the UNE platform.[101]

F. Demand Side Substitution of Elements

From a demand-side perspective, the correct manner to assess whether an ILEC has the ability to exercise monopoly power is to ascertain the following: if the ILEC attempted to raise prices for end-user access while restricting its supply of a given UNE, would customers find an alternative source of acceptable end-user service. Accordingly, where cable, wireless, and voice telephony substitutes exist, the ability of ILECs to exhibit market power is significantly curtailed. Under the circumstances, it makes no sense to apply the impairment test on a UNE specific level.[102] There is nothing in the Act or the Court's opinion that would "constrain"[103] the Commission's inquiry regarding consideration of cable, wireless, or other substitutes to ILEC unbundling. The inherent fallacy in the Commission ignoring competitive substitutes is reflected in the findings of

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[99] *Second Further Notice of Proposed Rulemaking* at 2, ¶2.

[100] Hausman/Sidak Affidavit at 108.

[101] *Id.* at 109.

[102] *Id.*

[103] *Second Further Notice of Proposed Rulemaking* at 12, ¶28.

Hausman/Sidak:

> In contrast, antitrust analysis implies that the relevant product markets for an end product or an essential facility must be continually revised over time. Given those considerations and given the growth of bundled services successfully offered by the ILECs' competitors, the FCC runs the risk of its unbundling policy's being irrelevant to competition before they are even fully implemented—and thus obsolete and harmful to consumer welfare.[104]

VI. PROCEDURAL ISSUES

A. State Commissions Role

State regulators should play an active role in the application of any necessary and impair standards adopted by the Commission. As the Washington State Commission decision declaring directory assistance a competitive service indicates, geographically specific, fact-based determinations are required when assessments regarding the availability of substitutable elements are present in the market such that mandatory unbundling of ILEC network elements is unnecessary.

B. Evidentiary Burdens and Sunset Provision

The burden to provide evidence regarding the scope of competition and the availability of substitutes to mandatory unbundling of ILEC network elements must depend upon whether the ILEC or CLEC possesses the best information. The rebuttable presumption should be that mandatory unbundling of any given network element at a TELRIC price is not required. CLECs should bear the burden of establishing the need for a particular ILEC network element in

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[104] Hausman/Sidak Affidavit at 113.

a geographically specific market.[105]

The Commission also requested comment on the adoption of a sunset provision, "under which unbundling obligations for a particular element or elements would no longer be required, upon the passage of time or occurrence of certain events, without any subsequent action by the Commission."[106] Consistent with the *Merger Guidelines* adopted by the DoJ and the Federal Trade Commission, and discussed at length in these comments, mandatory unbundling of ILEC network elements at TELRIC pricing should automatically sunset within two years, or upon the entry of any facilities-based CLEC into the market. The CLEC would bear the burden of proof that mandatory unbundling of a particular element or elements should continue.[107]

CONCLUSION

In *AT&T v. Iowa*, the Supreme Court instructed the Commission to review its decision to impose mandatory unbundling of ILEC network elements pursuant to Section 251(c)(3) of the Act because the Commission failed to properly apply the limiting provisions in the necessary and impair standards of Section 251(d)(2). USTA has proposed a comprehensive test for both the necessary and impair standards that can assess whether, in specific geographic markets, mandatory unbundling of ILEC network elements is necessary to promote the pro-competitive intent of the Act. State commissions are best able to render decisions on unbundling as the recent decision of the Washington

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[105] *Id* at 119-121.

[106] *Second Further Notice of Proposed Rulemaking* at 15, ¶39.

[107] Hausman/Sidak Affidavit at 119-118.

State Commission, finding directory assistance to be a competitive service, indicates.

Mandatory unbundling of an ILEC network element should sunset within two years or when facilities-based competition is present in the market. The Commission should reject requests to impose unbundling requirements on advanced broadband networks and services provided by ILECs because ILECs lack market power and imposition of mandatory unbundling is a disincentive for ILECs to invest in network upgrades and to innovate. The recommendations made by USTA promote consumer welfare, are consistent with the opinion of the Supreme Court, and the pro-competitive deregulatory intent of the Act.

Respectfully submitted.

UNITED STATES TELEPHONE ASSOCIATION



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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Implementation of the Local Competition Provisions in the Telecommunications Act of 1996	)	CC Docket No. 96-98
	)	
Interconnection between Local Exchange Carriers and Commercial Mobile Radio Service Providers	)	CC Docket No. 95-185

AFFIDAVIT OF

JERRY A. HAUSMAN AND J. GREGORY SIDAK

IN RESPONSE TO

SECOND FURTHER NOTICE OF PROPOSED RULEMAKING

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INTRODUCTION

Jerry A. Hausman and J. Gregory Sidak declare as follows:

1. We have been asked by the United States Telephone Association (USTA) to submit expert testimony, in response to this *Second Further Notice of Proposed Rulemaking*,[1] that reconciles the "necessary" and "impair" standards of section 251(d)(2) of the Telecommunications Act[2] with the economic principles that provide the basis for the economic analysis of competition and antitrust analysis. In January 1999, both Justice Scalia's majority opinion and Justice Breyer's separate opinion in *AT&T Corp. v. Iowa Utilities Board*[3] alluded to essential facilities and market power analysis in antitrust jurisprudence and invited the Federal Communications Commission (FCC) to consider that body of law as a possible approach to determining when a network element would satisfy the "necessary" and "impair" standards of section 251(d)(2). Responding to that invitation by the Justices, this affidavit explains how economic analysis and antitrust jurisprudence would inform the Commission's statutory interpretation of section 251(d)(2).

2. We propose a five-part "impairment" test that focuses on whether competition can be effective in the end-user services market rather than whether a particular competitor can earn profits. Our test thus is concerned with consumer welfare, not competitor welfare. The essential facilities doctrine in antitrust law provides four necessary but not sufficient conditions for

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1. Implementation of the Local Competition Provisions in the Telecommunications Act of 1996 and Interconnection Between Local Exchange Carriers and Commercial Mobile Radio Service Providers, Second Further Notice of Proposed Rulemaking, CC Dkt. Nos. 96-98, 95-185 (released Apr. 16, 1999) [hereinafter *SFNPRM*].
2. 47 U.S.C. § 251(d)(2).
3. AT&T Corp. v. Iowa Utils. Bd., 119 S. Ct. 721 (1999).

defining "impairment" under section 251(d)(2). The complete set of necessary and sufficient conditions includes a fifth requirement, responsive to the explicit text of section 251(d)(2), to address whether the denial of access to a particular network element at a regulated TELRIC price would impair competition at the end-user level. Once the CLEC has demonstrated that the UNE meets the four existing requirements of the essential facilities doctrine, the CLEC must then demonstrate that an ILEC could exercise market power in the provision of telecommunications services to end-users in the relevant geographic market by restricting access to the requested network element. We recommend that "necessary" be interpreted to mean that competition in end-user services would be impossible unless the requested element were unbundled at TELRIC prices. This heightened standard will protect the economic incentives to create the intellectual property embodied in elements that are proprietary in nature. Our impairment test yields standards that accord with traditional antitrust analysis. Those standards should be assessed with temporal and geographic specificity. We find that switches should not be unbundled in any geographic market, while loops may be unbundled in specific geographic markets where AT&T or another major cable-telephony provider has yet to enter.

QUALIFICATIONS

3. Our professional qualifications for submitting this expert affidavit are as follows.

4. My name is Jerry A. Hausman. I am the MacDonald Professor of Economics at the Massachusetts Institute of Technology (MIT). I received an A.B. degree from Brown University and B.Phil. and D.Phil. (Ph.D.) degrees in economics from Oxford University, where I was a Marshall Scholar.

5. My academic and research specialties are econometrics, the use of statistical models and techniques on economic data, and microeconomics, the study of consumer behavior and the behavior of firms. I have published over 100 papers, including about twenty papers in the areas of telecommunications and regulation. I teach a course entitled "Competition in Telecommunications" to graduate students in economics and business at MIT each year. I am also the director of MIT's Telecommunications Economics and Business Research Program. I was a member of the editorial board of the *RAND Journal of Economics* (formerly the *Bell Journal of Economics*) for thirteen years. The *RAND Journal of Economics* is the leading economics journal of applied microeconomics and regulation. In December 1985, I received the John Bates Clark Award of the American Economic Association, awarded every other year for the most "significant contributions to economics" by an economist under forty years of age. I have received numerous other academic and economic society awards, including the Frisch Medal from the Econometrics Society in 1980.

6. I have done significant amounts of research in the telecommunications industry. My first experience in this area was in 1969, when I studied the Alaskan telephone system for the Army Corps of Engineers. Since that time, I have studied the demand for local measured service, the demand for intrastate toll service, consumer demands for new types of telecommunications technologies, marginal costs of local service, costs and benefits of different types of local services, including the effect of higher access fees on consumer welfare, and consumer demand for new types of pricing options for long-distance service. I have also studied the effect of new entry on competition in paging markets, telecommunications equipment markets, and interexchange markets. Other areas of telecommunications in which I have recently done research

include the cellular telephone industry and the information services industry. I have also edited two books on telecommunications, *Future Competition in Telecommunications* (Harvard Business School Press 1989) and *Globalization, Technology and Competition in Telecommunications* (Harvard Business School Press 1993). My most recent papers in telecommunications are "Taxation By Telecommunications Regulation," *Tax Policy and the Economy* (1998); "Economic Welfare and Telecommunications Welfare: The E-Rate Policy for Universal Service Subsidies," *Yale Journal on Regulation* (1999), with Howard A. Shelanski; and "Regulation by TSLRIC: Economic Effects on Investment and Innovation," *MultiMedia und Recht* (1999).

7. I have submitted affidavits and declarations in numerous federal and state proceedings regarding telecommunications regulation. For example, I have testified on numerous occasions before the California Public Utilities Commission about its Alternative Regulatory Frameworks for local exchange carriers. In 1998 I testified before the CPUC on economically correct methods to set prices for unbundled elements. I also submitted numerous affidavits to Judge Harold Greene in various proceedings regarding revisions of the Modification of Final Judgment in *United States v. AT&T*. In 1997, I submitted an affidavit and a reply affidavit before the Federal Communications Commission on behalf of BellSouth Corporation in support of its petition to be allowed to offer in-region, interLATA services in Louisiana according to the procedures set forth in section 271 of the Telecommunications Act of 1996.[4] I have also submitted declarations to the FCC regarding the unbundling of network elements, and I

4. 47 U.S.C. § 271.

participated in the FCC's forum on interconnection regulation in May 1996 and submitted declarations on behalf of USTA in the FCC's interconnection proceeding, CC Docket No. 95-185, which culminated in the Commission order that the Supreme Court reviewed in *AT&T Corp. v. Iowa Utilities Board*.

8. My name is J. Gregory Sidak. I am the F. K. Weyerhaeuser Fellow in Law and Economics at the American Enterprise Institute for Public Policy Research (AEI) in Washington, D.C., where I direct AEI's Studies in Telecommunications Deregulation. I am also a senior lecturer at the Yale School of Management, where I teach a course on telecommunications regulation and strategy with Professor Paul W. MacAvoy. In addition to holding those two academic positions, I am a managing director in LECG, Inc., an economic consulting services firm.

9. I have worked in the federal government on three occasions. From 1987 to 1989, I was deputy general counsel of the FCC. From 1986 to 1987, I was senior counsel and economist to the Council of Economic Advisers in the Executive Office of the President. From 1981 to 1982, I served as a law clerk to Chief Judge Richard A. Posner during his first term on the U.S. Court of Appeals for the Seventh Circuit. In addition to having worked in government, I have previously worked, as an attorney in private practice, on numerous antitrust cases and federal administrative, legislative, and appellate matters concerning telecommunications and other network industries.

10. My academic research concerns regulation and strategy in telecommunications and other network industries, antitrust policy, and constitutional law issues concerning economic regulation. I am the co-author of four books concerning pricing, costing, competition, and

investment in regulated network industries: *Deregulatory Takings and the Regulatory Contract: The Competitive Transformation of Network Industries in the United States* (Cambridge University Press 1997), with Daniel F. Spulber; *Toward Competition in Local Telephony* (MIT Press & AEI Press 1994), with William J. Baumol; *Transmission Pricing and Stranded Costs in the Electric Power Industry* (AEI Press 1995), also with Professor Baumol; and *Protecting Competition from the Postal Monopoly* (AEI Press 1996), also with Professor Spulber. I am also the author of a fifth book, *Foreign Investment in American Telecommunications* (University of Chicago Press 1997), and of more than thirty scholarly articles in law reviews and economics journals. Some of those articles are directly relevant to this proceeding,[5] including "Essential Facilities," published in the May 1999 issue of the *Stanford Law Review*.[6] I am the editor of *Is the Telecommunications Act of 1996 Broken? If So, How Can We Fix It?* (AEI Press 1999), *Competition in International Telecommunications* (AEI Press forthcoming 1999), and *Telecommunications Deregulation in Germany and the United States* (AEI Press forthcoming 1999).

11. I have testified before the U.S. Senate and House of Representatives. My writings have been cited by the Supreme Court, including Justice Breyer's opinion in the 1999 decision in *AT&T Corp. v. Iowa Utilities Board*. My writings also have been cited by the lower federal and state supreme courts and by state and federal regulatory commissions.

12. I have been a consultant on regulatory and antitrust matters to the Antitrust Division of the U.S. Department of Justice, to the Canadian Competition Bureau, and to more

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5. *See* J. Gregory Sidak & Daniel F. Spulber, *The Tragedy of the Telecommons: Government Pricing of Unbundled Network Elements Under the Telecommunications Act of 1996*, 97 COLUM. L. REV. 1081 (1997); J. Gregory Sidak & Daniel F. Spulber, *Givings, Takings, and the Fallacy of Forward-Looking Costs*, 72 N.Y.U. L.

than thirty companies in the telecommunications, electric power, natural gas, mail and parcel delivery, broadcasting, newspaper publishing, and computer software industries in North America, Europe, Asia, and Australia.

13. From Stanford University, I earned A.B. (1977) and A.M. (1981) degrees in economics and a J.D. (1981) in law. I was a member of the *Stanford Law Review*.

14. We file this affidavit in our individual capacities and not on behalf of the Massachusetts Institute of Technology, the American Enterprise Institute, or the Yale School of Management.

SUMMARY OF CONCLUSIONS

15. The Telecommunications Act of 1996 sets forth, in sections 251 and 252, provisions to unbundle the local telecommunications network to encourage the development of a competitive market for local telephony.[7] In this proceeding, the FCC must devise a limiting principle for the "necessary" unbundling of proprietary network elements. In its 1996 *Local Competition First Report and Order*,[8] the FCC had no limiting principle, such that it deemed any

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REV. 1068 (1997).

6. Abbott B. Lipsky, Jr. & J. Gregory Sidak, *Essential Facilities*, 51 STAN. L. REV. 1185 (1999).

7. *See* 47 U.S.C. §§ 251-52. For detailed discussions of this open-access regulation, see J. GREGORY SIDAK & DANIEL S. SPULBER, DEREGULATORY TAKINGS AND THE REGULATORY CONTRACT: THE COMPETITIVE TRANSFORMATION OF NETWORK INDUSTRIES IN THE UNITED STATES (Cambridge University Press 1997); ALFRED E. KAHN, LETTING GO: DEREGULATING THE PROCESS OF DEREGULATION, OR: TEMPTATION OF THE KLEPTOCRATS AND THE POLITICAL ECONOMY OF REGULATORY DISINGENUOUSNESS (Institute of Public Utilities and Network Industries, Michigan State University 1998); Robert G. Harris & C. Jeffrey Kraft, *Meddling Through: Regulating Local Telephone Competition in the United States*, 11 J. ECON. PERSP. 93 (1997).

8. Implementation of the Local Competition Provisions in the Telecommunications Act of 1996 and Interconnection Between Local Exchange Carriers and Commercial Mobile Radio Service Providers, First Report and Order, CC Dkt. Nos. 96-98, 95-185, 11 F.C.C. Rcd. 15,499 (1996) [hereinafter *Local Competition First Report and Order*], *rev'd in part and affirmed in part sub nom.* Iowa Utils. Bd. *v.* FCC, 120 F.3d 753 (8th Cir.

technically feasible unbundling of proprietary network elements to be "necessary." Similarly, the Commission found that an incumbent local exchange carrier (ILEC) had to unbundle any nonproprietary network element if, in the absence of such mandatory unbundling, a telecommunications carrier seeking to offer a service would suffer even the slightest degree of "impairment" in its ability to do so. The Supreme Court, in *Iowa Utilities Board*, rejected those approaches and strongly suggested that the economic analysis of antitrust law provided the Commission with a useful model for interpreting section 251(d)(2).[9]

16. That is not to say that the Commission's interpretation of section 251(d)(2) must incorporate by reference all of antitrust law. Rather, to place the issue within the context of an agency interpretation of a newly enacted statute, the Court identified two disparate points along a continuum. Only a portion of that continuum, however, constitutes a zone of reasonable statutory interpretations for purposes of the *Chevron* doctrine.[10] The FCC's *Local Competition First Report and Order* was, in the Court's determination, plainly outside the zone of reasonable interpretations of "necessary" and "impair" that could have been chosen along the continuum. In contrast, one must read Justices Scalia and Breyer to imply that the essential facilities doctrine and related economic analysis of demand and supply substitution would produce definitions of "necessary" and "impair" that would safely fall within the zone of reasonable interpretations of section 251(d)(2).

1997), *rev'd in part and affirmed in part sub nom.* AT&T Corp. *v.* Iowa Utils. Bd., 119 S. Ct. 721 (1999).

9. AT&T Corp. *v.* Iowa Utils. Bd., 119 S. Ct. 721 (1999).

10. Chevron U.S.A. Inc. *v.* Natural Resources Defense Council, Inc., 467 U.S. 837 (1984).

17. It does not follow, however, that the Commission should pick any point that lies in the zone of reasonableness along the continuum of possible statutory interpretations. Rather, the Commission should adopt an interpretation that represents its best efforts to identify the *optimal* point along the continuum, where "optimality" for that purpose depends primarily on consumer-welfare maximization. The same is true if the continuum is recast as a measure of "impairment," running from blatant foreclosure of a more efficient competitor, at one extreme, to explicit subsidization of a less efficient competitor, at the other extreme. For purposes of section 251(d)(2), the public interest is, and should be interpreted as being, primarily determined by consumer welfare, which is determined by competition rather than competitor welfare.[11] The question, under *Chevron*, can thus be cast as whether the FCC now has a reasonable basis for interpreting section 251(d)(2) in a manner that more resembles its former approach in the *Local Competition First Report and Order* (which was outside the zone of reasonableness entirely and therefore clearly could not be optimal) than the antitrust jurisprudence on demand and supply substitutability (which plainly would be within the zone of reasonableness and therefore clearly could be optimal). Moreover, at a more pragmatic level, to maximize its likelihood of being affirmed on the inevitable appeal of its report and order in this proceeding, the Commission should accept the invitation of Justices Scalia and Breyer to incline its interpretation of section

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11. Our previous writings have emphasized this equivalence between the public interest standard and the consumer welfare standard. *See* JERRY HAUSMAN, TAXATION BY TELECOMMUNICATIONS REGULATION: THE ECONOMICS OF THE E-RATE 4 (AEI Press 1998); SIDAK & SPULBER, *supra* note 7, at 309–10, 340; WILLIAM J. BAUMOL & J. GREGORY SIDAK, TOWARD COMPETITION IN LOCAL TELEPHONY 26–27 (MIT Press & AEI Press 1994); Jerry Hausman & Howard A. Shelanski, *Economic Welfare and Telecommunications Welfare: The E-Rate Policy for Universal Service Subsidies*, 16 YALE J. ON REG. 19 (1999); Jerry Hausman, *Valuing the Effect of Regulation on New Services in Telecommunications*, BROOKINGS PAPERS ON ECON. ACTIVITY: MICROECONOMICS, 1997; J. Gregory Sidak, *Telecommunications in Jericho*, 81 CALIF. L. REV. 1209, 1234–38 (1993).

251(d)(2) toward established antitrust principles. The purpose of this affidavit is to explain how the Commission can successfully put that advice into practice.

18. In Part I of this affidavit, we examine the reasoning with which Justices Scalia and Breyer analyzed the "necessary" and "impair" standards of section 251(d)(2). Readers who already are familiar with the relevant statutory language and the *Iowa Utilities Board* decision can proceed to Part II. Our analysis begins with the proposition that Congress did not create through its enactment of the Telecommunications Act a conflict in objectives between that statute and the existing body of antitrust jurisprudence. Antitrust law seeks to maximize the well-being of consumers.[12] Similarly, Congress stated that the purpose of the Telecommunications Act of 1996 is to "promote competition and reduce regulation in order to secure lower prices and higher quality services for American telecommunications consumers and encourage the rapid deployment of new telecommunication technologies."[13] Both antitrust law and the Telecommunications Act seek to promote and protect the competitive process, not particular competitors or particular market structures. Both seek to protect the legitimate returns to private investment. Although the Commission has the discretion under *Chevron* to promulgate rules predicated on reasonable interpretations of the Telecommunications Act, it would not be reasonable in light of *Iowa Utilities Board* for the agency to interpret section 251(d)(2) in a manner that diverged from essential facilities and market power principles in antitrust law. The FCC, in short, could not

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12. This principle is well established in antitrust law. *See, e.g.*, National Collegiate Athletic Ass'n. *v.* Board of Regents of Univ. of Okla., 468 U.S. 85, 107 (1984); Reiter *v.* Sonotone Corp., 442 U.S. 330, 343 (1979) (citing ROBERT H. BORK, THE ANTITRUST PARADOX: A POLICY AT WAR WITH ITSELF 66 (Free Press 1978)). For special application of the consumer-welfare criterion to industries undergoing deregulation, see Stephen G. Breyer, *Antitrust, Deregulation, and the Newly Liberated Marketplace*, 75 CALIF. L. REV. 1005 (1987).

13. Telecommunications Act of 1996, Pub. L. No. 104–104, 110 Stat. 56, 56 (preamble).

dismiss such economic analysis as irrelevant to interpretation of the Telecommunications Act without also dismissing consumer-welfare maximization as the rightful objective of the 1996 legislation.

19. In Part II, we use economic analysis to explain why it is necessary for the FCC to enunciate limiting principles for the mandatory unbundling of network elements. First, unbundling rules should emphasize consumer welfare and competition rather than competitor welfare. Second, the issue is not whether the ILECs will unbundle their network elements for use by competitive local exchange carriers (CLECs), but whether the government will compel the ILECs to do so at regulated prices set on the basis of total element long-run incremental cost (TELRIC). Third, the social costs of a particular unbundling regime may outweigh the gains. Fourth, the "necessary" and "impair" standards should not rely on an economic misconception of sunk costs in local telecommunications. Fifth, the apparent justification for mandatory unbundling can be endogenously distorted by the FCC's own policies, particularly inefficient and uncompensatory pricing of unbundled network elements.[14]

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14. Three years before passage of the Telecommunications Act of 1996, Professor William J. Baumol and one of the present authors wrote:

> [R]egulators considerably influence the firm's demand elasticity by their decisions and policies that affect the firm's actual or potential competitors. Clearly, severe constraint of firms' entry and pricing will somewhat immunize each enterprise from the competitive pressures of others. That immunity from competition will reduce the elasticity of each supplier's demand—that is, it will reduce the loss of business that results from a rise in its prices. The firm's price elasticity of demand thus must be said to be endogenously determined by the regulatory process itself. . . .
>
> It appears especially clear in telecommunications that a firm's price elasticity of demand is endogenously determined by its regulatory environment.

BAUMOL & SIDAK, *supra* note 11, at 40–41 (citing William E. Landes & Richard A. Posner, *Market Power in Antitrust Cases*, 94 HARV. L. REV. 937, 945 (1981)).

20. In Part III, we examine the limiting principles that are inherent in the essential facilities doctrine and in the competitive analysis of demand and supply substitution that informs traditional antitrust analysis of market power. On the basis of antitrust learning, we present economic definitions for "necessary" and "impair." One immediate lesson is that sound economic analysis counsels the FCC to interpret section 251(d)(2) to impose geographic and temporal limitations on mandatory unbundling. That conclusion flows directly from an established body of antitrust jurisprudence on market definition and the assessment of market power. Before it will be able to conclude with any degree of confidence that its order of mandatory unbundling would serve the public interest and enhance consumer welfare, the Commission—or, preferably, the state public utilities commissions—would be well advised to make market-power determinations in each relevant geographic market for each network element for which the agency proposes to mandate unbundling. That market-power analysis should be based on a specified time horizon, after which time the requirement of unbundling for that network element should sunset unless the access seeker successfully carries the burden of proving that consumer welfare would suffer without the Commission's continuation of such mandatory unbundling.

21. Second, the definitions of "necessity" and "impairment" should be refined in terms of demand and supply substitution. The "necessity" of unbundling a proprietary network element, and the extent to which competition would be "impaired" if a nonproprietary element were not-unbundled, depend on of the respective price elasticities of demand and supply in both the input (unbundle network element) and output (end-user access) markets. Our recommended approach comports with the analysis of unilateral effects in the 1992 *Merger Guidelines* adopted

by the Federal Trade Commission and Antitrust Division of the U.S. Department of Justice.[15] Antitrust jurisprudence has long incorporated such techniques for measuring market power,[16] including the rules of derived demand, first enunciated by one of the pioneers of modern microeconomic theory, Alfred Marshall,[17] and subsequently exposited by the late Nobel laureate George Stigler.[18] The necessity of unbundling an element, or the likelihood that a failure to order mandatory unbundling of a particular element would impair competition, should be assessed in light of the existence of competition among different bundles of end services. With respect to its impairment test, section 251(d)(2) is even more emphatic that the focus shall be on the ability of the telecommunications carrier to provide *services*. Congress's choice of statutory language accords with correct economic analysis of competition. Thus, the interpretation of "impair" with respect to loops, for example, should reflect the existence of substitution among bundles of services that use different access technologies (such as cable television's coaxial and fiber-optic infrastructure to provide local access for voice telephony, or the wireless one-rate plans that encompass "free" roaming and long-distance calling).

22. The existing essential facilities doctrine sets forth necessary but not sufficient conditions for defining "impairment" under section 251(d)(2). The complete set of necessary

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15. Department of Justice and Federal Trade Commission, Horizontal Merger Guidelines (1992) [hereinafter *Merger Guidelines*].

16. The classic article is Landes & Posner, *supra* note 14, at 944–45.

17. *See* ALFRED MARSHALL, 5 PRINCIPLES OF ECONOMICS ch. 6 (Macmillan Publishing Co. 1922). For other explications of Marshall's rules of derived demand, see RICHARD G. LAYARD & ALAN A. WALTERS, MICROECONOMIC THEORY 259–72 (McGraw Hill, Inc. 1978). Derived demand is similar to, but distinguishable from, residual demand in the sense that the latter focuses on the demand for the end product and is calculated for any given firm by subtracting the supply of other firms from the market demand. *See* DENNIS W. CARLTON & JEFFREY M. PERLOFF, MODERN INDUSTRIAL ORGANIZATION 100 (Harper Collins 2d ed. 1994).

18. *See* GEORGE J. STIGLER, THE THEORY OF PRICE 252–55 (Macmillan Publishing Co. 4th ed. 1987).

and sufficient conditions includes a fifth requirement, responsive to the explicit text of section 251(d)(2), to address whether the denial of access to that network element at TELRIC prices would impair competition at the end-user level. Once the CLEC has demonstrated that the network element meets the four requirements already contained in the essential facilities doctrine, the CLEC must then demonstrate that an ILEC could exercise market power in the provision of telecommunications services to end-users in the relevant geographic market by restricting access to the requested network element. Our five-part test is as follows:

> The FCC shall mandate unbundling of a network element if and only if
>
> (1) it is technically feasible for the ILEC to provide the CLEC unbundled access to the requested network element in the relevant geographic market;
>
> (2) the ILEC has denied the CLEC use of the network element at a regulated price computed on the basis of the regulator's estimate of the ILEC's total element long-run incremental cost;
>
> (3) it is impractical and unreasonable for the CLEC to duplicate the requested network element through any alternative source of supply;
>
> (4) the requested network element is controlled by an ILEC that is a monopolist in the supply of a telecommunications service to end-users that employs the network element in question in the relevant geographic market; and
>
> (5) the ILEC can exercise market power in the provision of telecommunications services to end-users in the relevant geographic market by restricting access to the requested network element.

The fifth-element is operationalized by computing the "critical share" of customers that the ILEC must lose in order to deter the ILEC from exercising market power in the end-user service market. It is immediately clear that the FCC's requirement of any "technically

unbundling decision. Third, we explain why the state public utilities commissions should administer a market power test that is both location-specific and fact-intensive.

I. JUSTICES SCALIA AND BREYER ON "NECESSARY" AND "IMPAIR"

25. Nearly three years after Congress enacted the Telecommunications Act of 1996,[19] the Supreme Court, in *AT&T Corp. v. Iowa Utilities Board*,[20] struck down as arbitrary and capricious the FCC's implementation of the network element unbundling provisions contained in section 251(c)(3) of that new legislation.[21] Specifically, the Court vacated section 51.319 of the FCC's rules,[22] which the FCC had promulgated in its *Local Competition First Report and Order* in August 1996.[23] The FCC's 1996 order announced, among other things, the minimum list of network elements that incumbent local exchange carriers must offer to other telecommunications carriers on an unbundled basis pursuant to the newly enacted sections 251(c)(3) and 251(d)(2). The Court found that the FCC's unbundling rule, also known simply as Rule 319, erroneously interpreted the "necessary" and "impair" standards of section 251(d)(2).[24] Specifically, the Court directed the FCC, on remand, to "determine on a rational basis which network elements must be made available taking into account the objectives of the 1996 Act and giving some substance to the 'necessary' and 'impair' requirements."[25]

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19. Pub. L. No. 104-104, 110 Stat. 56.
20. 119 S. Ct. at 721.
21. 47 U.S.C. §§ 151 *et seq.*
22. 47 C.F.R. § 51.319.
23. *See Local Competition First Report and Order*, *supra* note 8. The Court, however, affirmed other aspects of the order, including provisions relating to the pricing of unbundled network elements.
24. 119 S. Ct. at 733–36.
25. *Id.* at 736.

26. We review here the statutory framework of the "necessary" and "impair" standards, including the objectives of the Telecommunications Act of 1996. Next, we review the FCC's interpretation of those standards. We then analyze Justice Scalia's opinion for the Court and Justice Breyer's separate opinion, which concurred in the Court's ruling that the FCC had imparted an unreasonable statutory interpretation to the terms "necessary" and "impair." Finally, we analyze the dissenting opinion of Justice David Souter and show that the reasoning that he employed, and that a majority of the Court rejected, helps to clarify the definitions of "necessary" and "impair" that would reduce consumer welfare and hence be impermissible for the FCC to adopt. Readers who are already familiar with the relevant statutory language and the *Iowa Utilities Board* decision can proceed to Part II of this affidavit.

A. The Statutory Framework

1. The Objectives of the Telecommunications Act of 1996

27. One cannot construe "necessary" and "impair" for purposes of section 251(d)(2) without first enunciating the larger objective of the Telecommunications Act of 1996. The preamble to the Telecommunications Act states that its purpose is to "promote competition and reduce regulation in order to secure lower prices and higher quality services for American telecommunications consumers and encourage the rapid deployment of new telecommunication technologies."[26] In the legislative history, Congress reiterated that the objectives of the Tele-

26. Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56, 56 (preamble).

communications Act are "to provide for a pro-competitive, deregulatory national policy framework designed to accelerate rapidly private sector deployment of advanced telecommunications and information technologies and services to all Americans by opening all telecommunications markets to competition . . . ."[27]

2. The "Necessary" and "Impair" Requirements

28. Section 251(c)(3) requires any ILEC (other than certain rural carriers[28]) to offer to competitors access to the ILEC's network elements on an unbundled basis.[29] In turn, section 251(d)(2) requires the FCC to consider, when determining whether to mandate the unbundling of an ILEC's network elements under section 251(c)(3),

> at a minimum, whether—(A) access to such network elements as are proprietary in nature is necessary; and (B) the failure to provide access to such network elements would impair the ability of the telecommunications carrier seeking access to provide the services that it seeks to offer.[30]

Together, those two subsections are known as the "necessary" and "impair" requirements.

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27. *See* H.R. REP. NO. 458, 104th Cong., 2d Sess. 1 (1996).

28. *See* 47 U.S.C. § 251(f).

29. Section 251(c)(3) provides that "[i]n addition to the duties contained in subsection [251(b)], each incumbent local exchange carrier" has certain other duties, including:

> (3) Unbundled access.—The duty to provide, to any requesting telecommunications carrier for the provision of a telecommunications service, nondiscriminatory access to network elements on an unbundled basis at any technically feasible point on rates, terms, and conditions that are just, reasonable, and nondiscriminatory in accordance with the terms and conditions of the agreement and the requirements of this section and section 252. An incumbent local exchange carrier shall provide such unbundled network elements in a manner that allows requesting carriers to combine such elements in order to provide such telecommunications service.

47 U.S.C. § 251(c)(3).

30. *Id.* at § 251(d)(2).

29. By the plain language of section 251(c)(3), the "necessary" standard applies only to "such network elements as are proprietary in nature."[31] But neither section 251(d)(2) nor any other section of the Telecommunications Act of 1996 defines "proprietary" for purposes of the ILEC's duty to unbundle network elements. In the practice, the "necessary" standard of section 251(d)(2) may ultimately prove to have less frequent application than the "impair" standard if, under whatever legal definition is adopted, an ILEC is deemed to have few or no network elements that are "proprietary in nature." One way to view the "necessary" standard is that the "impairment" standard sets necessary but not sufficient conditions for the mandatory unbundling of an element that is "proprietary in nature."

B. The FCC's Interpretation of the "Necessary" and "Impair" Requirements

30. The FCC promulgated its statutory interpretations of "proprietary," "necessary," and "impair" in its August 1996 *Local Competition First Report and Order*. The FCC concluded that proprietary network elements include "those elements with proprietary protocols or elements containing proprietary information."[32] An ILEC's signaling protocols that adhere to Bellcore standards, however, were not proprietary in the FCC's view because they use industry-wide protocols.[33]

31. The FCC defined "necessary" to mean "an element is a prerequisite for competition."[34] The agency ruled that "in some instances, it will be 'necessary' for requesting carriers to

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31. *Id.* at § 251(d)(2)(A).
32. *Local Competition First Report and Order*, 11 F.C.C. Rcd. at 15,641 ¶ 282.
33. *Id.* at 15,739 ¶ 481.
34. *Id.* at 15,641–42 ¶ 282.

obtain access to proprietary elements (*e.g.*, elements with proprietary protocols or elements containing proprietary information), because without such elements the ability of requesting carriers to compete would be significantly impaired or thwarted."[35] The FCC noted that ILECs "have economies of density, connectivity, and scale . . . [that must] be shared with entrants."[36]

32. The FCC, relying on a literal dictionary definition, ruled in the *Local Competition First Report and Order* that "impair" means "to make or cause to become worse; diminish in value."[37] The FCC further ruled that

> generally . . . an entrant's ability to offer a telecommunications service is "diminished in value" if the quality of the service the entrant can offer, absent access to the requested element, declines and/or the cost of providing the service rises.[38]

To effectuate its statutory interpretation of "necessary" and "impair," the FCC ordered, through its promulgation of Rule 319, that an ILEC make seven UNEs available to a requesting telecommunications carrier: local loops; network interface devices (NIDs); local switching; interoffice transmission facilities; signaling networks and call-related databases; operations support systems (OSS); and operator services (OS) and directory assistance (DA).[39]

33. On appeal, the U.S. Court of Appeals for the Eighth Circuit affirmed Rule 319 as a reasonable agency interpretation, under the *Chevron* doctrine,[40] of the "necessary" and "impair" standards of section 251(d)(2).[41] The Supreme Court granted certiorari on that and

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35. *Id.* at 15,641 ¶ 282.
36. *Id.* at 15,508–09 ¶ 11.
37. *Id.* at 15,643 ¶ 285 (quoting RANDOM HOUSE COLLEGE DICTIONARY 665 (rev. ed. 1984)).
38. *Id.* at 15,643 ¶ 285.
39. *Id.* at 15,683 ¶ 366 (codified at 47 C.F.R. § 51.319).
40. Chevron U.S.A. Inc. *v.* Natural Resources Defense Council, Inc., 467 U.S. 837 (1984).
41. Iowa Utils. Bd. *v.* FCC, 120 F.3d 753, 808–10 (8th Cir. 1997). *See generally* STEPHEN G. BREYER,

other questions.[42] The Court subsequently reversed the Eighth Circuit (and hence the FCC) on the interpretation of "necessary" and "impair," vacated Rule 319, and remanded the case to the FCC for further proceedings.[43]

C. Justice Scalia's Opinion for the Court

34. Writing for the Court, Justice Scalia regarded the unbundling provisions of the Telecommunications Act of 1996 as reflecting Congress's skepticism that local telephony is not a "natural monopoly" and that "[t]echnological advances . . . have made competition among multiple providers of local service seem possible."[44] But from that congressional concern, however, it did not follow that the Telecommunications Act gave the FCC unlimited authority to compel ILECs to share their facilities with competitors.

35. The Court ruled that section 251(d)(2) imposes "clear limits" on the FCC's authority to determine whether an ILEC must unbundle a particular network element pursuant to section 251(c)(3) and that Rule 319 exceeded the bounds of those clear limits.[45] Justice Scalia wrote for the Court that "the FCC did not adequately consider the 'necessary and impair' standards when it gave blanket access to these network elements, and others, in Rule 319."[46] The Court considered, but did not rule on, the relevance of the essential facilities doctrine in antitrust

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RICHARD B. STEWART, CASS R. SUNSTEIN & MATTHEW L. SPITZER, ADMINISTRATIVE LAW AND REGULATORY POLICY: PROBLEMS, TEXT, AND CASES 256 (Aspen Law & Business 4th ed. 1999) (explaining *Chevron*).

42. 118 S. Ct. 683 (1998).
43. 119 S. Ct. at 733-36.
44. *Id.* at 726.
45. *Id.* at 738.
46. *Id.* at 734.

law as a limiting principle for the FCC's correct interpretation of the "necessary" and "impair" standards. Justice Scalia wrote:

> The incumbents argue that § 251(d)(2) codifies something akin to the "essential facilities" doctrine of antitrust theory, opening up only those "bottleneck" elements unavailable elsewhere in the marketplace. We need not decide whether, as a matter of law, the 1996 Act requires the FCC to apply *that* standard; it may be that some other standard would provide an equivalent or better criterion for the limitation upon network-element availability that the statute has in mind. But we do agree with the incumbents that the Act requires the FCC to apply *some* limiting standard, rationally related to the goals of the Act, which it has simply failed to do.[47]

The Court found that Rule 319 lacked such a limiting principle, either with respect to "necessary" or "impair."

36. With respect to "necessary," Justice Scalia observed that "the Commission announced that it would regard the 'necessary' standards as having been met regardless of whether 'requesting carriers can obtain the requested proprietary element from a source other than the incumbent,' since 'requiring new entrants to duplicate unnecessarily even a part of the incumbent's network could generate delay and higher costs for new entrants, and thereby impede entry by competing local providers and delay competition, contrary to the goals of the 1996 Act.'"[48] Justice Scalia did not pause to elaborate on the fallacy of the FCC's reasoning.

37. Rather, he immediately proceeded to explain why, with respect to "impair," it was erroneous for the FCC to

> regard the "impairment" standard as having been met if "the failure of an incumbent to provide access to a network element would decrease the quality, or increase the financial or administrative cost of the service a requesting carrier

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47. *Id.* at 734–35 (citing 3A PHILLIP E. AREEDA & HERBERT HOVENKAMP, ANTITRUST LAW ¶¶ 771–73 (Little Brown & Co. 1996) (emphasis in original) (citation omitted)).

48. *Id.* at 735 (quoting *Local Competition First Report and Order*, 11 F.C.C. Rcd. at 15,642 ¶ 283).

> seeks to offer, compared with providing that service *over other unbundled elements in the incumbent LEC's network*,"—which means that comparison with self-provision, or with purchasing from another provider, is excluded.[49]

In the Court's assessment, the FCC had created a tautology: "Since any entrant will request the most efficient network element that the incumbent has to offer, it is hard to imagine when the incumbent's failure to give access to the element would not constitute an 'impairment' under this standard."[50] Moreover, in the process, the FCC had assigned to potential entrants the critical determination that Congress had delegated to the agency through its enactment of section 251(d)(2):

> The Commission asserts that it deliberately limited its inquiry to the incumbent's own network because no rational entrant would seek access to network elements from an incumbent if it could get better service or prices elsewhere. That may be. But that judgment allows entrants, rather than the Commission, to determine whether access to proprietary elements is necessary, and whether the failure to obtain access to nonproprietary elements would impair the ability to provide services.[51]

In seeking to implement the unbundling provisions of the 1996 legislation, the FCC had created a process that would, in effect, be controlled by the access seekers themselves.

38. The Court also criticized, on two grounds, the economic reasoning underlying the FCC's interpretation of "necessary" and "impair." Those two errors of economic logic translated into two reversible legal errors in the agency's interpretation of section 251(d)(2). First, the FCC ignored the relevance of supply substitutability. The Court found that, in determining the list of elements that ILECs must provide on an unbundled basis pursuant to

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49. *Id.* (quoting *Local Competition First Report and Order*, 11 F.C.C. Rcd. at 15,643 ¶ 285) (emphasis added by the Court).

50. *Id.*

sections 251(c)(3) and 251(d)(2), the FCC must consider the availability of network elements outside the incumbent's network:

> The Commission cannot, consistent with the statute, blind itself to the availability of elements outside the incumbent's network. That failing alone would require the Commission's rule to be set aside.[52]

Second, Justice Scalia emphasized that the "impairment" standards must embody some threshold of materiality. Otherwise, "impairment" could be said to result from the slightest difference between what the ILEC implicitly paid itself for use of a particular network element and what the requesting carrier would pay for it as a UNE. "Impairment" similarly could be said to result from any difference in the quality of the network element:

> [T]he Commission's assumption that *any* increase in cost (or decrease in quality) imposed by denial of a network element renders access to that element "necessary," and causes the failure to provide that element to "impair" the entrant's ability to furnish its desired services is simply not in accord with the ordinary and fair meaning of those terms. An entrant whose anticipated annual profits from the proposed service are reduced from 100% of investment to 99% of investment has perhaps been "impaired" in its ability to amass earnings, but has not *ipso facto* been "impaired . . . in its ability to provide the services it seeks to offer"; and it cannot realistically be said that the network element enabling it to raise its profits to 100% is "necessary."[53]

In articulating that legal and economic reasoning for the Court, Justice Scalia responded to Justice Souter's dissent, which would have found that the common usage of the words "necessary" and "impair" made Rule 319 a reasonable agency interpretation of section 251(d)(2), to which the Court should defer under *Chevron*.[54]

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51. *Id.*
52. *Id.*
53. *Id.* (emphasis in original).
54. *Id.* at 739 (Souter, J., dissenting).

39. Justice Scalia's response to Justice Souter made two important points, one concerning an incumbent's cost advantage over entrants, and the other concerning whether an entrant was entitled to expect anything more than a reasonable opportunity to earn a competitive return:

> Justice Souter points out that one can say his ability to replace a light bulb is "impaired" by the absence of a ladder, and that a ladder is "necessary" to replace the bulb, even though one "could stand instead on a chair, a milk can, or eight volumes of Gibbon." True enough (and nicely put), but the proper analogy here, it seems to us, is not the absence of a ladder, but the presence of a ladder tall enough to enable one to do the job, but not without stretching one's arm to its full extension. A ladder one-half inch taller is not, "within an ordinary and fair meaning of the word," "necessary," nor does its absence "impair" one's ability to do the job.[55]

Justice Scalia also emphasized for the Court that the statutory right of competing telecommunications carriers to receive unbundled access to an ILEC's network element under the "impairment" standards was not a guarantee of supracompetitive profits:

> We similarly disagree with Justice Souter that a business can be impaired in its *ability* to provide services—even impaired in that ability "in an ordinary, weak sense of impairment"—when the business receives a handsome profit but is denied an even handsomer one.[56]

Stated differently, Justice Scalia reasoned that, if a telecommunications carrier does not need to lease a particular UNE to earn a normal economic profit after entering a particular market, then that carrier cannot claim to have been "impaired" in its ability to supply telecommunications services to consumers simply because its lease of the UNE in question might have enabled the carrier to earn a supracompetitive profit. Consistent with the view that the unbundling rules exist

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55. *Id.* at 735 n.11 (Scalia, J., for the Court) (quoting *id.* at 739 (Souter, J., concurring in part and dissenting in part) (citation omitted)).

56. *Id.* (Scalia, J., for the Court) (quoting Souter, J., dissenting) (emphasis in original) (citation omitted).

to enhance consumer welfare rather than competitor welfare, Justice Scalia seemed to say that a CLEC could have *at most* a legally cognizable claim under the "necessary" and "impair" standards *only if* it would be denied, by an ILEC's refusal to offer the desired UNE, a reasonable opportunity to earn a competitive return on capital, or what is called *zero economic profit*.[57] The mandatory unbundling provisions of section 251(d)(2) do not grant an entrant any legally cognizable right to earn a supracompetitive return, or what is called *economic rent*.[58] Nor would the FCC have a legitimate rationale under the public interest standard for ordering an ILEC to ensure that a telecommunications carrier requesting UNEs pursuant to an order of mandatory unbundling could earn economic rent as a windfall or entry subsidy. "In a world of perfect competition," wrote Justice Scalia, "in which all carriers are providing their service at marginal cost, the Commission's total equating of increased cost (or decreased quality) with 'necessity' and 'impairment' might be reasonable; but it has not established the existence of such an ideal world."[59] Justice Scalia saw no statutory basis for the distortions that Rule 319 would create in an imperfect world—let alone the distortions that the FCC would create by ensuring that entrants would earn windfall profits if they chose to lease, at a TELRIC price, any network element for which the FCC had found it to be technically feasible to order mandatory unbundling.

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57. "Economic profits are zero when total revenues equal total costs, inclusive of a competitive return on capital." SIDAK & SPULBER, *supra* note 7, at 313; *see also* CARLTON & PERLOFF, *supra* note 16, at 340.

58. Economic rent is a return to a factor of production in excess of the payment that is necessary to prevent that factor from being redeployed to an alternative use. *See, e.g.*, PAUL MILGROM & JOHN ROBERTS, ECONOMICS, ORGANIZATION AND MANAGEMENT 269 (Prentice-Hall, Inc. 1992); Armen A. Alchian, *Rent*, *in* 4 THE NEW PALGRAVE: A DICTIONARY OF ECONOMICS 141 (John Eatwell, Murray Milgate & Peter Newman eds., Macmillan 1987).

59. 119 S. Ct. at 735.

40. The Court found that the FCC's interpretations of "necessary" and "impair" produce a more invasive approach to mandatory network unbundling than the Court believed Congress possibly could have intended:

> We cannot avoid the conclusion that, if Congress had wanted to give blanket access to incumbents' networks on a basis as unrestricted as the scheme the Commission has come up with, it would not have included § 251(d)(2) in the statute at all. It would simply have said (as the Commission in effect has) that whatever requested element can be provided must be provided.[60]

The Court traced that error in the FCC's statutory interpretation to the agency's conclusion that it would be necessary to unbundle, and would impair entry not to bundle, every network element that was technically feasible to unbundle:

> The FCC was content with its expansive methodology because of its misunderstanding of § 251(c)(3), which directs an incumbent to allow a requesting carrier access to its network elements "at any technically feasible point." The Commission interpreted this to "impose on an incumbent LEC *the duty to provide all network elements for which it is technically feasible to provide access*," and went on to "conclude that we have authority to establish regulations that are coextensive" with this duty.[61]

Justice Scalia observed that this interpretation was "undoubtedly wrong," as the Eighth Circuit had held.[62] Quoting the Eighth Circuit's decision, the Court emphasized that "[s]ection 251(c)(3) indicates '*where* unbundled access must occur, not *which* [network] elements must be unbundled.'"[63] The FCC, however, adopted a contrary interpretation in its *Local Competition First Report and Order*: "The Commission began with the premise that an incumbent was obliged to

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60. *Id.*

61. *Id.* at 736 (quoting *Local Competition First Report and Order*, 11 F.C.C. Rcd. at 15,640 ¶ 278 (emphasis added by the Court); *see also id.* (quoting *Local Competition First Report and Order*, 11 F.C.C. Rcd. at 15,643 ¶ 286 ("we conclude that the statute does not require us to interpret the 'impairment' standard in a way that would significantly diminish the obligation imposed by section 251(c)(3)").

62. *Id.*

turn over as much of its network as was 'technically feasible,' and viewed [section 251(d)(2)] as merely permitting it to soften that obligation by regulatory grace . . . ."[64]

41. The Court ruled that the FCC's "premise was wrong" and that "[s]ection 251(d)(2) does not authorize the Commission to create isolated exemptions from some underlying duty to make all network elements available."[65] Far from intending the FCC's discretionary dispensation of "regulatory grace," section 251(d)(2)

> requires the Commission to determine on a rational basis *which* network elements must be made available, taking into account the objectives of the Act and giving some substance to the "necessary" and "impair" requirements. The latter is not achieved by disregarding entirely the availability of elements outside the network, and by regarding *any* "increased cost or decreased service quality" as establishing a "necessity" and an "impair[ment]" of the ability to "provide . . . services."[66]

In short, the Court held that the FCC's interpretation of "necessary" and "impair" must reflect the procompetitive goals of the 1996 legislation, that the interpretation must embody an assessment of competitive substitution in the supply of network elements, and that the interpretation must not trigger mandatory unbundling of network element on the basis of insignificant differences between the cost or service quality of the network elements used by the ILEC and the cost or service quality of the network elements that the ILEC supplies an entrant.

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63. *Id.* (quoting Iowa Utils. Bd. *v.* FCC, 120 F.3d at 810) (emphasis added by Justice Scalia).

64. *Id.* at 736 (citation omitted). As evidence of that erroneous premise, Justice Scalia quoted, *id.*, the following language from the *Local Competition First Report and Order*: "To give effect to both sections 251(c)(3) and 251(d)(2), we conclude that the proprietary and impairment standards in section 251(d)(2) grant us the authority to refrain from requiring incumbent LECs to provide all network elements for which it is technically feasible to provide access on an unbundled basis." 11 F.C.C. Rcd. at 15,641 ¶ 279.

65. 119 S. Ct. at 736.

66. *Id.* at 736 (emphasis in original). Justice Thomas concurred with this part of the Court's decision but wrote a separate opinion, joined by Chief Justice Rehnquist and Justice Breyer, that dissented from other parts of the Court's decision that are not pertinent to our discussion. *Id.* at 741 (Thomas, J., concurring in part and dissenting in part).

D. Justice Breyer's Concurring Opinion

42. Justice Breyer wrote a separate opinion in *Iowa Utilities Board* that concurred in the Court's holding on the "necessary" and "impair" standards but dissented from the Court's holding concerning the FCC's jurisdiction to promulgate pricing rules that were binding on the states.[67] Unlike Justice Scalia, whose opinion for the Court confined itself to linguistic interpretation of statutory text, Justice Breyer began with the premise that the "statute's history and purpose can illuminate its language."[68] Accordingly, Justice Breyer read the "necessary" and "impair" requirements not only "in light of history, purpose, and precedent,"[69] but also in light of scholarly research on the law and economics of regulation and antitrust jurisprudence.[70]

1. Justice Breyer on the History, Purpose, and Precedent of the Telecommunications Act

43. Unlike Justice Scalia, Justice Breyer presented the litigation over unbundling and UNE pricing as the current act of a long drama, commencing with the divestiture of AT&T. Thereafter, the federal government had used the prospect of its lifting the regulatory quarantine against entry into interLATA markets by the regional Bell operating companies (RBOCs) as an inducement to their taking the practical steps to open their local exchange markets to competitive entry—by, among other possible firms, the interexchange carriers

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67. 119 S. Ct. at 746-54 (Breyer, J., concurring in part and dissenting in part).

68. *Id.* at 746. For historical analysis, Justice Breyer relied upon Justice Thomas's dissenting opinion, *id.* at 740-46, in which Justice Breyer and Chief Justice Rehnquist joined, concurring in part and dissenting in part.

69. *Id.* at 746 (Breyer, J., concurring in part and dissenting in part).

70. Justice Breyer, of course, has made his own contributions to that scholarly literature. *See* STEPHEN G.

(IXCs).[71] Justice Breyer acknowledged that the government's use of a barrier to entry in one market as a lever to promote entry into another market created costs in terms of diminished interLATA competition that must be balanced against the perceived benefits of stimulating competition in local telephony. Through the Telecommunications Act, he observed, Congress codified, in section 271, its judgment concerning the proper tradeoff between competitive benefits and costs.[72]

44. To advance toward competition in local telephony, Justice Breyer observed, the 1996 legislation poses, but "does not purport to answer," the empirical question, "To what extent is local competition possible without wasteful duplication of facilities?"[73] The Telecommunications Act "creates a set of legal rules," including unbundling rules, "which, through interaction with the marketplace, aims to produce sensible answers."[74] Justice Breyer summarized Congress's logic in enacting the local competition and long-distance provisions of the Telecommunications Act as follows:

> [O]ne can understand the basic logic of "unbundling" by imagining that Congress required a sole incumbent railroad providing service between City A and City B to share certain basic facilities, say, bridges, rights-of-way, or tracks, in order to avoid wasteful duplication of those hard-to-duplicate resources while facilitating competition in the *remaining* aspects of A-to-B railroad service. In-

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BREYER, REGULATION AND ITS REFORM (Harvard University Press 1982); Breyer, *supra* note 12.

71. *Id.* at 746-47 (citing, among other secondary sources, THOMAS G. KRATTENMAKER, TELECOMMUNICATIONS LAW AND POLICY 411-12 (Carolina Academic Press 2d ed. 1998); KAHN, *supra* note 7, at 37-38 & n.53; PAUL W. MACAVOY, THE FAILURE OF ANTITRUST AND REGULATION TO ESTABLISH COMPETITION IN LONG-DISTANCE TELEPHONE SERVICES 171-77, 179-83 (MIT Press & AEI Press 1996); PETER W. HUBER, MICHAEL K. KELLOGG & JOHN THORNE, THE GEODESIC NETWORK II: 1993 REPORT ON COMPETITION IN THE TELEPHONE INDUSTRY at 2.3-2.5 (1992); Thomas G. Krattenmaker, *The Telecommunications Act of 1996*, 49 FED. COMM. L.J. 1, 15-16 (1996); Glen O. Robinson, *The* Titanic *Remembered: AT&T and the Changing World of Telecommunications*, 5 YALE J. ON REG. 517, 537 (1988)).

72. *Id.* at 747.

73. *Id.*

74. *Id.* (citing 47 U.S.C. §§ 251(c)(2), 251(c)(3), 251(c)(4), 253(a)).

> deed, one might characterize the Act's basic purpose as seeking to bring about, without inordinate waste, greater local service competition both as an end in local markets and as a means towards more competition, and fair competition, in long-distance markets.[75]

Justice Breyer believed that "[t]hose purposes neither require nor suggest reading the Act's language to change radically the scope of local regulators' traditional rate-setting powers."[76] His basis for that view has equal applicability to the "necessary" and "impair" standards of section 251(d)(2), an issue on which Justice Breyer concurred with seven other Justices:

> The introduction of competition into a particular locality does not diminish the importance of place-specific factors, such as local history, geography, demands, and costs. And local regulators are likely more familiar than are national regulators, for example, with a particular utility's physical plant, its cost structure, the pattern of local demand, the history of local investment, and the need for recovery of undepreciated fixed costs. Moreover, local regulators have experience setting rates that recover both the immediate, smaller, added costs that demand for additional service imposes upon a local system and also a proper share of the often huge fixed costs (of local loops, say, or switches) and overhead needed to provide the dial tone itself. Indeed, local regulators would seem as likely, if not more likely, than national regulators to know whether, when, or the extent to which, particular local charges or systems of charges will lead new entrants to abandon efforts to use a local incumbent's elements, turning instead to alternative technologies. And local regulators would seem as likely as national regulators to know whether or when use of such alternative technologies in the local circumstances will prove more beneficial than wasteful. It is the local communities, and, hence, local regulators, that will directly confront the problems and enjoy the benefits associated with local efforts to integrate new and old communications resources and communications firms.[77]

As we shall explain in Part V, this insight concerning the unique competence of state regulators in evaluating the competitive and regulatory aspects of local telecommunications markets has special relevance to the FCC's 1999 proposal in the *Second Further Proposed*

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75. *Id.* at 748 (emphasis in original).
76. *Id.*
77. *Id.* Justice O'Connor did not participate in the case. *Id.* at 721.

Notice of Rulemaking to preempt state participation in the interpretation and administration of section 251(d)(2) by announcing, on a nationwide basis, that certain unbundled network elements are deemed to meet the "necessary" and "impair" requirements.

2. Justice Breyer on the FCC's Pricing Rules for Unbundled Network Elements

45. Much of Justice Breyer's separate opinion addressed his disagreement with the majority over whether the Telecommunications Act gave the FCC the authority to preempt state rate-setting for unbundled network elements. Although most of that analysis is not directly relevant to interpreting the "necessary" and "impair" requirements, some portions unquestionably are. In particular, Justice Breyer emphasized that, "when faced with ambiguity" in a regulatory statute that envisions federal and state cooperation, the Court is "to interpret statutes . . . on the assumption that Congress intended to preserve local authority."[78] That insight illuminates as well the question of whether the FCC's interpretation of section 251(d)(2) will preserve a role for the state public utilities commissions (as finders of fact, for example) in determining whether a particular network element in a particular geographic market is subject to mandatory unbundling under the "necessary" and "impair" requirements.

46. Justice Breyer observed that, far from being "general," the "dozens of pages of text that set . . . forth" the FCC's pricing rules for unbundled network elements were "highly specific and highly detailed."[79] Their effect was to deny any discretion to state regulators:

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78. *Id.* at 749-50 (citing Cipollone v. Liggett Group, Inc., 505 U.S. 504, 518 (1992); Rice v. Santa Fe Elevator Corp., 331 U.S. 218, 230 (1947)).

79. *Id.* at 751 (citing *Local Competition First Report and Order*, 11 F.C.C. Rcd. at 15,844-62 ¶¶ 672-715).

> [The FCC's pricing rules] deprive state commissions of methodological leeway. Their rate-setting instructions grant a state commission little or no freedom to choose among reasonable rate-determining methods according to the State's policy-related judgments, assessing local economic circumstance or community need. I grant the fact that the rules leave it to the state commissions to fix the actual rate, but that is rather like giving a restaurant chef the authority to choose a menu while restricting him to one dish, an omelet, and to one single favorite recipe.[80]

Furthermore, Justice Breyer noted, the Telecommunications Act did not compel the pricing rule that the FCC imposed on the states.[81] He regarded the FCC's vision of competition as misguided: "The FCC does argue that the Act's purpose, competition, favors its system."[82] But Justice Breyer disagreed with the FCC's understanding of "competition." "The competition that the Act seeks is a process, not an end result; and a regulatory system that imposes through administrative mandate a set of prices that tries to mimic those that competition would have set does not thereby become any the less a regulatory process, nor any the more a competitive one."[83] As we shall explain in Part II, this misconception of competition directly affects the FCC's interpretation of the "necessary" and "impair" standards as well, for the *Second Further Notice of Proposed Rulemaking* subordinates consumer welfare to competitor welfare and then regards the latter as the indicator of whether "competition" exists.

47. The *Second Further Notice of Proposed Rulemaking* invites the question of whether the FCC would, by announcing nationwide unbundling rules, similarly attempt to deny state regulators all discretion with respect to identifying whether particular elements are

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80. *Id.*
81. *Id.* ("Nor can the FCC successfully argue that the Act requires the particular rate-setting system that its regulations contain.").
82. *Id.*
83. *Id.*

subject to mandatory unbundling at TELRIC prices. In the context of UNE pricing, Justice Breyer intimated that the FCC's strategy in preempting the states from developing their own pricing rules was to foreclose other reasonable interpretations of the statute without having to supply an intellectually respectable justification for that exclusion: "Most importantly, the FCC's rules embody not an effort to circumscribe the realm of the reasonable, but rather a policy-oriented effort to choose among several different systems, including systems based upon actual costs or price caps, which other systems the FCC's rules prohibit."[84] Those alternative pricing rules, prohibited by the FCC, "illustrate . . . how easily a regulator weighing certain policy considerations (for example administrative considerations) differently might have chosen a different set of reasonable rules."[85] One could imagine state regulators similarly adopting conclusions about "necessity" and "impairment" that differ reasonably from the FCC's conclusions.

3. Justice Breyer on the "Necessary" and "Impair" Requirements for Mandatory Unbundling of Network Elements

48. Justice Breyer concurred in the Court's holding with respect to the FCC's interpretation of the "necessary" and "impair" requirements of section 251(d)(2). In writing

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84. *Id.*

85. *Id.* at 751-52. With respect to the "the FCC's decision to prohibit use" of the efficient component-pricing rule (ECPR), *id.* at 752, Justice Breyer noted: "The FCC rejected that [ECPR] system, but in doing so it did not claim, nor did its reasoning support the claim, that the use of such a system would be arbitrary or unreasonable." *Id.* (citing Sidak & Spulber, *The Tragedy of the Telecommons*, *supra* note 5, at 1095-98). Of "the FCC's decision to forbid the use" of Ramsey pricing, *id.*, Justice Breyer wrote: "Many experts strongly prefer the use of such a system [and some argue] that the FCC's prohibition of Ramsey pricing will 'minimize rather than maximize consumer welfare.' The FCC disfavors Ramsey pricing, but it does not explain why a contrary judgment would conflict with the statute or otherwise be arbitrary or unreasonable." *Id.* (citing 1 ALFRED E. KAHN, THE ECONOMICS OF REGULATION: PRINCIPLES AND INSTITUTIONS 137-41 (MIT Press rev. ed. 1988), and quoting Sidak & Spulber, *The Tragedy of the Telecommons*, *supra* note 5, at 1109).

separately on this part of the Court's decision, he employed economic analysis that complemented the linguistic analysis of Justice Scalia's majority opinion.

49. Justice Breyer began by noting the Telecommunications Act expresses the unbundling obligations of ILECs "in general terms, reflecting congressional uncertainty about the extent to which compelled use of an incumbent's facilities will prove necessary to avoid waste."[86] He then anticipated the question, which we address in Part III, that goes to the heart of the *Second Further Notice of Proposed Rulemaking*: "Will wireless technology or cable television lines, for example, permit the efficient provision of local telephone service without the use of existing telephone lines that now run house to house?"[87] Such substitution at the end-user level has the potential, over the near term in some geographic markets, to render mandatory unbundling of even residential local loops unnecessary, inappropriate, and thus unlawful.

50. Justice Breyer found the "reasonably clear" objective of section 251(d)(2) to be "to facilitate the introduction of competition where practical, *i.e.*, without inordinate waste."[88] That objective, he reasoned, required section 251(d)(2) to function like the essential facilities doctrine in antitrust law:

> [A]lthough the provision describing which elements must be unbundled does not explicitly refer to the analogous "essential facilities" doctrine (an antitrust doctrine that this Court has never adopted), the Act, in my view, does impose related limits upon the FCC's power to compel unbundling. In particular, I believe that, given the Act's basic purpose, it requires a convincing explanation of why facilities should be shared (or "unbundled") where a new entrant could

86. *Id.* at 753.
87. *Id.*
88. *Id.*

> compete effectively without the facility, or where practical alternatives to that facility are available.[89]

Justice Breyer noted that Justice Scalia reached this insight by textual analysis.[90] The great utility of Justice Breyer's concurrence on the unbundling rules is that he went beyond the majority's textual analysis to suggest that the kind of consumer welfare analysis that a court routinely conducts in an antitrust case also would yield the same answer: Section 251(d)(2) must be implicitly limited by a principle that resembles the essential facilities doctrine.

51. Justice Breyer emphasized that, in multiple respects, unbundling is not costless, either to private firms, consumers, or regulators:

> The fact that compulsory sharing can have significant administrative and social costs inconsistent with the Act's purposes suggests [that a limiting principle implicitly exists.] Even the simplest kind of compelled sharing, say, requiring a railroad to share bridges, tunnels, or track, means that someone must oversee the terms and conditions of that sharing. Moreover, a sharing requirement may diminish the original owner's incentive to keep up or to improve the property by depriving the owner of the fruits of value-creating investment, research, or labor.[91]

Furthermore, Justice Breyer warned that the complexity and cost of mandatory unbundling multiply as the network elements in question become more technologically sophisticated and as product or process innovation becomes a more significant dimension over which firms compete in the provision of end services:

> And as one moves beyond the sharing of readily separable and administrable physical facilities, say, to the sharing of research facilities, firm management, or technical capacities, these problems can become more severe. One would not ordinarily believe it practical, for example, to require a railroad to share its lo-

89. *Id.* (citing Phillip E. Areeda, *Essential Facilities: An Epithet in Need of Limiting Principles*, 58 ANTITRUST L.J. 841, 852-53 (1989)).

90. *Id.* ("the Act's language itself suggests some such limits").

91. *Id.*

> comotives, fuel, or workforce. Nor can one guarantee that firms will undertake the investment necessary to produce complex technological innovations knowing that any competitive advantage deriving from those innovations will be dissipated by the sharing requirement. The more complex the facilities, the more central their relation to the firm's managerial responsibilities, the more extensive the sharing demanded, the more likely these costs will become serious. And the more serious they become, the more likely they will offset any economic or competitive gain that a sharing requirement might otherwise provide. The greater the administrative burden, for example, the more the need for complex proceedings, the very existence of which means delay, which in turn can impede the entry into long-distance markets that the Act foresees.[92]

We examine these costs of mandatory unbundling in detail in Part II.

52. To Justice Breyer, the need for a limiting principle found further support in a proper understanding of the kinds of competition that would and would not emerge from mandatory unbundling:

> Nor are any added costs imposed by more extensive unbundling requirements necessarily offset by the added potential for competition. Increased sharing by itself does not automatically mean increased competition. It is in the *un*shared, not in the shared, portions of the enterprise that meaningful competition would likely emerge. Rules that force firms to share *every* resource or element of a business would create, not competition, but pervasive regulation, for the regulators, not the marketplace, would set the relevant terms.[93]

The interpretation of section 251(d)(2) therefore requires a "balance" of the expected benefits and costs that the interpretation will engender.[94] "Regulatory rules that go too far, expanding the definition of what must be shared beyond that which is essential to that which merely proves advantageous to a single competitor, risk costs that, in terms of the Act's objectives,

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92. *Id.* at 753-54 (citing 1 HAROLD DEMSETZ, OWNERSHIP, CONTROL, AND THE FIRM: THE ORGANIZATION OF ECONOMIC ACTIVITY 207 (1988)).

93. *Id.* at 754 (emphasis in original).

94. *Id.* Justice Breyer's conclusion is consistent with his broader view that regulation should be subjected to rigorous cost-benefit analysis. *See generally* STEPHEN G. BREYER, BREAKING THE VICIOUS CYCLE: TOWARD EFFECTIVE RISK REGULATION (Harvard University Press 1995).

may make the game not worth the candle."[95] Why, asked Justice Breyer, if (as the FCC seemed to believe) Congress had intended through its enactment of the Telecommunications Act of 1996 that "an incumbent should be forced to share virtually every aspect of its business, ... would Congress have seen a need for a separate wholesale sales requirement (since the 'unbundling' requirement would have led to a similar result)? Indeed, would Congress have so emphasized the importance of competition?"[96] Justice Breyer concluded that the FCC's vision of the optimal level of unbundling—"the more the incumbent unbundles, the better"[97]—would create nothing more than a Potemkin village of competition: "A totally unbundled world—a world in which competitors share every part of an incumbent's existing system, including, say, billing, advertising, sales staff, and work force (and in which regulators set all unbundling charges)—is a world in which competitors would have little, if anything, to compete about."[98]

E. Justice Souter's Dissent

53. In a separate opinion in *Iowa Utilities Board*, Justice Souter concurred in the Court's holding that the FCC had jurisdiction to set UNE pricing rules that bound the states, but he dissented from the Court's holding that the FCC unreasonably interpreted the "necessary" and "impair" requirements of section 251(d)(2).[99] Justice Souter's dissent is significant because, of the four opinions by the Justices in *Iowa Utilities Board*, his most closely resembles the reasoning contained three months later in the FCC's *Second Further Notice of Proposed*

95. 119 S. Ct. at 754 (Breyer, J. concurring in part and dissenting in part).
96. *Id.*
97. *Id.*
98. *Id.*

Rulemaking. Justice Souter's interpretation of "necessary" and "impair" was the polar opposite of Justice Breyer's, for the former would read the public interest standard of the Telecommunications Act of 1996 to subordinate the welfare of consumers to the welfare of individual competitors.

54. Justice Souter considered that, "[u]nder *Chevron*, the only question before us is whether the Commission's interpretation, obviously favorable to potential competitors, falls outside the bounds of reasonableness."[100] He conceded that Rule 319 would "probably allow a competitor to obtain access to any network element that it wants" by presenting at most "a weak economic justification."[101] As a matter of statutory interpretation, Justice Souter considered "necessary" and "impair" to be ambiguous words that *Chevron* entitled the FCC to define in any reasonable manner, including what he described as the "weak . . . but unquestionably still ordinary uses of the words" that he illustrated with this ladder-and-light-bulb example, commented upon by Justice Scalia.[102] Justice Souter did not recognize that what he regarded as the FCC's "reasonable" statutory interpretation would redefine the public interest standard as a competitor-welfare standard:

> A service is surely "necessary" to my business in an ordinary, weak sense of necessity when that service would allow me to realize more profits, and a business can be said to be "impaired" in delivery of services in an ordinary, weak sense of

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99. 119 S. Ct. at 739 (Souter, J., concurring in part and dissenting in part).
100. *Id.*
101. *Id.*
102. "If I want to replace a light bulb, I would be within an ordinary and fair meaning of the word 'necessary' to say that a stepladder is 'necessary' to install the bulb, even though I could stand instead on a chair, a milk can, or eight volumes of Gibbon. I could just as easily say that the want of a ladder would 'impair' my ability to install the bulb under the same circumstances." *Id.*

> impairment when something stops the business from getting the profit it wants for those services.[103]

Unlike Justice Breyer, Justice Souter could perceive no social costs that would offset the perceived social benefits of greater degrees of unbundling. Justice Souter did not recognize that his interpretation of section 251(d)(2) would place the unbundling rules at cross-purposes with the rest of the Telecommunications Act, as well as with the antitrust laws. Justice Souter's reasoning was rejected by every other member of the Court participating in the *Iowa Utilities Board* decision.

II. WHY LIMITING PRINCIPLES ARE NECESSARY

55. In this Part, we will use economic analysis to articulate why the FCC must give interpretations to the "necessary" and "impair" standards that are rationally related to the purposes of the Telecommunications Act of 1996. Foremost among those limiting principles is the proposition that the FCC's unbundling rules should regard the public interest as primarily determined by consumer welfare, which in turn is determined by competition rather than competitor welfare. Whether it is "necessary" for the FCC to mandate, at TELRIC prices, the unbundling of a particular proprietary network element in a particular location at a particular time should depend on whether such unbundling is necessary to permit the competitive supply of telecommunications services to end users. Similarly, the correct meaning of "impair" for purposes of section 251(d)(2) is whether the ILEC's failure to unbundle, at TELRIC prices, a particular nonproprietary network element in a particular location at a particular time would

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103. *Id.* at 740.

produce an equilibrium supply of telecommunications services that was, relative to the competitive equilibrium, significantly inferior for consumers. Here, "inferior" can mean not only higher prices, but also lower quality services or less innovation in new telecommunications services, the consumer welfare losses from which have been shown empirically to be enormous.[104]

A. Unbundling Rules Should Emphasize Consumer Welfare Rather than Competitor Welfare

56. The "necessary" and "impair" standards should be applied to overall competition, not to the economic interests of individual competitors, large or small. In its *Local Competition First Report and Order*, the Commission failed to make that distinction, which is well recognized in antitrust law, as we explain below. Unfortunately, the FCC's 1999 *Second Further Notice of Proposed Rulemaking* seems inclined to repeat that error.

1. The Goal of the Telecommunications Act Is to Improve Consumer Welfare

57. Consumers benefit from competition because it leads to greater innovation and lower prices. Thus, the public interest is consistent with increased competition and innovation. The public-interest standard, however, has not always received so precise a definition in telecommunications regulation. Three years before the passage of the Telecommunications Act of 1996, Professor William J. Baumol and one of the present authors wrote:

> [W]e will use the phrase "the public interest" more precisely and restrictively than do the Communications Act, the FCC, and the state public utility commissions. It will connote economic efficiency, or the maximization of the general

104. *See* Hausman, *Valuing the Effect of Regulation on New Services in Telecommunications*, *supra* note 11.

> welfare of consumers and producers—that is, the maximization of the sum of consumers' surplus and producers' surplus. Often this criterion is referred to in the abbreviated form "consumer welfare maximization."
>
> The primacy that economists ascribe to economic efficiency and consumer welfare maximization has a related benefit: it harmonizes economic regulation and antitrust law. For in the latter, the Supreme Court has contributed a muscular jurisprudence asserting that the first goal of the Sherman Act and other federal antitrust statutes is to be a "consumer welfare prescription." This harmony between regulation and antitrust has three important implications. First, the same basic tools of microeconomic analysis can be employed in one as in the other. There can be little disagreement that the economic sophistication of antitrust law has enriched the regulatory analysis of natural monopoly. Second, changes in technology or other circumstances that permit natural monopoly to give way to competition impart continuity to the relationship between economic regulation and antitrust. Third, many of the thorniest problems in antitrust law—such as judicial enforcement of injunctive remedies under the [Modification of Final Judgment] or the essential facilities doctrine—are fundamentally regulatory in nature, involving issues such as entry or the pricing of intermediate goods sold to competitors. Thus, the economic scholarship on regulation can in many instances enrich antitrust jurisprudence.[105]

In 1996, Congress removed any remaining ambiguity about the goal of federal telecommunications law when, as noted earlier, it emphasized in the Telecommunications Act that the improvement of consumer welfare was the new legislation's overarching purpose.

2. The Supreme Court Has Instructed the Commission to Pursue a Consumer-Welfare Standard

58. A standard that looks to the effect on competition, rather than the interests of a given CLEC, comports with the Supreme Court's command that the Commission must take into account the availability of substitutes for ILEC network elements outside the ILEC's network. If substitutes outside the ILEC's network are available, that availability occurs

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105. BAUMOL & SIDAK, *supra* note 11, at 26–27 (citing National Collegiate Athletic Ass'n. *v.* Board of Regents of Univ. of Okla., 468 U.S. 85, 107 (1984); Reiter *v.* Sonotone Corp., 442 U.S. 330, 343 (1979); BORK, *supra* note 12, at 66; Breyer, *supra* note 12).

because some firms have made the rational economic decision that they can efficiently provide services that employ those elements.

59. Two conclusions necessarily follow. First, the element as provided by the ILEC cannot be essential for competition because competition is already occurring *without* ILEC provision. Thus, the network element, unbundled by government decree at TELRIC prices, cannot be labeled an essential facility, or "necessary" to competition, or an element for which the decision not to mandate unbundling at a TELRIC price would "impair" the competitive supply of telecommunications services. "Increased sharing," observed Justice Breyer, "by itself, does not automatically mean increase competition."[106]

60. Second, competition will not be adversely affected if a given CLEC cannot procure the unbundled element from the ILEC. Since other firms are providing substitutes outside the ILEC's network, in the absence of diminishing returns to scale, increased demand for the element outside the ILEC's network can be met at the same or lower economic cost. Diminishing returns to scale would occur if a scarce input, which could not be reproduced, were present. Fertile land is an example of a scarce input that causes diminishing returns to scale. But in telecommunications those scarce inputs do not exist, and the Commission states that increasing returns to scale are expected.[107] The same cost occurs with constant returns to scale, while a lower cost arises with increasing returns to scale. Thus, the "limiting principle" demanded by the Court naturally emerges when one uses the effect on competition, rather than

106. *Iowa Utilities Board*, 119 S. Ct. at 754 (Breyer, J., concurring on "necessary" and "impair").
107. *Id.*

the effect on individual competitors as in the Commission's past and present formulations of the "necessary" and "impair" standards.

3. A Consumer-Welfare Standard Is Consistent with Established Case Law

61. The foregoing principles concerning the primacy of consumer welfare are completely consistent with established law. For example, Chief Judge Posner has written repeatedly for the Seventh Circuit since the early 1980s that "[c]ompetition is the allocation of resources in which economic welfare (consumer welfare, to oversimplify slightly) is maximized; it is not rivalry per se, or a particular form of rivalry, or some minimum number of competitors."[108] In a 1983 antitrust decision, he expressed this reasoning in a manner that is directly relevant to the Commission's approach, in its 1999 *Second Further Notice of Proposed Rulemaking*, to defining "impairment" under section 251(d)(2) of the Telecommunications Act:

> [T]hough there is a sense in which the exclusion of any competitor reduces competition, it is not the sense of competition that is relevant to antitrust law. The policy of competition is designed for the ultimate benefit of consumers rather than of individual competitors, and a consumer has no interest in the preservation of a fixed number of competitors greater than the number required to assure his being able to buy at the competitive price. Maybe the older, competitor-protection view would survive in a case of naked aggression resulting in the total exclusion of a competitor from the market, but that would be a per se case (if anything) and this is not.[109]

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108. Roland Machinery Co. *v.* Dresser Indus., Inc., 749 F.2d 380, 395 (7th Cir. 1984) (Posner, J.) (citing Product Liability Ins. Agency, Inc. *v.* Crum & Forster Ins. Cos., 682 F.2d 660, 663-65 (7th Cir. 1982) (Posner, J.)).

109. Marrese *v.* American Academy of Orthopedic Surgeons, 706 F.2d 1488, 1497 (7th Cir. 1983) (Posner, J.) (citing *Products Liability*, 682 F.2d at 663-64; University Life Ins. Co. of America *v.* Unimarc Ltd., 699 F.2d 846, 853 (7th Cir. 1983) (Posner, J.)). In *Products Liability*, Chief Judge Posner wrote in 1982: "The consumer does not care how many sellers of a particular good or service there are; he cares only that there be enough to assure him a competitive price and quality." 682 F.2d at 664. In another antitrust decision the following year, he wrote that "competition in the antitrust sense signifies not the preservation of all existing competitors but the maintenance of a sufficient number to assure that consumers get the best possible quality of product at the lowest possible price." *University Life*, 699 F.2d at 852 (citing *Products Liability*, 682 F.2d at 663-64).

Similarly, Justice (then Judge) Breyer wrote for the First Circuit in 1987:

> "[U]nreasonableness" in antitrust law has a rather special meaning. It means that the anticompetitive consequences of a particular action or arrangement outweigh its legitimate business purposes. "Anticompetitive" also has a special meaning: it refers not to actions that merely injure individual competitors, but rather to actions that harm the competitive process, a process that aims to bring consumers the benefits of lower prices, better products, and more efficient production methods.[110]

The Supreme Court has repeatedly embraced such reasoning. In 1993, for example, the Court stated in *Spectrum Sports, Inc.* v. *McQuillan*:

> The purpose of the [Sherman] Act is not to protect businesses from the working of the market; it is to protect the public from the failure of the market. The law directs itself not against conduct which is competitive, even severely so, but against conduct which unfairly tends to destroy competition itself. It does so not out of solicitude for private concerns but out of concern for the public interest.[111]

This principle in antitrust law flows from the Court's 1977 decision in *Brunswick Corp.* v. *Pueblo Bowl-O-Mat, Inc.*, which held that "antitrust injury . . . is . . . injury of the type the antitrust laws were intended to prevent and that flows from that which makes defendants' acts unlawful."[112]

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110. Interface Group, Inc. *v.* Massachusetts Port Auth., 816 F.2d 9, 10 (1st Cir. 1987) (citing 7 PHILLIP E. AREEDA, ANTITRUST LAW ¶ 1500, at 362–63 (Little Brown & Co. 1986); Brown Shoe Co. *v.* United States, 370 U.S. 294, 320 (1962)).

111. 506 U.S. 447, 548 (1993).

112. 429 U.S. 477, 488 (1977); *see also* Atlantic Richfield Co. *v.* USA Petroleum Co., 495 U.S. 328, 338 (1990); Cargill, Inc. *v.* Monfort of Colorado, Inc., 479 U.S. 104, 116–117 (1986); Associated Gen'l Contractors of Cal., Inc. *v.* Carpenters, 459 U.S. 519, 539–540 (1983); Blue Shield of Va. *v.* McCready, 457 U.S. 465, 483 & n.19 (1982); J. Truett Payne Co. *v.* Chrysler Motors Corp., 451 U.S. 557, 562 (1981). For an earlier articulation of that proposition, see Brown Shoe Co. *v.* United States, 370 U.S. 294, 320, (1962).

4. Contrary to the Goals of the Telecommunications Act, the Instructions of the Supreme Court, and the Lessons of Established Case Law, the FCC Has Embraced a Competitor-Welfare Standard

62. In its *Local Competition First Report and Order*, the Commission determined in 1996 that a "*requesting carrier's* ability to offer service is 'impaired' ('diminished in value') if 'the quality of the service *the entrant* can offer absent access to the requested element, declines' or if 'the cost of providing the service rises.'"[113] That impairment standard explicitly formulated a competitor-based standard, not a competition-based standard. Unfortunately, the Commission continues in 1999 to consider the economic interests of a given CLEC rather than the effect of the "necessary" and "impair" standards on overall competition.[114] Indeed, the FCC asks in its *Second Further Notice of Proposed Rulemaking* whether the "requesting carrier's particular market entry strategies should be considered as part of the 'necessary' and 'impair' analysis."[115] Moreover, the *Second Further Notice of Proposed Rulemaking* takes liberties in characterizing the relevant statutory language. The FCC states: "Section 251(d)(2)(B) requires us to consider whether the failure to provide access to an element would 'impair' the ability of a *new entrant* to provide a service it seeks to offer."[116] In fact, the statute speaks of a "telecommunications carrier,"[117] and it is inaccurate to characterize CLECs such as AT&T, MCI WorldCom, and Sprint as "new entrants" in local telecommunications markets. The Commission has yet to consider the crucial difference between the effect on competition, which the Telecom-

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113. *See SFNPRM*, *supra* note 1, at ¶ 6 (emphasis added) (quoting *Local Competition First Report and Order*, 11 F.C.C. Rcd. at 15,643 ¶ 285); *see also id.* at ¶ 17 (quoting same).
114. *Id.* at ¶ 20.
115. *Id.* at ¶ 27.
116. *Id.* at ¶ 17 (emphasis added).
117. 47 U.S.C. § 251(d)(2)(B).

munications Act of 1996 was intended to create, and the economic interests of a particular competitor, which neither the 1996 legislation attempted, nor the Commission subsequently should attempt, to protect.

63. The *Second Further Notice of Proposed Rulemaking* continues, incorrectly, to impart to the Telecommunications Act of 1996 "the older, competitor-protection view"—even when the FCC's statutory interpretation of section 251(d)(2) is judged by standards of antitrust jurisprudence dating at least to the early 1980s. To extend Chief Judge Posner's reasoning from 1983 to the present case of interpreting the "necessary" and "impair" standards of section 251(d)(2), the relevant analysis is whether "either the exclusion of an individual [CLEC] from a local market or the possible effect of that exclusion on the competitive behavior of other aspirants . . . could result in a higher price or lower quality of [service] in [the affected] communities."[118] The FCC's *Second Further Notice Proposed Rulemaking*, however, does not propose to undertake such analysis. Rather, it ascribes paramount importance to the supplications of individual competitors. Thus, to paraphrase another of Chief Judge Posner's antitrust opinions, "there is a question to what extent, with their emphasis on the welfare of competitors rather than consumers," those regulators at the FCC proposing a statutory interpretation of section 251(d)(2) "can survive the consumer-oriented view of antitrust that prevails today."[119] The fact that the business plan of any one CLEC might not be viable unless the FCC were to order the ILEC to unbundle its network elements at TELRIC prices "would have no appreciable effect on competition, viewed as a state in which consumer interests are well served rather than as a

118. *Marrese*, 706 F.2d at 1497.

process of rivalry that is diminished by the elimination of even one tiny rival."[120] As Judge Posner concluded thirteen years before passage of the Telecommunications Act: "That 'there's a special providence in the fall of a sparrow,' is not the contemporary philosophy of antitrust."[121]

5. There Is No Necessary Relationship between CLEC Profits and Consumer Welfare under an Imperfectly Competitive Outcome

66. The economic welfare of any single CLEC will not affect consumer welfare because the overall effect on the competitive supply of telecommunications services is what matters. If, under the Commission's interpretation of the "necessary" and "impair" standards, any single CLEC can claim that a given element is necessary to its business strategy, then it is likely that *all* elements of the network will be subjected to mandatory unbundling at TELRIC prices. Such a standard would harm consumers and diminish consumer welfare. As noted earlier, Justice Breyer discussed this outcome: "Regulatory rules that go too far, expanding the definition of what must be shared beyond that which is essential to that which merely proves advantageous to a single competitor, risk costs that in terms of the Act's objectives, may make the game not worth the candle."[122] But, if the Commission instead adopts the standard of whether competition will be impaired, then consumer welfare will be maximized in those instances in which regulators conclude that unbundling of a particular network element is appropriate to mandate at regulated TELRIC prices. Justice Souter failed to recognize the distinction between consumer's interest in competition and the economic interest of an individual competitor. His standard was whether an individual competitor might have slightly

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119. *Id.* at 1495–96 (citing Reiter *v.* Sonotone Corp., 442 U.S. 330, 343 (1979)).
120. *University Life*, 699 F.2d at 853.

lower profits, rather than whether competition or consumers would be affected by that competitor's access to UNEs at TELRIC prices.[123]

67. As we will explain in greater detail in Part III, the Commission can determine whether competition will be impaired by analyzing the question of whether prices for telecommunication services will be higher or quality (innovation) will be lower as a result of the agency's "necessary" and "impair" policy. Thus, whether an individual competitor's profits would be affected if a given element were not unbundled at a government-mandated TELRIC price is not the correct question under a competition standard or public interest standard. The correct questions, rather, are whether competition will be impaired in the absence of unbundling on such terms and whether a given element is necessary for competition.

68. The Supreme Court realized in *Iowa Utilities Board* that, in a world of imperfect competition, cost differences that do not arise in marginal cost might have no effect on either competition or competitive prices. The Court stated:

> In a world of perfect competition, in which all carriers are providing their service at marginal cost, the Commission's total equation of increased cost (or decreased quality) with "necessity" and "impairment" might be reasonable; but it has not established the existence of such an ideal world.[124]

There can be no claim that telecommunications is a world of perfect competition given the significant fixed costs and common costs that exist.[125] Indeed, the Commission's standard for

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121. *Id.* (quoting Hamlet, Act V, sc. ii, line 232).
122. *Iowa Utilities Board*, 119 S. Ct. at 754 (Breyer, J., concurring in part and dissenting in part).
123. *Id.* 739–40 (Souter, J., dissenting).
124. *Id.* at 735 (Scalia, J.).
125. *See, e.g.*, BAUMOL & SIDAK, *supra* note 11, at 7, 9, 34.

pricing unbundled elements, where TELRIC includes both fixed costs and foresees the inclusion of a "reasonable share" of forward-looking common costs, specifically rules out the possibility that the Commission believes that perfect competition could occur in the local telecommunications network.[126]

69. Furthermore, economists generally accept that with imperfect competition, prices are set as a markup over marginal costs, subject to a breakeven constraint so that the firm can cover its fixed and common costs.[127] Under free entry, a sufficient number of firms enters so that firms expect to earn their normal cost of capital (that is, they break even); but firms do not earn excess economic profits, because new entry decreases profits to normal levels. Prices exceed marginal costs, but only by enough to cover the fixed and common costs and to allow the firm to earn a normal economic return on invested capital. Thus, an imperfectly competitive outcome could lead to the same (or even lower) prices where CLECs do not have access to a given unbundled element from the ILEC but instead self-supply the element or buy it from another supplier. The expected profit of a CLEC might be higher if the Commission required the ILEC to supply the unbundled element, but competition could be greater without the requirement because the marginal cost to the CLEC and resulting prices to consumers could well be lower, especially in a situation of lumpy investment or excess capacity. Thus, under imperfect competition, the "necessary" and "impair" standards do not imply that competition is greatest or consumer welfare is highest when CLEC profits are the greatest, as the Commission has incorrectly assumed. Indeed, the normal result in economics

126. *Local Competition First Report and Order*, 11 F.C.C. Rcd. at 15,847 ¶ 682.

is that a CLEC's profits (which include fixed costs and common costs as factors) bear no necessary relationship to the amount of competition or consumer welfare under an imperfectly competitive outcome.

6. The Definition of "Impair" Cannot Become an Indemnification from Competitive Losses

70. In a competitive marketplace, firms are constantly engaged in a competitive struggle. Some firms will succeed while others fail. Unlike the regulated monopolies of the past, competitive telecommunications firms are not guaranteed an opportunity to earn a fair return. Instead, efficient economic markets demand that each player be forced to do its best to provide efficiently produced, competitively priced, high-quality service. The competitive process that the Telecommunications Act envisages does not imply that all competitors, new or existing, will succeed. The unbundling process should not be used to ensure the success of any individual competitor in any individual geographic market and certainly should not be used to guarantee the success of all competitors in the marketplace.[128]

71. The central principle underlying the implementation of the "necessary" and "impair" decision making process thus should not lie on the impact of unbundling any given network element on an individual competitor but rather on its impact on competition and market power. Whether or not an individual competitor is able to stave off competitive losses with or without unbundling is not an appropriate criterion or standard. If, on the other hand, one or more competitors are affected adversely, and that, in turn, leads to a significant

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127. *See* SIDAK & SPULBER, *supra* note 7, at 359.
128. *See generally* J. Gregory Sidak & Daniel F. Spulber, *Deregulation and Managed Competition in*

reduction in competition in the marketplace for end-user services, then unbundling may be appropriate under the Telecommunications Act.

72. Indeed, all firms in the telecommunications industry are not alike. They differ in many respects, including their starting places in the competitive battle, their abilities to raise capital, their efficiency in building facilities, and their managerial competence. It cannot be expected that all firms can or should succeed. Focusing on competition rather than individual competitors will obviate making individual firm assessments in determining the necessity of unbundling particular network elements.

73. Also, in concert with the geographic and temporal aspects discussed above, a competitor's losses in specific geographic areas are similarly irrelevant except to the extent that competition is materially affected in that area. That fact underscores the need to recognize the importance of the geographic dimension of competition and, hence, of mandatory unbundling. As in antitrust law, it is not the injury to competitors that matters. Instead, the injury to competition should serve as the necessary test before unbundling is required.

B. The Issue Is Not Whether the ILECs Will Unbundle Their Network Elements for Use by CLECs, but Whether the Government Will Compel the ILECs to Do So at TELRIC Prices

74. A decision by the Commission not to impose mandatory unbundling of a particular network element at TELRIC rates would not imply that that network element would be generally unavailable to competitive carriers. The pricing of access and the "necessary" and

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Network Industries, 15 YALE J. ON REG. 117 (1998).

"impair" standards governing which elements to unbundle are inseparable, as one of us wrote in 1997: "[T]he pricing of network access is inextricably linked to the scope of mandatory unbundling. One cannot say whether or not a particular unbundling obligation is just and reasonable unless one knows how the regulator will permit the incumbent firm to price the mandatory network access associated with that obligation."[129] The Commission's *Second Further Notice of Proposed Rulemaking* confirms that assessment. Nothing prevents voluntary negotiations between incumbents and competitors on the terms of unbundling.[130] In fact, ILECs have a strong incentive to sell unbundled elements to competitors at market-determined prices. Increased usage by the CLEC's customers and innovative services developed by the CLEC itself represent a positive externality (or, "network effect") that will be enjoyed by the ILEC and all its customers on the network. Furthermore, the regional Bell operating companies (RBOCs) remain obligated to unbundle loops, local switching, and local transport at market prices to comply with the competitive checklist that is a prerequisite, under section 271 of the Telecommunications Act, for an RBOC's entry into in-region interLATA services.[131]

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129. *See* SIDAK & SPULBER, *supra* note 7, at 565; *see also* Sidak & Spulber, *Givings, Takings, and the Fallacy of Forward-Looking Costs*, *supra* note 5, at 1163.

130. The recent consolidations in the CLEC industry (for example, the merger of MCI and WorldCom) would serve as a countervailing source of market power in any voluntary negotiation. For a review of the recent mergers in the CLEC industry, see Perrin Sterling, *The CLEC Market: Prospects, Problems, and Opportunities*, TELECOMMUNICATIONS INT'L. Nov. 1, 1998, at 41.

131. 47 U.S.C. § 271(c)(2)(B).

C. The Social Costs of Mandatory Unbundling May Outweigh the Gains

1. Mandatory Unbundling Imposes Social Costs by Distorting the Investment Incentives of Both ILECs and CLECs

75. Mandatory unbundling is nothing more than a form of compulsory sharing. In the telecommunications industry, mandatory unbundling can impose social costs by distorting the incentives of both incumbents and entrants. Disincentive effects on incumbents are substantial because those firms are continuing to make large, sunk investments in their existing networks. As noted in Part I, Justice Breyer explained in *Iowa Utilities Board* the importance of such incentives: "Nor can one guarantee that firms will undertake the investment necessary to produce complex technological innovations knowing that any competitive advantage deriving from those innovations will be dissipated by the sharing requirement."[132]

76. Regulatory use of cost-based rates (such as TELRIC) creates disincentives for new investment and for innovation in telecommunications.[133] If the new investment succeeds, the CLEC can purchase the ILEC's unbundled element at cost, as set by TELRIC. If the new investment fails, the CLEC does not bear any of the cost, but the ILEC's shareholders bear the cost of the unsuccessful investment. Thus, the regulators force the incumbent to provide CLECs a *free option* on its investment. Modern economic and finance theory demonstrates the value of options,[134] including call options, which are options to buy an asset.[135] By the

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132. *Iowa Utilities Board*, 119 S. Ct. at 721 (Breyer, J., concurring in part, dissenting in part) (concurring).

133. *See* SIDAK & SPULBER, *supra* note 7, at 403–26, 545–51. For a discussion of the important gains that have been realized by innovation in the Internet, see Jerry Hausman, *Telecommunications: Building the Infrastructure for Value Creation*, *in* SENSE AND RESPOND 63 (S. Bradley & R. Nolan eds., Harvard Business School Press 1998).

134. *See* AVINASH K. DIXIT & ROBERT S. PINDYCK, INVESTMENT UNDER UNCERTAINTY (Princeton University Press 1994); Fisher Black & Myron Scholes, *The Pricing of Options and Corporate Liabilities*, 81 J.

principle of "conservation of value" in finance, the Commission's grant of a free option to a CLEC diminishes the expected return of an ILEC's investment by the value of the option given to the CLEC. Thus, the grant of the option decreases the ILECs' incentives to invest.[136] Regulatory reliance on TELRIC pricing causes those free options to be given to competitors at the expense of the incumbent. Even if such an option is never exercised, it nonetheless represents for the CLEC a thing of considerable value, procured for the CLEC's advantage by the government through involuntary exchange. The result is a level of investment and innovation by the ILEC that falls below the economically efficient level. New services will then be provided at less than economically efficient levels, and consumers and businesses will be made worse off.[137] Thus, the "necessary" and "impair" standards should not be applied to new network service elements, or else diminished competition and decreased consumer welfare will result.

77. For example, consider R&D and investment in new services. Many new telecommunications services do not succeed.[138] For example, new information gateway services, which were unsuccessfully offered by ILECs, required substantial sunk costs of development because the cost of creating the large databases necessary to provide such service is substan-

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POL. ECON. 637 (1973).

135. *See*, e.g., WILLIAM F. SHARPE, INVESTMENTS 471 (Prentice-Hall, Inc. 3d ed. 1985).

136. For a discussion of conservation-of-value principles, see RICHARD A. BREALEY & STEWART C. MYERS, PRINCIPLES OF CORPORATE FINANCE 400-01 (McGraw-Hill 4th ed. 1991).

137. For a discussion and estimation of particular cases where regulation costs U.S. consumers and businesses billions of dollars because of regulatory delay of new services, see Hausman, *Valuing the Effect of Regulation on New Services in Telecommunications*, *supra* note 11.

138. *See, e.g.*, A Michael Noll, *Anatomy of a Failure: Picturephone Revisited*, 16 TELECOMMUNICATIONS POL'Y, 307 (1992); A Michael Noll, *Conspicuous (Lack of) Consumption*, TELE.COM, Feb. 8, 1999 (discussing Picturephone).

tial. Since the FCC's adoption of its *Local Competition First Report and Order* in 1996, if a new service is successful, under TELRIC price regulation, an ILEC competitor can buy the service at its total service long-run incremental cost (TSLRIC). For a successful new service, the ILEC recovers at most its cost. For unsuccessful services, the ILEC recovers nothing and loses its sunk investment.[139] Thus, the TELRIC regulation is analogous to a rule that would require pharmaceutical companies to sell their successful products to their generic competitors at incremental cost and would allow the pharmaceutical companies to recover their R&D and production costs on their successful new drugs, but to recover nothing on their unsuccessful attempts.

78. This truncation of returns, where a successful new telecommunications service recovers its cost (but no more) and unsuccessful new services recover nothing, decreases economic incentives for innovative new services from regulated telecommunications companies. Thus, the tighter is the cost standard, the lower are the incentives to innovate, as one would expect. More important, as the returns to the innovation become more uncertain, the expected return and the incentives to innovate also decrease. (At the same time, under standard option theory, the value of the option implicitly granted to the CLEC rises dramatically, for it is driven by the standard deviation of returns to the optioned network element, which rises with uncertainty.) If the cost-based rate of the unbundled elements corresponding to the new service were set exactly at the cost of providing the new service, with no return to R&D costs and no reward to uncertainty, then regulation would completely eliminate the economic

139. *See* Jerry Hausman, *Regulation by TSLRIC: Economic Effects on Investment and Innovations,*

incentive to provide the new service, because the expected return to the ILEC would *always* be negative. Thus, regulation would lead to decreased introduction of new services, decreased investment, decreased innovation, and decreased consumer welfare.[140]

79. Consumers also suffer from the effect of unbundling on the incentives of entrants. If there is no existing alternative supply for a network element, but much potential supply, then unbundling will reduce the incentives for alternative suppliers to enter the fray. Conversely, forbearing from unbundling will increase the opportunities for entrants, promote facilities-based competition, and promote diversity for innovation, choice, and product diversification. In addition, unbundling could cause an already present CLEC to exit. In May 1997, the Canadian Radio-television and Telecommunications Commission (CRTC) adopted an unbundling policy that is responsive to such concerns, when (in contrast to the FCC's *Local Competition First Report and Order*) the agency ordered that Canadian ILECs "should generally not be required to make available facilities for which there are alternative sources of supply or

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MULTIMEDIA UND RECHT, Mar. 1999, at 22; *see also* SIDAK & SPULBER, *supra* note 7, at 375.

140. As noted in Part I, Justice Breyer warned of this perverse outcome:

> Nor can one guarantee that firms will undertake the investment necessary to produce complex technological innovations knowing that any competitive advantage deriving from those innovations will be dissipated by the sharing requirement. . . .
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> Nor are any added costs imposed by more extensive unbundling requirements necessarily offset by the added potential for competition. Increased sharing by itself does not automatically mean increased competition. It is in the *un*shared, not in the shared, portions of the enterprise that meaningful competition would likely emerge. Rules that force firms to share *every* resource or element of a business would create, not competition, but pervasive regulation, for the regulators, not the market place, would set the relevant terms.

Iowa Utilities Board, 119 S. Ct. at 753–54 (Breyer, J., concurring on "necessary" and "impair") (emphasis in original).

which [competitive local exchange carriers] can reasonably supply on their own."[141] Mandatory unbundling in Canada extends only to the ILEC's "essential" facilities.[142] As the CRTC well understood, compulsory unbundling requirements can deprive facilities-based entrants of opportunities to share costs, achieve efficient scale, and maximize utilization of zero marginal cost and/or sunk infrastructure.

2. The "Impair" Standard Cannot Be Satisfied Simply Because Implicit Subsidies Are Removed from Regulated UNE Prices

80. Regulated prices that are set on the basis of TELRIC confer implicit subsidies to those who purchase unbundled network elements.[143] That point has already been made, as well as its negative implications for efficiency, competition, and innovation. Those highly favorable prices encourage the use of and reliance on unbundled network elements of the incumbent and discourage the use of and investment in competitors' own facilities. The availability of those UNEs at inefficiently low prices not only attracts firms that could have deployed their own facilities, but also induces firms that could not have efficiently entered or expanded in the marketplace to do so. The subsidized prices shield inefficient entrants from facing the true economic prices they would otherwise be forced to face.

81. An issue arises if those subsidized prices are subsequently brought up to market-based, efficient levels. Clearly, as markets become increasingly competitive, any network elements that are required to become unbundled may not continue to face that requirement at some point in the future. When prices are allowed to rise to efficient levels, whether by market

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141. Local Competition, Telecom Decision CRTC 97-8, at ¶ 74 (Canadian Radio-television & Telecommunications Comm'n May 1, 1997).

forces or by regulation, those marginal firms may well incur financial difficulties, at least with respect to the purchase of certain UNEs. Any such difficulties should not be considered in determining whether the "impair" standard has been met. Surely, the Telecommunications Act does not intend any such result. If that measure of "impairment" were entertained, it would suggest that unbundling should be used indefinitely to support inefficient producers of telecommunications services. Such an outcome would be contrary to the interests of competition, consumer welfare, and the public interest.

82. The need to ignore the effects of the removal of subsidies from unbundled element prices further underscores the need to focus on competition and not on individual competitors. Assuming that all new competitors in the marketplace are not inefficient (a result that would imply the existence of a natural monopoly), there is no need to assess the effect at the individual firm level. Rather it will suffice to concentrate on competition in the market, appropriately defined.

3. The FCC Has Recognized the Negative Effect of Aggressive Unbundling

83. The FCC itself has explicitly recognized the disincentive effect of mandatory unbundling on investment in its 1998 *Advanced Services Notice of Proposed Rulemaking*.[144] In its 1999 *Second Further Notice of Proposed Rulemaking* on unbundling, the Commission discusses the ability of competition among carriers to develop and deploy new advanced

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142. *Id.*

143. *See* SIDAK & SPUBLER, *supra* note 7, at 410-12.

144. *See* Deployment of Wireline Services Offering Advanced Telecommunications Capability, Memorandum Opinion and Order and Notice of Proposed Rulemaking, CC Dkt. Nos. 98-147, 98-11, 98-26, 98-32, 98-15, 98-78, 98-91, 13 F.C.C. Rcd. 24,011, 24,055-59 at ¶¶ 95-100 (1998) [hereinafter *Advanced Services NPRM*].

services.[145] In the same paragraph, the Commission states, without any apparent awareness of its self-contradiction, that it is critical that the "marketplace for these services be conducive to investment, innovation, and meeting the needs of consumers."[146] The Commission then states that the unbundled elements shall be offered at cost-based rates.[147] If the Commission makes the "necessary" and "impair" standards responsive to individual competitors and not to competition, it will create economic *disincentives* for investment, innovation, and meeting the needs of consumers. Consistent with this analysis, the social costs of unbundling owing to the disincentives for incumbents and entrants to invest should be incorporated into the overall welfare analysis that guides any mandatory unbundling standards that the FCC formulates for interpreting section 251(d)(2).

D. The "Necessary" and "Impair" Standards Should Not Rest on an Economic Misconception of Sunk Costs in Local Telecommunications

84. The concepts of "necessary" and "impair" cannot usefully be analyzed without recognizing the central role of prices and costs in telecommunications. As we shall explain in greater detail in Part III, within the essential facilities doctrine, costs have a primary role in that an essential facility "cannot be economically duplicated." Thus, as Justice Breyer noted, if the Commission establishes a pricing rule for unbundled elements that is uneconomically low, it can incorrectly make an unbundled element appear to be "necessary" or "essential" for competition, because a CLEC will not be able to self-provision the element at a cost near the Commission's established price of the unbundled element. Nor would the CLEC be able to

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145. *SFNPRM*, *supra* note 1, at ¶ 3. This passage is the *only* reference to investment or innovation in the entire *Second Further Notice of Proposed Rulemaking*.

buy the use of the element from another provider at a price near the Commission-set price because of the uneconomically low price that the agency has set. Thus, the "necessary" and "impair" standards cannot be considered as a legal doctrine in isolation from the basic economics and technology underlying the network and the Commission's approach to establishing the price of unbundled elements.

85. The economic distinction between unbundled elements that require only a fixed-cost investment, as opposed to a sunk-cost investment, has an important role in both the "necessary" and "impair" standards and the essential facilities standards.[148] A fixed-cost investment may require a significant expenditure of capital, but it does not necessarily lead to an element meeting the "necessary" and "impair" standards. Capital markets work well in the United States, so CLECs can always raise the necessary capital for an investment in a fixed-cost element. The essential economic feature of a fixed-cost investment is that if the project does not succeed, the capital equipment can be used in alternative projects. For example, a switch, along with its associated software, is largely a fixed-cost investment. Although the cost of a switch is significant, if the CLEC fails to gain sufficient business to be successful, the CLEC can sell the switch and software. Thus, a switch and the associated software cannot lead to an element satisfying the "necessary" or "impair" requirement of section 251(d)(2) because a CLEC would not be at a significant economic disadvantage if it did not have access to the *ILEC's* switches.

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146. *Id.*
147. *Id.* at ¶ 4.
148. The FCC requests an analysis of the effect of sunk costs in defining the "necessary" and "impair"

86. Sunk-cost investments differ from fixed-cost investments because the capital cannot be recovered from a failed sunk-cost investment. Thus, most of the invested capital cannot be shifted to an alternative project.[149] Residential loops provide an example of a sunk-cost investment. Large sunk-cost investments can also provide one of the necessary conditions to establish the existence of an essential facility, because it may be uneconomic for the CLEC to attempt to duplicate large sunk-cost investments given the high degree of risk involved. The *Second Further Notice of Proposed Rulemaking* ignores the relevance to mandatory unbundling of an ILEC's sunk investment in a network element. Paradoxically, the FCC's sole concern over sunk costs is their effect on CLECs—whether sunk costs "would be incurred by requesting carriers if they were to obtain the network elements through self-provisioning or from other sources outside the incumbent LEC's network (*e.g.*, those costs associated with entry that are not fully recoverable if the requesting carrier exits the market)."[150]

E. The Commission's Own Policies May Exaggerate the Apparent Justification for Mandatory Unbundling

1. The Commission's Unbundling Policy Confers a Valuable Option on the CLEC

87. If the Commission requires an ILEC to unbundle, at a TELRIC price, a network element that has a significant sunk cost, the agency is compelling the ILEC to provide an option to the CLECs, as one of us has previously explained.[151] The CLEC can decide to invest

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standard. *SFNPRM*, *supra* note 1, at ¶ 26.

149. *See* SIDAK & SPULBER, *supra* note 7, at 78–82.

150. *SFNPRM*, *supra* note 1, at ¶ 26.

151. *See* Hausman, *Valuing the Effect of Regulation on New Services in Telecommunications*, *supra* note 11;

in its own facilities or to buy the use of the unbundled element from the ILEC. If the element arises from a sunk and irreversible investment, the option is valuable because the CLEC need not take the risk of investment but instead can cause the ILEC to take that risk. For the example of investment in a residential loop, significant risk exists currently that over the next twenty years (or the economic lifetime of a residential loop) that wireless competition or cable competition may cause the prices of services offered over residential loops to decrease significantly. Even more drastic, in twenty years copper-based residential loops may not even be in widespread use because wireless "loops" may prove to be significantly less costly or the broadband feature of cable television networks may cause demand to shift away from copper-based ILEC loops.[152] If a CLEC buying an unbundled sunk-cost element from an ILEC were required to sign a contract for the economic life of the investment (say, twenty years), then the CLEC would not receive a "free option" from the ILEC.

88. But the Commission's current pricing policy of using TELRIC for mandatory unbundling neither requires a CLEC to sign a contract for the economic life of the element nor provides the ILEC a markup to pay for the economic value of the option that regulators compel it to issue. Thus, CLECs can argue correctly that access to unbundled elements is necessary for all sunk-cost elements because competitive supply of those elements will not arise. The competitive supply will not arise because the Commission has set an uneconomically low price for the element that does not recognize the sunk-cost nature of the required

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Hausman, *Regulation by TSLRIC, supra* note 139.

152. Of course, digital subscriber line (DSL) technology may allow for broadband to be offered over ILEC loops. The point is that the technological evolution of competition is sufficiently uncertain to make investment in

investments. If ILECs are required to supply unbundled elements at prices below economic costs, they will be elements that (erroneously) satisfy the "necessary" and "impair" requirements of section 251(d)(2). Those UNEs will appear to satisfy the statutory test not for correct economic reasons, but because the Commission will have cut off any prospect of facilities-based competition through its pricing policies.

89. During the 1996 interconnection proceedings, in response to testimony on the effect of sunk and irreversible investments in setting economically efficient unbundled element prices, one IXC claimed that many of the ILEC's elements were *not* sunk investments. Thus, the investment would be fixed, but not sunk and irreversible.[153] As we discussed above, if an investment in an unbundled element is fixed but not sunk, the element cannot satisfy either the "necessary" or "impair" requirement. A CLEC can always raise the necessary investment funds in the capital markets and begin competing. If the CLEC is unsuccessful, the CLEC can always resell, without a significant economic loss, the capital equipment in which it invested. Thus, to the extent that at least one IXC previously has claimed (through its sponsored affidavits) that specific elements are not the result of sunk investment, those elements cannot satisfy the "necessary" and "impair" requirements. Only an element necessitating a sunk investment can do so.

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sunk-cost elements very uncertain.

153. *See Local Competition First Report and Order*, *supra* note 8, 11 F.C.C. Rcd. at 15,826 n.1562 (discussing response of Jerry A. Hausman to filing of Glen Hubbard and William Lehr on behalf of AT&T Corp.).

2. The Commission's Regulated TELRIC Prices Artificially Reduce a UNE's Price Elasticity of Derived Demand

90. Regulators distort the apparent need for mandatory unbundling when they force an ILEC to lease a network element at TELRIC rather than at a price that incorporates the full option value conferred on the CLEC. Any UNE priced below its full option value will exhibit artificially higher demand than would obtain at a price that incorporated that option value. If the demand curve for the element is linear, then demand will be observed at the more price-inelastic portion of the demand curve. Thus, asking whether competitors would substitute away from consumption of the element if the ILEC attempted to impose a nontransitory price increase of nontrivial magnitude will automatically lead to a misdiagnosis of market power, for the elasticity calculation would be made with respect to a starting point that is, by regulatory distortion, too far down the demand curve.[154]

91. Antitrust lawyers and economists will recognize that analytical refinement to be the converse of the error in the *Cellophane* case, where the cross-price elasticity of demand was evaluated at the putatively higher monopoly price.[155] In *Cellophane*, that error falsely overstated the product's cross-price elasticity of demand *at the competitive price*.[156] In the case of the FCC's

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154. A technical caveat is necessary here. In the case of an isoelastic demand curve, such as one associated with a Cobb-Douglas utility function, the price elasticity of demand is constant at all points along the (nonlinear) demand curve. *Cf.* JAMES A HENDERSON & RICHARD E. QUANDT, MICROECONOMIC THEORY: A MATHEMATICAL APPROACH 111-13 (McGraw-Hill, Inc. 3d ed. 1980) (discussing constant elasticity of substitution of the Cobb-Douglas production funtion). Even in such a case of an isoelastic demand curve, however, it is still true that the FCC, by setting too low a price for the UNE, would suppress competitive supply of that element. As will become clear from our discussion in Part III.B.3, *infra*, that regulatory distortion would make it more difficult for the ILEC to meet the "critical share" calculation that would establish that the ILEC could not impair competition in the market for telecommunications services sold to end-users by declining to lease a particular network element to a CLEC at a TELRIC price.

155. United States *v.* E.I. du Pont de Nemours & Co., 351 U.S. 377, 404 (1956).

156. In the *Cellophane* case, the government claimed that du Pont was exercising unilateral monopoly power

mandatory unbundling of network elements at TELRIC prices, a "reverse *Cellophane*" problem arises: The FCC's failure to evaluate the price elasticity of demand for that element at a price that would cover the element's full option value would falsely understate the element's price elasticity of demand—and hence the true measure of its degree of "impairment" for purposes of section 251(d)(2)—*at a competitive price*. Simply put, an element that is unnecessary for the competitive supply of telecommunications services can be erroneously made to appear to satisfy the "impairment" standard for purposes of section 251(d)(2) as long as the ILEC is obliged to sell the unbundled element at an uncompensatory price and the FCC declines to correct for that market distortion.

92. A related implication of that insight is that the FCC can perpetuate the apparent need for its regulatory intervention by predicating its mandatory unbundling rules on determinations of "impairment" that assume that UNE prices are set at TELRIC levels. The regulator's stimulation of excess demand for UNEs thus preordains the result that the network element in question must be subject to mandatory unbundling. The FCC has used that regulatory strategy for years in another context—the regulation of broadcasting. The justification for regulatory intervention into the market structure and conduct of broadcasters was the putative "scarcity" of spectrum, which the FCC itself controlled through its licensing policies. The FCC artificially created excess demand for spectrum by underpricing it (at a zero price) and then justified its intervention as a way to alleviate the consequences of that excess demand. Judge Williams has

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over food wrappings. By allegedly increasing the price of Cellophane to monopoly levels, du Pont caused competitors to supply, and consumers to buy, other wrapping materials. The government claimed that such supply and demand substitution did not prove that Cellophane would exhibit significant cross-price elasticity at a

described this putative spectrum "scarcity" as "an excess of demand over supply at a price of zero."[157] In the same manner, the pricing of UNEs according to the FCC's *Local Competition First Report and Order* would exaggerate the demand for, and hence the evident "necessity" of, the FCC's order of mandatory competitor access to those UNEs at regulated prices.

3. The FCC Endogenously Determines the Substitutability of Wireless Access for Wireline Loops Because of Its Control over Spectrum Allocation

93. Because the Commission controls the amount of spectrum that is allocated to commercial uses, the agency also controls the availability of alternative supply of telecommunications services. The amount of spectrum potentially available to wireless competitors could increase substantially beyond the current 180 MHz allocated to cellular, personal communications services (PCS), and enhanced specialized mobile radio (ESMR) spectrum. For example, the lower eighty blocks of ESMR spectrum remain to be auctioned.[158] Similar to its underpricing of UNEs, the Commission's spectrum policy may exaggerate the apparent justification for mandatory unbundling. This regulatory distortion is significant because, as we discuss in Part III, the availability of substitute offerings at the end-user level, such as wireless local loops, constrains the ability of the ILEC to exercise market power and hence protects consumer welfare.

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competitive price. *See* RICHARD A. POSNER, ANTITRUST LAW: AN ECONOMIC PERSPECTIVE 127-28 (University of Chicago Press 1976).

157. Time Warner Entertainment Co. v. FCC, 105 F.3d 723, 724 (D.C. Cir. 1997) (Williams, J., dissenting from the denial of rehearing *en banc*).

158. In phase I of the ESMR auctions, the Commission licensed the upper 200 blocks of ESMR spectrum. In phase II, the Commission will auction the lower 80 blocks. FEDERAL COMMUNICATIONS COMMISSION SPECIALIZED MOBILE RADIO (SMR): SMR UPPER 200 FACT SHEET (available at http://www.fcc.gov/wtb/auctions).

III. Limiting Principles Inherent in the Essential Facilities Doctrine and in the Competitive Analysis of Demand and Supply Substitutability

94. Our definition of "necessary" and "impair" relies on the competitive analysis of demand and supply substitution that provides the primary basis for other areas of regulatory economics and provides the analytical basis for modern antitrust jurisprudence. In this Part, we first review the logic and limits of the essential facilities doctrine and examine its empirical implications with respect to defining relevant markets in both geographic and temporal dimensions.[159] Next, we apply that understanding of antitrust analysis to define our test of "impairment." We then extend our analysis to define "necessary" for purposes of section 251(d)(2). Finally, we discuss how related policies of the Commission may distort the conclusions derived from any application of the essential facilities doctrine or market power analysis to mandatory unbundling.

A. The Logic and Limits of the Essential Facilities Doctrine

95. The federal courts first applied the essential facilities doctrine to telecommunications networks in *MCI Communications Corp.* v. *American Telephone & Telephone Co.*[160] There, the Seventh Circuit refined the essential facilities doctrines into a four-part test that requires the plaintiff to show

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159. The following discussion directly responds to the FCC's request for "comment on the significance of the essential facilities standard under section 251(d)(2)." *SFNPRM, supra* note 1, at ¶ 21; *see also id.* at ¶¶ 22-23. Of necessity, our discussion here treats in summary fashion a topic that merits lengthier analysis. For a thorough and up-to-date examination, see Lipsky & Sidak, *supra* note 6.

(1) control of the essential facility by a monopolist;

(2) a competitor's inability practically or reasonably to duplicate the essential facility;

(3) the denial of the use of the facility to a competitor; and

(4) the feasibility of providing the facility.[161]

Inherent in the concept of an "essential facility" is the premise that the owner of that facility possesses monopoly power. The first two elements of the doctrine incorporate that recognition in a variety of ways. First, some degree of uniqueness and market control is inherent in the term "essential." Second, the inquiry regarding the impracticability of duplication ensures that the doctrine will apply only to facilities for which no feasible alternative exists or that cannot be reasonably reproduced. Finally, the term "facility" itself connotes an integrated physical structure or large capital asset with the degree of cost advantage or unique character that usually confers monopoly power and market control by virtue of its superiority for its intended purposes.

96. Although, as noted by Justice Breyer in *Iowa Utilities Board,* the Supreme Court has never endorsed the essential facilities doctrine,[162] seven Justices nonetheless agreed in that case that the doctrine might be useful, by analogy, as a limiting principle in interpreting the "necessary" and "impair" standards of section 251(d)(2) of the Telecommunications Act.[163]

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160. MCI Communications Corp. *v.* American Tel. & Tel. Co., 708 F.2d 1081 (7th Cir. 1982), *cert. denied*, 464 U.S. 891 (1983).

161. *Id.* at 1132-33.

162. *Iowa Utilities Board,* 199 S. Ct. at 753 (Breyer, J., concurring in part and dissenting in part) (concurring).

163. *Id.* at 734-35 (Scalia, J., for the Court); *id.* at 753 (Breyer, J., concurring in part and dissenting in part) (concurring).

A strength of the doctrine is that is has shown the capacity to screen out a multitude of unmeritorious claims.[164] In that respect, the doctrine plainly rejects the notion, embodied in the *Local Competition First Report and Order,* that the public interest is advanced by the simplistic rule that any compulsory sharing that is technically feasible to order shall be ordered. Indeed, as we shall show presently, the technical feasibility of access is a necessary but not sufficient condition for mandatory unbundling to advance consumer welfare.

97. It is inappropriate to apply the essential facilities doctrine to circumstances in which the owner of the facility lacks monopoly power in the market for the end service employing the input, because without monopoly power there can be no basis for applying antitrust principles and remedies. Justice Breyer seemed to make that point in *Iowa Utilities Board*:

> [A]lthough the provision describing which elements must be unbundled does not explicitly refer to the analogous "essential facilities" doctrine (an antitrust doctrine that this Court has never adopted), the [Telecommunications] Act [of 1996], in my view, does impose related limits upon the FCC's power to compel unbundling. In particular, I believe that, given the Act's basic purpose, it requires a convincing explanation of why facilities should be shared (or "unbundled") where a new entrant could compete effectively without the facility, or where practical alternatives to that facility are available.[165]

If the facility must compete for users with other products or services that are effective substitutes for access to the facility, the discipline imposed by such competition will suffice to control the conduct of the facility owner.

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164. *See* Lipsky & Sidak, *supra* note 6.
165. *Id.* at 753 (Breyer, J., concurring in part and dissenting in part) (concurring).

98. There will, of course, be instances in which the facility in question will be somewhat better than the alternatives, but not so much better as to preclude totally the continued survival of excluded parties. The colorful exchange between Justices Scalia and Souter about ladders and lightbulbs[166] confirmed that the Court in *Iowa Utilities Board* understood this concern in the context of mandatory unbundling of network elements under the Telecommunications Act. It may be difficult indeed to determine whether exclusion from the use of a particular facility will mean inconvenience, extinction, or some intermediate degree of harm to the excluded competitor. The point is not that the judgment as to the magnitude of the competitive disadvantage of exclusion is simpler in principle with one test instead of another. Rather, the point is that the question of "essentiality" and ease of duplication—measured by either the potential harm of exclusion or the potential benefit of inclusion—is no different from, and ought legally to be the same as, the issue of whether monopoly power is present in the market for the service produced with the allegedly "essential" facility. The focus of courts and regulators should be on whether mandatory access to the facility will enhance the long-term welfare of consumers, regardless of the effect on individual competitors.

99. Because a finding of monopoly power should be a prerequisite to any further inquiry, any market characteristic that prevents the exercise of market power should preclude the application of the essential facilities doctrine. Suppose, for example, that a pipeline is the only means of transporting oil from the field where it is produced to the city where it is consumed. Suppose further that some local topographical feature precludes construction of an

166. *Id.* at 735 n.11 (Scalia, J.) (quoting *id.* at 739 (Souter, J., concurring in part and dissenting in part)

alternative pipeline. At first it might appear that the refusal of the pipeline owner to permit competing oil distributors to ship their oil through the pipeline is an act of monopolization by virtue of the essential facilities doctrine. If oil is readily available to the region from another source, however, no monopoly constraint on pipeline output (or enhancement in price) would be rational or, in equilibrium, even possible. Alternatively, there may be an energy source that is a reasonable alternative for consumers of oil. In either case, the consequence would be that no method of transporting oil—regardless of the "facility" by which transport is supplied—could exercise monopoly power. The demand for use of the facility is a derived demand based on the underlying demand for the end product—in this case, consumers' use of energy.[167] The derived demand for the facility cannot confer greater market power on its owner than exists for the end product for which that facility would be an input. Under those circumstances, there is no basis to apply antitrust enforcement mechanisms because no change in the conduct of the facility owner would increase consumer welfare or improve resource allocation.

100. Facilities with otherwise identical characteristics may have different antitrust obligations, depending on available substitutes for the output of the facility. The only shopping mall in a geographically isolated locality may have antitrust obligations that are not shared by

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(dissenting)).

167. *See* Hartigan *v.* Panhandle E. Pipe Line Co., 730 F. Supp. 826, 866 (C.D. Ill. 1990) (defining the concept of "derived demand"); United States *v.* Standard Oil Co., 155 F. Supp. 121, 146 (S.D.N.Y. 1957) ("The demand for ocean tankers is a derived demand reflecting changes in the demand for petroleum and its products. An increase in the demand for crude and its products would ordinarily bring an increased demand for ocean tankers and an increase in ocean tanker rates."). The former Interstate Commerce Commission employed such analysis of demand and supply substitution in the 1980s when reforming rate-regulation principles for rail transportation supplied to "captive shippers." *Ex Parte* No. 347 (Sub.-No.1), Coal Rate Guidelines—Nationwide (unpublished decision issued Feb. 8, 1983); Coal Rate Guidelines, Nationwide, 1 I.C.C.2d 520 (1985); *see also* Burlington N. R.R. *v.* ICC, 985 F.2d 589, 595–99 (D.C. Cir. 1993) (Williams, J.).

an identical facility in the suburbs of a metropolis. Equally significant, the same facility may have different antitrust obligations depending on the time of the suit. The first shopping mall in a newly developed area may be found to have monopoly power—that is, the facility may be regarded as "essential"—and exclusion of competing retailers may well create liabilities under section 2 of the Sherman Act. The identical shopping mall, however, may lose such antitrust obligations once competing commercial real estate developments have emerged in the natural course of growth and the development of increased commercial real estate capacity. In short, the essential facilities doctrine should be *temporally bounded*, although courts have failed to recognize that requirement.

101. The foregoing analysis suggests why, in the vast majority of essential facilities doctrine cases, the federal courts have declined to find the facility in question "essential."[168] That pattern has prompted academic criticism of the essential facilities doctrine, including criticism by one of the present authors.[169] The criticisms of the essential facilities doctrine may reflect two underlying forces, one which is irrelevant to the FCC's interpretation of section 251(d)(2) and the other which underscores the need for a limiting principle.

102. First, remedies in essential facilities cases necessarily require some form of regulation. In other words, by hypothesis no remedy of mandated access can eliminate the

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168. Those decisions are surveyed in Lipsky & Sidak, *supra* note 6.

169. *See id.*; Donald I. Baker, *Compulsory Access to Network Joint Ventures Under the Sherman Act: Rules or Roulette?*, 1993 UTAH L. REV. 999 (arguing that the core conceptual problem with compulsory access orders is that mandating cooperation among businesses is futile); Philip E. Areeda, *Essential Facilities: An Epithet in Need of Limiting Principles*, 58 ANTITRUST L.J. 841 (1990) (arguing that no Supreme Court case has provided a consistent rationale for the doctrine or has explored either the social costs and benefits or the administrative costs of requiring the creator of an asset to share it with a rival).

underlying monopoly. Once identified, the role of judicial regulation (through consent decree) in essential facilities cases may be judged by the same standards applied to other forms of public control of natural monopolies. The central thesis derived from this analysis is that the wisdom of judicial regulation of essential facilities requires an assessment of the administrative complexity of the relief proposed. But this consideration is not applicable to a regulatory agency like the FCC, which already has the expertise and resources to administer a regime of mandatory access, if one is deemed necessary to impose.

103. The second criticism directed against the essential facilities doctrine concerns the incentives created by the doctrine and their dynamic effect on consumer welfare. As Justice Breyer noted in *Iowa Utilities Board*,[170] compulsory sharing of property has social costs because it truncates the returns to private investment, especially investment in innovative activity. There are obvious social costs when competitors, like children in a sandbox, are admonished to share. Any case in which the fundamental output of the facility consists of information or any other form of intellectual property seems a poor candidate for application of the essential facilities doctrine. The essential facilities doctrine is, above all, a legal rule of mandatory sharing and compulsory dealings. That characteristic alone is inconsistent with the exclusivity granted to innovators, which government has decided is appropriate to preserve their incentives to create new properties. The essential facilities doctrine, moreover, is most likely to condemn intellectual property in precisely those circumstances in which that result is least defensible: Under the essential facilities doctrine, the more an invention is unique,

170. 119 S. Ct. at 753-54 (Breyer, J., concurring in part and dissenting in part) (concurring).

valuable, and difficult to duplicate, the greater is the obligation to share it. In short, essential facilities principles are inherently inconsistent with intellectual property protection.

104. This consideration regarding intellectual property has direct relevance to the FCC's interpretation of the "necessary" and "impair" requirements. The Telecommunications Act contains this solicitude for intellectual property, for section 251(d)(2) does not mandate the unbundling of a "proprietary" network element unless it satisfies *both* the "impair" standard *and* the "necessary" standard.[171] Furthermore, those two factors are what the Commission shall consider "at a minimum" when deciding whether to mandate unbundling.[172] The FCC's consideration of additional factors in appropriate cases should tighten rather than expand the focus of this authority to mandate unbundling in the public interest.

B. Deriving the "Necessary" and "Impair" Standards Based on the Lessons of the Essential Facilities Doctrine

1. The Standards Should Be Assessed with Temporal and Geographic Specificity

105. The FCC should interpret "necessary" and "impair" with temporal and geographic specificity. The FCC can usefully identify multiple geographic zones for unbundling purposes without imposing a uniform nationwide unbundling rule—let alone a uniform nationwide *presumption* or *outcome*.[173] Without temporal and geographic specificity to its mandatory unbundling rules, the FCC would create a body of law in direct conflict with the antitrust principles that the Court considered relevant to interpreting section 251(d)(2). The resulting

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171. For proprietary network elements, the statutory requirement is conjunctive: "necessary . . . *and* . . . impair." 47 U.S.C. § 251(d)(2) (emphasis added).

172. *Id.*

173. *Cf. SFNPRM*, *supra* note 1 (separate statement of Commissioner Powell).

vision of competition would at best bear no relation to a rigorous economic understanding of the term "necessary" or "impair" and at worst be affirmatively harmful to consumers.

106. The *Second Further Notice of Proposed Rulemaking*, however, incorrectly concluded that establishment of minimum national unbundling requirements remains valid under the Court's decision in *Iowa Utilities Board*.[174] The FCC could "find nothing in the Supreme Court's decision that calls into question our decision to establish minimum national unbundling requirements."[175] That statement is remarkable because Justice Scalia's reference to supply substitution for the ILEC's network elements presupposes a competitive analysis that must begin by defining relevant product and geographic markets. The references by Justices Scalia and Breyer to the essential facilities doctrine reinforces the premise that competition must be evaluated with respect to a meaningful geographic market. The FCC's tentative conclusion about the need to impose nationwide unbundling requirements is inconsistent with the holding in *Iowa Utilities Board* because that conclusion is inconsistent with the underlying technology used to provide local telephone service and with the analysis in a number of previous Commission decisions.[176] Consider residential telephone service. The basic technology to provide circuit-switched local telephone service to residential customers is essentially the same throughout the United States.[177] But, as discussed in many prior Commission

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174. *SFNPRM*, *supra* note 1, at ¶ 14.

175. *Id.*

176. *See, e.g.*, Applications of NYNEX Corp., Transferor, and Bell Atlantic Corp., Transferee, for Consent to Transfer Control of NYNEX Corp. and Its Subsidiaries, Memorandum Opinion and Order, 12 F.C.C. Rcd. 19,985, 20,014-19 ¶¶ 49-57 (1997).

177. *See, e.g.*, BELL COMMUNICATIONS RESEARCH, BOC NOTES ON THE LEC NETWORK (Bellcore 1994); BELL COMMUNICATIONS RESEARCH, TELECOMMUNICATIONS TRANSMISSION ENGINEERING: PRINCIPLES (Bellcore 1990).

decisions and contained in significant amounts of U.S. telecommunications policy, costs differ greatly among different geographical areas. Since the technology being employed is essentially the same, the conclusion follows that features of the geographical areas lead to the large variation in costs.[178] Indeed, the FCC discusses economies of scale and economies of density that lead to those differences in costs.[179] Those differences in costs would be expected to lead to differences in competition.[180]

107. When the density of customers is high enough and the number of customers is large enough in a given geographical area, the economies of scale and density will either be exhausted or will become sufficiently small so as not to have an economic effect of any significant magnitude. In that situation, an ILEC will not have an economic advantage, and economic analysis leads to the prediction of significant CLEC entry. Indeed, Commissioner Powell correctly recognized the principle that, when competitors already exist in a particular market, other firms would not be impaired in their ability to compete if they do not have unbundled access to the ILEC's network elements, let alone unbundled access at TELRIC prices.[181] Furthermore, that economic analysis is confirmed by the finding that facilities-based CLECs are much more prevalent in urban, high-density areas, than in more rural areas.[182]

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178. *See, e.g.*, ROBERT W. CRANDALL & LEONARD WAVERMAN, TALK IS CHEAP: THE PROMISE OF REGULATORY REFORM IN NORTH AMERICA 75–85 (Brookings Institution 1995).

179. *SFNPRM*, *supra* note 1, at ¶ 26.

180. Indeed, the definition and geographical scope of the local access and transport areas (LATAs) took account of customer density and its expected effect on long-distance competition. *See, e.g.*, HUBER, KELLOGG & THORNE , *supra* note 71, at 227–34.

181. *SFNPRM*, *supra* note 1 (separate statement of Commissioner Powell).

182. *See* INDUSTRY ANALYSIS DIVISION, COMMON CARRIER BUREAU, FEDERAL COMMUNICATIONS COMMISSION, REPORT—LOCAL COMPETITION 2 (Dec. 1998) [hereinafter 1998 LOCAL COMPETITION REPORT].

108. The employment of a single nationwide standard would be in direct contradiction to the market definition standards found in the Department of Justice and Federal Trade Commission *Merger Guidelines*,[183] which the FCC has used in its own recent merger reviews under the public interest standard of the Communications Act.[184] In terms of geographic market definition, the *Merger Guidelines* ask whether a hypothetical (unregulated) monopolist could impose a "small but significant and nontransitory" increase in price (that is, raise price above competitive levels).[185] That standard is established by determining whether the hypothetical monopolist would have market power or, alternatively, would be constrained by firms outside the market.[186]

109. In a given geographic market, the correct question is whether an (unregulated) ILEC could exercise market power if it were not required to provide its competitors a given unbundled element at regulated cost-based rates. If other CLECs are already providing competing services using the element, or if the element itself is available from non-ILEC suppliers, then an ILEC could not exercise market power. Provision of the unbundled element by the ILEC would not be necessary for competition in telecommunications services in the given geographic area. Nor would competition be impaired if the ILEC were not required to supply the unbundled element at cost-based rates. It is likely, however, that the outcome of

183. *Merger Guidelines*, *supra* note 15, at § 1.2.

184. *See, e.g.*, Application of WorldCom, Inc. and MCI Communications Corporation for Transfer of Control of MCI Communications Corporation to WorldCom, Inc., Memorandum Opinion and Order, CC Dkt. No. 97-211, 13 F.C.C. Rcd. 18,025, 18,048-50 ¶¶ 37-39 (1998) (citing *Merger Guidelines*).

185. *Merger Guidelines*, *supra* note 15, at § 1.21.

186. This approach is similar to that found in economics textbooks, *see, e.g.*, CARLTON & PERLOFF, *supra* note 16, at 801-08, and in the legal literature, *see, e.g.*, Landes & Posner, *supra* note 14.

that analysis would differ depending on the particular element and the geographical area under consideration.

110. As an example, consider transport. In a densely settled area with a high population, such as eastern Massachusetts around Boston (the eastern Massachusetts LATA), numerous competitors currently provide transport competition to Bell Atlantic. In rural areas of western Massachusetts, however, competitor provision of transport is considerably less developed. Furthermore, Bell Atlantic's costs of providing local service and transport vary significantly between eastern Massachusetts and western Massachusetts. Thus, hypothetically Bell Atlantic might be able to increase the price of transport in rural areas of western Massachusetts above competitive levels, but it could not do so in eastern Massachusetts. Bell Atlantic's competitors need not provide transport to every location in eastern Massachusetts for transport to be competitive. Because Bell Atlantic is required to offer transport under tariff by using nondiscriminatory prices, Bell Atlantic needs to lose only a relatively small share of its overall transport business in eastern Massachusetts for an attempted price increase to be unprofitable. Thus, if competitors offer competitive transport to a sufficient number of locations in eastern Massachusetts, competition will effectively constrain Bell Atlantic's prices. Thus, the added regulatory mandate that Bell Atlantic provide CLECs unbundled transport elements in eastern Massachusetts at TELRIC prices will *not* affect competition. Transport does not meet that interpretation of the "impair" standard in eastern Massachusetts. Thus, as this example illustrates, it will be necessary for regulators to make separate determinations under the "impair" standard for different geographic areas.

111. It is conceivable that a CLEC would argue that its ability to provide an end service to consumers would be impaired for purposes of section 251(d)(2) if the ILEC did not *simultaneously* unbundle a particular element throughout the ILEC's entire service territory. There are two fallacies with such reasoning. First, it presumes that the service territory is identical to the relevant geographic market. That will be a factual question, but in general we observe ILEC service territories spreading over far larger expanses than one would typically regard as a single geographic market for purposes of competitive analysis. Second, the argument misconceives how entry occurs and how much entry is necessary to impart competition to a market. Entrants target their customers, and competition takes *place on the margin*. As our discussion of critical share demonstrates, it is the marginal consumers rather than the inframarginal consumers whose choices determine the competitiveness of a market. The argument that competition would be impaired unless a CLEC can simultaneously serve *all* consumers, marginal and inframarginal alike, overstates the critical share of the ILEC's customers that is necessary for the CLEC to capture to produce a competitive equilibrium.

112. In summary, whether the FCC should mandate the unbundling of a particular network element in a particular geographic location at a particular time should depend on whether such unbundling is necessary to permit the competitive supply of telecommunications services to end users. The correct meaning of "impair" for purposes of section 251(d)(2) is whether the ILEC's failure to unbundle a particular network element, at a TELRIC price, in a particular geographic location at a particular time would produce an equilibrium supply of telecommunications services that was, relative to the competitive equilibrium, significantly inferior for consumers.

2. The Standards Should Incorporate Derived Demand

113. An olive is necessary for a good martini. But that does not make an olive an essential facility, which Rick should be obliged to offer for sale, at cost, to every other saloon keeper in Casablanca. Although a particular network element may be essential to producing a bundle of services in a particular manner, the existence of competition among bundles of services limits the extent to which that element is essential to the competitive supply of telecommunications services. Specifically, the development of wireless voice, data, and vertical services has served to increase the availability of substitutes for wireline access. That reasoning is analogous to the economic concept of derived demand, which has been incorporated in antitrust and regulatory law for many years. In the context of section 251(d)(2), the relevant question is whether competition among bundles of services produces for a particular network element a sufficiently low level of derived demand that makes it inessential to producing a competitive equilibrium.

114. In the language of economics, "necessity" and competitive "impairment" are given rigorous economic meaning by computing the price elasticity of derived demand for any given unbundled network element. That exercise is a direct application of insights in microeconomic theory that were explicated early in the twentieth century by the great British economist, Alfred Marshall.[187] Later, in his classic text on price theory, the late Nobel laureate George Stigler wrote, "Since the demand for a productive service is indirectly created by the demand for the product in whose production it is used, the demand for the service is said to be a derived

187. *See* 5 MARSHALL, *supra* note 7, at ch. 6.

demand."[188] Marshall demonstrated (and Stigler reiterated) that the elasticity of derived demand for an input varies directly with (1) the elasticity of demand for the product that the factor produces; (2) the share of the factor in the cost of production; (3) the elasticity of supply of the other factor(s); and (4) the elasticity of substitution between the factor in question and the other factor(s).[189]

115. The application of Marshall's rules of derived demand can illuminate whether the demand for a given network element is so inelastic (that is, the quantity demanded is not sensitive to changes in price) that it could not be considered a necessary element. The availability of close substitutes to traditional wireline service such as wireless applications serves to increase the elasticity of demand for wireline service and hence, by Marshall's first rule, tends to increase the elasticity of demand for *all* of the ILEC's network elements used to produce voice telephony. As wireless prices approach wireline prices, fixed (as opposed to mobile) customers begin to substitute wireless telephones for landline telephones. Some evidence today already indicates an interest on the part of wireless carriers to serve fixed customers. By February 1999, AT&T had begun offering digital wireless service in Plano, Texas, in a package designed to attract customers interested in second lines for their businesses or homes.[190] By offering consumers a $40 monthly package of unlimited local calling bundled with voicemail, caller ID, call waiting, call forwarding, three-way conferencing, and ten-cents-

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188. STIGLER, *supra* note 18, at 252; *see also* THE NEW PALGRAVE, *supra* note 58, at 813 ("the demand for intermediate goods is *derived* from the demand for the final goods they help produce").

189. Marshall first derived those conditions for the two-factor case, given constant returns to scale. *See* LAYARD & WALTERS, *supra* note 17, at 259.

190. Jennifer Files, *AT&T Tests Mobile Phone Promotion: Plano Plan Casts Alternative to 2nd Home Line*, DALLAS MORNING NEWS, Nov. 12, 1998, at 1D.

per-minute long-distance service, AT&T has positioned itself to attract second-line customers to its standard wireless service.

116. For ease of exposition, we apply the remaining rules of derived demand to loops in particular. According to Marshall's second rule, the price elasticity of derived demand for a network element should rise as the share of the element in the network costs rises. The intuition is as follows: Suppose that the price of a network element, which represents a large portion of the total costs, doubles. Because the price of total network costs would rise substantially, the demand for additional network services would fall, and hence the demand for unbundled access to that particular network element would fall. An example of a network element that represents a large portion of the ILEC's total network costs is the loop. Thus, Marshall's second rule implies that the price elasticity of derived demand for loops would be larger than for other network elements, *ceteris paribus*, and hence unbundled loops would be less likely to be considered necessary for competition.

117. According to Marshall's third rule, the price elasticity of derived demand for a loop should increase with the elasticity of *supply* of another network element, such as a switch. Intuitively, the more price elastic the supply of switches, the less the price of switches will fall with a given reduction in the quantity of switches employed, and hence the greater must be the reduction in the quantity employed of loops. As other network elements such as switches and network interface devices (NIDs) have become increasingly competitively supplied,[191]

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191. For an example of competition in the switching industry, see Susan Breidenbach, *Switching Grows Up: The Entire Report*, Network World, May 4, 1998 (available at http://www.nwfusion.com/news/0504switch9.html).

Marshall's third rule of derived demand implies that the price elasticity of derived demand for loops should be rising.

118. Finally, according to Marshall's fourth rule, the price elasticity of derived demand for a loop should increase with an increase in the cross-price elasticity of substitution between a loop and other network elements. If network elements are used in fixed proportion, then the cross-price elasticity of substitution between a loop and another network element would be small. In that case, Marshall's fourth rule of derived demand would be the only one of the four rules that does not imply a large price elasticity of derived demand for loops. On the other hand, if technological change permits network elements to be used in variable proportions, substitution will occur across network elements and Marshall's fourth rule of derived demand will have relevance.

3. The Relevant Product Market and Critical Share

119. The 1992 *Merger Guidelines* specify that relevant markets for merger analysis may be defined for classes of customers on whom a hypothetical monopolist of the merging firms' products would likely impose a discriminatory price increase. [192] Although the DOJ and FTC had attempted before 1992 to define markets on the basis of the feasibility of price discrimination, the explicit endorsement of that approach by the 1992 *Merger Guidelines* has increased use of this practice by those agencies.[193] According to the *Merger Guidelines*, the

192. *Merger Guidelines, supra* note 15.

193. For recent examples of the use of the price discrimination approach of merger guidelines by the FTC in the petroleum market, see William J. Baer, *Prepared Statement of the Federal Trade Commission On the Role of the Commission in Enforcing the Antitrust Laws to Protect Consumers in the Petroleum Industry*, as delivered before the Subcommittee on Energy and Power, House Committee on Commerce (Mar. 10, 1999) (available at http://www.ftc.gov/os/1999/9903/exxonmobiltestimony.htm). For similar use of the *Merger Guidelines* with

task of defining the relevant product market when price discrimination is not feasible involves identifying the smallest set of products for which a hypothetical monopolist could profitably raise price a significant amount (typically 5 percent) above the competitive level for a sustained period of time, which is normally assumed to be two years.[194] Thus, under the *Merger Guidelines*, a potential market definition is too narrow if, in the face of a 5 percent price increase, the number of customers who would switch to products outside the "market" is sufficiently large to make the price increase unprofitable.

120. Economists refer to the customers who decide not to purchase the product (or to purchase less of the product) at the increased price as "marginal" consumers. For small price increases they switch from the products inside the putative "market." Not all customers, however, are marginal customers. Indeed, in the typical case, most customers would continue to purchase the product despite the higher price because their willingness to pay for the product exceeds the raised price. Economists refer to such customers as "inframarginal" consumers.

121. In the presence of high demand elasticity and high supply elasticity, a firm cannot exercise unilateral monopoly power by attempting to decrease its supply.[195] Demand elasticity is captured by a customer's willingness to switch to competing suppliers as relative

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respect to the airline industry, see Department of Justice, *Comments of the Department of Justice*, Dkt. No. OST-97-2058, *Joint Application of American Airlines, Inc. and British Airways PLC for Approval of and Antitrust Immunity for Alliance Agreement* (May 21, 1998) (available at http://www.usdoj.gov/atr/public/comments/1777.htm).

194. *See Merger Guidelines*, *supra* note 15, § 1.11. For convenience, we will use the 5 percent level, although for some purposes a 10 percent level may be more appropriate.

prices change. Thus, a broad range of available substitutes would imply a high own-price elasticity of demand. Following the same logic as the market definition criteria, the *Merger Guidelines* provide a concrete test for evaluating the competitiveness of a market as captured in the idea of market power, which is the ability of a single firm unilaterally to increase price above the competitive level for a significant period of time.[196] The *Merger Guidelines* emphasize the own-price elasticity of demand, while other analyses focus on the cross-price elasticity of demand. But the two elasticity measures are closely related.[197]

122. Because competition takes place at the margin, only a small proportion of the ILEC's customers needs to defect to defeat its attempted price increase. In a simple example, it is possible to calculate that necessary proportion. Suppose that an ILEC attempted to increase prices on end-user access by 5 percent. How much traffic would that ILEC need to lose before the increase would be unprofitable? The formula to calculate that "critical share" is:

$$(1 - MC/P)\, Q_1 \leq (1.05 - MC/P)\, Q_2.$$

An important empirical fact for network elements is that fixed costs are a very large component of the overall cost, so that marginal cost is a relatively small component. Assume, for

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195. The importance of demand elasticities and supply elasticities has long been recognized in law and economics as important to assess the possibility of the exercise of unilateral market power. *See* Landes & Posner, *supra* note 14.

196. *See Merger Guidelines*, *supra* note 15, § 1.11. The other type of monopoly power recognized by the *Merger Guidelines* is coordinated interaction among all suppliers of a product. Such a possibility is not relevant here because competitors of an ILEC have very different cost structures and product offerings. Moreover, it is far-fetched to imagine firms such as AT&T and MCI WorldCom attempting to achieve coordination interactions with the RBOCs and GTE.

197. The own-price elasticity of demand is the percentage change in demand when the product's own price is raised by say 10 percent. The cross-price elasticity of demand is the percentage change in demand in response to the change in a competitor's price by, say, 10 percent. The two elasticity measures are related by the Slutsky equation in economic theory. The share-weighted (negative) own-price elasticity of demand equals the sum of the share-weighted cross-price elasticities of demand. *See, e.g.*, HENDERSON & QUANDT, *supra* note 154, at 22-24.

example, that the ratio of marginal cost to price, *MC/P*, is 0.2. Thus, we calculate Q_2 to be $0.94Q_1$, so that the critical share is 6 percent. Thus, if the ILEC attempts to raise its price by 5 percent, and if, as a result, it loses more that 6 percent of its traffic, the attempted price increase would be unprofitable and thus unilaterally rescinded.[198]

C. A Proposed Test for the "Impairment" Standard

123. As our discussion makes clear, the existing essential facilities doctrine sets forth necessary but not sufficient conditions for defining "impairment" under section 251(d)(2).[199] The complete set of necessary and sufficient conditions includes a fifth requirement, responsive to the explicit text of section 251(d)(2), to address whether the denial of access to that network element at TELRIC prices would impair competition at the end-user level. Our five-part test is as follows:

The FCC shall mandate unbundling of a network element if and only if

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198. For a more extensive discussion of critical share, see Jerry A. Hausman, Gregory K. Leonard & Christopher A. Vellturo, *Market Definition Under Price Discrimination*, 64 ANTITRUST L.J. 367 (1996).

199. We have previously argued that the essential facilities doctrine identifies necessary, but not sufficient, conditions for mandatory unbundling at long-run incremental cost. *See* Hausman, *Regulation by TSLRIC, supra* note 138, at 22 ("Economic principles suggest that only the 'essential facility' elements of the network, which cannot be economically reproduced in the short run by new competitors, should be unbundled by regulation."); Paul W. MacAvoy & J. Gregory Sidak, *What Is Wrong with American Telecommunications?*, MULTIMEDIA UND RECHT, Mar. 1999, at 15, 15 ("Surely it is economic folly to mandate unbundling of any network element that is not 'essential' in the antitrust sense—that is, a network element that cannot be readily duplicated by the entrant or procured at competitive prices from the same vendors who supply the element to the incumbent firm subject to the unbundling obligation."). *See also* Robert W. Crandall, Managed Competition in U.S. Telecommunications 17 (AEI-Brookings Joint Center for Regulatory Studies, Working Paper 99-1, Mar. 1999) ("the decision to unbundle everything and to require its leasing at cost-based rates is wildly excessive"). For a similar conclusion by German scholars, applying American antitrust principles to German telecommunications law, see CHRISTOPH ENGEL & GÜNTER KNIEPS, DIE VORSCHRIFTER DES TELEKOMMUNIKATIONSGESETZES ÜBER DEN ZUGANG ZU WESENTLICHEN LEISTUNGEN (Nosmos Verlagsgesellschaft 1998); Christoph Engel, *Der Weg der deutscher Telekommunikation in den Wettbewerb*, MULTIMEDIA UND RECHT, Mar. 1999, at 7, 12–13. As noted earlier, *see* text accompanying notes 140–41 *supra*, Canada employs an essential facilities approach to mandatory unbundling.

(1) it is technically feasible for the ILEC to provide the CLEC unbundled access to the requested network element in the relevant geographic market;

(2) the ILEC has denied the CLEC use of the network element at a regulated price computed on the basis of the regulator's estimate of the ILEC's total element long-run incremental cost;

(3) it is impractical and unreasonable for the CLEC to duplicate the requested network element through any alternative source of supply;

(4) the requested network element is controlled by an ILEC that is a monopolist in the supply of a telecommunications service to end-users that employs the network element in question in the relevant geographic market; and

(5) the ILEC can exercise market power in the provision of telecommunications services to end-users in the relevant geographic market by restricting access to the requested network element.

It is clear that the FCC's requirement of any "technically feasible" unbundling, articulated in the *Local Competition First Report and Order*, is subsumed within our framework and hence demonstrated as properly being a necessary, but not sufficient, condition for mandatory unbundling at TELRIC prices. Moreover, we have rearranged the order of the requirements in increasing degree of evidentiary burden. Stated another way, if a CLEC cannot demonstrate that a network element meets the first requirement, then that element is immediately declared inessential, and society is spared the expenditure of the resources needed to perform the more intensive analysis required in the subsequent parts of the test.[200]

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200. We focus here on the "impairment" standard. As we shall explain presently, our understanding of the "necessary" standard is that it would raise the bar of our five-part test in cases where the desired element embodied some type of intellectual property to which the ILEC had a legally recognizable form of protection.

124. To implement the fifth element of our test, one needs to modify the *Merger Guideline*'s test for unilateral market power only slightly to address the relevant question in the *Second Further Notice of Proposed Rulemaking*—namely, whether it would impair competition for an ILEC not to sell a particular unbundled network element to a CLEC at a TELRIC price.[201] Intuitively, our impairment test asks whether the ILEC can exercise market power when restricting access to a particular network element to the CLEC in a particular geographic market. If the ILEC cannot exercise market power (in the output market) when declining to offer a particular network element at a TELRIC price, then all of the consumer benefits associated with a competitive outcome have already been secured. Therefore, the regulator should not order the network element in question to be unbundled. In contrast to the method employed by the Commission, our test is focused on protecting competition as opposed to competitors.

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201. Assume, as the Telecommunications Act requires (*see* 47 U.S.C. §§ 251(c)(2)(D), 251(c)(3), 252(d)(1)(A)(ii)), that the ILEC must charge nondiscriminatory prices for end-user access. If the hypothetical monopolist has the ability to identify the inframarginal customers, it will have the incentive to charge customers different prices depending on their willingness to pay for the product. Thus, even though the hypothetical monopolist may not find it profitable to raise price 5 percent above the competitive level uniformly across all its customers, it may find it profitable to raise price 5 percent to some of its customers.

Let $c\ (p,\ u_n)$ be the critical share of customers that the ILEC must lose to deter the ILEC from raising end-user access above p when all elements except the n^{th} network element are available to CLECs at competitive prices. For example, $c(30,\ 2)$ indicates the critical share of customers the ILEC must lose to deter the ILEC from raising end-user access above $30 when all elements except the second network element are available to CLECs at competitive prices. Additionally, let $q\ (p)$ be the residual demand for end-user access faced by the ILEC for any given end-user access price p. We are now ready to state our proposed test for the "impairment" standard of section 251(d)(2):

> **Impairment Test**: Assume within a market that, by regulatory fiat, the ILEC must charge nondiscriminatory prices. The regulator should mandate unbundling of some network element n at its TELRIC price only when $1 - [q\ (1.05p)\ /\ q\ (p)] < c\ (p,\ u_n)$.

Stated another way, if the share of departing ILEC customers, $1 - [q\ (1.05p)\ /\ q\ (p)]$, exceeds the critical share that the ILEC can profitably sustain, $c\ (p,\ u_n)$, then the ILEC could not exercise market power.

125. What market forces may prevent, in general, the ILEC from successfully implementing that price increase? There are at least three such forces. First, if the ILEC attempts to raise the output price, CLECs will find it profitable to increase their supply of the output. CLECs could self-supply the network element in question (for example, switches) or purchase the use of the element from non-ILEC sources (for example, transport). Second, if the ILEC raises price, customers will shift their demand to competing forms of access, such as cable telephony or wireless for residential customers and CAPs for business customers. With its proposed acquisition of MediaOne and TCI and its proposed joint venture with Time-Warner, AT&T has positioned itself to serve 95 percent of all households in the United States. It is not economically rational to claim that AT&T, MCI WorldCom, and all the other CLECs would conspire to keep landline access prices above the competitive level. Thus, the "critical share" analysis described above would indicate that, in many situations, CLECs would find it profitable to replace the ILEC's reduction in supply and thereby defeat any attempted exercise of unilateral market power by the ILEC. Third, falling wireless prices will continue to displace traditional wireline users. Those three constraining forces make it implausible that the ILEC could exercise market power as defined by the *Merger Guidelines*. If market forces can protect consumers from the harms of monopolization, then the Commission should not impose mandatory unbundling.

126. Some might argue that the *Merger Guidelines* approach simply highlights that ILECs have high market shares for certain services, such as residential access. But that reasoning is fallacious. Professor William E. Landes and Judge Richard A. Posner have noted that high market shares in a price-regulated industry are either meaningless from a competitive

perspective or indicative of prices that are set at or below marginal cost—that is, at or below the price that would obtain in a competitive equilibrium:

> To the extent that regulation is effective, its effect is to sever market power from market share and thus render our analysis inapplicable. This is obviously so when the effect of regulation is to limit a monopolist's price to the competitive price level. A subtler effect should also be noted, however. 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, in many regulated industries firms are compelled to charge uniform prices in different product or geographical markets despite the different costs of serving the markets. As a result, 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, where the policy of uniform pricing yields revenues in excess of costs. In these circumstances, a 100% market share is a symptom of a lack, rather than the possession, of market power.[202]

That assessment is directly relevant to the familiar assertion that an ILEC must possess market power because it has a high share of customers for a particular service. That reasoning is incorrect. Landes and Posner noted that in such a case "the causality between market share and price is reversed. Instead of a large market share's 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."[203] The Ninth Circuit well described that relationship when it said: "Reliance on statistical market share in cases involving regulated industries is at best a tricky enterprise and is downright folly where . . . the predominant market share is the result of regulation. In such cases, the court should focus directly on the regulated firm's ability to

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202. Landes & Posner, *supra* note 14, at 975–76.

control prices or exclude competition."[204] Our proposed test for the "impairment" standard would provide that proper focus. Moreover, our "impairment" test would provide the FCC with "a mechanism for removing particular elements from the unbundling requirements" and for declining to subject particular elements to mandatory unbundling in the first place.[205]

D. A Proposed Test for the "Necessary" Standard

127. As we noted in Part I, the elements of the test for establishing "impairment" are necessary, but not sufficient, conditions for the mandatory unbundling of a network element that is "proprietary in nature." For any element embodying a form of legally protected intellectual property, the "necessary" standard of section 251(d)(2) would apply. For such an element, the Commission should recognize that a heightened standard, beyond impairment of competition, should apply because of the importance to consumer welfare of innovation that leads to the creation of intellectual property and because of the uncertainty of successful outcomes that is inherent in the innovative process.[206] For these purposes, we accept as relevant to section 251(d)2) the definition of intellectual property contained in the *Antitrust*

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203. *Id.* at 976.

204. Metro Mobile CTS, Inc. *v.* NewVector Communications, Inc., 892 F.2d 62, 63 (9th Cir. 1989); *accord*, Consolidated Gas Co. of Fla. *v.* City Gas Co., 880 F.2d 297, 300 (11th Cir.), *vacated and reh'g granted*, 889 F.2d 264 (11th Cir. 1989), *on reh'g*, 912 F.2d 1262 (11th Cir. 1990), *rev'd per curiam on other grounds*, 499 U.S. 915 (1991).

205. *SFNPRM*, *supra* note 1, at ¶ 37.

206. It has long been recognized in the economics literature that the private incentive to innovate is too low relative to the socially optimal outcome that maximizes consumer welfare even when a patent is granted. *See, e.g.*, JEAN TIROLE, THE THEORY OF INDUSTRIAL ORGANIZATION 389-415 (MIT Press 1988). The Commission will further decrease the already insufficient incentive to innovate if it requires mandatory unbundling of elements based on intellectual property and requires them to be sold at TELRIC-based prices.

Guidelines for the Licensing of Intellectual Property, issued in 1995 by the Department of Justice and the Federal Trade Commission.[207]

128. Although, as noted in Part I, the Commission relied on a dictionary definition for "impairment," it appears to have defined "necessary" without any similar reliance on a dictionary. The FCC stated: "'Necessary' means, in this context, that an element is a prerequisite for competition."[208] The proper dictionary definition of "necessary," however, is considerably more emphatic than the FCC's definition. The *Oxford English Dictionary* gives "necessary" the following primary definition: "Indispensable, requisite, essential, needful; that cannot be done without."[209] Similarly, *Webster's* defines "necessary" as "absolutely required; indispensable."[210]

129. The Commission then compounded its definitional problems by incorrectly subsuming "necessary" within the definition of "impair": "We believe that, in some instances, it will be 'necessary' for new entrants to obtain access to proprietary elements (e.g., elements with proprietary protocols or elements containing proprietary information), because without such elements, their ability to compete would be significantly impaired or thwarted."[211] By principally relying on "impairment" to define "necessary," the Commission created a logical circularity that failed to differentiate the two requirements.

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207. U.S. Department of Justice & Federal Trade Commission, Antitrust Guidelines for the Licensing of Intellectual Property § 1.0 & n.1 (patents, copyrights, trade secrets, and know-how agreements). The *Guidelines* state: "The intellectual property laws and the antitrust laws share the common purpose of promoting innovation and enhancing consumer welfare." *Id.* at § 1.0.

208. *Local Competition First Report and Order*, *supra* note 8, 11 F.C.C. Rcd. at 15,641-42 ¶ 282.

209. 10 OXFORD ENGLISH DICTIONARY 275 (Oxford University Press 2d ed. 1989).

210. WEBSTER'S II NEW RIVERSIDE UNIVERSITY DICTIONARY 787 (Riverside Publishing Co. 1988).

211. *Local Competition First Report and Order*, *supra* note 8, 11 F.C.C. Rcd. at 15,641-42 ¶ 282.

130. While our impairment of competition standard is based on the ability of an ILEC to exercise significant market power for a service in the absence of unbundling, in the case of a proprietary element based on intellectual property we recommend a standard that provides for unbundling only if competition is impossible in the absence of unbundling. Thus, an ILEC might retain some degree of market power based on the intellectual property, as currently happens with respect to intellectual property in the rest of the economy.[212] However, so long as competition is possible without the use of the ILEC's intellectual property, economic incentives will exist for ILECs and CLECs to negotiate an agreement over terms, because the ILEC will not be able to control competitive entry into the market for end-user services by means of its control of the intellectual property. We refer to our approach for proprietary elements based on intellectual property as the "absolutely essential" standard because unbundling is appropriate only when the element is truly necessary for competition.

IV. Applying the Proposed Test for "Impairment" to Specific Network Elements

131. The consumer-welfare approach described in Part III not only guides our understanding of the "necessary" and "impair" standards, but also lends itself naturally into a decision framework for determining whether a particular network element in a particular market requires unbundling. We now apply our impairment test to the seven network elements in the *Second Further Notice of Proposed Rulemaking*, as well as to several additional network elements that embody new technologies or make possible new services. We understand Justices Scalia and

212. *See, e.g.*, David J. Teece & Mary Coleman, *The Meaning of Monopoly: Antitrust Analysis in High-*

Breyer to imply that there this an established body of antitrust case law that provides guidance on the application of the first four parts of our impairment test. Thus we focus primarily on how the fifth part of our test should be applied to network elements. The clear point that emerges from this analysis is that determining whether a particular network element in a particular geographic area actually is an essential facility requires a close empirical investigation based on the specific facts in that geographic market. In the sections that follow, we explain why demand-side constraints on market power apply to all of the ILEC's network elements in general, while supply-side constraints can be analyzed at the level of specific network elements.

A. Supply-Side Effects Influence the Unbundling of Specific Network Elements

132. From a supply-side perspective, the correct way to assess whether an ILEC has the ability to exercise monopoly power is to ascertain the following: If the ILEC attempted to restrict its supply of a given network element to increase the price of end-user services above competitive levels, would *other providers* increase their supply of that network element or competing network elements sufficiently to defeat the attempted price increase? If competitors have no barriers to expansion or can access the network element from an alternative source, then the ILEC cannot exercise market power in the end-user service market by restricting the supply of a given element.[213] Typically, a competitor providing a network element will have no binding capacity constraints, and it will be able economically to increase its supply of a given

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Technology Industries, 43 ANTITRUST BULL. 801, 820-22 (1998).

213. The following analysis responds to the FCC's request for "comment on when we should deem a substitute sufficiently available so as to render access to the incumbent's network element unnecessary." *See SFNPRM*, *supra* note 1, at ¶ 21; *see also id.* at ¶ 24 (asking "how the Commission should consider the availability of network

element at current prices because it already would be supplying the element. Since marginal costs are not increasing for provision of network elements, a firm's current provision of a UNE will demonstrate its ability to expand supply.[214] Thus, for a given network element in which competitive supply exists, an ILEC will be unable to exercise market power in most situations.

133. The Supreme Court ruled in *Iowa Utilities Board* that the Commission needed to consider the availability of network elements from alternative suppliers to the ILEC in determining whether the ILEC's supply of a particular network element met the "necessary" and "impair" standards.[215] Thus, an economic analysis of the expected supply of a given network element would be required for the Commission to make a reasoned determination. Because of the underlying technology of network elements, where fixed costs are high relative to marginal (or variable) costs, the economic incentives for non-ILECs that have entered the market to expand their supply will be very high. With high supply elasticity from competing firms, the ILEC will not likely be able to exercise market power in the supply of network elements.

134. Our impairment test is necessarily stated in the abstract. Regulators attempting to employ our standard, however, may require simple, objective market characteristics that would serve as proxies for constraints on an ILEC's ability to exercise market power. With respect to supply-side substitution constraints, two market characteristics should be incorpo-

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elements outside of the incumbent's network").

214. Indeed, marginal costs are either constant or decreasing for most UNEs. Otherwise, we would expect to see numerous small competitors entering the market to supply UNEs.

rated. First, regulators should examine whether a CLEC is self-supplying the element in question in the relevant geographic market. If at least one CLEC is supplying the element in question, the ILEC cannot exercise market power in the end-user services market by restricting access to that element. If the element is not competitively supplied, regulators should next examine the nature of the costs of the network element to determine whether the element *could be competitively supplied* in the short term. In particular, if fixed (as opposed to sunk) costs represent a large share of the total costs of the element in question, then the element should not be unbundled. As explained in Part II, as long as the asset can be redeployed in a different geographic market at little cost, the CLEC will face no exit barriers. Because low exit costs encourage entry, the regulator need not rely on unbundling of that network element to stimulate competition.[216]

135. Furthermore, as a network element becomes competitively supplied, TELRIC pricing better approximates the element's market value. But the proper measure of TELRIC incorporates the value of the option associated with the forward-looking nature of the investment.[217] The competitive price and the element's TELRIC converge to the same value when only fixed cost but not sunk costs are present in the element, because the value of the option under those circumstances converges to zero. Thus, we would predict a socially perverse relationship

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215. 119 S. Ct. at 735.

216. It is well recognized that a barrier to exit becomes a barrier to entry. For a discussion of the absence of exit barriers in the wireless industry because fixed investment is amenable to redeployment by other firms or in other geographic markets, see SIDAK & SPULBER, *supra* note 7, at 78-79.

217. To a limited extent, the Commission recognized this notion of cost in its 1996 interconnection proceeding. *See Local Competition First Report and Order, supra* note 8, 11 F.C.C. Rcd. at 15,824-33 ¶¶ 638-52, 15,849-52 ¶¶ 686-95 (discussing testimony of Jerry Hausman). For further discussion, see Hausman, *Valuing the Effect of Regulation on New Services in Telecommunications, supra* note 11; Hausman, *Regulation by TSLRIC,*

between the sunk-cost nature of the ILEC's network investment on the one hand, and the CLEC's demand for mandatory unbundling on the other hand. The more likely it is that TELRIC accurately approximates the market-determined price of an unbundled network element, the *less* likely it is that the CLEC will demand mandatory unbundling of that element, because the value of the free option granted to the CLEC by the Commission will be near zero. Conversely, the less likely it is that TELRIC fully compensates the ILEC for the option value of mandatory unbundling of a particular network element when sunk costs are important, the *more* likely it is that the CLEC will demand mandatory unbundling of that element at a TELRIC-based price. This perverse effect flows from the FCC's failure to recognize the substantial option value that is associated with the CLEC's right to compel sharing of the ILEC's sunk investments in network infrastructure. The effect of the option value on the CLEC's demand for mandatory unbundling is in addition to the "reverse *Cellophane*" effect described earlier, which holds whether or not the element in question embodies sunk costs.

1. The Supply of Existing Network Elements Listed in the *Local Competition First Report and Order*

136. We now consider how our impairment test would apply to the two most significant of the seven network elements listed in the *Local Competition First Report and Order*. The first such element, local switching, illustrates how our test would apply to an element with primarily fixed but not sunk costs. The second network element, an unbundled loop, involves a relatively greater degree of sunk costs. After we have shown how the analysis would differ between elements depending on their degree of fixed versus sunk costs, we then

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supra note 138.

briefly explain why the remaining five elements would require a regulatory commission to undertake geographically-specific fact finding before it could conclude whether or not those elements meet the impairment standard of section 251(d)(2). Recall that in this subsection, we consider only *supply*-side substitution constraints on an ILEC's ability to exercise market power in the end-user services market.

a. Local Switching

137. The switch is a telephone company's central computer that processes cross-connections for telephone calls and makes routing decisions based on some parameter, such as the digits dialed by the customer.[218] The nature of costs for switches and the level of competition in their supply indicate, for at least three reasons, that switches should not be unbundled in any geographic market in the United States. First, switches are already competitively supplied. As of March 1999, over one-third of all RBOC and GTE rate centers in the United States were served by at least one CLEC voice switch, and 18 percent were served by at least two CLEC switches.[219]

138. Second, even if one were to assume counterfactually that switches are not competitively supplied, the nature of their costs still indicates that switches should not be unbundled. In particular, switches are highly substitutable across wide geographic areas. If a local switch is combined with digital loop carrier equipment, the switch can provide service to distant customers. At a certain point, the cost of transporting calls to a distant switch becomes

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218. *See* REGIS J. BATES & DONALD GREGORY, VOICE AND DATA COMMUNICATIONS HANDBOOK 31 (McGraw-Hill 1998).

219. PETER W. HUBER & EVAN T. LEO, UNE FACT REPORT, Submitted by United States Telephone

more costly than the benefits achieved from the scale economies of increasing the switch load. According to AT&T, such an arrangement is feasible within a 125-mile radius from the switch.[220] Consequently, the relevant geographic markets for switching are large.

139. Third, it is economical for competitors to self-supply (buy and install) switches across a wide range of geographic areas. As long as a CLEC believes that it can serve the minimum number of access lines needed to operate the switch in an economic fashion, self-supply is a viable alternative. Because there are no barriers to exit in the switch industry, mandatory unbundling of switches would not increase competition and therefore could not improve consumer welfare.

b. Unbundled Loops

140. In general, loops are much less substitutable than switching because a large portion of the facility is dedicated to an individual customer, or at least to a specific street or neighborhood, and is costly to redeploy. But in many suburban areas there are facilities-based local competitors for business services. Indeed, unbundled loops for businesses in downtown areas and other areas where CLECs (or competitive access providers, as they were formerly known) provide service cannot satisfy the "necessary" or "impair" standard. Supply-side analysis shows that it cannot impair competition to decline to lease unbundled loops to those firms at TELRIC prices. Over time, those CLECs should spread their service to residential

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Association, and prepared for Ameritech, Bell Atlantic, BellSouth, GTE, and U S West (May 26, 1999). Huber and Leo computed those figures on the basis of Bellcore's *Local Exchange Routing Guide*.

220. *See* Petition of AT&T Corp. to Deny Application, in the Matter of GTE Corp. & Bell Atlantic Corp. for Consent to Transfer of Control, CC Dkt. No. 98-184, at 24 (Nov. 23, 1998) [hereinafter *AT&T Petition to Deny*]. *See also* Memorandum of Robert H. Bork on behalf of AT&T Corp. at 10 (Apr. 7, 1999).

customers as well. In some geographic areas, facilities-based competitors already serve residential customers.

141. Given the pace of new technology deployment, suburban and even rural markets need to be analyzed on a case-by-case basis to determine whether and where unbundled loops are essential facilities. Even if one considers only the constraints on market power owing to CLEC supply opportunities, unbundled loops may be essential facilities in some markets but not in others.[221] The *Second Further Notice of Proposed Rulemaking*, however, presumes that loops must be unbundled: "It is our strong expectation that under any reasonable interpretation of the 'necessary' and 'impair' standards of section 251(d)(2), loops will be generally subject to the section 251(c)(3) unbundling obligations."[222] If the Commission were to incorporate demand-side substitution possibilities, as we do in the following section, the agency would have to revise its expectation that mandatory unbundling of loops will be necessary.

c. Other Network Elements

142. As the preceding discussion shows, the question of whether or not to mandate unbundling of a network element depends on factual questions concerning the level of actual competition in the supply of the requested element and the degree to which the costs of the element are sunk or fixed. The answers to those questions are likely to vary from one geographic market to another for the reasons we have discussed earlier. For four of the five remaining elements—namely, network interface devices (NIDs), interoffice transmission

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221. This section addresses only supply-side effects. With respect to demand-side constraints on market power, as soon as AT&T begins to supply cable telephony, unbundled loops should no longer meet the impairment test. At that time, an ILEC should no longer be compelled to supply CLECs unbundled loops at a TELRIC price.

facilities, signaling networks, and operations support systems—the regulatory commission would have to undertake geographically-specific fact finding before it could conclude whether or not those elements are competitively supplied, and if not, whether they could be competitively supplied in a reasonable period of time. Finally, we believe operator services and directory assistance, the remaining element, need not be unbundled in *any* geographic market because they are competitively supplied, as one state PUC recently concluded.[223]

2. New Technologies for Which the FCC Potentially Could Mandate Network Unbundling

143. In terms of broadband networks and the services they deliver, market evidence demonstrates that mandatory unbundling of the ILECs' networks is not required to permit competition. Because an ILEC does not have market power in the delivery of broadband services, the network elements that the ILEC uses to supply those services cannot be essential facilities. Competition in broadband services is well underway without any compulsory unbundling of the ILECs' network elements. Indeed, in its 1999 report to Congress on the deployment of advanced telecommunications capabilities, the Commission recognized the current state of broadband competition that exists without any use of ILEC network elements:

> Numerous companies in virtually all segments of the communications industry are starting to deploy, or plan to deploy in the near future, broadband to the consumer market. Current providers include cable television companies, incumbent LECs, some utilities, and "wireless cable" companies.[224]

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222. *SFNPRM*, *supra* note 1, at ¶ 32.

223. In the Matter of Petition of U S WEST Communications, Inc. for Competitive Classification of Directory Assistance Services, Order Granting Petition, Dkt. UT-990259 (Wash. Utils. & Transp. Comm'n Apr. 29, 1999).

224. Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of

Because cable companies currently pass more than 95 percent of U.S. homes, it follows that mandatory unbundling of the ILECs' broadband networks is not necessary for competition in broadband services, nor would competition be impaired if the ILECs' broadband networks were not unbundled.

144. Furthermore, although the ILECs' loops in certain geographical areas may be subjected to mandatory unbundling under the impairment standard, as we discussed above, the ILECs' broadband backbone facilities should not be unbundled. Again, the Commission recognized in its 1999 report to Congress that competition is proceeding without mandatory unbundling of the ILECs' broadband networks: "We consider investment in both backbone facilities and the 'last mile.' We find that broadband backbone facilities are being deployed in a reasonable and timely manner."[225] In the same report to Congress, the FCC also observed:

> Deployment of broadband, both backbone and last mile, is occurring on a major scale, for both business and consumer markets. American business and the capital markets are obviously betting that broadband will be successful in the business and consumer markets and many companies are rushing to seize part of that success. We expect that this sizeable investment by numerous companies will translate in the near future into significant deployment of broadband capability.[226]

Regulatory intervention is not required when competition is thriving, and unnecessary regulation can distort otherwise competitive markets. Thus, if the Commission applies to section 251(d)(2) a competition-based consumer-welfare standard as we have urged, and not a competitor-welfare standard, the factual findings in the Commission's own 1999 report to

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the Telecommunications Act of 1996, Report, CC Dkt. No. 98-146, ¶ 12 (released Feb. 2, 1999) [hereinafter *Advanced Telecommunications Capability*].

225. *Id.* at ¶ 13 (footnote omitted).

226. *Id.* at ¶ 36.

Congress demonstrate that no unbundling of the ILECs' broadband networks should be required.

145. Furthermore, mandatory unbundling of the ILECs' broadband networks at TELRIC-based costs would very likely decrease innovation and the introduction of new broadband services to consumers for the reasons that we discussed previously. An ILEC is unlikely to invest in a new broadband service if it knows that the FCC will compel it to sell to its competitors at TELRIC prices the network elements used to supply that service if it proves to be commercially successful. The Commission seems to be oblivious to the impact of mandatory unbundling on ILEC investment in advanced services:

> We also see nothing in the statute or the Supreme Court's opinion that would preclude us from requiring that loops that must be unbundled must also be conditioned in a manner that allows requesting carriers supplying the necessary electronics to provide advanced telecommunications services, such as digital subscriber line technology (xDSL).[227]

The Commission's gift of a free option to CLECs is not costless to society as a whole, for it will decrease innovation and thereby harm consumers, contrary to the explicit goals of the Telecommunications Act of 1996.

3. Combinations of Elements

146. Our test can be adapted to treat combinations of elements. The Commission stated in its *Second Further Notice of Proposed Rulemaking* that "[t]he ability of requesting carriers to use unbundled network elements, including combinations of unbundled network elements, is integral to achieving Congress' objective of promoting rapid competition in the local telecommu-

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227. *SFNPRM*, *supra* note 1, at ¶ 32. *See also id.* at ¶ 34 (seeking comment on whether to "modify the

nications market."[228] Our proposed impairment test, as described earlier, supposes that all but a single network element are competitively supplied to CLECs. If the CLEC can demonstrate that the ILEC's restriction of unbundled access to the remaining element at a TELRIC price would allow the ILEC to exercise market power in the output market, then that element should be unbundled at its TELRIC price. Stated differently, our impairment test is conducted on a "stand-alone basis." One may argue, however, that our test does not consider cases where sets of network elements are not competitively supplied. In those circumstances, would competition in the output market be impaired? Two cases need to be considered.

147. First, suppose two network elements failed to meet the impairment test on a stand-alone basis. If it would not impair the competitive supply of telecommunications services for the FCC to refrain from mandating the unbundling of a nonproprietary element, then it necessarily follows that such an element is one that, when assembled with other elements that failed to pass the impairment test on a stand-alone basis, produces a competitive service that the FCC should forbear from regulating entirely. In those cases, the set of network elements should not be unbundled at TELRIC-prices.

148. Second, suppose that one network element, *A*, failed to meet the impairment test on a stand-alone basis, while the restriction of access to another network element, *B*, was shown to impair competition at the output level. The Commission might reason in the following way: Element *A* only failed the impairment test because the CLEC could rely on

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definition of 'loops' or 'transport' to include dark fiber"); *id.* at ¶ 35 (seeking comment on mandatory unbundling of DSLAMs and packet switches).

228. *Id.* at ¶ 2.

element *B* in the hypothetical. Recall that all other network elements are assumed to be competitively supplied in the stand-alone test. In those cases, the burden of proof should be on the CLEC to demonstrate that the cost of supplying element *A conditional* on supplying element *B* is sufficiently less than the cost of supplying element *A* alone. If the CLEC could not demonstrate significant cost synergies, then element *A* could not be reclassified as essential.

149. Finally, consider the case of the "UNE platform," where all of the ILEC's network elements are considered simultaneously as an "element" unto itself. The logic developed earlier implies that, as long as any one element of the UNE platform fails to meet the impairment test on a stand-alone basis, then the UNE platform as whole should not be unbundled at TELRIC. The only condition under which the UNE platform should be unbundled at TELRIC prices is when *each* of the elements of the UNE platform individually passes the impairment test on a stand-alone basis. For the reasons discussed above, that condition cannot hold in the face of the clearly competitive supply of elements such as switching and directory assistance.

B. Demand-Substitution Effects Influence the Unbundling of All Network Elements

150. In contrast to the supply-side effects articulated above, the demand-side effects do not influence each network element on an individual basis. From a demand-side perspective, the correct way to assess whether an ILEC has the ability to exercise monopoly power is to ascertain the following: If the ILEC attempted to raise prices for end-user access while restricting its supply to CLECs of a given network element, would *customers* find an

alternative source of acceptable end-user service? Consumers could make that choice without considering whether a particular network element or set of network elements was competitively supplied to CLECs. Any consumer substitution in response to an increase in the price of end-user services constrains the ILEC's market power across all network elements. Demand elasticity at the output level does not differentially affect individual network elements at the input level. Thus it would be unproductive for the Commission to attempt to apply this portion of the impairment test at an element-specific level.

151. It is well known that the price elasticity of demand for any good increases with the availability of suitable substitutes.[229] In recent years, credible substitutes to traditional landline service have begun to emerge, which should increase the price elasticity of demand for traditional voice telephony services. For example, Cox Cable is offering local telephone service over its coaxial cable plant in parts of Orange County and San Diego, California; Phoenix, Arizona; Omaha, Nebraska; Hampton Roads, Virginia; and parts of New England.[230] AT&T's recent purchase of TCI, its bid for Media One, and its alliance with Time Warner would give the firm access to 55 percent of homes in the United States.[231]

152. In addition to cable, wireless technologies are being deployed in an increasing number of geographic areas. For example in Plano, Texas, AT&T's "Wireless Home Phone Option" is designed to compete directly with the local exchange service of the wireline

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229. *See, e.g.*, STIGLER, *supra* note 18, at 24.

230. Alex Best, Senior Vice President of Engineering, Cox Communications, *New Service Rollout-1999: Presentation Before the Fifth Annual Goldman Sachs Communications Technology Retreat* (Mar. 1, 1999) (available at Cox website, Investor Center, http://www.cox.com).

231. Paul Farhi, *AT&T: Too Big Once Again?*, WASH. POST, Apr. 27, 1999, at E01. AT&T would *pass* a much higher percentage of homes.

incumbent, GTE. The plan offers unlimited airtime within the fixed local calling area (that is, the home cell site) at a comparable price to GTE's basic service. Also, AT&T is testing a fixed wireless local loop, known as "Project Angel," that is designed to fill in coverage gaps in AT&T's cable network. AT&T can provide users with up to four phone lines, each capable of carrying voice, high-speed data, and video through an antenna-like device installed outside one's house.[232] Wireless local loops are likely to be the preferred access technology in rural areas because they are a cost-effective way to transmit signals to remote residences. For example, in Regent, South Dakota, fixed wireless services from Western Wireless allow customers to connect regular home phones into wireless base station units to get competitively priced local and long-distance services while effectively bypassing the wireline local loop.[233] Such developments in the demand substitutability of alternative access technologies provide a clear answer when the Commission, asks in the *Second Further Notice of Proposed Rulemaking*, what is "the relevance, if any, to the interpretation of the 'necessary' and 'impair' standard, that we are reexamining these issues today, more than three years after passage of the Act."[234]

153. The first competitive constraint on any exercise of ILEC market power is cable telephony. Wireless telephony is an additional constraint on market power. Barring any coordinated interaction among firms providing competitive technology platforms, competition in voice telephony should be robust, demand substitutability should be high, and thus little regulatory intervention is warranted.

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232. Rebecca Blumenstein, *AT&T Plans to Enter Some Areas Using 'Fixed Wireless' Technology*, WALL ST. J., Mar. 19, 1999, at B6.

233. Joe Gardyasz, *Phone Co-Op Pulls Plug on Wireless Competitor*, BISMARCK TRIB., Jan. 13, 1999, at 5.

154. Demand substitution constraints on the ILEC's ability to exercise market power also may come from consumers' demand for bundles of services that include local voice telephony. As the FCC pursues a belief that competition requires extensive mandatory unbundling at TELRIC prices, competitors of the ILECs pursue a business strategy of acquiring (through the capital market) network elements at market prices on the presumption that consumers demand bundled services.

155. It would seem to have been an unstated premise of the FCC's interpretation of the mandatory unbundling provisions in section 251 and 252 of the Telecommunications Act of 1996 that those statutory provisions should be read in a demand-substitution vacuum. Although the Telecommunications Act of 1996 ostensibly removed artificial regulatory distinctions based on the particular technology employed to produce a communications service, the administrative rulemakings and federal court litigation that dominated the first three years of experience under the new statute focused on the traditional narrowband wireline access network. Indeed, developments in cable telephony and wireless local loops may soon make the entire exercise of wireline unbundling irrelevant. Yet, from considering the relevance of demand substitution to interpretation of section 251(d)(2), the *Second Further Notice of Proposed Rulemaking* asks whether the FCC should truncate its analysis of all relevant sources of supply substitution.[235] The FCC evidently does not contemplate *any* evaluation of demand substitution whatsoever.

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234. *SFNPRM*, *supra* note 1, at ¶ 14.

235. *Id.* at ¶ 28 (asking "whether and the extent to which the language of the statute and the Supreme Court's opinion constrain the factors that we can or should consider in evaluating the availability of elements outside the incumbent's network").

156. It is inconsistent for the FCC to emphasize forward-looking TELRIC costs for pricing unbundled network elements and yet retain a backward-looking view of product definitions and demand substitution for telecommunications services. Put differently, it is not "forward-looking" for the Commission to presume that a current product definition for telecommunications service will remain constant over time, especially when there is strong evidence that the bundling of services may redefine the relevant product market for purposes of competitive analysis. In discussing the problems created by TELRIC pricing for unbundled network elements, one of us observed in 1997:

> Like Janus, regulators alternate between past and future perspectives on markets as doing so serves their purpose. The result, which we call the Janus artifice, is an inconsistent economic analysis of competition and pricing. When evaluating the prospects for competition, regulators often look to the past, emphasizing the sunk costs of the incumbent LECs and past market share. For pricing purposes, however, regulators look to the future, promoting their notion of forward-looking costs. Regulators can only compound the fallacies inherent in the forward-looking cost approach when they engage in shifts in perspective that are meant to facilitate desired policy outcomes.[236]

In contrast, antitrust analysis implies that the relevant product markets for an end product or an essential facility must be continually revised over time. Given those considerations and given the growth of bundled services successfully offered by the ILECs' competitors, the FCC runs the risk that its unbundling policy will be irrelevant to competition before it is even fully implemented—and thus obsolete and harmful to consumer welfare.

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236. SIDAK & SPULBER, *supra* note 7, at 425.

C. The Relationship between an "Efficient-Competitor" Standard and the Consumer-Welfare Standard

157. We have argued at length that the FCC should use consumer welfare, not competitor welfare, at the touchstone for interpreting the "impairment" standard of section 251(d)(2). That said, suppose that the Commission nonetheless inclined toward a competitor-welfare approach, but attempted to mitigate the harm that such an approach would impose on consumers by mandating unbundling only if the CLEC were deemed to be an *efficient* competitor. In other words, the FCC would ask whether the ILEC's failure to unbundle the network element at a TELRIC-based price would impair an efficient competitor's ability to provide telecommunications services to end users. What would be the practical difference between an efficient-competitor standard and the consumer-welfare test that we propose? How would the FCC or a reviewing court reconcile the two seemingly disparate techniques?

158. To compare the two approaches, it is useful first to articulate the circumstances under which both standards would produce the same result for a given unbundled network element. Recall that our five-part consumer-welfare standard asks whether the ILEC can exercise market power in the *output* market for end-user services. That is, can the ILEC raise prices in the output market in a nontrivial way for a nontransitory period of time? In contrast, the efficient-competitor standard focuses on competition in the *input* market and asks whether there is a competitive supply of network elements. It is critical to recognize, however, that competition in the output market does not depend solely on the level of competition for one of

the inputs. Competition in the input market is a sufficient, *but not necessary*, condition for competition to be effective in the output market.

159. Thus, whenever competition is apparent in the input market for a particular network element, both the efficient-competitor and consumer-welfare standards will indicate that mandatory unbundling would be inappropriate. According to the efficient-competitor standard, a CLEC could, under those conditions, self-supply the network element or purchase it at competitive rates and thereby effectively compete against the ILEC. Similarly, the consumer-welfare standard would indicate that, under those conditions, the ILEC would be constrained from exercising market power in the end-user services market through an attempt to deny a CLEC access to the competitively supplied network element in question.

160. Under other conditions, however, the two standards would produce divergent outcomes. Suppose that within a well-defined geographic market the ILEC is the sole supplier of the network element requested by a CLEC. Suppose further that, within the same geographic market, the ILEC faces intense competitive pressure in the end-user services market from AT&T in the form of voice telephony provided over TCI's coaxial and fiber-optic infrastructure. Under those circumstances, the efficient-competitor standard would indicate mandatory unbundling of the requested network element. To the contrary, the consumer-welfare standard would indicate that no mandatory unbundling of the network element in question would be warranted. That example highlights the major shortcoming of the efficient-competitor standard—*it ignores that alternative sources of supply in the output market constrain the ILEC's ability to exercise market power.* It is clear from the *Second Further Notice of Proposed Rulemaking* that, consistent with an efficient-competitor standard, the FCC's

approach to interpreting section 251(d)(2) incorrectly focuses on competition in the input market while ignoring competition in the output market.[237] Table 1 summarizes, for various scenarios, the differences in outcomes that would result, under TELRIC prices, from the Commission's use of the consumer-welfare standard, the efficient-competitor standard, and the original standard in the *Local Competition First Report and Order* (namely, any unbundling that is "technically feasible").

TABLE 1: COMPARISON OF THE OUTCOMES RESULTING FROM THE APPLICATION OF THREE DIFFERENT STANDARDS FOR MANDATORY UNBUNDLING AT TELRIC PRICES

Scenario (Is unbundling feasible? Is the network element competitively supplied? Is the output competitively supplied?)	**Technical-Feasibility Standard**	**Efficient-Competitor Standard**	**Consumer-Welfare Standard**
Unbundling is not technically feasible, UNE is competitively supplied, output is competitively supplied (N, Y, Y)	Do Not Unbundle	Do Not Unbundle	Do Not Unbundle
Unbundling is not technically feasible, UNE is competitively supplied, output is not competitively supplied (N, Y, N)	Do Not Unbundle	Do Not Unbundle	Do Not Unbundle
Unbundling is not technically feasible, UNE is not competitively supplied, output is competitively supplied (N, N, Y)	Do Not Unbundle	Do Not Unbundle	Do Not Unbundle
Unbundling is not technically feasible, UNE is not competitively supplied, output is not competitively supplied (N, N, N)	Do Not Unbundle	Do Not Unbundle	Do Not Unbundle
Unbundling is technically feasible, UNE is competitively supplied, output is competitively supplied (Y, Y, Y)	Unbundle	Do Not Unbundle	Do Not Unbundle
Unbundling is technically feasible, UNE is competitively supplied, output is not competitively supplied (Y, Y, N)	Unbundle	Do Not Unbundle	Do Not Unbundle
Unbundling is technically feasible, UNE is not competitively supplied, output is competitively supplied (Y, N, Y)	Unbundle	Unbundle	Do Not Unbundle
Unbundling is technically feasible, UNE is not competitively supplied, output is not competitively supplied (Y, N, N)	Unbundle	Unbundle	Unbundle
Unbundling Results	**4 of 8**	**2 of 8**	**1 of 8**

Note: We assume that the efficient-competitor standard, like the consumer-welfare standard, incorporates a technical-feasibility requirement.

237. *SFNPRM*, *supra* note 1, at ¶ 42 ("[W]e seek comment on whether the existence of a competitive market for a network element is necessary to demonstrate that an element is sufficiently available outside the incumbent's network so that failure of the incumbent to provide the element would not be 'necessary' or would not 'impair' a carrier's ability to provide service.").

As Table 1 shows, the FCC's original rule of "technically feasible" unbundling would mandate unbundling in half of the possible scenarios. With respect to its outcomes (as opposed to its intellectual grounding), the efficient-competitor standard more resembles the FCC's original "technically feasible" unbundling rule than our proposed consumer-welfare standard.

161. The preceding comparison of the efficient-competitor standard with our proposed consumer-welfare standard presupposes that it would be feasible for the FCC to define in the abstract, and identify in the concrete, an "efficient" CLEC. There are multiple reasons, however, to expect that such an exercise would be daunting. There is no reason to expect CLECs to be homogeneous firms, such that the FCC could make uniform assumptions about production technologies. CLECs vary in size, lines of business, regulatory burdens or advantages, brand name recognition, and so forth. AT&T, for example, has cable television and wireless businesses with which to offer local access for voice telephony, as well as a brand name that is immediately recognizable to consumers. MCI WorldCom, as of May 1999, had neither cable television nor wireless, and the company presumably still faces challenges in uniting the separate corporate identities of MCI and WorldCom. Meanwhile, Sprint has wireless, no cable television, and extensive operational experience as a traditional ILEC in a number of geographic markets. Which of those three firms would the FCC deem the most "efficient" for purposes of an efficient-competitor standard for section 251(d)(2), and why? Furthermore, how would the FCC evaluate the efficiency of smaller CLECs, such as Winstar or Teligent or RCN, relative to the efficiency of the large IXCs?

162. The FCC, of course, could undertake engineering cost modeling of a hypothetically efficient CLEC. But that prospect cannot be regarded as appealing or promising. By

comparison, the Commission undertook to model the costs of a hypothetically efficient ILEC for purposes of generating TELRIC estimates with which to establish proxy rates for UNEs. That exercise generated controversy and litigation.[238] More fundamentally, as a matter of both jurisdiction and economic policy, the FCC would tread shaky ground if, in the name of implementing its policy of mandatory unbundling, it was resorted to creating ersatz cost-of-service regulation for *unregulated* CLECs.

163. In short, if the FCC were to interpret section 251(d)(2) under an efficient-competitor standard, it would invariably be compelled to make precisely the kinds of predictions about "best" technologies that Congress resolved, in the Telecommunications Act of 1996, that the market is better suited to supply. The Commission emphasized shortly before its issuance of the *Second Further Notice of Proposed Rulemaking* that it would not hazard to make such predictions.[239] Clearly, such intervention would not "reduce regulation" in the pursuit of "lower prices and higher quality services for American telecommunications consumers."[240]

238. *See* Hausman, *Regulation by TSLRIC*, *supra* note 138; SIDAK & SPULBER, *supra* note 7, at 421 (discussing the Hatfield model).

239. In early 1999, the FCC stated: "Our role is not to pick winners and losers, or to select the best technology to meet consumer demand. We intend to rely as much as possible on free markets and private enterprise." *Advanced Telecommunications Capability*, *supra* note 225, at ¶ 5.

240. Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56, 56 (preamble).

V. EFFICIENT PROCEDURES FOR ADMINISTERING THE IMPAIRMENT TEST

164. Economic analysis should guide the Commission in establishing evidentiary rules for mandatory unbundling proceedings and in allocating fact-finding responsibilities between the state public utility commissions and the FCC itself.

A. Evidentiary Burdens and Sunset Mechanisms

165. Through its design of evidentiary rules, the FCC should create efficient incentives for ILECs and CLECs to discover and reveal information about optimal network design, usage, and investment. Here, the Commission should apply the legal scholarship on economic analysis of evidentiary law.[241] Evidentiary presumptions and burdens of proof under section 251(d)(2) should be assigned to the party (ILEC versus CLEC) that is the most efficient producer of the information sought. In most cases, that party will be the CLEC. The rebuttable presumption, therefore, should be that mandatory unbundling of any given network element at a

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241. In a 1998 symposium on the economics of evidentiary law, Professor Richard Friedman of the University of Michigan summarized the economic questions posed by the allocation of evidentiary burdens in terms that are directly pertinent to questions posed in the *SFNRPM*, *supra* note 1, at ¶ 12:

> [C]osts and burdens [of producing evidence] must be allocated between the parties. Here, I think we can see a strong connection between a basic concept of evidentiary analysis, the best evidence principle, and one of the keystones of economic analysis of law, the concept of the cheapest cost avoider. Under the best evidence principle, evidence that is beneficial to the truth-determining process can be excluded in hopes of inducing the proponent to produce evidence that is better yet; the better evidence may include the originally proffered evidence but with a supplement, such as a foundation. Suppose, however, that the opponent is at least as able to produce the better evidence, or the supplement necessary to make it better. Then perhaps it is better to allow the proponent to introduce her evidence, leaving it to the opponent to introduce the better or supplemental evidence. Similarly, differential ability to produce evidence is a factor in allocating the burden of production.

Richard D. Friedman, *Economic Analysis of Evidentiary Law: An Underused Tool, an Underplowed Field*, 19 CARDOZO L. REV. 1531, 1533 (1998) (citations omitted). For further applications of economic analysis to evidentiary allocations, see Bruce L. Hay, *Allocating the Burden of Proof*, 72 IND. L.J. 651 (1997); Jason S. Johnston, *Fact-Finding and Efficiency: Toward an Economic Theory of Liability Under Uncertainty*, 61 S. CAL. L. REV. 137 (1987); Richard A. Posner, *An Economic Approach to Legal Procedure and Judicial Administration*, 2 J. LEGAL STUD. 399,

TELRIC price is *not* required by section 251(d)(2). That allocation of evidentiary burden would be analogous to the plaintiff's burden of proof in an essential facilities doctrine case.[242]

166. If CLECs are currently the most efficient producers of the information sought regarding the competitive justifications for mandatory unbundling, then it is even more likely CLECs will also be the most efficient producers of information in the future. In the *Second Further Notice of Proposed Rulemaking*, the Commission "seek[s] comment on an approach that would allow sunset or modification of the unbundling obligations as technology and market conditions evolve over time."[243] At the end of a finite time horizon, or upon the entry of a facilities-based competitor, the unbundling order should sunset automatically. Specifically, the passage of two years (the time horizon used in the *Merger Guidelines*) or the entry of a facilities-based competitor of the stature of AT&T, MCI WorldCom, or Sprint should provide the Commission the requisite "passage of time or occurrence of certain events" after which the mandatory unbundling obligations for the ILEC's elements should sunset "without any subsequent action by the Commission."[244] The CLEC should bear the burden of proving that *continued* mandatory unbundling of the element is indispensable for consumer welfare.

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410 (1973).

242. Apartment Source of Pa., L.P. *v.* Philadelphia Newspapers, Inc., 1999-1 TRADE CAS. (CCH) ¶ 72,502 (E.D. Pa. 1999).

243. *SFNPRM*, *supra* note 1, at ¶ 11; *see also id.* at ¶ 36 ("whether the Commission should adopt a mechanism by which network elements would no longer have to be unbundled at a future date"); *id.* ("whether affirmative steps by the parties or the Commission should be necessary to remove a particular element from unbundling requirements, or whether affirmative action should be necessary to continue requiring the unbundling of particular elements").

244. *Id.* at ¶ 39.

B. The Proper Role of State Commissions in Administering the Proposed Test

167. The state public utilities commissions (PUCs) should play an active role in administering the "necessary" and "impair" requirements. The FCC is capable of announcing a general standard for determining whether a network element is subject, under section 251(d)(2), to mandatory unbundling at TELRIC prices. But the FCC correctly noted in its *Second Further Notice of Proposed Rulemaking* that "application of the 'necessary' and 'impair' standards that we develop pursuant to section 251(d)(2) may be relatively fact-intensive."[245] More important, many of the critical facts are likely to be unique to a particular geographic market and are thus directly "relevant to a decision to impose minimum national unbundling requirements."[246]

168. To apply our five-part test for "impairment," regulators should examine data on the network facilities and equipment that competitors have actually deployed, or intend to deploy or are capable of deploying over the relevant time horizon, to supply service in a relevant product market and geographic market. Regulators should examine as well the implications for facilities-based entry in that geographic market of the substantial acquisitions, by AT&T and other telecommunications carriers, of the nation's largest competitive access providers, cable television multiple system operators, and wireless carriers. AT&T's expenditure of (or commitment to spend) more than $100 billion on acquisitions of cable television networks, which has all occurred in the three years since the enactment of the Telecommunica-

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245. *Id.* at ¶ 12.

tions Act, calls into question whether it is necessary for competition that AT&T receive unbundled access at TELRIC prices to ILEC network elements in areas where it now owns cable networks or has joint ventures with other cable network owners. Furthermore, it is extremely unlikely that competition would be impaired in those areas if AT&T did not have access to unbundled elements at regulated prices, because those cable networks pass over 95 percent of households and AT&T has announced that the networks will be used to provide telephone and internet services. Thus, application of our impairment test to the areas in which AT&T has cable networks would likely yield different conclusions from those for areas where AT&T does not own cable networks or have joint ventures with other cable partners.

169. The sheer volume of unbundling proceedings that can be expected, and the numerous questions that those proceedings will necessarily present regarding competitive conditions in particular geographic markets, will severely tax the FCC's resources, particularly because the Commission has properly committed itself to "resolving these fact-intensive questions . . . in an expedited time frame."[247] That administrative burden may prove to be especially great because the FCC acknowledged in late 1998 that "it does not yet possess the detailed information necessary to evaluate the current state of local telephone competition on a market-by-market basis."[248] Because markets create and process vast quantities of information, it is challenging enough for regulators to digest all of the pertinent economic facts concerning competition in a particular service in a particular geographic market. Surely it would

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246. *Id.* at ¶ 14.
247. *Id.*
248. *See* 1998 LOCAL COMPETITION REPORT, *supra* note 182, at 3.

overwhelm even the most indefatigable regulatory staff to try to digest, simultaneously and centrally from Washington, the salient facts in *all* of the relevant product markets and geographic markets for local telecommunications services in the United States.[249] Yet, the FCC has no alternative to undertaking such geographically specific analysis—unless, of course, the agency's economic analysis of optimal unbundling principles (as opposed to the application of those principles to specific cases in specific geographic markets) would enable the FCC to conclude that a particular network element could not satisfy the "necessary" or "impair" requirement in *any* geographic market in the United States and thus should be removed altogether from the list of potential network elements subject to mandatory unbundling at TELRIC prices.[250]

170. Fortunately, the state PUCs have the resources and fact-finding experience to assist the FCC in conducting the analysis that is essential to administer the "necessary" and "impair" standards with the requisite degree of geographic specificity. Indeed, Congress already recognized that state regulators have the comparative advantage in compiling and analyzing facts regarding local competition in particular geographic markets. Congress did so through its design of both the local competition provisions[251] and the interLATA entry provisions[252] of the Telecommunications Act of 1996. Between the fall of 1996 and the Supreme Court's issuance of its decision in *Iowa Utilities Board* in January 1999, the state

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249. *See generally* Friedrich A. Hayek, *The Use of Knowledge in Society*, 35 AM. ECON. REV. 519 (1945).

250. *Cf. SFNPRM*, *supra* note 1, at ¶ 36 (discussing "whether the Commission should adopt a mechanism by which network elements would no longer have to be unbundled at a future date").

251. *See* 47 U.S.C. § 252(b).

252. *See id.* at §§ 271(c)(1)(A) (state approval of the RBOC's generic interconnection plan), 271(c)(1)(B) (alternative procedures if no requests for interconnection are forthcoming), 272(b) (competitive checklist).

PUCs held *hundreds* of local arbitration proceedings to set the prices for unbundled network elements and the discounts for wholesale services.[253] Similarly, the checklist process under section 271 directly involves the state commissions in precisely the kind of geographically specific fact-finding that would properly inform the implementation of the "necessary" and "impair" requirements of section 251(d)(2).

171. In short, Congress concluded in 1996 that the states are competent to conduct the fact-intensive arbitration proceedings envisioned in section 252 and the equally fact-intensive analyses of local telecommunications markets envisioned in the competitive checklist of section 271. It is reasonable to expect that those same state commissioners are competent as well to apply a general rule enunciated by the FCC, pursuant to its *Second Further Notice of Proposed Rulemaking*, to the specific facts concerning the relevant product markets and geographic markets within those commissioners' respective states. Uniform national *outcomes* are neither necessary nor conducive to consumer welfare.

172. It is therefore appropriate to conclude that the "states may, consistent with the Supreme Court's decision, apply [the FCC's] interpretation of section 251(d)(2) to determine in the first instance that a network element need not be unbundled in light of the availability of that element outside the incumbent's network in that state."[254] Basic principles of the economics of information support the conclusion that Congress intended, through it enactment of the Telecommunication Act, for the states to play an active role in determining whether a particular network element in a specific geographic market is subject to mandatory unbundling

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253. *See, e.g.*, Sidak & Spulber, *The Tragedy of the Telecommons*, *supra* note 5, at 1082-83.

at arbitrated (which is to say, regulated) prices. If, as seems most reasonable to infer, Congress already gave the states that authority, then it would be unnecessary for the FCC to adopt rules purporting "to delegate to the states responsibility for removing network elements from any national unbundling requirements" that the FCC promulgated.[255] Economic reasoning counsels that Congress already commended that power to the states, such that the Commission in fact has no "opt out" authority to delegate to them. Like the unbundling rules themselves, the extent of the states' participation in the implementation of section 251(d)(2) should not be regarded by the FCC as being conditional on its exercise of "regulatory grace."[256]

173. As we discussed above, separate local telecommunications markets exist with different degrees of competition throughout the United States. For the FCC to attempt to establish rules for each of those local telecommunications markets would be extremely time consuming if the proper fact-intensive investigation were performed for each telecommunications market. If the FCC instead were to take a broad-brush approach without considering and analyzing the market-specific factors, the agency would likely err in many of its decisions. In turn, those errors would reduce both innovation in and the quality of telecommunications services available to consumers, a result that would frustrate the objectives of the Telecommunications Act.

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254. *SFNPRM*, *supra* note 1, at ¶ 14.
255. *Id.* at ¶ 38.
256. *Iowa Utilities Board*, 119 S. Ct. at 736.

CONCLUSION

174. Even after the Supreme Court's remand in *Iowa Utilities Board*, the FCC continues to interpret its authority to mandate the unbundling of the local telecommunication network at regulated, cost-of-service prices in a manner that is at war with the antitrust laws. The agency's interpretation of "necessary" and "impair" for purposes of section 251(d)(2) cannot find support in sound economic analysis because no responsible economist could defend subordinating the welfare of consumers to the welfare of individual competitors. The proper interpretation of section 251(d)(2) would give primacy to consumer welfare and would use the competitive analysis of demand and supply substitutability, as the long-established tools of economic analysis of competition and of antitrust jurisprudence, to ensure, as Congress directed, that the unbundling rules successfully "promote competition and reduce regulation in order to secure lower prices and higher quality services for American telecommunications consumers and encourage the rapid deployment of new telecommunication technologies."[257]

175. Our impairment test is necessarily stated in the abstract—namely, it asks whether the ILEC could exercise market power in the end-user services market by restricting access to a particular network element. Regulators attempting to employ our standard, however, may require simple, objective market characteristics that would serve as proxies for constraints on an ILEC's ability to exercise market power in the end-user services market. In particular, three market characteristics should be incorporated into the decision-making process:

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257. Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56, 56 (preamble).

(1) whether a CLEC is self-supplying the element in question in the relevant geographic market. As long as one CLEC is supplying the element in question, the ILEC cannot exercise market power in the end-user services market by restricting access to that element;

(2) whether fixed (as opposed to sunk) costs represent a large share of the total costs of the element in question. As long as the asset is redeployable, the CLEC will not face barriers to exit, which in turn, implies low entry barriers. Thus the ILEC cannot exercise market power in the end-user services market by restricting access to that element; and

(3) whether AT&T or any other firm offering cable telephony has established a presence in the relevant geographic market. As long as one firm is offering cable telephony service, the ILEC cannot exercise market power in the end-user services market by restricting access to that element.

The first two conditions represent supply-side substitution constraints, while the third condition is a demand-side substitution constraint on the exercise of market power in the end-user services market.

176. With respect to the Telecommunications Act's goal of "promoting competition," our analysis and proposed test of "impairment" are rooted in economic analysis of competition

and antitrust law, which are designed to promote consumer welfare. Our proposed test for "impairment" would follow Congress's directive to "reduce regulation."[258] In contrast, the competitor-welfare approach of the *Second Further Notice of Proposed Rulemaking* and the *Local Competition First Report and Order* would *maximize* regulation because any CLEC could trigger regulatory intervention by its assertion that its profitability would be diminished by the inability to lease the ILEC's unbundled elements at TELRIC prices. Our approach requires that the CLEC's request for a particular unbundled network element satisfy the four existing requirements of the essential facilities doctrine and then also pass a fifth requirement, based on critical share, that examines whether an attempt by the ILEC to deny the CLEC access to the element in question would decrease competition in the output market for telecommunications services. In so doing, our impairment test advances consumer welfare and provides the "limiting principle" that the Supreme Court demanded in *Iowa Utilities Board*.

258. *Id.*

I declare, under of penalty of perjury, that the foregoing is true and correct, to the best of my knowledge and belief. Executed on May 25, 1999.

Jerry A. Hausman

I declare, under penalty of perjury, that the foregoing is true and correct, to the best of my knowledge and belief. Executed on May 25, 1999.

J. Gregory Sidak

Washington
District of Columbia

On this the 25th day of May, 1999, before me, , a Notary Public for the District of Columbia.

Notary Public

PAULITA F. ROSS
NOTARY PUBLIC STATE OF MARYLAND
My Commission Expires October 12, 1999

My commission expires

BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554

In the Matter of	)	
	)	
Implementation of the Local Competition Provisions in the Telecommunications Act of 1996	)	CC Docket No. 96-98
	)	
Interconnection between Local Exchange Carriers and Commercial Mobile Radio Service Providers	)	CC Docket No. 95-185

AFFIDAVIT OF

THOMAS M. JORDE, J. GREGORY SIDAK, AND DAVID J. TEECE

IN RESPONSE TO

SECOND FURTHER NOTICE OF PROPOSED RULEMAKING

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INTRODUCTION

1. In response to the Supreme Court's January 1999 decision in *AT&T Corp. v. Iowa Utilities Board*,[1] which struck down the FCC's interpretation in the *Local Competition First Report and Order*[2] of the "necessary" and "impair" requirements of section 251(d)(2) of the Telecommunications Act,[3] the Commission now seeks comments in this *Second Further Notice of Proposed Rulemaking* on "how the unbundling obligations of the [Telecommunications Act of 1996] can best facilitate the rapid and efficient deployment of all telecommunica-

1. 119 S. Ct. 721 (1999).

2. Implementation of the Local Competition Provisions in the Telecommunications Act of 1996 and Interconnection Between Local Exchange Carriers and Commercial Mobile Radio Service Providers, First Report and Order, CC Dkt. Nos. 96-98, 95-185, 11 F.C.C. Rcd. 15,499 (1996) [hereinafter *Local Competition First Report and Order*].

tions services, including advanced services."[4] To assist the Commission in answering that question, the United States Telephone Association (USTA) has asked us to analyze how the Commission's interpretation of the "necessary" and "impair" standards are likely to affect innovation, investment, and product development in the U.S. telecommunications industry.

2. The application of time-tested economic theory to the telecommunications industry allows us to conclude that mandatory unbundling at prices computed on the basis of the total element long-run incremental cost (TELRIC) of the various network elements belonging to an incumbent local exchange carrier (ILEC) will adversely affect the ILEC's incentives not only to upgrade or maintain existing facilities, but also to invest in new facilities. Mandatory unbundling at TELRIC prices also will encourage competitive local exchange carriers (CLECs) to deviate from the socially optimal level of investment and entry. Finally, the confluence of mandatory unbundling and other Commission policies aggravate the distortion of investment decisions.

QUALIFICATIONS

3. My name is Thomas M. Jorde. I am professor of law, University of California at Berkeley. I specialize in antitrust, intellectual property, and civil procedure. I am cochair of

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3. 47 U.S.C. § 251(d)(2).

4. *See* Implementation of the Local Competition Provisions in the Telecommunications Act of 1996 and Interconnection Between Local Exchange Carriers and Commercial Mobile Radio Service Providers, Second Further Notice of Proposed Rulemaking, CC Dkt. Nos. 96-98, 95-185, ¶ 3 (released Apr.16, 1999) [hereinafter *SFNPRM*].

Boalt Hall's Program in Technology and Law. I am also president of LECG, Inc., an economic consulting firm. I received A.B. and J.D. degrees from Yale University.

4. I have served as a law clerk to Justice William Brennan, U.S. Supreme Court; special assistant to the Bureau of Competition of the Federal Trade Commission; special master in the U.S. District Court for complex antitrust legislation; and as a private mediator.

5. I have written extensively and testified before Congress on the subject of competition policy and innovation, and I have presented "The Changing Nature of Competition in a Global and Innovation-Driven Age" and "Antitrust, Innovation and Competitor Cooperation" at the Federal Trade Commission. Relevant books include *Antitrust, Innovation, and Competitiveness* (Oxford University Press 1992), with David J. Teece; and *Intellectual Property in the New Technological Age* (Little, Brown & Co. 1997), with Mark Lemley, Peter Menell, and Robert Merges. Published articles of mine that are relevant to this proceeding include, "Rule of Reason Analysis of Horizontal Arrangements: Agreements Designed to Advance Innovation and Commercialize Technology," 61 *Antitrust Law Journal* 2 (1993), with David J. Teece; "Assessing Market Power in Regimes of Rapid Technological Change," 2 *Industrial and Corporate Change* 3 (1993), with Raymond Hartman, David J. Teece, and Will Mitchell; "Antitrust Policy and Innovation: Taking Account of Performance Competition and Competitor Cooperation." 147 *Journal of Institutional and Theoretical Economics* 120 (1991), with David J. Teece: "Summary Judgment in Antitrust Cases: Understanding *Monsanto* and *Matsushita*," 36 *Antitrust Bulletin* 271 (1991), with Mark Lemley; "Innovation and Cooperation: Implications for Competition and Antitrust," 4 *Journal of Economic Perspectives* 3

(1990), with David J. Teece; and "Innovation, Dynamic Competition, and Antitrust Policy," 13 *Regulation* 35 (1990), with David J. Teece.

6. My name is J. Gregory Sidak. I am the F. K. Weyerhaeuser Fellow in Law and Economics at the American Enterprise Institute for Public Policy Research (AEI) in Washington, D.C., where I direct AEI's Studies in Telecommunications Deregulation. I am also a senior lecturer at the Yale School of Management, where I teach a course on telecommunications regulation and strategy with Professor Paul W. MacAvoy. In addition to holding those two academic positions, I am a managing director of LECG, Inc.

7. I have worked in the federal government on three occasions. From 1987 to 1989, I was deputy general counsel of the FCC. From 1986 to 1987, I was senior counsel and economist to the Council of Economic Advisers in the Executive Office of the President. From 1981 to 1982, I served as a law clerk to Chief Judge Richard A. Posner during his first term on the U.S. Court of Appeals for the Seventh Circuit. In addition to having worked in government, I have previously worked, as an attorney in private practice, on numerous antitrust cases and federal administrative, legislative, and appellate matters concerning telecommunications and other network industries.

8. My academic research concerns regulation and strategy in telecommunications and other network industries, antitrust policy, and constitutional law issues concerning economic regulation. I am the coauthor of four books concerning pricing, costing, competition, and investment in regulated network industries: *Deregulatory Takings and the Regulatory Contract: The Competitive Transformation of Network Industries in the United States* (Cam-

bridge University Press 1997), with Daniel F. Spulber; *Toward Competition in Local Telephony* (MIT Press & AEI Press 1994), with William J. Baumol; *Transmission Pricing and Stranded Costs in the Electric Power Industry* (AEI Press 1995), also with Professor Baumol; and *Protecting Competition from the Postal Monopoly* (AEI Press 1996), also with Professor Spulber. I am also the author of a fifth book, *Foreign Investment in American Telecommunications* (University of Chicago Press 1997), and of more than thirty scholarly articles in law reviews and economics journals. Some of those articles are directly relevant to the issues of investment, innovation, and competition posed by this proceeding.[5] I am the editor of *Is the Telecommunications Act of 1996 Broken? If So, How Can We Fix It?* (AEI Press 1999), *Competition in International Telecommunications* (AEI Press forthcoming 1999), and *Telecommunications Deregulation in Germany and the United States* (AEI Press forthcoming 1999).

9. I have testified before the U.S. Senate and House of Representatives. My writings have been cited by the Supreme Court, including Justice Breyer's opinion in the 1999 decision in *AT&T Corp. v. Iowa Utilities Board*. My writings also have been cited by the lower federal and state supreme courts and by state and federal regulatory commissions.

10. I have been a consultant on regulatory and antitrust matters to the Antitrust Division of the U.S. Department of Justice, to the Canadian Competition Bureau, and to more than thirty companies in the telecommunications, electric power, natural gas, mail delivery,

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5. *See* Abbott B. Lipsky, Jr. & J. Gregory Sidak, *Essential Facilities*, 51 STAN. L. REV. 1185 (1999); J. Gregory Sidak & Daniel F. Spulber, *The Tragedy of the Telecommons: Government Pricing of Unbundled Network Elements Under the Telecommunications Act of 1996*, 97 COLUM. L. REV. 1081 (1997); J. Gregory Sidak &

broadcasting, newspaper publishing, and computer software industries in North America, Europe, Asia, and Australia.

11. From Stanford University, I earned A.B. (1977) and A.M. (1981) degrees in economics and a J.D. (1981) in law. I was a member of the *Stanford Law Review*.

12. My name is David J. Teece. I am Mitsubishi Bank Professor, Haas School of Business, and director, Institute for Management, Innovation and Organization, University of California at Berkeley. I am also chairman of LECG, Inc. I have been a full professor at Berkeley since 1982. Before that, I was assistant and then associate professor of business economics at the Graduate School of Business, Stanford University. I received my Ph.D. in Economics from the University of Pennsylvania in 1975. As an industrial organization economist, I have studied the economics of technological change, competition policy, and business strategy issues for over two decades.

13. At U.C. Berkeley, I was the cofounder of the Management of Technology Program, a joint program between the School of Business and College of Engineering, and of the Consortium on Competitiveness and Cooperation, a multicampus research program linking scholars at Berkeley, Stanford, Columbia, Harvard, and Wharton who have deep and enduring interests in the long-run performance of the United States in the global economy. I am also chairman of the Consortium for Research on Telecommunications Policy Program, a multi-

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Daniel F. Spulber, *Givings, Takings, and the Fallacy of Forward-Looking Costs*, 72 N.Y.U. L. REV. 1068 (1997); J. Gregory Sidak, *Debunking Predatory Innovation*, 83 COLUM. L. REV. 1121 (1983).

campus research group with active nodes at U.C. Berkeley, the University of Michigan, and Northwestern University.

14. My research has been centrally concerned with the relationship between the structure of firms (especially the scope of their activities) and their economic performance, particularly their capacity to develop and introduce new technologies. I have had a special interest in innovation, organizational structure, and antitrust. I have testified before Congress on regulatory policy and competition policy and am the author or coauthor of over 100 books and scholarly articles. Books of mine that are relevant to this proceeding include *Strategy, Technology, and Public Policy* (Edward Elgar Publishing 1998); *Fundamental Issues in Strategy* (Harvard Business School Press 1994), with Richard P. Rumelt; *Antitrust, Innovation, and Competitiveness* (Oxford University Press 1992), with Thomas M. Jorde; and *The Competitive Challenge: Strategies for Industrial Innovation and Renewal* (1987). Relevant articles include "The Meaning of Monopoly: Antitrust Analysis in High-Technology Industries," 43 *Antitrust Bulletin* 801 (1998), with Mary Coleman; "Telecommunications in Transition: Unbundling, Reintegration, and Competition," 4 *Michigan Telecommunications and Technology Law Review* 4 (1995); "Competition and Unbundling in Local Telecommunications: Implications for Antitrust Policy," published in *Towards a Competitive Telecommunications Industry: Selected Papers from the 1994 Telecommunications Research Conference* (Gerald Brock, ed., Lawrence Erlbaum Associates 1995), with Robert G. Harris and Gregory L. Rosston; and "Competition and Cooperation: Striking the Right Balance," *California Management Review* (Spring 1984),

with Thomas M. Jorde. I am also the founding editor of the economics journal *Industrial and Corporate Change*, published by the Oxford University Press.

15. Throughout the 1980s and 1990s, I have provided expert testimony on numerous occasions to the FCC, other state and federal regulatory agencies, the federal courts, and foreign regulatory bodies and courts on the competitive and strategic implications of regulatory and antitrust proceedings concerning both wireline and wireless telecommunications. That testimony has frequently encompassed the interplay between regulation and incentives for innovation, investment, and new product development. For example, I submitted testimony on behalf of AT&T in the divestiture case, *United States v. AT&T Corporation*; on behalf of Ameritech in support of its Customers First Plan; and, more recently, on behalf of Bell Atlantic and GTE in support of their proposed merger.

16. We file this affidavit in our individual capacities and not on behalf of the University of California, the American Enterprise Institute, or the Yale School of Management.

SUMMARY OF CONCLUSIONS

17. Section 251(d)(2) of the Telecommunications Act directs the Commission to consider "at a minimum" the "necessary" and "impair" standards when deciding whether to mandate unbundling of a network element. It is a sign of FCC's blindness to the costs of mandatory unbundling that the *Second Further Notice of Proposed Rulemaking* can only envision the phrase "at a minimum" adding considerations that would *increase* the likelihood of mandatory unbun-

dling.[6] Any considerations that might decrease the likelihood of mandatory unbundling, such as the effect of unbundling on innovation, appear outside the scope of the current debate. Yet, the *Antitrust Guidelines for the Licensing of Intellectual Property* suggest the goals of encouraging innovation and promoting the public interest are inextricably connected.[7] We submit, therefore, that innovation is exactly the "something more" that the FCC should consider when identifying which network elements shall be subject to mandatory unbundling at regulated prices.

18. Mandatory unbundling of network elements at total element long-run incremental cost (TELRIC) prices will diminish the incentives of both ILECs and CLECs to invest in existing facilities and new technologies. The Commission must therefore carefully weigh that cost against the putative benefits of any limiting principle that it promulgates to implement the "necessary" and "impair" standards of section 251(d)(2) of the Telecommunications Act. A firm's investment decisions are based on its careful weighing of the expected returns from the investment against the firm's weighted-average cost of capital. The mandatory unbundling rules that the Commission tentatively adopts, or hints in the *Second Further Notice of Proposed Rulemaking* that it will adopt, would decrease the incentives of both ILECs and CLECs to invest in existing facilities and new technologies by lowering the expected returns and increasing the weighted-average cost of capital for each group of firms.

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6. *SFNPRM*, *supra* note 4, at ¶ 30 ("Commenters should specifically identify any factors deemed sufficiently important in meeting the goals of the 1996 Act to require the unbundling of a network element, even if such unbundling did not otherwise meet the 'necessary' or 'impair' standards of sections 251(d)(2)(A) or (B) standing alone.").

7. U.S. Department of Justice & Federal Trade Commission, Antitrust Guidelines for the Licensing of Intellectual Property §1.0 & n.1 (patents, copyrights, trade secrets, and know-how agreements) [hereinafter *Intel-*

19. In Part I of this affidavit, we explain that government-mandated unbundling decreases an ILEC's incentives to invest in the upgrade and maintenance of *existing* facilities by reducing the *ex ante* payoffs of such investments.[8] Mandatory unbundling also distorts an ILEC's incentives with respect to investment in *new* technologies. In addition to lowering the expected returns of investment in existing facilities and new technologies, mandatory unbundling at regulated prices also raises an ILEC's weighted-average cost of capital.

20. In Part II, we examine how mandatory unbundling distorts the investment incentives of CLECs. First, mandatory unbundling at TELRIC prices encourages CLECs to delay entry into the local services market. Second, a generous unbundling policy encourages CLECs to demand a "bug free" version of the ILEC's network element and to request, at no cost to the CLEC, the offering of unbundled network elements (UNEs) from the ILEC with no intention of actually using them. Third, mandatory unbundling at TELRIC prices diminishes a CLEC's incentive to provide "plain old telephone service" (POTS) by innovative means. For

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lectual Property Guidelines]. The *Guidelines* state: "The intellectual property laws and the antitrust laws share the common purpose of promoting innovation and enhancing consumer welfare." *Id.* at §1.0.

8. The passage of the Telecommunications Act of 1996 has caused this disincentive to ILEC investment to be analyzed extensively in the scholarly literature on regulatory economics. *See* J. GREGORY SIDAK & DANIEL F. SPULBER, DEREGULATORY TAKINGS AND THE REGULATORY CONTRACT: THE COMPETITIVE TRANSFORMATION OF NETWORK INDUSTRIES IN THE UNITED STATES (Cambridge University Press 1997); ALFRED E. KAHN, LETTING GO: DEREGULATING THE PROCESS OF DEREGULATION, OR: TEMPTATION OF THE KLEPTOCRATS AND THE POLITICAL ECONOMY OF REGULATORY DISINGENUOUSNESS (Institute of Public Utilities and Network Industries, Michigan State University 1998); Debra Aron, Ken Dunmore & Frank Pampush, *The Impact of Unbundled Network Elements and the Internet on Telecommunications Access Infrastructure*, HARV. INFORMATION INFRASTRUCTURE PROJECT (Dec. 4, 1997); Robert W. Crandall, Managed Competition in U.S. Telecommunications 17 (AEI-Brookings Joint Center for Regulatory Studies, Working Paper 99-1, Mar. 1999); Jerry Hausman, *Valuing the Effect of Regulation on New Services in Telecommunications*, BROOKINGS PAPERS ON ECON. ACTIVITY: MICROECONOMICS, 1997; Jerry Hausman, *Regulation by TSLRIC: Economic Effects on Investment and Innovations*, MULTIMEDIA UND RECHT, Mar. 1999, at 22; Robert G. Harris & C. Jeffrey Kraft, *Meddling Through: Regulating Local Telephone Competition in the United States*, 11 J. ECON. PERSP. 93 (1997).

example, an ill-conceived unbundling policy can undermine a CLEC's efforts to deploy POTS over a digital subscriber line (DSL) without the use of any circuit-switching apparatus.

21. In Part III, we discuss how mandatory unbundling and other Commission policies adversely interact to distort further the investment decisions of ILECs and CLECs. Relying on intellectual advances in antitrust analysis,[9] innovation markets,[10] and real-option theory,[11] we discuss in qualitative terms the direction and potential magnitude of those various effects. First, we demonstrate that the relationship between retail rates and costs in a particular geographic market strongly influences the entry decision of CLECs. Second, unbundling requirements at the input level eliminate bundling opportunities in the end-user market that would increase competition and thus benefit consumer welfare. Third, the Commission should address and resolve the commitment problem associated with its discretion to unbundle additional elements in the future.

22. In Part IV we examine recent innovations in several network elements, including switches, loops, transmission facilities, and digital subscriber line access multiplexers. Mandatory unbundling of those elements at TELRIC prices would jeopardize each of those innovative developments and thus threaten consumer welfare over the longer term.

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9. *See Intellectual Property Guidelines*, *supra* note 7.

10. *See* THOMAS M. JORDE & DAVID J. TEECE, ANTITRUST, INNOVATION, AND COMPETITIVENESS (Oxford University Press 1992); *see also* THOMAS M. JORDE, MARK LEMLEY, PETER MENELL & ROBERT MERGES, INTELLECTUAL PROPERTY IN THE NEW TECHNOLOGICAL AGE (Little, Brown & Co. 1997).

11. *See, e.g.*, Aron, Dunmore & Pampush, *supra* note 8, at ¶ 6. For the fundamentals of decisionmaking under uncertainty, see AVINASH K. DIXIT & ROBERT S. PINDYCK, INVESTMENT UNDER UNCERTAINTY (Princeton University Press 1994); Avinash K. Dixit & Robert S. Pindyck, *The Options Approach to Capital Investment*, HARV. BUS. REV., May-June 1995, at 105.

23. We conclude that the Commission should not interpret the "necessary" and "impair" requirements of section 251(d)(2) to mandate unbundling of facilities that an ILEC has created through new or relatively recent investments. In such cases, the disincentive effects on both ILECs *and* CLECs are so great that the damage that would be done to the competitive process would be severe. Moreover, excessive unbundling of that sort would violate the stated policies in the Telecommunications Act of 1996 "to preserve the vibrant and competitive free market that presently exists for the Internet and other interactive computer services, unfettered by Federal or State regulation"[12] and "to encourage the rapid deployment of new telecommunications technologies."[13] The Commission should therefore decline to promulgate rules mandating the unbundling of network elements in which the ILEC has invested to provide advanced services,[14] as the agency proposed to do in another proceeding in 1998.[15]

I. THE EFFECT OF MANDATORY UNBUNDLING ON THE ILEC'S INVESTMENT DECISION

24. Investment results from voluntary exchange.[16] A firm's decision to invest in facilities and innovative activity depends upon its weighing the probability of earning excess re-

12. *See* 47 U.S.C. § 230(b)(2).

13. *See* Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56, 56 (preamble).

14. *See* 47 U.S.C. §§ 10(a), 11, 403.

15. *See* Deployment of Wireline Services Offering Advanced Telecommunications Capability, Memorandum Opinion and Order, and Notice of Proposed Rulemaking, CC Dkt. Nos. 98-147, 98-11, 98-26, 98-32, 13 F.C.C. Rcd. 24,011, 24,055-57 at ¶ 95-96 (1998) [hereinafter *Advanced Capability Memorandum Opinion and Order*]. In that proceeding, the FCC established seven conditions to govern the circumstances under which an ILEC's "advanced services affiliate" is deemed not to be an ILEC and, therefore, not subject to the unbundling requirements of section 251(c)(3). *Id.* at 24,055-57 ¶ 96.

16. *See* SIDAK & SPULBER, *supra* note 8, at 109.

turn from such investment against the risk of investment loss.[17] For example, any basic text-book on corporate finance will instruct managers to make an investment only if that investment has a positive net present value (NPV), or alternatively if the expected rate of return on that investment exceeds some appropriate measure of the firm's weighted-average cost of capital.[18] Other texts are even more explicit: "[S]enior management's most important job must be to maximize its firm's current market value."[19]

25. To formalize that investment rule, one must define several parameters. Let $p(b)$ be the probability of the "bad state of the world" and $p(g)$ be the probability of the "good state of the world." Similarly, let $r(b)$ be the return in the "bad state of the world" and $r(g)$ be the return in the "good state of the world." Finally, let c be the ILEC's weighted-average cost of capital. The *expected* return to the investment is simply the average return over all possible outcomes (in this case, we have assumed for simplicity only two possible outcomes), weighted by their respective probabilities, or $p(b) \times r(b) + p(g) \times r(g)$. An ILEC will invest in a project if and only if $p(b) \times r(b) + p(g) \times r(g) > c$.[20]

26. Many economic theories cannot be practically applied to the real world. The investment rule described above, however, represents a guiding principle in the discipline of corporate finance. Telecommunications executives making multibillion-dollar investments rec-

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17. *Id.* at 423–25.

18. *See* RICHARD A. BREALEY & STEWART C. MYERS, PRINCIPLES OF CORPORATE FINANCE 181 (McGraw-Hill 4th ed. 1991). The weighted-cost of capital for a firm is a weighting of the common equity and debt cost of capital according to the capital structure of the individual firm. *See, e.g.*, STEPHEN A. ROSS, RANDOLPH W. WESTERFIELD & JEFFREY JAFFE, CORPORATE FINANCE 161–88 (Irwin McGraw-Hill 5th ed. 1999).

ognize and act upon the importance of that fundamental principle. In late 1998, for example, AT&T's chief executive officer succinctly described the effect that mandatory unbundling of the cable television infrastructure would have on his company's incentives to invest: "No company will invest billions of dollars . . . if competitors which have not invested a penny of capital nor taken an ounce of risk can come along and get a free ride in the investments and risks of others."[21]

A. How Mandatory Unbundling at TELRIC Prices Affects Expected Returns

1. Investments to Lower the Marginal Costs of Existing Services

27. Mandatory unbundling decreases an ILEC's incentive to invest in upgrading its existing facilities by reducing the *ex ante* payoffs of such investment. Requiring a firm to grant to its competitors unbundled access to its facilities at TELRIC-based rates greatly reduces, if it does not eliminate entirely, the probability of excess return; such mandatory unbundling thus eliminates the ILEC's incentive to invest in existing facilities.[22] It makes no economic sense for the ILEC to invest in technologies that lower its own marginal costs so long as competitors can achieve the identical cost savings by regulatory fiat. Thus, by ensuring that the ratio of

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19. *See* G. BENNET STEWART III, THE QUEST FOR VALUE: A GUIDE FOR SENIOR MANAGERS 1 (HarperCollins 1990).

20. *See, e.g.*, BREALEY & MYERS, *supra* note 18, at 181.

21. *See* C. Michael Armstrong, *Telecom and Cable TV: Shared Prospects for the Communications Future*, as delivered to the Washington Metropolitan Cable Club (Nov. 2, 1998) (available on AT&T's website at http://www.att.com/speeches/98/981102.maa.html).

22. *See, e.g.*, Sidak & Spulber, *The Tragedy of the Telecommons*, *supra* note 5, at 1158–61.

marginal costs between an ILEC and its competitors is always constant, mandatory unbundling at TERLIC prices destroys the ILEC's incentive to continue investing in cost-reducing improvements to its own existing network facilities.[23] The regulator may respond by *compelling* investment—that is, conscripting private capital. But that "fix" would merely heap one regulatory distortion upon another and hasten disinvestment.

28. The disincentive that mandatory unbundling creates for investment has direct competitive consequences. For example, over the past several years, ILECs have been extending fiber in the network and replacing copper in the loop. Those upgrades have produced a number of positive benefits for end-users. Fiber is more reliable than copper wire, and it has higher quality in terms of cross-talk, signal-to-noise ratios, and other factors.[24] The investment also has had the advantage of decreasing the ILEC's marginal costs, and that cost reduction has made the ILEC's network more competitive with the networks that CLECs have been constructing. For example, one competitive access provider (CAP), Teleport Communications Group (TCG), stated in a 1996 securities prospectus:

> The Company uses the latest technologies and network architectures to develop a highly reliable infrastructure for delivering high-speed, quality digital transmissions of voice, data and video telecommunications. The basic transmission platform consists primarily of optical fiber equipped with high capacity SONET equipment deployed in self-healing rings. These SONET rings give TCG the capability of routing customer traffic simultaneously in both directions around the ring[,] thereby eliminating loss of service in the event of a cable cut.

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23. *See* SIDAK & SPULBER, *supra* note 8, at 545–57; Sidak & Spulber, *The Tragedy of the Telecommons*, *supra* note 5, at 1158–61; KAHN, *supra* note 8, at 101–03; Harris & Kraft, *supra* note 8, at 93.

24. For a comparison of the quality characteristics of fiber-optic networks and copper-based networks, see REGIS J. BATES & DONALD GREGORY, VOICE AND DATA COMMUNICATIONS HANDBOOK 631 (McGraw-Hill 1998).

> . . . Redundant electronics, with automatic switching to the backup equipment in the event of failure, protects against signal deterioration or outages. Continuous monitoring of system components focuses on proactively avoiding problems rather than just reacting upon failure.[25]

TCG further stated that one factor that promoted competition in local telecommunications markets after the AT&T divestiture was "technological advances in the transmission of data and video requiring greater capacity and reliability levels than copper-based ILEC networks were able to accommodate."[26] TCG, which has since merged into AT&T, noted in 1996 that "CAPS generally offered . . . improved reliability in comparison to [sic] the ILECs," but that "[i]n recent years, the ILECs steadily have been increasing the amount of fiber used in their networks, thereby decreasing the competitive advantage held by the CAPs in the special access and private line markets."[27]

29. The existing and planned entry by CLECs into local telecommunications markets shows that the new technologies available to CLECs offer cost and performance advantages over existing technologies currently used by ILECs. Moreover, because the largest of the CLECs have been acquired since 1996 by interexchange carriers (IXCs)—MFS by what is now MCI WorldCom, and TCG by AT&T[28]—the disincentive that mandatory unbundling creates for ILEC investment in network upgrades directly affects the robustness of competition between ILECs and the nation's two largest IXCs. In its *Second Further Notice of Proposed*

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25. TELEPORT COMMUNICATIONS GROUP, INC., PROSPECTUS FOR 23,500,000 SHARES OF CLASS A COMMON STOCK 50 (June 3, 1996). Since the enactment of the Telecommunications Act, the acronym CAP has given way to CLEC, which is a term of art in the 1996 legislation.

26. *Id.* at 42.

27. *Id.*

Rulemaking, the Commission "seek[s] comment on the relevance, if any, to the interpretation of the 'necessary' and 'impair' standard, that we are reexamining these issues today, more than three years after passage of the Act."[29] The recent entry of the major IXCs into the local access market should force the Commission to reexamine the meaning of "impairment" in that new competitive context.

30. If the Commission were to adopt a nationwide rule mandating unbundling of the loop at a TELRIC price, then the ILEC's benefits to investing in fiber upgrades would decrease. In particular, any advantages that the ILEC might achieve in marginal costs would be eliminated. Therefore, according to the investment decision articulated above, the ILEC's economic justification for incurring that cost would erode. Consumer welfare would fall in the amount of the portion of the cost savings that the ILEC otherwise could pass onto consumers. Moreover, end-users would have to defer the benefit of increased quality and reliability.

2. Investments in Unproven Technologies to Provide New Services

31. By reducing returns to investment in general, mandatory unbundling at TELRIC prices is likely to reduce direct innovation by the ILEC in the form of research and development, creation of intellectual property, and general product development. As two of us have previously written: "To maintain adequate incentives to invest in innovative activity, without providing government subsidies, free riding must be curtailed. This rationale is how economists justify patents, copyrights, trade secrets, and other aspects of intellectual property

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28. For a review of the consolidation in the CLEC industry, see Sterling Perrin, *The CLEC Market: Prospects, Problems, and Opportunities*, TELECOMMUNICATIONS INT'L, Nov. 1, 1998, at 41.

law."[30] The *Intellectual Property Guidelines,* issued by the Department of Justice and the Federal Trade Commission in 1995, echo this concern and emphasize that it is consonant with the consumer-welfare goals of the antitrust laws:

> The intellectual property laws and the antitrust laws share the common purpose of promoting innovation and enhancing consumer welfare. The intellectual property laws provide incentives for innovation and its dissemination and commercialization by establishing enforceable property rights for the creators of new and useful products, more efficient processes, and original works of expression. In the absence of intellectual property rights, imitators could more rapidly exploit the efforts of innovators and investors without compensation. Rapid imitation would reduce the commercial value of innovation and erode incentives to invest, ultimately to the detriment of consumers. The antitrust laws promote innovation and consumer welfare by prohibiting certain actions that may harm competition with respect to either existing or new ways of serving customers.[31]

Firms undertake innovative activities in the pursuit of higher returns, through the development of products having either unique qualities or superior quality-to-price ratios. Any requirement to share those innovative developments will therefore reduce the incentives to create them in the first place. In his separate opinion concurring in the Court's holding on "necessary" and "impair" in *Iowa Utilities Board*, Justice Breyer warned that "a sharing requirement may diminish the original owner's incentive to keep up or to improve the property by depriving the owner of the fruits of value-creating investment, research, or labor."[32] He further observed that this disincentive to investment increases with the technological sophistication of the network elements potentially subject to the mandatory unbundling rule:

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29. *SFNPRM, supra* note 4, at ¶ 14.
30. *See* JORDE & TEECE, *supra* note 10, at 52.
31. *Intellectual Property Guidelines, supra* note 7, at § 1.0.

> [A]s one moves beyond the sharing of readily separable and administrable physical facilities, say, to the sharing of research facilities, firm management, or technical capacities, these problems can become more severe . . . . Nor can one guarantee that firms will undertake the investment necessary to produce complex technological innovations knowing that any competitive advantage deriving from those innovations will be dissipated by the sharing requirement. The more complex the facilities, the more central their relation to the firm's managerial responsibilities, the more extensive the sharing demanded, the more likely these costs will become serious. And the more serious they become, the more likely they will offset any economic or competitive gain that a sharing requirement might otherwise provide.[33]

As Justice Breyer makes clear, the long-term harm to consumer welfare from reduced innovation may vastly exceed the short-term benefits from more rapid imitation of the fruits of prior innovative activity.

32. Technological progress in telecommunication network services has yielded new techniques, such as asymmetric digital subscriber line (ADSL), which has enabled ILECs to deliver advanced data services. ADSL uses the existing copper pair serving homes and businesses "to provide customers network access to the Internet and other popular multimedia and data services at speeds 50 times faster than an ordinary phone line."[34] Several ILECs have deployed ADSL, and, as of May 1999, consumers had begun to adopt the services supported by that technology.[35]

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32. *Iowa Utilities Board*, 119 S. Ct. at 753 (Breyer, J., concurring in part and dissenting in part) (concurring).

33. *Id.* at 753-54 (citing 1 HAROLD DEMSETZ, OWNERSHIP, CONTROL, AND THE FIRM: THE ORGANIZATION OF ECONOMIC ACTIVITY 207 (1988)).

34. *See* AMERITECH CORP., 1998 SEC FORM 10-K, at 21 (1999) (glossary).

35. For example, it is reported that 20 percent of Bell Atlantic customers in New York and Boston will be served by central offices equipped for ADSL by the end of 1999, and that 80 percent of those customers are expected to be served by the end of 2000. *See* Brian Quinton, *ADSL picks up more speed*, TELEPHONY, Apr. 5, 1999, at 6.

33. Because of such progress, the Commission is now considering whether it should lengthen the list of network elements subject to mandatory unbundling pursuant to the "necessary" and "impair" standards of section 251(d)(2). The *Second Further Notice of Proposed Rulemaking* states:

> We also see nothing in the statute or the Supreme Court's opinion that would preclude us from requiring that loops that must be unbundled must also be conditioned in a manner that allows requesting carriers supplying the necessary electronics to provide advanced telecommunications services, such as digital subscriber line technology (xDSL).[36]

Under such a scenario, an ILEC would be compelled to share the following network elements with its competitors:

- *Dark fiber*. This is fiber that does not have connected to it the electronics required to transmit data on such fiber.[37]
- *Packet switching*. This is a method of transmitting messages as digitized bits, assembled in groups called "packets" or "cells." These packets and cells contain industry-standard defined numbers of data bits, along with addressing information and data integrity bits. The switching (or routing) of the packets or cells of data replace the circuit-switching of traditional voice telephone calls. Packet and cell

36. *SFNPRM*, *supra* note 4, at ¶ 32. *See also id.* at ¶ 34 (seeking comment on whether to "modify the definition of 'loops' or 'transport' to include dark fiber"); *id.* at ¶ 35 (seeking comment on mandatory unbundling of DSLAMs and packet switches).

37. *See* INTERMEDIA COMMUNICATIONS INC., 1999 SEC FORM 10-K, at 53 (1999) (glossary).

switching is considered to be a more cost-efficient method of delivering voice and data traffic than circuit switching.[38]

- *Digital subscriber line access multiplexers (DSLAMs).* The DSLAM concentrates the data traffic from multiple DSL loops onto the backbone network for connection to the rest of the network. The DSLAM provides back-haul services for packet, cell, and/or circuit-based applications through concentration of the DSL lines onto 10Base-T, 100Base-T, T1/E1, T3/E3, or ATM outputs.[39]

In addition, some CLECs and even state lawmakers have urged that an ILEC be subjected to mandatory unbundling of the portion of spectrum above 4 kHz on its subscriber line, a practice that has been dubbed "spectrum sharing" or "bandwidth sharing" or "line splitting."[40] In

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38. *Id.* at 54. *See generally* J. Gregory Sidak & Daniel F. Spulber, *Cyberjam: The Law and Economics of Internet Congestion of the Telephone Networks*, 21 HARV. J.L. & PUB. POL'Y 327 (1998) (discussing packet-switched and circuit-switched networks).

39. PARADYNE CORPORATION, THE DSL SOURCE BOOK 27 (2d ed. 1998) (available at http://www.paradyne.com/sourcebook_offer/index.html).

40. For example, the California state legislature is considering such a policy:

> If the Federal Communications Commission does not adopt an order on or before January 1, 2000, with regard to its proceeding entitled "In the Matters of Deployment of Wireline Services Offering Advanced Telecommunications Capability," CC Docket No. 98-147, adopted March 18, 1999, that the Public Utilities Commission expeditiously examine the technical, operational, economic, and policy implications of line sharing and, if the Public Utilities Commission determines it to be appropriate, adopt rules to require incumbent local exchange carriers in this state to permit competitive data local exchange carriers to provide high bandwidth data services over telephone lines with voice services provided by incumbent local exchange carriers.

A.B. 991, Calif. Legis., 1999-2000 Reg. Sess., §2(b), lines 4-17 (amended Apr. 22, 1999). *See also* Comments of Covad Communications Co., Deployment of Wireline Services Offering Advanced Telecommunications Capability, CC Dkt. 98-147, at 48 (received Sept. 25, 1999); Comments of E.Spire Communications, Inc., Deployment of Wireline Services Offering Advanced Telecommunications Capability, CC Dkt. 98-147, at 36-37 (received Sept. 25, 1999); Comments of Northpoint Communications, Inc., Deployment of Wireline Services Offering Advanced Telecommunications Capability, CC Dkt. 98-147, at 38-39 (received Sept. 25, 1999). The label

1999, the FCC found that this proposed regulatory intervention would be technically feasible.[41] That conclusion was portentous, for it is a prerequisite to any subsequent Commission order of mandatory unbundling of wireline bandwidth at regulated prices.

34. When investing in a particular technology to support a new service, an ILEC bears two risks. First, consumers may not adopt the service as widely as informed parties envision at the time that the ILEC must commit to its investment. Second, consumers may adopt the product, but with a different supporting technology. In the best-case scenario, when the new service is widely adopted by consumers and the technology chosen by the ILEC proves to be the most effective, a policy of mandatory unbundling enables the CLEC to purchase the ILEC's unbundled element at cost, as set by TELRIC. Alternatively, if either of the risks eventuates, then the CLEC does not bear any of the cost; to the contrary, the ILEC's shareholders bear the entire cost of the unsuccessful investment. Thus, mandatory unbundling at TELRIC is equivalent to the government's grant to the CLEC of a *free option* to consume, at incremental cost, the fruits of the ILEC's investment.[42] Of course, that option is not "free" in terms of either its private costs to ILEC shareholders or its social costs to consumer welfare because of the ILEC's diminished levels of investment in innovation.

"spectrum sharing" is unfortunate because it is likely to cause confusion about the access line (wireless versus wireline) being unbundled.

41. *See* Deployment of Wireline Services Offering Advanced Telecommunications Capability, First Report and Order and Further Notice of Proposed Rulemaking, CC Dkt. No. 98-147, at ¶ 78, ¶¶ 102–07 (released Mar. 31, 1999) [hereinafter *Advanced Services FNPRM*].

42. *See* Hausman, *Valuing the Effect of Regulation on New Services in Telecommunication*, *supra* note 8; Hausman, *Regulation by TSLRIC*, *supra* note 8.

35. Thus, the Commission's imposition of mandatory unbundling aimed at unproven technologies that are necessary to support new services would severely damage the ILEC's incentives to invest. Suppose, for example, that an ILEC has an opportunity to make a $100 investment in a new technology such as asynchronous transfer mode (ATM) switches.[43] Suppose further that, in the absence of mandatory unbundling, the firm will receive with equal probabilities a payoff of $90 or $150. We hypothesize that the $90 payoff corresponds to a future where internet protocol (IP) routers are the superior packet-switching technology, while the $150 payoff corresponds to an outcome where ATM switches are indeed the superior technology.[44] Assuming that the ILEC's cost of capital is 15 percent, the ILEC would make that investment in the absence of mandatory unbundling at TELRIC prices, as its expected rate of return would exceed its cost of capital. The expected revenue would be $120 (= 50% x $90 + 50% x $150), which would imply an expected return of 20 percent. The expected excess return does *not* imply or assume that the ILEC possesses market power of any sort.[45] As noted above, any rational firm will seek to invest in projects when the expected return exceeds the firm's cost of capital.

36. To extend the example of an ILEC's investment in ATM switches, consider now the case where the ILEC must provide CLECs unbundled access to ATM switches at

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43. ATM is a high bandwidth, low-delay, connection-oriented, packet-like switching and multiplexing technique. *See* BATES & GREGORY, *supra* note 24, at 693-94.

44. For an overview of the pros and cons of those two packet-switching alternatives, see Susan Breidenbach, *Switching Grows Up: The Entire Report*, NETWORK WORLD, May 4, 1998 (available at http://www.nwfusion.com/news/0504switch9.html).

TELRIC prices. In the adverse case, where the ILEC selects a technology that turns out to be inferior in hindsight, its payoff is likely to remain the same, as CLECs will not demand access to an inferior technology. The payoff in the favorable case, however, is substantially lower than it would be in the absence of mandatory unbundling. TELRIC is based upon the ILECs' current effective cost of capital, which is 15 percent in our example. Therefore, the TELRIC-based price for the network element will be set to permit an *ex post* rate of return on capital of 15 percent. Thus, the ILEC will be limited to earning a 15 percent return on the network element that the ILEC uses to supply new services to end-users, as well as only a 15 percent rate of return on compulsory access to that network element that the ILEC provides to CLECs. A rational ILEC will expect that outcome and correctly calculate that the introduction of mandatory unbundling with TELRIC prices will cut the *ex ante* expected return on investment from 20 percent to 2.5 percent. The calculation is straightforward. Half of the time, IP routers are the preferred technology, giving the ILEC a payoff of $90. The other half of the time, ATM switches are the better technology, but TELRIC unbundling lowers the *ex post* payoff to $115 (an *ex post* return of 15 percent). The *ex ante* expected return is therefore 2.5 percent (50% x $90 + 50% x $115 = $102.50). Given a cost of capital of 15 percent, the ILEC will rationally decline to invest in ATM switches. In addition, the amount of investment in ATM switches would fall relative to investment in IP routers. Thus, mandatory unbundling of se-

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45. *See* David J. Teece & Mary Coleman, *The Meaning of Monopoly: Antitrust Analysis in High-Technology Industries*, 43 ANTITRUST BULL. 801, 820-22 (1998) (distinguishing monopoly rents from Schumpeterian returns from innovation).

lected elements not only lowers overall investment in that element, but also distorts investment choices toward elements that are believed to be less susceptible to mandatory unbundling.

37. Through a second example, we can further explore the asymmetric effect of mandatory unbundling on investments in advanced services and new technology. Suppose that the Commission requires an ILEC to offer unbundled access to DSLAMs. If DSL is not widely adopted by consumers, perhaps because it becomes eclipsed by cable modems over cable television networks, then CLECs will not demand unbundled access to the DSLAMs, and the ILEC will unilaterally bear the risk of consumer rejection. Alternatively, if DSL is widely adopted by consumers, then CLECs, by obtaining unbundled DSLAMs at TELRIC prices, will be able to compete away any risk reward that the ILEC would hope to earn on its investment in an uncertain technology. In practice, the ILEC will earn at most its cost of capital. The ILEC cannot know with certainty, however, whether DSL will be widely adopted by consumers. Therefore, in the presence of mandatory unbundling, the ILEC will rationally expect that regulation will greatly diminish the reward for successful innovation. The ILEC will therefore choose to reduce investments in the new technology or avoid such investments altogether.

38. An additional disincentive can arise from the interplay of TELRIC pricing rules and the declining path of costs over time in markets subject to technological progress. Regulators set TELRIC prices on the basis of their estimates of the forward-looking cost of investment.[46] Telecommunications equipment is generally subject to its own version of Moore's

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46. *See Local Competition First Report and Order*, *supra* note 2, 11 F.C.C. Rcd. at 15,541 ¶ 79.

Law,[47] with rapidly declining costs over time for capacity.[48] Indeed, this kind of productivity growth is the premise for ILEC price-cap regulation.[49] An ILEC will correctly expect that (1) the forward-looking cost of investment in a facility will decline over time; and (2) TELRIC rules applied every year over the life of the asset in an *ex post* manner will ratchet down to a new, lower forward-looking cost, such that the ILEC will be denied an opportunity to recover its cost of capital.[50]

39. To apply this lesson to ILEC investment in new technologies, we return to our earlier example. Recall our previous hypothetical investment opportunity, requiring an outlay of $100 today (for example, for a line card for a DSLAM). Suppose that the price of that unit is expected to decline at a rate of 2 percent per year in real terms, owing to productivity improvements in manufacturing. Because TELRIC prescribes the use of the *current* forward-looking cost applied to past investment, the TELRIC cost basis for the investment calculated in

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47. Gordon Moore, the cofounder of Intel Corporation, predicted in 1965 that

> computer chip complexity would double every twelve months for the next ten years. Ten years later his forecast proved true. He then forecasted that the doubling would occur every two years for the next ten years. Again history demonstrated his accuracy. The average of the two estimates is often stated as doubling every 18 months.

HARRY NEWTON, NEWTON'S TELECOM DICTIONARY 508 (Miller Freeman 15th ed. 1999).

48. *See* Jerry Hausman, *Cellular Telephone, New Products, and the CPI*, 17 J. BUS. ECON. & STAT. 188 (1999).

49. *See* ROBERT W. CRANDALL & LEONARD WAVERMAN, TALK IS CHEAP: THE PROMISE OF REGULATORY REFORM IN NORTH AMERICAN TELECOMMUNICATIONS 75-96 (Brookings Institution 1995); DAVID E. M. SAPPINGTON & DENNIS L. WEISMAN, DESIGNING INCENTIVE REGULATION FOR THE TELECOMMUNICATIONS INDUSTRY 80-88 (MIT Press & AEI Press 1996).

50. *See* SIDAK & SPULBER, *supra* note 8, at 419-25; Sidak & Spulber, *Givings, Takings, and the Fallacy of Forward-Looking Costs*, *supra* note 5, at 1139-45; Affidavit of Jerry Hausman on Behalf of the United States Telephone Association, Implementation of the Local Competition Provisions of the Telecommunications Act of

2002 would only be $94 in constant real terms.[51] Modifying our previous example to include that reduced TELRIC cost basis, we see that the ILEC's *ex ante* expected return for the third year is as low as *negative* 1 percent—a loss of capital, let alone a denial of any opportunity to earn a competitive return on capital.[52] The ILEC would therefore be forced *ex post* to unbundle the element at a rate that makes the ILEC's investment unprofitable *ex ante*. No reasonable firm would choose to invest under those conditions. Consumers suffer as a result, because the mandatory unbundling deters efficiency-enhancing investments.

40. Therefore, the combination of TELRIC pricing and expected declines in forward-looking costs compounds the disincentive effect of mandatory unbundling on investment in new technologies. Although the Commission has recognized the possibility that it would be necessary to incorporate higher-than-customary rates of depreciation and return in its TELRIC calculations,[53] it has yet to change historical depreciation in its actual implementation of its policy on mandatory unbundling. Thus, the disincentive effects of a properly computed forward-looking TELRIC are compounded by the improper use of historical depreciation schedules that often have been deliberately elongated by state regulators to keep local rates low.[54]

1996, CC Dkt. No. 96-98 (F.C.C. May 1996); Letter from Alfred E. Kahn to Hon. Reed E. Hundt, then-Chairman of the FCC (Jan. 14, 1997); KAHN, *supra* note 8. This effect has been called "anticipatory retardation."

51. Projecting a 2 percent annual decline in cost in real terms over the three years between 1999 and 2002, we obtain a price in 2002 of $94 (= $100 ÷ 1.023).

52. The payoff to the "adverse" technology is unaffected (IP routers are the preferred technology, giving the ILEC a payoff of $90 with 50 percent probability). The other half of the time, ATM switches are the better technology, but mandatory unbundling at forward-looking TELRIC prices reduces the ILEC's *ex post* payoff to $108 (the projected cost basis of $94 plus a return of 15 percent). The *ex ante* expected return therefore falls even lower, to negative 1% (50 % x $90 + 50% x $108 = $99).

53. *See Local Competition First Report and Order*, *supra* note 2, 11 F.C.C. Rcd. at 15,849 ¶ 686.

54. *See* SIDAK & SPULBER, *supra* note 8, at 200.

Those considerations imply that the Commission should allow ILECs to make investments in advanced services in a regulatory environment in which the market will entirely determine the eventual rate of return. That conclusion holds with even greater force when one recognizes, as is documented by the earlier quotes from the SEC filings of the CAPs that were subsequently acquired by AT&T and MCI WorldCom, that an ILEC cannot be said to be an "incumbent" with respect to any new technology or service.[55]

41. The Commission itself has recognized how important incentives are to the innovation process and has already proposed a regulatory environment in which an ILEC may invest in advanced services without the threat of constant regulation, including mandatory unbundling at TELRIC prices:

> We now explore the circumstances under which an advanced services affiliate would not qualify as an "incumbent LEC" under the definition set forth by Congress in section 251(h), and thus would not be subject to section 251(c) obligations. We also tentatively conclude that an advanced services affiliate, to the extent it provides interstate exchange access services, should, under existing Commission precedent, be presumed to be nondominant. Therefore, such affiliate would not be subject to price cap regulation or rate of return regulation for its provision of such services. We tentatively conclude that such an affiliate, as a non-incumbent, also should not be required to file tariffs for its provision of any interstate services that are exchange access.[56]

Conditional on satisfying a number of criteria, an ILEC may create a separate affiliate that would be exempt from the requirements of section 251(c). The Commission recognized that by allowing ILECs to create separate subsidiaries that are exempt from the unbundling require-

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55. *Id.* at 80-81.

56. *See Advanced Capability Memorandum Opinion and Order*, *supra* note 15, 13 F.C.C. Rcd. at 24,055-59 ¶¶ 95-100 (footnotes omitted).

ments in the Telecommunications Act, the agency could increase the likelihood that ILECs would continue to have an incentive to invest, develop products, and innovate.

42. Finally, we note that mandatory unbundling of a new technology is a disguised form of industrial policy.[57] Ironically, the Commission has attempted to distance itself from such blatant regulatory intervention. It stated two months before its issuance of the *Second Further Notice of Proposed Rulemaking*: "The role of the Commission is not to pick winners or losers, or select the 'best' technology to meet consumer demand, but rather to ensure that the marketplace is conducive to investment, innovation, and meeting the needs of consumers."[58] Rather than fund its program of developing broadband networks through a broad financing scheme, the Commission, assuming that it is acting with the authority the U.S. government, has chosen to finance its version of industrial policy solely by taxing ILECs through TELRIC price regulation and compulsory access. If the government wants to subsidize the development of a new technology, then there should be nondiscriminatory funding ex ante *and* nondiscriminatory access ex post. But if the funding is *not* competitively neutral, then access should not be either. The Commission cannot have it both ways. It is well established, under cases such as *Monsanto*

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57. Industrial policy largely has been discredited in the economics profession. For examples of industrial policy failures, see SIDAK & SPULBER, *supra* note 8, at 495-97; PAUL R. KRUGMAN & MAURICE OBSTFELD, INTERNATIONAL ECONOMICS: THEORY AND POLICY 285-92 (Addison-Wesley 4th ed. 1997); J. Gregory Sidak & Daniel F. Spulber, *Deregulation and Managed Competition in Network Industries*, 15 YALE J. ON REG. 117 (1998).

58. *See* Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, Report, CC Dkt. No. 98-146, at ¶ 5 (released Feb. 2, 1999) [hereinafter *Advanced Services Report*].

and *Kaiser Aetna*,[59] that the compelled sharing of the fruits of private investment can be a taking of property entitled to just compensation under the Fifth Amendment.

B. How Mandatory Unbundling Affects the Weighted-Average Cost of Capital

43. In the examples presented above, we have assumed that the ILEC's cost of capital, which serves as the benchmark of comparison for all expected-return calculations, has remained constant.[60] Unfortunately, that assumption ignores the impact that mandatory unbundling has on the riskiness and cyclicality of the ILEC's economic performance and hence on the ILECs' weighted-average cost of capital. Mandatory unbundling raises both components of the weighted-average cost of capital for ILECs—equity and debt.

1. Mandatory Unbundling Raises the Cost of Equity Capital

44. The cost of equity capital depends on the systematic or "beta" risk of the firm. Beta risk is any risk whose source is related to economy-wide effects. An immediate implication of systematic risk is that it cannot be eliminated through diversification.[61] Beta risk is measured by examining the sensitivity of a firm's stock price to the movements of a broad portfolio that contains the stocks of all firms in the economy. For example, one would expect to see higher betas for companies in industries that are highly cyclical.[62] Investors demand a

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59. Kaiser Aetna *v.* United States, 444 U.S. 164 (1979); Ruckelshaus *v.* Monsanto Co., 467 U.S. 986 (1984).

60. For a clear exposition of cost-of-capital analysis, see EUGENE F. BRIGHAM & LOUIS C. GAPENSKI, INTERMEDIATE FINANCIAL MANAGEMENT 167-210 (Dryden Press 5th ed. 1996).

61. *See* BREALEY & MYERS, *supra* note 18, at 137-38.

62. For a description of how cyclicality affects beta, see ROSS, WESTERFIELD & JAFFE, *supra* note 18, at 300. Other factors that influence beta include operating leverage and financial leverage.

larger risk premium for stocks with large betas because such stocks contribute more to the volatility of an investor's overall portfolio.[63]

45. How does mandatory unbundling affect an ILEC's beta and thus its cost of equity? The answer depends on how unbundling affects the cyclicality of an ILEC's returns. The effect of unbundling is to make an ILEC more sensitive to swings in the overall economy. In particular, a CLEC is more likely to lease the unbundled elements of the ILEC's network in times of weak demand for telecommunications services. Weak demand for a telecommunications service lowers its price and thus makes it harder for a CLEC to justify facilities-based entry, which not only may be more expensive in the short-term, but also may require investment that has a greater degree of sunk (as opposed to merely fixed) cost than does the leasing of UNEs at TELRIC prices over rather short lease terms. Alternatively, in times of high demand, a CLEC is more inclined to enter as a facilities-based competitor. Thus, the *timing* of the CLEC's request for unbundled network elements exaggerates the ILEC's risk of loss during times of weak demand. An ILEC's profits will fall in the face of CLEC entry through mandatory unbundling because the CLEC will capture some customers from the ILEC. The ILEC's profit will fall even more if the access price for the unbundled network element is calculated by regulators in a manner that is not compensatory. The combination of lower returns during "weak demand" and unaffected returns during "high demand" intensifies the cyclicality of an ILEC's returns.

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63. Of course, other factors such as dividend yield, affect the cost of equity capital as well. *See, e.g.*, Mukesh Bajaj & Anand M. Vijh, *Dividend Clienteles and the Information Content of Dividend Changes*, 26 J. FIN.

46. Because there has not been a recession since the passage of the Telecommunications Act of 1996, that conjecture about increased systematic risk is not falsifiable. There exist no data with which to test our conjecture empirically. What matters, however, is whether the capital markets understand the possibility of increased cyclicality and thus penalize ILECs by requiring them to produce a higher (risk-adjusted) return on equity investment.

47. In summary, one would expect mandatory unbundling at TELRIC prices to increase beta for an ILEC by increasing the cyclicality of the company's financial performance. As a result, an ILEC's investors would demand a larger risk premium to hold the ILEC's stock because that stock would contribute more to the volatility of the investor's overall portfolio. The larger risk premium would imply a higher cost of equity capital for an ILEC.

2. Mandatory Unbundling Raises the Cost of Debt Capital

48. Mandatory unbundling also raises the ILEC's cost of debt. It is well established in corporate finance that debt financing is a less expensive source of capital than equity financing.[64] For any given level of financial risk, debt financing is preferable to other forms of capitalization because the interest that the firm pays is a tax-deductible expense.[65] A firm will continue to invest through debt offerings until the additional tax paid by lenders on an extra dollar of interest equals the corporate tax shield on an extra dollar of interest. As Professors Brealey and Myers observe, uncertainty is the enemy of debt financing: "If companies cannot be sure of taxable profits in the future, the expected corporate tax saving will be less, and less

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ECON. 193 (1990).

64. *See* BREALEY & MYERS, *supra* note 18, at 432.

debt will be issued."[66] Increased uncertainty limits a firm's ability to debt finance because the threat of financial distress trumps the corporate tax savings at an earlier stage of the capital allocation process.

49. Mandatory unbundling increases the cost of debt capital for an ILEC because it increases uncertainty for the firm. Under the FCC's current regime of mandatory unbundling, an ILEC is required to make the sunk investment to provide a particular UNE on the basis of expected orders submitted by requesting CLECs. The requesters, however, are not required to make firm commitments to take specified volumes of the UNE for a minimum contract duration. If the ILEC makes the UNE available but there are no CLEC orders that actually materialize for the UNE, as has occurred with unbundled switching, the ILEC is forced to bear that entire cost. This allocation of risk distorts competition: The ILEC is compelled to impute *to itself* this additional transition cost of mandatory unbundling when providing the network element in question to one of its affiliates. On the other hand, the CLECs do not need to incur that unbundling cost or impute it to themselves, to their affiliates, or to any other party with whom they choose to do business. Because an ILEC must bear all the risk of mandatory unbundling, the uncertainty of the ILEC's profits naturally rises. Moreover, because an ILEC will be limited in the *share* of total financing that it may structure as debt (a cheaper source than equity), the firm will experience an increase in its overall cost of capital. That effect, in addition to the increase in the cost of equity described above, will serve to undermine further

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65. *Id.* at 422.
66. *Id.* at 433.

an ILEC's investment prospects by "raising the bar" by which all expected returns are measured.

II. The Effect of Mandatory Unbundling on the CLEC's Investment Decision

A. Optimal Entry Delay

50. The uncertain success of any technology gives imitators an advantage over innovators when regulators mandate unbundling at TELRIC prices. By requesting unbundled elements, the CLEC can always "keep its powder dry" and unbundle the ILEC's successful technology choice. In that manner, mandatory unbundling confers a "second-mover" advantage and substantially decreases a CLEC's incentives to make a sunk investment, an effect that has been investigated in the recent academic literature on innovation and real-option theory.[67] Indeed, one CLEC, Intermedia, has recognized that fact in its 1999 SEC filings:

> Utilizing leased facilities enables Intermedia to (i) meet customers' needs more rapidly; (ii) improve the utilization of Intermedia's existing network; (iii) add revenue producing customers before building out its network, thereby *reducing the risks associated with speculative network construction or emerging technologies*; and (iv) subsequently focus its capital expenditures in geographic areas where network construction or acquisition will provide a competitive advantage and clear economic benefit.[68]

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67. *See* Aron, Dunmore & Pampush, *supra* note 8; Dixit & Pindyck, *supra* note 11. For an application of option theory to investment in telecommunications, see Hausman, *Valuing the Effect of Regulation on New Services in Telecommunications*, *supra* note 8.

68. *See* Intermedia Communications Inc., 1999 SEC Form 10-K, at 8 (1999) (emphasis added).

Simply put, CLECs have the freedom to choose between investing today in sunk equipment embodying uncertain technology or delaying that investment until more information becomes available and reduces that uncertainty.

51. In telecommunications—with leapfrogging innovations and fundamentally different competing technologies—the decision to invest today (rather than to delay investment) is particularly risky, as it often commits the CLEC to a particular technology that may reveal itself later to be an inferior one. Investments in telecommunications technology also face uncertainties about market demand, competition, and the associated costs. The history of telecommunications offers many examples of firms that squandered substantial market opportunities by investing either too early or too late.[69]

52. Without mandatory unbundling, a CLEC would have to balance delay against the potential loss of a first-mover advantage. Through early investment, a CLEC could serve markets before other CLECs or ILECs in complementary markets could deploy networks. With mandatory unbundling, however, the payoff to swift action diminishes, as such outlays can only confer transitory rewards. A compulsory-sharing regime tips the balance of the CLEC's calculus in favor of waiting. The value of the first-mover advantage erodes, and the value to the CLEC of keeping its options open increases. If hindsight confirms that the ILEC chose to invest in the correct technology, then the CLEC can simply demand to unbundle the ILEC's facilities at TELRIC prices.

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69. For example, AT&T introduced Picturephone too soon. *See, e.g.*, www.djvu.att.com/djvu/att/archives.

53. The option value of mandatory unbundling at TELRIC prices can lead the CLEC to prefer unbundling to building facilities, even if building facilities has a higher net present value. One CLEC, Focal Communications, admits in its SEC filings that it can shift risk onto the ILEC by exploiting the option to unbundle:

> The Company's strategy of leasing rather than building its own fiber transport facilities results in the Company's cost of service being a significant component of total costs. The Company has to date been successful in negotiating lease agreements which match the duration of its customer contracts, thereby allowing the Company to avoid the risk of continuing expenses associated with transmission facilities that are not being used by revenue generating customers.[70]

Moreover, if each CLEC expects other CLECs to reason in the same manner, the incentive to delay investment is amplified. Stated another way, as soon as a particular CLEC commits to an investment in a particular technology, that CLEC is no longer protected by its second-mover status. Other CLECs may benefit by waiting for a superior technology to emerge.

B. The Possibility of Regulatory Gaming

54. Mandatory unbundling of network elements at TELRIC prices creates incentives for a CLEC to game the regulatory system. One plausible strategy that CLECs (and their IXC parents or strategic partners) could employ is to demand a perfect, "bug-free" version of the ILEC's back-office systems and operations support systems (OSS) before considering entry. Because most CLECs and IXCs have new OSS and back-office computer systems, requests for UNEs by those firms can place heavy burdens on the ILEC's older computer systems and da-

70. *See* FOCAL COMMUNICATIONS CORP., 1999 SEC FORM 10-K, at 11 (1999).

tabases. An ILEC has invested large amounts in upgrading its legacy systems and training employees.[71] Nonetheless, some IXCs claim that the current system is still plagued by errors.[72] Three years after the enactment of the Telecommunications Act, not a single RBOC has received permission to begin offering consumers in-region interLATA service. It would be naïve to ignore that such delay can be increased through regulatory gaming by CLECs—whose owners and strategic partners, the IXCs, have a strong incentive under the competitive checklist process of section 271 to characterize any problem in the ILEC's network as evidence that its local exchange markets are closed to competition.

55. Before an RBOC undergoes scrutiny under the checklist, it first must enter into an interconnection agreement, approved by the state public utilities commission in the state where the RBOC seeks to originate interLATA calls, with a facilities-based provider of local exchange service.[73] Then the FCC, in consultation with the relevant state public utilities commission (PUC), will determine whether the RBOC's interconnection agreement satisfies the fourteen requirements of the checklist.[74] If the interconnection agreement passes the checklist, and if the RBOC has established a structurally separate entity for the provision of in-region

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71. *See. e.g.*, Raymond W. Smith, *Smoke Detection: Clearing the Air on Local Competition*, *in* IS THE TELECOMMUNICATIONS ACT OF 1996 BROKEN? IF SO, HOW CAN WE FIX IT? 25 (J. Gregory Sidak ed. AEI Press 1999) (describing OSS compliance at Bell Atlantic).

72. *See. e.g.*, John Zeglis, *Out of the Courts and Into the Market: Wouldn't It Be Great?*, *in id.* at 100 (describing AT&T's complaints about RBOC provision of OSS).

73. 47 U.S.C. § 271(c)(1)(A). Alternatively, if the state PUC approved a generic interconnection plan offered by the RBOC but the RBOC received no request for interconnection within the first seven months after enactment of the Telecommunications Act of 1996, then the RBOC may proceed to be evaluated under the checklist. *Id.* § 271(c)(1)(B).

74. *Id.* § 271(c)(2)(B).

interLATA service,[75] then the FCC, after consulting with and giving substantial weight to the views of the Department of Justice,[76] must rule, under the general public interest standard of the Communications Act, on the RBOC's request to provide in-region interLATA service.[77]

56. Although the FCC must approve or reject the RBOC's application within ninety days, the complexity of the checklist and the related approval process will inevitably produce disputes on matters of fact, law, economics, and engineering. That complexity—along with the provision authorizing the FCC to suspend or revoke its approval of the RBOC's provision of in-region interLATA service and the related provision creating a process for the filing of complaints by private parties upon which the FCC must act within ninety days[78]—creates a rich opportunity for strategic gaming by IXCs and CLECs seeking to block RBOC entry into long-distance markets. The experience with the MFJ is suggestive. The MFJ allowed for modification of its line-of-business restrictions through a waiver process. That process proved to be a quagmire that was costly in terms of delaying benefits to consumers in the form of greater price competition and new service introductions. By 1993 the average age of pending waiver requests before the Department of Justice was thirty-six months, despite the fact that the DOJ had opposed relief in only six of the 266 waiver requests filed by the RBOCs.[79] By the end of 1993 the average age of pending waiver motions before the district court had grown to 54.7

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75. *Id.* § 272(b).
76. *Id.* § 271(d)(2)(A).
77. *Id.* § 271(d)(3).
78. *Id.* § 271(d)(6).
79. Paul H. Rubin & Hashem Dezhbakhsh, *Costs of Delay and Rent-Seeking Under the Modification of Final Judgment*, 16 MANAGERIAL & DECISION ECON. 385, 385–86 (1995).

months, despite the fact that the court had approved in full 96 percent of all waiver requests filed.[80]

57. Viewed in these terms, it is not surprising that the Commission has not approved a single section 271 application since the passage of Telecommunications Act of 1996. The process of construing and applying the checklist fuels esoteric regulatory proceedings and litigation. Because the outcome of such proceedings and litigation will determine when an RBOC will be allowed to compete in lucrative interLATA markets, one would therefore expect the IXCs, and the CLECs controlled by them, to contest those proceedings and litigation fiercely. The competitive checklist has become "regulation's rendition of *Waiting for Godot*."[81] The likely result of the FCC's ordering of mandatory unbundling of OSS and other information-based assets at TELRIC prices would be to slow the section 271 approval process even more.

C. Diminished Provision of "Traditional" Services Using Innovative Means

58. In the face of mandatory unbundling at TELRIC prices, CLECs will be less inclined to develop innovative ways to provide service. For example, innovations are being developed to permit the provision of POTS over DSL lines without the use of any circuit-

80. *Id.* at 389, 392.

81. *See* PAUL W. MACAVOY, THE FAILURE OF ANTITRUST AND REGULATION TO ESTABLISH COMPETITION IN LONG-DISTANCE TELEPHONE SERVICES 176 (MIT Press & AEI Press 1996).

switching apparatus.[82] CLECs will have less incentive to pursue those technologies if they can require the ILEC, through "spectrum unbundling," to provide the POTS service, especially if the ILEC is compelled to provide that service below cost because of rate regulation and social-pricing concerns.

59. Without spectrum unbundling, CLECs have an incentive to add voice service to DSL—either by investing in voice switching or by developing voice-over-DSL protocols. Innovation and investment would therefore be higher in the absence of spectrum unbundling. In early 1999, Commissioner Powell warned that mandatory unbundling may diminish the CLEC's incentive to offer "traditional" service using new means: "While mandating access can bring about short-term improvements in retail competition, it also may undermine incentives for developing new methods to circumvent the influence of incumbents over distribution."[83]

60. Also, as noted by Commissioner Powell in the *Second Further Notice of Proposed Rulemaking*[84] and by Justice Breyer in *Iowa Utilities Board*,[85] the incentives for a CLEC in such a regulatory framework encourage its overdependence on unbundling and its underinvestment in facilities-based competition. Commissioner Powell observed that "unconstrained access would eviscerate incentives for entrants to install their own facilities and thereby inhibit the type of competition most likely to spur innovation, provide price discipline and otherwise

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82. *See Jetstream Offers CLECs Affordable Entry into Small Business*, COMMUNICATIONS TODAY, Dec. 8, 1998; 3COM PRESS RELEASE, "End-to-end ADSL: Solutions for Deployable ADSL Services" (www.teledotcom.com/strategies/xdsl3com.html); PARADYNE CORPORATION, THE DSL SOURCE BOOK, *supra* note 39.

83. *See Advanced Services Report*, *supra* note 58 (statement of Commissioner Powell).

84. *See SFNPRM*, *supra* note 4 (statement of Commissioner Powell).

benefit consumers."[86] The FCC should scrutinize the CLECs' strategic incentives when designing the optimal policy of mandatory unbundling pursuant to section 251(d)(2).

III. Further Distortions of the Investment Decision Caused by the Commission's Mandatory Unbundling Rules

61. In the following sections, we show how the possibility of mispriced UNEs aggravates the disincentives to invest in innovation efforts. We also demonstrate how mandatory unbundling will eliminate or greatly reduce procompetitive bundling opportunities for ILECs that would redound to the direct benefit of consumers. Finally, we argue that the Commission should endeavor to solve the commitment problem associated with its discretion to mandate the unbundling of additional network elements at TELRIC prices in the future.

A. The Relation between Retail Rates and Costs Affects the CLEC's Entry Decision

62. The possibility of mispriced UNEs further reduces the incentives to invest in innovation efforts. A conflict arises if UNEs are available at TELRIC prices while resale rates are calculated on the basis of avoided-cost discounts applied to retail rates.[87] In cases where retail rates are below costs, especially in rural and low-density service areas, CLECs will rationally choose to use resale rather than lease unbundled network elements at TELRIC prices, thus obtaining wholesale service considerably below cost. That effect drastically reduces the

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85. *See Iowa Utilities Board*, 119 S. Ct. at 754 (Breyer. J., concurring in part and dissenting in part).
86. *See SFNPRM*, *supra* note 4 (statement of Commissioner Powell).
87. *See* SIDAK & SPULBER, *supra* note 8, at 308, 335–37.

ILEC's incentive to engage in innovation and the CLEC's incentive to enter a particular geographic market as a facilities-based competitor. By contrast, the CLEC's ability to bypass wholesale rates in areas where retail prices exceed costs reduces the CLEC's incentives to invest in facilities.[88] That is particularly important in locales where particular rates (often, for business service) are maintained artificially high by regulatory fiat.

B. Input Unbundling Eliminates Procompetitive Output-Bundling Opportunities that Would Benefit Consumers

63. Mandatory unbundling will eliminate or greatly reduce procompetitive bundling opportunities for ILECs that would redound to the direct benefit of consumers.[89] Bundling of outputs is attractive if a new service is most cost-effectively marketed and most convenient to the end-user when combined with an existing service. For example, many ILECs currently offer POTS bundled with DSL service at an attractive price and include an Internet service provider (ISP) for a nominal charge. Thus, some customers are able to purchase all three of those services from an ILEC for a single price. This bundling advantage is being threatened by AT&T, which announced plans in 1998 to bundle POTS, long-distance service, cable television service, cable modem, and ISP offerings all for one price:

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88. As Justice Scalia, writing for the Court in *Iowa Utilities Board*, noted: "Because this universal-service subsidy is built into retail rates, it is passed on to carriers who enter the market through the resale provision. Carriers who purchase network elements at cost, however, avoid the subsidy altogether and can lure business customers away from ILECs by offering rates closer to cost. This, of course, would leave the ILECs holding the bag for universal service." 119 S. Ct. at 737.

89. It has long been noted that bundling can have procompetitive or efficiency-enhancing effects in markets subject to rapid technological innovation. *See, e.g.*, J. Gregory Sidak, *Debunking Predatory Innovation*, 83 COLUM. L. REV. 1121 (1983).

> AT&T intends to pursue local entry by transforming the cable footprint of one-way cable plant into a two-way, broadband network capable of meeting the full spectrum of communication needs of the residential customer. AT&T intends to deploy a variety of services over the upgraded cable plant, including a richly featured "all-distance" (i.e., local, long distance, international) voice telephony offering. AT&T plans to use existing circuit-switched technology to pilot telephony service offers over the cable plant beginning in 1999. However, AT&T expects to begin to transition to an integrated Internet protocol (IP) packet data architecture by the end of 2000 that affords cost and feature benefits over the older circuit-switched technology.[90]

Mandatory spectrum unbundling would eliminate the ILEC's opportunity to offer bundled one flat-rate residential service and DSL service. Such regulatory intervention would make it harder for ILECs to match the bundled services that sophisticated rivals like AT&T intend to will likely offer in the marketplace. Despite this perverse consequence for competition and consumer welfare, the FCC is pursing mandatory spectrum unbundling in the *Advanced Services Further Notice of Proposed Rulemaking*.[91]

64. Mandatory spectrum unbundling would decrease the ILEC's incentive to develop innovative technical solutions that facilitate bundling, such as splitterless DSL. It would also decrease incentives for CLECs to compete in residential telephony. Instead of unbundling the entire loop, CLECs would simply pursue the most profitable advanced-services portion of the customer's demand. That digital cream-skimming would not necessarily increase competition in residential voice telephony; rather, it would more likely siphon off to CLECs the most lucrative opportunities among the most attractive customers of the residential market. Moreo-

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90. *See* AT&T CORP., 1998 SEC FORM 10-K, at 15 (1999).

91. *See Advanced Services FNPRM*, *supra* note 41. The California legislature is similarly considering such a policy in A.B. 991. *See supra* note 41.

ver, in the process the CLECs would not be developing the customer service and other intangible assets that are required to be successful local exchange carriers. In short, mandatory spectrum unbundling would preclude (at least in the short-term) the possibility of ILECs competing for the advanced-services market.

C. The Commission Should Solve the Commitment Problem Associated with Its Discretion to Unbundle Additional Network Elements in the Future

65. Economic theory recognizes that commitments made in bargaining situations influence the behavior of other actors only to the extent that the person making such commitments is credibly bound (by himself or others) to honoring them.[92] The notion of enforceable agreements plays a similar role in regulated industries as it does in competitive markets. As Pablo T. Spiller and others have shown, both theoretically and empirically, that the level of investment in long-lived infrastructure undertaken by a regulated (or recently privatized) public utility depends critically on regulatory institutions' having been designed to ensure the credibility of the regulator's commitments that it will not act opportunistically once the utility has placed those nonsalvageable assets into service.[93]

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92. *See, e.g.*, OLIVER E. WILLIAMSON, THE MECHANISMS OF GOVERNANCE 120–44 (Oxford University Press 1996); PAUL MILGROM & JOHN ROBERTS, ECONOMICS, ORGANIZATION AND MANAGEMENT 131 (Prentice Hall 1992); OLIVER E. WILLIAMSON, THE ECONOMIC INSTITUTIONS OF CAPITALISM: FIRMS, MARKETS, RELATIONAL CONTRACTING 167 (Free Press 1985); THOMAS C. SCHELLING, THE STRATEGY OF CONFLICT (Oxford University Press 1960).

93. Pablo T. Spiller, *Institutions and Regulatory Commitment in Utilities' Privatizations*, 2 INDUS. & CORP. CHANGE 387 (1993); Brian Levy & Pablo T. Spiller, *The Institutional Foundations of Regulatory Commitment: A Comparative Analysis of Five Country Studies of Telecommunications Regulation*, 10 J.L. ECON. & ORG. 201 (1994); Shane Greenstein, Susan McMaster & Pablo T. Spiller, *The Effect of Incentive Regulation on Infrastructure Modern-*

66. The FCC's interpretation of the "necessary" and "impair" standards ultimately leads to a choice of which network elements shall be unbundled. For any well-defined geographic market, the Commission's framework will result in one of four classifications for each network element:

(1) the element will be unequivocally within the set of elements to be unbundled;

(2) the element will be unequivocally outside the set of elements to be unbundled;

(3) the element will be just within the set of elements to be unbundled; or

(4) the element will be just outside the set of elements to be unbundled.

The first two classifications may be regarded as *inframarginal* cases, and the latter two classifications may be regarded as *marginal* cases. Economics teaches, of course, that consumers and firms make decisions at the margin. An ILEC considering whether to invest in a technology that relies on a network element in the fourth category would rationally forgo that investment if there were a significant risk that regulators would later reclassify the element as one subject to mandatory unbundling at regulated, cost-based rates. To the extent that the risk of regulatory reclassification is significant, the incentive problem extends not only to network elements that the FCC currently subjects to mandatory unbundling, but also to any network element for which it might be technically feasible for the FCC *in the future* to order mandatory unbundling at a TELRIC price.

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ization: Local Exchange Companies' Deployment of Digital Technology, 4 J. ECON. & MGMT. STRATEGY 187 (1995).

67. There are several ways in which a network element that "just passed the test" might eventually be reclassified as being subject to mandatory unbundling at a TELRIC price. First, any standard adopted by the Commission will incorporate several exogenous characteristics that will likely change over time. For example, suppose the FCC embraced an efficient-competitor standard for mandatory unbundling that incorporated the extent of competition in the supply of the requested element. Suppose further that the number of distinct suppliers of the requested element in a well-defined geographic market decreased as the result of a consolidation or a decision to exit the industry. When applied at a later date, the efficient-competitor standard might reclassify the requested element such that the ILEC would then be ordered to unbundle that element at a TELRIC price.

68. Second, the application of any regulatory standard that relies on empirical data is subject to measurement error. To continue the earlier example, suppose that the Commission's standard required the level of competition for the supply of the network element to meet some threshold, t^*. Suppose that the Commission (or the state PUC) must measure the actual level of competition for the supply of that element, t, which is randomly distributed from 0 to 100.[41] Suppose further that the Commission (or the state PUC) measures the actual level of competition with error, such that the Commission's estimate of competition is $t + e$, where e is a random error term that ranges from -10 to 10. Assume that the Commission declares that the network element should *not* be unbundled at the present time (that is, the actual level of

competition surpasses the target level, t^*.) The ILEC can only infer from such a decision that the actual level of competition, t, ranges from t^*-10 (if the error term was -10) to 100. Assuming the Commission's subsequent measurement of competition is just as accurate as its first attempt, the probability that the Commission will reclassify the network element in the subsequent round of examination is substantial.[95]

69. Given the significant likelihood that a network element that the FCC originally considered off-limits may eventually be unbundled, either through measurement error or through a change in exogenous variables underlying the test, the Commission should adopt an appropriate commitment mechanism to encourage investments in network elements subject to this risk of regulatory reclassification. The Commission should outline its position regarding network elements *conditional on the first application of its impairment test* in the present remand proceeding. To all elements that are originally unbundled at TELRIC prices, the Commission should apply a sunset provision that would (1) remove the element from the set of network elements subject to mandatory unbundling and (2) place the burden on the CLEC to prove that an absence of competitive conditions for end-user telecommunications services requires regulators to continue to mandate unbundling of the element at a TELRIC price. The mandatory unbundling of obligations for the ILEC's elements should sunset after the passage of

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94. For example, the Commission may attempt to measure the Herfindahl-Hirschman Index (HHI) of concentration in the switching market by calculating shares as a function of switches sold. In that case, the range of the competitive index would be from 0 to 10,000.

95. The probability that the UNE would be reclassified can be calculated by summing the probabilities that $t + e$ is less than t^* given that t ranges from t^*-10 to 100. Assuming (1) both variables are uniformly distributed, (2) e is independent of t, and (3) $t^*=75$, the probability would be 28 percent.

two years or upon the entry of a facilities-based competitor of the stature of AT&T, MCI WorldCom, or Sprint, whichever occurs first.

70. For those elements for which the Commission (or the relevant state public utilities commission) does *not* initially mandate unbundling at TELRIC prices, the Commission should announce a "rising competitive benchmark" by which those elements would be tested in the future. Suppose, for example, that the Commission adopted a consumer-welfare standard that asked whether the ILEC could exercise market power in the end-user services market by restricting access to a given network element. Upon the first application of the test, the Commission (or state PUC) would assess whether, in a particular geographic market, the ILEC's restriction of CLEC access to the element at a TELRIC price would allow the ILEC to raise prices in the end-user services market by *five* percent. Conditional upon the element not being unbundled at a TELRIC price in the first regulatory iteration, the Commission (or state PUC) would assess, in its second iteration, whether denying CLECs unbundled access to that network element at a TELRIC price would allow the ILEC to raise prices in the end-user services market by *ten* percent. Because it is less likely that an ILEC could sustain a ten-percent price increase (relative to a five-percent increase), the probability would greatly diminish that regulators would reclassify the element as being subject to mandatory unbundling at a TELRIC price.

71. Suppose, alternatively, that the Commission embraced a competitor-welfare standard that asked whether a CLEC could profitably produce the service given the ILEC's

restriction of unbundled access to the network element in question.[96] In its first application of the test, the Commission (or state PUC) could assess whether a CLEC could earn a *fifteen* percent rate of return without having access to the requested element at TELRIC prices.[97] Again, conditional upon the regulator's not ordering the ILEC to unbundle the element at a TELRIC price, in its second application, the Commission (or state PUC) would assess whether a CLEC could earn a *ten* percent rate of return without having access to the requested element at a TELRIC price. An increasing competitive benchmark would credibly commit the regulator to a policy of not reclassifying one of the ILEC's network elements after the regulator has initially determined that the element in question should not be subject to mandatory unbundling at a TELRIC price. Such a credible commitment by the Commission would maintain the proper incentives for the ILEC to continue making investments in the development and improvement of that element.

IV. THE EFFECT OF MANDATORY UNBUNDLING ON INNOVATION IN PARTICULAR NETWORK ELEMENTS

72. In the following sections, we describe recent innovations in switching, loops, DSLAMs, and transmission facilities. Mandatory unbundling at TELRIC prices would jeopardize continued innovation with respect to each of those recent developments.

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96. We emphasize that the Commission should adopt a consumer-welfare standard rather than a competitor-welfare standard for interpreting section 251(d)(2).

97. One such profitable business plan might entail leasing the element from the ILEC at a voluntary rate in excess of TELRIC.

A. Switching

73. A number of voice-switching innovations, including more efficient routing tables and vertical features, should not be unbundled. Whether or not those innovations ultimately are deemed to be "proprietary," they represent a substantial investment by the ILEC in embedded intellectual property for the creation of service enhancements. Similar concerns and negative implications arise with respect to the mandatory unbundling of data switching (such as ATM and DSLAMs).

74. First, these advanced switching services have not been as extensively deployed as competing technologies. For example, cable modems outnumber DSL modems. After AT&T's acquisition of TCI, the CLEC that will provide the majority of cable modem service throughout the United States will be AT&T.[98] AT&T's proposed acquisition of MediaOne would increase that dominance.[99]

75. Second, the provision of business switched-data services is currently dominated by IXCs, and the ILECs have only a miniscule share of this market segment. Frost & Sullivan reports that in 1997, the three largest IXCs (AT&T, MCI, and Sprint) accounted for 73.5 per-

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98. *See* PAUL KAGAN ASSOCIATES, INC., CABLE TV TECHNOLOGY, *U.S. High-Speed Access Cable & ADSL Projection Model*, 1997-2006 (Feb. 28, 1998) (predicting that by 2003 over 12 million households (or over 10 percent of U.S. households) will subscribe to high-speed data service, and that three quarters of those households will obtain service through digital cable modems).

99. *See* Kathy Chen, Bryan Gruley & John R. Wilke, *AT&T-MediaOne Deal Is Likely: Complaints Involve Control Over Cable-TV Business And Pipelines to Internet*, WALL ST. J., May 6, 1999, at B11.

cent of such traffic.[100] Frost & Sullivan also reports that IXCs control over 90 percent of the market in certain advanced segments, such as ATM and frame relay.[101] That evidence suggests that IXCs, not ILECs, are the dominant providers of services in this segment of the industry.

76. The FCC's suggestion that mandatory unbundling extend to packet switches raises troubling issues with respect to the Telecommunications Act's goals of fostering innovation and extending advanced telecommunications services: "It is the policy of the United States . . . to preserve the vibrant and competitive free market that presently exists for the Internet and other interactive computer services, unfettered by Federal or State regulation."[102] Packet switches are the legitimate object of these expressions of legislative concern, for they are expected to be the foundation for delivering advanced telecommunications services. By definition, advanced services currently are services not widely deployed, for which the critical technology is advancing rapidly. The supply of those services is therefore fraught with technological risk. In many cases, the supply is yet to be created, as the assets need yet to be deployed. Therefore, we conclude that mandatory unbundling of switches at TELRIC prices would likely impose large social costs in the form of reduced investments. Such mandatory unbundling would not "reduce regulation," nor would it "encourage the rapid deployment of new tele-

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100. *See* FROST & SULLIVAN, U.S. MARKETS FOR ATM, FRAME RELAY, SMDS AND X.25 PUBLIC DATA SERVICES 1-5 (1998) [hereinafter *SMDS Report*]. This category includes switched multimegabit data service (SMDS), ATM, and frame relay, as well as lower-speed services such as ISDN and X.25 service. *Id.* at 1-13.

101. *See id.* at 2-3.

102. *See* 47 U.S.C. §230(b)(2). The stated congressional purpose prefacing the Telecommunications Act is "to promote competition and reduce regulation in order to secure lower prices and higher quality services for American telecommunications consumers and encourage the rapid deployment of new telecommunications technologies." *See* Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56, 56 (preamble).

communications technologies,"[103] as Congress intended through its enactment of the Telecommunications Act.

B. Loops

77. There is also a high potential for innovation in the area of loops, especially in the development of advanced broadband technologies such as DSL. Those areas include loop plant upgrades and conditioning (for example, bridge tap, dry join, and load coil removal), the implementation of DSLAMs at digital loop carrier (DLC) huts,[104] and the development of new and faster DSL protocols. Although interfaces are not *per se* proprietary to ILECs, they do reflect substantial development in trade secrets, such as engineering, installation, and trouble-shooting techniques and methodologies.

78. In the presence of mandatory unbundling of the traditional loop, mandatory spectrum unbundling exacerbates the disincentive for investment. It currently is both cost-effective and feasible for CLECs to provide their own DSLAMs and switching equipment to provide both DSL and POTS over an ILEC's unbundled "traditional" loops. For example, Paradyne has developed a DSL "starter kit" for extending service to as few as twenty subscribers over loops exceeding 20,000 feet.[105] Given the feasibility of unbundling the entire loop

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103. *Id.*

104. DLC is "network transmission equipment used to provide pair gain on a local loop. The digital loop carrier system derives multiple channels, typically 64 Kbps voice-grade, from a single four-wire distribution cable running from the central office to a remote site." *See* NEWTON, *supra* note 47, at 252.

105. Bob Metcalfe, *More from Maine's rural MVL DSL front: Pick your speed and pay your toll*, INFOWORLD, July 13, 1998, at 4 (available at http://www.infoworld.com).

for use by the CLEC, and the given desirability of increasing competition in the local telephone market, the consumer benefits of mandatory spectrum unbundling are nonexistent. The only "benefit" of such a policy is captured by the CLEC and its shareholders, because the CLEC most likely would unbundle the entire loop if mandatory spectrum unbundling were not an option. In that sense, spectrum unbundling would be a classic case of asymmetric regulation: The CLEC would pursue the more profitable, unregulated service, while the ILEC would be left providing basic local service (in many cases, below cost). Innovation would be eroded by regulations that arbitrarily favored CLECs, without regard to the adverse effect of such asymmetric regulation on the welfare of consumers.

79. The Commission should reject mandatory spectrum unbundling outright because of its obviously deleterious effects on innovation. Such regulatory intervention would certainly reduce and possibly eliminate the current innovation occurring in loop technology, as well as reduce the market for small, entrepreneurial companies like Paradyne that are creating CLEC-tailored solutions to the provision of DSL and POTS over an unbundled loop. Indeed, once one accounts for the harmful effects that such an unbundling rule would have on the currently dynamic and competitive market for advanced services, the only reason to implement mandatory unbundling would be to enrich CLECs at the expense of ILECs and their ratepayers. Nothing in the Telecommunications Act authorizes the FCC to engage in such redistribution of income..

C. Digital Subscriber Lines Access Multiplexers

80. The *Second Further Notice of Proposed Rulemaking* raises the prospect of mandatory unbundling of DSLAMs.[106] Such a policy would harm the public interest. To understand why, it is instructive to review the recent developments in DSLAM technology. Some RBOCs are now experimenting with versions of DSL service that rely on high-frequency, high-power transmission over ordinary copper loops using asymmetrical data rates—such as asymmetric digital subscriber lines (ADSL), where the end-user's download rate is much faster than the upload rate. In particular, some firms are experimenting with ADSL technology that does not require a splitter at the customer's premises.[107] This technology is known as G.Lite, or "splitterless ADSL."[108] Some analyst have criticized G.Lite as the "wrong" technology,[109] which appears to be inferior to alternative symmetric DSL solutions relying on other standards, such as Paradyne's Hotwire multiple virtual lines (MVL) system.[110] Although G.Lite is a public, nonproprietary standard, the consortium members are devoting considerable effort to the implementation of G.Lite in their networks. Such efforts include the deployment of G.Lite-

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106. *See SFNPRM*, *supra* note 4, at ¶ 35.

107. A splitter "resides at both the [central office] and service user locations, allowing the copper loop to be used for simultaneous high-speed DSL data transmission and single line telephone service. POTS splitters usually come in two configurations—a single splitter version designed for mounting at the residence and a multiple splitter version designed for mass termination at the [central office]." *See* PARADYNE CORPORATION, THE DSL SOURCE BOOK, *supra* note 43.

108. For a general description of G.Lite technology, see Tim Greene, *Key DSL flavor faces big compatibility test, but G.Lite modem makers hope to achieve interoperability by June*, NETWORK WORLD, Apr. 19, 1999, at 1.

109. Bob Metcalfe, *Universal ADSL Working Group Is Speeding G.Lite Down a Road to Nowhere*, INFO WORLD ELEC., Sept. 7, 1998 (available at http://www.infoworld.com).

110. PARADYNE CORPORATION, THE DSL SOURCE BOOK, *supra* note 43, at 73.

compatible DSLAMs in central offices, training of installation personnel, development of loop selection and testing procedures, and OSS support.

81. If the Commission were to mandate the unbundling of DSLAMs, the attractiveness of G.Lite deployment would plummet. First, the ILEC would have to sell wholesale access to DSLAMs, which would dampen investment incentives in central office facilities. Second, the ILEC would be forced to share with other DSL operators the considerable investment in personnel training, installation procedures, and OSS support. Finally, the product differentiation that the ILEC is seeking through its ability to offer "splitterless" DSL service would be nullified. The provision of the splitter would entail an additional cost that the ILEC would have to charge to the customer. Consequently, the price-adjusted quality of the ILEC's DSL service would diminish relative to the CLEC's DSL service.

D. Transmission Facilities

1. Fixed-Link Innovations

82. Often CLECs provide competing loop services without using any regulated input from the traditional ILEC. For example, AT&T claims that half of its traffic from business customer terminates on its own network, a figure that is certainly higher after the company's purchase of Teleport Communications Group in 1998.[111] Competing carriers encourage the use of their facilities through discounts or rebates for traffic either originating or terminating on

111. Statement by Frank Ianna, AT&T Data Services, *cited in* Stephanie N. Mehta & John J. Keller, *Sprint Plans to Integrate Voice, Data*, WALL ST. J., June 3, 1998, at A3.

proprietary networks, or through the use of special "on-net" tariffs. Any mandatory unbundling rule that facilitates a CLEC's ability to share the ILEC's innovations in fixed-link transmission would reduce the CLEC's incentive to invest in those types of proprietary networks. Government-induced disincentives to investment do not enhance consumer welfare and should not be regarded as advancing the public interest.

2. Wireless Innovations

83. Wireless carriers are experimenting with a wide range of wireless data services.[112] For example, Teligent has integrated point-to-point and point-to-multipoint wireless technologies with traditional broadband wireline technology. Teligent serves its customers by placing a small digital microwave antenna on the roof of a customer's building. It currently offers service in 24 markets that comprise more than 405 cities and towns with a combined population of more than 75 million.[113] The company views changing consumers preferences and a favorable regulatory climate as key ingredients to its success:

> We believe we are well positioned to capture revenues in the estimated $128 billion business communications market. Our focus is on the estimated $51 billion local exchange market, which is currently one of the most profitable segments in the communications industry. Local exchange services have historically been provided by regional monopolies known as incumbent local exchange carriers or "ILECs." ILECs have typically used older, existing copper wire-based networks. The ILECs' networks, faced with increasing demand from businesses for new services, such as Internet access, at reasonable costs, have

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112. Traditional commercial mobile radio operators (including cellular, PCS, and specialized mobile radio) are increasing their deployment of next-generation wireless data services. *See, e.g.*, Eoin Licken, *New Data Age: Now, Portable Phones Aren't Just For Talking*, INT'L HERALD TRIB., Jan. 21, 1999, at ¶ 1. Other wireless carriers are also entering the fray. For example, Metricom, Ardis, and Ram are all offering a mobile wireless low-speed data service. Other carriers, such as Winstar, Teligent, and Teledesic, are offering fixed high-speed (DS-1 and above) services using land-based or satellite-based technologies.

113. *See* TELIGENT INC., 1999 SEC FORM 10-K, at 3 (1999)

> created a "last mile bottleneck" between the customer location and the ILEC network switch. Our market research indicates that the ILECs have been unable to satisfy customer demands for cost-effective, flexible and responsive service and that a significant portion of Teligent's target customer base—small and medium-sized businesses—is currently dissatisfied with its ILEC service. The potential revenue opportunity in this market, coupled with changes in the regulatory environment designed to enhance competition, have created opportunities for competitive local exchange carriers, or "CLECs," such as Teligent. We intend to reduce or eliminate this last mile local bottleneck and gain market share primarily through the use of our SmartWave(TM) local networks while providing quality customer service and competitive pricing.[114]

Teligent's strategy is suggestive of what other CLECs can do. Again, such investments in alternative technologies for access to the local network, which are already taking place *without* mandatory unbundling of the ILEC's advanced services, would surely diminish in the face of more expansive mandatory unbundling rules.

CONCLUSION

84. Mandatory unbundling at TELRIC prices distorts the investment decision of ILECs. With respect to investments that decrease the marginal cost of an existing service, an invasive policy of mandatory unbundling undermines the ILEC's incentive to maintain and upgrade its existing facilities. Mandatory unbundling of new services supported by new technologies is even more harmful to consumer welfare because it confers a valuable option on CLECs that can be exercised against the ILEC whenever the service and technology prove successful. It is disturbing that the Commission's *Second Further Notice of Proposed Rule-*

114. *Id.* at 4.

making refers to "investment" or "innovation" only *once*.[115] Investment, innovation, and product development are too central to consumer welfare in a high-technology industry such as telecommunications to be treated as an afterthought by the FCC.

85. Mandatory unbundling also raises the ILEC's cost of capital, which serves as a benchmark of comparison for all expected returns. First, mandatory unbundling at TELRIC prices increases the cyclical nature of an ILEC's profits and hence raises the ILEC's systematic risk or beta risk. As a result, an ILEC's investors would demand a larger risk premium because the firm's stock would contribute more to the volatility of an investor's overall portfolio. The larger risk premium would imply a higher cost of equity capital for an ILEC. Second, mandatory unbundling raises the uncertainty of an ILEC's profits, increases the probability of its financial distress, and hence diminishes the ILEC's ability to use debt financing. Because debt is a cheaper source of finance, the ILEC's weighted-average cost of capital will rise.

86. Mandatory unbundling at TELRIC prices also adversely affects the CLEC's investment decision. First, a compulsory-sharing regime tips the balance of the CLEC's calculus in favor of waiting. The value of the first-mover advantage erodes, and the value to the CLEC of keeping its options open increases. Second, mandatory unbundling of network elements at TELRIC prices also creates incentives for a CLEC to game the regulatory system. Third, in

115. *SFNPRM*, *supra* note 4, at ¶ 3.

the face of mandatory unbundling at TELRIC prices, CLECs will be less inclined to develop innovative ways to provide service.

87. Other Commission policies exacerbate the perverse incentives that stem from mandatory unbundling at TELRIC prices. In cases where retail rates are below costs, especially in rural and low-density service areas, CLECs will rationally choose to use resale rather than lease unbundled network elements at TELRIC prices, thus obtaining wholesale service considerably below cost. Mandatory unbundling will also eliminate or greatly reduce procompetitive bundling opportunities for ILECs that would redound to the direct benefit of consumers. Finally, the Commission should credibly commit itself to maintaining the proper incentives for the ILEC to continue making investments in elements that would be at risk of being unbundled at TELRIC prices in the future.

88. In assessing whether a particular interpretation of section 251(d)(2) would enhance consumer welfare and thus serve the public interest, the Commission should recognize that any regulation that mandates the unbundling of network elements at regulated prices can severely distort investment, product development, and innovation in the telecommunications marketplace. If some mandatory unbundling is good, it does not at all follow that more is better for purposes of serving the public interest. Mandatory unbundling has costs as well as benefits, and the *Second Further Notice of Proposed Rulemaking*, by ignoring that tradeoff, fails to give investment and innovation the solicitude that the public interest standard requires. Congress directed the FCC in section 251(d)(2) to consider, "at a minimum," the "necessary" and "impair" standards when deciding whether to mandate unbundling of particular network

elements at regulated prices. The "something more" that the Commission should consider, beyond the statute's minimum concerns, is the harm that mandatory unbundling at TELRIC prices would impose on consumer welfare by discouraging investment, innovation, and product development.

I declare, under penalty of perjury, that the foregoing is true and correct, to the best of my knowledge and belief. Executed on May 25, 1999.

Thomas M. Jorde

Washington
District of Columbia

On this the 25th day of May, 1999, before me, Charlotte L. Brown, a Notary Public for the District of Columbia.

Charlotte L Brown
Notary Public

4-30-03
My commission expires

I declare, under penalty of perjury, that the foregoing is true and correct. to the best of my knowledge and belief. Executed on May 25, 1999.

J. Gregory Sidak

Washington
District of Columbia

On this the 25th day of May, 1999, before me, , a Notary Public for the District of Columbia.

Notary Public

PAULITA F. ROSS
NOTARY PUBLIC STATE OF MARYLAND
My Commission Expires October 12, 1999

My commission expires

I declare, under penalty of perjury, that the foregoing is true and correct, to the best of my knowledge and belief. Executed on May 25, 1999.

David J. Teece

Washington
District of Columbia

On this the 25th day of May, 1999, before me, Charlotte L. Brown, a Notary Public for the District of Columbia.

Charlotte L Brown
Notary Public

4-30-03
My commission expires

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Implementation of the Local Competition Provisions in the Telecommunications Act of 1996	)	CC Docket No. 96-98
	)	
	)	

UNE FACT REPORT

Submitted by the United States Telephone Association

Prepared for Ameritech, Bell Atlantic, BellSouth, GTE, SBC, and U S WEST

Peter W. Huber
Evan T. Leo

May 26, 1999

FOREWORD

This report was prepared on behalf of the Bell Operating Companies (Ameritech, Bell Atlantic, BellSouth, SBC, and U S WEST), and GTE. These companies supplied us with internal data, and helped us to understand its competitive significance. We also drew extensively from public sources, including the trade press, industry reports, company disclosures to the investment community, and maps and databases compiled by independent analysts. All proprietary information regarding competitors' use of ILEC network elements, capabilities, and services was kept strictly confidential, and is presented only in aggregate form.

Peter Huber
Evan Leo

I. SWITCHING

When the FCC made switching a UNE in August 1996, CLECs had deployed fewer than 100 switches. ALTS, the CLEC trade association, claims that CLECs operated only 65 switches before the 1996 Act. Since that time, and despite CLECs' right to obtain unbundled switching from ILECs, CLECs have deployed over 600 new switches of their own. ALTS reports that CLECs had 667 switches by the end of 1998.[1] According to Bellcore's *Local Exchange Routing Guide* (LERG) database,[2] 167 different CLECs had deployed 724 switches in 320 cities as of March 1999.[3] *See* Map 1, Figure 1, & Appendix A. The RBOCs and GTE, by comparison, have deployed only 220 new switches since the 1996 Act.[4]

These numbers make clear that even smaller CLECs are readily able to deploy their own switches – just as many private, corporate users deploy their own private branch exchanges. Over 150 CLECs have actually deployed switches – even though the top-five CLECs alone represent over 70 percent of total CLEC revenues.[5] *See* Figure 2. CLECs that serve only a few markets have deployed switches (*e.g.*, XIT Communications, Rio Communications[6]), so have CLECs that are very small in terms of revenue (*e.g.*, Waller Creek, Otter Tail[7]).

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[1] *See* The Council of Economic Advisors, National Telecommunications and Information Administration, *Progress Report: Growth and Competition in U.S. Telecommunications 1993-1998*, Feb. 8, 1999; ALTS Press Release, *The Telecommunications Act of 1996: Progress After Three Years*, Jan. 21, 1999. Another source reports that, as of year-end 1998, 86 CLECs had deployed 579 switches in 186 cities, with another 250 switches planned. *See* New Paradigm Resource Group, *The 1999 CLEC Report*, at Ch. 6 pp. 9-11, Ch. 8 pp. 1-117 (10th ed. 1999) ("*1999 CLEC Report*"). According to another industry database, CLECs had deployed 611 switches as of December 1998. *See* CLECInfo, *On Target Mapping*, Feb. 1999.

[2] Bellcore, TR-EQP-000315, *Local Exchange Routing Guide*, Mar. 1, 1999 ("*March 1999 LERG*"). On March 9, 1999, Bellcore changed its name to Telcordia. *See* S. Salamone, *Bellcore Morphs Into Telcordia Technologies*, TechWeb News, Mar. 10, 1999.

[3] According to another industry database, 152 CLECs had deployed switches as of year-end 1998. *See* CLECInfo, *On Target Mapping*, Feb. 1999.

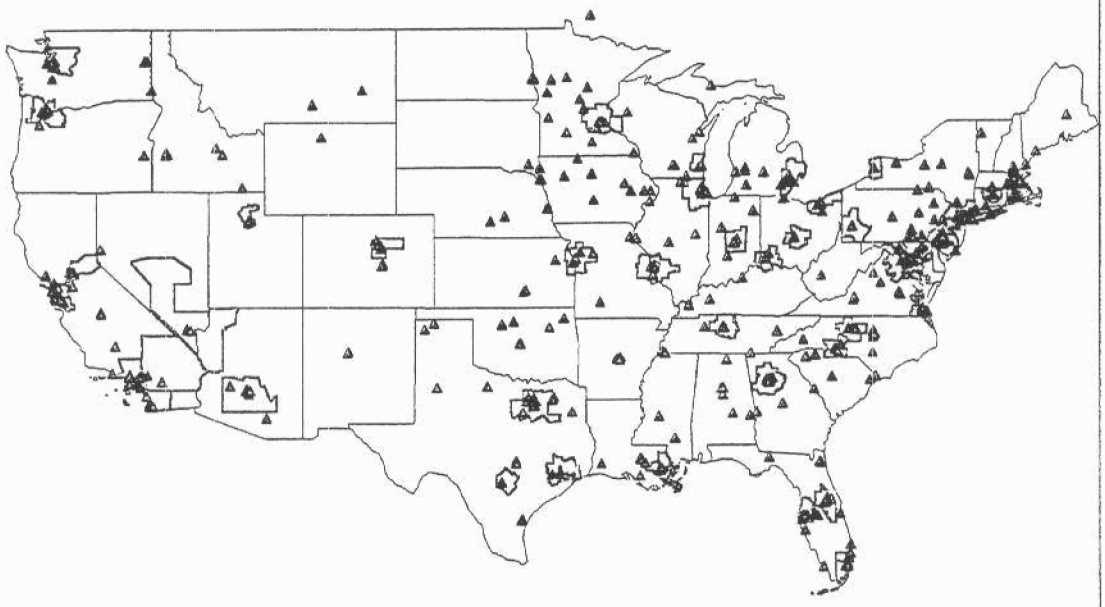
[4] *See* Bellcore, TR-EOP-000315, Local Exchange Routing Guide, Apr. 1, 1996; *March 1999 LERG*.

[5] The top 5 CLECs in terms of revenues are: AT&T, MCI WorldCom, Intermedia, McLeod, and ICG. *See 1999 CLEC Report* at Ch. 6 pp. 28-30. AT&T and MCI WorldCom alone make up 55 percent of CLEC revenues. *See id.*

[6] XIT serves Dalhart and Stratford Texas with one Lucent 5ESS Switch. *See id.* at Ch. 11, XIT profile p.1. Rio serves three Oregon cities (Eugene, Medford, and Bend) with a Class 5 switch. *See id.* at Rio profile pp. 2-3.

[7] Waller Creek had 1998 revenues of $600,000 and one switch. *See id.* at Waller Creek profile pp. 1-2. Otter tail had 1998 revenues of $610,000 and one switch. *See id.* at Otter Tail Profile pp. 1-3.

Map 1. CLEC Switches

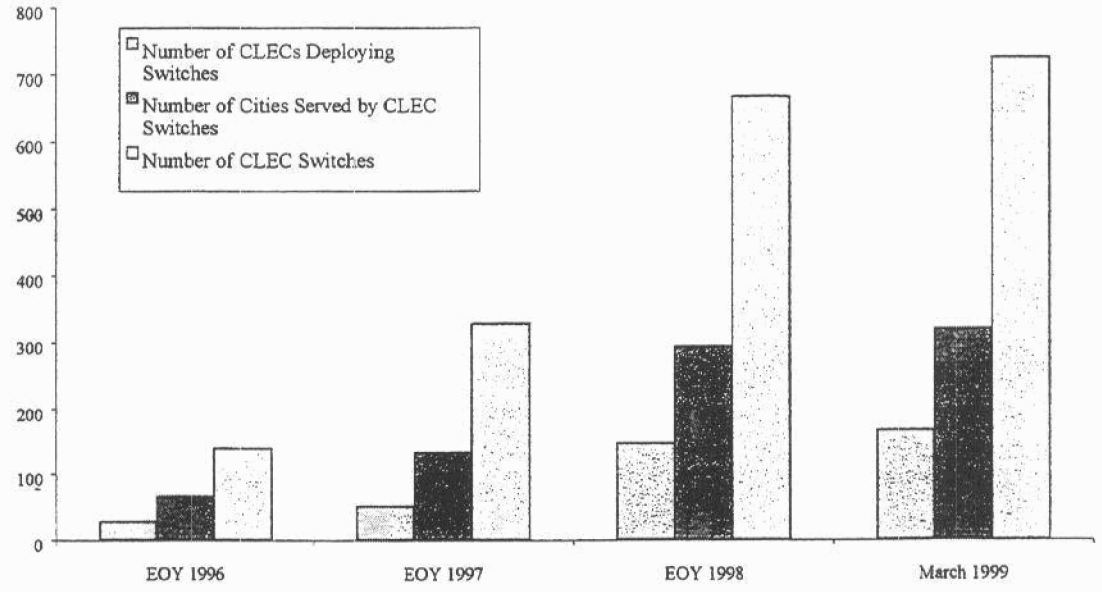


▲ CLEC Switch

— Borders of Top 50 MSAs

Source: *March 1999 LERG.*

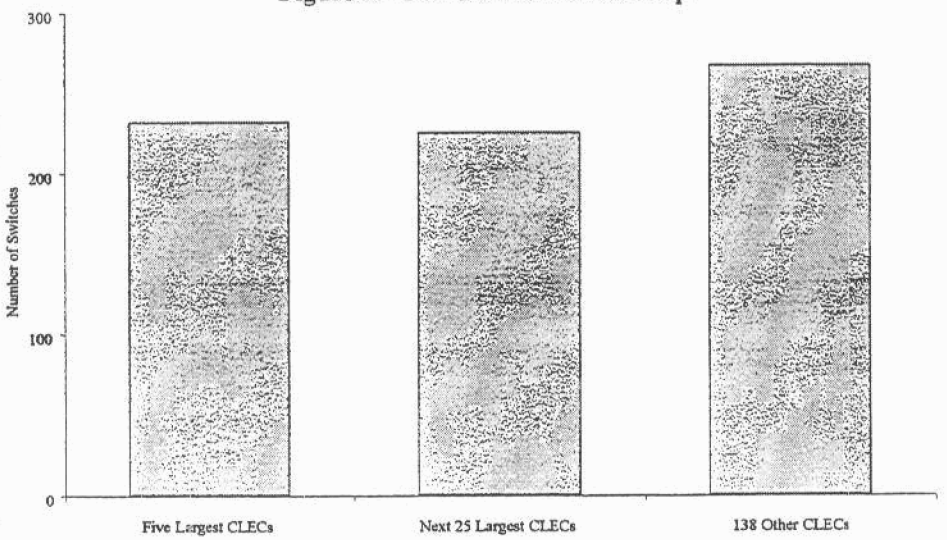
Figure 1. CLEC Switch Deployment



Sources: See Appendix C.

000608

Figure 2. CLEC Switch Ownership



Sources: See Appendix C.

A. ILEC Rate Exchange Areas Served By CLEC Switches

A CLEC that operates its own switch must obtain telephone numbers for that switch in order to serve local customers. A CLEC can obtain numbers in one of two ways. *First*, it can obtain NXX codes from the North American Numbering Plan administrator. *Second*, a CLEC can port a number from an ILEC's switch to its own switch. Until the implementation of long-term number portability (LNP), CLECs relied primarily on the first method. Since the implementation of LNP, CLECs increasingly have used ported numbers to win ILEC customers, while continuing to use NXX codes to serve new customers.[8]

Each telephone number is associated with a unique "rate exchange area." A rate exchange area is the basic building block for the local switching services provided by incumbent local carriers.[9] This is typically a specific geographic area drawn around a single point on a map -- that point being the "rate center."[10] The rate center is often the

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[8] It is also possible for a CLEC that is seeking to sign up a new customer to encourage that customer first to obtain service from an ILEC, and then immediately to disconnect that service, permitting the CLEC to port the ILEC-assigned phone number to its own switch.

[9] *See* FCC, Industry Analysis Division, Common Carrier Bureau, *Local Competition*, at 41 (Dec. 1998) ("*FCC Local Competition Report*") ("Rate exchange areas are geographically defined areas within which calls that originate and terminate (*i.e.*, remain within the area) are considered local calls."); *id.* ("Rate exchange areas form the building blocks of a LATA.").

[10] *See Petition for Declaratory Ruling and Request for Expedited Action on the July 15, 1997 Order of the Pennsylvania Public Utility Commission Regarding Area Codes 412, 610, 215, and 717*, 13 FCC Rcd 19009, 19013 n. 7 (1998) (defining "rate center" as a "telephone company-designated geographic location[] assigned vertical and horizontal coordinates within an area code.") (*citing* Newton's Telecom Dictionary, 11th Edition, at 498 and Local Exchange Routing Guide (LERG), Volume 2, Section 1 at 24 (March 1997)).

location of an incumbent phone company's central-office switch.[11] *See* Figure 3. In many areas there is an exact, one-to-one correlation between phone company switches and rate centers. *See* Figure 4. The original model was that calls that originated and terminated on the same, single switch would be treated as "local," while those handed off to other switches were "toll."[12] This is still often the case.[13] In more densely populated urban areas, however, a single rate exchange area will more typically represent a tight geographic cluster of ILEC switches, though the "rate center" will typically coincide with the location of one of the ILEC's central office switches. *See* Figure 5. Although each ILEC switch typically serves only a single rate center, CLECs can and do use their switches to serve multiple rate centers. *See* Figure 6.

Both the FCC and state regulators have concluded that the rate exchange area is the starting point for assessing competition in the provision of switching services.[14] "[A]ll presently available landbased telephone hardware and software on the market is designed to work in the context of rate centers."[15] This means that "[f]acilities-based CLECs must mirror the ILECs' rate center structure so that rating and routing of calls can be correctly performed."[16]

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[11] Alternatively, it may be chosen as a post office or other central building within a particular community. *See generally Bill Langworthy, et. al. vs. Calaveras Telephone Company (U 1004-C) and Pacific Bell (U 1001 C)*, Decision No. 98-09-015, Case No. 97-01-013, *12 (CPUC Sept. 3, 1998) ("Many of the older exchange rate centers were established at the location of the post office or of another federal building within the given community or city and not at the actual location of the telephone central office. This ancient custom appears to have its origin when, prior to the existence of the Federal Communications Commission (FCC)(1943) the Postmaster General had certain authority to fix rates and interconnection on a nondiscriminatory basis.").

[12] Thus, rate exchange areas are "geographically defined areas within which calls that originate and terminate (*i.e.*, remain within the area) are considered local calls." *FCC Local Competition Report* at 41.

[13] A few states have implemented "rate center consolidation" under which once separate rate centers are combined in order to prevent NXX code exhaustion. *See, e.g., Relief Plan for the Exhaust of the 612 Area Code*, 1998 Minn. PUC LEXIS 93, *1 (Jun. 4, 1998); *DPUC Review of Management of Telephone Numbering Resources In Connecticut – Reopening*, 1998 Conn. PUC LEXIS 187, *39 n.7 (Jul. 8, 1998); *Rate Center Consolidation within 303 Area Code*, 1998 WL 394296 (Colo.P.U.C.), *1 (Jun. 23, 1998).

[14] Moreover, MapInfo, an industry-leading compiler of telecommunications databases, recently created the RatecenterInfo database, noting that "Rate Centers are increasingly becoming the telecom region of choice for Competitive Local Exchange Carriers (CLECs) and Internet Service Providers (ISPs) when determining areas of operations." MapInfo, *Telecom MapInfo Data*, http://www.atmapping.com/solutions/ratecenterinfo.html.

[15] *Petition of NEXTLINK Pennsylvania, L.L.P. for Arbitration of an Interconnection Agreement with Bell Atlantic-PA, Inc., Pursuant to the Telecommunications Act of 1996,* Pennsylvania Public Utility Commission, Docket No. A-310260F0002 (Interconnection Arbitration), *98 (May 22, 1998).

[16] *Re Exhaustion of Central Office Codes,* Public Service Commission of The State of Missouri, Case No. TO-98-212, *49; 187 P.U.R.4th 100, (Aug. 4, 1998).

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Figure 3

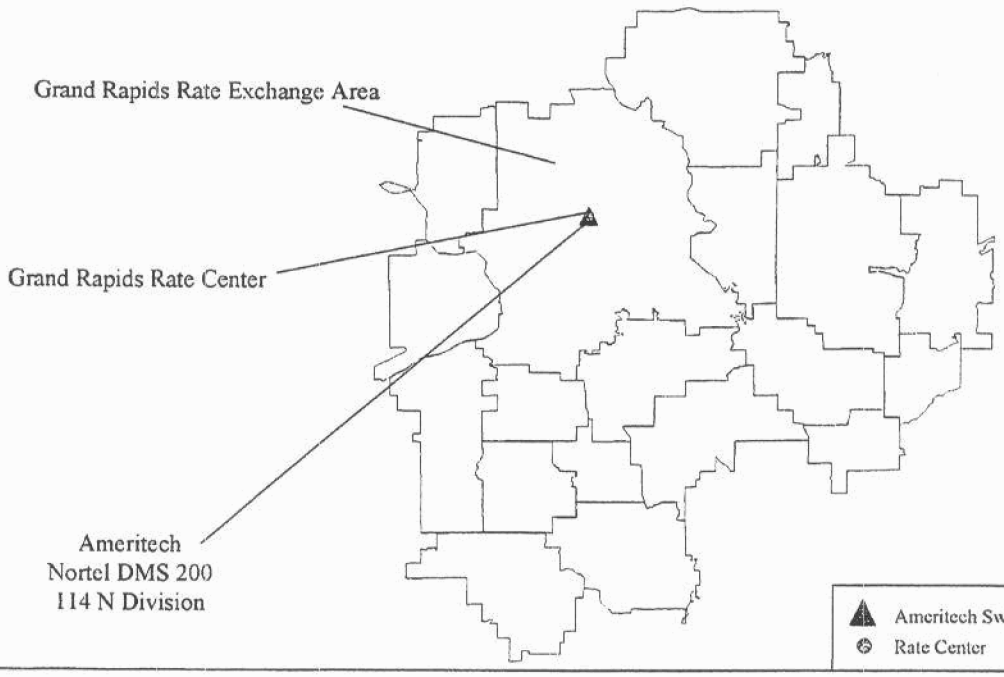
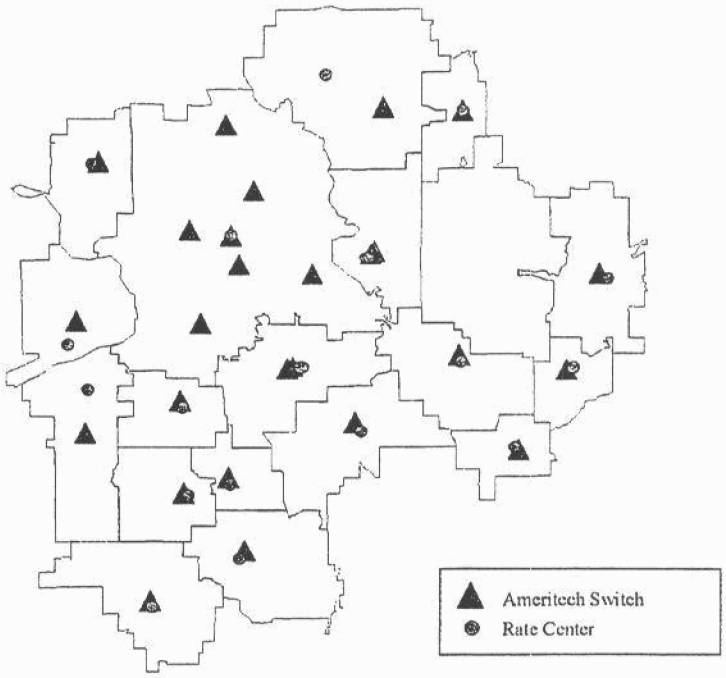


Figure 4



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Figure 5

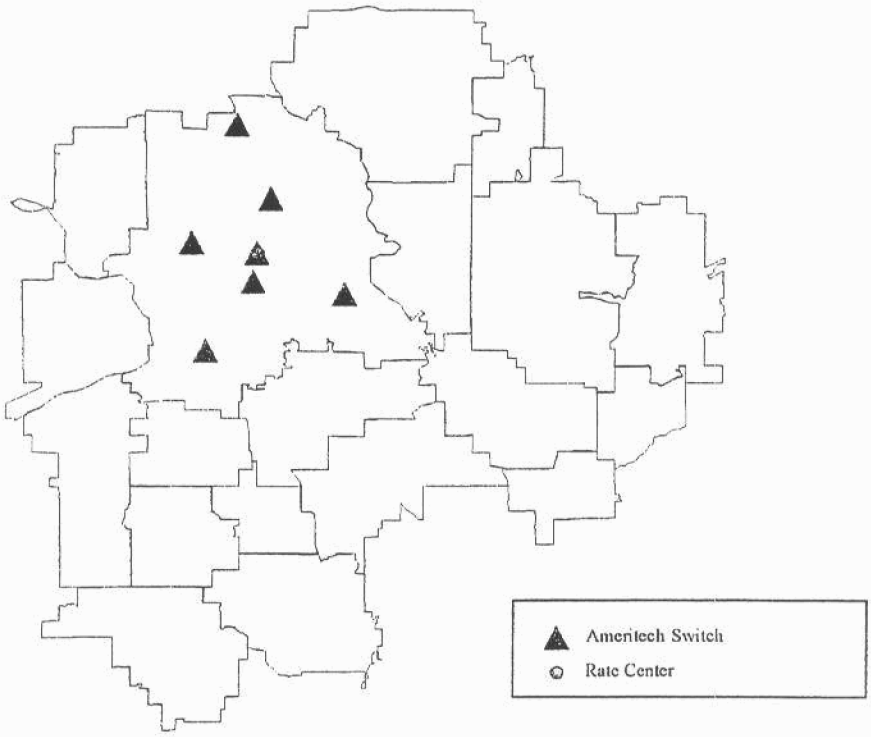
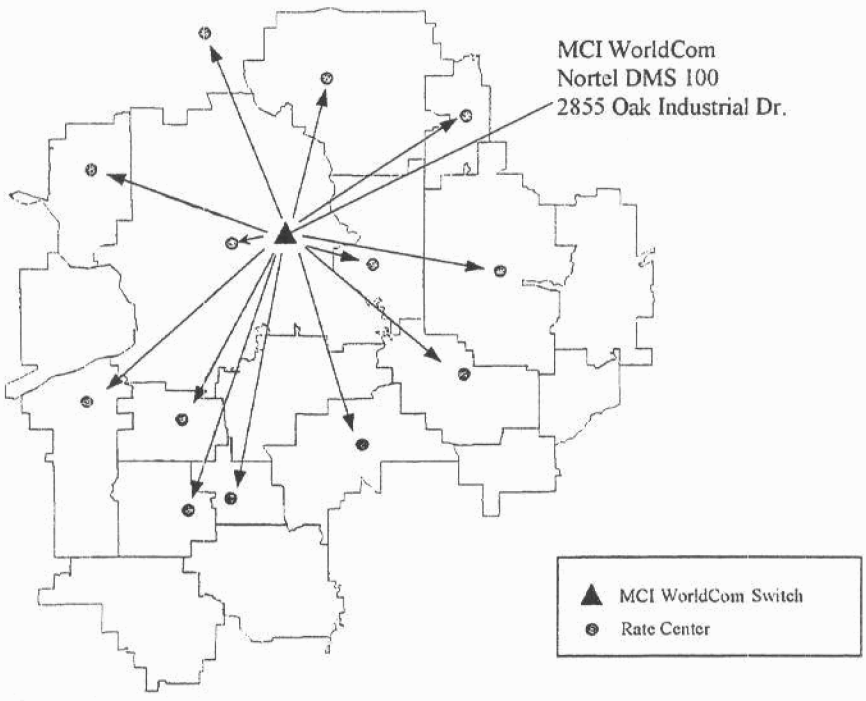


Figure 6



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1. Rate Exchange Areas Where CLECs Have Obtained NXX Codes. In its December 1998 *Local Competition Report*, the FCC sets out a detailed analytical methodology for identifying "new entrants in the switched market," and for quantifying the extent of competition in that market.[17] The FCC's framework evaluates competitive switch providers based on where such competitors have obtained NXX codes.[18] It is a straightforward matter to apply the FCC's own framework. We have merely updated the numbers using the most current data from the LERG database. The data were current as of March 1999.[19]

As of that date, over one third of all BOC and GTE rate exchange areas in the United States were served by at least one CLEC voice switch.[20] Eighteen percent were served by at least two CLEC switches. Twelve percent were served by at least three. Nearly eight percent were served by four or more. In some of the BOC regions, the totals are considerably higher. *See* Table 1 & Map 2.

Table 1. Rate Exchange Areas Where CLECs Have Obtained NXX Codes

	Percentage of Rate Exchange Areas Served by:			
	1 or more CLEC switch(es)	2 or more	3 or more	4 or more
Ameritech	47	36	26	21
Bell Atlantic	59	38	27	19
BellSouth	33	26	17	12
GTE	15	11	6	4
SBC	38	31	23	20
U S WEST	31	24	14	9

Source: March 1999 LERG.

[17] *FCC Local Competition Report* at 41.

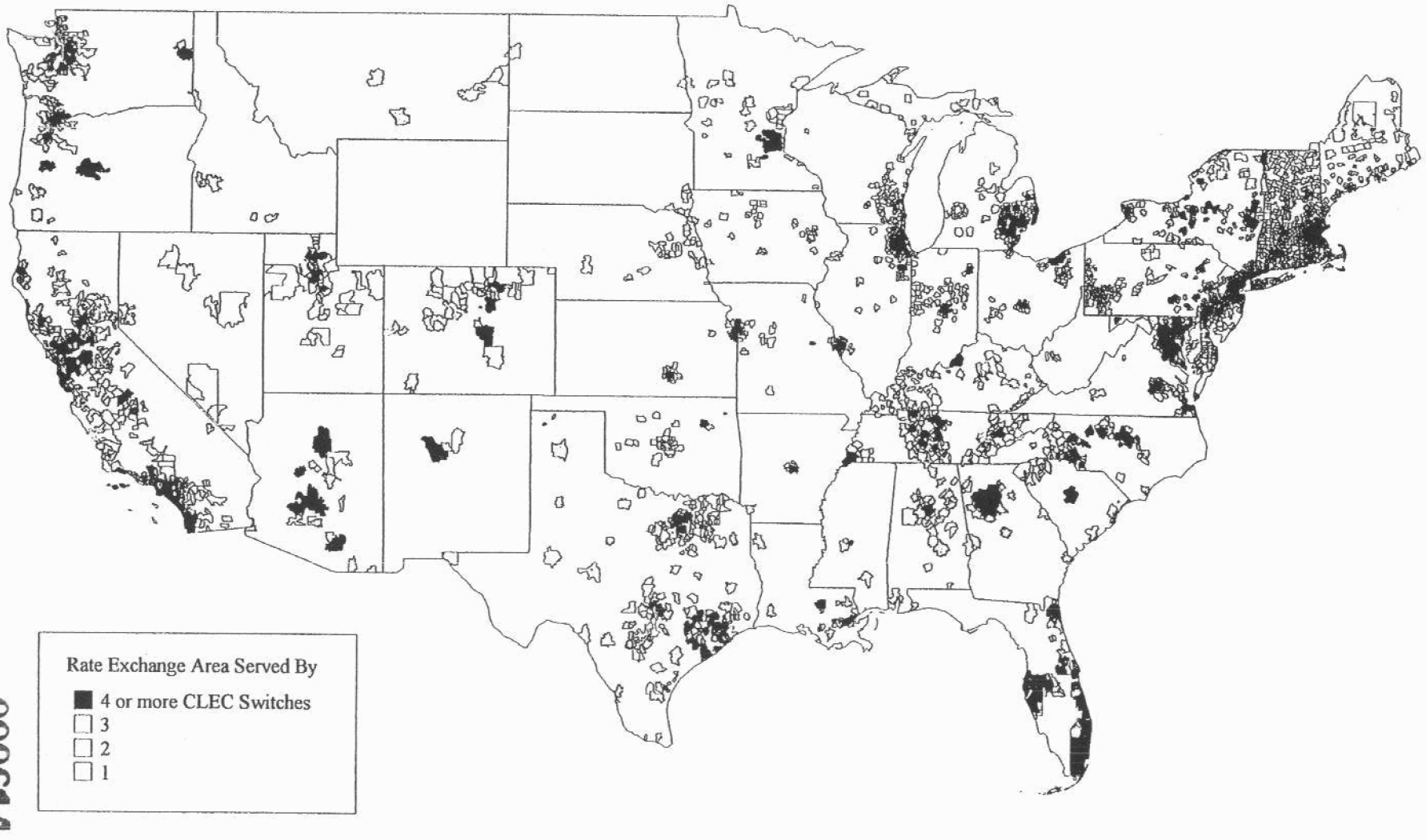
[18] The FCC states that "[a] local service competitor that own a telephone switch must acquire a numbering code for that switch before commencing operation as a facilities-based CLEC providing mass market telephone service." *Id.*

[19] By contrast, the FCC's data were current as of Third Quarter 1998. *See Id.*

[20] According to the LERG, there are 19,591 rate centers in the U.S. of which approximately 10,100 are served by the BOCs and GTE. By comparison, there are 11,571 BOC and GTE wire centers. *See* Scholosser Geographic Systems Inc., *Wire Center Premium Database for U.S. States* (1998). In dense urban areas there are often many wire centers within a single rate exchange area.

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Map 2. BOC and GTE Rate Exchange Areas Where CLECs Have Obtained NXX Codes



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These are highly conservative numbers. They count only CLEC switches actually up and running; CLECs could readily extend the geographic reach of existing switches, or deploy still more switches.[21] And they count only conventional circuit switches, though fax, e-mail, and data, along with a growing volume of voice traffic, too, are now being switched on packet rather than circuit switches. Moreover, as discussed in the following section, these numbers ignore the fact that CLECs do not need an NXX code to provide service in a particular rate exchange area – the CLEC may instead obtain a ported number from an ILEC.

The Commission's 1998 framework for analyzing competition in the market for switching services is based on well established and easily verified facts about telephone network operations.

Telephone numbering codes are currently assigned to all CLECs (and ILECs) in blocks of 10,000. Industry guidelines, established at the direction of the FCC,[22] direct every CLEC that obtains a numbering code ("NXX code") to specify the rate exchange area it intends to serve, and the switch from which it intends to provide service.[23] Even if regulators didn't so require, network engineers would. The NXX code – the first three digits of an ordinary telephone number – tells other switches in the network where to route traffic. Thus, when a customer dials the number 202-370-1000, all the switches in the U.S. network must recognize that "202" switches are located in Washington, D.C., and that "370" calls are terminated through the e.spire switch located at 1275 K Street, Northwest. To provide switching services, e.spire must first be assigned a block of numbers like those beginning with "370."

The FCC compiles information on where CLECs have obtained NXX codes.[24] Bellcore's LERG database compiles precisely the same information, but updates it more frequently. CLECs may begin using a code as soon as it is assigned, and under existing

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[21] In reaching this total we have counted only Class 5 end office, host, and remote switches, and 4ESS switches that AT&T is using to provide competitive local service. *See* Appendix A.

[22] *See* ATIS, Central Office Code (NXX) Assignment Guidelines, INC 95-0407-008, Reissued Jan. 27, 1999, at 1 & n.1, ("*CO Assignment Guidelines*") ("these guidelines were developed at the direction of the FCC," which sent "a letter to NANPA dated June 21, 1991," to develop number allocation procedures).

[23] *See CO Assignment Guidelines* at 6-7 (§ 4.1); *see also FCC Local Competition Report* at 41. In order to obtain the code, "[t]he applicant must be licensed or certified to operate in the area, if required, and must demonstrate that all applicable regulatory authority required to provide the service for which the central office code is required has been obtained." *CO Assignment Guidelines* at 8 (§ 4.1.4). It is possible for a local reseller to obtain a numbering code, and the FCC's data includes a small number of resellers that have done so. But the LERG indicates whether a particular CLEC is using its numbering codes to provide resale service using an ILEC's switch or facilities-based service using its own switch. According to the LERG, only 157 of the roughly 13,700 NXX codes that CLECs have obtained are being used for resale.

[24] *See FCC Local Competition Report* at 41-111 (reporting such information by state and by LATA).

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industry guidelines, no CLEC may reserve an NXX code for more than 18 months without actually activating it to provide service.[25]

In sum, the FCC's own reports, updated by means of the industry's standard database, provide exact, unambiguous data on which CLECs are using their own switches to serve which rate exchange areas. Each CLEC switch has assigned to it one or more NXX codes.[26] Each NXX code is associated with a rate center, which corresponds to one or more ILEC switches within the rate exchange area. Although each ILEC switch typically serves only a single rate exchange area, CLECs can and do use their switches to serve multiple rate exchange areas.

It is on this basis that we arrive at the numbers set out at the beginning of this section. CLECs are already using their own switches to serve over one third of BOC and GTE rate exchange areas. The numbers are much higher than that in major markets.[27] *See* Table 2.

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[25] *See CO Assignment Guidelines* at 10 (§ 4.4) ("If a reserved code is not activated within 18 months, the codes will be released from reservation."); *see also FCC Local Competition Report* at 41 (quoting same). Moreover, "[r]equests for code assignments cannot be made more than 6 months prior to the requested effective date." *CO Assignment Guidelines* at 15 (§ 6.1.2). *But see id.* at 10 (§ 4.4) (permitting a six months extension when the use date is missed to uncontrollable circumstances such as hardware, software, or regulatory delays).

States may impose even more stringent use-it-or-lose-it requirements. *See, e.g., Order Instituting Rulemaking On The Commission's Own Motion Into Competition For Local Exchange Service*, Decision No. 98-07-096, California Public Utilities Commission, July, 23, 1998 (requiring code activation within six months, with possible six-month extension); *Illinois Commerce Commission On Its Own Motion vs. All Telecommunications Carriers Holding 847 NXX Codes*, No. 98-0497, Illinois Commerce Commission, Dec. 16, 1998 (requiring code activation "in a timely manner"); *Petition Of NPA Relief Coordinator Re: 412 Area Code Relief Plan*, Docket No. P-00961027, Pennsylvania Public Utility Commission, July 15, 1997 (requiring code activation within 9 months).

[26] An NXX code may also be assigned to a CLEC facility other than an actual end office, remote, or host circuit switch. *See CO Assignment Guidelines* at 5 ("CO codes are assigned to entities for use at a Switching Entity or Point of Interconnection they own or control."). We have included only NXX codes assigned to Class 5 end office, remote, or host switches. One complication is that, for some CLECs, the LERG lists a particular CLEC having a switch in a particular location with a particular NXX but, according to other sources (*e.g.*, the CLECinfo database and CLEC websites), that location does not contain an actual switch. For example, the LERG lists Intermedia as having five Nortel DMS 500s at five different locations (each in a different rate exchange area) in the Washington DC MSA, even though other sources indicate that Intermedia has only one DMS 500 within that MSA. Intermedia ostensibly has other equipment (*e.g.*, interconnection points or multiplexers) located within these rate exchange areas that it uses to provide service within those areas, and to or from which it is capable of routing calls using its one switch. Examples such as this confirm the fact that CLEC switches in one rate center substitute for ILEC switches in distant rate centers. In such instances, we have attributed only one switch to Intermedia, but have attributed to that switch all of the NXX codes of all Intermedia switching entities located within the same city or MSA.

[27] The following table and examples represent minimums based on assigned NXX codes.

Table 2. Rate Exchange Areas in Top 50 MSAs Where CLECs Have Obtained NXX Codes				
	Percentage of Rate Exchange Served by:			
	1 or more CLEC switch(es)	2 or more	3 or more	4 or more
1. Los Angeles-Long Beach	92	88	75	71
2. New York	78	56	46	39
3. Chicago	78	67	58	48
4. Philadelphia	81	67	43	33
5. Washington, DC	50	43	36	34
6. Detroit	96	94	67	45
7. Houston	85	56	44	37
8. Atlanta	80	73	67	64
9. Boston	99	87	74	61
10. Dallas	73	44	24	24
11. Riverside-San Bernardino	72	39	22	16
12. Phoenix-Mesa	33	17	8	8
13. Minneapolis-St. Paul	38	15	8	4
14. San Diego	85	68	65	65
15. Orange County	96	87	83	83
16. Nassau-Suffolk	44	22	8	8
17. St. Louis	31	18	12	9
18. Baltimore	88	75	61	46
19. Pittsburgh	98	45	14	2
20. Oakland	10	93	83	72
21. Seattle-Bellevue-Everett	100	70	52	48
22. Tampa-St. Petersburg-Clearwater	80	80	80	80
23. Cleveland-Lorain-Elyria	71	61	53	47
24. Miami	100	100	100	80
25. Newark	95	77	64	51
26. Denver	100	80	80	80
27. Portland-Vancouver	81	58	42	29
28. San Francisco	100	83	71	71
29. Kansas City	74	61	42	32
30. San Jose	100	92	67	58
31. Cincinnati	24	6	0	0
32. Fort Worth-Arlington	95	63	37	32
33. Norfolk-Va. Beach- Newport News	55	30	15	10
34. Sacramento	92	60	44	28
35. San Antonio	73	45	9	9
36. Indianapolis	37	16	11	8
37. Orlando	100	100	80	60
38. Milwaukee-Waukesha	93	66	34	21
39. Fort Lauderdale	100	100	100	100
40. Columbus, OH	35	28	18	15
41. Las Vegas	56	0	0	0
42. Charlotte-Gastonia-Rock Hill	68	48	28	20
43. Bergen-Passaic	96	85	33	22
44. New Orleans	36	7	4	4
45. Salt Lake City-Ogden	100	100	75	50
46. Buffalo-Niagara Falls	42	23	19	13
47. Greensboro-Winston-Salem	100	38	38	25
48. Nashville	90	45	34	31
49. Hartford	28	21	13	4
50. Providence-Fall River-Warwick	100	74	56	22
Source: March 1999 LERG				

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For example, 14 CLECs operate 23 switches in the Washington, DC MSA.[28] Fifty percent of the rate exchange areas in the MSA are served by at least one CLEC switch; 43 percent are served by two or more; 36 percent by three or more; and 34 percent by four or more. *See* Map 3. AT&T operates a Nortel DMS 100 to serve 37 rate exchange areas, and two Lucent 4ESSs to serve 21 more. MCI WorldCom operates three DMS 100s and an Ericsson AXE-10, which collectively serve 31 rate exchange areas. e.spire and Intermedia each operates two switches, serving 29 and six rate exchange areas, respectively. Allegiance, Commonwealth, Focal, Frontier, Jones Intercable, Global NAPs, Net2000, RCN, Teligent, and Winstar each operates one switch.

In the Denver MSA, 10 CLECs operate 12 switches.[29] All of the rate exchange areas in the MSA are served by at least one CLEC switch; 80 percent are served by four or more. *See* Map 4. AT&T operates a DMS 100 that serves 46 rate exchange areas, and a 4ESS that serves six. MCI WorldCom operates a DMS 100 that serves four rate exchange areas. Convergent, Frontier, Great West, ICG, NEXTLINK, Optel, Teligent, Time Warner and WinStar also operate one switch each.

In the Dallas MSA, 17 CLECs operate 22 switches.[30] Seventy-three percent of the rate exchange areas in that MSA are served by at least one CLEC switch; 44 percent are served by two or more; 24 percent by four or more. *See* Map 5. AT&T operates a DMS 100 and a Lucent 5ESS, which together serve 57 rate exchange areas. MCI WorldCom operates three switches – a DMS 100 (76 rate exchange areas), a Nortel DMS 10-S (10 rate exchange areas), and an AXE-10 (one rate exchange area). Allegiance operates a 5ESS (26 rate exchange areas) and a Nortel DMS 500 (one rate exchange area). CoServ, Frontier, Great West, GST, ICG, Intermedia, Multitechnology Services, NEXTLINK, Nortex, Optel, Southside, Teligent, Westel, and Winstar each operates one switch.

In the Detroit MSA, there are eight CLECs operating 11 different switches.[31] Ninety-six percent of the rate exchange areas in the MSA are served by at least one CLEC switch; 94 percent are served by two or more; 67 percent by three or more; and 45 percent by four or more. *See* Map 6. AT&T operates a DMS 500 that serves 104 rate exchange areas, and a Lucent 5ESS that serves 110. MCI WorldCom operates a Siemens DE4 EWSD RCU Switching System that serves 31 rate exchange areas, an AXE-10 that serves 34, and a DMS 100 that serves eight. Coast to Coast, Focal, KMC Telecom, MediaOne, Phone Michigan, Teligent, and WinStar each operates one switch.

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[28] The Washington, DC MSA consists of 80 different rate centers. Bell Atlantic is the incumbent LEC in the entire MSA.

[29] The Denver MSA consists of 5 different rate centers. U S WEST serves the entire Denver MSA.

[30] The Dallas MSA consists of 55 different rate centers. SBC and GTE jointly serve the entire MSA.

[31] The Detroit MSA consists of 78 different rate centers. Ameritech serves the entire Detroit MSA.

In the Atlanta MSA, 13 CLECs operate 19 different switches.[32] Eighty percent of the rate exchange in the MSA are served by one or more CLEC switches; 73 percent are served by two or more; 67 percent are served by three or more; 64 percent are served by four or more. *See* Map 7. AT&T operates a 5ESS that serves one rate exchange area, a DMS 100 that serves 34, and a 4ESS that serves two. MCI WorldCom operates a DMS 100 (four rate exchange areas), AXE-10 (one), and two DE4 EWSD RCUs (11 and 26). Intermedia operates two DMS 500s that together serve nine rate exchange areas. Allegiance, Business Telecom, e.spire, Frontier, ICG, Media One, MGC, NEXTLINK, Teligent, and WinStar each operates one switch.

In the Tampa MSA, five CLECs operate seven different switches.[33] Eighty percent of the rate exchange areas in Tampa are served by four or more CLEC switches. *See* Map 8. MCI WorldCom operates a DE4 EWSD RCU that serves eight rate exchange areas. Intermedia operates a DMS 10 and DMS 10S that serve one rate exchange area each. e.spire, National Telecommunications, and WinStar each operates one switch.

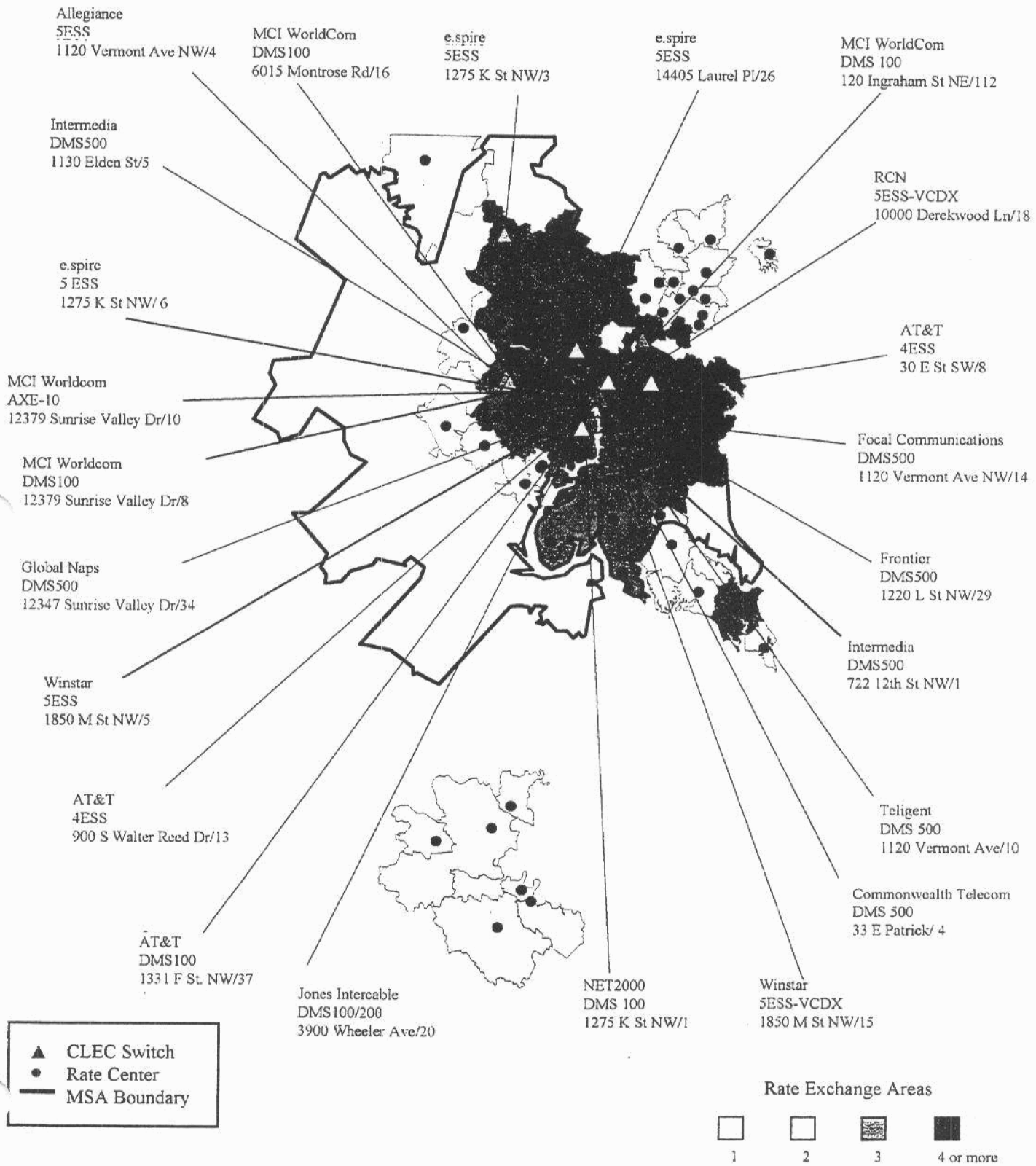
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[32] The Atlanta MSA consists of 45 different rate centers. BellSouth is the incumbent LEC in the entire MSA.

[33] The Tampa MSA consists of 10 different rate centers. GTE serves the entire Tampa MSA.

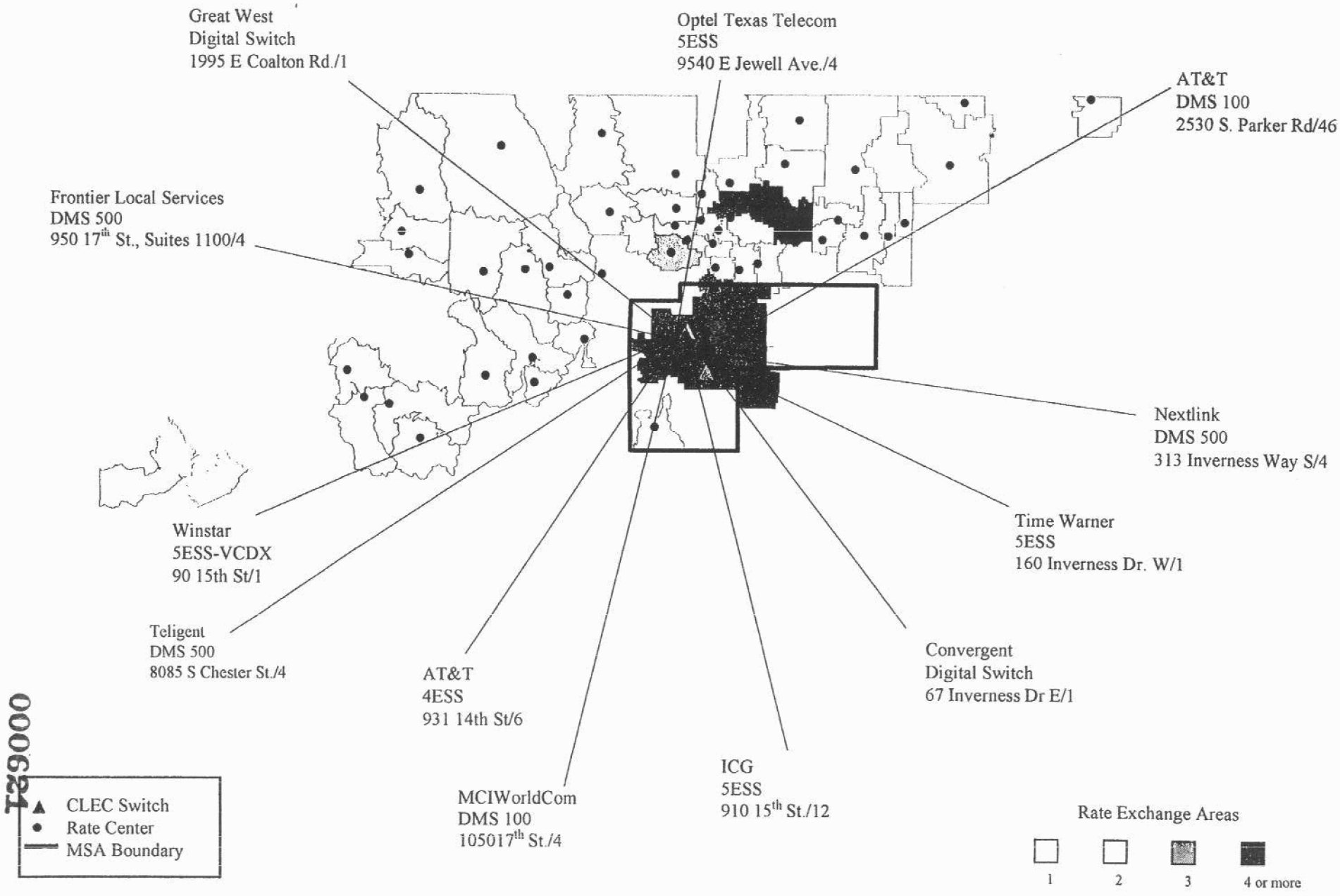
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Map 3. CLEC Switches and Competitively Served Rate Exchange Areas
Washington, DC MSA



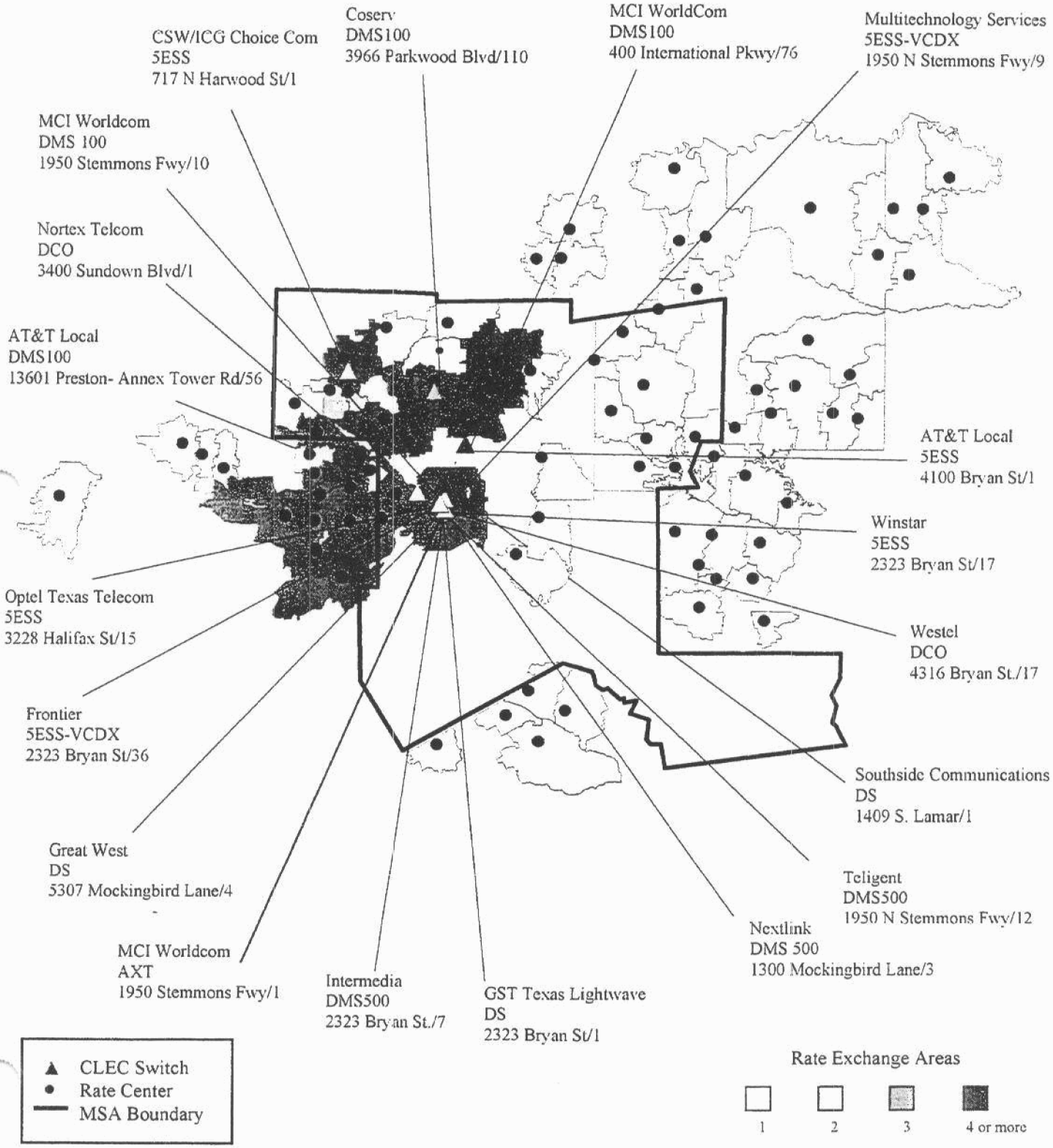
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Map 4. CLEC Switches and Competitively Served Rate Exchange Areas
Denver MSA

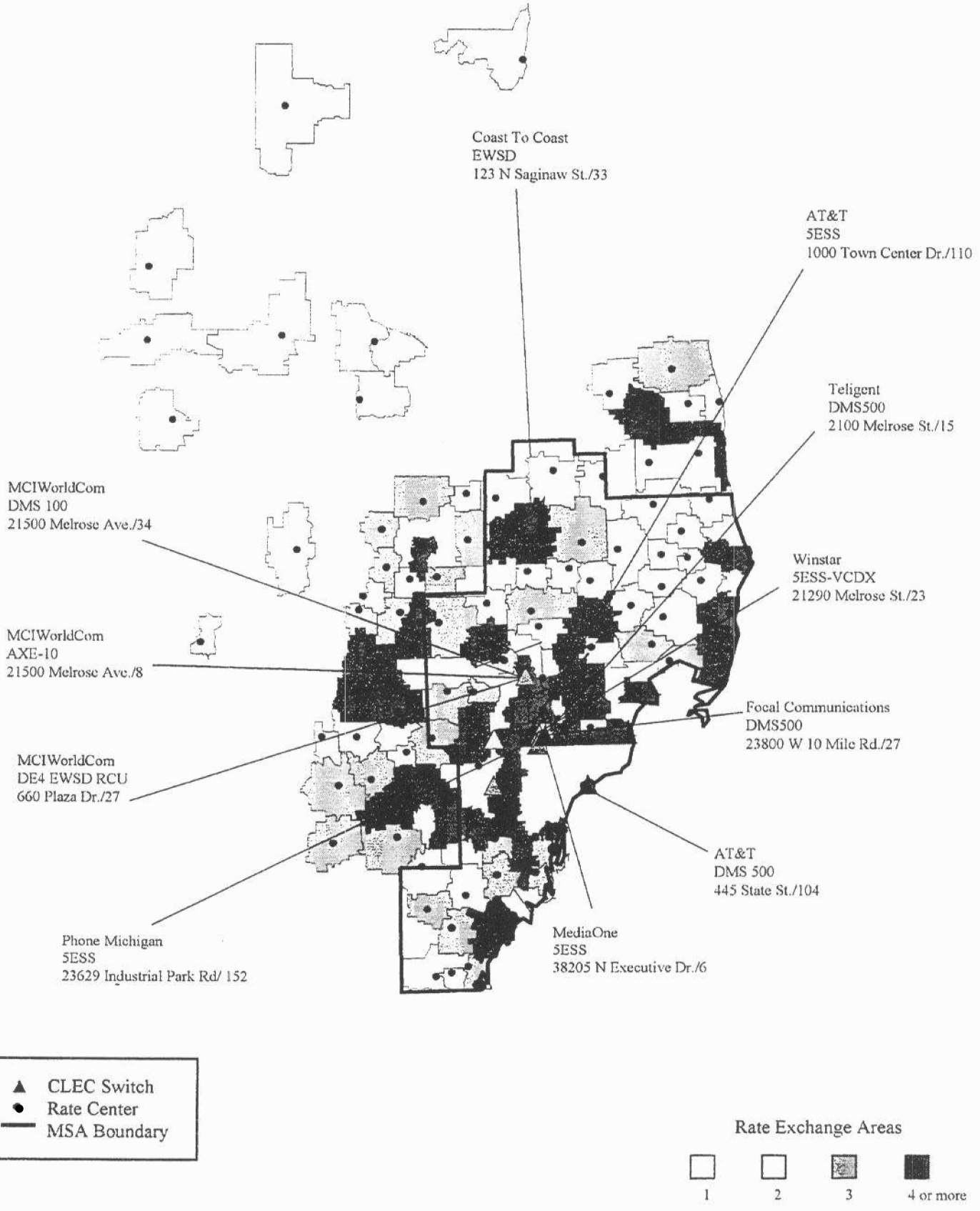


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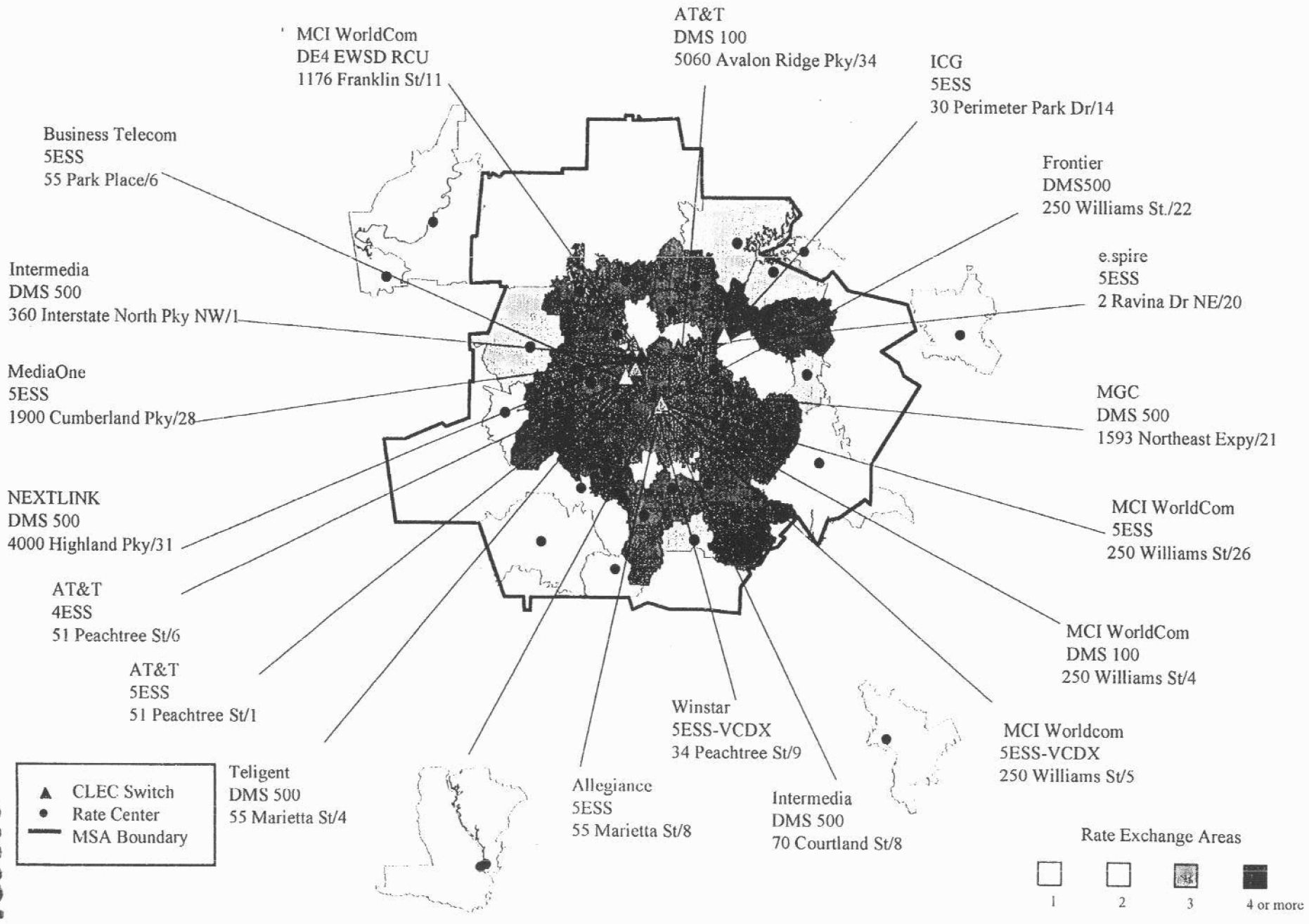
Map 5. CLEC Switches and Competitively Served Rate Exchange Areas
Dallas MSA



Map 6. CLEC Switches and Competitively Served Rate Exchange Areas
Detroit MSA

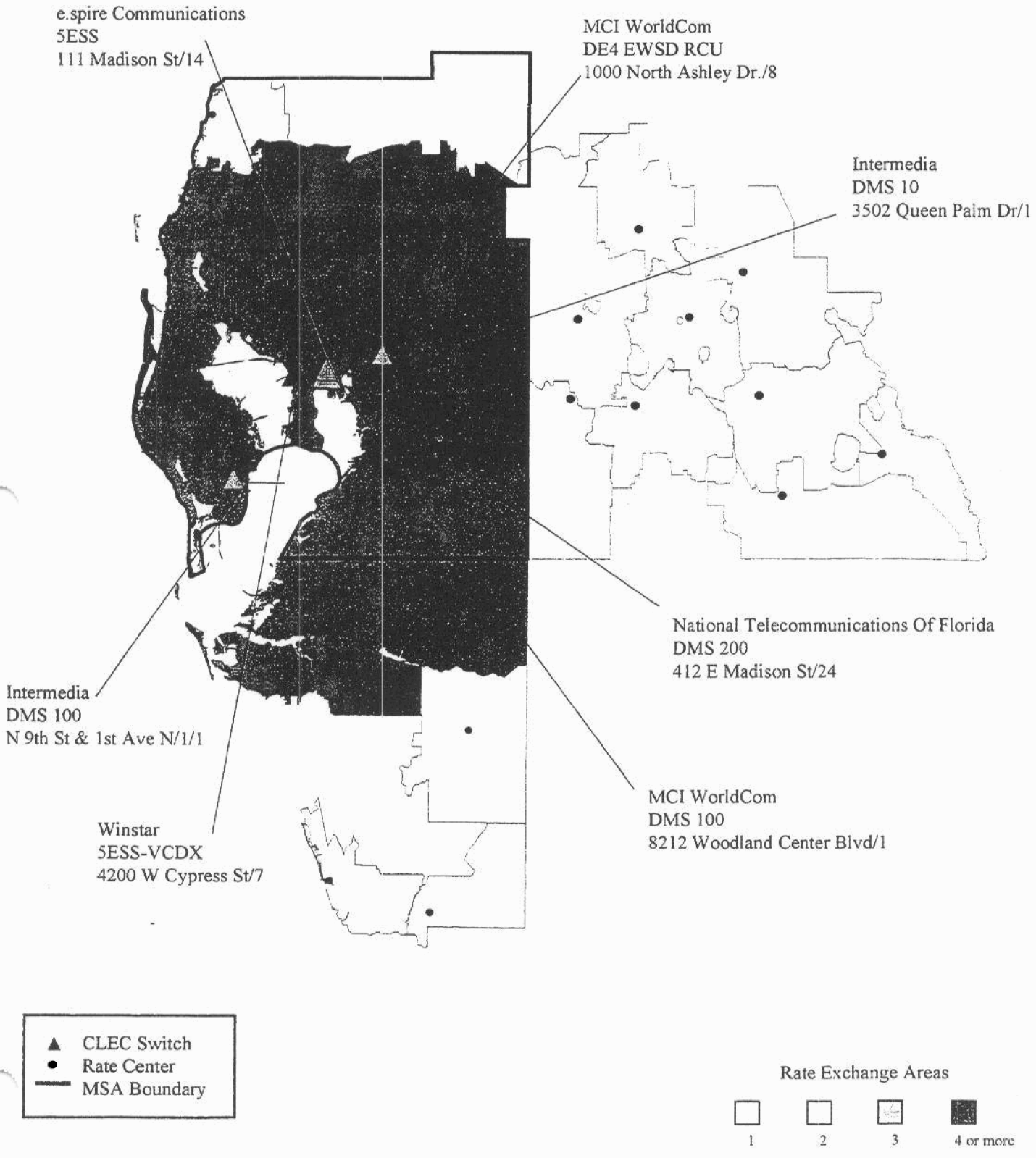


Map 7. CLEC Switches and Competitively Served Rate Exchange Areas
Atlanta MSA



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Map 8. CLEC Switches and Competitively Served Rate Exchange Areas
Tampa MSA



2. Rate Exchange Areas Where CLECs Can Port ILEC Numbers. CLECs do not need to obtain NXX codes in order to provide local service using their own switches. CLECs instead can obtain numbers by porting them from ILEC switches. Section 251(b)(2) of the 1996 Act requires all local exchange carriers to provide "to the extent technically feasible, number portability in accordance with requirements prescribed by the Commission." Once an ILEC has implemented LNP on a switch, CLECs can port local numbers from the ILEC switches to CLEC switches in the same geographic area, or, indeed, to CLEC switches located at any distance from the ILEC switch.

Under FCC rules, incumbent LECs are required to implement LNP only upon request, in switches that CLECs specifically designate as their competitive targets.[34] This approach, the FCC concluded "allows carriers to focus their resources where competitors plan to enter, which is where number portability is likely to have the most impact in the short run on the development of competition for local services."[35] Number portability is implemented only on ILEC switches that CLECs have formally designated as targets of their "actual competitive interest."[36]

The FCC directed the industry and state commissions to determine "the most efficient means of identifying those switches within the top 100 MSAs in which carriers have expressed interest."[37] That process, through which CLECs formally designated the ILEC switches against which they intended to compete, began in June 1997. The vast majority of facilities-based CLECs participated. Each one formally submitted a list of ILEC switches against which it intended to compete. The process was concluded in March 1998. By December, 1998, the BOCs and GTE had implemented LNP in the designated switches.

The LERG database now lists all ILEC switches in which LNP has been implemented. Using the LERG, we can further determine the specific rate exchange areas associated with each switch. In light of the LNP switch-designation proceedings, and the regulatory backdrop against which they occurred, it is entirely reasonable to infer that all rate exchange areas served by an LNP-capable ILEC switch face direct competition from CLEC switches. Indeed, any other inference requires an assumption of bad faith by CLECs – an assumption of deliberate misrepresentation to federal and state regulatory authorities.

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[34] In the 100 largest MSAs, LECs are required to provide number portability only in switches for which a competing carrier "has specifically and reasonably requested the provision of number portability." *Telephone Number Portability*, First Reconsideration Order, 12 FCC Rcd 7236, 7272-77 (1997) ("*First Reconsideration Order*"). With respect to a switch located outside of the top 100 MSAs, a CLEC may submit a request to a LEC to implement LNP in that switch, and LECs must fulfill such requests within six months. *Id.* at 7298.

[35] *Telephone Number Portability*, Third Report, 13 FCC Rcd 11701, 11714 ¶ 20 (1998).

[36] *First Reconsideration Order*, 12 FCC Rcd at 7277 n.225.

[37] *Telephone Number Portability*, Third Memorandum and Opinion on Reconsideration, 13 FCC Rcd. 16090, ¶ 5 (1998). The Commission established "minimum criteria" to guide this process. *See id.*; *First Reconsideration Order*, 12 FCC Rcd at 7272-73.

In BOC and GTE regions, CLEC switches may currently obtain ported numbers on 39 percent of all BOC and GTE switches, which serve 29 percent of all BOC and GTE rate exchange areas. In some of the BOC regions, the totals are considerably higher. *See* Table 3.

Table 3. Rate Exchange Areas Where CLECs Can Obtain Ported ILEC Numbers

	Percentage of BOC/GTE switches that are LNP-capable	Percentage of BOC/GTE rate exchange areas served by LNP-capable switches
Ameritech	53%	43%
Bell Atlantic	50%	52%
BellSouth	35%	27%
GTE	14%	10%
SBC	54%	46%
U S WEST	27%	9%

Source: March 1999 LERG.

Only the CLECs themselves can disclose precise data on how many numbers have actually been ported within each particular rate exchange area. It is, however, reasonable and conservative to assume that a CLEC switch can, at a minimum, serve the entire MSA in which it is located. Every CLEC switch, in other words, is effectively capable of competing directly against every LNP-enabled ILEC switch located in the same MSA.

Based on this methodology, we find that, within the 50 largest MSAs, CLEC switches may currently obtain ported numbers on 81 percent of all BOC and GTE switches, which serve 75 percent of all BOC and GTE rate exchange areas. Sixty-four percent of these MSAs contain switches of at least 5 different CLECs; 18 percent contain switches of at least 10 different CLECs. *See* Table 4.

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Table 4. Rate Exchange Areas in Top 50 MSAs Where CLECs May Port ILEC Numbers				
MSA	Number of CLECs with Switches	Number of CLEC Switches	Percentage of LNP-Capable BOC/GTE Switches	Percentage of BOC/GTE Rate Exchange Areas Served by LNP-Capable BOC/GTE Switches
1. Los Angeles-Long Beach	13	16	81 %	96 %
2. New York	10	12	85 %	98 %
3. Chicago	12	19	78 %	67 %
4. Philadelphia	13	24	88 %	91 %
5. Washington, DC	13	23	64 %	90 %
6. Detroit	7	11	63 %	50 %
7. Houston	9	10	80 %	61 %
8. Atlanta	12	19	92 %	89 %
9. Boston	15	21	93 %	98 %
10. Dallas	16	22	79 %	76 %
11. Riverside-San Bernardino	1	3	80 %	68 %
12. Phoenix-Mesa	8	10	95 %	100 %
13. Minneapolis-St. Paul	9	12	75 %	31 %
14. San Diego	7	8	90 %	97 %
15. Orange County	3	4	81 %	96 %
16. Nassau-Suffolk	3	4	88 %	98 %
17. St. Louis	8	8	53 %	31 %
18. Baltimore	6	10	88 %	89 %
19. Pittsburgh	4	5	85 %	60 %
20. Oakland	3	3	93 %	100 %
21. Seattle-Bellevue-Everett	9	11	84 %	52 %
22. Tampa-St. Petersburg-Clearwater	5	7	94 %	60 %
23. Cleveland-Lorain-Elyria	7	9	97 %	58 %
24. Miami	10	12	82 %	60 %
25. Newark	6	7	81 %	82 %
26. Denver	9	12	91 %	100 %
27. Portland-Vancouver	7	9	70 %	52 %
28. San Francisco	6	7	95 %	100 %
29. Kansas City	4	6	92 %	61 %
30. San Jose	3	3	83 %	100 %
31. Cincinnati	4	5	50 %	62 %
32. Fort Worth-Arlington	2	2	92 %	79 %
33. Norfolk-Virginia Beach-Newport News	3	3	84 %	75 %
34. Sacramento	3	3	89 %	80 %
35. San Antonio	7	9	82 %	82 %
36. Indianapolis	5	7	83 %	68 %
37. Orlando	7	10	73 %	80 %
38. Milwaukee-Waukesha	6	7	98 %	76 %
39. Fort Lauderdale	7	7	88 %	100 %
40. Columbus, OH	2	2	68 %	45 %
41. Las Vegas	2	2	Sprint is ILEC	Sprint is ILEC
42. Charlotte-Gastonia-Rock -Hill	6	8	71 %	56 %
43. Bergen-Passaic	1	2	89 %	96 %
44. New Orleans	7	7	86 %	75 %
45. Salt Lake City-Ogden	4	6	39 %	50 %
46. Buffalo-Niagara Falls	1	1	82 %	74 %
47. Greensboro-Winston-Salem-High Point	5	6	88 %	88 %
48. Nashville	4	4	85 %	76 %
49. Hartford	3	4	90%	65%
50. Providence-Fall River-Warwick	6	6	85 %	89 %
Source: March 1999 LERG.				

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B. CLECs Can Extend the Reach of Existing Switches

Many CLECs use their switches to serve more than one rate exchange area. According to the March 1999 LERG, the average CLEC switch in BOC and GTE territory has NXX codes for 14 rate exchange areas. Both the FCC and state regulators have recognized that CLEC switches can be expected to serve much larger areas than ILEC switches typically do.[38]

AT&T maintains that when used with a digital loop carrier, a single switch can readily serve customers within a 125-mile radius.[39] MCI uses switches in Seattle to reach suburbs in Tacoma, Wash (27 miles), in Baltimore to reach suburbs in Rockville, Md. (32 miles), and in New York City to reach Queens (12 miles), lower Westchester County (15 miles) and Nassau County (16 miles).[40] ITC Deltacom uses a switch in Birmingham, Alabama to serve Huntsville (90 miles) and Montgomery (84 miles), and a switch in Columbia, South Carolina to serve Greenville (100 miles) and Charleston, Charlotte, North Carolina (85 miles), and Atlanta, Georgia. (190 miles).[41] Focal Communications uses a switch in downtown Chicago to serve Utica, Illinois (80 miles) and Morocco, Indiana (66 miles).[42]

Switch manufacturers have specifically designed their equipment to meet CLECs' need to serve large geographic areas. *See* Table 5. Nortel's Remote Switching Center-S (RSC-S) "[e]xtends a full complement of host switch features to subscribers up to 650 miles from a DMS-100 or DMS-500 host, [and] up to 100 miles from a DMS-10 host."[43] Lucent's 5ESS "enables a remote switching module to be located in a different Local

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[38] *See, e.g., Telephone Number Portability*, First Report and Order and Further Notice of Proposed Rulemaking, 11 FCC Rcd 8352, 8449 n. 539 (1996) ("A new entrant will employ equipment capable of serving a larger area per switch, and serve fewer customers in each area served by one switch, than incumbent LECs do presently. As a result, one switch of a new entrant could serve all customers in a certain area, while the incumbent LEC must use two or more switches to serve all customers in that area."); Report of Texas Number Conservation Task Force, posted 12/15/97, http://www.npac.com/regions/southwest/swdocs/texas/txNumberConservation.htm ("[CLECs] are likely to provide service using a network architecture which is not a mirror image of the ILEC infrastructure. Specifically, the area served by a CLEC switch is likely to be much larger than that of the ILEC and may/will cover a multitude of existing rate centers.").

[39] *See* Petition of AT&T Corp. to Deny Application at 24, GTE Corp. Transferor, and Bell Atlantic Corp. Transferee, For Consent to Transfer of Control, CC Docket No. 98-184 (FCC filed Nov. 23, 1998) ("Such technology has a range of about 125 miles, which would permit it to be used in conjunction with the contiguous provider' switch in its nearby home territory."). Robert Bork recently reiterated this claim in a letter to the FCC prepared on AT&T's behalf. *See* Memorandum from Robert H. Bork to FCC Chairman William E. Kennard (Apr. 7, 1999).

[40] *See* D. Braun, *Carrier Adds To Network, Broadens Offerings – MCI Goes After Local Phone Market*, InternetWeek, Mar. 3, 1997.

[41] *See* ITC Deltacom, Inc., Form 10-K, Mar. 30, 1998; Rand McNally, *Commercial Atlas and Marketing Guide* (1999).

[42] *See* Focal Communications website, http://www.focal.com/about/af_service_areas.html.

[43] Nortel Networks, *Remote Switching Center-S*, http://www1.nortelnetworks.com/pcn/products/rscs.html.

Access Transport Area (LATA) and up to 600 miles from the host."[44] According to Lucent, this provides "emerging competitors with the ability to expand networks and service offerings cost-effectively, using RSMs where previously this may not have been feasible." Using Castle Network's switching platform, "a CLEC serving Chicago can cost-effectively expand to support the Milwaukee area."[45]

Table 5. CLECs Using Remote Switches

Remote Switch Type	CLEC
Lucent 1AESS Remote	Westel
Lucent 5ESS Remote	ACC National Telecom; Framco; Frontier ; MCI WorldCom; US Xchange
Lucent 5ESS-2000 VCDX	ACC National Telecom; Advanced Telcom Group; Buckeye Telesystem; Business Telecom; Columbia Telecommunications; Dakota Telecommunications; Kings Deer Telephone Company KMC Telecom; LEC Unwired; Multitechnology Services Ovation Communications; Paetec Communications; RCN; US LEC; US Xchange; WinStar; XIT Telecommunication & Technology
Nortel DMS 10 Remote Equipment Module	Cumby Telephone Cooperative; Green Hls Telecom Svc Intermedia
Nortel DMS 10 Remote Line Concentrating Module	Mark Twain Communications Company
Nortel DMS 100 Remote Line Module	CommChoice; Commonwealth Telecom Services; GST; Hawarden Municipal Utilities; Knology MCI WorldCom; Service Electric Telephone
Nortel Remote Line Concentrating Module	Commonwealth Telecom Services; GST
Nortel Remote Switching Center	Advanced Network Communications; Alltel Crystal Communications; Farmers And Business Mens Telephone Company General Communication; Goldfield Access Network GST; Infotel Communications; Intermedia Knology; Lost Nation; MCI WorldCom; MGC Communications Shellsburg Telecommunications
Remote Digital Switching Equipment	Commonwealth Telecom Services; Electric Lightwave Multitechnology Services; Service Electric Telephone

Sources: March 1999 LERG; see Appendix A.

[44] Lucent, *The 5ESS-2000 Switch Product Family*, http://www.lucent.com/netsys/5ESS/family/sm_switch.html.

[45] J. Caron, *Switches Get Personal*, tele.com, Jan. 25, 1999.

C. LATAs Served By CLEC Switches

Current CLEC practices support the conclusion that the effective footprint of a CLEC switch is the entire LATA in which the CLEC switch is located.[46] The effective footprint of a switch ultimately depends on how much it costs to haul traffic from distant points to that switch. Some CLECs read existing tariff and interconnection agreements as entitling them to "free" transport LATA-wide – in their view, the ILEC is required to deliver traffic to the CLEC's switch, wherever it may be located in the LATA.[47] The CLEC, in other words, maintains that its switch should be treated in the same manner as an interexchange carrier "point-of-presence." It has long been settled that an IXC is entitled to serve an entire LATA from a single POP.[48]

We do not address here whether CLECs are in fact entitled to free transport LATA wide; the matter is under investigation in several states.[49] For our purposes, it is sufficient to note that many CLECs do currently take advantage of such arrangements, obtaining NXX codes in one rate exchange area, and leaving it to the ILEC to transport the traffic to a CLEC switch situated in another rate center.[50] Such arrangements permit CLECs to charge local rates to what are, in effect, intraLATA toll calls to a wide variety

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[46] In its analysis of "new entrants in the switched market," the FCC itself reports NXX data by LATA. *See FCC Local Competition Report* at 41-112.

[47] Under section 271, BOCs are not permitted to deliver calls across LATA boundaries. *See* 47 U.S.C. § 271(a).

[48] *See, United States v. Western Elec. Co.*, 552 F. Supp. 131, 228 (D.D.C. 1982) (AT&T Decree § IV(F)); *United States v. Western Elec. Co.*, 569 F. Supp. 990, 1027 n. 192 (D.D.C. 1983) (clarifying that BOCs were required to provide access to only one point per LATA); 47 U.S.C. § 251(g) (preserving equal access and interconnection obligations in place when the Act was passed).

[49] *See, e.g.*, Notice of Investigation at 11, *Investigation into Use of Central Office Codes (NXXs) by New England Fiber Communications L.L.C. d/b/a Brooks Fiber Communications*, Docket No. 98-758, (Maine P.U.C. Oct. 6, 1998) (proposing to outlaw such arrangements on the ground that it "creates a serious risk of erosion of the distinction between local calling . . . and toll calling that is embodied in the ILECs' terms and conditions and in regulatory policy."); *see also* ALJ's Ruling Soliciting Comments on Rating and Routing Issues Pursuant to Decision (D.) 97-12-094, Rulemaking 95-04-043, Investigation 95-04-044 (CA PUC filed July 22, 1998) (investigating such arrangements); First Amended Verified Complaint, *Illinois Bell Telephone Company d/b/a Ameritech Illinois vs. Focal Communications Corp. of Illinois*, Docket No. 98-0526 (Ill. Commerce Comm'n Aug. 3, 1998) (complaining against such arrangements and seeking relief from providing free LATA-wide transport).

[50] The fact that a CLEC is using a switch to originate a call in one rate center and terminate it another further supports the analysis in section A.1 above. With respect to every call that originates and terminates in a different rate center, only one of which contains a CLEC switch, a decision must be made as to which rate center – the originating or terminating – the CLEC switch should be assigned, or whether to assign the switch to both. We have conservatively assigned the CLEC switch to only one rate center –the rate center to which the NXX is assigned.

of customers, including ISPs,[51] voice mail providers, and large business (particularly those with telecommuting employees).[52]

To the extent that CLECs actually do receive free LATA-wide transport from ILECs, the effective footprint of their switches must be expanded accordingly.[53] And attributing a LATA-wide shadow to CLEC switches of course increases, quite significantly, the overall level of competition in the switching market. According to the FCC's data, 87 of 193 LATA are served by 1-4 CLEC switches, 13 LATAs are served by 5-8 CLEC switches, and 4 LATAs are served by 9-12 CLEC switches.[54]

The LERG permits a more detailed, rate-exchange-area-based analysis. Assuming that every CLEC switch is capable of serving all rate exchange areas in the LATA in which the switch is located, 94 percent of all BOC and GTE rate exchange areas in the United States would be served by at least one CLEC voice switch. Eighty percent would be served by at least two CLEC switches. Seventy percent would be served by at least three. Sixty-two percent would be served by four or more. *See* Map 9.

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[51] *E.g.*, Brooks Fiber has obtained NXX codes to attract ISP customers in Maine. *See* Notice of Investigation at 11, *Investigation into Use of Central Office Codes (NXXs) by New England Fiber Communications L.L.C. d/b/a Brooks Fiber Communications*, Docket No. 98-758, (Maine P.U.C. Oct. 6, 1998) (FILL IN).

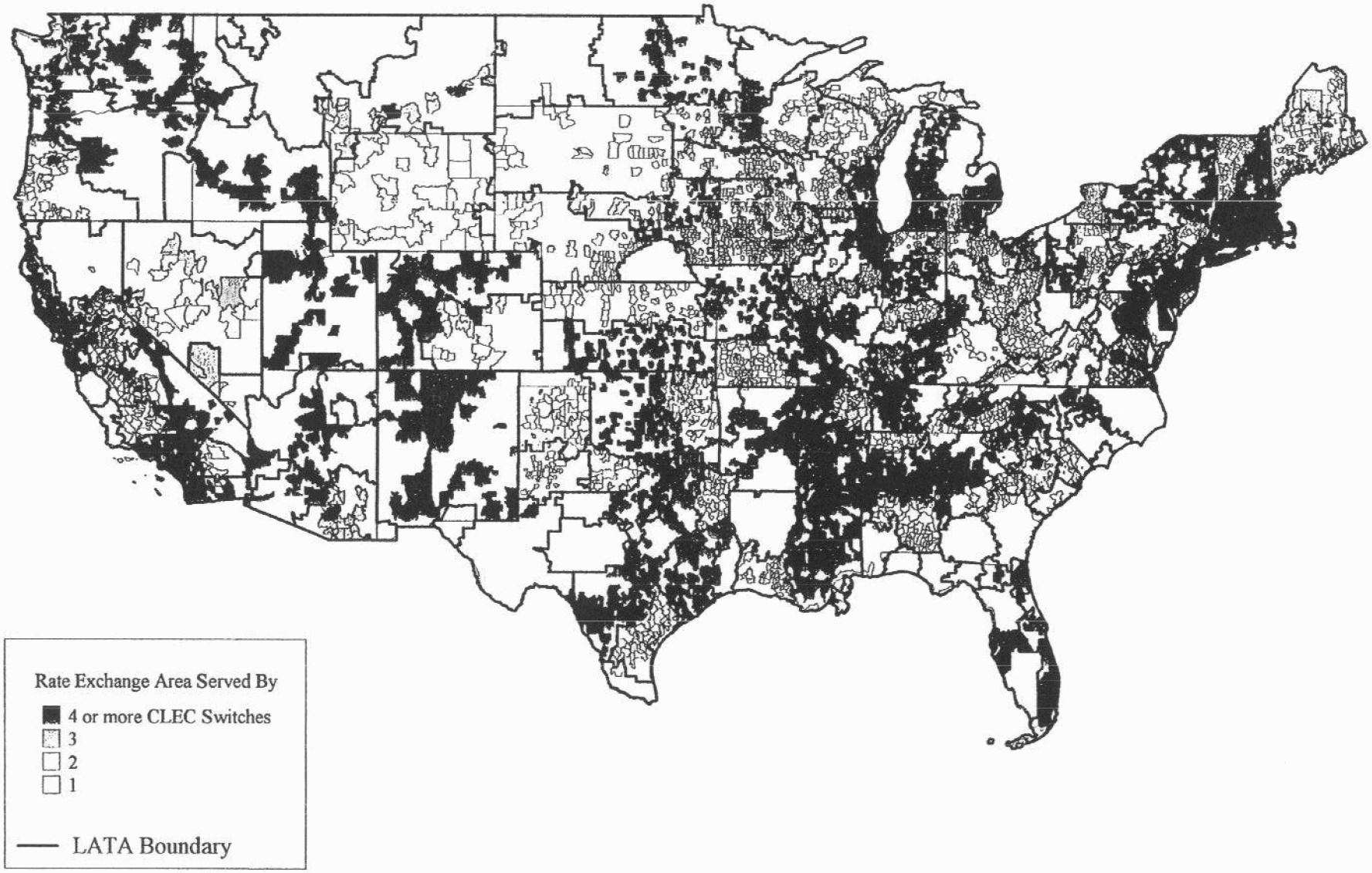
[52] *E.g.*, Focal Communications offers its Virtual Office Service, which its describes as follows on its Web Page:

> Here's how it works: your business is given telephone numbers throughout the city and suburbs, so that your employees always have access to a local telephone number. The employee dials a local Focal telephone number using their residential telephone service. The telephone company central office routes the call to Focal's central office, which in turn routes the call over dedicated T1s from Focal's central office to your business' server. The costs to your business include the T1 trunks between Focal's switch and the server at your business, and the local telephone numbers. The cost to your employee is the cost of an everyday local telephone call they are billed for on their residential telephone bill. If the CLEC's customer is an ISP, voice mail provider, or other entity that re-assigns the number, this would then apply to the customer of that entity, which is indirectly a customer of the CLEC (as it uses the CLEC switch).

[53] Even in the absence of free transport, the LATA may be the appropriate footprint for a single CLEC switch. *See* NewSouth Communications, *Network Strategy*, http://www.newsouth.com/site91498/HTML/strategy.html (NewSouth, a self-described "non-digging switch-based CLEC," has deployed "one full digital switch for each LATA to serve the local market."); *ISPs Strongarm GTE for SS7 Bypass Savings*, Communications Today, Nov. 10, 1998 (noting that, using SS7 networks, CLECs "can backhaul local numbers from an entire LATA region into one location and terminate them all on that one switch.").

[54] *See FCC Local Competition Report* at Table 4.13. We have included only CLECs that have been holding NXX codes for 18 months or more. By contrast, the FCC sums all CLECs holding numbering codes, and reaches the following results: 111 LATAs served by 1-4 CLECs; 28 LATAs served by 5-8 CLECs; 9 LATAs served by 9-12 CLECs; 12 LATAs served by 13 or more CLECs. *See id.* Chart 4.7.

Map 9. Competitively Served RBOC and GTE Rate Exchange Areas Assuming LATA-Wide Footprint of Each CLEC Switch



D. CLECs Can Buy Additional Voice Switches

CLECs may also extend their service territory by deploying new switches. Within BellSouth's region alone, 30 CLECs already have plans to deploy an additional 95 switches.

The market for central office switches is served by numerous manufacturers.[55] Costs have been driven down rapidly by advances in digital technology.[56] On a per-line basis, prices declined over 60 percent from 1986 to 1996,[57] and were projected to fall another 12 percent by 2000.[58] As a result, newer buyers – like CLECs – typically pay less for switching than older buyers – like ILECs.

The three major U.S. switch manufacturers have designed switches specifically with CLEC needs in mind, including the need to start small.[59] Nortel offers the DMS-10 Local Switch "at a price that has put it at the center of the entrepreneurial strategies of Competitive Local Exchange Carriers across North America."[60] Nortel's larger DMS-500 offers "a cost-effective vehicle for cable operators and competitive access providers to quickly enter local exchange markets today."[61] Lucent markets its flagship 5ES-2000 directly to CLECs, noting that "[w]ith a minimal investment in hardware, real estate and staff, emerging competitors can quickly provide telecommunications services and support a large number of customers and services with our 5ESS®-2000 Switches."[62] Siemens' DCO switching system "is a local switching exchange designed to serve the small to medium size markets as well as a low cost solution for Competitive Local Exchange Carriers (CLECs)."[63] These switches support a full range of services -- local, long-

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[55] According to the LERG, CLECs have purchased switching equipment from at least 10 different manufacturers: Alcatel/DSC, Ericsson, Excel, Harris, Lucent, Mitel, Nortel, Northern Electric, Siemens, and Stromberg-Carlson. *See* Appendix A.

[56] *See generally* Deutsche, Morgan, Grenfell, Inc., *Telecom Equipment*, Mar. 27, 1998, at 69.

[57] *See* Northern Business Information, *U.S. Central Office Equipment Market: 1996 Database*, Version 1.0, at 27 (Jan. 1997).

[58] *See id.*

[59] *See* W. Tucker, *Is Switch Partitioning Feasible for CLECs?*, Mar. 1999, http://www.phonelpusmag.com/search/archive/pp/articles/931carri.html ("The wide variety of vendors and products allows a CLEC to acquire a switching solution tailored to fit its customer and market needs.").

[60] Nortel Networks, *PCN: Product Portfolio – DMS-10 Carrier Class Switching System*, http://www1.nortelnetworks.com/pcn/products/dms10.html. According to Nortel, the DMS-10 is "[d]esigned for small to medium applications;" it "provides the competitive service provider with low market entry and overall life cycle cost. This means quick payback and higher operating margins." *Id.*

[61] Nortel Networks, *DMS-500 Local & Long Distance Switch Product Information*, http://www1.nortel.com/broadband/dms/500/product_cc.html.

[62] Lucent, *Build a Flat, Flexible Network*, http://www.lucent.com/netsys/5ESS/family/build.html.

[63] Siemens Information and Communications Networks, *Siemens DCO Solutions*, http://www.icn.siemens.com/icn/products/digital/dco.html. Siemens further describes its switch as "an efficient and economical solution for competitive local exchange carriers (CLECs) seeking to enter switched, integrated services markets," and as "an ideal system for CLECs entering new markets." *Id.*

distance, ISDN, Internet access, wireless, and Advanced Intelligent Network (AIN) Services.[64]

Many of the new, smaller switch manufacturers target the CLEC market exclusively.[65] Castle Networks' C2100 Services Mediation Platform is "designed to extend the range of Class 5 services to smaller markets where it is not cost effective to use 5ESS or DMS 500, while providing a platform for the creation of new services."[66] The C2100 "will enable CLECs to both lower their barriers to entry and enable advanced services."[67] Coyote Technologies' DSS switch "is designed to secure the customer threshold and economic benefits of smaller switches, without some of the feature compromises that smaller switches impose."[68] Coyote's switching solutions "provides CLECs . . . with cost effective, scalable solutions that enable them to enter new markets with revenue-generating services."[69] Sattel manufactures switches designed for CLECs that compete in smaller and medium-sized markets.[70]

CLECs can deploy their own switches much more quickly than some regulators apparently believe.[71] Since the 1996 Act, CLECs and equipment manufacturers have

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[64] *E.g.*, Nortel's DMS-500 can be used to provide both local and long distance services, offering "a cost-effective vehicle for cable operators and competitive access providers to quickly enter local exchange markets today and garner new subscriber revenues." Nortel website, http://www1.nortel.com/broadband/dms/500/product_cc.html. Lucent offers AnyMedia capability for its 5ESS switch, which enables carriers to switch "ISDN voice and data, local voice and long distance calls, Internet access, wireless PCS, Advanced Intelligent Network (AIN) Services, interactive video and multimedia services." Lucent website, http://www.lucent.com/wirelessnet/products/networks/5ess_adv.html. Siemens' EWSD switch "provides a single switch platform solution for local and long distance services. Siemens website, http://www.icn.siemens.com/icn/news/1998/98082402.html.

[65] *See* L. Wirbel, *Startups to Storm Switch Market*, tele.com, Jan. 15, 1999 ("Most of the newcomers are targeting competitive local exchange carriers (CLECs).").

[66] C. Nicoll, *Castle Networks and Verticle Networks Address Turnkey Solutions*, Current Analysis, Jan. 27, 1999, http://www.castlenetworks.com/newsroom/news_reviews/cn012799-01.html. The C2100 starts at $101,500 and is available for customer shipment in July 1999. *Id.* Castle Notes that: "[S]erver-based switches promise carriers very low-cost market entry, particularly into small cities where return on investment (ROI) may appear most risky." The president of Castle Networks noted "CLECs can only compete with incumbents by replacing the old incumbent tools with a new architecture of distributed switches and servers." *Id.*

[67] P. Lambert, *Startup Castle Networks to "Unbundle" Class 5 Switch*, Dec. 1998, http://castlenetworks.com/newsroom/news_reviews/cn120098-02.html.

[68] Coyote Technologies, *Capitalizing on Local Exchange Opportunities*, http://www.coyotetech.com/pressrel/ctpr980309a.asp.

[69] *Id.* Coyote further notes that its DSS can be "readily deployed even in the early days of a carrier launch. It can be installed at a low line threshold – below 500." *Id.*

[70] Sattel explains that: "A scalable switch could enable a market participant to enter into and test a new market at a relatively low initial capital cost per port by purchasing a less expensive switch with a smaller port capacity that could be expanded in the future as the business grows." The Diana Corporation, 1997 Annual Report, at 8 (1997).

[71] *See Local Competition Order*, 11 FCC Rcd at 15705-6, ¶ 411 (citing testimony of Illinois Commission in support of claim that switch purchase and installation can take up to 2 years). The testimony that the FCC relies on refers to the average time for all carriers – ILECs and CLECs – to install

worked together to speed switch deployment times. Lucent has developed "prefab central offices" specifically to reduce installation times for CLECs.[72] According to Lucent, "the entire process, from prefab to the deployment of service takes 40 days."[73] e.spire states that its typical switch installation takes "'[n]o longer than 28 weeks' from the time a competitive provider places an order with its switch vendor to the time the switch is turned up."[74] Many CLECs are now at the stage of deploying remote switches to link up to large units already in operation, and remotes can be put into operation very quickly.[75] Vendors offer systems on a "turnkey" basis, supplying all the technical expertise needed to get switches up and running.[76] Labor markets are of course fluid, too, and CLECs can hire "human capital" away from ILECs or others as they need it. And major CLECs like AT&T and MCI WorldCom acquire the expertise they need by acquiring companies (like MFS and TCG) already fully engaged in local exchange markets.

Equipment manufacturers are helping CLECs finance switch purchases. Industry analysts note that "[w]hen Wall Street runs the other way, CLECs increasingly turn to equipment suppliers for funding. Financing deals were becoming more evident in late 1998 and are expected to continue this year."[77] Lucent has committed to provide up to $2 billion in equipment financing for WinStar,[78] and $250 million for KMC Telecom

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switches, even though CLECs may install switches much more quickly than ILECs because they do not need to perform timely cutovers of existing customers.

[72] *See* Breakaway Strategies, *Prefab COs Speed Market Entry*, Insight, Fall-Winter 1998, at 9 (*quoting* Michael A. Sternberg, president and CEO, KMC Telecom: "Lucent has taken central office technology out of the traditional commercial office space and paced it for transport into four modular, concrete buildings, each measuring 11 feet by 26 feet and weighing 42 tons.").

[73] *Id.* at 10. KMC Telecom, a CLEC that has used Lucent's prefab COs, notes that "[w]ith Lucent's prefab COs, we have been able to chop four to six months off our installation cycle, meet our aggressive service plans and start generating revenues on schedule with our business plans." *Id.* at 9 (quoting Michael A. Sternberg, president and CEO, KMC Telecom). The prefabs "have saved KMC almost 40 percent over traditional methods." *Id.* at 10.

[74] *ASCI Refines Switch Deployment Game Plan, Switching Strategies for C-LECs*, Sept. 1997, www.clec.com/latest/switch/switchindex.cfm (*quoting* Mark Fuller, vice president of switch services management, ACSI). Press Release, *RNK Selects Siemens DCO Central Office Switch for CLEC Network Backbone*, Nov. 11, 1998, http://www.icn.siemens.com/icn/news/1998/98111101.html (*quoting* RNK President Richard Koch as stating that his company obtained a switch from Siemens and was "able to get it up and certified in a month. The people at Siemens really bent over backwards with amazingly dedicated customer service.").

[75] ITC Deltacom notes that remote switches "can be installed more quickly than DMS-500 switches." ITC Deltacom, Inc., Form 10-K, Mar. 30, 1998.

[76] *E.g.*, "[Intermedia's] telecommunications equipment vendors actively participate in planning and developing electronic equipment for use in Intermedia's network." Intermedia Communications, Inc. Form 10-K, filed Mar. 25, 1998.

[77] P. Brown, *Telecom Act Turns Three*, tele.com., Jan. 25, 1999.

[78] *Id.*

(expandable up to $600 million).[79] Nortel signed a three-year, $170 million deal with Net2000 that finances both equipment and professional services.[80] Nortel and Teligent have entered into an equipment purchase and vendor financing contract valued at $780 million over 5 years.[81] Siemens has invested more than $100 million in CLECs.[82] According to one CLEC executive, "One vendor was offering me 125 percent financing, so every time I needed to make payroll, I bought a switch."[83]

E. Additional Substitutes for Incumbent LEC Voice Switches

CLECs can and do provide competition to incumbent LEC switches by deploying equipment other than Class 5 central office switches. Long-distance switches, packet-data switches, wireless switches, and PBXs, can all be used to substitute, in varying degrees, for incumbent LEC switches.

1. Long-Distance Carriers' Switches. Switches like Nortel's DMS-500 and Lucent's 5ESS are now routinely configured to support both local and long-distance services.[84] In January 1997, AT&T introduced its "Digital Link Service," which uses its installed base of 4ESS switches to offer a bundle of local and long distance services.[85] To provide this service, AT&T upgrades its "switches to perform class 5 local-switching functions and . . . [makes] . . . software changes in the private branch exchanges (PBXs) that are located on the customers' premises."[86]

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[79] KMC Telecom to Expand State-of-the-Art Data and Voice Networks, PR Newswire, Feb. 4, 1999.

[80] P. Brown, *Telecom Act Turns Three*, tele.com., Jan. 25, 1999.

[81] L. Luna, Nortel Pays to Play in Broadband Wireless: LMDS Auction Could be Dud, Radio Comm. Report, Nov. 10, 1997, at 1.

[82] P. Brown, *Telecom Act Turns Three*, tele.com.

[83] *Handled Improperly, IPOs Can Hurt, Not Help, CLECs Are Warned*, Communications Today, Feb. 20, 1998 (*quoting* Chris Edgecomb, CEO of Star Telecom).

[84] Sattel's DSS switch "can perform Class 4 switching (when connecting other switches in a tandem configuration) or Class 5 Central Office ("CO") switching (when connecting individual customers to the PSTN)." The Diana Corporation, 1997 Annual Report, at 8 (1997). Carrier Access Corp.'s Access Exchange Nodal Switching software "acts as a tandem switch to a Class 4 toll switch," turning "'Class 4 toll switches into mini local exchange switches." K. Cholewka, *Versatility for Class 4 Switch*, Telephony, Jan. 19, 1998.

[85] AT&T refers to this new service as its "4E local solution" because it provides AT&T with "the ability to take the existing network configurations of [its] large customers [who have dedicated access lines into AT&T's 4ESS switches], add local traffic and route it accordingly." J. Dix and D. Rohde, *AT&T Plots Invasion of Baby Bell Turf, Network World*, July 8, 1996, at 1 (quoting Harry Bennett, vice president and general manager of AT&T's local services division). AT&T trials of the service in 35 states have attracted 2,500 businesses, and AT&T planned to extend the service to 45 states by February 1999. *See* D. Weimer, *AT&T Offers Local Service to Medium, Large Businesses*, The Palm Beach Post, Jan. 28, 1997, at 4B.

[86] Deutsche Morgan Grenfell Inc., *AT&T Corp. - Company Report*, Jan. 29, 1997, at 2. AT&T has described the software changes that must be made to PBXs as "minor" and "easy to implement." *AT&T Ready to Launch Local Phone service for Business Customers*, Jan. 27, 1997, http://www.att.com/press/0197/970127.bsc.html. The credit rating company, Duff and Phelps, explained that "AT&T's Digital Link

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AT&T is already using 34 of its roughly 145 4ESS switches to provide competitive local service in 379 different rate exchange areas.[87] If AT&T opted to use all its existing 4ESS switches to provide local service in addition to long-distance, and served an average of 10 rate exchange areas with each 4ESS, the company would serve approximately 15 percent of the rate exchange areas in BOC and GTE territory.

2. Wireless Switches. All of the major switches in the marketplace today are likewise capable of handling both wireline and wireless communications.[88] Many of the switches that wireless carriers are using are indeed the same switch types that CLECs are using – for example, the Lucent 5ESS, Nortel DMS 100, and Ericsson AXE-10. According to the March 1999 LERG, wireless carriers operate over 3300 switches in the U.S., approximately 2500 of which are owned by carriers other than the BOCs and GTE.

Moreover, wireless and wireline markets are gradually converging, as the price of wireless service continues to fall rapidly.[89] AT&T is already aggressively marketing its "Digital One Rate Plan" as a direct substitute for wireline service.[90]

3. Packet Switches. Data traffic already equals or exceeds voice traffic on phone networks,[91] and the volume of data traffic is growing much faster than voice.[92]

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strategy is not nearly as capital-intensive as building a stand alone network." Duff & Phelps Credit Rating Co., *AT&T – Company Report*, Aug. 13, 1997, at 8.

[87] J. Rendleman, *AT&T: Now for the hard part; Company Business and Marketing*, PC Week, Mar. 22, 1999 (AT&T has 145 4ESS switches); *March 1999 LERG* (AT&T is using 34 of these to provide local service); *id.* (rate exchange area calculation).

[88] Lucent's 5ESS-2000 AnyMedia Platform supports "wireless, landline, gateway, toll, local, advanced ISDN, and other applications coexisting on the same exchange." Lucent website http://www.lucent.com/wirelessnet/products/networks/5ess_adv.html. Nortel's DMS-100 "offers a flexible and cost effective way for a service provider to establish a single point of presence in both traditional wireline and wireless markets." Nortel website, http://www1.nortelnetworks.com/pcn/products/dms100.html. Ericsson's AXE is "a vital part in next generation networks, the strategy behind Ericsson's commitment to bridging telecom and data in fixed and mobile networks." Ericsson website, http://www.ericsson.se/switching/. The Siemens EWSD digital switch can serve as "a platform for all call processing applications." Siemens website, http://www.siemens.de/ic/networks/products/carriswn/index.htm. Alcatel's 1000 switch handles "mobile switching, fixed switching, data switching, and value-added IN-based services." Alcatel website, http://www.alcatel.com/telecom/ssd/products/highlit/multifunctiona/.

[89] The FCC's Wireless Bureau has noted that "wireless and wireline technologies are increasingly competing for a single pool of minutes-of-use," and that "wireless providers can compete for local access by creating pricing plans that encourage their customers to use mobile phones as substitutes for wireline phones." *Implementation of Section 6002(b) of the Omnibus Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services*, Third Annual CMRS Competition Report at 27-28, FCC 98-91, (rel. June 11, 1998). *See also* Section III.B.2 of this report.

[90] In announcing the plan, AT&T Chairman Michael Armstrong stated that one of AT&T's target groups for this service is those customers who see PCS service as a replacement for wireline service. According to Mr. Armstrong, "[p]retty soon, someone's going to wonder why that [wireline] phone is sitting there." *AT&T Wireless Joins Sprint PCS in Single-Rate Offer, But Adds Contracts*, Communications Daily, May 8, 1998, at 7-8.

Packet switches thus already compete directly with circuit switches for at least one major segment of traffic. Fast packet networks will soon occupy center stage, not only for data traffic, but for voice too.[93]

Long-distance carriers, ISPs, and CLECs – not ILECs – are the major buyers and operators of packet switches.[94] Precise counts are not available, however. According to New Paradigm Resource Group's *1999 CLEC Report*, CLECs had deployed 874 data switches as of December 1998.[95] By comparison, the LERG reports that the BOCs and GTE have deployed 663 packet switches.[96] But both sources vastly understate the extent of competitive packet switching, because neither counts ISPs or Internet backbone operators.[97]

AT&T currently ranks as the nation's largest provider of frame relay switching services,[98] followed by Sprint and MCI WorldCom.[99] These switches are already being

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[91] *See, e.g.*, Address of FCC Chairman William E. Kennard, National Telephone Cooperative Association, Annual Meeting, Feb. 10, 1999 ("[L]ast year, Internet data traffic eclipsed voice traffic on phone lines."); J. Kedersha, et al., Cowen & Company, Crosskeys – Company Report, Rpt. No. 2647958, at *4 (Mar. 18, 1998) ("Data traffic now exceeds voice traffic for US carriers.").

[92] *See, e.g.*, First Marathon Securities Ltd., *Voice Over Internet Protocol*, Dec. 11, 1998, at 2 ("within the next three years, IP data traffic is forecast to outstrip voice traffic several times over."); Remarks of Commissioner Susan Ness Before the Policy Summit of the Information Technology Association of America, Washington, DC, Mar. 30, 1998 ("While voice traffic increases at a modes pace of 8 or 10 percent a year, data traffic is skyrocketing.").

[93] As AT&T CEO Michael Armstrong has noted, "we're going from the circuit switched world to a packet world." Remarks of AT&T Chairman & CEO, Michael Armstrong, *Networking: The New Generation Comes of Age*, Jan. 26, 1999, www.att.com/speeches/99/990126_cma.html.

[94] One leading manufacturer of packet switches, FORE Systems, has estimated that half of its service provider revenue comes from emerging carriers such as CLECs and cable operators. *See* Painewebber Inc., *Network January Review - Industry Report*, Report-No: 2624791. Ascend sells "primarily to ISPs and competitive local exchange carriers (CLEC)." T. Greene, *Ascend Buys Clout In Carrier Markets*, Network World, Aug. 10, 1998. Another major packet switch manufacturer, 3Com, has launched a series of product offerings intended exclusively for CLECs. *See* Furman Selz LLC, *Telecommunications/Competitive Local Exchange Carriers*, Report No. 2653156, Jun. 16, 1998.

[95] *See 1999 CLEC Report* at Ch. 6, pp. 15-16.

[96] The LERG lists CLECs as having 50 packet switches as of March 1999.

[97] The *1999 CLEC Report* does not count the vast packet-switched networks of the two largest CLECs – AT&T and MCI WorldCom. LERG counts only switches that interconnect with long-distance switches; the purpose of the LERG is to enable long-distance carriers to route calls to specific switches. And many, if not most, packet switches are used in private networks, which would not be registered in the LERG.

[98] On March 23, 1999, AT&T announced that it would begin providing "local" ATM Service in 41 cities using AT&T's "existing" switching platform. AT&T, News Release, AT&T First To Provide Seamless End-to-End Asynchronous Transfer Mode, Mar. 23, 1999. In the Fall of 1998, AT&T announced that it would provide local frame relay services. AT&T Press Release, *AT&T First to Offer Seamless 'Any-Distance' Frame Relay Service, Extends Reach with Loacl Frame Offer*, Nov. 23, 1998. MCI WorldCom has likewise announced the availability of its Metro ATM service in more than 350 cities nationwide. The service lets customers connect to other business sites within the same LATA.

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deployed to siphon local voice traffic off ILEC voice networks.[100] Numerous other CLECs have announced major investments in packet switches to provide IP telephony in addition to circuit-switched local-service offerings.[101] Overall, packet switches are much more cost-efficient than circuit switches, and therefore even easier for CLECs to deploy.[102]

4. PBX Systems. PBX systems compete directly with switch-based Centrex services. The FCC has reached this conclusion.[103] So have numerous state commissions.[104] And analysts recognize that PBX and Centrex offer "essentially the

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[99] *See* J. Rendleman, *Sprinting Forward; Sprint Data Services Strategy Leverages Core Networking And Technological Capabilities*, PC Week, Jul. 20, 1998, at N29 ("Sprint was the second-largest provider, behind AT&T, of frame relay services in terms of U.S. revenues, with 20.2 percent of the total $2.5 billion frame relay market. In ATM revenues, Sprint had 21.7 percent of the overall $183.5 million U.S. market in 1997, again second only to AT&T, according to Vertical Systems Group, in Dedham, Mass.").

[100] *See, e.g.*, *Bridging the Edge*, America's Network, Mar. 1, 1999 ("AT&T, Sprint, and MCI WorldCom are all calling for ATM at the business premises, so they'll be bringing voice calls in over ATM signaling."); K. Gerwig, *Executive Orders – A New Survey Reveals What IT Executives Want-And Fear-From Convergence*, tele.com, Feb. 22, 1999 (AT&T's new Integrated Network Connection (INC) lets business customers "buy a single AT&T network connection to combine their voice with frame relay and Internet data traffic over an ATM circuit that extends to their premises.").

[101] Sprint invested $2 billion to construct its ION network, which will "carry pin-drop quality voice traffic over an ATM network and seamlessly connect to any public switched network. Sprint claims its ION "will obsolete the telcos' traditional circuit-switched networks." R. Higgins, *Paying the Piper*, Communications News, at 36 (Feb. 1, 1999). MCI WorldCom offers "On-Net" services, which "allows business customers to combine voice and data traffic from local U.S. and international locations onto one seamless, end-to-end network." WorldCom Press Release, *MCI WorldCom Unveils New "On-Net" Communications Services For Businesses*, Sept. 28, 1998. Intermedia claims "the highest [packet] switch density in the industry," and boasts "more frame relay nodes in place than the combined total of America's top three local telephone companies." Intermedia Communications, *At A Glance*, http://www.intermedia.com/pressroom/ataglance.html.

[102] *See, e.g.*, P. Brown, *Telecom Act Turns Three*, tele.com (second-generation CLECs are developing "much cheaper" alternatives to Class 5 switches, such as ATM switches); Intermedia Communications, Inc. Form 10-K, filed Mar. 25, 1998 ("An ATM switch can handle approximately ten times as many calls as a voice switch and costs approximately one tenth as much as a voice switch"); R. King, *Data Leaves Voice Standing Still*, Headend, Jul. 1998 (*quoting* Level 3 CEO James Q. Crowe: "Packet switching has a better performance/cost ratio than ATM or conventional class 4/5 switches, and the difference is growing.").

[103] *See, e.g.*, *Amendment of Part 69 of the Commission's Rules Relating to Private Networks and Private Line Users of the Local Exchange*, Notice of Proposed Rulemaking, 2 FCC Rcd 7441, 7447 (1987) (decision to apply the surcharge to Centrex leakage as well as PBX leakage was "based upon a recognition that Centrex and PBX switches competed directly with one another."); *Id.* (Centrex-ETS, and PBX-ETS switching services "are increasingly being used to provide similar switching functions for customers . . . The switching services appear to be directly competitive . . ."); *KLF Electronics v. Indiana Bell Telephone*, Memorandum Opinion and Order, 1 FCC Rcd 502, 502 n.3 (1986) ("Centrex service performs some of the same functions performed in a PBX, and therefore telephone exchange carriers offering Centrex compete with companies . . . that provide PBX switches.").

[104] *See, e.g.*, Indiana, Cause No. 37558, Mar. 20, 1985 (finding that PBX and Centrex are competitive alternatives to one another and that "therefore the market for Centrex is also highly competitive."); Ohio, Case Nos. 89-719-TP-ATA and 89-720-TP-AEC, May 31, 1989 (finding that Centrex

same capabilities."[105] As of year-end 1997, there were nearly 44 million installed PBX lines in the United States.[106]

PBXs can serve the needs of companies both large and small.[107] Many new PBX vendors have developed PC-based products designed for small and mid-sized businesses with 100 workstations or fewer.[108] Altigen sells a PBX called "AltiServ" which was described by PC Magazine as superior to traditional PBXs in "product maturity, usability, and price."[109] Centrepoint Technologies sells a "micro PBX" to small businesses for under $500.[110] These products offer features that a traditional PBX cannot offer, such as web access to voice mail.[111] PBX systems are now available for as few as two lines, and can be created with small hardware and software additions to Windows-based PCs.[112]

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switching and features should be classified as competitive and should be granted contract pricing authority for such services.).

[105] G. Lawyer, *CLECs Fashion Centrex Services for Small Businesses, National Customers*, 1998, www.phoneplusmag.com/search/archive/xc/articles/8c1feat3.html. *See also*, H. Peterzell, *Centrex III – Some Other Considerations*, May 8, 1998, http://www.phonehelp.com/p-1-31.htm ("I know of nothing that can be accomplished with either of these technologies [PBX and Centrex] that cannot be accomplished with the other. Functionality, interestingly enough, is not a consideration.").

[106] Multimedia Telecommunications Association, *1998 Multimedia Telecommunications Market Review and Forecast*, at 92 (1998). Between 1994 and 1997, PBX line shipments have grown at a compounded annual rate of 10.3 percent. *See id.* at 90. That growth rate accelerated in 1998. *See* M2 Presswire, *Telecommunications Manufacturers Continue to show Steady Growth*, Jan. 14, 1999.

[107] *See 1998 Multimedia Telecommunications Market Review and Forecast* at 94 ("The PBX can be used by small companies to serve their basic call-control needs by providing a system to handle voice messaging, voice mail, fax, and e-mail with protection from obsolescence. The PBX is also appropriate for large companies that may have more sophisticated needs with respect to the integration of voice and data.").

[108] W. Hersch, *PC PBX Progress*, Computer Reseller News, Mar. 29, 1999 http://www.techweb.com/se/directlink.cgi?CRN119990329S0059.

[109] Altigen Communications, Inc. http://www.altigen.com.

[110] Compugalaxy Home Page, http://projects.netxactics.com/compugalaxy/listproducts.asp.

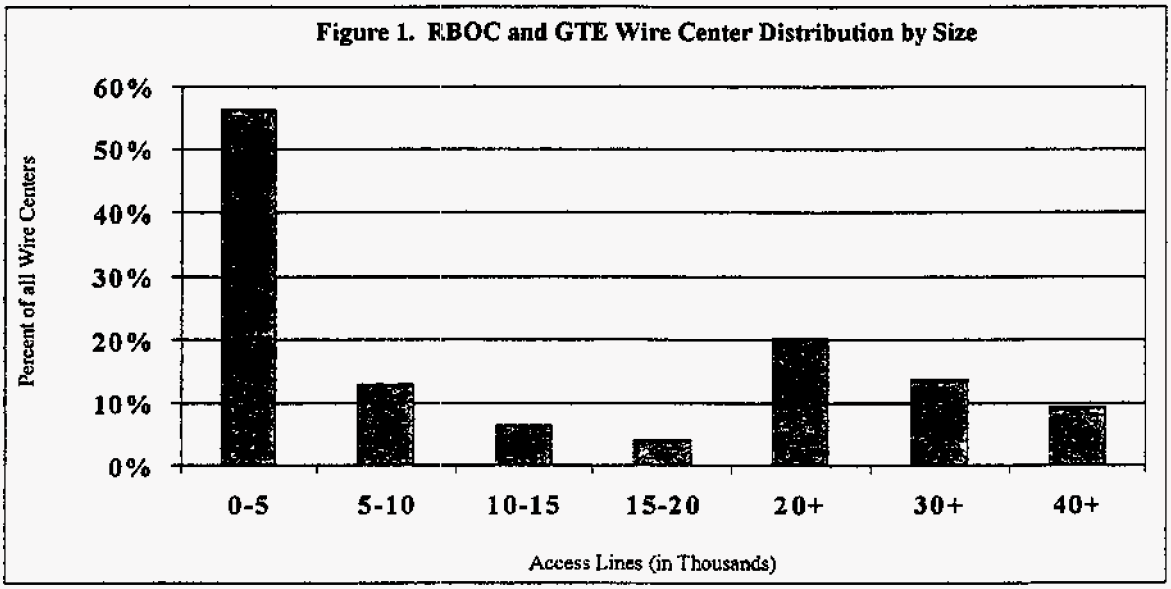
[111] *See* R. Tehrani, *The Voice/Data Switch: Your Next PBX*, Call Center Solutions, Vol. 17, No. 7, at 14.

[112] *See, e.g.*, Alactel, *Online Product Guide, Alcatel 2740/2750*, http://www.alcatel.com/telecom/mbd/products/products/opg/products/2740.htm (describing PBX-equivalents "for residential and small business" with a "maximum of 2 analog trunk lines and 8 extensions"); Press Release, *Netphone Introduces Telephony Industry's First ISDN PCI Board for Windows NT-Based PBXs*, http://www.netphone.com/press.htm (describing PC-based PBX system); *Artisoft Wins Two Product of the Year Awards from CTI Magazine; Televantage and Visual Voice Products Recognized for Technical Innovation*, Business Wire, Feb. 2, 1999 (describing TeleVantage, a PC-PBX application, that serves up to 48 trunk lines and 144 extensions).

II. INTEROFFICE TRANSPORT

The FCC has defined the interoffice transport UNE to comprise links between ILECs' and requesting carriers' wire centers or switches, and between ILEC switches.[1] The availability of competitive interoffice transport is most reasonably evaluated at the level of the individual "wire center serving area." A "wire center" is an end office where local loops terminate at an ILEC switch.[2] A "wire center serving area" is the geographic area served by those loops.[3] *See* Figure 1.

Figure 1. RBOC and GTE Wire Center Distribution by Size



Local competitors began deploying fiber networks in urban markets nearly 15 years ago. Since 1996, both the number of alternative suppliers of interoffice transport, and the areas served by such suppliers, have grown significantly.

For the reasons set out below, it is reasonable, and conservative, to conclude that competitive interoffice transport is available to and from ILEC wire centers that (a) contain competitive fiber and (b) have attracted one or more collocated CLECs. We have been able to establish – conservatively, and with a high degree of confidence, that CLEC collocation in "dense" wire centers is a very reliable indicator of the presence of competitive fiber in those wire

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[1] *See* 47 C.F.R. § 51.319(d)(1)(i) (defining dedicated transport as "transmission facilities . . . between wire centers owned by incumbent LECs or requesting telecommunications carriers, or between switches owned by incumbent LECs or requesting telecommunications carriers."); *id.* § 51.319(d)(1)(ii) (defining shared transport as "transmission facilities . . . between end office switches, between end office switches and tandem switches, and between tandem switches, in the incumbent LEC network.").

[2] *See Newton's Telecom Dictionary* 671 (11th ed. 1996).

[3] *See id.* Wire centers vary widely in size, from fewer than 500 lines in rural areas, to over 300,000 in the most densely populated urban areas.

centers. A reasonable threshold for "dense" wire centers lies in the range of 20,000+ to 40,000+ lines served, but varies from region to region.

A. Economic and Regulatory Background

When the Bell System was broken apart in 1984, the objective was to separate actually or potentially competitive portions of the national network from those that were still thought to be part of a natural economic monopoly.[4] MCI argued at that time that the dividing line lay at the Class 5 switch.[5] In other words, it maintained that the entire interoffice transport market – all transport currently encompassed by the FCC's interoffice transport UNE – was capable of attracting facilities-based competitors – companies like MCI itself. Though its own network was still quite limited at the time, MCI enthusiastically endorsed that conclusion. Delineating between local and long-distance at the level of the Class 5 switch, MCI insisted, was a practice "well-established in the telecommunications industry."[6]

To accelerate entry into the long-distance market, however, the Department of Justice decided to draw the initial line one tier higher up in the network – at the level of the Class 4 switch. LATAs were defined accordingly.[7] The Department adopted 100,000 telephone stations as the "guideline minimum size" for a LATA.[8]

The Department and Judge Greene recognized, however, that competition could extend well below that level, and they welcomed the possibility.[9] State regulators began to reach similar conclusions soon thereafter.[10] New York authorized interoffice competition in 1985,[11] and that year Teleport built facilities in lower Manhattan, where the most concentrated wire centers in the nation reside. By 1990, CLECs had deployed 20 networks in 15 cities.[12] In 1991, the FCC

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[4] The decree accordingly restricted the BOCs "from engaging in any non-monopoly business so as to eliminate the possibility that they might use their control over exchange services to gain an improper advantage over competitors in such businesses." *United States v. AT&T*, 552 F. Supp. 131, 143 (D.D.C. 1982).

[5] *See* Objections of MCI Communications Corporation to Application for Approval of Exchange Areas, *United States v. Western Elec. Co.*, No. 82-0192 (D.D.C. Nov. 3, 1982).

[6] *Id.* at 9.

[7] No LATA was to "be smaller than the geographic region . . . served by an existing AT&T Class 4 Office." Competitive Impact Statement at 30, *United States v. Western Elec. Co.*, No. 74-1698 (D.D.C. Feb. 10, 1982).

[8] *See* Response of the United States to Comments Received on the BOC LATA Proposals at 16-17, *United States v. Western Elec. Co.*, No. 82-0192 (D.D.C. Nov. 23, 1982).

[9] *See, e.g., United States v. AT&T*, 552 F. Supp. at 175 & n. 185 ("eventually . . . bypass technology may permit interconnection to all subscribers. . . . If and when bypass technology becomes technically and economically feasible for widespread use, it should have the effect of reducing telephone costs and charges across the board, to the benefit of consumers, the economy, and the nation."); Competitive Impact Statement at 31, *United States v. Western Elec. Co.*, No. 74-1698 (D.D.C. Feb.10, 1982) ("Technological change presently underway, however, may cause the local distribution function of the divested BOCs to lose its monopoly character and, perhaps, eventually result in its deregulation.").

[10] By August 1986, sixteen states had decided to permit intraLATA competition. *See* Semilof, *IntraLATA Competition: Lata Barrier Falls*, Network World, Aug. 25, 1986, at 11.

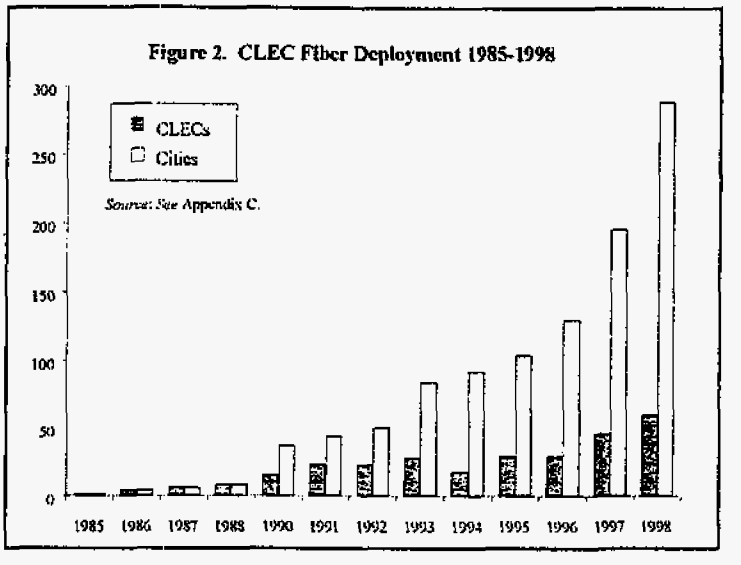
[11] *See* Case 28891, *Teleport Communications* (NYPSC Jan. 7, 1985).

[12] *See* U.S. Department of Commerce, *U.S. Industrial Outlook* at 33-7 (1990).

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found that "[r]ecent changes" – "most importantly, fiber optic technology" – "have facilitated the development of competition in the provision of [local access] facilities and services."[13]

In 1994, in its *Expanded Interconnection* proceedings, the Commission again recognized both the feasibility and the actuality of competition in the local market for interoffice transport. "[I]nterconnectors now are able to provide special access and switched transport transmission services in competition with the LECs,"[14] the Commission found. The underlying economics of the interoffice transport market, the Commission concluded, suggested that competition "could develop more rapidly than"[15] it previously had in long-distance markets. And indeed, by 1995, 29 CLECs had deployed fiber-optic networks in 104 cities. *See* Figure 2. Again in 1996, in its *Local Competition Order*, the FCC expressly found that "there are alternative suppliers of interoffice facilities in certain areas."[16]



[13] *Expanded Interconnection with Local Telephone Company Facilities*, Notice of Proposed Rulemaking and Notice of Inquiry, 6 FCC Rcd 3259 (1991).

[14] *Expanded Interconnection with Local Telephone Company Facilities*, Third Report and Order, 9 FCC Rcd 2718, 2719 ¶ 4 (1994).

[15] *Expanded Interconnection with Local Telephone Company Facilities*, Report and Order and Notice of Proposed Rulemaking, 7 FCC Rcd 7369, 7380 n.37 (1992).

[16] *Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, First Report and Order, 11 FCC Rcd 15499, ¶ 441 (1996). *See also Applications of NYNEX Corporation Transferor, and Bell Atlantic Corporation Transferee, for Consent to Transfer Control of NYNEX Corporation and Its Subsidiaries*, Memorandum Opinion and Order, 12 FCC Rcd 19985, 20042 ¶ 111 (1997) ("there are already a number of competitors offering [transport] services, and individual interexchange carriers (including MCI) often choose particular providers to carry large amounts of traffic on a dedicated basis.") (*"Bell Atlantic NYNEX"*); *1993 Annual Access Tariff Filings*, Memorandum Opinion and Order, 1997 FCC LEXIS 4665 (rel. April 17, 1997) (transport services "face increasing competition").

Since 1996, the availability of alternative facilities has continued to grow rapidly. New competitors such as Qwest, Level 3, Enron, MFN, and IXC "are in the midst of a fiber-building frenzy."[17] Electric utilities – which "own the third-largest telecom infrastructure in the nation"[18] – and cable companies[19] have also sold fiber to CLECs.[20] Dark fiber has become a commodity that CLECs can purchase in a rapidly expanding wholesale market.[21] *See* Table 1. The use of fixed wireless radio technologies also has grown rapidly.[22] As described below, companies like WinStar and Teligent have built local networks using predominantly fixed wireless links, while established CLECs such as AT&T and MCI WorldCom are using fixed wireless connections to extend their existing fiber networks. (*See* Table 3, infra.)

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[17] J. Akasie, *Lighting Up*, Forbes, Apr. 19, 1999.

[18] *Id.*

[19] *See, e.g.*, Frontier Communications Press Release, *Frontier Turns Up Western Half of the "Optronics" Network; Capacity Swap with WTCI Adds 1,661 Network Miles and a Third Ring in the Northwest*, June 22, 1998 (discussing Frontier's exchange of fiber with TCI subsidiary on the Seattle-Billings-Denver route); Williams Press Release, *Williams Acquires High-Capacity Fiber Route from MediaOne, Extends National Network to Key Southeast Markets*, July 27, 1998 (describing Williams' purchase of fiber in Florida from MediaOne).

[20] *See, e.g. id.* (Montana Power's subsidiary, Touch America, wholesales fiber); American Electric Power, *AEP Communications*, http://www.aep.com/global/communications/comm.html (American Electric Power wholesales fiber capacity to IXCs, CLECs and wireless providers); ICG Communications, *ICG Telecom Group*, http://www.icgcom.com/telecom/corpinfo/AboutUs.html; ICG Communications Press Release, *ICG Communications Announces Fiber Network Project in Atlanta*, Jun. 11, 1997 (ICG acquires fiber from Southern California Edison, Alabama Power, and American Electric Power).

[21] According to some estimates, "35% of the fiber already in the ground is 'dark.'" C. Mack, *Fiber Frenzy*, Forbes, Apr. 19, 1999, at 252. Since June 1998, "the wholesale spot price of bandwidth is down 35%, thanks to ample supply." *Id.* Bandwidth is now sold as a commodity through numerous clearinghouses, including Arbinet, AT&T Global Clearinghouse, GRIC Communications, IXTC WweXchange, and Ratexchange RTBX. *See* K. Henderson, *Market Makers Push "Telecommodities,"* Phone+ Magazine, Dec. 1998.

[22] The FCC recognized as early as 1991 that wireless radio was being used to bypass LEC networks. *See, e.g., Expanded Interconnection with Local Telephone Company Facilities*, Notice of Proposed Rulemaking and Notice of Inquiry, 6 FCC Rcd 3259 n.3 (1991) (End users also use microwave and other radio-based facilities in lieu of LEC access services in some cases."); *see also Expanded Interconnection with Local Telephone Company Facilities*, Report and Order and Notice of Proposed Rulemaking, 7 FCC Rcd 7369, 7372 ("technological advances" such as "fiber optic and radio networks" "compete with existing LEC services.").

Table 1. Major Suppliers of Dark Fiber		
	Fiber Network	**CLEC Purchasers**
Frontier Corp.	20,000 route miles planned (interconnecting 120 major cities), 57 percent lit	• Level 3 Communications (8,300 route miles of fiber)
GST Telecommunications	5,751 route miles (including network currently under construction)	• FTV (owned by Williams, Enron, and Touch America) (745 route miles in California)
IXC Communications	10,200 route miles (16,400 miles by the end of 1999) IXC is currently in 36 of the top 50 MSAs and 57 of the top 100 MSAs	• Electric Lightwave (20 years, $101 million and 2,800 route miles of fiber) • Telco Communications Group (3 years) • STAR Telecommunications (20 years, $31 million, covering Los Angeles, Dallas, Atlanta, Miami, Phoenix and other areas) • Digital Teleport ($33 million, 3 years) • Level 3 Communications (7,355 route miles of fiber) • Time Warner (2 years) • RSL Communications (10 years)
Level 3 Communications	1,300 route miles (nearly 16,000 mile intercity network by first quarter of 2001)	• INTERNEXT ($700 million for capacity over the entire route) • PSINet (3 year, 10,000 miles)
Metromedia Fiber Network	650 route miles/230,000 fiber miles (expanding to over 1 million fiber miles)	• Allegiance (Dallas and New York) • Time Warner (20 years in the New York/New Jersey metropolitan areas) • Intermedia ($56 million, covering Boston, Chicago, New York, Philadelphia, San Francisco, Silicon Valley and Washington) • Hyperion (Chicago, New York and Washington) • e.spire ($29 million, covering New York, Philadelphia and fibers on the New York to Baltimore intercity corridor) • WinStar (25 years, $40 million, covering Chicago, New York, Washington, Philadelphia, and San Francisco)
Qwest Communications	15,000 route miles (18,815 by mid-1999)	• Advanced TelCom Group ($63 million, 7 years) • STAR Telecommunications (20 years, $85 million) • Sprint • MCI • AT&T • ELI ($122 million)
Williams Communications	20,000 route miles (32,000 route miles connecting 125 cities by the end of 2000)	• WinStar ($640 million for four strands of fiber over approximately 15,000 route miles) • Intermedia (20 years, $450 million, IRU on nationwide network) • Frontier ($68 million and 3,000 route miles through Houston, Atlanta, Tampa and Miami) • UniDial

B. A Methodology for Determining Where CLEC Fiber Offers an Alternative to ILEC Interoffice Transport

CLECs have deployed fiber in all major metropolitan areas, and the overwhelming majority of second and third tier markets. Indeed, CLEC fiber networks extend far beyond the level of "interoffice" transport – these networks serve not only ILEC and CLEC offices, but a great number of private switches too. Indeed, they serve nearly 15 percent of all commercial office buildings in the country.[23]

Since 1996, the number of CLECs that have deployed fiber networks has grown from 29 to 60, and the number of cities served by this fiber has grown from 130 to 289. *See* Figure 2. Within the top 50 MSAs, CLECs have deployed nearly 30,000 miles of fiber. *See* Appendix A. Forty seven of the top 50 MSAs are served by at least three CLEC fiber networks; 29 are served by five or more CLECs; 16 are served by seven or more.[24] *See* Appendix A. CLECs have deployed fiber in all but 15 of the MSAs ranked between 51 and 150.[25] *See* Appendix B.

CLEC fiber provides competitive interoffice transport to the ILEC wire centers that it reaches. CLEC fiber invariably reaches all major interexchange carrier POPs as well. And CLECs can provide transport between the ILEC switches to which they connect, by using the CLEC switch as a tandem. In practice, however, there is little if any use of the UNE for transport between pairs of ILEC switches.[26] CLECs that require transport among ILEC switches generally hand off the traffic to the ILEC. CLECs actually use the interoffice transport UNE mainly to make connections: (1) between a CLEC switch and an ILEC switch, or (2) between CLEC facilities collocated in an ILEC central office and an interexchange carrier point of presence (POP).

Nobody doubts that competitive alternatives are available in some segments of the market for interoffice transport. The practical difficulty lies in determining precisely where. Regulators do not maintain comprehensive maps of precisely where CLEC fiber routes run nationwide.[27] The maps that are available quickly become obsolete – this is a very dynamic market, and CLECs are continuously extending their networks.

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[23] *Compare* New Paradigm Resources Group, *1999 CLEC Report*, at Ch. 6 p. 23 (10th ed. 1999) ("*1999 CLEC Report*") (104,097 office buildings served by CLECs) *with* U.S. Dep't of Commerce, *Statistical Abstract of the United States 1998*, 118th ed., at Table 1229 (Oct. 1998) (705,000 commercial office buildings nationwide).

[24] Royce Holland, CEO of Allegiance Telcom, states: "In Tier I markets today there is a tremendous glut of capacity." W.T. Scott, et al, ING Baring Furman Selz LLC, Investext Rpt. No. 2787890, *Telecommunications/Fiber Vs. Fiberless* (Sept. 30, 1998).

[25] MSAs 51-150 range in population from 489,000 to 1.1 million. *See* Rand McNally, *Commercial Atlas & Marketing Guide 1999*, 130th ed. at 60 (1999).

[26] The only important exception is when one of the ILEC switches is collocated with an IXC POP.

[27] The FCC, for example, collects information only on the amount of fiber CLECs have deployed, not on where it has been deployed. *See* J. Kraushaar, *FCC Fiber Deployment Update End of Year 1997* at 2 (Sept. 1998). Moreover, CLECs generally do not provide this information. For example, at least 65 of approximately 120 facilities-based CLECs profiled in the *1999 CLEC Report* do not even report how much fiber they have in each city they serve, and only a handful of CLECs provide fiber maps of any variety. *See 1999 CLEC Report* at Ch. 11.

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But complete maps are not needed. Both the ILECs and the Commission compile reliable data, frequently updated, on where CLECs have obtained collocation.[28] And we have been able to establish – conservatively, and with a high degree of confidence, that CLEC collocation in "dense" wire centers is a very reliable indicator of the presence of competitive interoffice transport.[29] Different ILECs serve different demographic areas, and what constitutes a "dense" wire center in each ILEC's territory may therefore vary. In the following analysis, we present three alternative definitions of "dense" wire centers: centers with 20,000+, 30,000+, and 40,000+ lines.

A CLEC that is going to provide its own interoffice transport will, with very few exceptions, initiate the transport at a collocation cage.[30] Royce Holland, one of the founding fathers of the CLEC industry, describes the strategy as follows:

> We enter the market and put in switches, routers, both central office and frame-relay switches. We co-locate in a huge number of COs. We've targeted over 500 central offices to be in within the next few years. It represents a huge addressable market and then we go out and lease capacity initially, and as we reach the crossover point in terms of traffic, we either lease dark fiber or overbuild it. For instance, in New York, the crossover point is 40,000 lines. We have already moved to stage two, in which we acquired dark fiber from Metromedia Fiber Network.[31]

It therefore makes sense to begin any analysis of competition for interoffice transport with the fact of collocation. The FCC's December 1998 *Local Competition Report* finds that CLECs (as of mid-year 1998) had operational collocation arrangements in some 5000 wire centers.[32]

Three major ILECs – Bell Atlantic, SBC, and U S WEST – have compiled quite comprehensive, and reasonably current information on CLEC fiber routes within their regions.[33] These fiber-route maps can be superimposed on top of the corresponding ILEC wire-center-boundary maps. And we can superimpose maps that show which wire centers have attracted

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[28] All proprietary information regarding competitors' taking of collocation and ILEC UNEs was kept strictly confidential, and is presented only in aggregate form in this report.

[29] Under the FCC's *Expanded Interconnection* regime, CLECs were indeed required to bring in fiber to central offices in which they obtained collocation. *See, Expanded Interconnection with Local Telephone Company Facilities*, Report and Order and Notice of Proposed Rulemaking, 7 FCC Rcd 7369, 7409-10, 7413-14 (1992).

[30] *See, e.g.*, W.T. Scott, et al, ING Baring Furman Selz LLC, Investext Rpt. No. 2787890, *Telecommunications/Fiber Vs. Fiberless* (Sept. 30, 1998) (*quoting* WinStar CEO, Bill Rouhana: "The fundamental underpinning of the strategy of most fiber-based companies in the industry today is that we will build to a central office, and we will co-locate with a regional bell operating company.").

[31] *Id.* (*quoting* Allegiance Telecom CEO Royce Holland).

[32] FCC, Industry Analysis Division, *Local Competition*, at 6 (Dec. 1998) ("*FCC Local Competition Report*").

[33] Together, these three BOC regions comprise 35 states and the District of Columbia and 47 percent of all BOC and GTE wire centers.

CLEC collocation. We can then count – one by one – the wire centers through which CLEC fiber passes, and in which CLECs have also obtained collocation.

What we find is a reasonably good fit between wire centers with CLEC collocation and wire center serving areas that contain CLEC fiber.[34] In SBC's region, for example, we're able to confirm that at least 90 percent of wire centers with collocation serve areas in which CLEC fiber is also found. In Bell Atlantic's region, we can confirm that the figure is at least 75 percent. In U S WEST's region, we can confirm that the figure is at least 65 percent.

This good fit becomes better still if we restrict the focus to "dense" wire centers. *See* Table 2.

Table 2. Wire Centers with Collocation by Region

	Total wire centers	Wire centers with collocation (% of total)	Wire centers with 40,000+ lines (% of total)	Wire centers with 40,000+ lines and collocation (% of total)	Wire centers with 30,000+ lines (% of total)	Wire centers with 30,000+ lines and collocation (% of total)	Wire centers with 20,000+ lines (% of total)	Wire centers with 20,000+ lines and collocation (% of total)
Ameritech	1136	341 (30%)	176 (16%)	150 (13%)	258 (23%)	198 (17%)	365 (32%)	260 (23%)
Bell Atlantic	2418	359 (15%)	302 (13%)	189 (8%)	447 (18%)	243 (10%)	669 (28%)	305 (13%)
BellSouth	1598	250 (16%)	149 (9%)	117 (7%)	244 (15%)	176 (11%)	377 (24%)	225 (14%)
GTE	3873	142 (4%)	78 (2%)	47 (1%)	138 (4%)	74 (2%)	256 (7%)	105 (3%)
SBC	2088	325 (16%)	321 (15%)	253 (12%)	410 (20%)	286 (14%)	548 (26%)	311 (15%)
U S WEST	1230	235 (19%)	138 (11%)	118 (10%)	199 (16%)	159 (13%)	285 (23%)	200 (16%)
Total:	12,343	1652(13%)	1164 (9%)	874 (7%)	1696 (14%)	1136 (9%)	2500 (20%)	1406 (11%)

For example, in wire centers with 20,000+ lines in SBC's region, collocation implies the nearby presence of CLEC fiber at least 90 percent of the time. In Bell Atlantic's region, the corresponding figure is at least 72 percent. In US West's region the figure is at least 74 percent. Analyzing instead wire centers with 30,000+ lines yields a figure of at least 91 percent for SBC, at least 81 percent for Bell Atlantic, and at least 76 percent for U S WEST. Analyzing wire centers with 40,000+ lines yields a figure of at least 92 percent for SBC, at least 80 percent for Bell Atlantic, and at least 77 percent for U S WEST.

Similar conclusions emerge from a closer study of individual markets, both large and small.

- In the Los Angeles MSA, 72 wire centers serve 40,000+ lines. Of these, 20 have at least one collocated CLEC. An analysis of fiber route maps shows that CLEC fiber passes through at least 15 of the 20 wire center areas with collocation. *See* Map 1.

[34] In some instances, our maps show fiber within a wire center serving area that does not pass straight through the wire center itself. It is reasonable, however, to include such instances as wire centers served by fiber, for two reasons. *First*, our maps are incomplete, and there may indeed be competitive fiber running directly from CLEC networks to ILEC wire centers. *Second*, to the extent that such connections do not already exist, it is clear that CLECs easily could make them, particularly in light of the short distances (within the same wire center serving area) and attractive economics (dense wire centers) involved.

- In the San Jose MSA, 17 wire centers serve 40,000+ lines. Of these, 16 have at least one collocated CLEC. An analysis of fiber route maps shows that CLEC fiber passes through at least 15 of the 16 wire center areas with collocation. *See* Map 2.

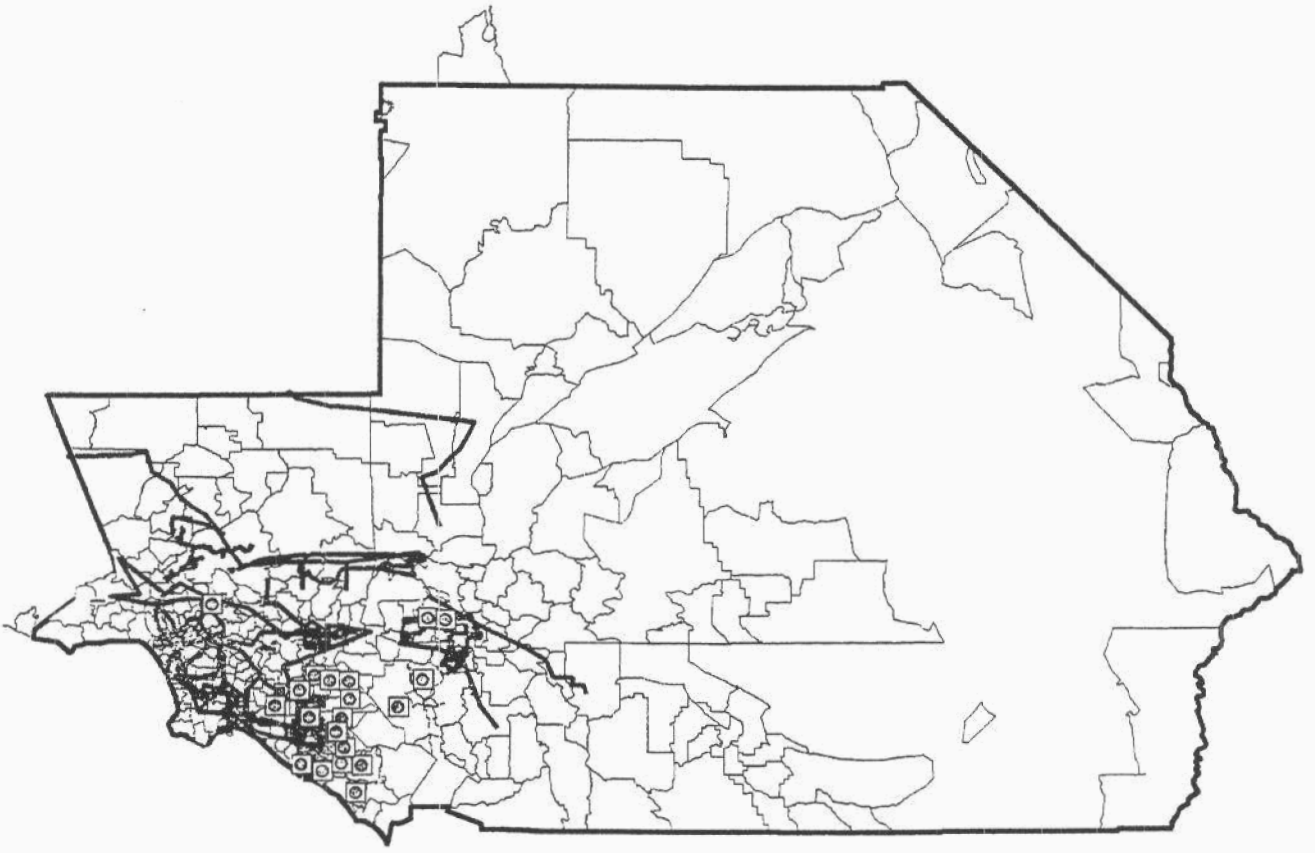
- In the Washington DC MSA, 40 wire centers serve 40,000+ lines. Of these, 34 have at least one collocated CLEC. An analysis of fiber route maps shows that CLEC fiber passes through at least 32 of the 34 wire center areas with collocation. *See* Map 3.

- In the Richmond MSA, 7 wire centers serve 40,000+ lines. All 7 have at least one collocated CLEC. An analysis of fiber route maps shows that CLEC fiber passes through at least 5 of the 7 wire center areas with collocation. *See* Map 4.

- In the Seattle MSA, 14 wire centers serve 40,000+ lines. All 14 have at least one collocated CLEC. An analysis of fiber route maps shows that CLEC fiber passes through at least 12 of the 14 wire center areas with collocation. *See* Map 5.

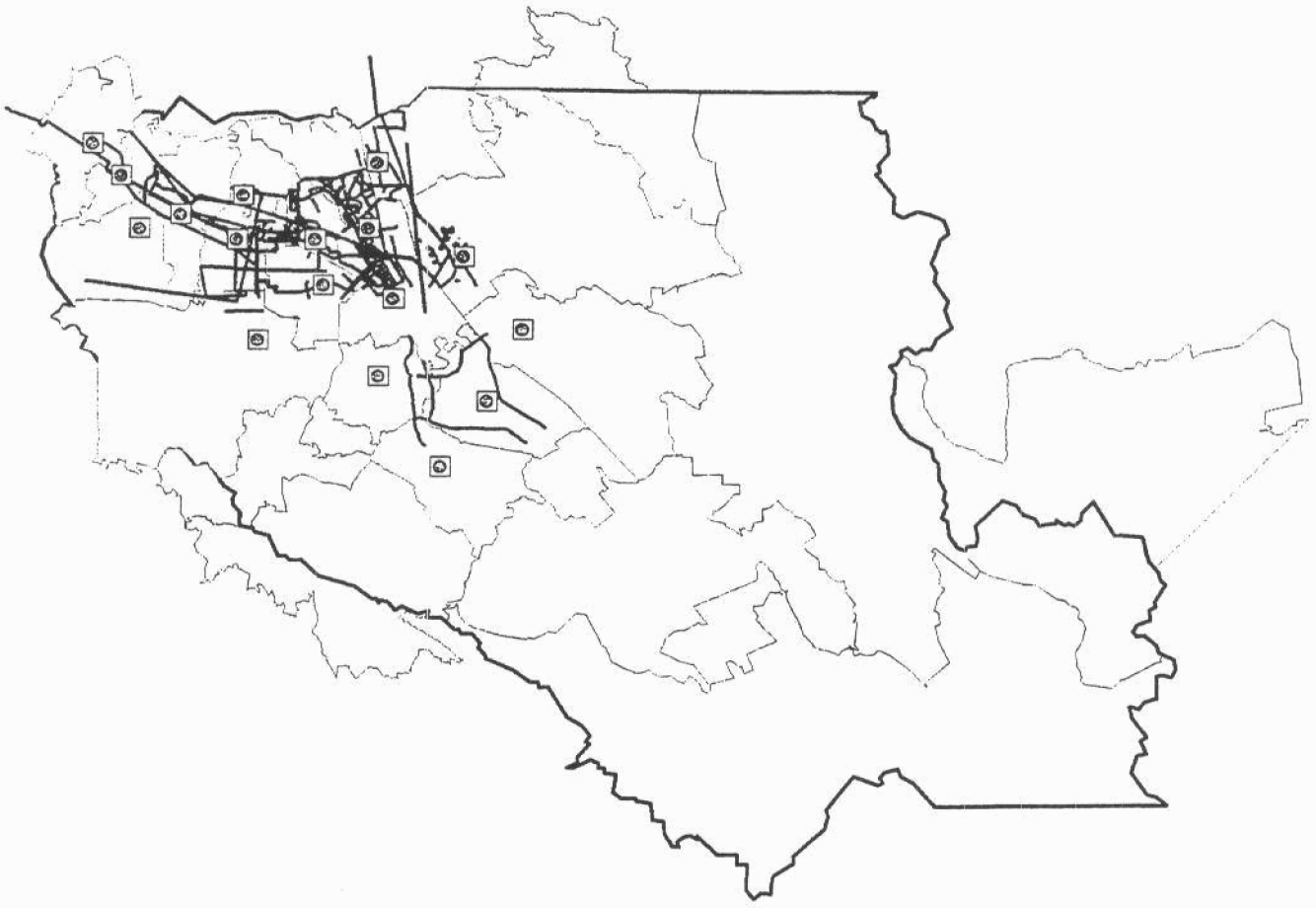
- In the Minneapolis MSA, 11 wire centers serve 40,000+ lines. All 11 have at least one collocated CLEC. An analysis of fiber route maps shows that CLEC fiber passes through at least 10 of the 11 wire center areas with collocation. *See* Map 6.

Map 1. CLEC Fiber And Collocation
Los Angeles MSA



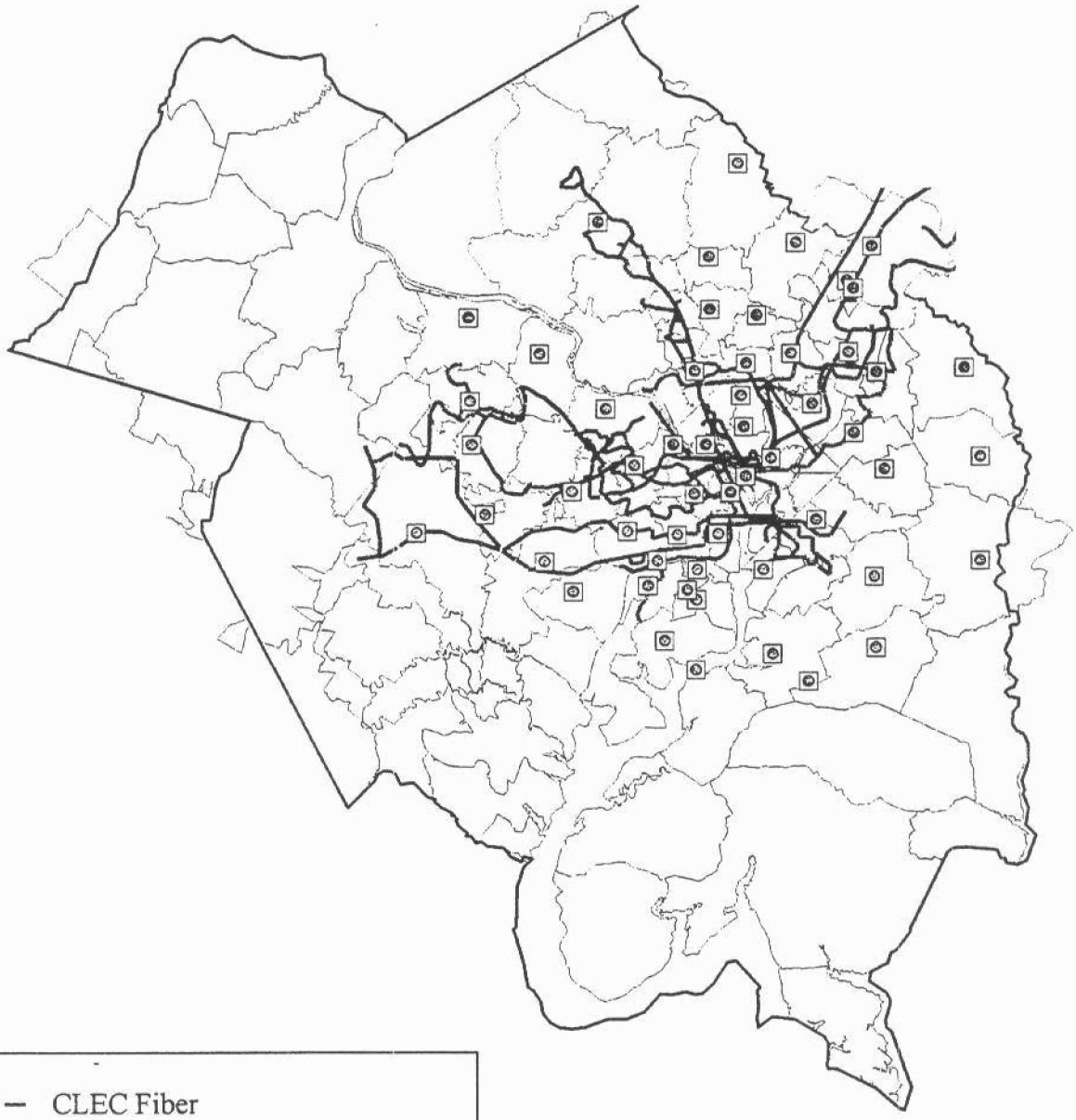
- CLEC Fiber
- Wirecenter
- Collocated Wirecenter
- Wirecenter With 40,000+ Lines

Map 2. CLEC Fiber And Collocation
San Jose MSA



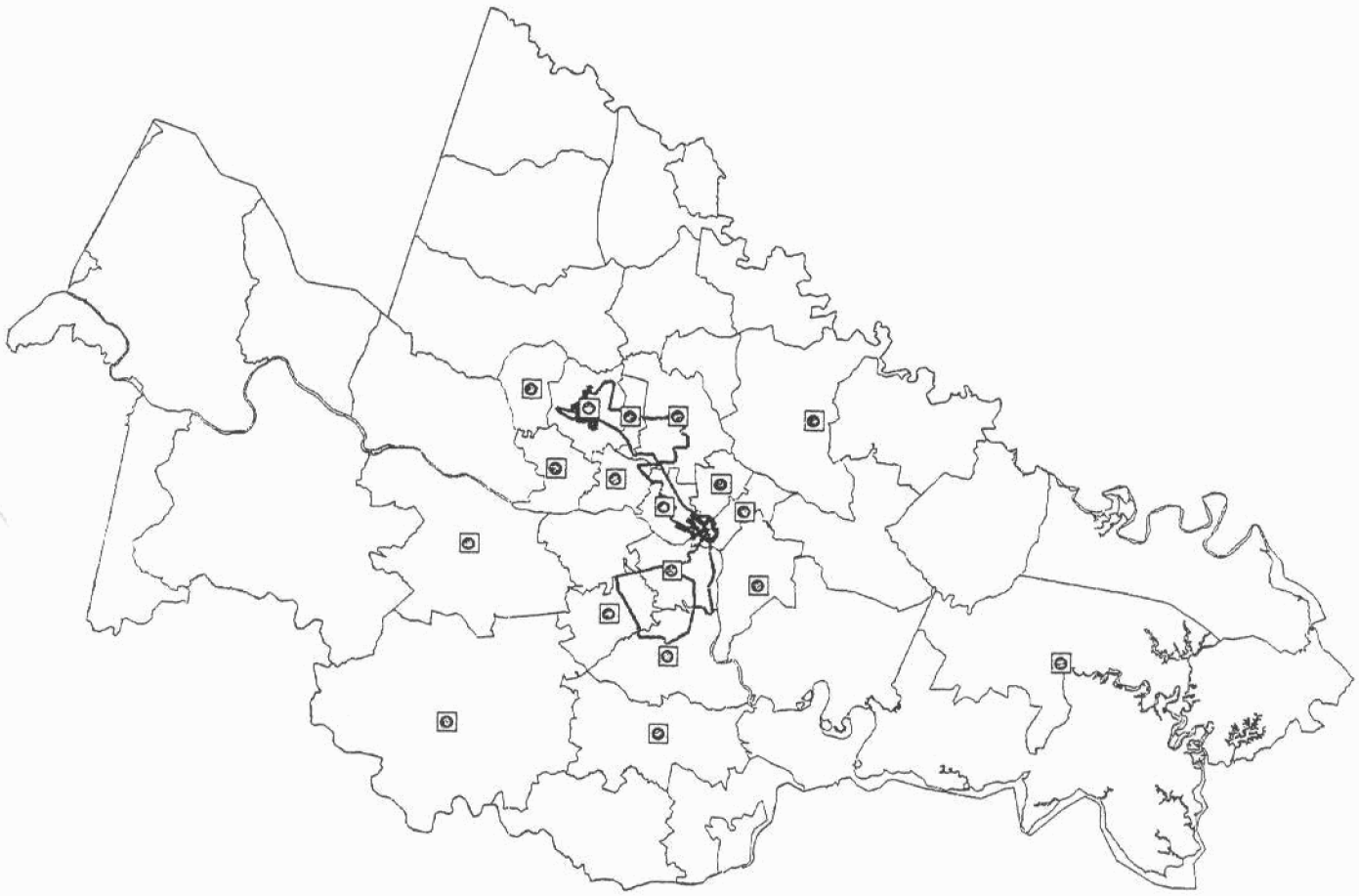
- CLEC Fiber
- Wirecenter
- Collocated Wirecenter
- Wirecenter With 40,000+ Lines

Map 3. CLEC Fiber And Collocation
Washington, DC MSA



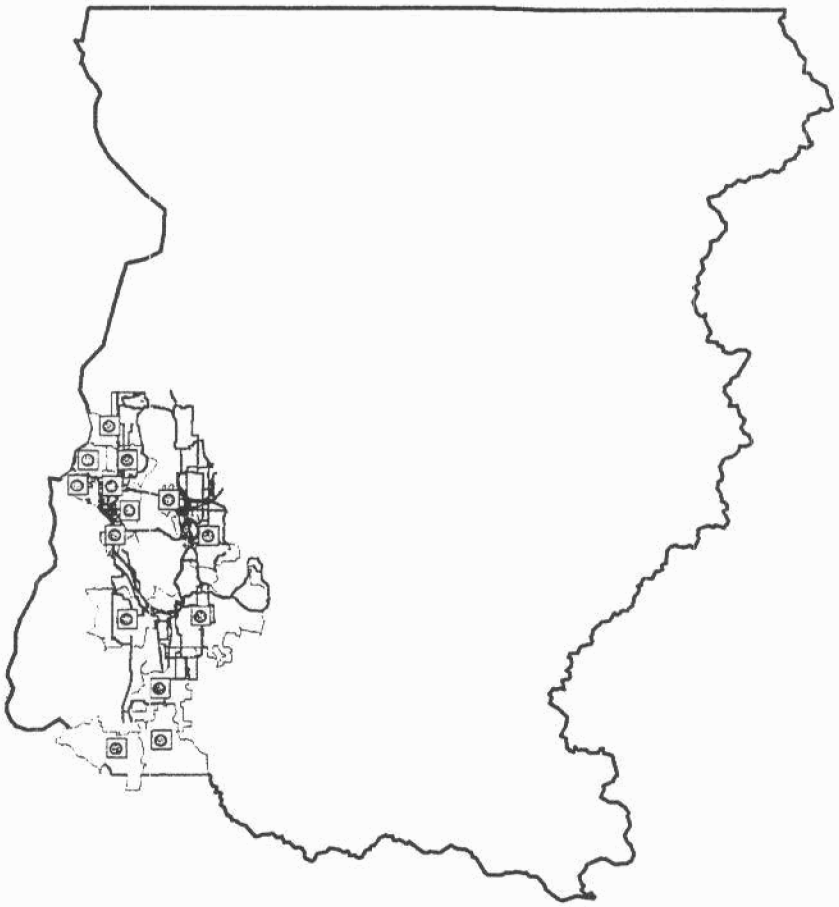
- CLEC Fiber
- Wirecenter
- Collocated Wirecenter
- Wirecenter With 40,000+ Lines

Map 4. CLEC Fiber And Collocation
Richmond MSA



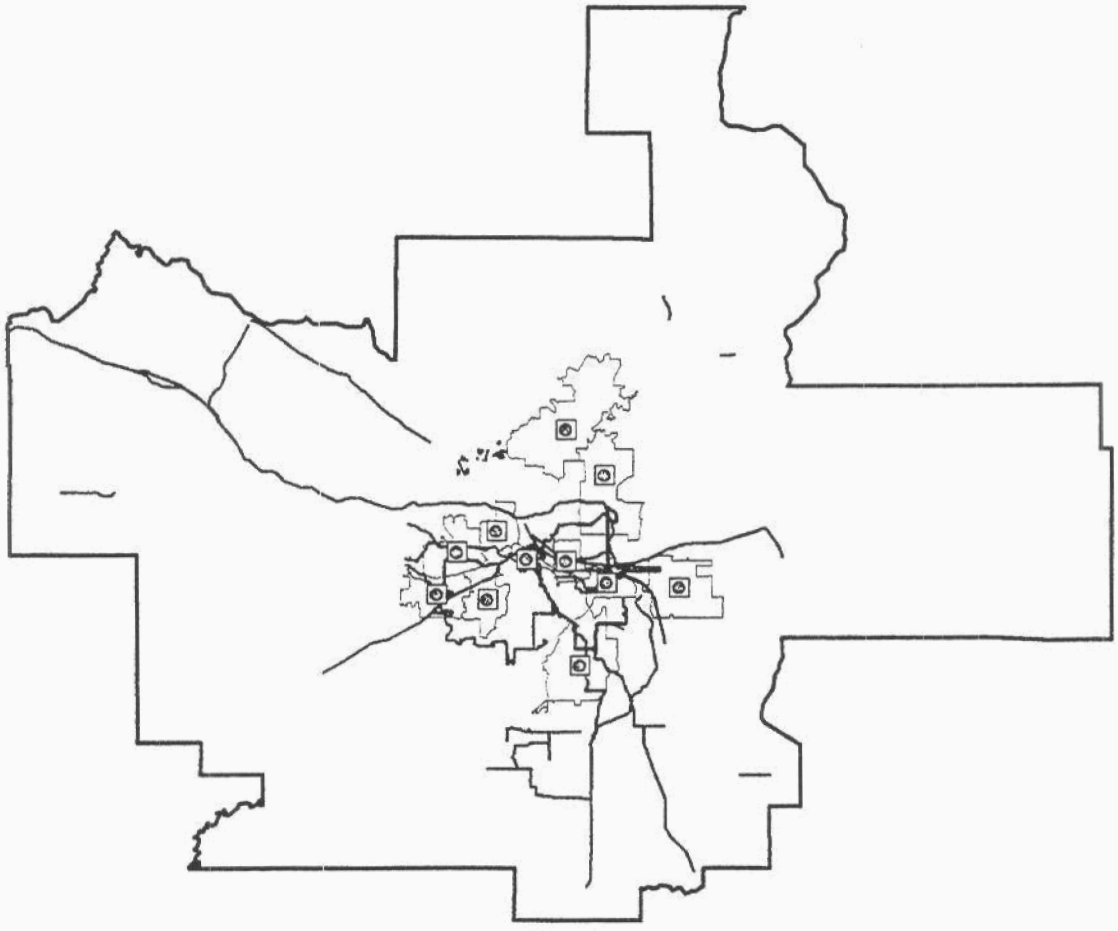
- CLEC Fiber
- Wirecenter
- Collocated Wirecenter
- Wirecenter With 40,000+ Lines

Map 5. CLEC Fiber And Collocation
Seattle MSA



- CLEC Fiber
- Wirecenter
- Collocated Wirecenter
- Wirecenter With 40,000+ Lines

Map 6. CLEC Fiber And Collocation
Minneapolis MSA



- CLEC Fiber
- Wirecenter
- Collocated Wirecenter
- Wirecenter With 40,000+ Lines

This analysis is very conservative, in several important respects.

To begin with, the available fiber maps are by no means a complete representation of all CLEC and third party fiber. They do not include the fiber of all CLECs within a given area. The maps generally do not include fiber that public utilities or cable companies have deployed, although CLECs often have obtained fiber from these sources. The maps were prepared at least 6-9 months ago, and do not include fiber constructed since this time, or fiber that is now under construction. The fiber routes themselves are incomplete, and do not include many network spurs off of the main rings, many of which may run across wire center boundaries to a collocated central office. In sum, it is very likely that CLEC fiber actually serves even more collocated wire centers than our data indicate.[35]

Second, we are considering here only fiber-optic interoffice transport. Other transport technologies are available, and are used as well. Numerous CLECs have long used wireless radio and microwave technologies to extend their networks.[36] This trend has accelerated rapidly in the past few years. Several CLECs – WinStar, Teligent, and NEXTLINK – are using fixed wireless connections in lieu of fiber to provide high-capacity connections.[37] AT&T, MCI WorldCom, and Sprint all have made substantial recent investments in such technology to enhance their competitive local networks,[38] as have many other CLECs.[39] *See* Table 3.

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[35] Moreover, our analysis ignores the fact that CLECs may have fiber and serve customers in wire centers in which they do not obtain collocation.

[36] In 1994, TCG advertised that "A Boston customer...didn't have time to wait for us to reach him with fiber. So we connected his office to our network through a microwave facility until the fiber loop was installed." TCG, *The People Behind a Decade of Vision in Local Telecommunications: 1984-1994* (1994).

[37] *See, e.g.*, WinStar, *Carrier Services*, http://www.winstar.com/indexCarrServ.htm (WinStar's Wireless Fiber offers other carriers "a quick and cost-efficient solution for extending the reach of an existing fiber ring providing local transport."); N. Swartz, *InTeligent Challenger*, Mar. 15, 1999, http://www.teligent.com ("We can put somewhere between four T1s worth of capacity all the way up to a DS3 worth of capacity in a building.") (quoting Keith Kaczmarek, Teligent senior vice president, engineering & operations); NEXTLINK Press Release, *NEXTLINK Closes WNP Acquisition*, Apr. 27, 1999 (NEXTLINK will use LMDS "to build fixed wireless extensions to its local fiber optic networks planned to cover most major cities in the United States.").

[38] With its purchase of TCG, AT&T acquired 38 GHz licenses that cover more than 200 U.S. markets, including 95 of the 100 largest domestic markets. *See Teleport Prepares to Take on WinStar in 38 GHz CLEC Market*, Communications Today, Nov. 3, 1997. MCI WorldCom recently acquired CAI Wireless. *MCI Inks $414 M Deal to Buy CAI*, Times Union, Apr. 20, 1999, at E1. Sprint has acquired People's Choice TV and American Telecasting, which provide Sprint a "wireless alternative to deliver advanced communications services to [its] customers." Sprint Press Release, *Sprint Agrees to Acquire American Telecasting, Inc.*, Apr. 27, 1999. Sprint has also purchased VideoTron USA and Transworld, which both have fixed wireless licenses.

[39] *See, e.g.*, ART Press Release, *Advanced Radio Telecom and Electric Lightwave Execute Strategic Agreement*, Mar. 14, 1997 (ELI purchased wireless transport from ART).

Table 3. Use of Wireless Technology to Extend CLEC Networks

	Wireless Coverage	Wireless Strategies
WinStar	28- and 38-GHz licenses in 160 markets nationwide	"WinStar's 'Wireless Fiber' service offers a flexible and profitable alternative for extending the reach of an existing fiber ring or providing local transport."
Teligent	24-GHz licenses in 74 markets	Teligent CEO Alex Mandl: "When I decided to do this more than two years ago, there weren't a lot of people who even knew what [fixed wireless] is...Today, I think everybody in the industry recognizes that fixed-wireless networks and point-to-multipoint networks will be a very important part of how the industry will evolve."
NEXTLINK	39 A Block LMDS licenses and 1 B Block LMDS license, with 114 million POPs, and coverage of 95% of the top 30 markets.	"NEXTLINK is well positioned to leverage its unique combination of assets, including its growing number of metropolitan fiber networks, its fixed broadband wireless spectrum, and the high-speed IP-centric fiber backbone connecting over 50 cities in the U.S. and Canada that is currently under construction."
Advanced Radio Telecom (ART)	38 GHz licenses in 90 of the top 100 U. S. markets and 210 markets nationwide.	"By integrating its own fixed wireless national spectrum assets with fiber optic transport, ART is capable of serving the vast majority of businesses that do not have direct fiber connectivity."
AT&T	Through AT&T's acquisition of TCG/BizTel, it gained 38-GHz Licenses in 213 geographic regions and 95 of the top 100 largest markets.	38-GHz licenses allow us to "bring TCG's service to customers that cannot be served economically with fiber optics. Thus we can expand our geographic reach using our own facilities predominantly, and achieve higher penetration in all communities we serve."
MCI WorldCom	Acquired CAI Wireless for $483 million (licenses in New York City, Rochester and Albany, N.Y.; Philadelphia, Washington and Norfolk/Virginia Beach, Va. Long Island, Buffalo and Syracuse, N.Y., Providence, R.I., Hartford, Conn., Boston, Baltimore and Pittsburgh). CAI Wireless also has a 94% stake in CS Wireless, with licenses in 10 markets. Invested $200 million combined in Wireless One (licenses in 80 markets); Heartland Wireless (licenses in 90 markets); CAI Wireless (14 markets); and CS Wireless (10 markets). Signed a five-year national agreement with WinStar for "Wireless Fiber."	Ernest D. Yates, Wireless One Executive VP and Chief Operating Officer: "Wireless data services . . . offers affordable alternatives to traditional local loop services for the 'last mile' connections." Nate Davis, Senior VP, Network Operations and Chief Operating Officer, MCImetro: "We're excited about the potential of WinStar's Wireless Fiber service. It will allow us to expand our network reach and provide more choices for MCI customers."
Sprint	Acquired People's Choice TV for $469 million (licenses in Chicago, Detroit, Indianapolis, Houston, Phoenix, St. Louis, Milwaukee, Salt Lake City, Tucson and Albuquerque). Acquired American Telecasting, Inc. (ATI) (licenses in 55 markets). Acquired Videotron USA for $180 million and Transworld for $30 million (licenses in San Francisco, San Jose, and Oakland, Calif; Tampa, Fla.; Seattle and Spokane, Wash.; and Greenville, S.C.).	"The beauty of Sprint ION is that it is compatible with all broadband access methods. Fixed wireless is one such method, and PCTV's markets are exceptionally well-suited for deployment." "Together with our recently announced merger with People's Choice TV, this transaction gives us a wireless alternative to deliver advanced communications services to our customers," said William T. Esrey, Sprint chairman and chief executive officer. "[W]e will be able to greatly extend the reach of Sprint's Integrated On-Demand Network to consumers and small businesses."
Electric Lightwave	3-year agreement for 300 wireless paths (equivalent to 1200 DS-1 circuits) in the Pacific Northwest.	ELI President David Sharkey: "Our relationship with ART allows us to move quickly into our planned market buildout, stepping up the time line."
ICG/ChoiceCom	3-year, $3.5 million agreement, for wireless DS-1 and DS-3 access in up to 10 states, including California, Tennessee, Colorado, Texas, and states in the Ohio Valley and the Southeast.	ICG President Sheldon Ohringer: "This agreement is an excellent fit with our plans to develop and expand our presence in the markets we serve."
Williams Communications	Purchased 2% of WinStar's "Wireless Fiber" capacity for $400 million.	Williams President and CEO Howard E. Janzen: "WinStar's proven ability to provide wireless T-1s, together with Williams' technologically advanced fiber-optic network, offers Williams' carrier customers an unmatched end-to-end solution."

Sources: See Appendix C

Finally, CLECs with fiber-optic networks have made clear that they can readily extend their existing networks reasonable distances to pick up large volumes of traffic. According to TCG, "[w]hen a company signs up for the service, TCG runs fiber-optic cable from its nearest line right into the building that houses the business."[40] NEXTLINK states that they will "pay all the costs of taking the fiber optic lines" to their large business customers.[41] MFN will "bring [its] fiber right up to [its] customers' floors in their buildings."[42] Industry observers acknowledge that "[m]ost CLECs can justify running or leasing fiber facilities from their regional switching centers (RSCs) out to a central location within a community."[43]

C. Competitive Interoffice Transport by Wire Center

Using the methodology set forth above, it is a straightforward matter to determine which ILEC wire centers are served by competitive interoffice transport. As of March 1999, CLECs had operational collocation arrangements in 1407 BOC and GTE wire centers with 20,000+ lines, 1136 in wire centers with 30,000+ lines, and 874 in wire centers with 40,000+ lines. *See* Tables 4-6.

Table 4. Competitive Interoffice Transport by Region

	Wire Centers with 20,000+ Access Lines Served by:			
	1 or more CLEC collocation nodes	2 or more	3 or more	4 or more
Ameritech	260	159	105	71
Bell Atlantic	305	185	112	66
BellSouth	225	136	85	56
GTE	106	64	22	8
SBC	311	223	169	129
U S WEST	200	N/A	N/A	N/A

[40] D. Burrough, *Businesses Are Top Beneficiaries of High-Tech Telecommunications*, Phoenix Business Journal, Oct. 27, 1995, at 23.

[41] S. Cruz, *Yes, Virginia, There is Phone Competition*, Las Vegas Business Press, Aug. 10, 1998, at 19.

[42] A. Lindstrom, *Regional CLECs Plant Fiber Stakes in the Ground*, America's Network, Sept. 1, 1998.

[43] K. Kolderup, *Voice Brings New Perspective to DSL*, X-Change, Apr. 1999, http://www.x-changemag.com/articles/941feat3.html.

Table 5. Competitive Interoffice Transport by Region				
	Wire Centers with 30,000+ Access Lines Served by:			
	1 or more CLEC collocation nodes	2 or more	3 or more	4 or more
Ameritech	198	130	89	66
Bell Atlantic	243	158	101	59
BellSouth	176	115	77	55
GTE	74	49	16	8
SBC	286	216	163	127
U S WEST	159	N/A	N/A	N/A

Table 6. Competitive Interoffice Transport by Region				
	Wire Centers with 40,000+ Access Lines Served by:			
	1 or more CLEC collocation nodes	2 or more	3 or more	4 or more
Ameritech	150	109	78	59
Bell Atlantic	189	135	89	53
BellSouth	117	85	67	48
GTE	47	35	15	8
SBC	253	206	159	126
U S WEST	118	N/A	N/A	N/A

Moreover, CLECs are rapidly expanding their collocation facilities. In BOC and GTE wire centers, CLECs had 3007 collocation arrangements pending as of March 1999.[44] Of these, 2714 are within BOC and GTE wire centers with 20,000+ lines, 2312 in wire center with 30,000+ lines, and 1897 in wire centers with 40,000+ lines. *See* Tables 7-9. Factoring these collocation arrangements already underway into the results presented above will of course boost the percentages of competitively served wire centers.

[44] This figure excludes data from U S WEST.

Table 7. Competitive Interoffice Transport by Region (Based on Actual and Pending Collocation)				
	Wire Centers with 20,000+ Access Lines Served by:			
	1 or more actual *plus pending* CLEC collocation nodes	2 or more	3 or more	4 or more
Ameritech	303	220	157	116
Bell Atlantic	473	317	230	155
BellSouth	284	216	162	136
GTE	168	125	83	56
SBC	379	293	217	177
U S WEST	200	N/A	N/A	N/A

Table 8. Competitive Interoffice Transport by Region (Based on Actual and Pending Collocation)				
	Wire Centers with 30,000+ Access Lines Served by:			
	1 or more actual *plus pending* CLEC collocation nodes	2 or more	3 or more	4 or more
Ameritech	222	176	129	99
Bell Atlantic	364	265	203	140
BellSouth	212	178	141	121
GTE	109	88	64	46
SBC	334	270	210	172
U S WEST	159	N/A	N/A	N/A

Table 9. Competitive Interoffice Transport by Region (Based on Actual and Pending Collocation)				
	Wire Centers with 40,000+ Access Lines Served by:			
	1 or more actual *plus pending* CLEC collocation nodes	2 or more	3 or more	4 or more
Ameritech	161	135	108	86
Bell Atlantic	274	214	171	120
BellSouth	136	123	109	99
GTE	70	62	46	34
SBC	284	244	199	169
U S WEST	118	N/A	N/A	N/A

In the vast majority of wire centers in which CLECs have obtained collocation, they are not in fact taking the interoffice transport UNE, but instead are relying on either their own facilities, those of a third party,[45] or are leasing ILEC facilities pursuant to tariff. In SBC's region, for example, CLECs have obtained collocation in 330 wire centers, but are taking the interoffice transport UNE from SBC in only 37 wire centers.[46] In GTE's region, CLECs have obtained collocation in 142 wire centers, but are not taking the interoffice transport UNE in any of them.

In 1982, the Department assumed that a 100,000-customer territory (LATA) was the smallest area that could reasonably be expected to attract facilities-based service from competing interexchange carriers.[47] Solid empirical data now establishes the actuality of interoffice transport competition down to the level of many end offices. Our analysis is in fact very much more conservative than DoJ's was in 1982, because it centers on actual – not merely potential – competition. In 1982, MCI and Sprint were the only facilities-based competitive long-distance carriers of any significance, and they provided facilities-based service only in limited areas. Today, by contrast, there are over 150 facilities-based CLECs. Many have deployed fiber facilities in numerous markets across the country. And we can say with high confidence that their competitive interoffice facilities extend to dense ILEC wire centers in which CLECs have actually chosen to collocate.

As we have noted, MCI insisted in 1982 that interoffice transport could be competitive right down to the level of every Class 5 end office – and not just down to the bigger ones. Whatever the facts back then, interoffice transport is plainly competitive today, so far as larger wire centers with collocated CLECs are concerned. Entry barriers for the last mile of the interoffice market are far lower than they were for the "last LATA," back in 1982. The costs of providing transport have dropped sharply in the intervening 17 years.[48] LATAs are often hundreds of miles apart; most central offices, by contrast, are fewer than 10 miles apart. And a CLEC that collocates in a wire center can contend not just for long-distance traffic, but for all the local traffic and advanced services, too – a far larger market in terms of both dollars and traffic volumes.[49]

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[45] In Illinois, 18 CLECs are provisioning all interoffice trunks themselves or though a third party. By comparison, only eight CLECs in Illinois rely exclusively on leasing trunks from Ameritech, whereas 19 CLECs provision trunks jointly with Ameritech, or in combination with Ameritech and a third party. In Ohio, 14 CLECs are provisioning all interoffice trunks themselves or though a third party. By comparison, only five CLECs in Ohio rely exclusively on leasing trunks from Ameritech, whereas seven CLECs provision trunks jointly with Ameritech, or in combination with Ameritech and a third party.

[46] In 143 of the 330 wire centers, CLECs are obtaining unbundled loops.

[47] *See* Response of the United States to Comments Received on the BOC LATA Proposals at 16-19, *United States v. Western Elec. Co.*, No. 82-0192 (D.D.C. Mar. 23, 1982). *See also United States v. Western Elec. Co.*, 569 F. Supp. 990, 1019 n.149 (D.D.C. 1983).

[48] Even in 1982, MCI argued that "[d]igital transmission, including fiber optics systems, drastically reduces terminal multiplex costs. This permits profitable short hauls to smaller and smaller markets." Objections of MCI Communications Corporation to Application for Approval of Exchange Areas at 8, *United States v. Western Elec. Co.*, No. 82-0192 (D.D.C. Nov. 3, 1982).

[49] *See, e.g.*, K.M. Leon, et al., ABN AMRO Chicago Corp. Investext Rpt. No. 1916888, Teleport

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Thus, the "most significant" CLECs in the country – AT&T, MCI WorldCom, and Sprint[50] – are today doing precisely what MCI said they could do in 1982.[51] AT&T has pursued a strategy of "migration of dedicated and terminating access facilities from LEC to TCG facilities nationwide."[52] MCI WorldCom has "local phone facilities [that] cover nearly 90% of the local service areas in the U.S."[53] which enable the company to "bypass the RBOCs," and "save on both access and termination charges."[54] Sprint acknowledges that it has alternative facilities-based "access alternatives . . . including CLEC networks and fixed wireless."[55]

Communications Group, Inc. – Company Report at •15 (May 6, 1997) (estimating potential CLEC revenues for access and private line services at $14.7 billion, public switched services at $82.4 billion, and other enhanced services at $7 to $10 billion).

[50] *Bell Atlantic/NYNEX*, 12 FCC Rcd at 20029-30 ¶ 82.

[51] As the FCC has noted, "[O]nce CAPs are interconnected to the central offices that handle heavy traffic, they can gain a significant share of the access market by selling their services to the three largest IXCs." *Expanded Interconnection with Local Telephone Company Facilities*, Report and Order and Notice of Proposed Rulemaking, 6 FCC Rcd 7369, 7422 n.253 (1992); *see also Expanded Interconnection with Local Telephone Company Facilities*, Second Report and Order and Third Notice of Proposed Rulemaking, 8 FCC 7374, 7380 ¶ 15 (1993) ("Increased competition in the interstate special access market undoubtedly will result in some diversion of business from the LECs.").

[52] AT&T/TCG, *Merger Presentation*, Jan. 8, 1998, http://www.att.com/ir/ep.

[53] D. Pappalardo & D. Rhode, *Ebbers' Job Has Only Just Begun; Merging Worldcom, MCI Nets Will Prove Challenging*, Network World, Nov. 17, 1997 (*quoting* CEO John Sidgmore).

[54] D. Rohde, *Price: Buyout to Benefit Customers*, Network World, Nov. 17, 1997, at 11 (*quoting* Tim Price, MCI President and COO).

[55] Remarks by Sprint Chairman & CEO William T. Esrey at Internet World, July 15, 1998, http://www.sprint.com/Stemp/press/releases/9807/9807150597.html.

III. LOCAL LOOPS

The *Local Competition Order* defined local loops that must be unbundled to include "two-wire and four-wire analog voice-grade loops, and two-wire and four-wire loops that are conditioned to transmit the digital signals needed to provide" advanced data services such as ADSL.[1] The FCC has already declared its "strong expectation" that under the necessary/impair standard, "loops will be generally subject to unbundling obligations."[2]

Loops, however, are provided in a wide range of different markets. The availability of competitive substitutes varies accordingly. It makes no economic sense to treat "the loop" as a single product supplied to a single class of consumers in a single national market. In this context, even more so than with other UNEs, it is necessary to take into account the fundamental differences between ordinary and high-capacity loops, between business loops and residential ones, and between rural markets and urban ones.[3]

In urban areas, many business customers are already served by CLEC fiber or fixed terrestrial wireless networks. And in most areas there is already extensive competition for the business of any customer that requires the very-high-capacity connections provided over dedicated fiber-optic plant. Numerous competitors already vie to supply either dark or lit fiber.

Other competitive alternatives to ILEC copper loop are also evolving very rapidly. Cable does not offer a competitive substitute to ILEC loop in most markets today, but AT&T has recently staked over $90 billion on the belief that cable plant can be upgraded to substitute for loops in residential markets nationwide. Wireless alternatives are developing very quickly too: prices are falling sharply and capabilities are improving. For many customers, mobile wireless service qualifies as a loop substitute today. And the class of customers that can be served competitively over wireless loops is likely to expand rapidly in the next few years. As Chairman Kennard has acknowledged, local

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[1] *See Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, First Report and Order, 11 FCC Rcd 15499, 15691 ¶ 380 (1996) ("*Local Competition Order*").

[2] *Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, Second Further Notice of Proposed Rulemaking ¶ 32, CC Dkt. No. 96-98 (rel. Apr. 16, 1999) ("*Second FNPRM*"); *see also*, William Kennard, Chairman, FCC, *A Stable Market, A Dynamic Internet*, presented before Legg Mason, Washington, DC, Mar. 11, 1999; William Kennard, Chairman, FCC, *A Competitive Call to Arms*, Association of Local telecommunications Services (ALTS) Convention, Nashville, TN, May 3, 1999.

[3] The 1996 Act and the FCC indeed recognize that local competition will develop differently in different geographic markets. Section 271 of the Act establishes two separate tracks for Bell companies to obtain long-distance relief: Track A for states where facilities-based competition develops quickly, and Track B for states where it does not. In the *Local Competition Order*, the FCC adopted a three-zone pricing structure to reflect disparities in the costs of deploying facilities in different areas. *See Local Competition Order*, 11 FCC Rcd at 15882 ¶ 765. The FCC recently has stayed this three-zone pricing rule. *See Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, Deaveraged Rate Zones for Unbundled Network Elements*, Stay Order, CC Docket No. 96-98 (rel. May 7, 1999).

markets are now seeing an "acceleration of competition" comparable to what the Commission "ha[s] seen in other markets, especially long distance and cellular."[4]

A. Large- and Medium-Sized Business Customers

The FCC recently defined "large business customers" as those with "twenty or more access lines."[5] (This is roughly equivalent to a single T-1 line, which provides 24 voice-grade circuits.[6]) Customers at the low end of this category typically spend at least $1000-$1500 per month on their purely local telecommunications service.[7]

As both the FCC and the Department of Justice have held, large business customers occupy a discrete telecommunications market.[8] A loop to a business customer is not bought, sold, or used, in the same market as a loop to a residential customer. Business customers pay much higher prices.[9] The differences are clearly sharp enough to place business and residential customers in separate markets. A 5 percent increase in the price of residential loops will not, in itself, attract new competitive supply from providers of business loops.[10]

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[4] William Kennard, Chairman, FCC, Statement Before the Subcommittee on Commerce, Justice, State, and the Judiciary, U.S. House of Representatives, Mar. 25, 1998.

[5] *Telecommunications Carriers' Use of Customer Proprietary Network Information and Other Customer Information*, Second Report and Order and Further Notice of Proposed Rulemaking, 13 FCC Rcd 8061, 8128, ¶ 88 (1998) (CPNI notice and opt-out approach "does not extend to business customers with twenty or more access lines. For these large business customers . . .").

[6] *See* H. Newton, *Newton's Telecom Dictionary* 583 (11th Ed. 1996).

[7] The average local rate for businesses with a key system line in urban areas is $60.02. FCC, *Reference Book of Rates, Price Indices, and Household Expenditures for Telephone Service*, at 24 (Jul. 1998) ("*FCC Reference Book*").

[8] *See, e.g., Competition in the Interstate Interexchange Market*, Notice of Proposed Rulemaking, 5 FCC Rcd 2627, 2654 ¶ 60 (1990) (large business customer market is properly "distinguish[ed]" from "the marketplace as a whole."); *see also id.* ("large business customers tend to be better informed and more sophisticated in their evaluation of their telecommunications alternatives than other customers."); *id.* ¶ 61 (large customers are "unique" in that they "generally have substantial bargaining power," because a very small percentage of business customers accounts for a relatively large percentage of all revenues); *Applications of NYNEX Corp. and Bell Atlantic Corp.*, Memorandum Opinion and Order, 12 FCC Rcd. 19985, 20016 ¶ 53 (1997) (large business customers "are served under individual contracts and marketed through direct sales contracts."); Report of the United States Recommending Denial of NYNEX's Request for a Waiver to Provide International Telecommunications Services Through Private Transatlantic Telecommunications System, Inc. at 17-18, *United States v. Western Elec. Co.*, No. 82-0192 (Aug. 4, 1988) ("[i]f NYNEX had proposed to limit the [provision of services] to large users in New York City, the Court would have to determine whether NYNEX has established a lack of bottleneck power with respect to any such economically distinct class of customers.").

[9] The average price of monthly business service (for key line systems in urban areas) is $60.02, compared to an average of $19.49 for residential service in urban areas. *See FCC Reference Book* at 3, 24.

[10] Under DOJ's Horizontal Merger Guidelines, a product market is the smallest group of products or services for which a hypothetical monopolist could profitably impose a "small but significant and nontransitory" increase in price, on the order of 5 percent. *Department of Justice and Federal Trade Commission, Horizontal Merger Guidelines*, § 1.11 (1992, as amended Apr. 8, 1997).

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1. CLEC fiber. CLECs reach many large- and medium-sized business customers directly, over the CLECs' own fiber networks. Indeed, CLEC fiber already serves nearly 15 percent of all commercial office buildings in the country.[11] CLECs routinely extend their fiber networks to reach larger business customers, and widely advertise their willingness to do so.[12]

Within the top 50 MSAs, CLECs have deployed nearly 30,000 miles of fiber. *See* Appendix A. CLECs have deployed fiber in all but 15 of the MSAs ranked between 51 and 150.[13] *See* Appendix B. According to ALTS, CLECs serve in excess of 350 Basic Trading Areas ("BTAs").[14]

Businesses invariably cluster in downtown areas and business parks – the areas of highest daytime population. Accordingly, competitors have deployed their fiber networks to areas of highest daytime population. Geographic Data Technology, Inc. compiles a database that provides daytime population by zip code, which we have used to derive the figures below.

- In Los Angeles, CLEC fiber passes through 91 percent of the zip codes that make up the top 10 percent of all zip codes within the state in terms of daytime population. Ninety-six percent of such zip codes in San Jose are passed by CLEC fiber, as are 100 percent of the zip codes in San Diego. *See* Map 1.

- In New York City, CLEC fiber passes through 75 percent of the zip codes that make up the top 10 percent of all zip codes within the state in terms of daytime population. One-hundred percent of such zip codes in Syracuse and Binghamton are passed by CLEC fiber. *See* Map 2.

- In New Brunswick, NJ, CLEC fiber passes through 78 percent of the zip codes that make up the top 10 percent of all zip codes within the state in terms of daytime

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[11] *Compare* New Paradigm Resources Group, *1999 CLEC Report*, at Ch. 6 p. 23 (10th ed. 1999) ("*1999 CLEC Report*") (104,097 office buildings served by CLECs) *with* U.S. Dep't of Commerce, *Statistical Abstract of the United States 1998*, 118th ed., at Table 1229 (Oct. 1998) (705,000 commercial office buildings nationwide).

[12] *See, e.g.*, CNBC/Dow Jones, Interview with Robert Manning, CFO, Intermedia Communications, Jun. 25, 1998 (Intermedia connects its fiber rings to "the main Class-A buildings in a downtown business district."); A. Lindstrom, *Fiber: Part II*, America's Network, Sept. 1, 1998. (MFN will "bring our fiber right up to our customers' floors in their buildings and provide them with wall-to-wall seamless connectivity."); W. Schaff, *Taking Stock: No Strings Attached*, Information Week, Feb. 22, 1999 ("Nextlink . . . has been concentrating on building fiber-optic connections to large offices and business parks. . . . Nextlink, however, intends to use the wireless system as a way to get to market faster. Once it has established service to a given location, it will build a fiber-optic connection to that location and relocate the radio equipment to another building.").

[13] MSAs 51-150 range in population from 489,000 to 1.1 million. *See* Rand McNally, *Commercial Atlas & Marketing Guide 1999*, 130th ed. at 60 (1999).

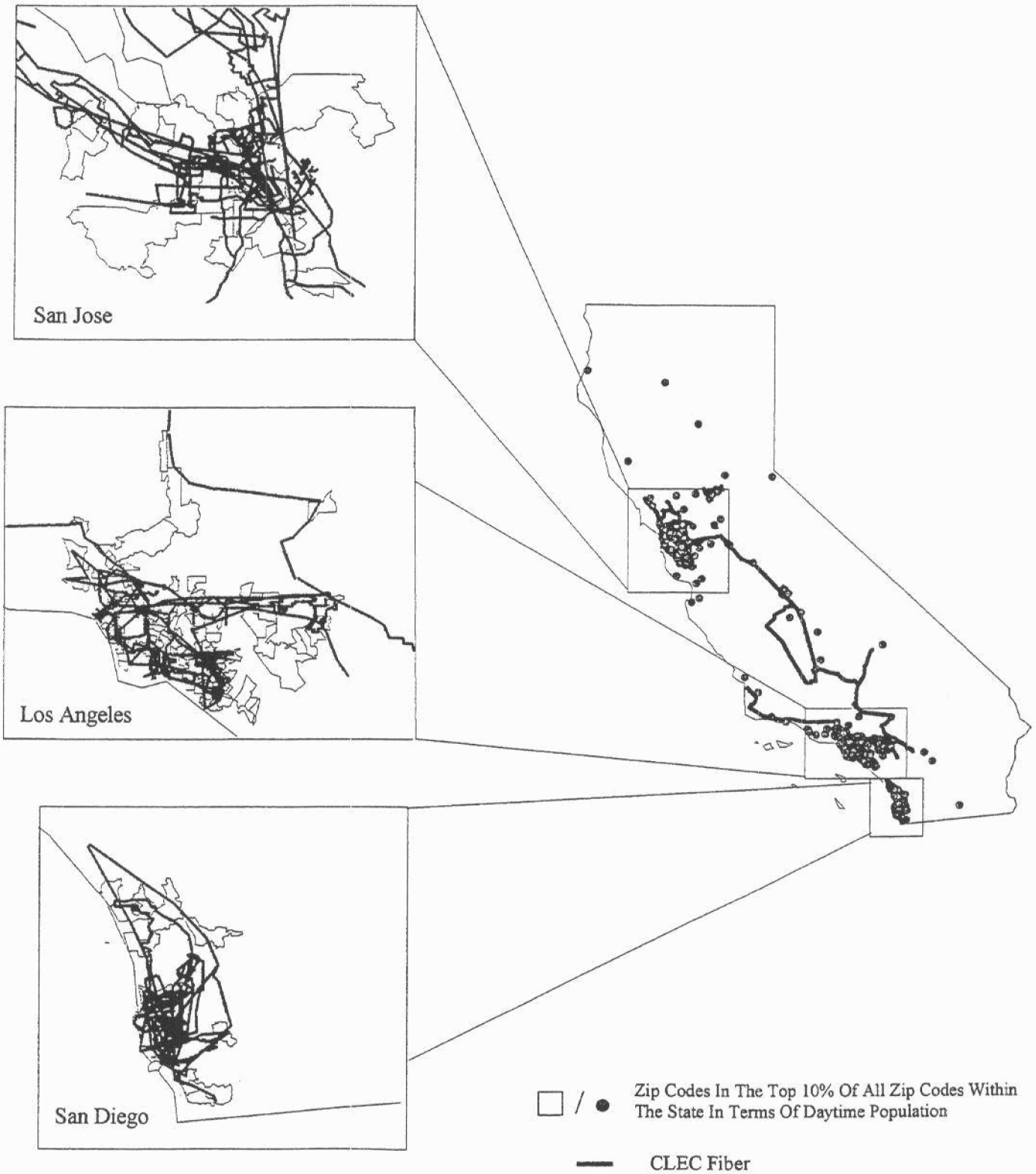
[14] ALTS, *Telecom Act's Third Birthday Wish*, Feb. 8, 1999. This represents 72 percent of the 487 BTAs in the U.S. *See* Rand McNally, *1999 Commercial Atlas & Marketing Guide* (1999).

population. Sixty-seven percent of such zip codes in Trenton are passed by CLEC fiber. *See* Map 3.

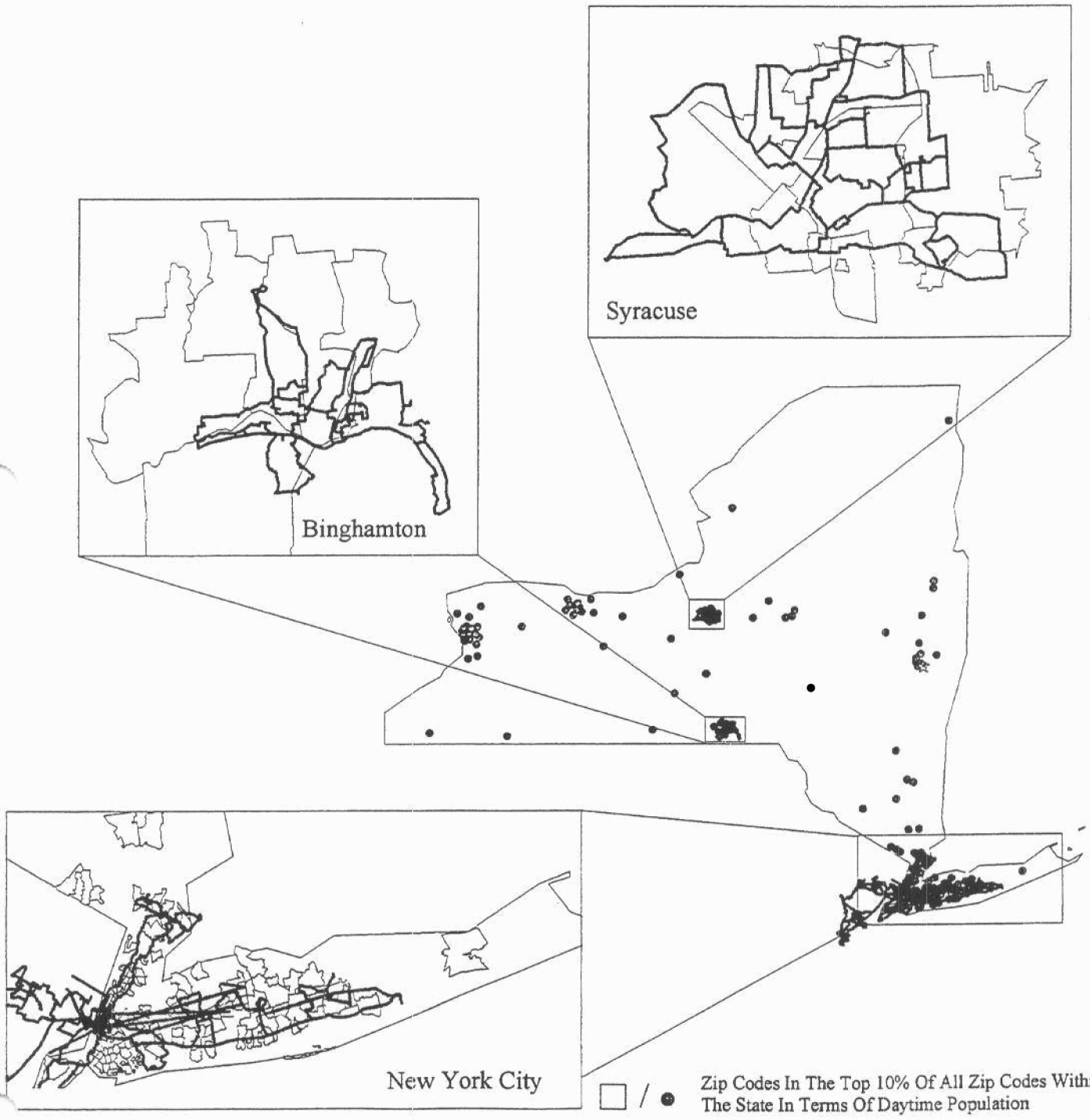
- In Northern Virginia, CLEC fiber passes through 93 percent of the zip codes that make up the top 10 percent of all zip codes within the state in terms of daytime population. Forty-eight percent of such zip codes in Richmond are passed by CLEC fiber. *See* Map 4.

- In Philadelphia, CLEC fiber passes through 95 percent of the zip codes that make up the highest 10 percent of all zip codes within the state in terms of daytime population. Forty-four percent of such zip codes in Allentown are passed by CLEC fiber. *See* Map 5.

Map 1. CLEC Fiber And Areas Of High Daytime Population



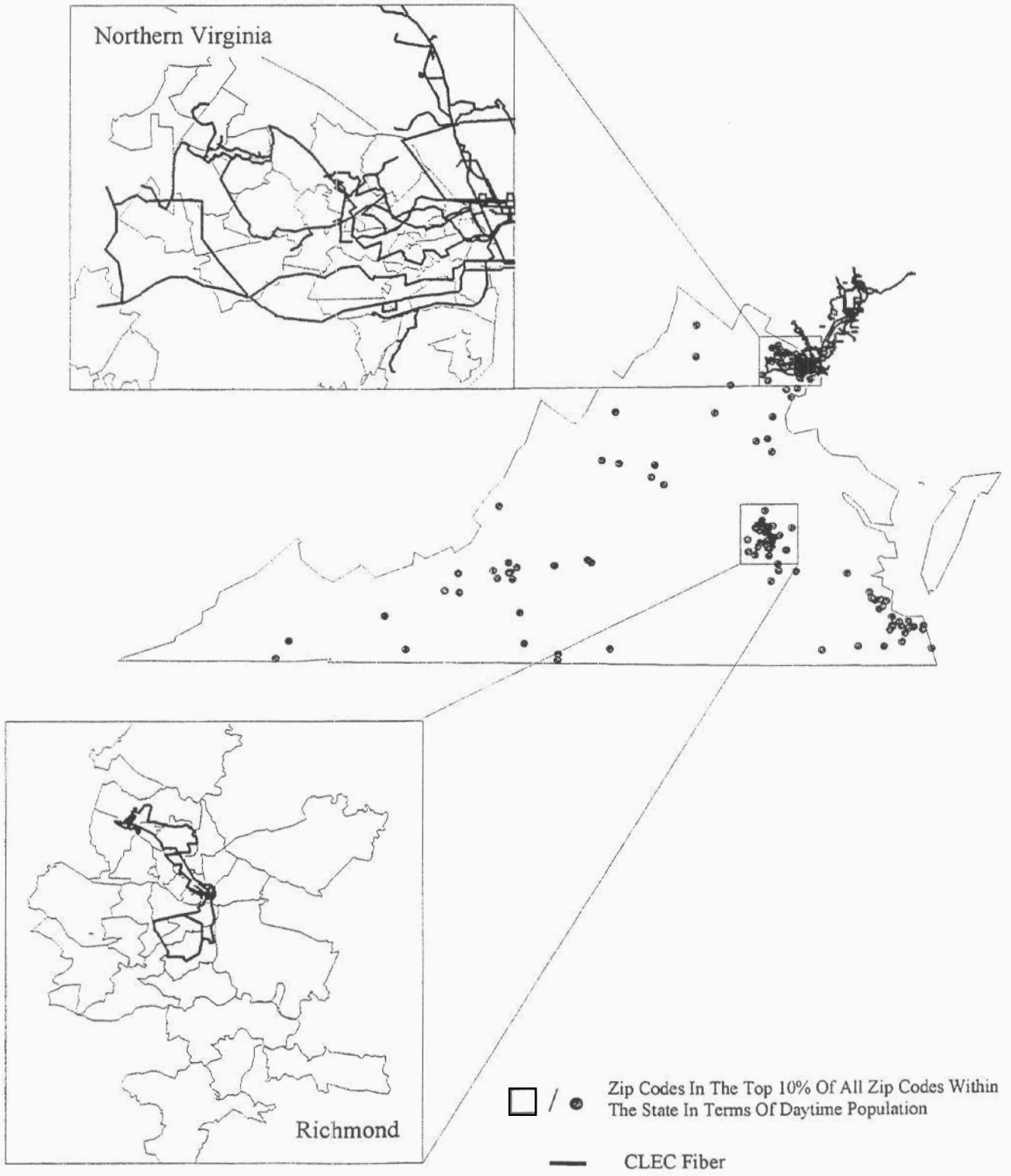
Map 2. CLEC Fiber And Areas of High Daytime Population



Map 3. CLEC Fiber And Areas Of High Daytime Population



Map 4. CLEC Fiber And Areas Of High Daytime Population



Map 5. CLEC Fiber And Areas Of High Daytime Population



2. Fixed terrestrial wireless. Fiber is the most important alternative loop technology, but it is not the only one. CLECs can and do also reach large- and medium-sized business customers via microwave and fixed terrestrial wireless connections.[15] As the Commission has recognized, fixed wireless access (wireless local loop, or WLL) offers "a replacement for the 'last mile' of copper wire."[16]

WLL is relatively inexpensive to deploy. According to the International Engineering Consortium, "deployment costs [are] expected to drop to $200 per subscriber installation."[17] This compares to a thousand dollars or more per wireline loop.[18] Moreover, WLL costs are not distance sensitive,[19] and almost every business in a license area can be reached as soon as service is activated. Roll out times are very short – "[a]ctivating a system within 90 to 120 days is feasible."[20] WLL is modular,[21] scalable,[22]

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[15] "WinStar estimates that it has to sell only 10 lines to break even on a point-to-multipoint system." *See* W. Schaff, *Taking Stock: No Strings Attached*, Information Week, Feb. 22, 1999. Winstar's average customer orders 20 access lines. *See* J. Dix, *High Fliers*, Network World, Apr. 26, 1999.

[16] *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, Third Report*, 13 FCC Rcd 19746, App. F at F-1 (1998) ("*Third CMRS Report*"). Similarly, the Personal Communications Industry Association (PCIA) describes WLL as "hav[ing] the potential to serve as 'backbone' telephone service facilities, . . . and constitut[ing] potential competitors to traditional LECs." Letter from J. Kitchen, President, PCIA, to the Hon. Thomas Bliley, Chairman, Committee on Commerce, U.S. House of Representatives, Dec. 1, 1998, at 7.

[17] International Engineering Consortium, http://www.webproforum.com/amd/topic01.html.

[18] *See, e.g., Third CMRS Report* at App. F, F-11 n.49 (*citing* Aberdeen Group estimate of WLL connection at $700-800 and wireline connection at $5000); P. Flanagan, *This Year's 10 Hottest Technologies in Telecom*, Telecommunications, May 1998 (WLL costs, which continue to fall, are $500-$1000 per-line, compared to as much as $2500 per-line for wireline); F. Dawson, *AT&T Throws Fixed Wireless Market for a Loop*, Inter@ctive Week, Mar. 18, 1997 (WLL provider "Tadiran claims a cost improvement of up to 60 percent over wireline networks."); J. Bartash, *Local Wireless Carriers Signal Advance*, CBS MarketWatch, Mar. 9, 1999 (WLL allows providers to charge up to 30% less than ILECs).

[19] *See* International Engineering Consortium, http://www.webproforum.com/amd/topic01.html.

[20] *Id. See also Third CMRS Report* at App. F at F-1 at n.1 (citing report that wireless networks cost one-third and can be deployed in one-third the time of wireline networks); F. Dawson, *AT&T Throws Fixed Wireless Market for a Loop*, Inter@ctive Week, Mar. 18, 1997 (*quoting* AT&T: WLL "doesn't require us to sink capital into a connection until we have a signed order.").

[21] *See, e.g.*, Nortel Networks, *Reunion System Overview*, http://www.nortel.com/wireless/bwa/overview.html (WLL "[d]esigned to be both modular and flexible . . . grows as you and your customers grow. Network buildouts can be gradual, minimizing capital investment in comparison to wired networks."); Lucent, *Flexent CDMA Wireless Local Loop*, http://www.lucent.com/wirelessnet/products/networks/flex_cdma_wll.html (The "Wireless Local Loop platform is modular. You can add capacity and capabilities when and wherever required and custom tailor your network design to meet your marketplace opportunities, while mixing fixed and mobile traffic on the same base stations.").

[22] *Third CMRS Report* at App. F, F-1 ("WLLs can be launched in much smaller segments than wireline systems."); Strategis Group, Press Release, *Wireless Broadband Forecast to be Strong Contender in Liberalizing Local Access Markets*, Feb. 1999 (WLL "has significant advantages, particularly the quick time to market and scalable systems. This means costs for infrastructure are incurred as customers are signed on and returns on investment start sooner.").

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movable[23] and easier and cheaper than wireline loops to maintain. It also offers greater capacity and speed than a standard copper loop,[24] with equivalent quality of service.[25]

As the Commission has already concluded, WLL allows "faster time to market advantage over fiber-based networks; key strategic relationships with wireline CAPs and CLECs who wish to extend their fiber networks to end users not currently connected; initial service to a niche customer base of small-medium sized business customers, many of which are not served by fiber facilities provided by CLECs or CAPs . . . and the ability to bundle services from a versatile spectrum base that is already used to offer local, long-distance and Internet access services in one package."[26] "[F]ixed wireless technology has developed to the point where it has the potential to provide a competitive alternative to the incumbent LEC network."[27]

Many of the largest CLECs already have obtained wireless facilities (including licenses) to extend their fiber networks. AT&T holds 38-GHz licenses in over 200 geographic areas, including more than 95 of the largest 100 metropolitan markets. MCI WorldCom has recently invested nearly $700 million to obtain fixed wireless connections to complement its local fiber networks. MCI WorldCom CEO Bernard Ebbers has stated that, while his company has already purchased enough cable to cover half the country, his goal is to eventually cover 70 percent, and to use this fiber to serve as a local loop to small and mid-sized businesses.[28] Sprint has made four recent fixed wireless acquisitions that it plans to use to provide access to its ION network. Other major providers of WLL services include Winstar, Nextlink, Teligent, and Advanced Radio Telecom (ART). *See* Table 1; Maps 6 & 7.

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[23] Lucent explains: "Wireless allows you to redeploy access facilities on a large scale without losing a large share of embedded investment." F. Dawson, *Are Clouds Clearing Over Wireless Local Loop?*, Inter@ctive Week, Mar. 2, 1998.

[24] *See, e.g., Third CMRS Report* at App. F, F-11 (WLL offers higher data speeds); J. Bartash, *Local Wireless Carriers Signal Advance*, CBS MarketWatch, Mar. 9, 1999 ("wireless broadband is already capable of equaling a T3 line.").

[25] Recent developments have alleviated line-of-sight requirements and obstruction concerns. Clarity Wireless Corporation, recently acquired by Cisco Systems, "is the first to provide high-speed, reliable operation in obstructed environments." Cisco Press Release, *Cisco Systems to Acquire Clarity Wireless Corporation*, Sept. 15, 1998.

[26] *Third CMRS Report* at App. F, F-12.

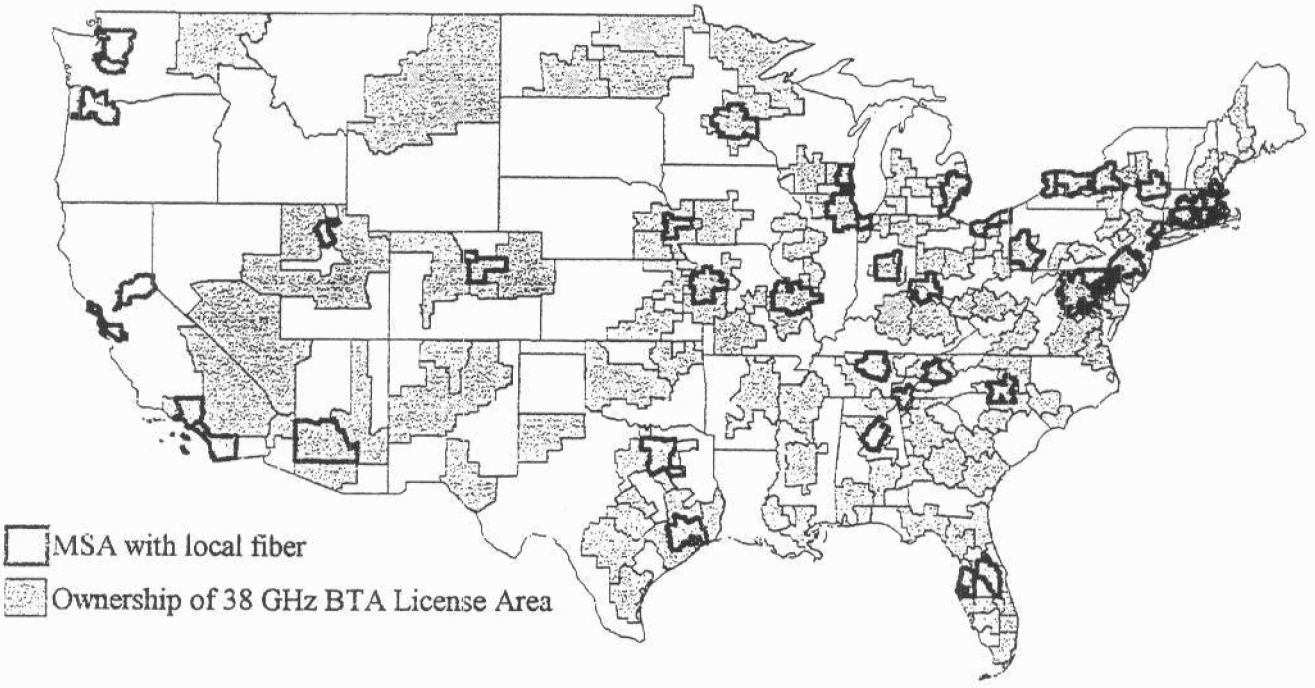
[27] *Amendment of the Commission's Rules to Establish Competitive Service Safeguards for Local Exchange Carrier Provision of Commercial Mobile Radio Services*, Report and Order, 12 FCC Rcd 15668, 15701, ¶54 (1997). *See also, William Kennard, Guest Opinion: Access: Key Word for New Millennium*, Wireless Week, Feb. 15, 1999 (*quoting* Chairman Kennard: "new wireless companies are building networks that can help break down the local loop or 'last mile' bottleneck controlled by the incumbent wireline firms, allowing wireless to become a significant substitute for wireline telephony.").

[28] *See* CIBC World Markets, Daily Teletimes, May 21, 1999 (summarizing comments of Bernard Ebbers at MCI WorldCom's Annual Meeting on May 20, 1999).

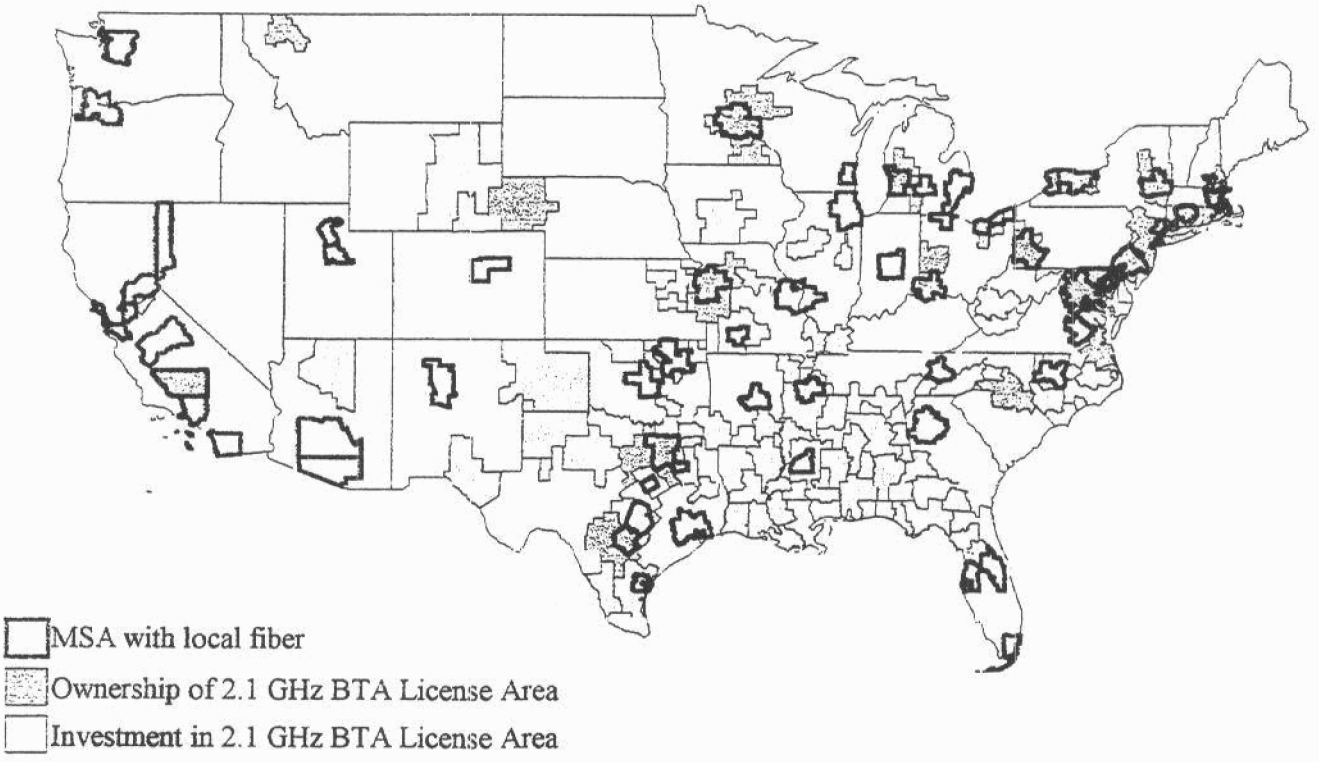
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Table 1. Use of Wireless Technology to Extend CLEC Networks		
	Wireless Coverage	**Wireless Strategies**
WinStar	28- and 38-GHz licenses in 160 markets nationwide	"WinStar's 'Wireless Fiber' service offers a flexible and profitable alternative for extending the reach of an existing fiber ring or providing local transport."
Teligent	24-GHz licenses in 74 markets	Teligent CEO Alex Mandl: "When I decided to do this more than two years ago, there weren't a lot of people who even knew what [fixed wireless] is...Today, I think everybody in the industry recognizes that fixed-wireless networks and point-to-multipoint networks will be a very important part of how the industry will evolve."
NEXTLINK	39 A Block LMDS licenses and 1 B Block LMDS license, with 114 million POPs, and coverage of 95% of the top 30 markets.	"NEXTLINK is well positioned to leverage its unique combination of assets, including its growing number of metropolitan fiber networks, its fixed broadband wireless spectrum, and the high-speed IP-centric fiber backbone connecting over 50 cities in the U.S. and Canada that is currently under construction."
Advanced Radio Telecom (ART)	38 GHz licenses in 90 of the top 100 U. S. markets and 210 markets nationwide.	"By integrating its own fixed wireless national spectrum assets with fiber optic transport, ART is capable of serving the vast majority of businesses that do not have direct fiber connectivity."
AT&T	Through AT&T's acquisition of TCG/BizTel, it gained 38-GHz Licenses in 213 geographic regions and 95 of the top 100 largest markets.	38-GHz licenses allow us to "bring TCG's service to customers that cannot be served economically with fiber optics. Thus we can expand our geographic reach using our own facilities predominantly, and achieve higher penetration in all communities we serve."
MCI WorldCom	Acquired CAI Wireless for $483 million (licenses in New York City, Rochester and Albany, N.Y.; Philadelphia, Washington and Norfolk/Virginia Beach, Va. Long Island, Buffalo and Syracuse, N.Y., Providence, R.I., Hartford, Conn., Boston, Baltimore and Pittsburgh). CAI Wireless also has a 94% stake in CS Wireless, with licenses in 10 markets. Invested $200 million combined in Wireless One (licenses in 80 markets); Heartland Wireless (licenses in 90 markets); CAI Wireless (14 markets); and CS Wireless (10 markets). Signed a five-year national agreement with WinStar for "Wireless Fiber."	Ernest D. Yates, Wireless One Executive VP and Chief Operating Officer: "Wireless data services . . . offers affordable alternatives to traditional local loop services for the 'last mile' connections." Nate Davis, Senior VP, Network Operations and Chief Operating Officer, MCImetro: "We're excited about the potential of WinStar's Wireless Fiber service. It will allow us to expand our network reach and provide more choices for MCI customers."
Sprint	Acquired People's Choice TV for $469 million (licenses in Chicago, Detroit, Indianapolis, Houston, Phoenix, St. Louis, Milwaukee, Salt Lake City, Tucson and Albuquerque). Acquired American Telecasting, Inc. (ATI) (licenses in 55 markets). Acquired Videotron USA for $180 million and Transworld for $30 million (licenses in San Francisco, San Jose, and Oakland, Calif; Tampa, Fla.; Seattle and Spokane, Wash.; and Greenville, S.C.).	"The beauty of Sprint ION is that it is compatible with all broadband access methods. Fixed wireless is one such method, and PCTV's markets are exceptionally well-suited for deployment." "Together with our recently announced merger with People's Choice TV, this transaction gives us a wireless alternative to deliver advanced communications services to our customers," said William T. Esrey, Sprint chairman and chief executive officer. "[W]e will be able to greatly extend the reach of Sprint's Integrated On-Demand Network to consumers and small businesses."
Electric Lightwave	3-year agreement for 300 wireless paths (equivalent to 1200 DS-1 circuits) in the Pacific Northwest.	ELI President David Sharkey: "Our relationship with ART allows us to move quickly into our planned market buildout, stepping up the time line."
ICG/ChoiceCom	3-year, $3.5 million agreement, for wireless DS-1 and DS-3 access in up to 10 states, including California, Tennessee, Colorado, Texas, and states in the Ohio Valley and the Southeast.	ICG President Sheldon Ohringer: "This agreement is an excellent fit with our plans to develop and expand our presence in the markets we serve."
Williams Communications	Purchased 2% of WinStar's "Wireless Fiber" capacity for $400 million.	Williams President and CEO Howard E. Janzen: "WinStar's proven ability to provide wireless T-1s, together with Williams' technologically advanced fiber-optic network, offers Williams' carrier customers an unmatched end-to-end solution."
Sources: See Appendix C		

Map 6. AT&T Local Fiber & Terrestrial Wireless Service Areas



Map 7. MCI WorldCom Local Fiber & Terrestrial Wireless Service Areas



3. CLEC deployment of competitive loops to business customers. CLECs already generate a larger share of their revenues from the provision of facilities-based, switched local service than from any other category of service.[29] For the customers that they reach, these networks offer complete, facilities-based local service, including, of course, transport from the customer's premises to the CLEC's switch.

CLECs reach a significant, and rapidly growing number of customers. Though it is impossible to know precisely how many facilities-based lines CLEC networks are providing, there are two ways reliably and conservatively to estimate this figure.

First, we can estimate CLEC lines based on the number of interconnection trunks CLECs are using. Facilities-based CLECs do not obtain trunks unless they have local lines and traffic to support and use such trunks. Based on ILEC engineering experience, a single trunk can support up to approximately 10 facilities-based lines. Since CLEC networks may not be engineered for maximum efficiency (*i.e.*, to serve the most efficient number of customers per trunk), and since CLECs disproportionately serve heavy-use Internet lines, we can conservatively assume that CLEC trunks are serving between 2.5 and 5 facilities-based lines per trunk. At least one CLEC – U S LEC – estimates its own access lines in precisely this manner, and estimates that each trunk serves 5 business access lines.[30]

ILEC engineers involved in provisioning trunks to CLECs inform us that only about half of all such trunks have actually been activated to carry traffic. We have therefore estimated the total number of "activated" trunks to be one-half the number of "provisioned" trunks. We next multiply the number of activated trunks by the average lines per trunk. We then subtract the number of unbundled loops CLECs are taking from ILECs, since the traffic carried on these loops also travels over interconnection trunks.

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[29] In 1998, CLECs earned $3.54 billion in switched revenues, which represents over 30 percent of all CLEC revenues. The second highest category was data ($2.46 billion), followed by dedicated access/private line ($2.45 billion), and long-distance ($1.04 billion). *1999 Annual CLEC Report* at Ch. 7, p. 3.

[30] The company's website states as follows:

> **Equivalent Access Lines:** This term is used by management to quantify the size of the Company's network. It is based on the number of customer lines and Trunks and the utilization of those lines and Trunks during the "busy hour". The "busy hour" refers to the hour of the day when line usage is at its highest level. The company calculates its Equivalent Access Lines by multiplying the number of its Trunks in service by five and adding to the result the number of its separate access lines in service. The decision to use five as the multiplier is based on management's experience, which now indicates that the typical business access line is in use for approximately 400 seconds during the busy hour (or approximately 11.1% of capacity during the busy hour) and a typical business Trunk is in use for approximately 2,000 seconds during the busy hour (or approximately 55.6% of capacity during the busy hour) or approximately five times use during the busy hour of a typical business line. NOTE: Beginning in July, 1998, management changed the multiplier that it uses in the calculation of EAL from six to five in order to reflect changes in the usage of its network."

US LEC, *Legal Information*, http://www.uslec.com/legal.htm.

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Applying this methodology, we estimate that CLECs are serving between 2.5 and 5.4 million lines over their own (non-ILEC) facilities in BOC and GTE service territories.[31] *See* Table 2.

Table 2. Facilities-Based CLEC Lines, by Region (Based on Interconnection Trunks)

	A Provisioned Trunks	B Activated Trunks (A/2)	C Unbundled Loops	D Facilities-Based Lines ((2.5*B) – C))	E Facilities-Based Lines ((5*B) – C))
Ameritech	347,607	173,804	122,208	312,302	746,812
Bell Atlantic	655,216	327,608	79,403	739,617	1,558,637
BellSouth	389,157	194,579	55,400	431,048	917,495
GTE	143,275	71,637	22,500	156,593	335,685
SBC	438,451	219,226	59,638	488,427	1,036,492
U S WEST	306,678	153,339	6385	376,963	760,310

Second, we can estimate CLEC lines based on the minutes of use (MOUs) exchanged between ILEC networks and CLEC networks. In the most recent month for which data are available, CLECs exchanged 13.2 billion MOUs with the BOCs and GTE, including 804 million MOUs originating on CLEC networks and terminating on BOC/GTE networks, and 12.4 billion MOUs originating on BOC/GTE networks and terminating on CLEC networks.[32]

The first category of MOUs (originating on CLEC networks) is most reasonably attributed entirely to voice calls, since most competitive networks use ILECs' networks for the termination of such calls. We assume that the average business line carries 500 MOUs of local calling each month.[33] Dividing 804 million MOUs by 500 (average use per line), we estimate that CLECs are serving 1.6 million voice-grade lines on their own networks (including unbundled loops obtained from ILECs).

The second category of calls (originating on ILEC networks) are predominantly data calls; many CLECs are also Internet Service Providers (ISPs),[34] or have numerous ISP customers. Moreover, because a typical customer will make and receive the same number of calls, a portion of calls that originate on ILEC networks and terminate on CLEC networks is already accounted for in the first category, and therefore must be subtracted. We assume that lines used primarily for Internet access are used, on average, 10,000 minutes a month.[35] Applying this methodology, we estimate that CLECs are serving 1.2 million data lines on their own networks.

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[31] This data is current as follows: for Ameritech, as of 4/99; for Bell Atlantic, as of 2/99; for BellSouth, as of 12/98; for GTE, as of 12/98; for SBC, as of 12/98; for U S WEST, as of 12/98.

[32] This data is current as follows: for Ameritech, as of 3/99; for Bell Atlantic, as of 2/99; for BellSouth, as of 3/99; for GTE, as of 3Q98; for SBC, as of 2/99; for U S WEST, as of 12/98.

[33] Estimate derived from internal company data.

[34] *E.g.*, MCI WorldCom, AT&T, RCN, WinStar, Electric Lightwave, and Frontier each operate major Internet backbones. *See* Boardwatch Magazine, *Directory of Internet Service Providers*, at 4 (Winter 1998 – Spring 1999).

[35] Estimate derived from internal company data.

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Adding these two totals and subtracting the number of unbundled loops CLECs are taking, we estimate that CLECs are serving approximately 2.5 million facilities-based lines in BOC and GTE service territories.[36]

Table 3. Facilities-Based CLEC Lines, by Region (Based on MOUs Exchanged)

	A MOUs from CLEC to ILEC	B Facilities-Based Voice Lines (A/500)	C MOUs from ILEC to CLEC	D Facilities-Based Data Lines ((C-A)/10,000)	E Unbundled Loops	F Total Facilities-Based Lines (B + D – E)
Ameritech	103 million	205,600	2.5 billion	239,720	122,208	323,112
Bell Atlantic	304 million	609,610	4.3 billion	397,452	79,403	927,659
BellSouth	186 million	371,449	3.0 billion	324,575	55,400	640,624
GTE	80 million	159,896	1.5 billion	142,002	22,500	279,398
SBC	131 million	262,450	1.1 billion	93,581	59,638	296,393
U S WEST	N/A	N/A	N/A	N/A	6385	N/A

The overwhelming majority of lines provided over CLECs' own facilities are serving business customers within the densest wire centers. It is therefore reasonable to measure CLEC penetration by comparing CLEC lines with the ILEC lines that CLECs compete against most directly – that is, ILEC business lines within dense wire centers. As discussed in Section II (Interoffice Transport), it is reasonable, and conservative, to conclude that competitive fiber is present in ILEC wire centers that (a) serve between 20,000+ to 40,000+ loops and (b) have attracted one or more collocated CLECs. These wire centers are where the vast majority of CLEC–supplied loops are likely to be found.

We therefore compare total CLEC facilities-based lines as a percentage of all business lines (ILEC plus CLEC) served by dense wire centers with collocation. Using this methodology, we estimate that CLECs are serving between 9 and 18 percent of all business lines within BOC and GTE wire centers with 40,000+ more lines and one or more CLECs with collocation; between 8 and 17 percent of all business lines within wire centers in which there are 30,000+ lines and one or more CLECs with collocation; and between 8 and 15 percent of all business lines within wire centers in which there are 20,000+ lines and one or more CLECs with collocation.[37] *See* Tables 4, 5, & 6.

Table 4. CLEC Share of Business Lines In RBOC/GTE Wire Centers with 40,000+ Lines and One or More Collocated CLECs

	A. Estimates of Facilities-Based CLEC Lines			B. RBOC/GTE Bus. Lines in Wire Centers with 40,000+ Lines and 1 or More Collocated CLECs	C. Estimates of CLEC Share (A/(A+B))		
	1. Table 2, Col. D	2. Table 2, Col. E	3. Table 3, Col. F		1.	2.	3.
Ameritech	312,302	746,812	323,112	4,156,948	7%	15%	7%
Bell Atlantic	739,617	1,558,637	927,659	5,411,364	12%	22%	15%
BellSouth	431,048	917,495	640,624	2,657,386	14%	26%	19%
GTE	156,593	335,685	279,398	909,893	14%	27%	23%
SBC	488,427	1,036,492	296,393	8,254,453	6%	11%	3%
U S WEST	376,963	760,310	N/A	2,440,057	13%	24%	N/A

[36] This total excludes U S WEST.

[37] These totals exclude U S WEST.

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Table 5. CLEC Share of Business Lines In RBOC/GTE Wire Centers with 30,000+ Lines and One or More Collocated CLECs							
	A. Estimates of Facilities-Based CLEC Lines			B. RBOC/GTE Bus. Lines in Wire Centers with 30,000+ Lines and 1 or More Collocated CLECs	C. Estimates of CLEC Share (A/(A+B))		
	1 Table 2, Col. D	2 Table 2, Col. E	3 Table 3, Col. F		1	2	3
Ameritech	312,302	746,812	323,112	4,730,235	6%	14%	6%
Bell Atlantic	739,617	1,558,637	927,659	6,029,247	11%	21%	13%
BellSouth	431,048	917,495	640,624	3,386,045	11%	21%	16%
GTE	156,593	335,685	279,398	1,346,841	11%	20%	18%
SBC	488,427	1,036,492	296,393	8,650,388	5%	11%	3%
U S WEST	376,963	760,310	N/A	2,907,703	10%	19%	N/A

Table 6. CLEC Share of Business Lines In RBOC/GTE Wire Centers with 20,000+ Lines and One or More Collocated CLECs							
	A. Estimates of Facilities-Based CLEC Lines			B. RBOC/GTE Bus. Lines in Wire Centers with 20,000+ Lines and 1 or More Collocated CLECs	C. Estimates of CLEC Share (A/(A+B))		
	1. Table 2, Col. D	2. Table 2, Col. E	3 Table 3, Col. F		1.	2.	3.
Ameritech	312,302	746,812	323,112	5,315,461	6%	12%	6%
Bell Atlantic	739,617	1,558,637	927,659	6,454,705	10%	19%	13%
BellSouth	431,048	917,495	640,624	3,881,485	10%	19%	14%
GTE	156,593	335,685	279,398	1,641,869	9%	18%	15%
SBC	488,427	1,036,492	296,393	8,904,965	5%	10%	3%
U S WEST	376,963	760,310	N/A	3,221,720	10%	19%	N/A

In sum, CLECs serve between 8 and 18 percent of all business lines in dense wire centers with collocation. By comparison, three and a half years after *Execunet II*, AT&T's competitors were serving less than 5 percent of business lines.[38] At least one market analyst has noted that "CLECs as a group [have] achieve[d] in less than two years after the Telecom Act what it took MCI and other alternative long-distance carriers over 10 years to achieve during the 1970s and 1980s."[39]

B. Residential Customers

Although competition for business loops is well established and widespread, competition for residential loops has been slower to develop. But technologies that compete directly against traditional copper loops are rapidly being deployed across the country.

1. Cable. There can be little serious doubt, now, that cable will offer a direct substitute for ILEC loops to most U.S. households.[40] AT&T and other cable operators

[38] *See* William Kennard, Chairman, FCC, Statement Before the Subcommittee on Commerce, Justice, State, and the Judiciary, U.S. House of Representatives, Mar. 25, 1998; C. Yang, *Yes, Virginia, There Is Phone Competition*, Business Week, Sept. 28, 1998.

[39] J. Grubman, et al., Salomon Smith Barney, *CLECs Surpass Bells in Net Business Line Additions for First Time*, May 6, 1998.

[40] This development was anticipated in 1996. In the Conference Report to the 1996 Act, Congress noted "that meaningful facilities-based competition is possible, given that cable services are available to more than 95% of United States homes. Some of the initial forays of cable companies into the field of local

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have clearly concluded that it is economically feasible to upgrade cable to provide direct substitutes for ILEC loops to residential customers.[41]

The FCC has found that "numerous MSOs" are offering commercial cable telephony, and that the service is now "available to a large number of customers in many markets."[42] *See* Table 7. For example, Cox Communications introduced local phone service in 1997,[43] now offers it "in parts of five major markets,"[44] and its offerings have been quite successful.[45] MediaOne Group recently introduced cable phone service in Atlanta, Los Angeles, Jacksonville, Boston, and Pompano, Florida, and says its results are "encouraging."[46] Jones Intercable has "had continued success with its rollout in the Washington, DC metropolitan area and plans to expand service within the region."[47] Cablevision is offering cable telephony on Long Island and in several Connecticut markets, and achieved penetration rates of 12 percent in just the first few months.[48]

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telephony therefore hold the promise of providing the sort of local residential competition that has consistently been contemplated." H. R. Conf. Rep. No. 104-230, 104th Cong., 2d Sess. at 148 (1996).

[41] The experience in the United Kingdom supports such conclusions. Nearly 40 percent of U.K. households now have the option to purchase cable telephony; that figure is projected to rise to 75 percent by 2002. *See* Opposition and Reply of British Telecom and MCI at 14, The Merger of MCI Communications Corporation and British Telecommunications plc, Dkt. No. 96-245 (F.C.C. filed Feb. 24, 1997). Fully one-quarter of the households that can subscribe to competitive local service opt to do so. *See* Independent Television Commission, ITC Cable Statistics, http://www.cable.co.uk (7 percent of all residential lines are cable-based); International Telecommunications Union, World Telecommunications Development Report, 1995 (number of U.K. households); M. Fagan, *Government Backs £13bn BT-MCI Deal*, Evening Standard (London), Feb. 26, 1997, at 35 (10 percent of all nationwide exchange lines are provided by BT competitors).

[42] *Annual Assessment of the Status of Competition in Markets for the Delivery of Video Programming*, Fifth Annual Report, CS Docket No. 98-102, FCC 98-335, ¶ 59, (rel. Dec. 23, 1998) ("*Fifth Annual Video Programming Report*").

[43] *See* Moody's Investor Service, *Cox Communications*, Investext Rpt. No. 3275589, (June 13, 1998). to residential customers in Orange County, California, and Omaha, Nebraska).

[44] *Fifth Annual Video Programming Report* ¶ 59.

[45] *See* L. Cauley, *Right Number? In Southern California, Cox Communications Rattles a Baby Bell*, Wall St. J., Aug. 6, 1998, at A1.

[46] L. Cauley, *Telecommunications (A Special Report): Bypassing the Bells*, Wall St. J., Sept. 21, 1998, at R14.

[47] *Fifth Annual Video Programming Report* ¶ 59. Jones has been offering phone service to MDU residents in Alexandria, VA since late 1995 and to Prince George's County, MD residents since 1996. *See* K. Gibbons, *Back From the Dead; Demand for Telephony*, Multichannel News, Jun. 29, 1998, at 22A.

[48] *See* J.R. Cohen, *et al.*, Merrill Lynch Capital Markets, *Cablevision Systems Corp. – Company Report*, Rpt. No. 2691812 (May 14, 1998).

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Table 7. Provision of Local Telephone Service by Cable Operators				
	Circuit-Switched Cable Telephony		IP Telephony Over Cable	
	Commercial Deployment	Planned Rollouts	Commercial Deployment	Planned Rollouts
Adelphia	Palm Beach County, FL	Buffalo, NY (trial)		
Cablevision	29,200 homes on Long Island; Fairfield, CT	200,000 additional homes in Connecticut and New York		
Comcast	West Palm Beach; Ft. Lauderdale; Baltimore	Negotiations with AT&T to offer AT&T-branded telephony in all Comcast markets.		
Cox	Cheshire, Manchester, Meriden, South Windsor, Southington, CT; Omaha, NE; Orange County, CA; San Diego, CA; Phoenix, AZ	San Clemente, CA; Hampton Roads, VA		
Jones	Alexandria, VA; Prince William County, MD.			
MediaOne	150,000 homes in Atlanta; Los Angeles; Jacksonville and Pompano, FL; Boston; 5,000 customers in Richmond, VA; Northville, Plymouth, MI	Minneapolis-St. Paul	Detroit	New owner AT&T plans to test IP telephony services in MediaOne's circuit-switched markets.
TCI	Arlington Heights, IL; Hartford, CT; Fremont/Sunnyvale, CA			New owner AT&T expects to have 60% of TCI's systems IP compatible by the end of 1999, and 90% by 2000.
Time Warner	Rochester, NY			Negotiations with AT&T to offer service on Time Warner's facilities beginning in year 2000.
Source: *See* Appendix C.				

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Led by AT&T, much of the rest of the cable industry will soon follow. AT&T itself states that its recent investments in cable answer "a big part of the question about how [AT&T] will provide local service to U.S. consumers."[49] AT&T has acquired the nation's largest cable company (TCI) and has reached an agreement to acquire the fourth largest (MediaOne).[50] AT&T's two direct acquisitions of cable properties represent a $90 billion investment in alternative local-loop technology. The company is also forging alliances with the second largest cable company (Time Warner) and the fifth largest (Comcast).[51] AT&T says it will offer "AT&T-branded cable telephony service to residential and small business customers over Time Warner's existing cable television systems in 33 states."[52] Time Warner indicates that they will offer the same services currently available to local phone customers and that "services will be competitively priced."[53]

Overall, about 20 percent of U.S. cable subscribers are already served by two-way systems.[54] Time Warner expects 85 percent of its cable plant "to be upgraded by the end of 1999."[55] TCI projects that by the end of 1999, 60 percent of its plant will be upgraded to two-way capability, and by 2000, 90 percent will be.[56] According to MediaOne, broadband telephony will be available to most of the homes in its service areas by the end of 2000.[57] MediaOne estimates the cost of upgrades to provide telephony and other two-way services at about $800 per customer. "This compares with roughly $1000 to $1200 of capital expenditure per subscriber that the RBOCs currently have."[58] And once the upgrade is made, cable companies can offer many services that basic residential loops

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[49] AT&T Press Release, *AT&T, TCI to Merge, Create New AT&T Consumer Services Unit*, Jun. 24, 1998.

[50] S. Schiesel, *Tasty Morsels and Digestive Challenges for AT&T*, New York Times, Apr. 26, 1999, K. Chen, *AT&T Buyout of MediaOne is Expected to Win Approval*, The Wall Street Journal, May 6, 1999.

[51] *See* AT&T Press Release, *AT&T and Time Warner Form Strategic Relationship to Offer Cable Telephony*, Feb. 1, 1999; L. Cauley, *Comcast Reaches Accord with AT&T on Media One*, The Wall Street Journal, May 5, 1999. These negotiations have been delayed pending AT&T's completion of the Media One deal. *See* R. Blumenstein, *AT&T Puts Cable Agreements on Hold*, The Wall Street Journal, May 20, 1999, at B9.

[52] Time Warner News Release, *AT&T and Time Warner From Strategic Relationship to Offer Cable Telephony*, Feb. 1, 1999.

[53] *Id.*

[54] Based on research by Kinetic Strategies, 20% of North America's cable plant is upgraded and activated to provide two-way services, passing 21 million homes. CableWeb Systems, *Market Opportunity*, www.cable-web.com/cable_web_marketing.htm.

[55] Time Warner News Release, *AT&T and Time Warner From Strategic Relationship to Offer Cable Telephony*, Feb. 1, 1999.

[56] *See* C. Mason, *Where Are CATV's Trump Cards?*, America's Network, Jun. 1, 1998.

[57] *See* MediaOne, *Overview*, http://www.mediaone.com/who_we_are/default.htm

[58] S. Masud, *Cable Telephony: Say Hello to Your New Phone Company*, Telecommunications Magazine, Dec. 1998.

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cannot. Cox Communications estimates that the "breakeven penetration rate is in the high single digits."[59]

Cable is emerging even more quickly as an alternative for the loops used for data traffic. Data loops in fact account for much of the current growth in usage of ILEC loops – households obtain second phone lines mainly for fax and Internet services.[60] Cable modem service is now available to an estimated 20 million homes, or roughly 20 percent of the U.S. mass market.[61] It will reach an estimated 20-30 million by the end of 1999.[62] An estimated 13 million cable modems will be deployed in the next three years.[63]

Before long, all of these data channels will be capable of providing voice too. AT&T plans to begin deploying IP telephony on TCI's systems in 1999.[64] Much of the work has already been completed;[65] trials are already under way in Atlanta, Baltimore, Boston, Miami, Phoenix, San Francisco, and San Jose.[66] In the words of AT&T's Chairman, "IP telephony is here."[67] TCI President Leo Hindery claims that "within 5 years, 100% of homes passed by AT&T will be able to take Internet protocol (IP) telephony," and thirty percent actually will subscribe."[68] IXC is about to begin trials of IP telephony over cable modems. Cisco Systems recently introduced the first Data Over

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[59] *Id.*

[60] *See, e.g.*, L. Selwyn and J. Laszlo, ETI, *The Effect of Internet Use on the Nation's Telephone Network* at Table 3 (Jan. 22, 1997) (prepared for the Internet Access Coalition) (the demand for 6 million "second" residential subscriber lines in 1995 – almost half of all "second" residential lines – can be attributed principally to on-line access). The Commission itself recognized that fact when it opted to raise monthly subscriber line charges on second residential phone lines, but not on first lines. *Access Charge Reform*, First Report and Order, 12 FCC Rcd 15982, 16014 ¶ 78 (1997).

[61] *See* Paul Kagan Associates, Inc., *Cable TV Technology*, Aug. 26, 1998, at 3, *as cited in* NCTA, *Cable Television Year-End Review 1998* (as of mid-1998). This number is estimated to grow to 39 million homes by 2000, and to more than 67 million homes by 2005. *Id.*

[62] *See* J.J. Bellace, et al., Merrill Lynch Capital Markets, Investext Rpt. No. 2706388, Wireline Communications Equipment – Industry Report at *1 (June 22, 1998).

[63] *See High Speed Internet Access to Reach 16 Million U.S. Households by 2002, According to Forrester*, Business Wire, Sept. 1, 1998 (predicting cable modems will capture 80 percent of the high-speed market). *But see Study Sees Cable Modem Deployments Surpassing ADSL Installations by 2003*, Broadband Networking News, Aug. 4, 1998 (estimating 10 million cable modem users by 2003).

[64] *See* S. Schmelling, *Ghostbusting*, Telephony, Apr. 12, 1999.

[65] Technology for IP telephony, according to AT&T's Chief Technology Officer and President of AT&T Labs David Nagel, is "well in hand" and "makes good economic sense." "The period of invention," Mr. Nagel declared, "is over." *AT&T Plans $4.4- Billion Upgrade*, Television Digest, Jul. 6, 1998.

[66] *See* AT&T, *AT&T Connect 'N Save® Service – Welcome*, http://www. connectnsave.att.com.

[67] *AT&T Proposes a Deal to Buy TCI*, CNN Moneyline News Hour with Lou Dobbs, Jun. 24, 1998.

[68] *Hindery Denies Athome-Roadrunner Talks, Cable Fault In Rate Hikes*, Communications Daily, Mar. 29, 1999.

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Cable Service Interface Specification (DOCSIS) 1.1 cable modem with router to deliver IP telephony.[69] CableLabs is in the process of completing the DOCSIS 1.1 standard.[70]

Most communities are served by only a single cable operator: upgraded cable will therefore provide a substitute for ILEC loop to only a single CLEC, unless incumbent cable operators are required to unbundle cable's capabilities in the same manner as incumbent LECs. It is worth noting, however, that the residential long-distance market remains dominated by just two providers, AT&T and MCI WorldCom.[71] In October 1995, when the Commission declared AT&T to be "non-dominant,"[72] and without significant market power, AT&T still served about 75 percent of presubscribed residential long-distance accounts; and MCI served 12 percent.[73]

2. Mobile Wireless. Cellular and PCS services clearly offer a functional alternative to wireline connections. Advanced digital technology has eliminated the quality gaps between wireline and wireless connections. But until quite recently, wireless service was not price competitive with wireline service, and therefore did not provide an economic substitute.[74]

In May 1998, however, AT&T introduced its Digital OneRate service plan. Since then, the company has widely advertised the service as a direct substitute for wireline

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[69] *See New Media*, Communications Daily, Apr. 21, 1999.

[70] *Id.*

[71] In 1997, the latest year for which such data is available, AT&T and MCI together had 79.8 percent of all residential pre-subscribed lines. *See* FCC, Common Carrier Bureau, *Long Distance Market Shares Fourth Quarter 1998*, Mar. 1999, at 23 Table 4.1.

[72] *Motion of AT&T Corp. to be Reclassified as a Non-Dominant Carrier*, Order, 11 FCC Rcd 3271, 3356 ¶ 164 (1995). AT&T became exempt from regulation for its residential long distance, operator, 800 directory assistance, and analog private line services, in addition to the business services that already were regulated as nondominant. *Id.*

[73] FCC, Common Carrier Bureau, *Long Distance Market Shares Fourth Quarter 1998*, Mar. 1999, at 23 Table 4.1.

[74] *See, e.g., Application by BellSouth Corporation, et al. Pursuant to Section 271 of the Communications Act of 1934, as amended, To Provide In-Region, InterLATA Services In Louisiana*, Memorandum Opinion and Order, 13 FCC Rcd 6245, 6290 (1998) (PCS providers "appear to be positioning their service offerings to become competitive with wireline service, but they are still in the process of making the transition 'from a complementary telecommunications service to a competitive equivalent to wireline services.'") (*quoting Implementation of Section 6002(b) of the Omnibus Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services*, Second Report, 12 FCC Rcd 11266, 11326 (1997)).

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service.[75] AT&T Wireless, Sprint PCS, and Nextel all offer nationwide plans without additional roaming and long distance charges.[76]

In announcing its OneRate plan, AT&T's Michael Armstrong stated that the company would market the service not just as a complement to wireline service, but as a direct substitute.[77] "Pretty soon, someone's going to wonder why that [wireline] phone is sitting there."[78] Sprint reached the same conclusion: "It's no wonder our customers are beginning to use their Sprint PCS phones as their one and only communications tool every day."[79]

Wireless is particularly competitive for second lines. AT&T is testing a mobile phone plan in Plano, TX where subscribers receive unlimited local phone calls inside Plano and pay for bundles of minutes that can be used elsewhere.[80] AT&T is offering the service to encourage people "to buy mobile telephone service rather than a second home line."[81] Frontier Cellular is likewise targeting applications such as a "phone line for a vacation home, a second line for a teenager, or a line for a rural residence without access to a landline."[82]

Usage patterns strongly suggest that a rapidly growing number of consumers view wireless as a direct substitute for wireline calling. The average PCS subscriber now makes 250 to 350 minutes of calls a month[83] – about double the usage levels in 1998.[84] And usage levels continue to rise very fast.[85] A Yankee Group manager stated that PCS

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[75] One AT&T ad states: "...[W]ith rates as low as 11 cents a minute, every call is like a local call. It could make your wireless phone your only phone." Ad for AT&T Digital OneRate, *New York Times*, Apr. 15, 1999, at A11.

[76] A PCIA spokesperson states "that simplified pricing – with no roaming and no long distance charges – is the clear trend for the wireless industry." Remarks of Mary McDermott, Senior Vice President, PCIA, at ICM's Third Annual Strategic Telecom Pricing Conference, Jan. 27, 1999.

[77] *AT&T Wireless Joins Sprint PCS in Single-Rate Offer, But Adds Contracts*, Communications Daily, May 8, 1998, at 7-8.

[78] *Id.*

[79] Sprint PCS News Release, *Sprint PCS Unveils All-Inclusive Nationwide Service Plans With Prices As Low As A Dime A Minute, Anytime, Anywhere*, Oct. 1, 1998.

[80] *See* J. Files, *AT&T Tests Mobile Phone Promotion*, The Dallas Morning News, Nov. 12, 1998.

[81] *Id.*

[82] Frontier Cellular Press Release, *Frontier Cellular Offers Digital Wireless Local Access*, Feb. 9, 1999.

[83] *See* P.D. Walter, et al., The Robinson-Humphrey Company, Inc., Investext Rpt. No. 3356892, *PCS Versus Cellular – Industry Report* at *9 (June 25, 1998).

[84] *See* Strategis Group, Press Release, *Good News for Mobile Phone Industry—Minutes of Use Are On the Uptick, The Bad News—So is Churn*, Nov. 10, 1998.

[85] *See* C. Motz, Credit Suisse First Boston Corporation, Investext Rpt. No. 2740395, *Wireless Telecommunication Svcs: the Wireless Review #35*, at *3 (Feb. 18, 1999). *See also* C.M. Motz, et al., Credit Suisse First Boston Corp., Investext Rpt. No. 2690909, Wireless Telecommunications Services – Industry Report at *2 (Apr. 23, 1998) ("We are seeing evidence of more minutes of use now with the PCS,

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providers are "showing average minutes of use that are triple the historical cellular number. That's the primary way of initially deploying wireless local loop in a domestic marketplace."[86] As a sign that residential usage is rising, many providers have eliminated free off-peak and weekend calling and are instead offering packages of bulk minutes during these times.[87]

The Commission itself has acknowledged that wireless providers are now "using aggressive pricing to position their services as true replacements for the wireline based services of LECs."[88] "As wireless service rates continue their downward trend and the use of wireless service increases, there is a greater likelihood that customers will view their wireless phones as a potential substitute for their wireline phones."[89] "[W]ireless and wireline technologies are increasingly competing for a single pool of minutes-of-use. ... [W]ireless providers can compete for local access by creating pricing plans that encourage their customers to use mobile phones as substitutes for wireline phones."[90]

Analysts have likewise concluded that wireless rates have fallen below the wireline "displacement point." Exact price parity is not the right test; wireless phones offer the considerable advantage of mobility, so consumers are willing to pay more for them, just as they are willing to pay more for cable service than for (free) broadcast television. The Yankee Group estimates the point of displacement is a wireless-to-wireline price ratio of 3-1.[91] Moreover, PCS providers routinely bundle in Caller ID, voice mail, and paging. On a bundled basis, these services are already priced at levels directly comparable to those charged for similar bundles of wireline alternatives, in both business and residential markets. Wireless calling is cheaper still when large calling areas (which eliminate many toll calls) and the elimination of long-distance charges under "one rate" plans are factored in

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digital cellular, and ESMR carriers. Most PCS carriers [are] seeing significantly higher minutes of use than their analog cellular counterparts. Although it takes a while to alter the averages, both large and small PCS players are reporting minutes of use in the range of 180-350 minutes per month. Bell Atlantic Mobile, a digital cellular carrier, says that converted analog users are using about 280 minutes per month. ESMR operator Nextel reports that it is seeing minutes of use in excess of 300 per month.").

[86] Pat Blake, *Hybrid WLLs*, Telephony, Jun. 1, 1998, at 26.

[87] *See, e.g.*, BestBeep.com, *Sprint PCS Service Plans*, www.bestbeep.com (On the Standard Sprint Service plan, unlimited off-peak hours can be purchased for an additional $9.99); New City Wireless Communications, Inc., *Cellular Service Promotion*, www.ehot.com/newcitywireless/promotion.html (under GTE Cellular Choice Plan users may purchase 1000 off-peak minutes per month for $10); newyorl.citysearch.com, *Personal Communication Center*, www.newyork.citysearch.com/E/V/NYCNY/0015/61/12/4.html (AT&T Digital PCS plans offer the option to buy unlimited evening and weekend airtime for an extra $9.99 per month)

[88] *Third CMRS Report*, 13 FCC Rcd at 19817.

[89] *Cellular Telecommunications Industry Association's Petition for Forbearance from Commercial Mobile Radio Services Number Portability Obligations and Telephone Number Portability* ¶ 23, WT Dkt No. 98-229 (rel. Feb. 9, 1999).

[90] *Third CMRS Report*, 13 FCC Rcd at 19776-19777.

[91] *See* Yankee Group, *Yankee Group Pricing Study: All-Inclusive Wireless Rates Usher in The Era of Landline Displacement*, Jan. 4, 1999.

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According to the Personal Communications Industry Association, "42% of all Americans would consider switching their local phone service to wireless."[92] Industry observers note that the "[w]ireless industry is winning new customers at the expense of wireline rivals, with very young and heavy volume customers most likely to yank wireline phone in favor of mobility."[93] AirTouch and Western Wireless figure that by 2001, some 10 percent of their wireless customers would use their wireless phone as their primary phone.[94]

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[92] PCIA Press Release, *PCIA Launches Advertising Blitz on Wireless Competition*, Mar. 26, 1998.

[93] *Executives See Low Volume and Heavy Users for Wireless*, Communications Daily, Feb. 10, 1999.

[94] *See id.*; J. Files, *Wireless Market Looks Homeward*, The Dallas Morning News, Feb. 9, 1999.

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C. Dark Fiber

The Commission has sought comment on whether it should "modify the definition of 'loops' or 'transport' to include dark fiber."[95]

Fiber is principally deployed as a loop to very large customers.[96] Using the current standard in loop electronics, a single fiber pair can transmit at speeds of at least OC-12, and OC-48 is quickly emerging as the new standard.[97] OC-12 enables connections of 622 million bits per section – the equivalent of over 10,000 voice-grade lines. Only the very largest customers require connections of this magnitude. Over 65 percent of BOC and GTE wire centers in fact contain 10,000 or fewer lines. And even in those wire centers, ILECs routinely deploy fiber-optic interoffice trunks.[98]

There can be no serious doubt that CLECs have and will continue to lay fiber to reach any customer capable of generating traffic volumes at such levels. One observer notes that "[l]arge companies have been able to use their marketplace clout to obtain direct fiber connections to network backbones."[99] Where CLECs do not have their own fiber-optic facilities in place, they can often lease dark fiber from wholesalers who do. Major wholesalers include Frontier, GST, IXC, Level 3, MFN, Qwest, and Williams.[100] *See* Table 8. Many utility companies are deploying fiber either on their own or in partnership with CLECs. *See* Table 9.

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[95] *Second FNPRM* ¶ 35.

[96] There are also instances, however, of small and medium businesses with access to alternative fiber networks, as well as residential customers within multiple dwelling units.

[97] *See* A. Lindstrom, *Terabit Routing: The Network's New DNA*, Americas Network, Jan 1, 1999 ("OC-48 is being deployed now") (*quoting* Cisco Project Marketing Director Andrew Greenfield); A. Lindstrom, *Optical networking: The Future of OC-768 Depends on Speed and Need*, America's Network, Sept. 15, 1998 ("The industry is starting to migrate from OC-12 to OC-48."); A. Lindstrom, *Sonet Cheats Death by Penetrating Local Loop*, America's Network, Apr. 1, 1999 ("We are driving to commoditize the market, making OC-48 deployment 'casual'") (quoting Rob Koslowsky, director of marketing, Cerent Corp.); T.J. Erickson, et al, Dain Rauscher Wessels, *Network Technology*, Report No. 2708837, Jul. 22, 1998., *3 ("Backbone ISPs are beginning to provision networks based on OC-12(633 Mbps) connections, with OC-48 just over the horizon."); W.T. Scott, et al, Furman Selz LLC., *Industry Report- Competitive Local Exchange Carriers*, Report No. 2648310, *3 (The 12,000 mile network being jointly constructed by ACSI, fonorola and IXC will carry voice, data, video and IP traffic at OC-12 rated transmission speeds"); GST Telecommunications, *GST Network Information*, http://www.gstcorp.com/network ("GST's network infrastructure is based on its own OC-48 fiber and ATM switches, with the ability to upgrade to OC-192.")

[98] J. Kraushaar, *Fiber Deployment Update, End of Year 1997* (1998), at 18 ("Fiber deployment data disclose that much of the fiber deployed to date has been in interoffice plant.").

[99] M. Kennedy, *Broadband Access for the Middle Market*, Telecommunications Online, Jan. 1999, http://www.telecoms-mag.com/issues/199901/tcs/kennedy.html.

[100] According to some estimates, "35% of the fiber already in the ground is 'dark.'" C. Mack, *Fiber Frenzy*, Forbes, Apr. 19, 1999, at 252. Since June 1998, "the wholesale spot price of bandwidth is down 35%, thanks to ample supply." *Id.* Bandwidth is now sold as a commodity through numerous clearinghouses, including Arbinet, AT&T Global Clearinghouse, GRIC Communications, IXTC WweXchange, and Ratexchange RTBX. *See* K. Henderson, *Market Makers Push "Telecommodities,"* Phone+ Magazine, Dec. 1998.

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Table 8. Major Suppliers of Dark Fiber		
	Fiber Network	**CLEC Purchasers**
Frontier Corp.	20,000 route miles planned (interconnecting 120 major cities), 57 percent lit	• Level 3 Communications (8,300 route miles of fiber)
GST Telecommunications	5,751 route miles (including network currently under construction)	• FTV (owned by Williams, Enron, and Touch America) (745 route miles in California)
IXC Communications	10,200 route miles (16,400 miles by the end of 1999) IXC is currently in 36 of the top 50 MSAs and 57 of the top 100 MSAs	• Electric Lightwave (20 years, $101 million and 2,800 route miles of fiber) • Telco Communications Group (3 years) • STAR Telecommunications (20 years, $31 million, covering Los Angeles, Dallas, Atlanta, Miami, Phoenix and other areas) • Digital Teleport ($33 million) • Level 3 Communications (7,355 route miles of fiber) • Time Warner (2 years) • RSL Communications (10 years)
Level 3 Communications	1,300 route miles (nearly 16,000 mile intercity network by first quarter of 2001)	• INTERNEXT ($700 million for capacity over the entire route) • RCN
Metromedia Fiber Network	230,000 fiber miles (expanding to over 1 million fiber miles)	• Allegiance (Dallas and New York) • Time Warner (20 years in the New York/New Jersey metropolitan areas) • Intermedia ($56 million, covering Boston, Chicago, New York, Philadelphia, San Francisco, Silicon Valley and Washington) • Hyperion (Chicago, New York and Washington) • e.spire ($29 million, covering New York, Philadelphia and fibers on the New York to Baltimore intercity corridor) • WinStar (25 years, $40 million, covering Chicago, New York, Washington, Philadelphia, and San Francisco)
Qwest Communications	15,000 route miles (18,815 by mid-1999)	• Advanced TelCom Group ($63 million, 7 years) • STAR Telecommunications (20 years, $85 million) • Sprint • MCI • AT&T • ELI ($122 million)
Williams Communications	17,600 route miles (32,000 route miles connecting 125 cities by the end of 2000)	• WinStar ($640 million for four strands of fiber over approximately 15,000 route miles) • Intermedia (20 years, $450 million, IRU on nationwide network) • Frontier ($68 million and 3,000 route miles through Houston, Atlanta, Tampa and Miami) • UniDial

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Table 9. Fiber Deployment by Utilities	
	Fiber Deployment
American Electric Power Company	"[AEP] is currently offering high capacity long haul data and voice service to major inter exchange carriers, competitive local exchange carriers, wireless providers and others."
PECO Energy-Hyperion	500-mile fiber optic network in southeastern Pennsylvania
Conectiv Communications	"State-of-the-art fiber optic network that spans over 600 miles in the region."
Entergy Corporation-Hyperion	350-mile SONET networks in Baton Rouge, Jackson, and Little Rock
Boston Edison	200-mile fiber optic backbone
MaineCom Services	In the process of constructing the New England Optical Network, a high-capacity inter-city fiber network. $20 million joint venture with Brooks Fiber to construct a fiber optic network to serve the Portland market
VPS Communications	270-mile fiber optic backbone
Montana power	8,000 mile network called Touch America, which covers thirteen states
SCANA Communications	2,500-mile fiber optic network stretching from the Carolinas to east Texas
C3 Communications	Fiber optic network that covers Texas, Arkansas, Oklahoma, and Louisiana
Sources: See Appendix C	

The FCC itself has found that CLECs "now have at least 11% of the total fiber optic system capacity potentially available to carry calls within local markets."[101] And the Commission's finding was in fact based on a vast understatement of CLEC fiber. It was based on the FCC's Fiber Deployment Update, which lists CLECs as having deployed 35,351 fiber miles as of year end 1997.[102] New Paradigm Resources Group, which surveyed far more CLECs than the FCC, put the number at more than double the FCC's estimate – 78,506.[103] In 1998, New Paradigm reports, CLECs increased their fiber networks by nearly half again, to 108,000 miles.[104] According to Corning, one of the largest fiber suppliers, CLEC demand for fiber grew 45 percent in 1998, whereas demand from ILECs increased only 10 percent.[105]

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[101] *FCC Local Competition Report* at 2.

[102] J. Kraushaar, Industry Analysis Division, FCC, *Fiber Deployment Update, End of Year 1997*, at Table 14 (1998).

[103] *See 1999 CLEC Report* at Ch. 6, Table 4.

[104] *See id.*

[105] Corning Press Release, *Worldwide Demand for Optical Fiber and Photonic Products Showed Continued Growth in 1998; Corning Expects Stronger Growth in 1999*, Feb. 23, 1999.

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D. Network Interface Devices (NIDs)

In the *Local Competition Order*, the FCC found that "[i]n many cases, inside wiring is connected to the incumbent LEC's loop plant at the NID," and that "[i]n order to provide service, a competitor must have access to this facility."[106]

The FCC implicitly acknowledged years ago, however, that NIDs are at least potentially competitive. In a 1990 proceeding concerning the deregulation of inside wiring, the FCC eliminated the requirement that end users connect their inside wiring to the telephone network through a carrier-installed jack (*i.e.*, a NID).[107] End users were permitted to supply their own NIDs or methods of interconnection to the network. As recapitulated by the FCC, AT&T argued at the time that "the customer should be allowed to install a jack at any point on the customer's side of the protector. This can be accomplished with little or no hazard to the customer and, if proper wire and jacks are used, with assurance of no harm to the network."[108] In an unrelated 1988 proceeding, AT&T in fact urged the Commission to deregulate the NID entirely.[109]

A NID is an inexpensive, off-the-shelf piece of equipment that any CLEC can acquire on the open market from numerous non-ILEC sources. NIDs are sold on the open market, by numerous companies, and in any volume. NID manufacturers include Siecor, Keptel, Gusto Communications, AMP, 3M, Charles Industries, Lucent Technologies, Raychem, Reltec, and TII Industries.

NIDs are cheap, often cheaper than handsets. The FCC has noted that the Hatfield model pegged the cost of a residential NID at $25 (plus $4 per line for a protection block) and assumed that each NID could handle up to six lines.[110] The Hatfield model pegged the cost of business NID at $40, plus $4 for a protection block.[111]

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[106] *Local Competition Order*, 11 FCC Rcd at 15697 ¶392.

[107] *Review of Sections 68.104 and 68.213 of the Commission's Rules Concerning Connection of Simple Inside Wiring to the Telephone Network and Petition for Modification of Section 68.213 of the Commission's Rules Filed by the Electronic Industries Association*, Report and Order and Further Notice of Proposed Rulemaking, 5 FCC Rcd 4686, 4687 ¶5 (1990).

[108] *Review of Sections 68.104 and 68.213 of the Commission's Rules Concerning Connection of Simple Inside Wiring to the Telephone Network and Petition for Modification of Section 68.213 of the Commission's Rules Filed by the Electronic Industries Association*, Order on Reconsideration, Second Report and Order and Second Further Notice of Proposed Rulemaking, 12 FCC Rcd 11897 (1997).

[109] In a brief before the FCC, AT&T argued: "[C]onsistent with the Commission's fundamental principle to assign costs to the cost causative customer, all expenses associated with installation of interface devices on the customer's side of the protector should be accounted for as a nonregulated activity and not charged to ratepayers." AT&T Comments on Direct Cases at 14, *Annual 1988 Access Tariff Filings*, CC Docket No. 88-1, Phase II (filed July 18, 1988).

[110] *See Federal-State Joint Board on Universal Service, Forward-Looking Mechanism for High Cost Support for Non-Rural LECs*, Further Notice of Proposed Rulemaking, 12 FCC Rcd 18514, 18558 ¶ 114 (1997).

[111] *Id.*

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IV. OPERATOR SERVICES AND DIRECTORY ASSISTANCE

The FCC defines directory assistance as a service that "allows subscribers to retrieve telephone numbers of other subscribers,"[1] and operator services as "any automatic or live assistance to a consumer to arrange for billing or completion, or both, of a telephone call."[2]

Competition in the provision of OS and DA began soon after divestiture. Both the FCC and state regulators have recognized this fact.[3]

Today, numerous CLECs – including AT&T and MCI WorldCom – provide their own competitive OS and DA services. And CLECs readily may establish their own OS and DA services without the OS/DA UNE. The Communications Act and FCC rules guarantee CLECs non-discriminatory access to all LECs' OS and DA databases and services, and directory listings.[4] CLECs also may obtain OS and DA databases and services, and directory listings from numerous wholesale providers.

A. Competitive OS and DA Providers

Numerous companies provide competitive OS and DA throughout the BOCs' and GTE's regions. The largest CLECs – AT&T and MCI WorldCom – offer nationwide directory assistance service, which provides "telephone listings anywhere in the United States."[5] AT&T markets "00 INFO" nationally to its presubscribed customers.[6] Both AT&T and MCI offer DA using 10-10-XXX dial-around patterns, which are accessible from any telephone in the nation.[7] MCI WorldCom launched its "10-10-9000" directory assistance service in October 1998.[8] AT&T has since introduced "10-10-ATT-00."

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[1] *Performance Measurements and Reporting Requirements for Operations Support Systems, Interconnection, and Operator Services and Directory Assistance*, Notice of Proposed Rulemaking, 12 FCC Rcd 12817, 12823 n.14 (1998).

[2] *Implementation of the Local Competition Provisions of the Telecommunications Act of 1996*, Second Report and Order and Memorandum Opinion and Order, 11 FCC Rcd 19392, 19448 ¶ 110 (1996).

[3] *See, e.g., Implementation of Sections 3(n) and 332 of the Communications Act Regulatory Treatment of Mobile Services*, Second Report and Order, 9 FCC Rcd 1411, 1489 (1994) ("Operator service providers (OSPs) compete with local exchange and long distance carriers."). Numerous states have removed OS or DA, or both, from price-cap regulation, or have otherwise proclaimed these services competitive. *See, e.g.*, Order Granting Petition, Petition of U S West Communications for Competitive Classification of its Directory Assistance Services, Docket UT-990259 (WUTC Apr. 28, 1999).

[4] *See* 47 U.S.C. § 251(b)(3); 47 C.F.R. § 51.217; 47 U.S.C. § 222(e).

[5] AT&T News Release, *AT&T Tests New '00' INFO Directory Assistance Service*, Sept. 22, 1997. *See also* MCI Press Release, *10-10-9000 - Directory Assistance Made Simple; MCI WorldCom Delivers One Number for National Long-Distance Directory Assistance*, Oct. 12, 1998 ("10-10-9000 is a national long distance directory that provides consumers with one number for all their directory assistance needs.").

[6] *See* D. Willis, *Numbers in U.S.?; Dial 411*, Asbury Park Press (Neptune, NJ.), Feb. 3, 1999, at B8.

[7] *See* J. Knapp, *National Directory Assistance Battle Heats Up*, Phone+ Magazine, Dec. 1998.

[8] *See* MCI Press Release, *10-10-9000 - Directory Assistance Made Simple; MCI WorldCom Delivers One Number for National Long-Distance Directory Assistance*, Oct. 12, 1998.

AT&T, MCI WorldCom, and Sprint also provide OS nationwide via toll-free 800 numbers. AT&T markets its service as "1-800 CALL ATT," MCI as "1-800 COLLECT," and Sprint as "1-800 ONE DIME." Using any of these services, customers may place calling card, collect, bill-to-third number, and person-to-person services.

Many other CLECs provide their own OS and DA services or resell the services of someone other than the in-region ILEC. *See* Table 1. McLeod USA, GST Telecom, Cox, and Winstar all provide such services.[9] Numerous wireless carriers also provide DA services that compete with ILEC services.[10]

Table 1. Major CLEC Providers of OS and DA

AT&T	Nationwide directory assistance: ATT-00-INFO; 10-10-ATT-00 OS: 1-800 CALL ATT
MCI WorldCom	Nationwide directory assistance: 10-10-9000 OS: 1-800 COLLECT
Sprint	OS: 1-800 ONE DIME
McLeod	Nationwide directory assistance
ALLTEL Communications	OS and DA (obtained from Metro One)
GST	OS and DA (obtained from Metro One)
Cox	OS and DA (obtained from Teltrust)
Omnipoint	OS and DA (obtained from Teltrust)
WinStar	OS and DA (obtained from Frontier)

Sources: See Appendix C.

Various Internet sites – many of which provide DA services at no charge[11] – are also a major source of competition. *See* Table 2. One consumer group – the Telecommunications Research and Action Center (TRAC) – recommends that customers "[u]se the Internet to search for numbers whenever possible and avoid all charges."[12] Switchboard.com is the most widely used directory service on the Internet, and was ranked as one of the top ten most used web sites by one study.[13] It has signed agreements with several Internet portals and search engines to be their exclusive source for yellow

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[9] *See e.g.*, The Insight Research Corporation, *Enhanced Directory and Operator Services 1998-2003* (July 1998)("*Insight*"); Metro One Press Release, *Metro One Telecommunications Signs Agreement with GST Telecom*, Oct. 2, 1997; Teltrust Press Release, *Teltrust To Provide Telecommunications Services to Cox Communications*, July 9, 1997; *Frontier Partners with WinStar Communications for Operator Services*, PR Newswire, Oct. 17, 1996.

[10] One analyst notes that, "[I]n their competition against landline operators, wireless operators will be aided in part by consumers' desire for the convenience of mobility and their current willingness to pay a premium for it." Fitch Investors Service, Ind. Rpt. No. 1702551, *Telecom's Wireless Battlefield*, Jan. 29, 1996, at *6.

[11] InfoNOW is an exception; it offers 22 searches covering residential, business and government listings for a monthly fee of $9.90. G.R. Notess, *Duplicative Databases: Yellow Pages from infoUSA*, Database, Feb. 1999.

[12] B. Mohl and P. Wen, *Directory Assistance Confusion May Have You Dialing Up Dollars*, Boston Globe, Jan. 10, 1999, at B2.

[13] Switchboard.com Press Release, *Switchboard Audience Figures Skyrocket*, Feb. 25, 1998. Switchboard.com was "ranked as the number 10 web site as measured by Media Metrix, The PC Meter Company, during the month of January 1998. Switchboard's total audience was 4,184,000, representing a reach of 11.1% of all users of the World Wide Web in that month." *Id.*

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and white page listings.[14] Other major DA websites include InfoSpace, InfoNow, Zip2.com, WhoWhere?, and DirectoryNet.[15] AT&T operates www.anywho.com, which contains extensive residential and business listings.[16]

Table 2. Major Internet Providers of OS and DA	
AT&T's Anywho Directories	Searchable national White and Yellow Page listings, toll free listings and reverse lookups. Call connection using AT&T Click2Dial. Available at <http://www.anywho.com>.
Alta Vista People Search	Searchable national White and Yellow Page listings. Available at <http://www.altavista.com>.
At Hand	Searchable national Yellow Page listings with links to webpages with White Page listings. Available at <www.athand.com>.
Big Yellow	Searchable national White and Yellow Page listings, including business searches by distance and address. Available at <http://www.bigyellow.com>.
Bigbook	Searchable national Yellow Page listings, including searches by distance and address. Available at <http://www.bigbook.com>.
Bigfoot	Searchable national White and Yellow page listings. Call connection using Net2Phone. Available at <http://www.bigfoot.com>.
555-1212.com	Searchable national White and Yellow Page listings, toll free listings and reverse lookups. Available at <http://www.555-1212.com>.
InfoNOW	22 searches of national White and Yellow Page listings for $9.90. Available at <http://www.directorynet.com/infonow>.
InfoSpace	Searchable national White and Yellow Page listings, toll free listings and reverse lookups. Available at <http://www.infospace.com>.
InfoUSA	Searchable national White and Yellow Page listings and reverse lookups. Available at <http://www.infousa.com>.
Switchboard.com	Searchable national White and Yellow Page listings. Available at <http://www.switchboard.com/>.
Smartpages	Searchable national White and Yellow Page listings, searches by distance and reverse lookups. Call connection using AT&T Click2Dial. Available at <http://www.infospace.com>.
WhoWhere People Finder	Searchable national White and Yellow Page listings. Call connection using AT&T Click2Dial. Available at <http://www.whowhere.lycos.com/Phone>.
Worldpages	Searchable White and Yellow Page listings, keyword searches, toll free listings and international listings. Available at <http://www.worldpages.com>.
Yahoo! People Finder	Searchable national White and Yellow Page listings. Available at <http://people.yahoo.com/> and <http://www.yp.yahoo.com>.
Zip2	Searchable national Yellow Page listings. Links to local content providers providing information on local events, restaurants and businesses. Available at <http://www.zip2.com>.

In addition to simple directory assistance, several Internet sites provide call completion options that compete with ILECs' OS. AT&T's Anywho offers a Click2Dial

[14] These include America Online, AltaVista, At Hand, Comcast, Cox, and GeoCities. *See* Switchboard.com Press Release, *Switchboard to be Exclusive Provider of White Pages and Maps on GeoCities Community Site*, Nov. 12, 1998.

[15] *See* Frost & Sullivan, *U.S. Directory Assistance Market*, Feb. 1999, at 7-23 ("*Frost & Sullivan*").

[16] H. Wessel, *Here's the 411 on Directory Assistance*, Orlando Sentinel, Apr. 21, 1999. Anywho "features over 90 million consumer and over 10 million business listings." Anywho Website, http://www.anywho.com/aboutus.html.

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feature, which enables users to complete calls to requested listings with software that AT&T provides for free at its site.[17] In March 1999, Qwest and Switchboard.com announced plans to offer customers the ability "to automatically place calls from the Internet," using "web-based click-to-conference technology as well as other Internet-based communications services."[18]

There are a large number of wholesale providers of OS and DA. *See* Table 3. These companies operate one or more call centers, and provide branded service to other carriers including many CLECs. The largest provides of such services include Excell, Teltrust, InfoNXX, Metro One, and HebCom.[19]

Excell is the outsourcing agent for AT&T's new nationwide directory information service, AT&T-00-Info.[20] Teltrust can "supply nationwide origination and termination services with a variety of live agent and automated network platform services, configured to each client's needs."[21] Teltrust provides services to numerous IXCs (*e.g.*, US Long Distance, and Qwest Communications) and CLECs.[22] InfoNXX markets its service as being "a true alternative to telephone company directory assistance."[23] Metro One describes itself as "a leading provider of EDA [enhanced directory assistance] for the telecommunications industry" and as having "thirteen significant EDA contracts with six different carriers to provide EDA in numerous U.S. metropolitan markets."[24] Metro One customers include AT&T, AirTouch, and Sprint.[25] Quest411 offers other carriers the ability to "[a]ccess high quality national listings without the need to develop and maintain your own national database."[26]

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[17] *See* AT&T Website, http://www.click2dial.att.com/.

[18] *See* Switchboard.com Press Release, *Qwest Communications and Switchboard to Offer Web-Based Calling Services*, Mar. 29, 1999.

[19] *See Insight* at 3.

[20] Excell Agent Services Press Release, *Excell Agent Services Announces Aggressive Hiring Campaign*, Mar.12, 1999.

[21] Teltrust Website, http://www.teltrust.com/network/index.html.

[22] Teltrust, Inc., SEC Form S-1 A, July 8, 1998.

[23] InfoNXX Website, http://www.infonxx.com/national.html.

[24] Metro One Telecommunications, Inc., SEC Form 10-Q, Nov. 16, 1998.

[25] *Insight* at 56.

[26] Company promotional material.

Table 3. Major Wholesale Providers of OS and DA	
Century Telecommunications	Provides Directory Assistance, call branding, call completion, collect calling, third party billing and busy verify/interrupt services.
Excell Agent Services	Provides Enhanced Directory Services including extended searches, call branding, call completion, driving directions and yellow pages DA.
Frontier Communications	Provides OS/DA from its Rochester, N.Y. call center for more than 100 other telecommunications companies.
HebCom	Provides enhanced directory services including extended and reverse searches, call branding, call completion, movie listings, local event information, directions, road assistance, weather reports, yellow pages DA, preferred vendor and concierge capabilities.
InfoNXX	Provides enhanced directory services including extended and reverse searches, call branding, call completion, restaurant guides, movie listings, local event information, emergency road service, weather reports and yellow-page searches.
Metro One	"Enhanced Directory Assistance" providing extended and reverse searches, call branding, call completion, driving directions, information on local events, movie listings, road assistance, weather reports and yellow pages DA capabilities.
Quest411	"Quest411 Nortel's national DA service . . . provides ready access to more than 120 million listings."
Teltrust	"FYI National Directory Assistance" provides extended and reverse searches, call branding, call completion, driving directions and yellow pages DA capabilities.
Sources: See Appendix C.	

Numerous CLECs provide competitive DA to their end user customers through arrangements with wholesale providers. GST Telecom provides directory assistance using services obtained from Metro One Telecommunications.[27] Cox provides directory assistance using services obtained from Teltrust.[28] Winstar provides directory assistance services obtained from Frontier.[29]

CLECs do not need large call volumes to obtain OS and DA from wholesalers. As one industry study notes, wholesalers "will quote prices for data listings or records. Quotes are usually based on a cost per 1000 records, and prices are fully negotiable. Typical quotes for raw data may range from $0.25 per record to fractions of a cent per record."[30] When CLEC GST hired Metro One, Metro One stated, "[w]e expect initial EDA call volumes to be relatively small, but we look forward to growing as it expands business."[31]

As a result of this diverse competition, ILECs have lost significant volumes of OS and DA traffic. For example, in SBC's region, directory assistance call volumes have

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[27] *See* Metro One Press Release, *Metro One Telecommunications Signs Agreement with GST Telecom*, Oct. 2, 1997.

[28] *See* Teltrust Press Release, *Teltrust to Provide Telecommunications Services to Cox Communications*, July 9, 1997.

[29] *See Frontier Partners with WinStar Communications for Operator Services*, PR Newswire, Oct. 17, 1996.

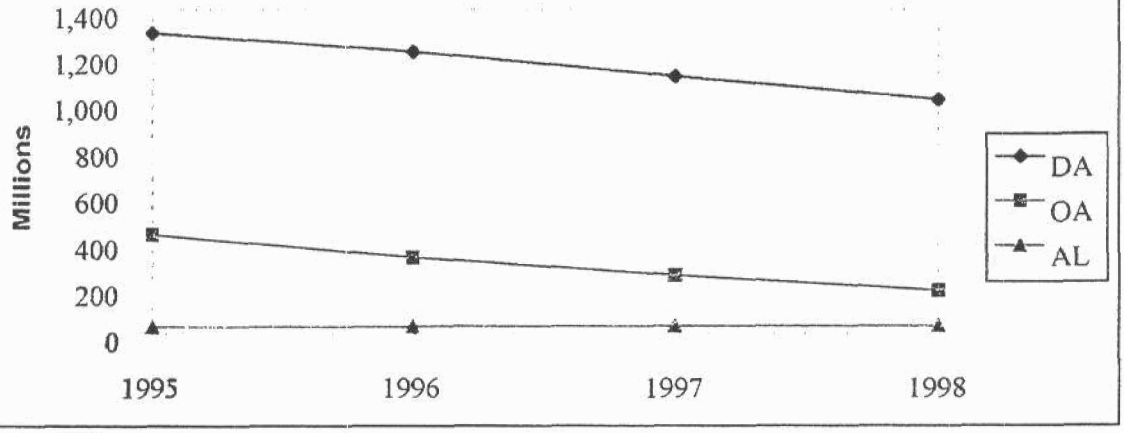
[30] *Insight* at 41.

[31] Metro One Press Release, *Metro One Telecommunications Signs Agreement with GST Telecom*, Oct. 2, 1997.

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decreased nearly 30 percent since 1995, and operator assistance calls have dropped by over 50 percent, even though access lines have grown during this time. *See* Figure 1. In BellSouth's territory, in-region call volumes for operator assistance have declined over 60 percent in the past eight years, even though access lines have grown in this time. BellSouth estimates that it carries only 30 percent of total in-region operator assistance calls. Bell Atlantic lost approximately 60 percent of its wholesale DA calls between 1994 and 1997. *See* Figure 2. This occurred even though the number of interLATA calls in Bell Atlantic's region increased during this time, as did the entire market for wholesale DA services.[32] These trends clearly indicate that consumers are using alternative OS and DA providers instead of the ILECs.

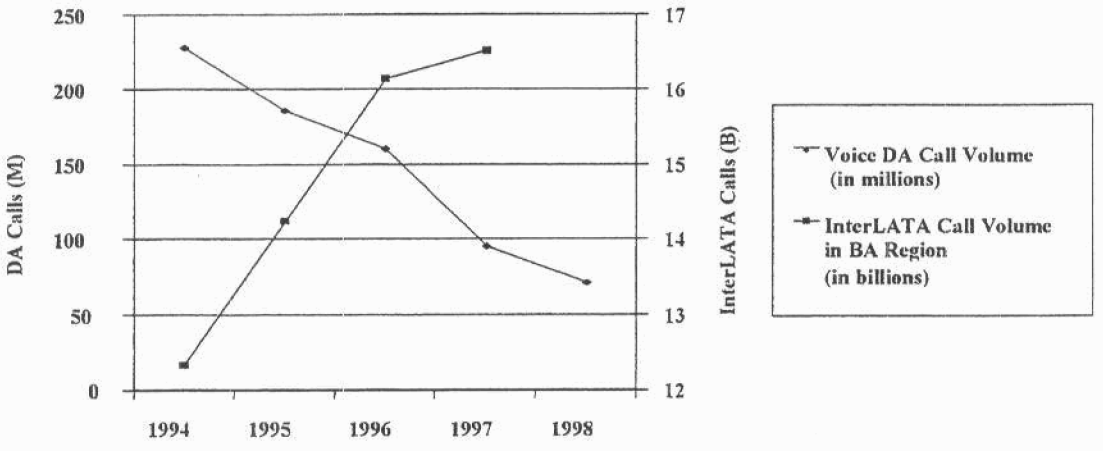
Figure 1. SBC Call Volumes vs. Access Line Growth



[32] *See Frost & Sullivan* at 4-13.

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Figure 2. Bell Atlantic Wholesale DA Call Volumes vs. InterLATA Call Volumes



B. CLECs' Ability To Provide OS and DA Services

1. Access to OS and DA Databases and Services and Directory Listings. ILECs provide OS and DA using databases derived from customer records. Directory assistance databases contain customer names, numbers, and addresses; operator services databases contain customer billing information (*e.g.*, whether a customer will accept collect calls or third party billing).[33]

Section 251(b)(3) of the Communications Act requires all LECs to provide CLECs with "nondiscriminatory access to . . . operator services, directory assistance, and directory listings." Pursuant to this section, the FCC adopted Rule 217, which requires all LECs to "permit competing providers to have access to and read the information in the LEC's directory assistance databases."[34] This guarantees CLECs non-discriminatory access to the OS and DA databases of all local exchange carriers. With assured access to these databases, CLECs may establish their own OS and DA call centers, using their own operators, computers, and equipment. AT&T has indeed conceded that "[c]ompared with other ILEC network elements, CLECs have greater opportunity to establish, themselves or by contract, work centers for providing operator and/or directory assistance services."[35]

Even if CLECs choose not to establish their own call centers, Rule 217 requires LECs to provide CLECs access to "operator services and directory assistance services . . . in their entirety, including access to any adjunct features (*e.g.*, rating tables or customer

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[33] *See Implementation of the Local Competition Provisions of the Telecommunications Act of 1996*, Second Report and Order and Memorandum Opinion and Order, 11 FCC Rcd 19392, 19446 n.252 (1996).

[34] 47 CFR §51.217(c)(ii).

[35] AT&T, *Remand Proceeding on Rule 319* at 50 (FCC filed Feb. 1999).

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information databases) necessary to allow competing providers full use of these services."[36] LECs are required to provide these services on a branded or unbranded basis so that CLECs may substitute their own brand-name announcements for those of the LEC.[37] In light of these provisions, the only ostensible purpose of the OS/DA UNE is to enable CLECs to obtain what Rule 217 already grants them, but at a far lower, TELRIC-based price, and under the FCC's rate structure rules for UNEs.

Yet CLECs clearly do not need the OS/DA UNE to provide these services. As described above, there are numerous competitive suppliers of OS and DA databases and services, and directory listings. The rise of these competitors has been facilitated by the Supreme Court's decision to permit the wholesale copying of LEC white pages listings.[38] The largest suppliers of directory listings today include Metromail, VoltDelta, InfoUSA (formerly American Business Information), Dun & Bradstreet, R.R. Donnelley, Axicom Corporation, and The Berry Company.[39] AT&T has for years obtained directory listings from such sources.[40]

These companies supply name, number, and address information on a local and nationwide basis.[41] They make considerable efforts to provide up-to-date and accurate listing information.[42] InfoUSA invests $30 million per year to compile its yellow and white page listings database, which are updated daily,[43] and the company "will soon be

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[36] 47 CFR §51.217(c)(iv).

[37] *See id.* § 51.217(d).

[38] *See Feist Publications, Inc. v. Rural Telephone Service Co., Inc.*, 499 U.S. 340 (1991). Moreover, Section 222(e) of the Communications Act requires all telecommunications carriers to provide their subscriber list information "to any person upon request for the purpose of publishing directories in any format."

[39] *See Insight* at 3; Axicom Website, http://www.acxiom.com/infobase/ ("Acxiom InfoBase is the most comprehensive collection of US consumer, business, property and telephone data available.").

[40] AT&T spokesman Michael Keady has stated that the company has "gotten better about" finding listings from non-ILEC sources in the past few years. L. Gornstein, *New Competition, Services Coming to Telephone Directory Assistance*, The Orange County Register, Feb. 16, 1998.

[41] MetroMail's database contains 90 million listings; VoltDelta's database contains 120 million residential, business and government listings; InfoUSA's database contains 115 million households and 11 million business listings with 120,000 new business listings added every month; Dun & Bradstreet's database contains 11 million business listings; Axicom's database contains over 140 million listings including over 13 million business listings. *See Insight* at 43, 47; Experian Website, http://www.experian.com/catalog_us/info_consumer/idprofile.html; VoltDelta, *Directory Express*, http://www.voltdelta.com/; InfoUSA Website, http://kickapoo.infousa.com/ab_iusa/; Acxiom Websites, http://www.acxiom.com/infobase/business/.

[42] *See, e.g.*, G.R. Notess, *Duplicative Databases: Yellow Pages from infoUSA*, Database, Feb. 1999 (DirectNET's InfoNOW provides "access to the same database used by [ILEC] directory assistance, this live access connects to a database that is updated daily."); InfoUSA Website, http://kickapoo.infousa.com/ab_iusa/item/ (InfoUSA makes "16 million phone calls to verify the information."); *Insight* at 42 ("[MetroMail's] database receives continuous updating through elecronic gateway access to the ILEC's independent telephone companies data.").

[43] InfoUSA Press Release, *infoUSA INC. Reports First Quarter 1999 Financial Results*, Apr. 19, 1999.

able to update [its] customers daily, weekly, or monthly via e-mail."[44] Many of these companies provide information on a per listing basis, or supply entire databases on magnetic tapes or CDs.[45]

Finally, the underlying components of the OS and DA databases – customer records – increasingly are supplied by competitors themselves. CLECs are adding new business customers at an even faster rate than ILECs,[46] and are capturing many residential customers as well. CLECs already control well over 1.5 million White Pages directory listings nationwide.[47] As CLECs' share of local customers increases, they will increasingly become a critical source of data for all carriers. As one analyst notes, "[a]s local competition continues to increase, the question becomes which LEC maintains the listings for a geographic area?"[48] Moreover, ILECs have strong incentives to share databases with CLECs, to obtain reciprocal access to CLECs' databases in order to publish complete white pages and provide more useful DA service.

2. Other Facilities Used to Provide OS and DA. Apart from databases, the key ingredients of OS and DA services are employees (operators), real estate, and computers. These are not intrinsic parts of ILECs' telecommunications networks, and ILECs have no particular advantage in obtaining them. Teltrust, "a leading independent outsource provider of a broad range of enhanced call processing and calling card services to the domestic telecommunications industry," states that there is an "absence of substantial barriers to entry in the call completion, national directory assistance, third-party verification and calling card services markets."[49]

OS and DA can be provided on a nationwide basis through a single call center, or with a handful of regional centers. Teltrust operates "four state-of-the-art megacenters"[50] that serve the entire country. HebCom operates five regional call centers that serve the U.S.[51] Excell operates six call centers, each serving the entire US.[52] McLeod USA operates one national call center.[53] InfoNXX provides nationwide service using four call

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[44] InfoUSA Website, http://kickapoo.infousa.com/ab_iusa/item/1,1051,3,00.html.

[45] *See Insight* at 41.

[46] *See, e.g.*, J. Grubman, Salomon Smith Barney, *Review of First Quarter CLEC and RBOC Line Growth*, May 6, 1998.

[47] *See* United States Telephone Association, *Competition in the Local Loop*, Dec. 9, 1998 (Does not include totals for GTE and US West).

[48] *Insight* at 35.

[49] Teltrust, Inc., SEC Form S-1 A, Jul. 8, 1998.

[50] *Insight* at 54. Teltrust operates three call centers in the Salt Lake City area and one in Clearfield, UT. Teltrust Press Release, *Teltrust Announces Relocation of Corporate Headquarters*, Jun. 29, 1998.

[51] *Insight* at 59.

[52] *Id.* at 52. Excell operates call centers in Mesa, Peoria, Phoenix and Tempe, AZ; Las Cruces, NM; and Rockledge, FL. Excell Agent Services Website, *Employment Opportunities, Current Openings*, http://www.excellagent.com/.

[53] *Insight* at 70.

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centers.[54] Call centers can be established in relatively short periods of time. In June 1994, CFW contracted with AT&T to provide DA even though it had "no directory service, no land and no employees" at the time; by December of that year it had built a building and hired employees, and began providing service in February 1995.[55] As discussed above, nationwide OS and DA can also be provided with a single web site. CLECs such as AT&T and Qwest are already providing, or have plans to provide, web-based OS and DA services.

Service centers must be staffed with operators. ILECs obviously exercise no control over this labor market. Both "AT&T and MCI employ their own operators."[56] Teltrust employs over 900 operators.[57] In March 1999, Excell announced an "aggressive hiring campaign," to hire 2,000 new operators in order to meet the demands associated with being named the outsourcing agent for AT&T's new nationwide directory information service, AT&T-00-Info.[58]

The major hardware and software components of OS and DA are operator platforms, database applications, and search engines. The market for such equipment is undeniably competitive. There are at least three vendors that make all three components: Nortel, Volt Delta, and PC Plus.[59] In addition, IBM produces operator platforms and search engines, and Metromail makes database applications.[60] Alcatel and Lucent also make one or more of these components.[61]

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[54] InfoNXX has call centers in Bethlehem, PA; Oakville, CT; Riverside, CA; and Tuscon, AZ; InfoNXX Website, http://www.infonxx.com/overview.html.

[55] M. Martinek, *Rural Regional & Remunerative*, Wireless Review, Feb. 1, 1999.

[56] B. Wolfe, *Directory-Assistance Options Have Your Number 1 Here's How to Get It*, The Courier-Journal (Louisville, KY.), Feb. 15, 1999, at 1C.

[57] *Id.*

[58] Excell Agent Services, Press Release, *Excell Agent Services Announces Aggressive Hiring Campaign*, Mar. 12, 1999.

[59] *Insight* at 76.

[60] *Id.*

[61] *Id*; Alcatel Website, http://www.alcatel.com/telecom/nid/netsol/operator/voiceser/infoserv.htm#dir.

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V. SIGNALING NETWORKS AND CALL-RELATED DATABASES

The FCC has defined incumbent LECs' signaling networks to include signaling links and signal transfer points (STPs);[1] it has defined call-related databases as those used "for billing and collection or the transmission, routing, or other provision of a telecommunications service."[2]

Carriers' signaling networks are, of course, interconnected, but current technology requires each local switch to link to one – and only one – signaling network. The RBOCs and GTE connect their switches to their own signaling networks. To the extent that a CLEC purchases unbundled switching from an RBOC or GTE, it must necessarily connect to that same ILEC's signaling network.

A CLEC that deploys its own switches, however, is free to link them to any signaling network it chooses. CLECs may deploy their own signaling networks, or link instead to the signaling network of a third party. Many CLECs already use one or the other of these two options. There are no significant barriers to deploying additional signaling networks and databases. A single STP pair or database can serve customers region-wide or nationwide. The equipment itself is readily available, from a number of highly competitive suppliers.

The market for the provision of signaling and databases is a national one. Efficient SS7 networks use a relatively small number of STPs to serve many switches nationwide. Additional STP pairs and databases are added only as needed to meet capacity requirements, and for network redundancy. Long-haul transport of signaling traffic to distant STP pairs is the industry norm. Two major signaling wholesalers (Illuminet and Transaction Network Services (TNS)) provide national service with only 11 and 2 STP pairs each, respectively. AT&T has a national signaling footprint with 22 STPs (11 pairs). MCI WorldCom uses 12 STPs (6 pairs).

That the BOCs have deployed STPs in every LATA reflects nothing but misguided regulatory history. They were forced to do so by the Bell Divestiture decree – notwithstanding the Department of Justice's strong support for a waiver that would have permitted them not to do so.[3] In 1996, Congress finally eliminated that unfortunate vestige of antitrust history.[4]

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[1] 47 C.F.R. §51.319(e)(1).

[2] *Id.* § 51.319(e)(2). Such databases include the LIDB, the Toll Free Calling database, number portability databases, and AIN databases.

[3] *See* Memorandum *United States v. Western Elec. Co.*, No. 82-0192 (D.D.C. July 13, 1990). The Department of Justice concluded that deployment of STPs in every LATA "would impose substantial inefficiencies and unnecessary costs on interexchange carriers – especially smaller carriers – as well as the BOCs, thereby hampering the implementation of SS7-CCS and its attendant public benefits." Department Memorandum at 2, *United States v. Western Elec. Co.*, No. 82-0192 (May 12, 1989).

[4] 47 U.S.C. § 271(g).

A. CLEC Signaling Networks and Databases

AT&T and MCI WorldCom deployed SS7 networks nearly a decade ago.[5] According to the March 1999 *Local Exchange Routing Guide* (LERG) database, AT&T has deployed STPs in 22 locations, and MCI WorldCom in 12. Both companies can and do use these networks to signal the switches these companies use to provide competitive local exchange service.[6]

According to the LERG, four other CLECs have deployed STPs as well.[7] Other sources indicate that several additional CLECs have done so, too. *See* Table 1.

A number of providers, including Illuminet, Transaction Network Services (TNS), GTE Internetworking Services, and SNET, now serve as competitive wholesalers of signaling services. Any CLEC may link its switches to one of those networks, rather than to one of the ILECs'. Though neither Illuminet or TNS reveal who their specific CLEC customers are, Illuminet states that "CLECs are the most likely candidates for wholesale LNP services."[8] The FCC has found that competitors can rely on such wholesalers instead of incumbents to obtain SS7 capabilities.[9]

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[5] *See AT&T to deploy SS7 by year-end*, Data Communications, Aug 1, 1989; R.N. Lane, Arthur D. Little Decision Resources, Ind. Rpt. No. 1023667, *Carrier Provisions of SS7 Services - Industry Report*, at 2 (Sept. 1, 1989).

[6] The LERG lists these AT&T and MCI STPs as "CLEC" switching entities.

[7] These are GST, Intermedia, ICG, and Universalcom.

[8] *Illuminet Provides Wholesale Number Portability Services*, Advanced Intelligent Network News, Oct. 29, 1997 (*quoting* Illuminet's Senior Product Manager, WIN Services, G. Christensen).

[9] *See, e.g., Application of WorldCom, Inc. and MCI Communications Corp. for Transfer of Control of MCI Communications Corp. to WorldCom Inc.*, Memorandum Opinion and Order, 13 FCC Rcd 18025, 18061 ¶ 60 ("We disagree with GTE's claim that the new firms [e.g., Qwest, IXC Williams, Level 3] will be unable to deploy signaling equipment for years. Applicants identify several companies, including Transaction Network Services, Inc., GTE Intelligent Network Services, and SNET, that provide wholesale signaling services.").

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Table 1: Competitive Signaling and Database Providers	
AT&T	22 STPs located in: Birmingham, AL; Phoenix, AZ; Sacramento, CA; Anaheim, CA; Denver, CO; Jacksonville, FL; Atlanta, GA; Chicago, IL; Louisville, KY; St Louis, MO; Kansas City, MO; Jackson, MS; Greensboro, NC; Freehold, NJ; Manhattan, NY; White Plains, NY; Cleveland, OH; Oklahoma City, OK; Philadelphia, PA; Pittsburgh, PA; Dallas, TX; Arlington, VA
CenturyTel	CenturyTel recently purchased two pairs of STPs that is using to "to provide connectivity between all its SS7 transfer points and to provide gateways to other networks."
GLOBAL NAPs	"Global NAPs also maintains its own SS-7 network."
GST	GST has deployed STPs in "three western U.S. cities," and has stated that "[w]ith our own SS7 network, we are reducing our reliance on third parties..." It expects "to have the remainder of its 15 major markets on-line by the end of June 1999."
GTE INS	GTE-INS is "a leading supplier of SS7 hubbing and transport services to competitive local exchange carriers, inter-exchange carriers, RBOCs and wireless providers."
ICG	4 STPs located in: Cleveland, OH; Columbus, OH; Denver, CO; Englewood, CO
Intermedia	4 STPs located in: Chicago, IL; Dallas, TX; Orlando, FL; Tampa, FL
MCI Worldcom	12 STPs located in: Fort Lauderdale, FL; Jersey City, NJ; New York, NY; San Francisco, CA; Los Angeles, CA; Chicago, IL; Atlanta, GA; Reston, VA; Southfield, MI; Maryland Heights, MO; Newark, NJ; Dallas, TX
SBC/SNET	SBC/SNET's Network Services division "helps growing providers expand into new markets. . . . We can even help turn a company with no network and no experience into a viable, profitable telecommunications provider."
UniversalCom, Inc.	STP located in: Destin, FL
US LEC	STPs in Charlotte and Virginia Beach US LEC Executive Vice President of Engineering David Conner: "US LEC will no longer depend on other SS7 vendors to connect to the National SS7 network."
Sources: *See* Appendix C.	

Illuminet claims to operate "the largest independently-owned [SS7] network in the United States."[10] It provides "connectivity to all RBOC LATAs, GTE, Sprint LTD and other carriers."[11] It offers "advanced signaling network technology and enhanced applications, including local number portability, wireless fraud management, SS7 network usage measurement and billing services,"[12] as well as access to LIDBs "throughout the United States."[13] CLECs may access Illuminet's network through a single connection: "One connection to Illuminet does it all; you won't have to negotiate separate connectivity arrangements."[14] It advertises that carriers may "[c]hoose an access

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[10] Illuminet web site, http://www.illuminetss7.com/wireless/wi-ISUP.htm.

[11] *Id.*

[12] Cisco, *Cisco and Illuminet Team to Deliver SS7 Solution for Advanced IP Network Access*, Feb. 22, 1999, http://www.cisco.com/warp/public/146/february99/20.html.

[13] Illuminet, *LIDB Access and Transport*, http://www. Illuminetss7.com/eedc

[14] Illuminet, *Illuminet Products and Services, Network Connectivity*, http://www.illuminetss7.com/textonly/prod_txt/loc_txt/_lonetco.htm.

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point closest to your switch(es); we offer access via 11 STP pairs located throughout the country."[15]

TNS likewise operates a "national SS7 network" that enables carriers "to complete calls and retrieve accurate information for billing and back office support."[16] It operates STPs in Washington, D.C., and Kansas City, MO that are "interconnected to the SS7 networks provided by the Regional Bell Operating Companies (RBOCs), SNET, ITN, GTE, and United Telephone."[17] TNS advertises itself as a "single gateway to all available LEC data centers, so you only have to manage one connection to TNS instead of custom connections to each LEC."[18] TNS provides "comprehensive SS7 network transport services," access to LIDBs, customized database products, and Local Number Portability.[19]

TNS and Illuminet both serve the CLEC market. Equally significantly, Illuminet's origins illustrate how easily small LECs can provide their own signaling, rather than rely on signaling provided by larger incumbents. The company was actually formed by the merger of two other – US Intelco and ITN – that were themselves established to deploy nationwide SS7 networks for independent telcos, to free those independent ILECs from having to rely on the signaling networks of adjacent BOCs and GTE.[20]

Two other independent ILECs have already made the same transition: first they built up SS7 networks to serve their own needs, then they began selling signaling services to other LECs that lacked signaling networks of their own. Under its own 1984 consent decree, GTE initially faced the prospect of having to deploy 101 STP pairs, one in every LATA GTE serves. But the company persuaded Judge Greene in 1992 that it should be permitted to deploy just 9, instead.[21] GTE then immediately formed a new subsidiary,

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[15] Illuminet, *Illuminet Products and Services, LIDB Access and Transport*, http://www.illuminetss7.com/textonly/prod_txt/loc_txt/_lolidb.htm. "Illuminet operates Gateway Signal Transfer Points (STPs) in Mattoon, IL; Rock Hill, SC; Las Vegas, NV; and Olympia, WA. In addition, eight Regional STP pairs and numerous Signaling Points of Interconnection, geographically dispersed throughout the United States, provide additional access points." Illuminet, Illuminet Products and Services, Network Connectivity, http://www.illuminetss7.com/textonly/prod_txt/loc_txt/_lonetco.htm.

[16] *SS7 Vendor Gears Up For Illinois Number Pooling Trial*, Communications Today, Jan. 12, 1999.

[17] Transaction Network Services, *Products and Services, SS7 Network Services*, http://www.tnsi.com/.

[18] Transaction Network Services, *Products and Services, LEConnect Data Services*, http://www.tnsi.com/. "This makes the entire process easier and much more cost effective for you. Plus, you won't need the extra resources necessary to manage your own links to the LECs. TNS does it all for you. Our nationwide facilities have connections into each of the LEC data centers established specifically for these applications." *Id.*

[19] Transaction Network Services, *Products and Services, Local Number Portability Services*, http://www.tnsi.com/.

[20] *See* Illuminet, *Corportate History*, http://www. Illuminetss7.com/about/history.htm.

[21] *United States v. GTE Corp.*, No. 83-1298 (D.D.C. March 26, 1992).

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Intelligent Network Services (INS), to provide nationwide SS7 and database services to other carriers. Today, GTE-INS is "a leading supplier of SS7 hubbing and transport services to competitive local exchange carriers, inter-exchange carriers, RBOCs and wireless providers."[22]

SNET, which became a subsidiary of SBC in 1998, was never subject to the Bell divestiture decree. SNET built up its own nationwide SS7 and database network beginning in 1991.[23] Today SBC/SNET offers signaling services on a wholesale basis to "interexchange carriers (IXC's), incumbent local exchange carriers (ILEC's), competitive local exchange carriers (CLEC's) and switch-less resellers."[24] SBC/SNET's Network Services division "helps growing providers expand into new markets. . . . We can even help turn a company with no network and no experience into a viable, profitable telecommunications provider."[25]

In sum, there are at least six major facilities-based SS7 network providers (AT&T, MCI WorldCom, Illuminet, TNS, GTE-INS, and SBC/SNET) that operate nationwide networks, plus at least four other mid-sized CLECs (GST, ICG, Intermedia, and US LEC) that operate regional SS7 networks. Two of the national competitors are backed by AT&T and MCI WorldCom; two more are backed by GTE and SBC/SNET; a fifth (Illuminet) is supported by a consortium of smaller, independent ILECs.

Finally, there are no significant entry barriers to additional entry in the national signaling market. As noted above, STPs and databases have very large geographic footprints. No CLEC needs to replicate the ILEC architecture to provide ubiquitous signaling and database services. Signaling equipment is readily available from a variety of competitive suppliers, including Nortel, Lucent, Alcatel, Tekelec, and ADC. Tekelec has designed an STP – the Eagle – with CLECs' needs in mind – it is "smaller, less costly, and arguably . . . more flexible," than other leading STPs.[26] CLECs US LEC, and CenturyTel have purchased the Eagle.[27] As one industry observer noted in 1997, "[t]he SS7 market has shifted from traditional LECs that built out large SS7 networks exclusively for basic call signaling functions to facilities-based CLECs that are building out highly advanced networks from scratch."[28]

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[22] GTE Intelligent Network Services, *SS7 Overview*, http://www.gteins.net/overview.htm.

[23] *See* B. Massick et al., *Company Report-Southern New England Telecommunications*, Report No. 1124711 at *8, Jun. 14, 1991.

[24] SNET, *About SNET: Wholesale Network Services*, http://204.60.166.5/snetcom/about/corp/cowhol.htm.

[25] *Id.*

[26] The Robinson-Humphrey Company, Inc., Investext Rpt. No. 1891928, *Network Equipment Portfolio - Industry Report*, at *3 (May 29, 1997).

[27] *See* Tekelec Press Release, *US LEC Purchases STP from Tekelec*, Apr. 26, 1999; Tekelec Press Release, *Century Tel Selects Eagle STP*, Feb. 22, 1999.

[28] D. O'Shea, *The Network That's Never Done: SS7 Networks Have Become Pervasive Enough That Some Carriers No Longer View Them As An Investment Priority. But A New Wave of Applications and Competitors will Challenge This Notion; Transmission Special*, Telephony, Sept. 15, 1997.

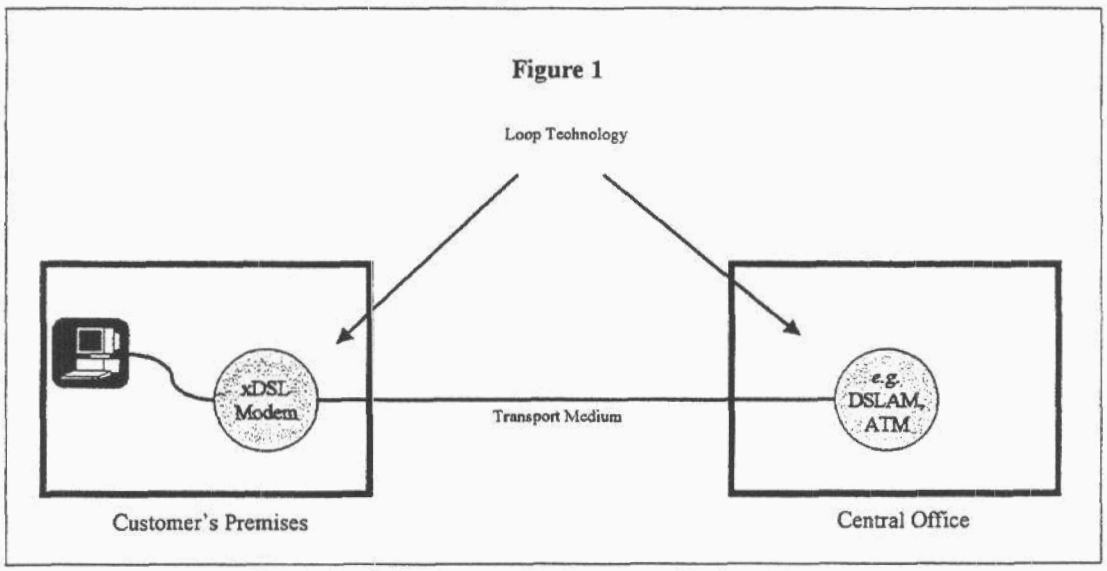
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VI. ADVANCED SERVICES INFRASTRUCTURE

The FCC has designated 200 kbps as the threshold of "advanced" or "broadband" services. This speed "is enough to provide the most popular forms of broadband – to change web pages as fast as one can flip through the pages of a book and to transmit full-motion video."[1] "Advanced" digital services are thus 10 to 100 times faster than those available in the past over dial-up telephone lines. Traditional telephone plant is "not ideally suited for broadband."[2] Existing copper loops are "not broad or fast enough to be called 'advanced.'"[3]

As with all other telecommunications services, the provision of high-speed services requires both equipment – modems, routers, and radios – and a transport medium – a phone line, a cable, or a spectrum band in the airwaves. The equipment is often referred to as "loop technology," a somewhat confusing term in that it appears to refer to the copper wire itself, but in fact refers to the electronics (the "technology") plugged in at either end. *See* Figure 1.

Figure 1



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[1] *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996*, Report, CC Docket No. 98-146, ¶ 20 (rel. Feb. 2, 1999) ("*Advanced Services Report*").

[2] *Id.* ¶ 46.

[3] *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996*, Notice of Inquiry ¶ 3, CC Docket No. 98-146 (rel. Aug. 7, 1998) ("*Advanced Services NOI*").

The Commission has indicated its intention to craft new UNEs out of both the equipment[4] and the transport medium that ILECs use to provide high-speed services.[5] In addition, the Commission has declared its intent to require "spectrum unbundling" or "line sharing."[6] In effect, the plan is to carve out a new UNE not in the physical space defined by the loop, but out of the bandwidth that the loop is able to deliver. A CLEC would thus be able to sell to customers high-speed data service over the same wire that the ILEC used to provide voice service, or vice versa. Two (or more) independent, competing providers could end up delivering distinct and possibly competing services over a single wire to a single home.[7]

High-speed services use the old transport media – wires, cables, and the airwaves – though with landline media, significant upgrading is often required. For both landline and wireless services, virtually all the equipment is new. None of it is required for ordinary voice, cable, or radio services. The technology in question was only very recently developed. Industry standards for the equipment – the catalyst for widespread consumer acceptance and deployment – have emerged only recently, and some are still under negotiation. *See* Table 1. Moreover, the technology has evolved on about the same timetable for phone lines, cable, and wireless media. As the FCC has acknowledged, no single medium starts with a history as the incumbent or monopoly provider.[8] Incumbent LECs are new entrants, like every other provider in the market. *Compare* Map 1 *with* Map 2.

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[4] The Commission declares that "the facilities and equipment used to provide advanced services are network elements subject to the obligations in section 251(c)." *First Advanced Services Order* ¶ 57. The Commission has sought further comment on the specific unbundling obligations that should apply. *See id.* ¶¶ 58, 167-184.

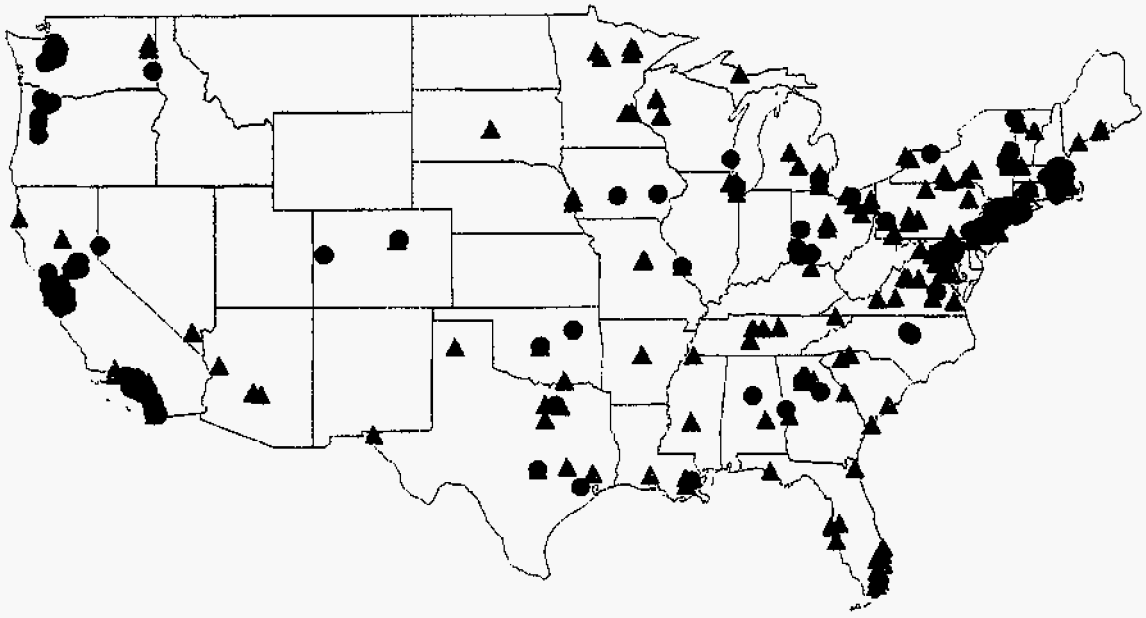
[5] The Commission has concluded that ILECs must "provide unbundled loops capable of transporting high speed digital signals." *Id.* ¶ 52. The Commission has further directed that, "[t]o the extent technically feasible, incumbent LECs must 'take affirmative steps to condition existing loop facilities to enable requesting carriers to provide services not currently provided over such facilities.'" *Id.* ¶ 53.

[6] *See Deployment of Wireline Services Offering Advanced Telecommunications Capability*, First Report and Order and Further Notice of Proposed Rulemaking, ¶¶ 8, 78-107, CC Docket No. 98-147 (rel. Mar. 31, 1999) ("*Second Advanced Services Order*").

[7] The Commission "tentatively concluded that [it has] authority to require line sharing." *Id.* ¶ 98. It also sought comment "on operational, pricing, and policy ramifications to determine whether or not to mandate line sharing nationally." *Id.* ¶ 8.

[8] *See, e.g., Advanced Services Report* ¶ 48 ("The preconditions for monopoly appear absent" in the "last mile" of the advanced services market); *id.* ("[N]o competitor has a large embedded base of paying residential consumers" and there is no "indicat[ion] that the consumer market is inherently a natural monopoly.").

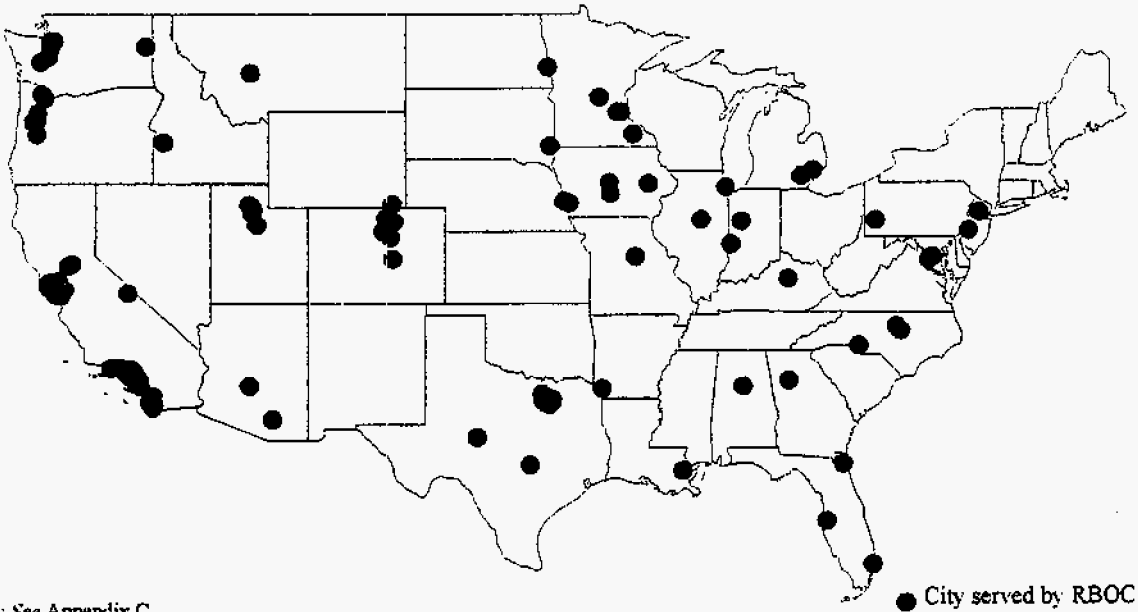
Map 1. CLEC xDSL and Cable Modem Deployment



Sources: *See* Tables 2, 6 & 7, *infra*.

● City served by CLEC xDSL ▲ City served by cable modem

Map 2. RBOC and GTE xDSL Deployment



Sources: *See* Appendix C.

● City served by RBOC or GTE xDSL

Table 1. Introduction Dates for Advanced Service Alternatives				
Technology		Date First Trials Began	Date of Commercial Availability	Date Standard Set
Cable Modem		Dec. 1993 (Cox) Dec. 1993 (Continental)	June 1996 (TCI) Sept. 1996 (Time Warner)	Mar. 1998 (DOCSIS 1.1)
XDSL		Jan. 1996 (Pacific Bell) Feb. 1996 (GTE) Oct. 1996 (Ameritech)	June 1997 (ioCom) Oct. 1997 (U S WEST) Nov. 1997 (Concentric)	Oct. 1998 (preliminary ITU approval of G-Lite) June 1999 (formal approval scheduled)
Satellite		Nov. 1994 (DirecPC)	Apr. 1995 (DirecPC)	N/A
Fixed Terrestrial Wireless	38 GHz	Sept. 1994 (WinStar) June 1998 (ART)	Mar. 1995 (WinStar) Sept. 1998 (ART)	N/A
	28 GHz	Apr. 1998 (WinStar)	Dec. 1998 (WinStar)	N/A
	24 GHz	Oct. 1997 (Teligent)	Sept. 1998 (Teligent)	N/A
	LMDS	June 1996 (est.) (CellularVision)	Apr. 1997 (CellularVision)	N/A
Sources: *See* Appendix C.				

In traditional areas of service, ILECs begin with commanding market positions created, in large part, by past regulatory policies that favored a single monopoly provider. But the opposite holds for advanced services – here, regulatory policy has favored competitors for as long as such services have been offered. CLECs may form alliances with long-distance carriers and Internet backbone providers – an essential edge in the business – while the Bell Company ILECs remain subject to the strictures of section 271. Cable operators may enter similar relationships, and have already done so. Broadband wireless carriers and satellite operators have likewise entered into strategic partnerships. Generally free of significant regulatory restraint, these competitors have all been able to secure ample financing for their endeavors.

A. Alternative Media

The Commission has already concluded that the advanced services market is technologically heterogeneous, it "accommodate[s] different technologies such as DSL, cable modems, utility fiber to the home, satellite, and terrestrial radio."[9] "Numerous companies in virtually all segments of the communications industry are starting to deploy, or plan to deploy in the near future, broadband to the consumer market."[10] Other providers, using other media, have already invested tens of billions of dollars in broadband facilities,[11] including enormous investment in the deployment of facilities that serve the "last mile" to the home.[12] Non-phone-

[9] *Advanced Services Report* ¶ 48.

[10] *Id.* ¶ 12.

[11] *See id.* ¶ 35 ("... publicly available data show that many companies in virtually all segments of the communications industry have made tens of billions of dollars of investment in broadband facilities.").

[12] *See id.* ¶¶ 34.

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company providers, including cable companies, electric utilities, and wireless cable companies are further along in last-mile deployment of broadband than ILECs.[13]

> The fact[] that different companies are using different technologies to bring broadband to residential customers and that each existing broadband technology has advantages and disadvantages as a means of delivery to millions of customers opens the possibility of intermodal competition, like that between trucks, trains, and planes in transportation. By the standards of traditional residential telecommunications, there are, or likely will soon be, a large number of actual participants and potential entrants in this market.[14]

1. Cable. The FCC recognizes that "[t]he most popular offering of broadband to residential customers is via 'cable modems' offered by cable television companies within their cable service territories."[15] "The cable industry's broadband platform makes cable an optimal medium for transmitting large amounts of digital information – data, graphics, and video – at high speeds."[16] Thus, "[f]or many, perhaps most, American citizens, their first opportunity to obtain high bandwidth Internet access will be through cable systems."[17] "[C]able modems have clearly taken the early lead in the race to become the residential broadband modem technology of choice in the United States."[18]

One-third to one-half of all cable networks already support two-way service, or will very soon.[19] High-speed Internet access is available from cable operators to more than 20 million homes, or roughly 20 percent of the U.S. market.[20] More than 50 companies have deployed commercial cable modem services; cable modems are available in more than 100 local markets,

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[13] *See id.* ¶¶ 53-58.

[14] *Id.* ¶ 48 (footnotes omitted); *see also id.* ¶ 48 n.46 ("[O]ne of the most attractive prospects that broadband creates is the blurring of previously distinct regulatory categories and the blending of old monopolies and oligopolies into a competitive 'broadband market'").

[15] *Id.* ¶ 54.

[16] B. Esbin, Office of Plans and Policy, FCC, *Internet Over Cable: Defining the Future in Terms of the Past* at 76, OPP Working Paper No. 30 (Aug. 1998).

[17] Petition to Deny of Consumers Union, Consumer Federation of America, and Office of Communication, Inc. of the United Church of Christ at 11, *Joint Application of AT&T Corp. and Tele-Communications, Inc. for Approval of Transfer of Control of Commission Licenses and Authorizations*, CS Docket No. 98-178 (FCC filed Oct. 29, 1998).

[18] Statement of Henry Samueli, Broadcom Corporation, in K. Fong, et al., *Hambrecht & Quist, Inc. Communications Symposium/Data Processing/Telecom. (Transcript) Industry Report*, Rpt. No. 2658327, April 16, 1998, at *11.

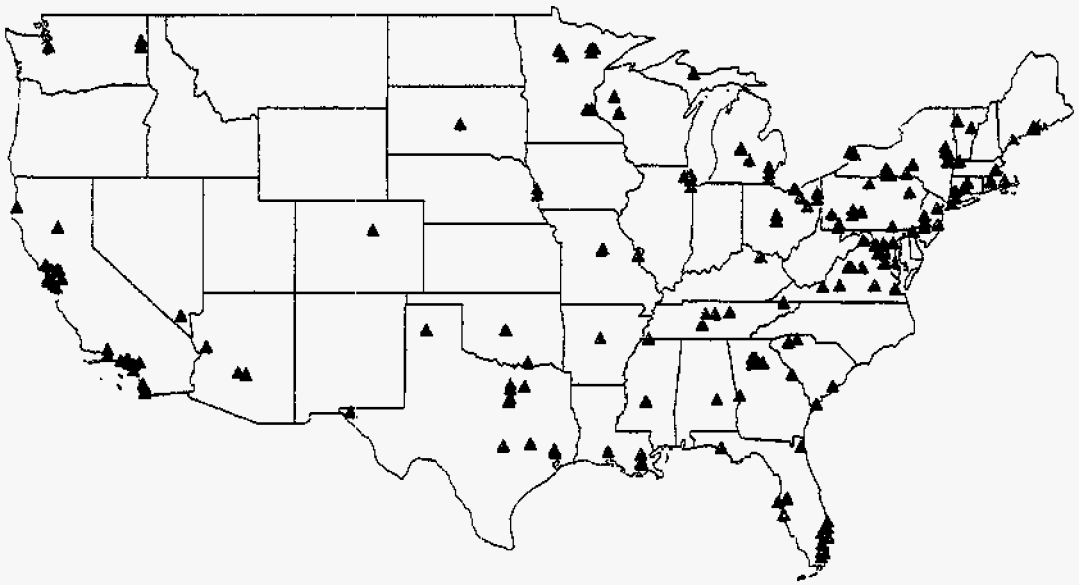
[19] *See Annual Assessment of the Status of Competition in the Market for the Deliver of Video Programming*, Third Annual Report, 12 FCC Rcd 4358, 4442 ¶ 172 (1997) (*citing* The Yankee Group).

[20] *See* Cable Datacom News, *Cable Modem Market Stats and Projections*, http://cabledatacomnews.com/cmic16.htm.

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including 25 of the top 30 MSAs.[21] TCI, Comcast, and Cox – the largest, third largest, and sixth largest MSOs, respectively, have partnered to create @Home, which offers cable modem service to over 13 million homes.[22] Road Runner, a partnership between Time Warner (the second largest MSO) and MediaOne (fourth largest), offers cable modem service to 8 million homes.[23] *See* Map 3 & Table 2.

Map 3. Cable Modem Deployment



Source: *See* Table 2, *infra*.

▲ City served by cable modem

[21] *See* Cable Datacom News, *Commercial Cable Modem Launches in North America*, http://cabledatacomnews.com/cmic/cmic7.html.

[22] *See* @Home Press Release, *@Home Network Reports Fourth Quarter and 1998 Results*, Jan. 20, 1999; @Home Press Release, *@Home Network Reports Subscriber Base Grows to 50,000, Upgraded Homes Passed Increases to 4.5 Million*, Jan. 20, 1998.

[23] *See* Road Runner Press Release, *Road Runner Races Past 250,000 Customer Milestone*, Apr. 6, 1999.

Table 2. Cable Modem Deployment

Cable MSO	Franchise Area Served
21st Century	Chicago IL
Adelphia Cable	Coudersport PA, Plymouth MA, North Adams MA, Toms River NJ, Pittsburgh PA, Philadelphia PA, Buffalo NY, Niagara NY, Western Reserve OH, Dade County FL, Boca Raton FL, Delray Beach FL, Wellington FL, Palm Beach Gardens FL, West Palm Beach FL, Stuart FL, Burlington VT, Charlottesville VA, Waynesboro VA, Staunton VA, Winchester VA, Blacksburg VA, Hilton Head SC
Advanced Cable Communications	Coral Springs FL
Armstrong Cable Services	Connellsville PA
Avenue Cable TV	Ventura CA
Bresnan Communications	Marquette MI, Northwoods MI, Lake Superior MI, Dickinson MI, Escanaba MI, Manistique MI, Bay City MI, Midland MI, Duluth MN, Mankato MN, Marshall MN, Madison WI
CableAmerica	Mesa AR
Cable Communications Co-op	Palo Alto CA
Cable TV Arlington	Arlington VA
Cable TV Montgomery	Montgomery County MD
Cable York	York PA
Cablecomm	Johnstown PA
Cablevision of Lake Havasu	Lake Havasu City AZ
Cablevision of Lake Travis	Lake Travis TX
Cablevision of Loudoun	Loudoun County VA
Cablevision Systems	Oyster Bay NY, Westport CT
Capitol Cable	Columbia County MO, Boone County MO
Century Communications	Norwich NY
Chambers Cable	Chico CA
Charter Communications	St. Louis MO, Riverside CA, Pasadena CA, Newtown CT, Henry Co. GA, LaGrange GA, Newnan GA, Lanett AL
Coast Cablevision	San Mateo CA
Coaxial Communications	Columbus OH
Comcast	Baltimore MD, Sarasota FL, Union County NJ, Detroit MI, Philadelphia PA, Orange County CA, Chesterfield VA, Atlanta GA
CommuniComm Services	Durant OK
Conway Corp.	Conway AR
Cox Communications	Orange County CA, Omaha NE, Newport News VA, Oklahoma City OK, Providence RI, San Diego CA, Phoenix AZ, Meriden CT, Kenner LA, Algiers LA, Las Vegas NV, Eureka CA
Daniels Cablevision	Encinitas CA
FrontierVision	Camden ME, Rockland ME
GCI	Anchorage AK
Genesis Cable	Winder GA
Helicon Corp.	Uniontown PA, Barre VT
Hibbing Cable TV	Hibbing MN
Horizon Cable	Central Michigan MI, Point Reyes CA
InterMedia Partners	Nashville TN, Greenville SC, Spartanburg SC, Kingsport TN
Jones Intercable	Alexandria VA, Prince William County VA
Kingwood Cable	Kingwood TX
Knology Holdings	Augusta GA, Columbus GA, Charleston SC, Montgomery AL, Panama City FL
Limestone Cable	Maysville KY
Marcus Cable	Highland Park TX, University Park TX, Eau Claire, WI, Rice Lake WI
Matrix Cable	Los Gatos CA
Media General Cable	Falls Church VA, Vienna VA, Merrifield VA, Fairfax VA
MediaOne	Boston MA, Detroit MI, Los Angeles CA, Atlanta GA, Chicago IL, Chestnut Hill MA, Jacksonville FL, Broward County FL, Dade County FL, Minneapolis MN, St. Paul MN, Avon Lake OH, Bay Village OH
Metro Cable	Philadelphia PA
Midcontinent Cable	South Dakota SD
Midwest Communications	Bemidji MN, Cass Lake MN
Palo Alto Cable Co-op	Palo Alto CA
Ponderosa Cable	Danville CA
Prestige Cable	Forsyth County GA
Prime Cable	Chicago IL
Range TV Cable	Hibbing MN, Chisholm MN
Rankin Cable	Rankin County MS
Rifkin & Associates	Miami Beach FL, Gwinnett County GA, Bedford VA, Cookville TN, Columbia TN, Lebanon TN
San Bruno Municipal Cable	San Bruno CA
Service Electric and Blue Ridge Cable	Eastern Pennsylvania PA
Suburban Cable	New Castle DE
Sun Country Cable	Los Altos CA, Spokane WA
TCA	Amarillo TX, Bryant TX, College Station TX, Lafayette LA
TCI	Alameda CA, Antioch CA, Castro Valley CA, Dublin CA, Fremont CA, Hercules CA, Livermore CA, Petaluma CA, Pinole CA, Pittsburg CA, Pleasanton CA, San Ramon CA, Hartford CT, Aurora CO, McKeesport PA, Garland TX, McKinney TX, Stonebridge TX, Arlington Heights IL, Seattle WA, Spokane WA, East Lansing MI
Time Warner Cable	Akron OH, Columbus OH, Youngstown OH, Binghamton NY, Corning NY, Elmira NY, San Diego CA, Tampa Bay FL, Oahu HI, Memphis TN, Austin TX, Portland ME, El Paso TX, Albany NY, Troy NY, Saratoga NY
TW Fanch	Altoona PA, Johnstown PA
Verto Communications	Dickson City PA, Scranton PA, Taylor PA, Old Forge PA, Throop PA
Western Shore Cable	St Mary's County MD, King George's County MD
WestStar	Half Moon Bay CA, Monterey CA

Sources: *See* Appendix C.

Cable operators are rapidly expanding their cable modem deployment. High-speed Internet access will be available to 30 million homes by the end of 1999.[24] According to one estimate cited by the FCC, 63 percent of all cable systems will be broadband-ready by 2001.[25] An estimated 13 million cable modems will be deployed in the next three years.[26] @Home is projected to reach 60 million homes within the next 5 years.[27] Road Runner plans to reach 20-30 million homes nationwide by year-end 1999.[28] Cable already accounts for fully 80 percent of the over 900,000 U.S. high-speed internet users.[29]

Cable operators are well financed and enjoy economies of scope and scale fully comparable to the ILECs.[30] Before AT&T's recent acquisitions of TCI and MediaOne, the seven largest cable MSOs[31] served over 60 percent of all U.S. households.[32] Now AT&T alone controls cable facilities that pass some 28 million or roughly 27 percent of all U.S. homes, and it has significant ownership interests in cable systems (Time Warner Cable 25%; Cablevision 33%; Bresnan Cable 49%; Falcon Cable 46%; Kansas City Cable 50%; Susquehanna Cable 30%) that pass an additional 29 million homes or roughly 29 percent of all U.S. homes. In 1997, the cable industry spent $6 billion on the deployment of two-way broadband via high-speed cable modems.[33] The pace of new investment in the industry has since accelerated. The investments are backed by very large and wealthy companies, including AT&T, Comcast, Microsoft, and

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[24] *See* J.J. Bellace, et al., Merrill Lynch Capital Markets, Investext Rpt. No. 2706388, Wireline Communications Equipment – Industry Report at *1 (June 22, 1998). DSL, by comparison, is estimated to serve 750,000 to 1 million lines by this time. *Id. See also* A. Breznik, *High-Speed Data Player Set to Compete: Suburban Market Become a New Focus For Data Service Providers*, Cable World, Dec. 7, 1998.

[25] *See Advanced Services Report* ¶ 37 (*citing* Allied Business Intelligence Press Release, www.alliedworld.com at CATV98.pdf release).

[26] *See High Speed Internet Access to Reach 16 Million U.S. Households by 2002, According to Forrester*, Business Wire, Sept. 1, 1998 (predicting cable modems will capture 80 percent of the high-speed market). *But see Study Sees Cable Modem Deployments Surpassing ADSL Installations by 2003*, Broadband Networking News, Aug. 4, 1998 (estimating 10 million cable modem users by 2003).

[27] *See* A. Harmon, *Excite and At Home Confirm $6.7 Billion Merger*, New York Times, Jan. 20, 1999, at C-1; M. Clothier, *Internet Marriage: Connection and Content*, Atlanta Journal and Constitution, Jan. 20, 1999, at 4D.

[28] *See* Road Runner Press Release, *Road Runner Races Past 250,000 Customer Milestone*, Apr. 6, 1999.

[29] *See The Battle for the Last Mile*, The Economist, May 1-7, 1999, p. 59.

[30] After announcing a proposed $60 billion merger with MediaOne, Comcast president Brian Roberts stated "The new company will have the size and scope to lead the evolving broadband environment." Comcast Press Release, *Comcast and MediaOne Announce $60 Billion Merger*, Mar. 22, 1999.

[31] TCI, Time Warner, MediaOne, Comcast, Cablevision Systems, Cox, and Adelphia.

[32] *See NCTA Cable Television Developments* at 13 (*citing* Kagan Associates).

[33] *See* S. Shapiro, et al., Deutsche Morgan Grenfell Inc., Investext Rpt. No. 1964154, *Modems – Industry Report* at *3 (Aug. 27, 1997) ("[W]hat is often overlooked is that several operators have been upgrading their networks diligently for the past three, four, and five years, and a great deal of this money has already been spent.").

Compaq.[34] Microsoft has invested $1 billion in Comcast, and is reportedly considering similar investments in other cable companies.[35] *See* Table 3.

Cable operators are free to ally with the major equipment vendors, long-distance carriers, and Internet backbone providers, and have done so aggressively. They have forged broad alliances with three main equipment vendors – General Instruments, Scientific-Atlanta, and Motorola.[36] @Home has signed exclusive distribution contracts with TCI, Comcast, Cox, and 16 other cable companies.[37] Together, @Home's current owners and affiliates pass 50 million U.S. homes, or just under half of all homes passed by cable in the country. AT&T, which has purchased TCI, and with it, TCI's 71 percent voting interest in @Home, brings a major Internet backbone network and additional local conduit to the venture.[38] AT&T's purchase of MediaOne gives it co-control of Road Runner.[39] AT&T expects to conclude negotiations with both Comcast and Time Warner next year to provide cable telephony over their systems.

Cable is thus positioned to emerge as a fully independent, facilities-based provider of high-speed Internet access services. A significant number of observers predict that cable will be dominant – that it will stay out ahead of broadband alternatives offered over wireless media or copper loop.[40] One study projects that deployment of high-speed cable modems will substantially outpace deployment of DSL over the next four years.[41]

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[34] *See Advanced Services Report* ¶ 37.

[35] *See* A. Gould, et al., Oppenheimer & Co., Inc., Report No. 2562652, *Media Stocks: Cable Stocks Reconsidered – Industry Report*, at 2 (Jul. 3, 1997).

[36] *See* Cable Datacom News, *Commercial Cable Modem Launches in North America*, Apr. 6, 1999, http://www.cabledatacomnews.com/cmic/cmic7.html.

[37] *See* @Home Network, *Partnerships*, http://www.home.net/about/partnerships.html.

[38] Some small technical changes are occurring related to the management practices of @Home's board, however, AT&T remains the largest stakeholder with 71% of the company and 3 board seats. *See* L. Cauley & S. Swisher, *AT&T May Give Up Some Control Of At Home Due to Missed Targets*, The Wall Street Journal Interactive Edition, Apr. 8, 1999.

[39] P. Farhi, *AT&T Poised to Regain Long Reach, Via Cable*, Washington Post, May 6, 1999, at A1.

[40] *See, e.g.*, D.H. Leibowitz, Donaldson, Lufkin & Jenrette Securities, Investext Report No. 2815791, *Media and Communications Statistics/November Review: Global – Industry Report* at *52 (Dec. 17, 1998) (cable has the "first mover advantage"); D.H. Leibowitz, Donaldson, Lufkin & Jenrette Securities, Investext Report No. 2771430, *Media and Entertainment – Industry Report* at *19 (Sept. 23, 1998) (cable is in a "superior near-term and long-term position" . . . "cable overwhelmingly wins out technologically because of the inherent bandwidth advantages of its broadband pipe under the HFC (hybrid fiber/coax) architecture versus the RBOCs' narrowband copper wiring."); C.P. Dixon, et al., PaineWebber, Inc., @ Home/Transcript, Company Report, Rpt. No. 3330831, Feb. 26, 1998, at *8-9 ("[I]f you just look at the inherent physics of the cable versus the telephone, the cable is anywhere from five to 50 times faster.").

[41] *See Study Sees Cable Modem Deployments Surpassing ADSL Installations by 2003*, Broadband Networking News, Aug. 4, 1998 (citing study by Forward Concepts).

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Table 3. Cable: Strategic Partners and Resources			
Company	**Equipment Partners**	**Other Strategic Partners**	**Access to Capital**
Adelphia Communications	Scientific-Atlanta: advanced digital set-top terminals General Instrument: cable modems	@Home affiliate 69% ownership of Hyperion IXC Corp.: 3-year agreement to resell long-distance service	Scripps has invested about $60 million to upgrade systems. Scheduled sale of $750 million in stock.
CableVision	Oracle Corp: $23 million, 4-year deal for software Bay Networks, 3Com: cable modems	@Home affiliate	Subsidiary of Cablevision Systems Corp., with $3.3 billion in 1998 revenues
Century Communications	General Instrument Corp: digital set-tops CSG Systems Inc: billing graphics and messaging management services Digital Equipment: cable modems	@Home affiliate TCI: partnership to consolidate Southern California cable systems	Pending acquisition by Adelphia Comm. for $5.2 billion
Comcast	Scientific-Atlanta: digital set-tops Comcast Cable will be the first cable operator to use SURFboard cable modems to provide @Home service to subscribers.	@Home partner AT&T: Negotiations underway for AT&T to offer telephony services over Comcast's cable network	Microsoft has taken a $1 billion stake in the cable company.
Cox Communications	Ericsson: developing a device to control a consumer's high-speed data, telephony, and cable television service Nortel: $65 million agreement for switches and other equipment Bay Networks: cable modems	@Home partner Frontier: long-distance service to be offered through a 5-year, co-marketing deal CyberSmart and AMP Inc.: partnership to offer data, video and voice services R&B Comm.: formation of FiberTel to offer voice, video and high-speed data comm.	$1.8 billion in 1998 revenues
Fanch Cable	Com21: cable modems Zenith, 3Com: cable modems	Road Runner affiliate Time Warner: joint venture to expand cable systems	
Jones Intercable	Hybrid Networks: advanced headend systems and cable modems	@Home affiliate AT&T: agreement to install nearly 50 route miles of fiber optic cable in several Chicago suburbs that AT&T will lease and use to provide local and long-distance service to customers	Equity investment by Bell Canada. Controlling interest recently acquired by Comcast.
Suburban Cable	Bay Networks, 3Com: cable modems	@Home affiliate	Subsidiary of Lenfest Comm., with $459 million in 1998 revenues
Marcus Cable	Com21, Nortel: cable modems	@Home affiliate	Purchased by Microsoft's Paul Allen for $2.8 billion. Soon to be integrated with Charter Comm., purchased by Mr. Allen for $4.4 billion.
Media General Cable	Toshiba, Motorola: cable modems	Road Runner affiliate	Subsidiary of Media General Comm., with $974 million in 1998 revenues.
MediaOne	Philips Electronics: digital set-top boxes Cisco Systems: internetworking solutions Bay Networks, NextLevel: cable modems	Road Runner partner Time Warner: joint venture for digital services. @home partner through acquisition by AT&T.	AT&T acquiring MediaOne for $58 billion. Microsoft $5 billion investment in AT&T.
Midcontinent Cable	Nortel: cable modems	@Home affiliate	
Multimedia Cablevision	Toshiba, Motorola: cable modems	Road Runner affiliate	Subsidiary of Gannett Co., with over $5 billion in 1998 revenues
TCI	Sony: advanced digital set-top devices General Instrument: digital cable set-top boxes Motorola, 3Com, Nortel: cable modems	@Home affiliate AT&T: merger enables AT&T to provide digital telephony and data services with digital video services	Acquired by AT&T for $48 billion Microsoft $5 billion in vestment in AT&T
Time Warner Cable	Toshiba: cable modems Motorola: CyberSURFR cable modems	Road Runner partner AT&T: Pending 20-year cable telephony deal	Subsidiary of Time Warner, with $27 billion in 1998 revenues
Sources: See Appendix C.			

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2. Fixed Terrestrial Wireless. As of February 1999, the FCC ranked wireless cable companies ahead of incumbent LECs in the current deployment of broadband facilities that serve the last mile.[42] Fixed wireless providers include providers of LMDS (which operates in the 28/31 GHz band), MMDS (2.1 to 2.7 GHz band), and operators in the 24GHz and 38GHz bands.[43] Fixed wireless can transmit the equivalent of several hundred T-1 lines to a fixed antenna with an unobstructed path.[44]

The three major operational fixed wireless carriers providing advanced services are WinStar, Teligent, and Advanced Radio Telecom. WinStar has an average 750 MHz of spectrum in the 38-GHz band in 60 U.S. markets.[45] It provides wireless broadband service in 30 cities with access rights to 4200 buildings.[46] Teligent has between 320 and 400 MHz of spectrum in the 24-GHz band in 27 of the 35 most populous market areas in the United States.[47] It has networks in service in 26 markets,[48] and has agreements with 2400 buildings.[49] Advanced Radio Telecom provides service in three existing markets – Phoenix AZ, Bellevue, WA, and Portland, OR.[50] The FCC found that "fixed wireless providers such as WinStar and Teligent are also possible providers of broadband in rural areas."[51]

These fixed wireless providers are expanding rapidly, and new providers are quickly emerging. WinStar plans to be fully operational in 60 markets by the end of 2000.[52] It plans to have access to 8000 buildings by the end of 1999.[53] By year end, Teligent expects to offer service in 40 markets across the country.[54] NEXTLINK, started by Craig McCaw, recently purchased 40 LMDS licenses from WNP Communications, covering 105 million points of

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[42] *See Advanced Services Report* ¶¶ 53, 57, 58.

[43] *See id.* at App. A, ¶ 8.

[44] *See* C. Nerney, *Whither the Wireless Dream*, Network World, Mar. 15, 1999, at 41; *see also Advanced Services Report* at App. A, ¶ 7.

[45] *See* WinStar Communications, Inc., Form 10-K, filed Mar. 31, 1999 (Average spectrum in each of the 60 markets in the United States in which WinStar operates or in which it intends to operate by the end of 2000).

[46] *See id.*

[47] *See* Teligent, Inc., Form 10-K, filed Mar. 29, 1999.

[48] *See* Teligent Press Release, *Teligent Debuts Lower-Cost Communications Services for Small and Mid-Sized Businesses in San Diego and Sacramento*, Mar. 30, 1999.

[49] *See* Teligent Press Release, *Teligent Reports 1998 Financial Results, Sets Operating Benchmarks for 1999*, Mar. 1, 1999.

[50] *See* Advanced Radio Telecom, *Service Locations*, http://www.artelecom.com/services/areas/index.html.

[51] *See Advanced Services Report* ¶ 71.

[52] *See* WinStar Communications, Inc., Form 10-K, filed Mar. 31, 1999.

[53] *See* J. Oldham, *The Cutting Edge/Personal Technology; Telecom Talk; Bundle of Discounts for Small Businesses*, Los Angeles Times, Dec. 14, 1998, p. C3.

[54] *See* Teligent Inc., *What's New*, http://www.teligent.com/whatsnew.html.

presence.[55] NEXTLINK plans to develop networks covering a majority of the nation's top 30 markets by the end of 2000.[56]

[55] *See* M. Mills, *Auctioned Licenses to be Resold for Big Gain*, Washington Post, Jan. 15, 1999.

[56] *See* Nextink Press Release, *NEXTLINK Communications Reports 1998 Financial Results*, Feb. 23, 1999.

Table 4. Wireless Cable: Strategic Partners and Resources			
Company	**Equipment Partners**	**Other Strategic Partners**	**Access to Capital**
LMDS/24GHz/38GHz			
WinStar	Lucent, Nortel, Innova, Hughes Network Systems	Williams Comm.: lease for long-haul services Spieker, Equity, and Cigna: non-exclusive agreements for access to buildings Metromedia Fiber Network: 25-year, $40 million deal for access to fiber network Recently purchased Midcom and PacNet, providers of long-distance and frame relay services, respectively Purchased Internet backbone provider GoodNet AOL: agreement to provide Dun and Bradstreet Reports over the Internet ISP AboveNet: $40 million contract to deliver Internet backbone access GRIC Communications, Inc: provides WinStar's dial-up customers with access to GRIC's Alliance Network POPs Billing Concepts: contract for operations support systems	$2 billion line of credit from Lucent over five years for equipment.
Teligent	Nortel, Hughes	Arden Realty, Spieker Properties, CarrAmerica, U.S. RealTel: agreements for access to nationwide properties PSInet: partnership for Internet access Purchased a $640 million stake in Williams Communications Concentric Networks: partnership for nationwide backbone access International Billing Services: partnership for operations support systems	$100 million invested by Nippon Telegraph and Telephone Corp. $800 million bank credit facility from Chase Manhattan and Goldman Sachs, for a total of $1.7 billion available for growth through 2000. $780 million in financing from Nortel. The Associated Group of Philadelphia has a 40% stake in Teligent.
Advanced Radio Telecom	Lucent	Snap.com: agreement to act as a portal Spieker: non-exclusive agreement for access to properties ICG, ChoiceCom: 3-year agreements to provide broadband service Electric Lightwave: agreement to provide broadband access InterNAP Network Services: agreement for backbone provider .comfax: marketing agreement	$200 million in financing from Lucent. WinStar has a 15% stake.
NEXTLINK	PulsePoint	Acquired WNP Communications, Inc. for approximately $695 million in cash and stock, adding 114 POPs to Nextlink's LMDS coverage area Level 3: 3-year, $700 million agreement for long-distance data transport and fiber network construction Covad, AT&T: strategic relationships to provide and transport DSL services PSINet: agreement to provide Internet services Metromedia Fiber Network: $92 million contract for access to fiber Founder Craig McCaw operates four other telecom companies: Nextel, Nextband, Internext, and Teledesic	Over $1.7 billion in cash assets available. Recently raised $835 million in the sale of senior notes.
MMDS			
American Telecasting (ATI)	Hybrid Networks, EMCEE Broadcast Products	Internet Ventures, Rocky Mountain Internet: agreements to provide Internet access Provides DirecTV over its network IBM: agreement for connection to Internet backbone Online Systems Services: agreement for turnkey Internet products and service packages	Sprint purchased ATI for $168 million in stock plus $281 million assumed ATI debt.
CAI Wireless	General Instrument, Hybrid Cable	94% stake in CS Wireless National Science Foundation: alliance to provide high-speed Internet connections to upstate New York schools Provides DirecTV over its network.	MCI WorldCom purchased CAI for approximately $476 million. $80 million senior credit facility from Merrill Lynch Global Allocation Fund.
CS Wireless	General Instrument, Hybrid Cable, NextLevel Systems	Stratton Voice and Data: strategic relationship to provide video conferencing, live video broadcasting, and stored video on demand to the desktop Provides DirecTV over its network TelQuest Satellite Services: agreement to provide digital video	Portion of $200 million MCI WorldCom investment. MCI has obtained 94% stake through purchase of CAI Wireless
Nucentrix (formerly Heartland Wireless)		Ownership of 20% stake in Wireless One Provides DirecTV over its network	Senior credit facility secured from Merrill Lynch Global Allocation Fund.
People's Choice TV	Hybrid Networks	Provides DirecTV over its network Fully owned subsidiary, Speed Choice, provides Internet access	Sprint purchased People's Choice TV for approximately $126.3 million. Portion of $200 million MCI WorldCom investment. The Blackstone Group also has a significant stake in the company.
Wireless One		Provides DirecTV over its network ALLTEL: long-term outsourcing contract	Portion of $200 million MCI WorldCom investment.

Sources: *See* Appendix C.

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These fixed wireless carriers are well financed and have formed numerous strategic alliances. Teligent has $1.2 billion available to fund its growth through 2000.[57] In addition, Teligent has tapped Nortel to build part of its network and to supply $780 million in financing.[58] WinStar leases its long-haul services from Williams Communications.[59] Lucent Technologies has provided WinStar with a $2 billion line of credit for equipment.[60] NextLink, which is backed by billionaire Craig McCaw, has an alliance with ISP InterNext, and leases long-distance data transport through an agreement with Level 3.[61] ART has received over $200 million in financing from Lucent,[62] and is also backed by WinStar.[63] *See* Table 4.

MMDS operators include CAI Wireless systems, CS Wireless Systems, Wireless One, Nucentrix (formerly Heartland Wireless), ATI Telecasting, and People's Choice TV. The Commission found that "[i]n a significant number of cities," MMDS companies are "offer[ing] broadband services to residential consumers."[64] And it cited estimates that "several million residential consumers could now obtain broadband from such companies.[65]

In March 1999, MCI WorldCom invested $200 million in four MMDS providers – CAI, CS Wireless, Wireless One, and People's Choice.[66] MCI WorldCom subsequently acquired CAI Wireless, and with it a 94 percent stake in CS Wireless.[67] The company has also entered into a five-year national agreement to resell WinStar's "Wireless Fiber," and is also reselling fixed wireless access from Teligent.[68] MCI WorldCom CEO Bernard Ebbers has stated that, while his company has already purchased enough cable to cover half the country, his goal is to eventually cover 70 percent, and to use this fiber to serve as a local loop to small and mid-sized

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[57] *See* Teligent Press Release, *Teligent Reports 1998 Financial Results, Sets Operating Benchmarks for 1999*, Mar. 1, 1999.

[58] *See* S. Mehta, *Teligent Taps Northern Telecom for Financing, Role in Network*, The Wall Street Journal, Nov. 5, 1997 (Teligent also received a $100 million investment from Nippon Telephone & Telegraph).

[59] *See* Winstar Press Release, *WinStar Reports Fourth Quarter and Year-End Results*, Mar. 4, 1999.

[60] *See id.*

[61] *See NEXTLINK Communications Reports Record Revenue Growth; Continues Nationwide Expansion*, Business Wire, Oct. 27, 1998.

[62] *See* ART Press Release, *Advanced Radio Telecom Reports Fourth Quarter, Year End Results*, Mar. 2, 1999.

[63] *See* E. Mooney, *WinStar Says It Wants ART's Spectrum*, Radio Comm. Report, Nov. 9, 1998, at 6.

[64] *Advanced Services Report* ¶ 57.

[65] *Id.* (*citing* Comments of AT&T Corp. at 16; Comments of BellSouth Corp., Exhibit E at 2).

[66] *MCI WorldCom's Wireless Cable Plans Seen Widening Broadband Options*, Communications Daily, Mar. 31, 1999, at 5.

[67] B. Menezes, *MCI WorldCom Discovers Fixed Wireless*, Wireless Week, Feb. 8, 1999.

[68] *Id.* ("By deploying its own solution, WorldCom might have more leverage to exploit the benefits of broadband wireless local access – such as speed of deployment and relatively low infrastructure costs – instead of having to negotiate with the incumbent wireline local exchange carrier" for local access.").

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businesses.[69] In April 1999, Sprint announced an agreement to merge with People's Choice TV, and said it would use PCTV's MMDS licenses to provide wireless broadband services as a part of its Sprint ION offering.[70] Sprint subsequently acquired ATI, Videotron USA, and Transworld, and plans to use these companies' facilities to provide high-speed Internet access.

3. Satellite. A new, more intelligent breed of satellites is rapidly being deployed as an additional competitor in the high-speed market. The nation's largest DBS operator, DirectTV (owned by Hughes), already provides nationwide Internet access at speeds of up to 400 kbps.[71] The Commission has granted fourteen Ka-band licenses, including thirteen geostationary systems and one non-geostationary system, Teledesic, which will deploy a low-earth orbiting system.[72] According to the Commission, several of these licensees – including Loral's CyberStar, Hughes' Spaceway, Lockheed Martin's Astrolink, SkyBridge, and Teledesic, among others – "are planning to enter the residential broadband market in the next decade."[73] The operators themselves have announced much more rapid deployment schedules.[74]

In the *Advanced Services Report*, the Commission noted that "[s]ince 1993, over $20 billion has been invested in the space industry, of which much has gone into the broadband satellite telecommunications sector."[75] Teledesic's $9 billion venture is backed by Craig McCaw, Microsoft Chairman Bill Gates, Motorola (with a 26 percent stake),[76] Saudi Prince

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[69] *See* CIBC World Markets, Daily Teletimes, May 21, 1999 (summarizing comments of Bernard Ebbers at MCI WorldCom's Annual Meeting on May 20, 1999).

[70] *See MDS Provider People's Choice TV Merging Into Sprint*, Telecommunications Report Daily, Apr. 12, 1999. Sprint stated that: "Along with recently announced plans to build asymmetrical digital subscriber lines (ADSL) in 35 major markets by the end of the year, the purchase offers Sprint another way to deliver Sprint ION broadband services to business and residential customers." *Id.*

[71] *See Applications for Consent to the Transfer of Control of Licenses and Section 214 Authorizations from Tele-Communications, Inc. to AT&T Corp.*, Memorandum Opinion and Order ¶ 74, CS Docket No. 98-178 (rel. Feb. 18, 1999).

[72] *See Advanced Services Report* ¶ 39 (These geostationary Ka-band licensees include systems owned by Comm Inc., EchoStar Satellite Corp., GE American, Hughes Space & Communications, KaStar Satellite Communications, Loral Aerospace Holdings, Inc., Lockheed Martin Corp., MorningStar Satellite Co., NetSat 28, Orion Atlantic, Orion Network Systems, PanAmSat Corp., and VisionStar, Inc.).

[73] *Id.* ¶ 60.

[74] Teledesic plans to begin its broadband satellite service in 2003. *See* Teledesic, *Fast Facts*, http://www.teledesic.com/overview/fastfact.html. Spaceway plans to begin operations in North America in 2002. *See* Company Press Release, *Hughes to Invest $1.4 Billion in Broadband Satellite System*, Mar. 17, 1999, http://www.hns.com/news/pressrel/corporat/p031799.htm. SkyBridge will begin operations in 2001. *See* Company Press Release, *SkyBridge Will Expand Its Satellite Constellation from 64 to 80 Satellites to Meet Market Demand*, June 1, 1998, http://www.skybridgesatellite.com/news/cont_81.htm. Astrolink plans to begin its operations in 2001. *See* Astrolink: System Concept, http://www.astrolink.com/concept.html.

[75] *See Advanced Services Report* ¶ 39.

[76] Motorola initially planned to build its own broadband satellite network (Celestri), but then pooled its resources with Teledesic and will now lead the industrial team that will develop and deploy the satellite system, along with Boeing and the Italian company Matra Marconi Space. *See* Teledesic, *Fast Facts*, http://www.teledesic.com/overview/fastfact.html.

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Alwaleed Bin Talal,[77] and Boeing. SkyBridge's $3.5 billion development costs are being footed by Alcatel, Loral Space & Communications, Toshiba, Mitsubishi Electric, Sharp, and others.[78] CyberStar's $1.6 billion system is also backed by Loral and Alcatel.[79] Astrolink's $3 billion project is backed by Lockheed Martin,[80] and there are plans to bring other investors and partners on board.[81] Finally, the $3.5 billion Spaceway project is financed by Hughes Electronics Corporation (a subsidiary of General Motors).[82] *See* Table 5.

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[77] The Prince invested $200 million. *See* C. Bulloch, *Coming Soon: Multimedia Satellites*, Interavia Business & Technology, Feb. 1, 1999, at 45.

[78] Alcatel, *SkyBridge*, http://www.alcatel.com/telecom/space/Systems/SkyBridge/index.htm.

[79] Cyberstar, *Common Questions*, http://www.cyberstar.com/abo0301.html.

[80] *See* C. Bulloch, *Coming Soon: Multimedia Satellites*, Interavia Business & Technology, Feb. 1, 1999, at 45.

[81] Astrolink, *About Us*, http://www.astrolink.com/about_us.html. Plans call for a team consisting of "country service providers, terminal and network manufacturers, content providers, application software developers and other value-added providers." *Id.*

[82] Hughes Press Release, *Hughes to Invest $1.4 Billion in Broadband Satellite System*, Mar. 17, 1999.

Table 5. Satellite: Strategic Partners and Resources			
Satellite Provider	**Equipment Partners**	**Other Strategic Partners**	**Access to Capital**
Teledesic	Motorola: prime contractor Boeing: assistance in building the satellite system Matra Marconi Space: likely to build platform structures for satellites	Craig McCaw: 21% stake; Co-CEO AT&T Wireless: 12% stake	Motorola: 26% stake valued at $750 million Boeing: 5% stake Bill Gates: 21% stake Saudi Prince Alwaleed Bin Talal: 11% stake ($200 million investment).
SkyBridge	Alcatel: design and development of satellite system Loral Space & Comm.: manufactures satellites and provides satellite-based communications services, but manufacturer for SkyBridge satellites has not been announced	CNES (National Center for Space Studies – France) SRIW (Societe Regionale d'Investissements de Wallonie – Belgium) Mitsubishi Sharp SPAR Aerospace (Canada) Aerospatiale (France) Toshiba COM DEV Satellite Comm. SkyBridge partners will receive licenses to offer its services in return for investing a combined $2 billion to build satellite dishes on the ground.	Alcatel and Loral have an agreement to allow for "cross-investment" between Alcatel's SkyBridge and Loral's CyberStar. The agreement stipulates that each company will invest an initial $30 million in the other's satellite venture.
CyberStar	Loral Space & Comm. (Managing Partner): use of existing satellites	Alcatel (Equity Partner): 14% stake	As of November 1998, Alcatel and Loral had spent $69 million on the CyberStar system.
Astrolink	Lockheed Martin	Astrolink will announce its international partners and service providers "very soon."	Astrolink is wholly-owned by Lockheed Martin, however plans call for the company to become a separate entity.
Spaceway	Hughes Network Services: manufacture of DirecTV receivers; provision of "key end-user marketing and distribution elements" Hughes Space & Comm.: manufacture of all satellites PanAmSat (81% owned by Hughes Electronics): control of satellite operations DirecTV (wholly-owned by Hughes Electronics): provision of satellite television service	"Hughes plans to work with global strategic partners to roll out additional systems."	Spaceway is a Hughes-controlled project.
Sources: *See* Appendix C.			

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4. Utilities. The FCC has noted that "[a] growing number of public utilities are offering broadband within their utility service territories."[83] According to the FCC, "as of 1997, utilities had installed 40,000 route miles of fiber optic cable representing over 750,000 fiber miles, and they intend to install another 36,000 route miles in the next few years."[84] Utility-based offerings have begun in numerous cities.[85]

Many utilities have formed partnerships with CLECs.[86] For example, Hyperion has partnered with PECO Energy to provide telecommunications services over PECO's 500-mile fiber optic network in southeastern Pennsylvania.[87] Boston Edison teamed up with RCN in the fall of 1996 to provide telephone, video, and Internet access over its 200-mile fiber optic backbone.[88] RCN has also joined forces with PEPCO to provide advanced services in the Washington, DC metro area.[89] MaineCom Services, a subsidiary of Central Maine Power, has a $20 million joint venture with Brooks Fiber to construct a fiber optic network to serve the Portland market.[90] According to the FCC, utilities have also entered into "joint ventures with software and content providers."[91]

Utilities clearly have deep financial pockets. The FCC notes that "[a]ctual and planned utility-affiliated ventures in Boston, New York, Philadelphia, Washington, and San Francisco areas have a capital budget for 1998 and 1999 that is estimated at $850 million."[92] Utilities

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[83] *Advanced Services Report* ¶ 60.

[84] *Id.*

[85] *E.g.*, VPS Communications, a subsidiary of Virginia Power, owns and operates a 270-mile fiber optic backbone. New Paradigm Resources Group and Connecticut Research, *1998 Annual Report on Local Telecommunications Competition*, at Ch. 6, p. 18 (9th ed. 1998) ("*1998 Annual Report on Local Competition*"). FTV, a joint venture between Montana Power, Enron, and the Williams Companies, is in the process of constructing a 1,620-mile fiber optic network between Portland and Los Angeles. *Id.* at 17 of 22. SCANA Communications, a subsidiary of the SCANA Corporation, owns and manages a 2,500-mile fiber optic network stretching from the Carolinas to east Texas. *Id.* at 18 of 22. C3 Communications, a subsidiary of Central and Southwest Energy, owns and operates a large fiber optic network that covers Texas, Arkansas, Oklahoma, and Louisiana. C3 Communications, *Our Network*, http://www.c3com.com/C3Networks/network/network.htm. Montana Power also owns an 8,000 mile network called Touch America, which covers thirteen states. They are planning to expand to a national footprint. W. Carter, *Proceeding With Caution*, Internet Telephony, Nov. 2, 1998, http://www.internettelephony.com/archive/11.02.98/STnews.htm.

[86] *See* CLEC.Com, News Release, *C-LECs Team with Electric Utilities*, Feb. 3, 1999, http://www.Clec.com/latest/newsjump.cfm?NewsID=854984116 ("And many [utilities] are joining forces with existing C-LEC operators that have competitive savvy at their roots.").

[87] *1998 Annual Report on Local Competition* at Ch. 6, p. 16.

[88] *Boston Edison and CTEC's RCN Unit Form Partnership To Offer Local Phone, Long Distance, Video and Internet Access*, PR Newswire, Sept. 30, 1996.

[89] Pepco Press Release, *PEPCO Subsidiary Joins RCN Corporation to Bring Washington, DC Area a Single-Source Package of Telecommunications and Cable Services*, Aug. 6, 1997.

[90] *1998 Annual Report on Local Competition* at Ch. 6, p. 19.

[91] *Advanced Services Report* ¶ 55.

[92] *Id.* ¶ 40.

entering the telecommunications market place include giants such as Virginia Power[93] and Con Ed of New York.[94]

B. Current CLEC Provision of Advanced Services Over ILEC Loops

In addition to the many direct alternatives to ILECs' networks, many competitors are providing advanced services by attaching their own facilities to ILECs' copper loops. Providing high-speed service over an ILEC copper loop requires new equipment deployed at the two ends of the wire: on the customer's premises and in the ILEC's central office. ADSL service, for example, requires an ADSL modem at the customer's premises and in the central office: (1) a Digital Subscriber Line Multiplexer ("DSLAM"); and (2) a fast-packet or ATM switch to route high-speed data traffic from there on out (*e.g.*, to an ISP).

ILECs can of course deploy such equipment, and are doing so. But CLECs can too, if they have direct access to the ILEC's unbundled loop. Which they do. No new "advanced services" UNE is required to ensure such access.[95] ILEC loops are already unbundled to permit competitive provision of ordinary voice service. Apart from a modest amount of loop testing for quality, nothing more is required.

Market experience confirms that conclusion beyond any possible dispute. CLECs already provide xDSL service in each of the 10 largest MSAs, and 25 of the top 50. They are in 21 states and 273 cities. Most of these markets are served by multiple CLECs. By comparison, ILECs are offering xDSL service in only 7 of the 10 largest MSAs and only 22 of the top 50. *See* Map 4, Table 6. In filings with the Commission, a major CLEC trade association insists that CLECs – not ILECs – "were the *first*" to deploy high-speed data networks and "continue to deploy such advanced technologies at a dramatic pace."[96] The Commission itself acknowledges

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[93] *Another Power Utility Subsidiary Seeks Entry into Competitive Telecom*, clec.com, Aug. 12, 1997.

[94] Credit Suisse First Boston Corporation, *Global Telecommunications Weekly*, Feb. 22, 1999, at 5.

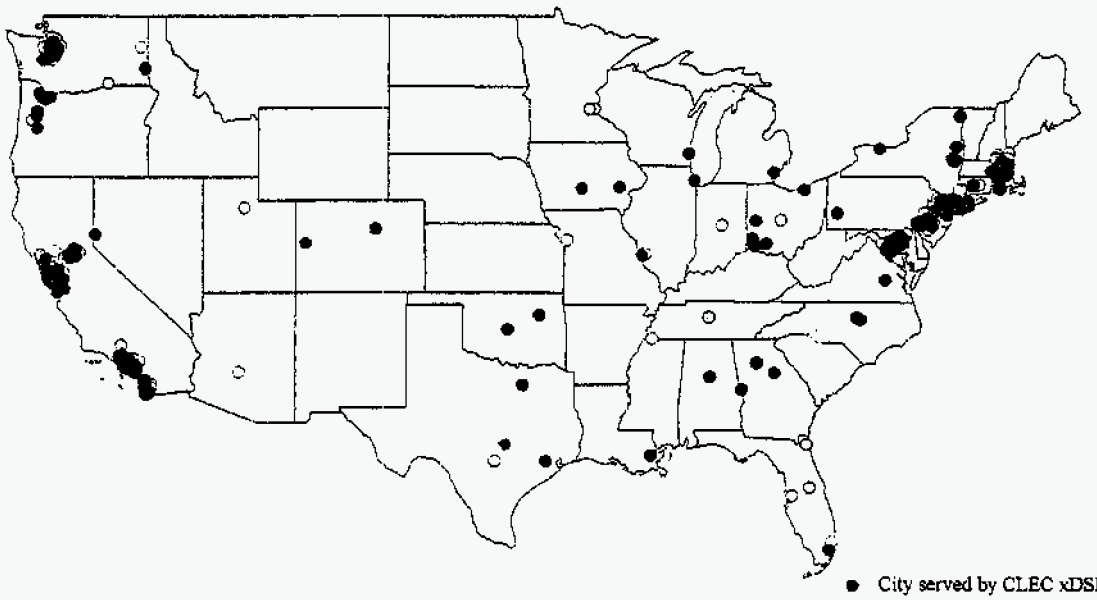
[95] The Commission's *Local Competition Order* created the only UNE CLECs need to provide competitive advanced services, and the Commission's several collocation orders ensure that CLECs can attach their own equipment to ILEC loops on the same physical premises as ILECs can. *See, e.g., Second Advanced Services Order* ¶¶ 27-60; *Local Competition Order*, 11 FCC Rcd at 15782-807 ¶¶ 55-607; *Expanded Interconnection with Local Telephone Company Facilities*, Memorandum Opinion and Order, 9 FCC Rcd 5154 (1994) (Virtual Collocation Order); Second Report and Order and Third Notice of Proposed Rulemaking, 8 FCC Rcd 7374 (1993) (Switched Transport Expanded Interconnection Order); Report and Order and Notice of Proposed Rulemaking, 7 FCC Rcd 7369 (1992) (Special Access Expanded Interconnection Order). NorthPoint CEO, Michael Malaga, notes that collocation is his company's key asset: "'The asset is really in the co-location." S. Schiesel, *Start-Up Leads Phone Cause in Battle for Internet Access*, The New York Times, May 17, 1999.

[96] Petition of the Association for Local Telecommunications Services (ALTS) for a Declaratory Ruling Establishing Conditions Necessary to Promote Deployment of Advanced Telecommunications Capability Under Section 706 of the Telecommunications Act of 1996 at ii, CC Docket No. 98-78 (FCC filed May 27, 1998) (emphasis added).

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that CLECs have already deployed more advanced-service equipment than ILECs over ILEC loops.[97]

Map 4. CLEC xDSL Deployment



Source: *See* Tables 1 & 7, *infra*.

[97] *See Advanced Services Report* ¶¶ 53, 56, 58 (outlining the current deployment of broadband facilities service the last mile, "begin[ning] with those that seem most advanced in deployment at this time," and listing CLECs ahead of ILECs).

Table 6. xDSL Deployment in Top 30 MSAs		
MSA	**ILEC**	**Other Providers**
1. Los Angeles	SBC, GTE	Concentric, Covad, DigitalSelect, Flashcom, InteleNet, ICG Netcom, NorthPoint, Orconet, Rhythms, UUNET, Verio, Zyan, and 34 ISP Partners
2. New York	Bell Atlantic (expected June 1999)	Concentric, Covad, DigitalSelect, Flashcom, NorthPoint, Red, Rhythms, UUNET, Verio, and 37 ISP Partners
3. Chicago	None	American Information Systems, @Work, Concentric, Covad, Flashcom, InterAccess, NorthPoint, Rhythms, UUNET, Verio, and 8 ISP Partners
4. Philadelphia	Bell Atlantic	Covad, Flashcom, NorthPoint, and 6 ISP Partners
5. Washington, D.C.	Bell Atlantic	Concentric, Covad, DigitalSelect, Flashcom, NorthPoint, UUNET, Verio, Rhythms and 16 ISP Partners
6. Detroit	None	Flashcom, NorthPoint, UUNET, and 2 ISP Partners
7. Houston	SBC	Concentric, DigitalSelect, Muse, ICG Netcom, NorthPoint, Verio, and 2 ISP Partners
8. Atlanta	BellSouth	Covad, DigitalSelect, Flashcom, ICG Netcom, NorthPoint, UUNET, Verio, and 7 ISP Partners
9. Boston	Bell Atlantic	Concentric, Covad, Digital Select, Flashcom, NorthPoint, Rhythms, Shore.Net, UUNET, Verio, WinStar iCi, and 19 ISP partners
10. Dallas	SBC, GTE	Concentric, DigitalSelect, Flashcom, Muse, ICG Netcom, NorthPoint, Telares, UUNET, Verio, and 2 ISP Partners
11. Riverside-San Bernardino	SBC (expected June 1999)	None
12. Phoenix	U S WEST	Covad (expected 1999), Flashcom (expected May 1999), NorthPoint (expected 1999), and Rhythms (expected 1999)
13. Minneapolis-St. Paul	U S WEST	Covad (expected 1999), Flashcom (expected May 1999), NorthPoint (expected 1999), and Rhythms (expected 1999)
14. San Diego	SBC	Concentric, Covad, Flashcom, NorthPoint, Rhythms, UUNET, Verio, Zyan, and 10 ISP Partners
15. Orange County	SBC	Concentric, Covad, Flashcom, NorthPoint, Rhythms, UUNET, Verio, and 35 ISP Partners
16. Nassau-Suffolk	None	CAIS Internet, Concentric, Covad, Flashcom, NorthPoint, Verio, and 36 ISP Partners
17. St. Louis	SBC (expected second quarter 1999)	NorthPoint, Flashcom (expected June 1999)
18. Baltimore	None	Concentric, Covad, Flashcom, Digital Select, NorthPoint, UUNET, Verio, and 5 ISP partners
19. Pittsburgh	Bell Atlantic	Flashcom, NorthPoint
20. Oakland	SBC	Concentric, Covad, Flashcom, Rhythms, NorthPoint, UUNET, Verio, and 40 ISP Partners
21. Seattle	U S WEST, GTE	Covad, Flashcom, Orconet, Telares, UUNET, Verio, and 13 ISP Partners
22. Tampa-St. Petersburg, FL	GTE	UUNET
23. Cleveland	None	NorthPoint, Flashcom, UUNET
24. Miami	BellSouth (expected 1999)	DigitalSelect, Flashcom, NorthPoint, UUNET, and 4 ISP Partners
25. Newark	Bell Atlantic	None
26. Denver	U S WEST	ICG Netcom, Telares, UUNET
27. Portland, OR	U S WEST, GTE	Telares, UUNET
28. San Francisco	SBC	Brainstorm Networks, Concentric, Covad, DigitalSelect, Flashcom, Ionix, Muse, ICG Netcom, NorthPoint, Orconet, Rhythms, UUNET, Verio, and 39 ISP Partners
29. Kansas City, MO	SBC (expected second quarter 1999)	Flashcom (expected August 1999)
30. San Jose, CA	SBC	Concentric, Covad, Flashcom, Ionix, Muse, ICG Netcom, Orconet, Rhythms, UUNET, Verio
Sources: See Appendix C.		

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The CLECs' own trade association insists that CLECs already lead the ILECs in providing advanced services over ILEC loops.[98] CLECs offer advanced services to over five million homes, and ALTS predicts that number will quadruple in 1999.[99] "Data CLECs have invested heavily in facilities, pushed DSL prices down," and "[s]everal competitive DSL providers have entered multiple markets in which they compete against each other, the ILECs, and cable modem providers."[100] CLECs – not ILECs – are "driving the deployment of cutting-edge technology."[101] *See* Table 7. CLECs are among the leading providers of dedicated access facilities to Internet Service Providers (ISPs), and in many instances, CLECs own controlling interests in the nation's better-known ISPs.[102] Data will constitute 20 percent of CLEC revenue by the year 2000.[103]

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[98] *See* ALTS Press Release, *ALTS' Fall Education Seminar Proves Success of Telecom Act in Stimulating Broadband Data and Competitive Providers*, Sept. 18, 1998.

[99] *See* ALTS Press Release, *ALTS Faults Monopolies' Repeated Efforts to Bypass Competitive Requirements for Advanced Services*, Dec. 7, 1998, http://www.alts.org/tdbshowarticle.asp?AID=117&type=News.

[100] The Council of Economic Advisors, United States Department of Commerce, *Progress Report: Growth and Competition in U.S. Telecommunications 1993-1998* (Feb. 8, 1999), http://www.ntia.doc.gov/ntiahome/press/ceafinalrpt.htm.

[101] ALTS Press Release, *ALTS' Fall Education Seminar Proves Success of Telecom Act in Stimulating Broadband Data and Competitive Providers*, Sept. 18, 1998.

[102] *See* ALTS Press Release, *ALTS Proposes Advanced Communications Network Model to Propel Investment in Local Broadband Networks*, May 17, 1998.

[103] *See id.*

Table 7. CLECs Providing Advanced Services on ILEC Loops			
CLEC	Cities Presently Served	Expansion Plans	Collocation Nodes in ILEC Central Offices
Covad	Atlanta; Baltimore; Boston; Chicago; Los Angeles; New York; Philadelphia; Sacramento; San Diego; San Francisco; Seattle; Washington, D.C.	1999 expansion into Austin; Dallas; Denver; Detroit; Houston; Miami; Minneapolis; Phoenix; Portland, OR; Raleigh	168
NorthPoint	Austin; Atlanta; Baltimore; Boston; Chicago; Cleveland; Dallas; Detroit; Houston; Los Angeles; Miami; New York; Philadelphia; Pittsburgh; San Diego; San Francisco; St. Louis; Washington, D.C. "40 percent of all businesses and 20 percent of all residences"	1999 expansion into 25 metro areas, including Columbus; Denver; Minneapolis/St. Paul; Orlando; Phoenix; Portland, OR; Raleigh-Durham; Seattle; Tampa	500
Rhythms NetConnections	Boston; Chicago; Los Angeles; New York; Oakland/East Bay; Orange County; Sacramento; San Diego; San Francisco; San Jose, Washington, D.C.	1999 expansion into 23 metro areas; including Austin, Baltimore, Cincinnati, Cleveland, Columbus, Denver, Detroit, Hartford, Houston, Kansas City; Miami, Milwaukee, Minneapolis/St. Paul, Pittsburgh, Phoenix, Portland, OR, Raleigh-Durham, Seattle, St. Louis and Tampa	200
Allegiance Telecom	Introducing service in Atlanta, Chicago, Dallas, New York and San Francisco	DSL services will be "provisioned from 100 more central offices by the end of the year"	150
ICG Communications	Colorado; California; the Ohio Valley and various part of the Southeastern United States	". . . expand even further and gain access to more than two-thirds of the businesses and more than half of the residential customers in the top 25 markets in the United States"	100
UUNET	Atlanta; Baltimore; Boston; Chicago; Cleveland; Connecticut; Los Angeles; New York; Rochester; San Diego; San Francisco; Washington, D.C.	". . . expects to deliver enhanced DSL services to 70% of American businesses by 2000"	
e.spire	New York; Washington, D.C.	"signed an agreement with Covad Communications that it enables it to offer a new type of high speed connection to the Internet in major metropolitan markets"	
Intermedia Communications	222 multi-tenant buildings in 16 markets	Agreements with NorthPoint and Rhythms will expand DSL reach to an additional 17 markets, including San Francisco, Chicago, and Boston.	
Network Access Solutions	Baltimore; Boston; New York; Philadelphia; Richmond; Washington, D.C.	". . . will be operational in Wilmington(DE); Norfolk and Pittsburgh by June 1, 1999"	
MGC Communications	Atlanta; Southern California; Nevada "40,000 small business and residential lines installed throughout the US"		
JATO Communications	Seattle; Spokane; Portland; Salem; Eugene; Boise; Salt Lake City; Las Vegas; Phoenix; Tucson; Ft. Collins; Greeley; Denver; Colorado Springs; Albuquerque; Dallas; Austin; San Antonio; Houston; Oklahoma City; Omaha; Lincoln; Kansas City; St. Louis; Des Moines; Minneapolis "JATO's markets cover 800 thousand businesses and 8 million residences"		
Choice One	Rhode Island (approved to offer service in March 1999)		
Microsoft	Atlanta; Seattle	"will begin trials in Chicago and San Diego" "By the fall of this year, the company plans to offer DSL in 20 US cities"	
Dakota Services	32 cities in Minnesota, South Dakota and Wisconsin, including Chicago	Canton, SD; Lauren and Marshall, MN	
Flashcom	Atlanta; Austin; Baltimore; Cleveland; Connecticut; Dallas; Detroit; Houston; Illinois; Los Angeles; Maryland; Massachusetts; Miami; Michigan; New Hampshire; New Jersey; New Orleans; New York; Philadelphia; Pittsburgh; Seattle; San Diego; San Francisco, San Jose, Virginia; Washington, D.C.	Flashcom is currently providing service in 22 major metro markets with plans for 20 more by the end of this year.	
HarvardNet	New Hampshire; Massachusetts	CLEC applications pending to Rhode Island and Maine. HarvardNet "plans to expand its DSL offerings to 4.2 million lines in New England over the next 18 months."	
InterAccess	Chicago	Expansion in March to include Northbrook; Oakbrook; Naperville; Elk Grove Village; and Schaumburg.	
Interstate Telephone Co.	Westpoint, GA		
Supra Telecommunications & Information Systems	Florida		
Sprint	Charlottesville, VA (expected May 1999)	Second half of 1999 rollouts in Las Vegas, Kansas City and Orlando	
AT&T	Currently conducting trials in 5 markets.		

Sources: See Appendix C.

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CLECs have access to significant resources, and have formed numerous strategic alliances. For example, Covad has "strategic relationships" with AT&T, NEXTLINK, Qwest, and Concentric whereby each has agreed to market and resell Covad's DSL lines to their customers.[104] The companies have also committed capital resources: Qwest has invested $15 million in Covad,[105] AT&T made a $25 million equity investment in Covad, and NEXTLINK provided another $20 million.[106] Rhythms has entered into a strategic alliance with MCI WorldCom, which is expected to invest $30 million in Rhythms.[107] Under the terms of the agreement, "Rhythms will be MCI WorldCom's preferred supplier of DSL-based solutions," and MCI WorldCom will purchase 100,000 lines of DSL-based services from Rhythms.[108] "The companies will also pursue joint product development opportunities targeting the bundled voice and data needs of businesses."[109] Microsoft and Rhythms have also recently announced an alliance,[110] and Microsoft has already invested $30 million in Rhythms to "assist in Rhythms' nationwide deployment plan."[111] ICG recently designated NorthPoint as its preferred DSL provider[112] and Intel, @Home, and the Carlyle Group have provided NorthPoint with financial backing.[113] *See* Table 8.

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[104] *See* Covad Press Release, *Covad Communications Announces 1998 Results*, Mar. 2, 1999.

[105] *See* Covad Press Release, *Covad Communications Enters into Strategic Relationship with Qwest Communications*, Jan. 19, 1999.

[106] *See* Covad Press Release, *Covad Communications Enters Into Strategic Relationship with AT&T and NEXTLINK*, Jan. 4, 1999.

[107] *See* Rythms Press Release, *Rhythms, MCI WorldCom Strategic Alliance Offers High-Performance Data Networking for Businesses*, Jan. 26, 1999.

[108] *Id.*

[109] *Id.*

[110] *See* Rhythms Press Release, *Microsoft and Rhythms Alliance to Focus on New Services for Rhythms' Business Customers*, Mar. 17, 1999.

[111] *See id.*

[112] *See* ICG Press Release, *ICG Communications Expands National DSL Footprint in Strategic Relationship with NorthPoint Communications*, Feb. 18, 1999.

[113] *See* NorthPoint Press Release, *NorthPoint Communications Receives Intel Investment*, Oct. 26, 1998; Press Release, *@Work Expands Transport Portfolio To Include DSL*, Jun. 29, 1998.

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Table 8. Facilities-Based Data CLECs: Strategic Partners and Resources			
Company	**Equipment Partners**	**Other Strategic Partners**	**Access to Capital**
NorthPoint Communications	Copper Mountain: central office equipment, DSL access concentrators and DSL modems	ICG Comm.: designated NorthPoint as its preferred DSL provider. ICG will purchase up to 75,000 DSL lines and sell its DSL assets to NorthPoint. Frontier Comm.: designated NorthPoint as its preferred DSL provider	Major Investors: @Work, Intel, Verio, The Carlyle Group, Vulcan Ventures, Accel Partners, Benchmark Capital and Greylock
Rhythms NetConnections	Xylan: high speed concentrators Compas: service support in the collocation process Genicom: service support, desktop integration, outside wiring and LAN/MAN/WAN maintenance Paradyne: integrated performance reports Copper Mountain: DSL equipment	Epoch: partnership to provide DSL services AboveNet Comm.: partnership to provide high speed Internet connectivity MCI WorldCom: designated Rhythms as its preferred supplier of DSL. WorldCom will purchase 100,000 lines of DSL from Rhythms. Microsoft: alliance to provide co-branded MSN portal	Major Investors: MCI WorldCom ($30 million); Microsoft ($30 million); Kleiner Perkins Caufield & Byers; Enterprise Partners; The Sprout Group; Brentwood Venture ($20 million); Entron Corp. $150 million in private placement of debt.
Covad Communications	Cisco Systems: routers, ATM equipment, ISDN line cards and CPE	AT&T, NEXTLINK, Qwest: agreements to market and resell Covad DSL lines to customers. Concentric: will use Covad to provide DSL in over 20 markets	Major Investors: Warburg, Pincus Ventures, L.P.; Crosspoint Venture Partners 1996; Intel; AT&T ($25 million); Qwest ($15 million); NEXTLINK ($20 million) $152 million from private placement of debt $435 million from private high yield debt offering, IPO
Jato Communications	Lucent: ADSL equipment Hewlett-Packard: partners in developing high-speed, two-way data, telephony and video service	Formus Comm., Stanford Telecom.: alliance to provide data, voice and Internet access to the metro Denver area	Major Investors: Lucent ($50 million credit), Chase Capital Partners, Centennial Funds, Spectrum Equity Investors, Telecom Partners
Network Access Solutions	Ascend: xDSL equipment Paradyne: Homwire M/SDSL products	MCI WorldCom, Level 3 Comm.: fiber provisioning for long-distance network National Rural Telecom Coop: agreement to use NAS services to manage its frame relay DBS network	Major Investor: Zeneca
Sources: *See* Appendix C.			

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1. Equipment and "Loop Technology". The major vendors of DSL equipment include Cisco Systems, Alcatel, Copper Mountain, Lucent, and Westell. CLECs buy exactly the same equipment as ILECs do to provide these services, and they buy it from exactly the same vendors. The only difference, to this point, is that the CLECs are the larger buyers – they have bought and deployed more of this equipment than ILECs have. *See* Table 9.

Table 9. Major xDSL Equipment Vendors and Purchasers

Manufacturer	ILEC Buyers	CLEC Buyers
Alcatel	Ameritech, BellSouth, SBC, Bell Atlantic	Recent agreements aimed at selling ADSL central office equipment and modems to CLECs;[1] currently markets non-ADSL equipment to CLECs such as e.spire and MCI WorldCom.
Cisco Systems, Inc.	U S WEST, Cincinnati Bell	Covad; CAIS Internet; Conectiv
Copper Mountain Networks		ICG Netcom; InterAccess; NorthPoint Communications; Rhythms NetConnections; UUNET WorldCom
3Com	BellSouth	Flashcom; NorthPoint Communications
Futisu-Orckit	GTE	SourceNet; Sprint
Lucent	BellSouth	JATO Communications
Westell	GTE, Bell Atlantic	OneNet Communications

[1] *See, e.g.*, Press Release, *Alcatel to Offer Cabletron ADSL Routers as Part of Its Speed Touch Modem Family*, Apr. 7, 1999 (describing agreement between Alcatel and Cabletron under which Alcatel will market Cabletron's ADSL SmartSwitch Router 250 to CLECs and ISPs, among others); Press Release, *Alcatel and Efficient Networks Sign Strategic Agreement to Jointly Develop and Market Universal Serial Bus ADSL Modems*, Feb. 17, 1999 (describing agreement between Alcatel and Efficient Networks under which they will jointly develop next generation, standards-based Universal Serial Bus (USB) ADSL modems for CLECs and ISPs, among others).

Sources: *See* Appendix C.

DSL equipment, including packet switching, is very cost efficient, and easy for CLECs to deploy. Analysts note that "IP-based networks are scaleable, flexible, more efficient, cheaper and easier to provide that traditional voice networks."[114] Intermedia, which employs over 200 ATM data switches, notes that, "an ATM switch can handle approximately ten times as many calls as a voice switch and costs approximately one tenth as much as a voice switch, yielding a cost reduction of up to 99% for the switching components of local telephone calls, compared to the traditional switching method."[115]

ILECs have no technical edge in the equipment market – they are not themselves manufacturers of the equipment, and an extensive array of rules, statutory provisions, and divestiture decree history either exclude ILECs from equipment markets entirely, or require open standards, advance disclosure of network changes, and scrupulously arms-length dealings between ILECs and any affiliates engaged in any manner in equipment markets.[116] CLECs, by

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[114] First Marathon Securities Ltd., *Voice over Internet Protocol*, Dec. 11, 1998, at 1. *See also*, J. Caron, *Multiservices Forum Fleshes Out Plan*, tele.com, Jan. 29, 1999 ("total costs for modular, software adaptable switching systems are expected to be significantly less than the price of Class 5 switching systems today...improving the cost structure for existing carriers and lowering the barriers of entry for newcomers.").

[115] Intermedia Communications, Inc., Form 10-K, filed Mar. 25, 1998.

[116] *See, e.g.*, 47 U.S.C. § 273(a) ("a Bell operating company may manufacture and provide telecommunications equipment, and manufacture customer premises equipment, if the Commission authorized that Bell operating company or any Bell operating company affiliate to provide interLATA services under section 271(d), subject to the requirements of this section and the regulations prescribed thereunder."); 47 U.S.C. § 273(c)

contrast, have formed close technical alliances with a number of major equipment vendors. (*See* Table 8, supra.)

At this point, the technical parameters of the industry are clearly being defined by equipment and computer vendors. The Universal Asymmetric Digital Subscriber Line Working Group (UAWG), recently created by Microsoft, Intel, and Compaq, "has been formed to accelerate the adoption and availability of high-speed digital Internet access for the mass market."[117] The group aims "to establish an open, interoperable International Telecommunications Union (ITU) standard to facilitate high-speed communications to consumers over existing standard phone lines."[118] UAWG members consist of PC, networking, and telecommunications companies, including CLECs such as Covad, and ICG.[119]

Such a universal ADSL standard "will make it possible to cost-effectively extend the benefits of DSL technology to the average consumer."[120] The G.Lite DSL standard is expected to be approved by the ITU in June 1999.[121] Using this standard, companies may deploy DSL service without sending technicians to a customers' premises, making "ADSL modems as easy to install as today's analog modems."[122]

2. Line-Sharing. As noted above, the Commission proposes to require ILECs to unbundle virtual space with individual telephone loops. Without line sharing, the Commission reasons, "the competing carrier effectively may be forced to provide both voice and data over the local loop it leases from the incumbent."[123]

The Commission has already rejected an almost identical proposal for a time-share "long-distance loop UNE." In 1996, long-distance carriers sought "to purchase a loop element solely

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(requires BOCs that have been authorized to engage in manufacturing to disclose information concerning network standards.); 47 U.S.C. § 273(e)(1) (prohibits BOCs from discriminating "in favor of equipment or supplied by an affiliate or related person."); 47 U.S.C. § 273(e)(2) (requires BOCs to make procurement and supply contracts "for equipment, services, and software on the basis of an objective assessment of price, quality, delivery, and other commercial factors."); *Implementation of Section 273 of the Communications Act of 1934, As Amended by the Telecommunications Act of 1996*, Notice of Proposed Rulemaking, 11 FCC Rcd 21784, 21791, ¶ 11 (the FCC tentatively concluded that the Act does not permit collaboration between unaffiliated BOCs); *id.* at 21791-92, ¶ 12 (suggesting that the BOCs' statutory right to enter into royalty agreements might be circumscribed to "protect against anticompetitive abuses."); MFJ § (II)(D)(2) (1984) (forbidding the BOCs to "manufacture or provide telecommunications products or customer premises equipment (except for the provision of customer premises equipment for emergency services).").

[117] *See* Covad Press Release, *Covad Communications to Participate in Advancing Goals of Universal Asymmetric Digital Subscriber Line Working Group*, Jan. 26, 1998.

[118] *Id.*

[119] *See* http://www.uawg.org/lead.html.

[120] *See* Covad Press Release, *Covad Communications to Participate in Advancing Goals of Universal Asymmetric Digital Subscriber Line Working Group*, Jan. 26, 1998.

[121] *See* J. Rendleman, *ITU Backs G.Lite 'Splitterless' DSL Standard*, PC Week Online, Oct. 22, 1998.

[122] *Compaq Deal Promises To Alter Face Of ADSL Landscape*, Communications Today, Nov. 25, 1998.

[123] *Second Advanced Services Order* ¶ 99.

for the purposes of providing interexchange service;"[124] the ILEC would remain the "owner" of the loop when it was used to place local calls rather than long-distance ones. The loop's spectrum, in other words, would be subdivided in the temporal domain, call by call.

The Commission, however, refused to require unbundling at that level, concluding that a loop element should not be defined "in functional terms, rather than in terms of the facility itself."[125] The Commission wanted local competitors to retain "maximum flexibility to offer new services," and that meant giving such competitors "exclusive control over network facilities dedicated to particular end users."[126] The Commission concluded, in short, that "time-division" unbundling proposed by the long-distance carriers would suppress competition, not promote it. The right approach, the Commission concluded, was to extend unbundling no further than the loop itself. Long-distance carriers could purchase unbundled loops like any other competitor, just not on a time-share basis, with the incumbent LEC left as a co-tenant responsible for whatever services the long-distance carrier declined to supply.

As noted above (*see* Table 8), several major CLEC providers of high-speed services have already forged alliances with AT&T, MCI WorldCom, and other long-distance carriers of both voice and data. These alliances can readily provide bundled voice and data services, both local and long-distance. BOC-ILECs, by contrast, may not currently create comparable bundles; the Commission has so far declined to provide section 271 relief, even in connection with high-speed data services.[127]

Any CLEC that does not want to offer voice service can obtain ILEC loops and unbundle the spectrum itself, selling off the voice channel to another CLEC, a long-distance carrier, or back to the ILEC itself. Long-distance carriers have, after all, already informed the Commission that they want to be able to buy partial occupancy in unbundled loops. At least one CLEC has already asked the Commission to protect its right to sell off the voice channel on an unbundled loop to another provider.[128]

But there is no evidence that either suppliers or consumers have any interest in dealing with the inevitable complexity and risk of buck-passing or confusion when two independent providers attempt to provide two separate services over a single loop. Rhythms, NorthPoint, and Covad, the top-three CLECs in DSL deployment, all provide data service alone over unbundled loops, and have been successful and profitable in doing so.

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[124] *Local Competition Order*, 11 FCC Rcd at 15693, ¶ 385.

[125] *Id.*

[126] *Id.*

[127] *See Deployment of Wireline Services Offering Advanced Telecommunications Capability*, Memorandum Opinion and Order, and Notice of Proposed Rulemaking, 13 FCC Rcd 24011, 24045 ¶ 69 (1998).

[128] NorthPoint mentioned the possibility in terms of the Commission's separate affiliate proposal: "if the [incumbent LEC's] advanced services affiliate leases the loop and resells the incumbent's voice service, the competitive LEC must be allowed to do likewise." Comments of NorthPoint Communications Inc., Docket No. 98-78, (FCC filed Sept. 25, 1998).

Finally, as the Commission has already recognized, most heavy users of data services already buy second lines. Secondary line penetration has reached 19 percent for larger ILECs, and is growing very rapidly – the Commission itself has cited annual growth rates of 152 percent.[129] Indeed, as the Commission has noted, additional line growth now far exceeds growth of primary lines.[130] Many households have more than one additional line.[131]

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[129] *See Tariffs Implementing Access Charge Reform*, Order Designating Issues for Investigation and Order on Reconsideration, 13 FCC Rcd 2249, 2256 (1998); *see also* A.D. Barr, PNC Institutional Investment Service, Investext Rpt. No. 3375836, *Telecommunications/Price Performance and Earning Outlook*, Dec. 18, 1998, at *2 ("Residential second lines continue to increase in the 20% range for the local telcos.").

[130] *See Tariffs Implementing Access Charge Reform*, Memorandum Opinion and Order, 13 FCC Rcd 14683, 14694-95 ¶ 19 (1998).

[131] *See 1998 Annual Access Tariff Filings; Southwestern Bell Telephone Company Revisions to Tariff*, Memorandum Opinion and Order, Order Designating Issues for Investigation, and Order on Reconsideration, 13 FCC Rcd 13977, 14692-93 (1998). *See also* A.G. Edwards & Sons, Inc., Telecommunications Equipment, Dec. 9, 1998, at 2 ("Residential line growth continues to be fueled by additions of second (and third) lines for home offices, Internet and LAN connectivity, fax machines, etc.").

APPENDIX A. CLEC SWITCHES

Source: Bellcore, TR-EQP-000315, *Local Exchange Routing Guide*, March 1, 1999

Number of CLECs with switches: 167 **Number of CLEC switches: 724**

State	CLEC	Switch Type	Street Address	City
AK	General Communication	DMS 100	ATU	Anchorage
AK	General Communication	DMS 10S	3900 Denali Rm 100	Anchorage
AK	General Communication	Nortel Remote Switching Center	3905 Jewel Lake Rd	Anchorage
AL	e.spire	5ESS	505 20th St	Birmingham
AL	AT&T	4ESS	1715 6th Ave N	Birmingham
AL	ICG	5ESS	2114 1st Ave N	Birmingham
AL	Intermedia	DMS 500	1012 First Ave N	Alabaster
AL	KMC Telecom	5ESS-2000 VCDX	994 Explorer Blvd	Huntsville
AL	Knology	DMS 100 Remote Line Module	204 E Jefferson St	Montgomery
AL	AT&T	DMS 100	2101 6th Ave N	Birmingham
AR	Alltel	DMS 250	4001 N Rodney Parham	Little Rock
AR	Alltel	DMS 100	4001 N Rodney Parham	Little Rock
AR	Alltel	Nortel Remote Switching Center	208 E Hillcrest Nlrk	Little Rock
AR	e.spire	5ESS	124 W Capital Ave	Little Rock
AR	AT&T	4ESS	715 S Louisiana St	Little Rock
AR	MCI WorldCom	5ESS	323 S Cross St	Little Rock
AR	Connect Communications Corporation	Harris Digital Telephone System Rural Electronic Exchange	124 W Capitol Ave	Little Rock
AR	Hyperion	5ESS	W 3rd St & S Gaines St	Little Rock
AZ	e.spire	5ESS	33 N North Stone Ave	Tucson
AZ	AT&T	4ESS	1231 W University Dr	Mesa
AZ	MCI WorldCom	5ESS	75 E Alameda St	Tucson
AZ	Cox	DMS 250	100 N 79th St	Chandler
AZ	Electric Lightwave	DMS 100/200	313 N 3rd Ave	Phoenix
AZ	GST	DMS 250	3220 N 3rd St	Phoenix
AZ	MCI WorldCom	DMS 100	111 W Monroe St	Phoenix
AZ	Mountain Telecommunications	Digital Switching System	10190 E Mckellips Rd	Scottsdale
AZ	Optel	5ESS	15795 N 76th St	Phoenix
AZ	AT&T	5ESS	2730 E Camelback Rd	Phoenix
AZ	Teligent	DMS 500	7850 South Hardy Drive	Tempe
AZ	WinStar	5ESS-2000 VCDX	1002 N 3rd St	Phoenix
CA	Advanced Telcom Group	5ESS-2000 VCDX	525 3rd St	Santa Rosa
CA	Allegiance	5ESS	818 W 7th St., Suite 320	Los Angeles
CA	AT&T	5ESS	420 S Grand Ave	Los Angeles
CA	AT&T	4ESS	1050 S C St	Oxnard
CA	AT&T	5ESS	95 Almaden Ave *	San Jose
CA	MCI WorldCom	5ESS	400 E Main St	Stockton
CA	MCI WorldCom	5ESS Remote	2991 Gold Canal Dr	Rancho Cordova
CA	Cox	5ESS	17 Journey St	Aliso Veijo
CA	Cox	DMS 100/200	1441 Euclid Ave	San Diego
CA	CRL Network Services	Digital Switching System	100 California St	San Francisco
CA	Electric Lightwave	DMS 100/200	3224 Luyung Dr.	Rancho Cordova
CA	Firstworld	DMS 500	23510 Telo St	Torrance
CA	Firstworld	5ESS	5238 Pisa Ct	San Jose
CA	Firstworld	DMS 500	440 W Cypress St	Glendale
CA	Focal Communications	DMS 250	650 Townsend St	San Francisco
CA	Focal Communications	DMS 500	1200 W 7th St	Los Angeles
CA	Frontier	DMS 500	624 S. Grand Ave	Los Angeles
CA	GST	DMS 250	7576 N Del Mar Ave	Fresno
CA	GST	DMS 10S	1340 Treat Blvd	Walnut Creek
CA	GST	DSS	1918 M St	Bakersfield
CA	GST	Nortel Remote Switching Center	501 Walnut	Mare Island
CA	GST	DMS 250	3700 Wilshire Blvd	Los Angeles
CA	GST	DMS 10S	590 N D St	San Bernardino
CA	GST	DSS	295 N Sunrise Way	Palm Springs
CA	GST	Nortel Remote Line Concentrating Module	780 S Milliken Ave	Ontario

State	CLEC	Switch Type	Street Address	City
CA	ICG	5ESS	180 Grand Ave	Oakland
CA	Intermedia	DMS 500	624 S Grand Suite 1510	Los Angeles
CA	Justice Technology	DCO	624 S Grand *	Los Angeles
CA	MCI WorldCom	DE4 EWSD RCU Switching System	274 Brannan St	San Francisco
CA	MCI WorldCom	DE4 EWSD RCU Switching System	609 W 7th Ave	Los Angeles
CA	MCI WorldCom	DE4 EWSD RCU Switching System	905 East Discovery Lane	Anaheim
CA	MCI WorldCom	DE4 EWSD RCU Switching System	707 Broadway	San Diego
CA	MediaOne	5ESS	1455 Van Ness Ave	Fresno
CA	MGC Communications	DMS 10S	362 E 4th St	Pomona
CA	MGC Communications	DMS 10S	16730 Bellflower Blvd	Bellflower
CA	MGC Communications	DMS 10S	2225 Mission Ave	Oceanside
CA	MGC Communications	DMS 500	4695 Palm Ave	La Mesa
CA	NEXTLINK	DMS 10S	624 S Grand *	Los Angeles
CA	NEXTLINK	DMS 500	855 Mission Ct	Fremont
CA	North County Communications	DMS 100	2405 Juan St	San Diego
CA	Optel	5ESS	975 Industrial Rd	San Carlos
CA	Option One Communications	Digital Switching System	770 L St	Sacramento
CA	Pac – West Telecomm	DEX-600E	4210 Coronado Ave	Stockton
CA	AT&T	5ESS	700 S Flower St	Los Angeles
CA	AT&T	5ESS	5464 Morehouse Dr	San Diego
CA	AT&T	5ESS	1 Bush St	San Francisco
CA	Teligent	DMS 500	1200 W 7th St	Los Angeles
CA	Time Warner	5ESS	8925 Ware Ct	San Diego
CA	U.S. Telepacific	5ESS	800 W 6th St, Suite 300, 3rd Floor	Los Angeles
CA	WinStar	5ESS	5077 E Lew Davis St *	Long Beach
CA	WinStar	5ESS	600 W Broadway	San Diego
CA	WinStar	5ESS-2000 VCDX	525 Market St	San Francisco
CA	MCI WorldCom	5ESS	2700 Spring St	Redwood City
CA	MCI WorldCom	AXE-10-Local	1149 S Broadway St	Los Angeles
CA	MCI WorldCom	DMS 100	611 River Oaks Pky	San Jose
CA	MCI WorldCom	DMS 10S	17642 Armstrong Ave	Irvine
CO	AT&T	4ESS	931 14th St	Denver
CO	Convergent Communications	Digital Switching System	67 Inverness Dr E	Englewood
CO	e.spire	5ESS	102 S Tejon St	Colorado Springs
CO	Frontier	DMS 500	950 17th Street, Suite 1100	Denver
CO	Great West Services	Digital Switching System	1995 E Coalton Rd	Louisville
CO	ICG	5ESS	910 15th St	Denver
CO	ICG	DMS 250	910 15th St	Denver
CO	Kings Deer Telephone Company	5ESS-2000 VCDX	6189 Lehman Dr	Colorado Springs
CO	MCI WorldCom	DMS 100	1050 17th St	Denver
CO	NEXTLINK	DMS 500	313 Inverness Way S	Englewood
CO	Optel	5ESS	9540 E Jewell Ave	Denver
CO	AT&T	DMS 100	2530 S Parker Rd	Aurora
CO	Teligent	DMS 500	8085 S Chester St	Englewood
CO	Time Warner	5ESS	160 Inverness Dr W	Englewood
CO	WinStar	5ESS-2000 VCDX	910 15th St	Denver
CT	AT&T	4ESS	310 Orange St	New Haven
CT	MCI WorldCom	5ESS	1351 Washington Blvd	Stamford
CT	Cablevision Lightpath	5ESS	28 Cross St	Norwalk
CT	Cox	DMS 100/200	170 Utopia Rd	Manchester
CT	MCI WorldCom	DMS 100/200	242 Trumbull St	Hartford
CT	AT&T	DMS 100	153 Market St	Hartford
CT	Teligent	DMS 500	111 Founders Plz	East Hartford
CT	MCI WorldCom	AXE-10-Local	3 Landmark Sq	Stamford
DC	Allegiance	5ESS	1120 Vermont Ave NW	Washington
DC	AT&T	4ESS	30 E St SW	Washington
DC	e.spire	5ESS	1275 K St NW	Washington
DC	Focal Communications	DMS 500	1120 Vermont Ave v	Washington
DC	Frontier	DMS 500	1220 L St NW	Washington
DC	Intermedia	DMS 500	722 12th St NW	Washington
DC	MCI WorldCom	DMS 100	120 Ingraham St NE	Washington
DC	Net2000 Communications	DMS 100	1275 K St NW	Washington
DC	AT&T	DMS 100	1331 F St NW	Washington

State	CLEC	Switch Type	Street Address	City
DC	Teligent	DMS 500	1120 Vermont Ave NW	Washington
DC	WinStar	5ESS	1850 M St NW	Washington
DC	WinStar	5ESS-2000 VCDX	1850 M St NW	Washington
DE	Conectiv Communications	DMS 100	901 N Tatnall St	Wilmington
DE	Teligent	DMS 500	301 N Walnut St	Wilmington
FL	Alltel	5ESS	601 Riverside Ave	Jacksonville
FL	e.spire	5ESS	100 NE 3rd Ave	Fort Lauderdale
FL	e.spire	5ESS Host	111 Madison St	Tampa
FL	AT&T	4ESS	1352 NW 40th Ave	Fort Lauderdale
FL	Business Telecom	5ESS	201 S Orange Ave	Orlando
FL	Business Telecom	5ESS-2000 VCDX	121 W Forsyth St Suite 100	Jacksonville
FL	City Of Lakeland	EWSD Switching System Type	1000 E. Parker St	Lakeland
FL	Eastland Of Orlando Telephone Company	DCO	28 W Flagler St	Miami
FL	Florida Digital Network	DMS 500	200 N Andrews Ave	Fort Lauderdale
FL	Global Naps	DMS 500	100 South Biscayne Blvd, 4th Fl.	Miami
FL	Intermedia	DMS 10 Remote Equipment Module	436 Gardenia St	West Palm Beach
FL	Intermedia	DMS 10S	NE 2nd Ave & E Broward Blvd	Fort Lauderdale
FL	Intermedia	DMS 500	7020 A C Skinner Pky	Jacksonville
FL	Intermedia	DMS 10S	N 9th St & 1st Ave N	St Petersburg
FL	Intermedia	DMS 10	3502 Queen Palm Dr	Tampa
FL	Intermedia	DMS 500	84 S Central Ave	Oviedo
FL	Intermedia	Nortel Remote Switching Center	500 N New York Ave	Winter Park
FL	KMC Telecom	5ESS	2075 Maryland Cir	Tallahassee
FL	KMC Telecom	5ESS-2000 VCDX	6288 Tower Ln	Sarasota
FL	KMC Telecom	5ESS-2000 VCDX	2300 Commerce Park Dr NE	Palm Bay
FL	MCI WorldCom	DE4 EWSD RCU Switching System	250 S. Orange Ave	Orlando
FL	MCI WorldCom	DE4 EWSD RCU Switching System	1000 North Ashley Dr., 9th Fl	Tampa
FL	MCI WorldCom	DE4 EWSD RCU Switching System	599 SW 16th Ter	Pompano Beach
FL	MCI WorldCom	DE4 EWSD RCU Switching System	150 Se 2nd Ave	Miami
FL	MediaOne	5ESS	5934 Richard Rd	Jacksonville
FL	MediaOne	5ESS	141 NW 16th St	Pompano Beach
FL	MGC Communications	DMS 500	201 NE 24th St	Fort Lauderdale
FL	MGC Communications	Nortel Remote Switching Center	838 S Dixie Hwy	Boca Raton
FL	National Telecommunications Of Florida	DMS 200	412 E Madison St	Tampa
FL	National Telecommunications Of Florida	DMS 10S	100 S Lucerne Cir W	Orlando
FL	National Telecommunications Of Florida	Digital Switching System	666 N Miami Ave	Miami
FL	National Telecommunications Of Florida	DMS 500	100 W Lucerne Cir	Orlando
FL	New Millennium Communications	DCO	100 N Biscayne Blvd	Miami
FL	New South Communications	5ESS	200 Ave B	Winter Haven
FL	NEXTLINK	DMS 10S	16565 B NW 15th St	Miami
FL	North American Telecommunications	EWSD Switching System Type	100 N Biscayne Blvd	Miami
FL	Orlando Tel Co Affil With Orlando Bus Tel Systms	EWSD Switching System Type	4558 35th St	Orlando
FL	Paetec Communications	5ESS-2000 VCDX	100 N Biscayne Blvd @ Use Miamfl98	Miami
FL	Sprint Metropolitan Networks	5ESS	200 E Robinson St	Orlando
FL	AT&T	5ESS	18400 NE 5th Ave	North Dade
FL	Teligent	DMS 500	45 NW 5th St	Miami
FL	Time Warner	5ESS	2251 Lucien Way	Maitland
FL	US LEC	5ESS	6410 Southpoint Pky	Jacksonville
FL	US LEC	5ESS-2000 VCDX	5301 Blue Lagoon Dr	Miami
FL	WinStar	5ESS	150 Se 2nd Ave	Miami
FL	WinStar	5ESS-2000 VCDX	4200 W Cypress St	Tampa
FL	MCI WorldCom	AXE-10-Local	8830 NW 18th Ter	Miami
FL	MCI WorldCom	DMS 100	400 Lk Destiny Rd	Orlando
FL	MCI WorldCom	DMS 10S	8212 Woodland Court	Tampa
GA	Allegiance	5ESS	55 Marietta St NW	Atlanta
GA	e.spire	5ESS	2 Ravinia Dr NE	Atlanta
GA	AT&T	4ESS	51 Peachtree Center Ave NE	Atlanta
GA	AT&T	5ESS	51 Peachtree Center Ave NE	Atlanta
GA	Business Telecom	5ESS	55 Park Pl NE	Atlanta
GA	Frontier	DMS 500	250 Williams St	Atlanta
GA	Golden Harbor Of Texas	DMS 100/200	55 Marietta St Suite 1950	Atlanta
GA	ICG	5ESS	30 Perimeter Park Dr	Chamblee
GA	Intermedia	DMS 500	360 Interstate North Pky NW	Atlanta

State	CLEC	Switch Type	Street Address	City
GA	Intermedia	DMS 500	70 Courtland St NE	Atlanta
GA	KMC Telecom	5ESS-2000 VCDX	419 11th St	Augusta
GA	Knology	Nortel Remote Switching Center	424 14th St	Columbus
GA	MCI WorldCom	DE4 EWSD RCU Switching System	1176 Franklin St	Marietta
GA	MCI WorldCom	DE4 EWSD RCU Switching System	250 Williams St NW	Atlanta
GA	MediaOne	5ESS	1900 Cumberland Pky	Atlanta
GA	MGC Communications	DMS 500	1593 Northeast Expy NE	Atlanta
GA	NEXTLINK	DMS 250	4000 Highlands Pky SE	Smyrna
GA	AT&T	DMS 100	5060 Avalon Ridge Pky	Norcross
GA	Teligent	DMS 500	55 Marietta St	Atlanta
GA	US LEC	5ESS	160 State St	Macon
GA	WinStar	5ESS	34 Peachtree St NW	Atlanta
GA	WinStar	5ESS-2000 VCDX	34 Peachtree St	Atlanta
GA	MCI WorldCom	AXE-10-Local	250 William St NW	Atlanta
GA	MCI WorldCom	DMS 100	250 Williams St NW	Atlanta
HI	GST	DMS 250	737 Bishop St	Honolulu
HI	GST	DMS 100	3016 Umi St	Lihue
HI	GST	DMS 10S	101 Aupuni St	Hilo
HI	GST	DMS 100 Remote Line Module	31 Kuualoha St	Kahului
HI	Time Warner	5ESS	200 Akamainui St	Mililani
IA	Advanced Network Communications	Nortel Remote Switching Center	E 4th St & Russell St	Storm Lake
IA	AT&T	4ESS	920 High St	Des Moines
IA	Crystal Communications	Nortel Remote Switching Center	6200 Ep True Parkway	West Des Moines
IA	Farmers And Business Mens Tel. Co.	Nortel Remote Switching Center	602 Vine St	Delmar
IA	Fibercom	DMS 200	901 Steuben St	Sioux City
IA	Goldfield Access Network	Nortel Remote Switching Center	First Ave NW & First St NW	Clarion
IA	Hawarden Municipal Utilities	DMS 100 Remote Line Module	716 Ave J	Hawarden
IA	Independent Networks	DMS 10	411 6th St	Armstrong
IA	Lost Nation - Elwood Telephone Company	Nortel Remote Switching Center	110 1/2 1st Ave N	Oxford Junction
IA	Mcleod USA	5ESS	221 3rd Ave SE	Cedar Rapids
IA	Mcleod USA	DMS 500	5617 W Locust St	Davenport
IA	Shellsburg Telecommunications	Nortel Remote Switching Center	301 Main St	Brandonurg
ID	CTC Communications	Digital Switching System	5883 W Dry Creek Rd	Boise
ID	Electric Lightwave	DSS	10452 Emerald St	Boise
ID	GST	EWSD Switching System Type	199 N Capitol Blvd	Boise
ID	One Eighty Communications	Digital Switching System	111 Main St	Lewiston
ID	Westel	1AESS Remote	431 S Main Ave	Mackay
ID	Westel	DMS 10 Host Switching Office	205 West Era Ave	Arco
ID	Westel	DMS 10	95 N Main St	Malad
IL	21st Century	DMS 500	350 N Orleans St	Chicago
IL	Allegiance	5ESS	140 S Dearborn	Chicago
IL	AT&T	5ESS	3820 Golf Rd	Rolling Meadows
IL	AT&T	5ESS	10 S Canal St	Chicago
IL	AT&T	5ESS	1000 Commerce Dr	Oak Brook
IL	AT&T	4ESS	10 S Canal St	Chicago
IL	AT&T	5ESS	3820 Golf Rd	Rolling Meadows
IL	Consolidated Communications	DMS 100/200	201-203 S Neil St	Champaign
IL	Consolidated Communications	DMS 100	151 N Michigan Ave	Chicago
IL	Consolidated Communications	DMS 500	528 S 5th St	Springfield
IL	Focal Communications	DMS 100	1305 E Algonquin Rd	Elk Grove Township
IL	Focal Communications	DMS 100	200 N La Salle St	Chicago
IL	Frontier	DMS 500	101 N. Wacker Dr. Suite 310	Chicago
IL	Intermedia	DMS 500	205 N Michigan Ave	Chicago
IL	MCI WorldCom	DMS 100	550 W Jackson	Chicago
IL	MCI WorldCom	DMS 100	602 N York Rd	Bensenville
IL	Mcleod USA	DMS 500	926 Broadway	Quincy
IL	MGC Communications	DMS 500	31 N Wolf	Wheeling
IL	NEXTLINK	DMS 500	711 N Edgewood Ave	Wood Dale
IL	Ovation Communications	5ESS	427 S La Salle St	Chicago
IL	AT&T	5ESS	717 S Wells St	Chicago
IL	Teligent	DMS 500	111 N Canal St	Chicago
IL	US Xchange	5ESS	9934 N Alpine Rd	Machesney Park
IL	WinStar	5ESS	101 N Wacker Dr	Chicago

State	CLEC	Switch Type	Street Address	City
IL	MCI WorldCom	AXE-10-Local	800 S Wells St	Chicago
IL	MCI WorldCom	DMS 100/200	955 Arthur Ave	Elk Grove Village
IL	MCI WorldCom	DMS 100	955 Arthur Ave	Elk Grove Village
IN	Indigital Telecom	EWSD Switching System Type	5312 West Washington Center Road	Fort Wayne
IN	Intermedia	DMS 500	550 Kentucky Ave	Indianapolis
IN	Intermedia	Nortel Remote Switching Center	8315 Masters Rd	Fishers
IN	KMC Telecom	5ESS-2000 VCDX	1710 Directors Row	Fort Wayne
IN	Mcleod USA	DMS 250	700 Kentucky Ave	Indianapolis
IN	AT&T	DMS 100	711 West Henry St	Indianapolis
IN	Teligent	DMS 100/200	5739 W Minnesota St	Indianapolis
IN	Time Warner	5ESS	1465 Gent Ave	Indianapolis
IN	US Xchange	5ESS	221 Red Coach Dr	Mishawaka
IN	US Xchange	5ESS Remote	2304 Brothers Dr	Lafayette
IN	US Xchange	5ESS-2000 VCDX	2599 W Vernal Pike	Bloomington Township
IN	MCI WorldCom	DMS 100	6835 Hillsdale Ct	Indianapolis
KS	Advanced Communications Group	DMS 500	8201 E 34th St N	Wichita
KS	AT&T	4ESS	154 N Broadway St	Wichita
KS	Dunn & Associates	DMS 10	6800 College Blvd	Overland Park
KS	KMC Telecom	5ESS-2000 VCDX	2444 Se Lakewood Blvd	Topeka
KS	Hyperion	5ESS	266 North Main St	Wichita
KS	AT&T	5ESS	7400 Johnson Dr	Kansas City
KS	Valu-Line Of Kansas	5ESS	3450 N Rock Rd	Wichita
KY	ALEC	Digital Switching System	1158 Jefferson St	Paducah
KY	e.spire	5ESS	462 S 4th St	Louisville
KY	e.spire	DSS2	462 South 4th St	Louisville
KY	AT&T	4ESS	521 W Chestnut St	Louisville
KY	Hyperion	5ESS	962 S 3rd St	Louisville
KY	ICG	5ESS	332 W Broadway St	Louisville
KY	Intermedia	DMS 500	111 E 11th St	Covington
KY	Ruddata Corporation	Digital Switching System	923 Washington St	Paducah
KY	Wright Businesses	Digital Switching System	54 W Lake St - Bldg 2	Madisonville
LA	Advanced Tel	DMS 500	1518 N Burnside Ave	Gonzales
LA	e.spire	5ESS	1250 Poydras Ave	New Orleans
LA	American Metrocomm	DMS 100/200	1650 Poydras St	New Orleans
LA	AT&T	4ESS	333 N 6th St	Baton Rouge
LA	Columbia Telecommunications	5ESS-2000 VCDX	1340 Poydras St	New Orleans
LA	Cox	DMS 500	338 Edwards Ave	Harahan
LA	Hyperion	5ESS	301 Main St	Baton Rouge
LA	Intermedia	DMS 500	1515 Poydras St, N.O.	New Orleans
LA	KMC Telecom	5ESS-2000 VCDX	5758 Essen Ln	Baton Rouge
LA	LEC Unwired	5ESS-2000 VCDX	844 Ryan St	Lake Charles
LA	New South Communications	5ESS	1250 Poydras St.,Ste. 1075	New Orleans
LA	Shell Offshore Services Company	DMS 100	701 Poydras St	New Orleans
LA	Shell Offshore Services Company	Digital Switching System	1750 Youngs Rd	Morgan City
MA	ACC National Telecom	5ESS Host	1441 Main St	Springfield
MA	Allegiance	5ESS	451 D St	Boston
MA	AT&T	4ESS	351 Bridge St	Springfield
MA	MCI WorldCom	5ESS Remote	1 Federal Sq Building 105	Springfield
MA	Comav	DCO	111 Speen St	Framingham
MA	Focal Communications	DMS 500	One Main St	Cambridge
MA	Frontier	5ESS	230 Congress St	Boston
MA	Frontier	DMS 500	230 Congress St	Boston
MA	Global Naps	DMS 250	10 Merrymount Rd	Quincy
MA	Global Naps	DMS 10S	1441 Main St	Springfield
MA	Intermedia	DMS 500	179 5th St	Cambridge
MA	LBC Telephony	Digital Switching System	300 Bent St	Cambridge
MA	Level 3 Communications	DMS 500	1 Main St	Cambridge
MA	MCI WorldCom	DMS 100	800 Boylston St	Boston
MA	MCI WorldCom	DMS 100	31 Nagog Park	Acton
MA	MediaOne	5ESS	12 Washer St	Lowell
MA	Network Plus	5ESS	185 Bent St	Cambridge
MA	New England Voice & Data	5ESS	90 Washington St	Worcester
MA	Paetec Communications	5ESS-2000 VCDX	230 Congress St	Boston

State	CLEC	Switch Type	Street Address	City
MA	RCN	5ESS Host	105 West 1st St	S Boston
MA	RNK	DCO	175 Great Rd	Bedford
MA	AT&T	5ESS	230 Congress St	Boston
MA	Teligent	DMS 500	500 Rutherford Ave	Charlestown
MA	WinStar	5ESS	99 Summer St	Boston
MA	WinStar	5ESS-2000 VCDX	99 Summer St	Boston
MA	MCI WorldCom	AXE-10-Local	580 Winter St	Waltham
MA	MCI WorldCom	DMS 100	300 Bent St	Cambridge
MA	MCI WorldCom	DMS 10S	300 Bent St	Cambridge
MD	AT&T	4ESS	323 N Charles St	Baltimore
MD	AT&T	5ESS	323 N Charles St	Baltimore
MD	Commonwealth Telecom Services	DMS 100	33 E Patrick St	Frederick
MD	Conectiv Communications	DMS 100	16 N Hays St	Bel Air
MD	e.spire	5ESS	14405 Laurel Pl	Laurel
MD	Frontier	DMS 500	1628 St Paul St	Baltimore
MD	Intermedia	DMS 500	8670 Georgia Ave	Silver Spring
MD	MCI WorldCom	DMS 100	111 Market Pl	Baltimore
MD	MCI WorldCom	DMS 100	6015 Montrose Rd	Rockville
MD	Net2000 Communications	DMS 250	300 W Lexington St	Baltimore
MD	RCN	5ESS-2000 VCDX	10000 Derekwood Ln	Lanham
MD	AT&T	DMS 100	25 S Charles St	Baltimore
MD	Teligent	DMS 500	6 Saint Paul St	Baltimore
MD	WinStar	5ESS	201 N Charles St	Baltimore
MD	MCI WorldCom	AXE-10-Local	6 Saint Paul St	Baltimore
MD	MCI WorldCom	DMS 100	900 Fleet St	Baltimore
ME	MCI WorldCom	5ESS	380 Cumberland(Nynex) Ave	Portland
ME	Mid-Maine Communications	DMS 10	N County Rd & Route 155	Enfield
ME	Mid-Maine Communications	DMS 10	N. County Rd & Route 155	West Enfield
MI	MCI WorldCom	DMS 100	2855 Oak Industrial Dr NE	Grand Rapids
MI	MCI WorldCom	DMS 10S	5688 W Grand River Ave	Lansing
MI	MCI WorldCom	DMS 100 Remote Line Module	3158 68th St Se	Dutton
MI	MCI WorldCom	Nortel Remote Switching Center	234 Central Ave	Holland
MI	Coast To Coast Telecommuniations	EWSD Switching System Type	123 N Saginaw St	Pontiac
MI	Focal Communications	DMS 500	23800 W 10 Mile Rd	Southfield
MI	KMC Telecom	5ESS	4575 Concourse Dr	Pittsfield Township
MI	MCI WorldCom	DE4 EWSD RCU Switching System	660 Plaza Dr	Detroit
MI	MediaOne	5ESS	38205 N Executive Dr	Westland
MI	Phone Michigan	5ESS	23629 Industrial Park Dr	Farmington Hills
MI	Phone Michigan	5ESS	G 4074 S Linden Rd	Flint
MI	Range Telecommunications	Digital Switching System	121 N Front St	Marquette
MI	AT&T	5ESS	1000 Town Center Dr	Southfield
MI	AT&T	DMS 500	445 State St	Detroit
MI	Teligent	DMS 500	2100 Melrose	Southfield
MI	US Xchange	5ESS	4750 Commercial Ave	Portage
MI	WinStar	5ESS-2000 VCDX	21290 Melrose St	Southfield
MI	MCI WorldCom	AXE-10-Local	21500 Melrose Ave	Southfield
MI	MCI WorldCom	DMS 100	21500 Melrose Ave	Southfield
MN	Ace Link Telecommunications	DMS 10	310 W Main St	Caledonia
MN	AT&T	4ESS	200 S 5th St	Minneapolis
MN	MCI WorldCom	5ESS	333 Sibley St	St Paul
MN	MCI WorldCom	5ESS Remote	500 N Carlton St	Maplewood
MN	C-I Communications	DCO	8 3rd St NW	Crosby
MN	Crystal Communications	DMS 10S	N Main St & Grove St	Janesville
MN	Federated Telcom	DCO	N Miles St & W Snelling Ave	Appleton
MN	Frontier	DMS 500	511 11th Ave S	Minneapolis
MN	Infotel Communications	DMS 500	26 6th Ave N	St Cloud
MN	Infotel Communications	Nortel Remote Switching Center	213 1st Ave Se	Little Falls
MN	Integra Telecom Of Minnesota.	EWSD Switching System Type	4690 Colorado St Se	Prior Lake
MN	Intermedia	DMS 500	511 11th Ave S	Minneapolis
MN	KMC Telecom	5ESS-2000 VCDX	730 Boone Ave N	Golden Valley
MN	MCI WorldCom	DMS 100	331 Second Ave	Minneapolis
MN	MediaOne	5ESS	2621 Fairview Ave	Roseville
MN	Otter Tail Telcom	EWSD Switching System Type	224 W Lincoln Ave	Fergus Falls

State	CLEC	Switch Type	Street Address	City
MN	Ovation Communications	5ESS	401 Second Ave South. Suite 900	Minneapolis
MN	Redwood Falls Telephone Company	DCO	33997 Cohwy 1	Redwood Falls
MN	AT&T	5ESS	511 11th Ave S	Minneapolis
MN	Tekstar Communications	DMS 500	327 West Main (Hwy 10)	Detroit Lakes
MN	Wetec	DCO	105 3rd St W	Park Rapids
MN	WinStar	5ESS-2000 VCDX	608 2nd Ave S	Minneapolis
MO	AT&T	4ESS	8201 Hwy 21	Hillsboro
MO	Birch Telecom	5ESS	107 Weldon Pky	Maryland Heights
MO	MCI WorldCom	5ESS	940 E Trafficway St	Springfield
MO	Digital Teleport	DMS 500	11111 Dorsett Rd	Maryland Heights
MO	e.spire	5ESS	1100 Main St	Kansas City
MO	e.spire	5ESS	1100 Main St	Kansas City
MO	Exop	EWSD Switching System Type	303 N Jefferson St	Kearney
MO	Frontier	DMS 500	20 Ferry St	St. Louis
MO	Green Hls Telecom Svc	DMS 10 Remote Equipment Module	106 E 2nd St	Norborne
MO	Intermedia	DMS 500	111 Toelle	Harvester
MO	Mark Twain Communications Company	DMS 10 Remote Line Concentrating Module	109 East Main	Ewing
MO	AT&T	5ESS	324 E 11th St	Kansas City
MO	AT&T	5ESS	11840 Borman Dr	Creve Coeur
MO	WinStar	5ESS-2000 VCDX	11656 Lilburn Park Rd	Creve Coeur
MO	MCI WorldCom	AXE-10-Local	11636 Lackland Rd	Merilyn
MO	MCI WorldCom	AXE-10-Local	11636 Lackland Rd	St Louis
MS	AT&T	4ESS	210 E Pearl St	Jackson
MS	MCI WorldCom	5ESS	317 E Capitol St	Jackson
MS	Diamond Telephone Services	DMS 10	200 Foxgate Ave	Hattiesburg
MS	Hyperion	5ESS	142 Lefleur Square Rd	Jackson
MT	Eclipse Communications	5ESS	2000 Coburn Rd	Billings
MT	Mid-Rivers Telephone Cooperative	DE4 EWSD RCU Switching System	Cemetery Rd & I 94	Miles City
MT	One Eighty Communications	Digital Switching System	210 N 29th St	Billings
NC	Alltel	DMS 100	131 W Matthews St	Matthews
NC	AT&T	4ESS	100 S Eugene St	Greensboro
NC	Business Telecom	5ESS	105 Creek Ridge Rd	Greensboro
NC	Business Telecom	5ESS-2000 VCDX	105-H Creek Ridge Rd	Greensboro
NC	CTC Communications	DMS 250	401 S College St	Charlotte
NC	ICG	5ESS	401 S College St	Charlotte
NC	Intermedia	DMS 250	5400 S. Miami Blvd. Suite #124	Durham
NC	Intermedia	Nortel Remote Switching Center	2314 Nelson Chapel Hill Hwy	Durham
NC	Intermedia	DMS 500	55 Olive Chapel Rd	Apex
NC	Interpath Communications	DMS 500	5150 Mccrimmon Pky	Morrisville
NC	KMC Telecom	5ESS-2000 VCDX	227 Robeson St	Fayetteville
NC	KMC Telecom	5ESS	133 Hicks St	Winston-Salem
NC	MCI WorldCom	DMS 100	1500 Perimeter Park Dr	Morrisville
NC	AT&T	DMS 100	200 S College St	Charlotte
NC	Teligent	DMS 100	3101 International Airport Dr	Charlotte
NC	Time Warner	5ESS	1500 N Sharon Amity Rd	Charlotte
NC	Time Warner	5ESS	496 Gallimore Dairy Rd	Greensboro
NC	Time Warner	5ESS	924 Ellis Rd	Durham
NC	US LEC	5ESS	301 S Elm St	Greensboro
NC	US LEC	DMS 100	68 Cabarrus St	Concord
NC	US LEC	DMS 10S	24 O Henry Ave	Asheville
NC	US LEC	5ESS-2000 VCDX	24 O Henry Ave	Asheville
ND	Eclipse Communications	5ESS	1447 44th St NW	Fargo
ND	IdeaOne Telecom Group	DMS 10	3239 39th St SW	Fargo
ND	Infotel Communications	Nortel Remote Switching Center	409 1st Ave N	Fargo
NE	Aliant Communications	5ESS	3650 W 13th St	Grand Island
NE	Aliant Communications	DMS 100/200	4004 6th Ave	Kearney
NE	Aliant Communications	DMS 500	10630 Burt	Omaha
NE	Cox	DMS 100/200	11505 W Dodge Rd	Omaha
NE	AT&T	5ESS	2505 S 72nd St	Omaha
NH	MCI WorldCom	5ESS	1100 Elm St	Manchester
NH	MCI WorldCom	5ESS Remote	97 Main St	Nashua
NH	Freedom Ring Communications	DMS 100/200	11 Manchester Sq	Portsmouth
NH	Global Naps	DMS 10S	1 Sundial Ave	Manchester

State	CLEC	Switch Type	Street Address	City
NH	New England Voice & Data	5ESS	1 Chestnut St	Nashua
NH	AT&T	5ESS	25 Concord St	Manchester
NJ	Allegiance	5ESS	95 William St	Newark
NJ	AT&T	4ESS	95 William St	Newark
NJ	AT&T	5ESS	88 Horse Hill Rd	Cedar Knolls
NJ	Conectiv Communications	DMS 100	373 N Broadway	Pennsville
NJ	Conectiv Communications	Digital Switching System	2542 Fire Rd	Pleasantville
NJ	Focal Communications	DMS 100	12 N 7th St	Camden
NJ	Global Naps	DMS 500	744 Broad St	Newark
NJ	Hyperion	5ESS	225 Old New Brunswick Rd	Piscataway
NJ	MCI WorldCom	DMS 100	23 Home News Row	New Brunswick
NJ	MCI WorldCom	DMS 100	29-35 Broadway Ave	Laurel Springs
NJ	NEXTLINK	DMS 500	12 N 7th St	Camden
NJ	AT&T	DMS 100	130 N Broadway	Camden
NJ	AT&T	5ESS	75 W Passaic St	Rochelle Park
NJ	AT&T	DMS 500	75 W Passaic St	Rochelle Park
NJ	Teligent	DMS 500	50 W State St	Trenton
NJ	WinStar	5ESS	95 William St	Newark
NJ	MCI WorldCom	AXE-10-Local	101 Hudson St	Jersey City
NJ	MCI WorldCom	DMS 10S	131 Market St	Newark
NM	e.spire	5ESS	201 3rd St	Albuquerque
NM	AT&T	4ESS	111 3rd St NW	Albuquerque
NM	MCI WorldCom	5ESS	422 Gold Ave SW	Albuquerque
NM	GST	DMS 250	3830 Singer Blvd NE	Albuquerque
NV	e.spire	5ESS	3944 Sylvestri	Las Vegas
NV	MCI WorldCom	5ESS	200 S Virginia St	Reno
NV	MGC Communications	DMS 250	3165 Palms Centre Drive	Las Vegas
NV	NEXTLINK	DMS 100	1301green Valley Parkway	Henderson
NV	Pac – West Telecomm	DEX-600E	50 W Liberty St Ste 1200	Reno
NY	ACC National Telecom	5ESS	66 Chenango Street	Binghamton
NY	ACC National Telecom	5ESS Host	32 Old Slip	New York
NY	ACC National Telecom	5ESS Remote	400 West Ave	Rochester
NY	ACC National Telecom	5ESS-2000 VCDX	400 West Ave	Rochester
NY	Allegiance	4ESS	221 E 37th St	Manhattan
NY	Allegiance	5ESS	55 Meserole St	Brooklyn
NY	American Network	Digital Switching System	60 E 56th St	Manhattan
NY	AT&T	5ESS	811 10th Ave	Manhattan
NY	AT&T	4ESS	33 Thomas St	Manhattan
NY	AT&T	5ESS	33 Thomas St	Manhattan
NY	MCI WorldCom	5ESS	20 Church St @ Main St	White Plains
NY	MCI WorldCom	5ESS	48 Swalm St	Westbury (Nassau)
NY	Cablevision Lightpath	5ESS	254 Old Country Rd.	Riverhead
NY	Choice One Communications	5ESS	80 State St	Albany
NY	Comav	EWSD Switching System Type	25 Chapel St	Brooklyn
NY	Commonwealth Telecom Services	Remote Digital Switching Equipment	33 Chenango St	Binghamton
NY	Eagle Communications	5ESS	601 W 26th St	Manhattan
NY	Focal Communications	DMS 100	32 Old Slip	Manhattan
NY	Focal Communications	DMS 100	32 Old Slip Rd.	New York
NY	Focal Communications	DMS 500	32 Old Slip	Manhattan
NY	Framco	5ESS Remote	66 Chenango St	Binghamton
NY	Frontier	5ESS Remote	160 W Broadway	Manhattan
NY	Frontier	5ESS Remote	100 Church St	New York
NY	Global Naps	DMS 500	32 Old Slip	Queens
NY	Hyperion	5ESS	101 Lasalle Ave	Buffalo
NY	Intermedia	DMS 500	221 E 37th St	Manhattan
NY	Marathon Metro	DMS 250	160 W Broadway	Manhattan
NY	MCI WorldCom	DMS 100	560 Washington St	New York
NY	MCI WorldCom	DMS 100	60 Hudson St	New York
NY	MCI WorldCom	DMS 100	60 Hudson St	New York
NY	Metropolitan Telecommunications	DMS 200	1095 Ave Of The Americas	Manhattan
NY	Mid-Hudson Communications	Digital Switching System	11 N Pearl St	Albany
NY	Network Plus	5ESS	601 W 26th St	Manhattan
NY	NEXTLINK	DMS 500	111 8th Ave	Manhattan

State	CLEC	Switch Type	Street Address	City
NY	North American Telecommunications	DE4 EWSD RCU Switching System	875 Merrick Ave	Hempstead
NY	Northland Networks	DMS 250	258 Genesee St	Utica
NY	Northland Networks	DMS 500	258 Genesee St	Utica
NY	Paetec Communications	5ESS	201 S State St	Syracuse
NY	Paetec Communications	5ESS-2000 VCDX	1 Commerce Plz	Albany
NY	AT&T	5ESS	67 Broad St	Manhattan
NY	Teligent	DMS 500	111 8th Ave	Manhattan
NY	Time Warner	5ESS	120 E 23rd St	Manhattan
NY	Time Warner	5ESS	71 Mt Hope Ave	Rochester
NY	Time Warner	5ESS	10 Airline Dr	Colonie
NY	Timely Information	Digital Switching System	228 Main St E	Rochester
NY	US Detanet	System 12	109 S Warren St	Syracuse
NY	Warwick Valley Telephone Company	DMS 10	24 John St	Middletown
NY	WinStar	5ESS	60 Hudson St	New York
NY	MCI WorldCom	AXE-10-Local	55 Exchange Blvd	Rochester
NY	MCI WorldCom	DMS 100	845 Stewart Ave	Garden City
NY	MCI WorldCom	DMS 10S	111 8th Ave	New York
OH	AT&T	4ESS	229 W 7th St	Cincinnati
OH	MCI WorldCom	DMS 10S	26 N 11th St	Toledo
OH	Cablevision Lightpath	5ESS	8179 Dow Cir	Strongsville
OH	Frontier	DMS 500	1621 Euclid Ave, Suite 620	Cleveland
OH	ICG	5ESS	520 S Main St	Akron
OH	Intermedia	DMS 10S	130 E 4th St	Cincinnati
OH	Intermedia	DMS 500	815 Superior Ave NE	Cleveland
OH	MCI WorldCom	DE4 EWSD RCU Switching System	1621 Euclid Ave	Cleveland
OH	MCI WorldCom	DMS 100	312 Plum St	Cincinnati
OH	NEXTLINK	DMS 100	76 S Main St	Akron
OH	NEXTLINK	DMS 500	815 Superior Ave NE	Cleveland
OH	AT&T	DMS 100	7555 E Pleasant Valley Rd	Independence
OH	Teligent	DMS 500	15248 Neo Pky	Garfield Heights
OH	Time Warner	5ESS	11252 Cornell Park Dr	Blue Ash
OH	Time Warner	5ESS	1125 Chambers Rd	Columbus
OH	Buckeye Telesystem	5ESS-2000 VCDX	4818 Angola Rd	Toledo
OH	WinStar	5ESS-2000 VCDX	1 Eaton Ctr	Cleveland
OH	WinStar	5ESS-2000 VCDX	240 N 5th St	Columbus
OH	MCI WorldCom	DMS 100	1150 W 3rd St	Cleveland
OK	American Comm Tulsa	5ESS	100 W 5th St	Tulsa
OK	AT&T	4ESS	121 Dean A Mcgee	Oklahoma City
OK	MCI WorldCom	5ESS	101 W Park Ave	Oklahoma City
OK	Cox	DMS 500	2312 N W 10th St	Oklahoma City
OK	Pioneer Long Distance	DMS 250	110 South 7th St	Fairview
OK	Pioneer Long Distance	Digital Switching System	225 W Chestnut Ave	Enid
OK	Total Telecommunicati Services	DCO	Oak & Main	Big Cabin
OR	Advanced Telcom Group	5ESS-2000 VCDX	198 Commercial St Se	Salem
OR	AT&T	4ESS	819 SW Oak St	Portland
OR	Electric Lightwave	DMS 100	6038 NE 78th Ct	Portland
OR	Great West Services	Digital Switching System	6351 NE Campus Ct	Hillsboro
OR	MCI WorldCom	DMS 100	425 SW Washington St	Portland
OR	North County Communications	DMS 100	921 SW Washington	Portland
OR	OGC Telecomm	5ESS Host	19545 NW Von Neumann Dr	Beaverton
OR	Rio Communications	5ESS	151 W 7th Ave	Eugene
OR	AT&T	5ESS	10340 SW Nimbus Ave	Tigard
OR	MCI WorldCom	AXE-10-Local	851 SW 6th Ave	Portland
PA	ACC National Telecom	5ESS	1050 Virginia Dr	Fort Washington
PA	Hyperion	5ESS	101 Innovations Blvd	State College
PA	Allegiance	5ESS	401 N Broad St	Philadelphia
PA	AT&T	4ESS	60 Westave	Wayne
PA	ATX Telecommunications Services	5ESS	200 S 24th St	Philadelphia
PA	ATX Telecommunications Services	DMS 100	200 S 24th St	Philadelphia
PA	ATX Telecommunications Services	DMS 10S	200 S 24th St	Philadelphia
PA	ATX Telecommunications Services	DMS 500	812 5th Ave	Pittsburgh
PA	Choice One Communications	5ESS	650 Smithfield St	Pittsburgh
PA	Commonwealth Telecom Services	DMS 100/200	5 W 3rd St	Bloomsburg

State	CLEC	Switch Type	Street Address	City
PA	Commonwealth Telecom Services	DMS 100 Remote Line Module	126 N Duke St	Lancaster
PA	Commonwealth Telecom Services	Nortel Remote Line Concentrating Module	154 Desmond St	Sayre
PA	Focal Communications	DMS 500	701 Market St	Philadelphia
PA	Hyperion	5ESS	140 W Market St	York
PA	Hyperion	5ESS	1037 N 7th St	Harrisburg
PA	Hyperion	5ESS	1180 Sathers Dr	Pittston
PA	Intermedia	DMS 500	401 N Broad St	Philadelphia
PA	MCI WorldCom	DE4 EWSD RCU Switching System	401 N. Broad St	Philadelphia
PA	MCI WorldCom	DE4 EWSD RCU Switching System	2990 Sassafras Way	Pittsburgh
PA	MCI WorldCom	DE3 EWSD RCU Switching System	401 N. Broad St	Philadelphia
PA	MCI WorldCom	DE5 EWSD RCU Switching System	2990 Sassafras Way	Pittsburgh
PA	NEXTLINK	DMS 100	991 Peiffers Lane	Harrisburg
PA	NEXTLINK	DMS 500	2400 Market St	Philadelphia
PA	Paetec Communications	5ESS-2000 VCDX	401 N Broad St	Philadelphia
PA	Hyperion	5ESS	1050 Virginia Dr	Fort Washington
PA	Service Electric Telephone	DMS 100 Remote Line Module	Apple Butter Rd & Best Station Rd	Washington Township (Lehigh)
PA	Service Electric Telephone	Remote Digital Switching Equipment	323 E Paxinosa Rd	Forks
PA	AT&T	5ESS	2500 Allegheny Ctr Mall	Pittsburgh
PA	AT&T	DMS 100	2130 Arch St	Philadelphia
PA	AT&T	DMS 250	2130 Arch St	Philadelphia
PA	Teligent	DMS 500	401 N Broad St	Philadelphia
PA	WinStar	5ESS-2000 VCDX	1101 Market St	Philadelphia
PA	MCI WorldCom	DMS 100	630 Clark Ave	King Of Prussia
RI	MCI WorldCom	5ESS	8 Parsonage St	Providence
RI	CCCRI	Harris Digital Telephone System Rural Electronic Exchange	2 Regency Plz	Providence
RI	Cox	DMS 10S	9 J P Murphy Hwy	West Warwick
RI	Global Naps	DMS 10S	275 Promenade St	Providence
RI	New England Voice & Data	5ESS	935 Westminster St	Providence
RI	AT&T	5ESS	234 Washington St	Providence
SC	e.spire	5ESS	218 College St	Greenville
SC	AT&T	4ESS	1645 Hampton St	Columbia
SC	Business Telecom	5ESS	461 E. Main Street	Spartanburg
SC	Business Telecom	5ESS-2000 VCDX	1401 Main St	Columbia
SC	HTC Communications	DE4 EWSD RCU Switching System	804 17th Ave	Conway
SC	HTC Communications	EWSD Switching System Type	Highway 707	Collins Creek
SC	New South Communications	5ESS	5 Duncan St	Greenville
SD	CommChoice	DMS 100 Remote Line Module	600 Stevens Port Dr	North Sioux City
SD	Dakota Telecommunications	5ESS-2000 VCDX	2000 Industrial St	Viborg
TN	AT&T	4ESS	410 Magnolia Ave / 439 Depot St	Knoxville
TN	MCI WorldCom	5ESS	406 Union Ave SW	Knoxville
TN	Hyperion	5ESS	2001 Hayes St	Nashville
TN	ICG	5ESS	315 Deaderick St	Nashville
TN	Intermedia	DMS 500	100 Franklin St	Nashville
TN	MCI WorldCom	DMS 100	240 S. Hollywood	Memphis
TN	New South Communications	5ESS	505 Fesslers Ln	Nashville
TN	NEXTLINK	DMS 10S	101 Molloy St	Nashville
TN	AT&T	DMS 100	611 Chestnut St	Chattanooga
TN	Time Warner	5ESS	5450 Winchester Rd	Memphis
TN	US LEC	5ESS	800 S Gay St	Knoxville
TN	US LEC	5ESS-2000 VCDX	6625 Lenox Park Dr	Memphis
TX	Allegiance	5ESS	1950 N Stemmons Fwy	Dallas
TX	Allegiance	DMS 500	1950 N Stemmons Fwy	Dallas
TX	e.spire	5ESS	323 Broadway	San Antonio
TX	AT&T	4ESS	105 Auditorium Cir	San Antonio
TX	AT&T	5ESS	4100 Bryan St	Dallas
TX	Austin Bestline Company	DTM	1122 Colorado St	Austin
TX	MCI WorldCom	DMS 100	700 N St Mary's	San Antonio
TX	Coserv	DMS 100/200	3966 Parkwood Blvd	Frisco
TX	CSW/ICG Choice Com	5ESS	717 N Harwood St	Dallas
TX	CSW/ICG Choice Com	5ESS	2100 W Loop S	Houston
TX	CSW/ICG Choice Com	5ESS	114 W 7th St	Austin

State	CLEC	Switch Type	Street Address	City
TX	CSW/ICG Choice Com	5ESS	539 N Carancahua St	Corpus Christi
TX	Cumby Telephone Cooperative	DMS 10 Remote Equipment Module	Fm 275 & Fm 1567	Miller Grove
TX	Cumby Telephone Cooperative	DMS 10	Us Hwy 67 & F M 2653	Brashear
TX	Cypress Telecommunications	Digital Switching System	777 Walker St #C190	Houston
TX	Fiber Wave Telecom	Digital Switching System	3101 Old State Hwy 174	Burleson
TX	Fort Bend Long Distance Company	5ESS	1400 Ave A	Katy
TX	Frontier	DMS 500	2323 Bryan Street, Suite 900	Dallas
TX	Golden Harbor Of Texas	DMS 100/200	105 Auditorium Cir	San Antonio
TX	Great West Services	Digital Switching System	5307 E Mockingbird Ln	Dallas
TX	GST	Digital Switching System	2323 Bryan St	Dallas
TX	GST	EWSD Switching System Type	2900 Weslayan St	Houston
TX	Intelcom Group	5ESS	114 W 7th St	Austin
TX	Intermedia	DMS 500	2323 Bryan St	Dallas
TX	IWL Communications	DMS 250	12017 North Fwy	Houston
TX	IWL Communications	GX5000	600 Travis St	Houston
TX	KMC Telecom	5ESS	303 W Harrison Rd	Longview
TX	KMC Telecom	5ESS	5337 Bear Ln	Corpus Christi
TX	MCI WorldCom	DMS 100	400 International Pkwy, 2nd Fl East	Richardson
TX	MCI WorldCom	DMS 100	1301 Fannin St	Houston
TX	MCI WorldCom	DMS 10S	222 Rotary	San Antionio
TX	Millennium Telcom	DMS 10	4700 Keller Hicks Rd	Keller
TX	Multitechnology Services	Remote Digital Switching Equipment	111 Congress Ave	Austin
TX	Multitechnology Services	5ESS-2000 VCDX	1950 N Stemmons Fwy	Dallas
TX	NEXTLINK	DMS 10S	1300 Mockingbird	Dallas
TX	Nortex Telcom	DCO	3400 Sundown Blvd	Denton
TX	Optel	5ESS	3228 Halifax St	Dallas
TX	Santa Rosa Telephone Cooperative	Digital Switching System	310 W California St	Seymour
TX	Southside Communications	Digital Switching System	1409 S.Lamar	Dallas
TX	Taylor Communications Group	DE5 EWSD RCU Switching System	100 Taylor #299	San Antonio
TX	Taylor Communications Group	EWSD Switching System Type	1770 St James Pl	Houston
TX	Tech Telephone Company	DMS 10	3302 Quaker Ave	Lubbock
TX	AT&T	DMS 100	13601 Preston- Annex Tower Rd	Dallas
TX	AT&T	DMS 500	105 Auditorium Cir	San Antonio
TX	AT&T	DMS 100	1301 Fannin, Suite 1290	Houston
TX	Teligent	DMS 500	1950 N Stemmons Fwy	Dallas
TX	Teligent	DMS 500	1950 N Stemmons Fwy	Dallas
TX	Time Warner	5ESS	12012 N Mopac Expy	Austin
TX	Time Warner	5ESS	8495 Tidwell Rd	Houston
TX	Time Warner	5ESS	301 Broadway	San Antonio
TX	U.S. Long Distance	DMS 250	660 S Santa Rosa Ave	San Antonio
TX	Westel	DCO	4316 Bryan St, Suite 26	Dallas
TX	WinStar	5ESS	2323 Bryan St	Dallas
TX	WinStar	5ESS-2000 VCDX	2323 Bryan St	Dallas
TX	MCI WorldCom	AXE-10-Local	1950 Stemmons	Dallas
TX	MCI WorldCom	DMS 10S	1950 Stemmons	Dallas
TX	XIT Telecommunication & Technology	5ESS-2000 VCDX	Hwy 87 North	Dalhart
TX	XIT Telecommunication & Technology	5ESS-2000 VCDX	Hwy 87 N	Dalhart
UT	AT&T	4ESS	70 S State	Salt Lake City
UT	AT&T	5ESS	70 S State	Salt Lake City
UT	MCI WorldCom	DMS 10S	175 S West Temple	Salt Lake City
UT	Electric Lightwave	DMS 100/200	265 E 100th S	Salt Lake City
UT	NEXTLINK	DMS 250	118 South 1000 West	Salt Lake City
UT	AT&T	DMS 100	2440 S 1070 W	West Valley City
VA	AT&T	4ESS	900 S Walter Reed Dr	Arlington
VA	Cavalier Telephone	5ESS	2134 W Laburnum Ave	Richmond
VA	CFW Network	Digital Switching System	105 Newman Ave	Harrisonburg
VA	Cox	Digital Switching System	4585 Village Ave	Norfolk
VA	Global Naps	DMS 500	12347 Sunrise Valley Dr	Reston
VA	Hyperion	5ESS	324 W Main	Charlottesville
VA	Intermedia	DMS 500	1130 Elden St	Herndon
VA	Jones Intercable	DMS 100/200	3900 Wheeler Ave	Alexandria
VA	Jones Intercable	DMS 100/200	3900 Wheeler Ave	Alexandria
VA	KMC Telecom	5ESS	2151 Hollins Rd NE	Roanoke

State	CLEC	Switch Type	Street Address	City
VA	KMC Telecom	5ESS-2000 VCDX	969 Broad St	Portsmouth
VA	MediaOne	5ESS	5401 Staples Mills Rd	Richmond
VA	R & B Network	5ESS	75 Sunset Ave	Troutville
VA	Teligent	DMS 500	111 S 6th St	Richmond
VA	US LEC	5ESS	477 Viking Dr	Virginia Beach
VA	MCI WorldCom	AXE-10-Local	12379 Sunrise Valley Dr	Reston
VA	MCI WorldCom	DMS 100	12379 Sunrise Valley Dr	Reston
VT	Hyperion	5ESS	102 Kimball Ave	South Burlington
WA	AT&T	4ESS	501 W 2nd Ave	Spokane
WA	AT&T	Digital Switching System	15008 8th Ave SW	Seattle
WA	Electric Lightwave	DMS 100/200	1218 3rd Ave Rm.410	Seattle
WA	Electric Lightwave	Remote Digital Switching Equipment	9515 E 1st Ave	Spokane
WA	Frontier	DMS 500	2001 6th Ave, Suite 1605	Seattle
WA	Great West Services	Digital Switching System	11028 Se 176th St	Renton
WA	GST	Digital Switching System	223 Taylor Ave N	Seattle
WA	GST	EWSD Switching System Type	601 W Main Ave	Spokane
WA	GST	Nortel Remote Switching Center	4317 NE Thurston Way	Vancouver
WA	International Telcom	DMS 250	417 2nd Ave W	Seattle
WA	MCI WorldCom	DE4 EWSD RCU Switching System	2001 6th	Seattle
WA	NEXTLINK	DMS 100/200	155 S Stevens St	Spokane
WA	NEXTLINK	DMS 100	1000 Denny Way	Seattle
WA	Rainier Cable	5ESS	5228 Tanwax Blvd	Eatonville
WA	AT&T	5ESS	1215 4th Ave	Seattle
WA	Teligent	DMS 500	1551 Eastlake Ave	Seattle
WA	WinStar	5ESS-2000 VCDX	1000 2nd Ave	Seattle
WA	MCI WorldCom	AXE-10-Local	11311 NE 120th St	Kirkland
WI	CTC Communications	DE5 EWSD RCU Switching System	611 E La Salle Ave	Barron
WI	Frontier	DMS 500	411 E Wisconsin Ave, Suite 519	Milwaukee
WI	KMC Telecom	5ESS	714 Market Pl	Madison
WI	MCI WorldCom	DE4 EWSD RCU Switching System	330 E Wells St	Milwaukee
WI	Net LEC	DMS 100	1046 Gray Ct	Green Bay
WI	Ovation Communications	5ESS-2000 VCDX	731 N Jackson St	Milwaukee
WI	Sharon Telephone Company	DMS 10	506 Madison Rd	Darien
WI	TDS Metrocom	EWSD Switching System Type	3330 University Ave	Madison
WI	AT&T	5ESS	2152 S 114th St	West Allis
WI	Teligent	DMS 500	324 E Wisconsin Ave	Milwaukee
WI	Time Warner	5ESS	1710 N 6th St	Milwaukee
WI	US Xchange	5ESS	10 College Ave	Appleton
WI	WinStar	5ESS	324 E Wisconsin Ave	Milwaukee
WV	AT&T	4ESS	816 Lee St E	Charleston
WY	Tri Tel	LNX 2000	408 3rd St	Basin

APPENDIX B. CLEC FIBER

CLEC Fiber Networks in Top 50 MSAs			
MSA	**Existing CLEC Fiber (Known Route Miles)**	**Existing CLEC Fiber (Unknown Route Miles)**	**Planned CLEC Fiber**
1. Los Angeles-Long Beach	MediaOne (1000); AT&T (450); ICG (88) **Total Number of CLECs: 3** **Total Route Miles: 1538**	FirstWorld Communications; GST; Intermedia; Level 3; MCI Worldcom; NEXTLINK **Total Number of CLECs: 6**	Advanced Radio Telecom Group; Convergent; Electric Lightwave; Logix; MegsINet; OpTel Telecom
2. New York	AT&T (580); e.spire (182); MCI Worldcom (172); Time Warner (157); Local Fiber (40) **Total Number of CLECs: 5** **Total Route Miles: 1131**	Level 3; Metromedia; Network Access Solutions; NEXTLINK; North American Telecommunications; NorthEast Optic Network; RCN **Total Number of CLECs: 7**	BTI; Convergent; WinStar
3. Chicago	AT&T (412); Ovation (100); 21st Century Telecom (70); **Total Number of CLECs: 3** **Total Route Miles: 582**	Intermedia; Level 3; MCI Worldcom; NEXTLINK **Total Number of CLECs: 4**	Convergent; e.spire; MegsINet; Metromedia; OpTel Telecom; US Xchange; WinStar
4. Philadelphia	AT&T (565); NEXTLINK(500); e.spire (12) **Total Number of CLECs: 3** **Total Route Miles: 1077**	Conectiv; Hyperion; Intermedia; Level 3; MCI Worldcom; Metromedia; Network Access Solutions **Total Number of CLECs: 7**	Convergent; RCN; WinStar
5. Washington	AT&T (233); Jones (150); e.spire (124) **Total Number of CLECs: 3** **Total Route Miles: 505**	Hyperion; Intermedia; Level 3; MCI Worldcom; Metromedia; Network Access Solutions; RCN; U.S. Online **Total Number of CLECs: 8**	Convergent; Metromedia; NEXTLINK; WinStar
6. Detroit	AT&T (266); US MidTel(5) **Total Number of CLECs: 2** **Total Route Miles: 271**	Level 3; MCI Worldcom **Total Number of CLECs: 2**	Convergent
7. Houston	Time Warner (418); AT&T (407); MCI Worldcom (6) **Total Number of CLECs: 3** **Total Route Miles: 831**	CapRock; GST; ICG; Intermedia; Level 3; Logix; OpTel; US Online **Total Number of CLECs: 8**	Convergent; Metromedia
8. Atlanta	MediaOne (5000); Marietta Fibernet (200); e.spire (101); ICG (100) **Total Number of CLECs: 4** **Total Route Miles: 5401**	BTI; Convergent; Intermedia; ITC-Deltacom; Level 3; MCI WorldCom; NEXTLINK **Total Number of CLECs: 8**	Hyperion; AT&T; Metromedia; NewSouth
9. Boston	AT&T (450); MCI Worldcom (320) **Total Number of CLECs: 2** **Total Route Miles: 770**	Intermedia; Level 3; MediaOne; Network Access Solutions; NorthEast Optic Network; RCN **Total Number of CLECs: 6**	Convergent; Metromedia
10. Dallas	AT&T (452); MCI Worldcom (134); e.spire (67); ICG (32) **Total Number of CLECs: 4** **Total Route Miles: 685**	CapRock; Convergent; Intermedia; Level 3; Logix; NEXTLINK; OpTel; US Online **Total Number of CLECs: 8**	MegsINet; Metromedia; Time Warner
11. Riverside-San Bernardino	**Total Number of CLECs: 0** **Total Route Miles: 0**	GST; ICG **Total Number of CLECs: 2**	Telepacific

MSA	Existing CLEC Fiber (Known Route Miles)	Existing CLEC Fiber (Unknown Route Miles)	Planned CLEC Fiber
12. Phoenix-Mesa	AT&T (364); Electric Lightwave (95); GST (11); ICG (9) **Total Number of CLECs: 4** **Total Route Miles: 479**	Advanced Radio Telecom Group; CapRock; Cox; MCI Worldcom **Total Number of CLECs: 4**	Convergent; e.spire; Level 3; Logix; OpTel Telecom
13. Minneapolis-St. Paul	Ovation (440); Crystal Communications (40) **Total Number of CLECs: 2** **Total Route Miles: 480**	AT&T; KMC Telecom; MCI Worldcom; MediaOne **Total Number of CLECs: 4**	Convergent; MEANS
14. San Diego	AT&T (300); Time Warner (193); ICG (59) **Total Number of CLECs: 3** **Total Route Miles: 552**	GST; Level 3; MCI Worldcom **Total Number of CLECs: 3**	Advanced Radio Telecom Group; Cox; Logix; NEXTLINK; OpTel Telecom; RCN; Telepacific
15. Orange County	Cox (537); FirstWorld Communications (196) **Total Number of CLECs: 2** **Total Route Miles: 733**	GST; ICG; NEXTLINK **Total Number of CLECs: 3**	Advanced Radio Telecom Group; Telepacific
16. Nassau-Suffolk	Cablevision Lightpath (844) **Total Number of CLECs: 1** **Total Route Miles: 844**	**Total Number of CLECs: 0**	
17. St. Louis	AT&T (203) **Total Number of CLECs: 1** **Total Route Miles: 203**	Digital Teleport; Intermedia; MCI Worldcom **Total Number of CLECs: 3**	Convergent; e.spire; Level 3; Logix; MegsINet
18. Baltimore	AT&T (500); e.spire (140) **Total Number of CLECs: 2** **Total Route Miles: 640**	Conectiv; MCI Worldcom; Network Access Solutions **Total Number of CLECs: 3**	Convergent; Hyperion; Level 3; RCN
19. Pittsburgh	AT&T (400) **Total Number of CLECs: 1** **Total Route Miles: 400**	Hyperion; Intermedia; MCI Worldcom **Total Number of CLECs: 3**	Level 3; Network Access Solutions
20. Oakland	 **Total Number of CLECs: 0** **Total Route Miles: 0**	GST; ICG; MCI Worldcom **Total Number of CLECs: 3**	Advanced Radio Telecom Group; Telepacific; WinStar
21. Seattle-Bellevue-Everett	AT&T (360); Electric Lightwave (232) **Total Number of CLECs: 2** **Total Route Miles: 592**	Advanced Radio Telecom Group; Convergent; GST; Level 3; MCI Worldcom **Total Number of CLECs: 5**	Logix; Metromedia; NEXTLINK
22. Tampa-St. Petersburg-Clearwater	Time Warner (240); e.spire (32) **Total Number of CLECs: 2** **Total Route Miles: 272**	AT&T; Hyperion; Intermedia; ITC-Deltacom; MCI Worldcom **Total Number of CLECs: 5**	BTI; Florida Digital Network; Level 3; NewSouth; Supra Telecom
23. Cleveland-Lorain-Elyria	AT&T (146); ICG (114) **Total Number of CLECs: 2** **Total Route Miles: 260**	e.spire; MCI Worldcom; NEXTLINK **Total Number of CLECs: 3**	Level 3
24. Miami	 **Total Number of CLECs: 0** **Total Route Miles: 0**	Hyperion; Intermedia; MCI Worldcom; NEXTLINK **Total Number of CLECs: 4**	BTI; Convergent; Florida Digital Network; Level 3; North American Telecommunications; OpTel; Supra Telecom
25. Newark	MH Lightnet(130) **Total Number of CLECs: 1** **Total Route Miles: 130**	Hyperion; MCI Worldcom **Total Number of CLECs: 2**	e.spire; Time Warner
26. Denver	AT&T (303); ICG (154) **Total Number of CLECs: 2** **Total Route Miles: 457**	Convergent; GST; Level 3; MCI Worldcom; NEXTLINK; U.S. Online **Total Number of CLECs: 6**	MegsINet; OpTel Telecom

MSA	Existing CLEC Fiber (Known Route Miles)	Existing CLEC Fiber (Unknown Route Miles)	Planned CLEC Fiber
27. Portland-Vancouver	Electric Lightwave (381); GST (95); AT&T (64) **Total Number of CLECs: 3** **Total Route Miles: 540**	Advanced Radio Telecom Group; Convergent; MCI Worldcom **Total Number of CLECs: 3**	Level 3; Logix
28. San Francisco	GST (500); AT&T (412); ICG (104); MCI Worldcom (47) **Total Number of CLECs: 4** **Total Route Miles: 1063**	Convergent; Level 3; NEXTLINK **Total Number of CLECs: 3**	Advanced Radio Telecom Group; Electric Lightwave; Logix; MegsINet; Metromedia; OpTel Telecom; RCN; WinStar
29. Kansas City	e.spire (70); MCI Worldcom (52) **Total Number of CLECs: 2** **Total Route Miles: 122**	Digital Teleport; Logix **Total Number of CLECs: 2**	Level 3; MegsINet
30. San Jose	ICG (20) **Total Number of CLECs: 1** **Total Route Miles: 20**	Level 3; MCI Worldcom **Total Number of CLECs: 2**	e.spire; MegsINet; Telepacific; WinStar
31. Cincinnati	Time Warner (271) **Total Number of CLECs: 1** **Total Route Miles: 271**	AT&T; ICG; Intermedia; MCI Worldcom **Total Number of CLECs: 4**	Level 3
32. Fort Worth-Arlington	MCI WorldCom (126); e.spire (120) **Total Number of CLECs: 2** **Total Route Miles: 246**	CapRock **Total Number of CLECs: 1**	
33. Norfolk-Virginia Beach-Newport News	Cox (1800) **Total Number of CLECs: 1** **Total Route Miles: 1800**	Hyperion; KMC Telecom **Total Number of CLECs: 2**	Network Access Solutions
34. Sacramento	GST (715); Electric Lightwave (183); MCI Worldcom (117) **Total Number of CLECs: 3** **Total Route Miles: 1015**	ICG; AT&T **Total Number of CLECs: 2**	Advanced Radio Telecom Group; Level 3
35. San Antonio	Time Warner (481); ICG (60); MCI Worldcom (53); e.spire (41) **Total Number of CLECs: 4** **Total Route Miles: 635**	Logix; U.S. Online **Total Number of CLECs: 2**	CapRock; Level 3
36. Indianapolis	AT&T (199); Time Warner (300) **Total Number of CLECs: 2** **Total Route Miles: 499**	Intermedia; MCI Worldcom **Total Number of CLECs: 2**	Convergent; Hyperion; Level 3
37. Orlando	Time Warner (826); Orlando Telephone (80) **Total Number of CLECs: 2** **Total Route Miles: 906**	AT&T; BTI; Hyperion; Intermedia; ITC-Deltacom; MCI Worldcom **Total Number of CLECs: 6**	e.spire; Florida Digital Network; Level 3; NewSouth; Supra Telecom
38. Milwaukee-Waukesha	Time Warner (378); AT&T (214); US Xchange (100); Ovation (75) **Total Number of CLECs: 4** **Total Route Miles: 767**	MCI Worldcom **Total Number of CLECs: 1**	
39. Fort Lauderdale	AT&T (400) **Total Number of CLECs: 1** **Total Route Miles: 400**	e.spire; Intermedia; MediaOne **Total Number of CLECs: 3**	Florida Digital Network; NewSouth
40. Columbus, OH	Time Warner (550); ICG Communications (39) **Total Number of CLECs: 2** **Total Route Miles: 589**	NEXTLINK **Total Number of CLECs: 1**	Hyperion; AT&T
41. Las Vegas	e.spire (80) **Total Number of CLECs: 1** **Total Route Miles: 80**	GST; Logix; NEXTLINK **Total Number of CLECs: 3**	Advanced Radio Telecom Group; Cox; Level 3

MSA	Existing CLEC Fiber (Known Route Miles)	Existing CLEC Fiber (Unknown Route Miles)	Planned CLEC Fiber
42. Charlotte-Gastonia-Rock Hill	Time Warner (672); ICG (143) **Total Number of CLECs: 2** **Total Route Miles: 815**	AT&T; BTI; Intermedia; ITC-Deltacom **Total Number of CLECs: 4**	Convergent; e.spire; Hyperion; Level 3
43. Bergen-Passaic	 **Total Number of CLECs: 0** **Total Route Miles: 0**	 **Total Number of CLECs: 0**	
44. New Orleans	American MetroComm (12); Cox (294); e.spire (4) **Total Number of CLECs: 3** **Total Route Miles: 310**	Hyperion; NewSouth **Total Number of CLECs: 2**	Level 3; Logix
45. Salt Lake City-Ogden	MCI Worldcom (65); Electric Lightwave (429); AT&T (50) **Total Number of CLECs: 4** **Total Route Miles: 544**	Convergent; GST; NEXTLINK **Total Number of CLECs: 3**	Advanced Radio Telecom Group; Level 3; Logix
46. Buffalo-Niagara Falls	Hyperion (350); MCI Worldcom (15) **Total Number of CLECs: 2** **Total Route Miles: 365**	AT&T; Intermedia **Total Number of CLECs: 2**	
47. Greensboro-Winston-Salem-High Point	Time Warner (94) **Total Number of CLECs: 1** **Total Route Miles: 94**	BTI; KMC Telecom **Total Number of CLECs: 2**	
48. Nashville	AT&T (150); ICG (40) **Total Number of CLECs: 2** **Total Route Miles: 190**	Hyperion; Intermedia; NewSouth; NEXTLINK **Total Number of CLECs: 4**	BTI; e.spire; Level 3
49. Hartford	AT&T (520); MCI Worldcom (8) **Total Number of CLECs: 2** **Total Route Miles: 528**	NorthEast Optic Network **Total Number of CLECs: 1**	
50. Providence-Fall River-Warwick	AT&T (115); MCI Worldcom (15) **Total Number of CLECs: 2** **Total Route Miles: 130**	NorthEast Optic Network **Total Number of CLECs: 1**	Cox

Sources: New Paradigm Resources Group, Inc., *1999 CLEC Report*, 10th ed., at Chapter 10 (1999).

CLEC Fiber Networks in MSAs Ranked 51-150		
MSA	**CLEC Presence**	**Total # of CLECs**
51. Middlesex-Somerset, NJ	Hyperion; MCI Worldcom	2
52. Monmouth-Ocean, NJ		0
53. Rochester, NY	AT&T; MCI Worldcom; Time Warner	3
54. Memphis, TN	Hyperion; Intermedia; MCI Worldcom; NEXTLINK; Time Warner	5
55. Austin, TX	e.spire; ICG; Logix; MCI Worldcom; Telephone Plus; Time Warner; U.S. Online; Waller Creek	8
56. Raleigh, Durham, Chapel Hill, NC	BTI; Intermedia; ITC-DeltaCom; MCI Worldcom; Time Warner	5
57. Jacksonville, FL	BTI; e.spire; Hyperion; Intermedia; MediaOne	5
58. Oklahoma City, OK	Cox; Logix; MCI Worldcom	3
59. Grand Rapids, MI	MCI Worldcom	1
60. West Palm Beach, FL	Intermedia	1
61. Louisville, KY	e.spire; Hyperion; ICG	3
62. Richmond-Petersburg, VA	Hyperion; Jones Communications; MCI Worldcom; MediaOne; Network Access Solutions	5
63. Dayton-Springfield, OH	ICG; McLeodUSA	2
64. Greenville-Spartanburg-Anderson, SC	BTI; e.spire; ITC Deltacom; NewSouth	4
65. Fresno, CA	GST; MCI Worldcom	2
66. Birmingham, AL	AT&T; e.spire; ICG; Intermedia; ITC Deltacom	5
67. Albany-Schenectady-Troy, NY	AT&T; Hyperion; MCI Worldcom; Time Warner	4
68. Honolulu, HI	GST; Time Warner	2
69. Tucson, AZ	Cox; e.spire; GST; MCI Worldcom	4
70. Tulsa, OK	e.spire; ICG; Logix; MCI Worldcom	4
71. Syracuse, NY	AT&T; Hyperion	2
72. Ventura, CA		0
73. El Paso, TX	e.spire; Logix	2
74. Omaha, NE	AT&T; Convergent; Cox; McLeodUSA	4
75. Akron, OH	ICG	1
76. Tacoma, WA	Electric Lightwave	1
77. Albuquerque, NM	Convergent; e.spire; GST; MCI Worldcom	4
78. Knoxville, TN	AT&T; Hyperion; MCI Worldcom	3
79. Bakersfield, CA	GST; MCI Worldcom	2
80. Gary, IN	AT&T	1
81. Scranton, PA	Hyperion; NEXTLINK	2
82. Harrisburg-Lebanon-Carlisle	Conectiv; Hyperion; NEXTLINK	3
83. Allentown-Bethlehem-Easton, PA	Hyperion; NEXTLINK	2
84. Toledo, OH	MCI Worldcom	1
85. Youngstown-Warren, OH		0
86. Springfield, MA	AT&T; MCI Worldcom; Northeast Optic Network Services	3
87. Baton Rouge, LA	e.spire; Hyperion; KMC Telecom	3
88. Sarasota, Bradenton, FL	KMC Telecom	1
89. Wilmington-Newark, DE-MD	AT&T; Conectiv; Hyperion; MCI Worldcom	4
90. Jersey City, NJ	AT&T; Intermedia; MCI Worldcom	3
91. Little Rock, AR	e.spire; Hyperion; MCI Worldcom	3
92. Stockton-Lodi, CA	MCI Worldcom	1
93. Ann Arbor, MI	KMC Telecom	1
94. Mobile, AL	e.spire; Hyperion; ITC DeltaCom	3
95. New Haven-Meridian, CT	AT&T; Cox; Metromedia; NorthEast Optic Network	4

MSA	CLEC Presence	Total # of CLECs
96. McAllen-Edinburg-Mission, TX	CapRock Communications	1
97. Columbia, SC	BTI; e.spire; ITC Deltacom	3
98. Vallejo-Fairfield-Napa, CA		0
99. Wichita, KS	Advanced Communications Group, Inc.; Hyperion	2
100. Worcester MA-CT	AT&T; NorthEast Optic Network	2
101. Charleston, SC	e.spire; ITC Deltacom; Knology Holdings	3
102. Colorado Springs, CO	e.spire; ICG	2
103. Fort Wayne, IN	KMC Telecom; US Xchange	2
104. Melbourne, Titusville, Palm Bay, FL		0
105. Lakeland-Winter Haven, FL		0
106. Daytona Beach, FL	KMC Telecom	1
107. Augusta-Aiken, GA-SC	KMC Telecom; Knology Holdings	2
108. Johnson City-Kingsport-Bristol, TN-VA		0
109. Lancaster, PA	Conectiv; Hyperion; NEXTLINK	3
110. Kalamazoo-Battle Creek, MI	Climax Telephone; US Xchange	2
111. Chattanooga TN-GA	AT&T; e.spire	2
112. Lansing-East Lansing, MI	MCI Worldcom	1
113. Lexington, KY	e.spire; Hyperion	2
114. Bridgeport, CT	AT&T; Cablevision Lightpath; NorthEast Optic Network	3
115. Santa Rosa, CA		0
116. Flint, MI	Ovation	1
117. Des Moines, IA	Convergent; McLeodUSA	2
118. Jackson, MS	e.spire; Hyperion; ITC DeltaCom; MCI Worldcom	4
119. Modesto, CA		0
120. Spokane, WA	Convergent; Electric Lightwave; GST; NEXTLINK	4
121. Pensacola, FL	KMC Telecom	1
122. Madison, WI	Bresnan; KMC Telecom; TDS Metrocom; US Xchange	4
123. Santa Barbara-Santa Maria-Lompoc, CA	Cox; GST	2
124. Saginaw-Bay City-Midland, MI	Ovation; Bresnan	2
125. Canton-Massillon, OH		0
126. Ft. Myers-Cape Coral, FL	Intermedia	1
127. Corpus Christi, TX	CapRock Communications; e.spire; ICG; KMC Telecom; MCI Worldcom	5
128. Boise City, ID	Electric Lightwave; GST	2
129. Salinas, CA		0
130. Shreveport-Bossier City, LA	e.spire; Hyperion; Intermedia; KMC Telecom	4
131. Beaumont-Port Arthur, TX	CapRock Communications	1
132. York, PA	Hyperion	1
133. Lawrence, MA	AT&T; NorthEast Optic Network	2
134. Lafayette, LA	Hyperion	1
135. Newburgh NY-PA		0
136. Visalia-Tulare-Porterville, CA		0
137. Davenport-Moline-Rock Island, IA-IL	Cambridge TelCom Services; McLeodUSA	2
138. Reading, PA	Hyperion; NEXTLINK	2
139. Rockford, IL	US Xchange	1
140. Peoria-Pekin, IL	McLeodUSA	1

MSA	CLEC Presence	Total # of CLECs
141. Appleton-Oshkosh-Neenah, WI	TDS Metrocom; US Xchange	2
142. Biloxi-Gulfport-Pascagoula, MS	ITC Deltacom	1
143. Provo-Orem, UT	Electric Lightwave; MCI Worldcom; NEXTLINK	3
144. Atlantic-Cape May, NJ	Conectiv; Hyperion;	2
145. Stamford-Norwalk, CT	Cablevision Lightpath; MCI Worldcom; Metromedia; NorthEast Optic Network	4
146. Huntsville, AL	Intermedia; KMC Telecom; Knology Holdings	3
147. Trenton, NJ	Conectiv; AT&T	2
148. Hamilton-Middletown, OH		0
149. Brownsville-Harlingen-San Benito, TX	CapRock Communications	1
150. Salem, OR		0

Sources: New Paradigm Resources Group, Inc., *1999 CLEC Report*, 10th ed., at Chapter 10 (1999)

APPENDIX C. ADDITIONAL SOURCES

I. SWITCHING

Figure 1. *1996.* New Paradigm Resources Group and Connecticut Research, *1997 Annual Report on Local Telecommunications Competition*, 8th ed. at 20, 165-185 (1997). *1997.* New Paradigm Resources Group and Connecticut Research, *1998 Annual Report on Local Telecommunications Competition*, 9th ed. at Chapter 2 – 8-9 of 22, Chapter 8 – 13-45 of 46 (1998). *1998.* ALTS Press Release, *The Telecommunications Act of 1996: Progress After Three Years*, Jan. 21, 1999; March 1999 LERG.

Figure 2. March 1999 LERG; New Paradigm Resources Group & Connecticut Research, *The 1998 CLEC Report: Annual Report on Local Telecommunications Competition*, 9th ed., Chapter 2 – 18-19 of 22 (1998).

II. INTEROFFICE TRANSPORT

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EXHIBIT AJV-4

Florida Fact Report

FLORIDA FACT REPORT

PURPOSE

This paper documents current facilities-based and resale ALEC activity by wireline competitors within Florida to the extent that it has been identified, by BellSouth, as of June 30, 1999. It discusses the various methods of ALEC market entry and describes the extent to which ALECs have effectively entered the market in Florida.

It should be noted that this report does not purport to cover all of the competition that exists in Florida, nor does BellSouth claim that all data included in this report is exact. As the Florida Public Service Commission (FPSC) has recognized in this data request, information concerning competitive activity is most accurate when obtained from the competitors themselves.

INTRODUCTION

This analysis describes the highly competitive local exchange service market that currently exists within BellSouth's Florida service area. The operations of 127 active wireline ALECs, as well as active PCS wireless providers, serve as undeniable evidence of the success of BellSouth, the ALEC industry, and the FPSC in establishing an open competitive local exchange services market within Florida.

Most facilities-based competitors in Florida focus on business customers. In fact, business lines account for close to 89% of the estimated facilities-based provider lines. Some companies, however, currently provide significant competitive local exchange services to both business and residential customers utilizing, almost exclusively, their own facilities-based wireline networks.

Other configurations of business and residential service also exist. An ALEC may offer competitive local exchange service to businesses using its own facilities as well as through resale, and provide a few resold residential lines. Some of the large facilities based providers in Florida provide over 75% of their total ALEC lines to business customers over their own facilities. These ALECs also provide a smaller quantity of business lines through the resale of BST provided services, as well as a very few residential local exchange service lines through resale and over their own facilities.

Other ALECs provide almost exclusively facilities-based business local exchange services. They provide virtually no wireline resold services to either businesses or residences. Although these companies use their own networks to provide business local exchange service, the networks are not being used to provide significant, if any, service to residential customers.

As shown above, how customers are served and which customers are served, is determined by each ALEC's market entry strategy. What is abundantly clear is that some 127 wireline ALECs are currently providing over 200,000 local exchange service lines to both residential and business customers in Florida through all the methods outlined in the 1996 Telecommunications Act. Over 10,000 ALEC lines are currently in service utilizing BST-provided unbundled network elements to connect the customer's location to the ALEC's wireline switch. BST estimates that, in total, over 75,000 wireline ALEC local lines, including over 10,000 wireline residential lines, are provided exclusively over the ALECs' own facilities. In addition, ALECs are utilizing BST's resale offerings to provide over 126,000 lines to their Florida customers.

Competitors continue to expand their services using every available means to compete with BST in Florida, including new technologies such as Internet-based telephony services and new wireless service options. Individually, facilities-based competitors' wireline and wireless networks each target specific segments of BST's highly concentrated residential and business revenue streams. Collectively, when combined with the capabilities of the ALECs currently providing resold local exchange services in Florida, the Florida ALEC industry can compete, today, for every local exchange line currently provided by BST within the state, as well as every additional line which might be added in the foreseeable future.

THE PATH TO LOCAL MARKET ENTRY

Before discussing the current competitive local exchange market in Florida in greater detail, it is useful to examine the general steps necessary for an ALEC to enter the local exchange market. The very general steps that a company must take once it decides to enter the local exchange services market in Florida are to obtain certification from the FPSC, to negotiate with BellSouth, and have approved by the FPSC, an interconnection agreement.

As of June 30, 1999 over 300 companies had requested certification for competitive local exchange service authority from the FPSC. Of the more than 300 companies, over 80% of the applicants have been approved by the FPSC and granted authority to provide competitive local

exchange services within the state. Additionally, over 50 applications were pending with the FPSC. This does not take into consideration any wireless facilities-based local exchange service providers currently providing local exchange services to Florida business and residential customers utilizing PCS spectrum. These companies fall under the jurisdiction of the FCC and do not require certification by the FPSC.

In addition to certification by the FPSC, an interconnection agreement must be effected between BellSouth and the ALEC. Interconnection agreements are signed contracts between BST and individual ALECs. Because ALECs differ greatly in their approach to local market entry, interconnection agreements are negotiated separately with each ALEC and include the terms and conditions specific to that ALEC in order to facilitate its own local exchange services market entry strategy within BST's Florida serving area.

Facilities-based ALECs often request that their contracts with BST provide for such items as collocation arrangements, unbundled network elements, number portability, numbering resources, interconnection trunks, and other such BST-provided facilities and services. Some interconnection agreements may include the terms and conditions governing the provision of competitive local exchange services on a resale-only basis if the ALEC wishes to act exclusively as a reseller of BST's retail local exchange service offerings. Interconnection of the ALEC's network to BST's network is not necessary in this case.

Interconnection agreements between BST and ALECs must be signed by both parties and be reviewed and approved by the FPSC. This process is required whether the ALEC is a wireless or wireline facilities-based provider, or a pure reseller of BST provided services. There are over 350 ALECs in Florida that have signed agreements with BST.

In addition to the legal authority provided by the certification process, a company must have (or have access to) a telephone network capable of providing local exchange service. Such a telephone network would, at a minimum, require the following basic components as building blocks for local exchange service: the local loop, the local switch, and interoffice connection.

In summary, the path to ALEC local market entry may be measured by these "mile markers": the ALEC is certified to provide local service by the FPSC; the FPSC approves the ALEC/BST interconnection agreement; and the ALEC builds or gains access to a telephone

network. How this last step is taken determines whether an ALEC is a facilities-based provider, a reseller, or both.

TYPES OF LOCAL EXCHANGE SERVICE COMPETITORS

There are many methods by which ALECs have successfully entered Florida's local exchange service market to compete with BST. Three of the most common types of ALEC market entrants can be broadly categorized as Facilities-based, Supplemental Resale, and Resale Only. These methods of entry are not mutually exclusive. Some ALEC market entrants have evolved over time from pure resellers to facilities-based providers. The basic characteristics of these three major classifications of ALEC entrants are discussed below with a more detailed discussion of the current activity of specific Florida ALECs in later sections of the affidavit.

FACILITIES-BASED ALECS

Facilities-based ALECs enter the market by constructing their own network transmission and switching facilities and may supplement these capabilities by using unbundled network elements (UNEs), such as ports or loops provided by BST.

Some facilities-based competitors, such as e.spire and MCI WorldCom, have built high capacity (HICAP) transmission facilities utilizing advanced fiber optic and high bandwidth wireless technologies in some of the metropolitan areas in Florida. (Exhibit A, attached to this report, shows several of the existing fiber routes in Florida.) By equipping these HICAP networks with switching capabilities, these CAP/ALECs provide facilities-based local exchange services to customers primarily through the use of their own facilities. These competitors have utilized advanced digital transmission technologies such as SONET-based (Synchronous Optical Network) systems to dramatically improve the capacity and quality of their transmission networks and significantly lower the cost of transport. Because of these technological advancements, switches no longer are required to be in close proximity to a customer location to provide local exchange service. Entrants can deploy their own switching equipment, or they may utilize BST's or another ALEC's switching equipment. With today's fiber connectivity, a single switching office may be used to compete effectively throughout a large metropolitan area such as Miami or Orlando. Remote switching facilities can be connected to the main switching equipment by fiber to allow a single switching center to serve an entire LATA or even an entire state. Utilizing HICAP facilities, traditional CAPs generally

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focus almost exclusively on serving business local exchange customers. They may use BST's unbundled elements and resold services to fill gaps in their current coverage area or to test new markets prior to expanding their own network facilities.

CATV companies have made significant investments to upgrade their old coaxial cable networks to Hybrid Fiber/Coax networks to support the delivery of higher bandwidth interactive programming and information services, Internet access, and cable telephony. By equipping their fiber/coax networks with switching capability, these competitors can provide competitive local exchange services to both business and residential customers passed by their hybrid networks. Because CATV companies currently have their own network facilities directly serving customer locations throughout their franchise area, they rarely utilize BST unbundled loops to provide their facilities-based local service. Local exchange services are provided almost exclusively through the use of their own networks which are interconnected to BST's public switched network for the exchange of local traffic.

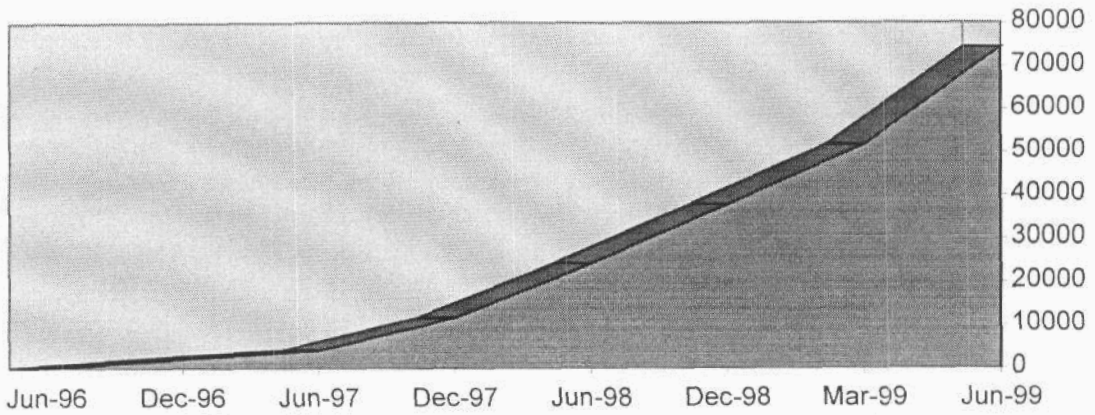
Facilities-based wireless ALECs and PCS providers have constructed their own wireless network transmission and switching facilities to provide local services which compete with BST's wireline local exchange network. These wireless ALECs utilize spectrum, licensed by the FCC, which replaces the need for wireline local loops and require wireline facilities only to connect their transmission towers to their switching location.

Other recent facilities-based ALEC entrants in Florida's competitive local exchange market have constructed their facilities to serve specific customer groups, such as the small to medium businesses located in the suburbs, multi-family dwelling units (MDUs), and large office parks.

As of June 1999, forty (40) wireline facilities-based ALECs were providing approximately 75,000 local exchange service lines in Florida utilizing their own networks. Of these 40, twenty-eight (28) were providing well over the traditional 10 lines used to characterize an operational ALEC.

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Florida Wireline CLEC Facilities-Based Lines



As can been seen in the figure above, facilities-based ALEC local exchange lines have grown substantially, rising from an estimated 50 in-service in June, 1996 to the current figure of just over 75,000.

There are some other useful measures of progress down the path to a fully open competitive local exchange market. Following are some additional "mile markers" on the road to competitive choice in the Florida facilities-based local exchange service market.

Collocation

Once an ALEC has entered into an interconnection agreement with the ILEC, the ALEC may collocate its facilities with that of the ILEC. Collocation is the ability of the ALEC to put its equipment in the ILEC's switching offices and join that equipment to the ILEC's. There are two primary forms of collocation, physical and virtual. Physical collocation is the physical presence of ALEC equipment in an ILEC central office. Physical collocation is available as a caged arrangement, a cageless arrangement, or a shared arrangement. Virtual collocation provides the same functionality as physical collocation but the collocated equipment is owned and maintained by the ILEC. The ALEC installs trunks from its switch and interconnects its facilities to the ILEC's facilities at a specified meet point. By connecting its network to the ILEC's local loop facilities, collocation and interconnection enable the ALEC to reach all of the end users and access lines served by the ILEC switch.

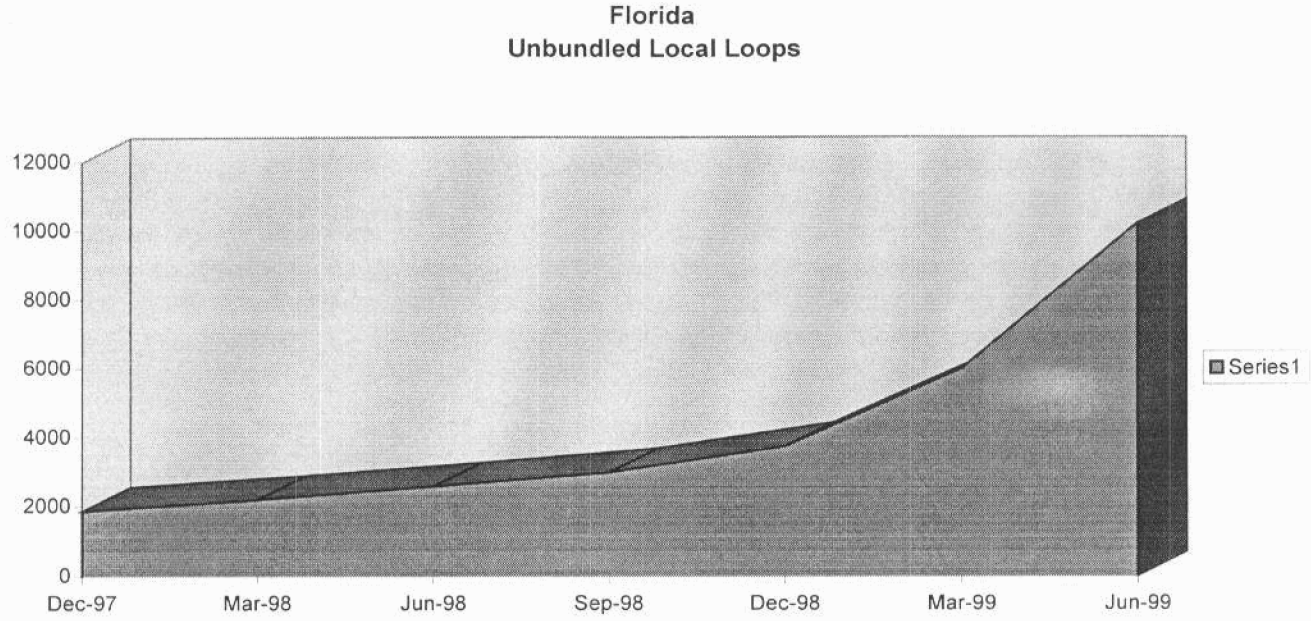
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Collocation provides for efficient access to BST's unbundled local loop offerings. By collocating, a wireline facilities-based ALEC can gain access to all local loop connections for customer locations served by the ILEC switching office.

As of June 1999, thirty-one (31) different Florida ALECs had requested collocation arrangements in 104 different BST central offices throughout the state of Florida. Currently, 96 virtual collocation arrangements and 114 physical collocation arrangements have been completed and accepted by the ALECs. An additional 39 virtual arrangements and 154 physical collocation arrangements have a firm order and are in process. BellSouth has received applications for an additional 11 virtual arrangements and 126 physical arrangements. Exhibit 1, attached to this report, lists the Florida wire centers that have collocation activity.

Unbundled Network Elements (UNEs)

ALECs may purchase various network pieces (elements) from the ILEC in order to serve customers. For example, an ALEC may provide its own switching but need the local loop facility to connect the end user to the switch. In this case, the ALEC can purchase the local loop network component, or unbundled loop, from the ILEC or from another ALEC. Interconnection agreements set forth the policies, procedures, and pricing to which each party must adhere for the purchase of UNEs. There are many other types of UNEs including unbundled ports or switching, unbundled interoffice transport, and access to other ILEC-provided network services like the directory assistance database or the SS7 signaling network. The quantity of unbundled network elements utilized by a facilities-based ALEC indicates a great deal about that ALEC's current local exchange market plans. For example, an active ALEC which serves a substantial number of customers but does not utilize unbundled loops, or relatively few, serves only those customers currently addressable by its own local loop facilities. As discussed above, many facilities-based ALECs have chosen to serve only those customers within close proximity to their own fiber networks which provide the local loop function of connecting the customer's location to the ALEC's switching facilities.



The first Florida unbundled local loop provided by BST was placed in service in 1996 and by the beginning of 1997 there were over 2,000 loops in service. As of June 30, 1999, thirteen (13) wireline facilities-based ALECs had requested and placed in service over 10,000 unbundled network loops in Florida. As shown in the chart above, the number of UNE loops has almost tripled since the end of 1998.

Number Portability

Number portability allows a customer to change from one local exchange service provider to another while keeping the same telephone number. Number portability allows the network to recognize that a telephone number is no longer served by BST's network and to "re-route" the call to the ALEC switch for termination to the customer over ALEC facilities. The quantity of telephone numbers ported to an ALEC is one indication of the number of customers, or local lines, BST loses to facilities-based ALECs.

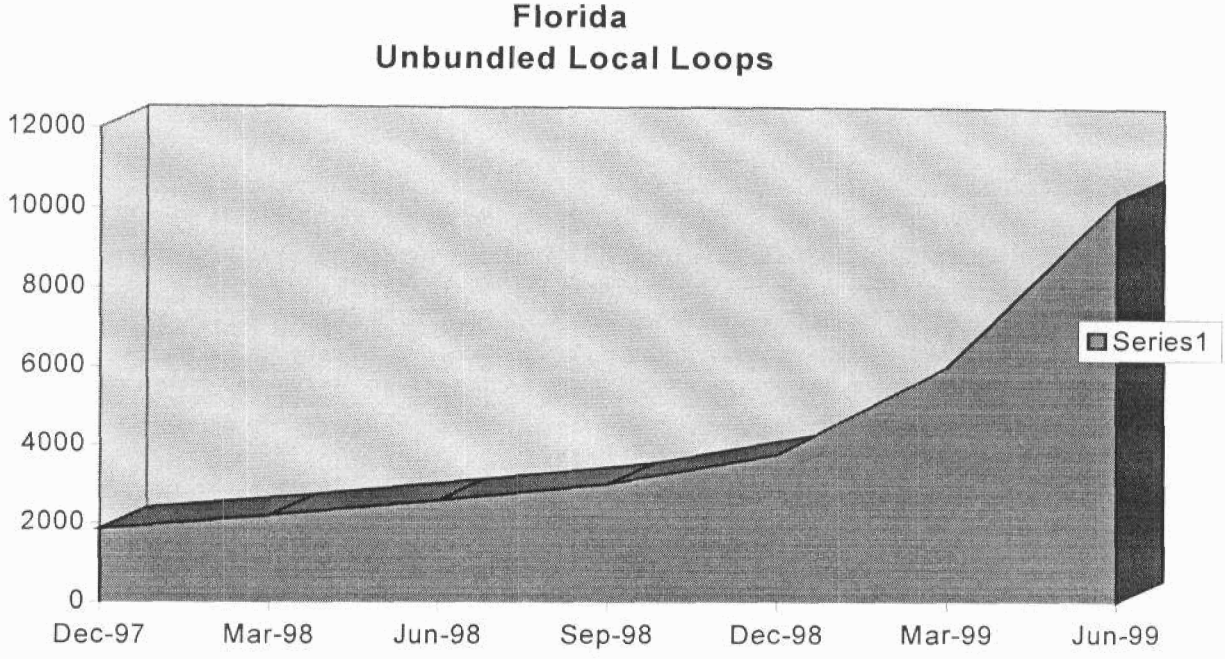
While the number of ported numbers is a useful indicator in measuring the growth of a facilities-based ALEC's customer base, it does not directly reflect the number of actual customers or, in most cases, the actual number of local exchange service lines being provided by that ALEC. Generally speaking, a BST ported residential telephone number may be assumed to represent one residential telephone customer and one residential local exchange service line that has moved from BST to a facilities-based ALEC. However, a growing

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number of residential customers, particularly those targeted by ALECs, have more than one local exchange service line. These customers need only port the telephone number for one line, for example the telephone number currently listed in the directory, while simply call forwarding incoming calls to a second unlisted line which uses a telephone number reserved for the ALEC's customers. This forwarding feature is easily provided by the ALEC's local exchange switch and does not require BST to port a second number.

For business customers, a single ported business number may represent one plain old business line (POTS line, 1FB, etc.) or, as in many cases, it may represent a group of hundreds of local exchange trunks in a rotary hunt group served by one lead number. One business customer may decide to port one telephone number representing numerous local exchange service lines, while another business customer may choose to port several different telephone numbers representing several different lines or groups of lines.

In short, although the actual number of lines BST loses is certainly higher, ported residential numbers generally can be viewed as representing, at a minimum, a one-to-one ratio of one ported number = one residential customer = one residential local exchange service line. By contrast, one ported business number cannot be viewed as losing one business customer = losing one business local line. The number of business local exchange lines being served by a facilities-based ALEC is generally significantly greater than the quantity of business telephone numbers ported to that ALEC by BST.



The first BST-provided number portability services in Florida were initiated during the third quarter of 1996. As of June 1999, BST had ported almost 50,000 business numbers and over 6,000 residential numbers to 26 wireline facilities-based ALECs from BST's Florida network using both interim and permanent number portability methods. As shown in the graphic, since the procedures for permanent number portability were implemented in Florida ported numbers have risen significantly, nearly doubling since the end of 1998.

Numbering Resources (NXX Codes)

To be fully functional as a facilities-based ALEC, the ALEC must obtain its own set of telephone numbers from the Numbering Code Administrator. This allows the ALEC to assign numbers to new or existing customers as they request new lines. Telephone numbers, or central office codes (NXX codes), are assigned to the ALEC in blocks of 10,000 numbers. These NXX codes are assigned within a given NPA, or Area Code. For example, if an ALEC obtained the NXX 555 in the 305 Area Code, it would be able to use all the numbers from 555-0000 to 555-9999 in the 305 Miami metropolitan area. The NPA or Area Code from which a facilities-based ALEC requests to be assigned NXXs is also useful in determining the geographic area the ALEC is targeting. The number of NXX codes within an NPA is indicative of the number of potential customers (10,000 per NXX) the ALEC anticipates serving.

As of June 1999, 32 current and future ALECs had activated or reserved a total of 775 NXX number blocks, or 7,750,000 telephone numbers, for assignment to customers. A list of ALECs and the quantity of their reserved telephone numbers follows.

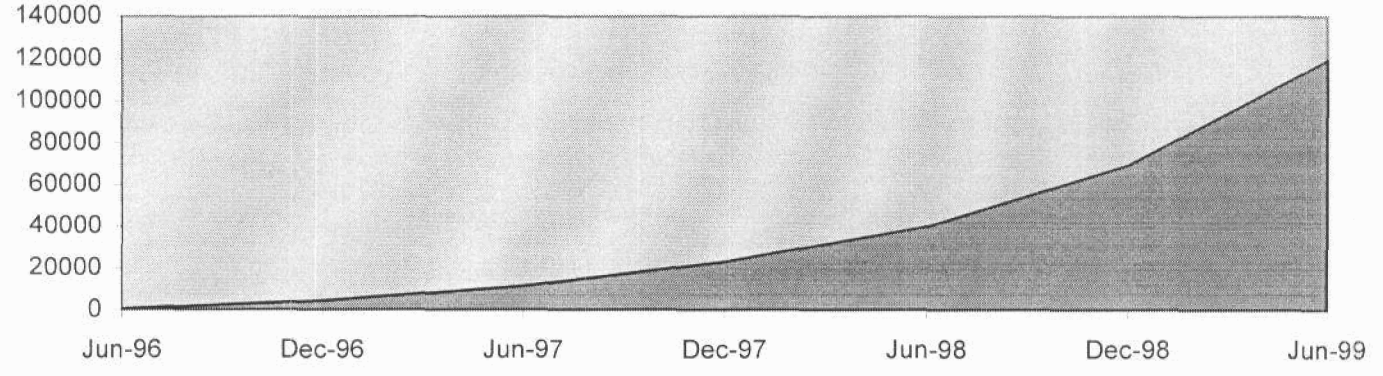
Current Assigned Florida ALEC Numbering Resources

Wireline ALECs	Telephone Numbers
AT&T Local	460,000
Business Telecom	50,000
Daytona Telephone	10,000
DeltaCom	490,000
Eastland of Orlando	10,000
e.spire	280,000
Fla. Digital	260,000
Global NAPS	350,000
Golden Harbor	10,000
Hyperion	100,000
IDS Long Distance	300,000
Intermedia (ICI)	280,000
KMC Telecom	160,000
Knology	30,000
Lakeland Electric	10,000
Level 3 Comm.	60,000
MCI WorldCom	610,000 (includes MFS)
MediaOne	340,000
MGC Comm.	270,000
National Tel	530,000
New South Comm	30,000
NextLink	310,000
North American Tel.	60,000
Orlando Business Tel	80,000
Paetec Comm	150,000
Sprint Metro	130,000
Teleport Comm.	830,000
Teligent	270,000
Time Warner	310,000
Universal Comm	10,000
US LEC	800,000
WinStar	160,000

Local Interconnection Trunks

Local interconnection trunks transport calls from the ILEC's network to customers served by the ALEC's network and vice versa. These trunks connect an ILEC switch to an ALEC switch and provide the interoffice connection function between the telephone networks. Interconnection agreements establish the procedures to which each party must adhere for handling call traffic, including the traffic types and the rate and method of compensation. The number of local interconnection trunks connecting BST's network to ALEC networks is useful in determining how rapidly their traffic is growing.

Florida Local Interconnection Trunks



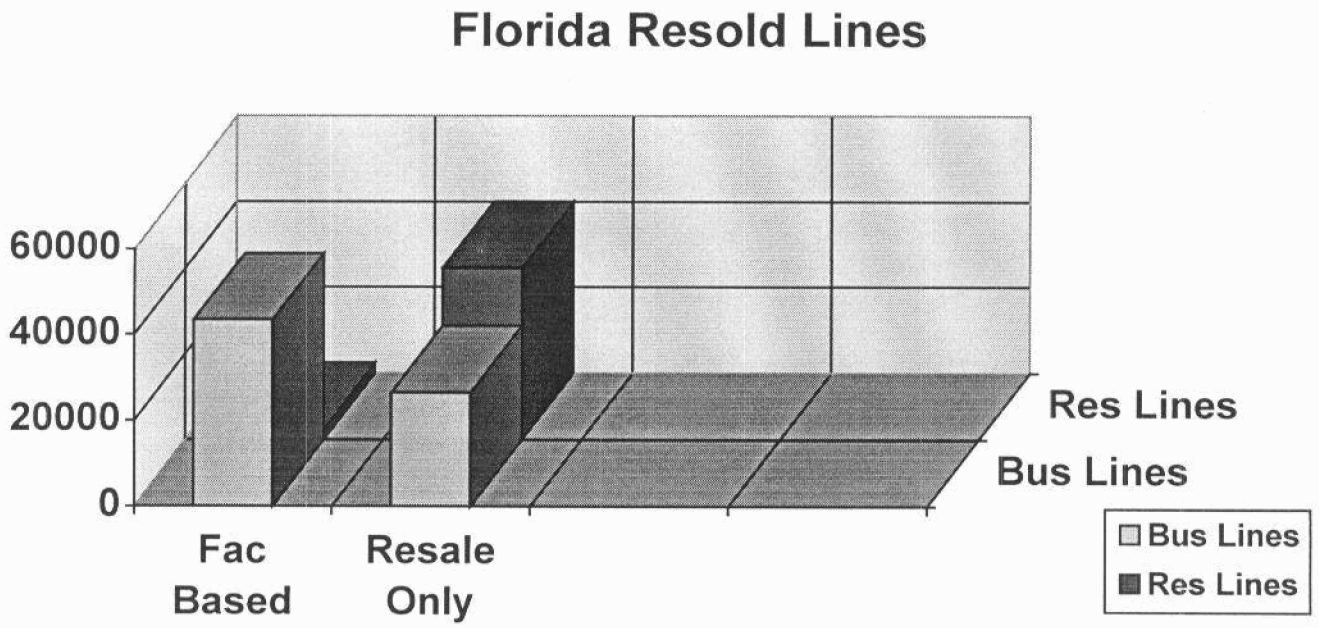
During the late summer and fall of 1996, BST placed in service the first interconnection trunks. As of June 30, 1999, 28 Florida wireline facilities-based ALECs had placed in service approximately 120,000 BST-provided local interconnection trunks for the exchange of traffic between their networks and BST's network.

Other BST-provided services

In addition to the above items, interconnection agreements include the terms and conditions for the BST-provision of many additional services to ALECs. These include, but are not limited to: directory listings; access to poles, ducts, and conduit; access to operator services, directory assistance services, and E911 services; and access to Operational Support Systems (OSS). Exhibit 2 of this report summarizes Florida ALEC activity in some of these areas.

SUPPLEMENTAL RESALE ALECS (Resale and Facilities-based)

Some ALECs take advantage of the opportunity that resale provides to build a customer base prior to making the significant financial investments necessary for the provisioning of facilities-based local exchange services. Some entrants, such as traditional CAPs or facilities-based IXCs, may utilize resale as a low-cost and immediate method to expand their current product and service portfolio to include local exchange services, prior to upgrading their current network facilities and support systems to provide facilities-based local exchange service. Resale also allows current facilities-based telecommunications service providers to test new markets and/or bundled service packages prior to expanding facilities-based offerings, or to fill in other gaps in the service they provide.



As of June 1999, the 40 active facilities-based wireline ALECs were providing 43,493 of the 69,996 resold business lines in Florida and only 2,361 of the resold residential lines in the state. Resale Only ALECs were providing approximately 26,503 resold business lines and 40,095 resold residential lines. As can be seen in the graphic above, a unique distribution of resold lines occurs between current/potential facilities-based ALECs and Resale Only ALECs. Facilities-based ALECs continue to serve business customers almost exclusively whether provisioning such services on a facilities-based or resold basis. On the other hand, resold

residential lines are provided almost exclusively by Resale Only ALECs. Facilities-based providers largely avoid the residential market even when it has proven itself to be a hugely successful market segment for other ALECs. However, unlike every other state in BellSouth's serving area except North Carolina, Resale Only ALECs in Florida are also concentrating much more heavily on business customers, with nearly 40% of their lines being resold to business customers.

RESALE ONLY ALECS (Pure Resellers)

Resale Only ALECs have chosen to enter the market as pure resellers of BST retail services provided to them on a wholesale basis. These ALEC entrants may enter the local exchange service market with virtually no capital outlay (often only a relatively small self-provided investment for advertising, marketing, and backoffice support systems). The resale market entry option offers ALECs a low-cost, low-risk method for entering the local services market.

Pure resellers often bundle their local exchange service offering with other services such as long distance, CATV services, paging, wireless communications, and Internet access. Pure resellers do not have known plans for facilities-based market entry. As of June 1999, 88 resellers, were providing approximately 26,503 resold business local exchange lines and 40,095 resold residential local exchange lines in Florida.

FACILITIES-BASED ALECS IN FLORIDA

As of June 1999, 28 wireline facilities-based ALECs, with over 10 lines, were providing over 75,000 local exchange service lines in Florida utilizing their own networks. Some 10,000 of these facilities-based lines provided wireline local exchange service to residential customers. Following is a brief discussion of a few of the ALECs that are operational in Florida.

MCI WorldCom

MCI WorldCom's facilities-based wireline operation is the result of the recent merger of two of the state's oldest facilities-based CAPs, Metropolitan Fiber Systems (MFS) and MCImetro. MFS had originally operated as a CAP in the Florida market. By acquiring RealCom Office Communications, a business office facility management firm and large national Shared Tenant Services (STS) provider, and Cylix Communications, a major corporate network outsourcing firm in 1994, MFS significantly increased its presence in the large business telecommunications market. In 1997, MFS purchased Internet backbone network service provider UUNET.

On January 29, 1998, MCI WorldCom acquired Brooks Fiber Properties, Inc. (BFP). BFP is a leading facilities-based provider of competitive local exchange services in selected cities within the United States, including Florida.

MCImetro is a wholly owned subsidiary of one of the nation's largest long distance providers, MCI Communications and is certified by the FPSC to offer facilities-based local exchange services. MCI has advertised an MCI One services package promising businesses "one-stop shopping" and a combined single bill for local, long distance, and messaging services. MCImetro, in concert with MCI Communications, has continued to expand its product line as well as its network infrastructure to target medium and small businesses that have not been a part of its traditional CAP customer base.

While it is too early for BST to evaluate the total impact on the Florida local exchange service market of the recently completed MFS WorldCom/MCI Communications merger, both companies have expressed their intent to capitalize on the synergies between their combined network infrastructures across the nation.

MCI WorldCom offers its carrier and larger business customers a full range of HICAP dedicated services including both DS-1 and DS-3 services, and SONET offerings in a range of signal speeds from OC-1 to OC-48. Larger, more traffic intensive business customers are provided facility-based wireline local exchange services utilizing these same HICAP facilities.

MCI WorldCom has signed contracts for use of WinStar's Wireless Fiber services. These leased 38 GHz wireless DS1 and DS3 services immediately and dramatically expand the addressable direct connect footprint well beyond MCI WorldCom's current fiber routes without the need to construct new fiber facilities. BST has not yet assessed what synergies MCI WorldCom may realize by interconnecting its fiber facilities to the extensive network and switching infrastructure operated by its IXC parent in the Florida market or the possible synergies from its plans to combine the MFS and MCImetro networks. The combined networks will increase dramatically the combined companies' facilities-based footprint throughout the state.

MCI WorldCom maintains it is "the largest and leading national provider of competitive access and local private line telecommunications services for business and government". MCI WorldCom offers a wide variety of voice, data, and video access services to its customers and prides itself on competing head-to-head with ILEC offerings on price, availability, performance

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standards, technological superiority, and customer service. To encourage business customers to send voice or data traffic using only the MCI WorldCom network rather than several phone networks, MCI introduced a service called On-Net. This service gives business customers incentives to combine their telecom services utilizing MCI WorldCom's local service facilities. Under On-Net, both ends of a call must terminate on an MCI WorldCom network.

In addition to the provision of retail services and wholesale long distance, MCI WorldCom announced that it would enter the wholesale market and begin to offer nationwide local telephone service for resale by carriers and resellers. Although initially local switched and private line service will be offered in select cities, MCI plans to have the service available in all domestic locations where MCI WorldCom owns local facilities during 1999.

Intermedia Communications Inc. (ICI)

Intermedia is a competitive local exchange competitor, headquartered in Tampa, Florida, that offers integrated telecommunications services to business and government customers throughout the Southeastern United States. The company also offers frame-relay, ATM, internet service, and local and long distance services. The company obtained its first state certification from the FPSC on October 31, 1995. ICI has interconnection agreements with BellSouth in all of its nine states.

At the end of the first quarter 1999, ICI's network infrastructure included over 376,000 local access line equivalents, 23 operational voice switches – 5 in Florida, 167 data switches – 15 in Florida, 855 route miles, and over 43,000 fiber miles. ICI had 4,359 buildings connected to its network. As of December 31, 1998, the infrastructure enabled ICI to address $100 billion of a $237 billion market opportunity.

In 1998 ICI completed a number of acquisitions. Shared Technologies Fairchild was purchased. Fairchild provided turnkey PBX and key system solutions throughout the U.S. The Long Distance Savers Group (LDS) group of companies, also purchased during 1998, was a regional inter-exchange carrier providing service to customers in several states including Florida.

In May 1998, ICI completed its acquisition of National Telephone Company of Florida, operating in Florida under the name National Tel. At the time of acquisition, National Tel provided competitive local exchange and long distance voice services to more than 11,000 business customers concentrated in Florida's major markets. With this acquisition, Intermedia

became the fourth largest provider of local exchange services in Florida based on access lines, exceeded only by BellSouth, GTE, and Sprint.

ICI's resale market entry focused largely on medium and small businesses. An ICI small business package bundled resold local exchange service with ICI-provided long-distance services, Internet access, and other optional telecommunications features. This "one-stop-shopping" approach led to significant market gains by ICI in the medium and small business market.

ICI's facilities-based offerings are targeted primarily at larger customers that can combine local exchange service, long distance access, and data transport needs on an ICI-provided digital facility of DS1 bandwidth or greater. Intermedia is offering Comactiv, a service of integrated services delivered to the customer's doorstep. A Comactiv building is one equipped with an electronic nervous system acting as a portal to the voice-data-video-Internet networks.

ICI remains committed to expanding its rollout by broadening its current facilities-based footprint and expanding its current facilities-based product and service offerings to Atlanta area customers. BST expects ICI to continue to expand its Florida facilities-based operations, gaining new customers and continuing to convert current resale customers to its facilities-based offerings.

Teleport Communications Group (TCG)

Teleport, the nation's oldest and largest competitive local telephone service provider, concentrates on business customers, and by early 1998 anticipated having local phone service available to 70% of the nation's business market. TCG is a New York-based company that called itself "The other local phone company".

In mid-1998 TCG merged with AT&T. At the time of the merger, TCG had an existing 450-mile fiber route in South Florida, from, at least, Miami to West Palm Beach. Teleport, with its Florida headquarters in Fort Lauderdale, also proposed to open offices in Orlando and Tampa. TCG's announced target market was small- and medium-sized business customers – those with 10 to 10,000 lines – whom it hoped to disconnect from BellSouth. Teleport also announced plans to offer local service to select large apartment and condominium complexes, making it BellSouth's first competitor in the residential market.

MediaOne

MediaOne operates an extensive wireline facilities-based network in Florida. MediaOne, until June 1998 a wholly owned subsidiary of US West Media Group, was spun off as its own independent company. After a bid for takeover by Comcast was withdrawn, MediaOne, the nation's No. 3 cable company, entered into an agreement on May 6, 1999 to become a part of the AT&T family of companies.

While originally active in the Florida market as a CAP providing dedicated access and private line services to large business and carrier customers, MediaOne expanded its area network infrastructure to provide facilities-based HICAP services to medium and small business customers. Additionally, it expanded its offerings through its association with the U S West Interprise Networking Group to include advanced HICAP service offerings, such as LAN Interconnection, Frame Relay, and Asynchronous Transfer Mode (ATM) access and transport services.

At year-end 1998 MediaOne had approximately 10,000 route-miles, 360,000 fiber miles, in service. In Florida, 2,000 of these route-miles were in the Jacksonville area. MediaOne also had a Lucent 5ESS switch operational in the Jacksonville. In total, MediaOne had 6 voice switches operational, and an additional 6 switches planned. In the data network, MediaOne had operational networks in 11 markets, including Jacksonville, Lighthouse Point, Naples, and Pompano, Florida.

MediaOne is certified by the FPSC to provide facilities-based local exchange services. Since its initial phase rollout of residential facilities-based local exchange service to single-family homes along its hybrid fiber/coax network began in the first quarter of 1998, MediaOne has reportedly achieved between 7-10% penetration of homes where it currently makes the service available. .

e.spire Communications (formerly ACSI)

e.spire, previously American Communication Services, Inc., a Maryland company, was founded in 1993. e.spire's business strategy is to offer high quality local telephone service in second- and third-tier markets where the competition from larger phone companies like AT&T and MCI is less. e.spire used fiber optic networks where the Bell System has typically deployed copper systems.

e.spire has been granted authority by the FPSC to provide local exchange services in Florida. They have one of the earliest approved interconnection agreements with BellSouth. e.spire began providing facilities-based competitive business local exchange services in Jacksonville during the middle of 1996 and is currently also serving in several other markets in the state.

During the first quarter of 1999, e.spire took another step toward integrated product lines by launching digital subscriber line (DSL) in New York and Washington. The company will work with Covad Communications to provide the service, enabling e.spire to offer DSL in additional locations as Covad expands its footprints later in 1999. Covad is also currently certified to do offer local exchange services in Florida, which should insure e.spire additional locations in a reasonably short timeframe.

In January 1999, e.spire announced a national buildings agreement with U.S. RealTel, Inc., the landlord for over 6,500 pre-leased telecommunications access sites. The contract specifically allows e.spire to access buildings in U.S. RealTel's portfolio based on a pre-negotiated Master Sublease. e.spire will expand its customer base by focusing on U.S. RealTel buildings that can be economically connected to its local network.

Since its creation, e.spire has leveraged strategic relationships with IXCs, CATV providers, and electric utilities to construct and operate its networks. On March 6, 1997 e.spire announced a 5-year agreement with MCImetro that names e.spire as MCI's preferred local provider for dedicated access and transport services in 21 e.spire markets, including Florida. The agreement allows MCI to purchase loop transport services from e.spire in markets where e.spire is collocated with the ILEC and where MCI has deployed its own local switching facilities. The agreement also establishes terms and conditions for the resale of e.spire facilities-based local switched services under the MCImetro brand name. MCImetro has contracted with e.spire to assist in the construction of e.spire's fiber networks and owns warrants to purchase close to one million shares of common stock at a fixed price. e.spire also has "preferred provider" agreements with AT&T and other IXCs. Also, in a recent agreement signed with Hyperion, e.spire will receive capacity on Hyperion's fiber optic network between West Palm Beach, Florida and Miami. In exchange, e.spire has licensed to Hyperion the use of dark fiber in 14 metropolitan areas, including Tampa, Florida. Hyperion said the agreement would accelerate its entry into the new markets.

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Business Telecom Inc. (BTI)

BTI is a Raleigh-based firm that was formed 16 years ago at the beginning of competition in the long-distance industry. The company, now also selling local service in the southeast, has spent millions of dollars on fiber-optic networks and telephone switches in order to expand beyond the southeast. The company has not been shy about attacking BellSouth. A fairly recen ad campaign included full-page ads that read "All The Bells And Whistles Without Paying Extra For The Bell."

BTI is building a 3,400-route mile fiber optic network from New York City to Miami and from Atlanta to Nashville. At the end of the second quarter 1999 the 1,200 miles were in service, extending between New York City and Atlanta, Georgia. The entire 3,400-mile network is scheduled to be deployed in phases through the end of 1999.

BTI ended the second quarter with over 75,000 local access lines, and increase of 12,000 from the prior quarter. BTI claims that approximately 19% of these lines are facilities based, compared to just 3% a year ago.

Since the first quarter of 1999, BTI activated Lucent Technologies 5ESS 2000 switches in Wilmington, NC, and Jacksonville, FL. This brings the total number of switches owned and operated by BTI to nine for local service, including machines in Jacksonville and Orlando, FL. To date, BTI has deployed 48 Digital Loop Carriers (DLCs) collocated in ILEC offices.

NextLink Communications, Inc.

NextLink Communications, Inc. is a nationwide competitive local exchange carrier that offers switched local and long-distance services over its fiber-optic network. The company also offers non-network interactive voice response products and dedicated transmission and competitive access services to long distance end users. NextLink announced its plans to initially enter the Florida market in Miami by 1999. NextLink markets its services to firms with 50 lines or fewer in order to avoid direct competition with Baby Bells.

NextLink's goal is to install and operate 21 million business lined by the end of 1999. By the end of the year 2000, NextLink hopes to develop networks throughout the majority of the nation's top 30 markets and increase the number of addressable business lines in markets served by NextLink to 27 million.

ITC DeltaCom

ITC DeltaCom is a subsidiary of Georgia-based ITC Holding Co. and is a regional long-distance company in the southeast that has traditionally focused on the business market. As of May 1999, ITC DeltaCom reaches 8 of the 9 states in the BST region using a regional fiber-optic network. ITC DeltaCom also offers Internet access through MindSpring Enterprises Inc., another subsidiary of ITC, and Viper, a leading Internet access provider in the Southeast acquired by ITC DeltaCom in June 1996. The current ITC DeltaCom network comprises over 7,800 miles of fiber-optic cable and spans the Carolinas, Florida, Florida, Alabama, Mississippi, Florida, Tennessee and parts of Texas and Arkansas. Of these miles, approximately 4,150 are company-owned and operated and approximately 3,650 are owned and operated principally by three public utilities, including Florida Power & Light. As of December 31, 1998 ITC DeltaCom provided retail services to approximately 10,700 business customers in its 22 metropolitan areas and had sold approximately 42,000 access lines. The company offers local service in 20 of its 22 markets in Alabama, Florida, Mississippi, North and South Carolina, Florida and Louisiana. ITC DeltaCom intends to add approximately 700 network miles in 1999, as well as additional self-healing rings, and expects to extend its presence to 30 markets. ITC DeltaCom currently maintains 80 POPs in the Southeast US, including several in Florida.

ITC DeltaCom has constructed a series of SONET-rings along its fiber routes in order to provide HICAP access and transport services. Eventually, the company plans to offer access services to all 44 LATAS in the BellSouth region. The regional fiber network delivers digital telecommunications long haul transport at DS3 bandwidths and above to other carriers and large corporate customers. Its dedicated access offerings are delivered in a variety of options from DS1 to OC-3. The company also has 64-port Signal Transfer Point (STP) systems in mated pairs within its network, allowing customers to have access to Signaling System 7 (SS7) functionality.

ITC DeltaCom's parent, ITC Holdings, also owns interests in several other BellSouth competitors including InterCel, a wireless PCS provider doing business under the PowerTel brand name; Knology Holding Company (formerly CyberNet Holding) which owns and operates CATV properties and facilities-based ALEC operations in Florida; and Globe Telecommunications which also provides facilities-based services.

InterCel, Inc. owns and operated cellular telephone systems in an FCC licensed service area with a population of over 260,000, covering approximately 2,900 square miles. PowerTel is the brand name for the digital personal communications services (PCS) that cover portions of 10 southeastern states.

Knology Holding Company owns and operates CATV franchises under the Knology brand name. Knology has been offering residences discounted cable services and facility-based local exchange services when they purchase ITC DeltaCom long distance and/or select MindSpring as their ISP. Knology is certified separately as a facilities-based provider in Florida.

KMC TeleCom

KMC Telecom, Inc. (KMC) is a wholly owned subsidiary of Kamine Multimedia Corporation, which is an affiliate of Kamine Development Corporation. KMC currently provides facilities-based competitive local exchange services using a 45-mile fiber optic network in Brevard County, reaching more than a dozen cities on Florida's "Space Coast", including Melbourne, Palm Bay, and West Melbourne. Although not a BellSouth serving area, KMC also has a 27-mile fiber optic ring in Tallahassee. This SONET-ring circles through primary business, government, educational and other areas. KMC offers a wide range of high-speed data, video, dedicated access and transport services, as well as facilities-based local exchange service.

AT&T Local Services

In June 1996, AT&T's Chairman Robert Allen announced an aggressive plan for AT&T entry into the local exchange market by stating that the company would have "20% of the market by the year 2000," and eventually have one-third of local traffic. AT&T talked of plans to offer a "bundled service package" of local, long-distance, PCS, cellular, Internet access, and DBS entertainment services. AT&T reportedly was considering a number of options to facilitate rapid market entry including resale of ILEC services, building its own facilities, using its wireless facilities, partnering with CAPs, and partnering with CATV companies.

During the first half of 1996, AT&T announced agreements with e.spire, Brooks Fiber, Hyperion Telecommunications, ICG, and Time Warner Communications to resell facilities-based local services and to utilize their networks for delivery of AT&T local services in 70 major markets nationwide.

In July 1998, AT&T acquired the Teleport Communications Group (TCG) operations in Norcross, a northern Atlanta suburb, which were themselves in the early stages of facilities-based local market entry. TCG's sales strategy also targeted the business community, typically approaching potential customers with the idea of acquiring 50% of their critical voice and data communications transmissions. AT&T is incorporating all TCG's services into its offers for businesses nationwide.

In May 1999, in a deal to acquire all of the assets and liabilities of MediaOne, the nation's No. 3 cable company, AT&T established itself as a leading carrier in the cable TV market and possibly one of the nation's largest providers of local phone service. MediaOne provides facilities-based services to both business and residential customers.

With its recent acquisitions and mergers, BST is not sure how AT&T's additional entry into the wireline local exchange market in Florida will be affected. It may be that, other than gaining existing residential customers, AT&T's apparent strategy will not change. It will continue to make no serious attempt to enter the residential wireline local exchange market in Florida or elsewhere in the BST region until forced to do so by market conditions brought about by BST's entry into the interLATA telecommunications market.

MGC Communications

MGC Communications targets small business and residential customers with a facilities-based bundle of local and long distance telecommunications services. Like US LEC, MGC Communications relies on leased facilities provided by other ALECs, CAPs, and IXCs in addition to facilities provided by BST.

US LEC

US LEC operates as a facilities-based ALEC in Florida, certified by the FPSC to provide local exchange and long distance service. The company focuses its primary sales efforts on telecommunications-intensive businesses, universities, financial institutions, hospitals, hotels, government agencies and other telecommunications companies. US LEC leases network transport and interconnection facilities from BST, as well as other CAPs and IXCs, thereby reducing the up-front capital expenses required to enter new markets. As of December 31, 1998, equivalent access lines had increased from 49,229 at year-end 1997 to 199,578. At the end of the first quarter, 1999 US LEC had 12 operational switches in several markets, including Orlando, Miami, Jacksonville, and Tampa. US LEC utilizes a "smart-build" strategy of

purchasing and deploying switching equipment and leasing the required fiber optic transmission capacity from CAPs, other ALECs, and ILECs. US LEC connects to its business customer base utilizing DS1 facilities while providing interconnection with other CAPs and IXCs at DS3 interface levels.

WinStar Wireless Communications

WinStar Wireless, a wholly owned subsidiary of WinStar Communications, provides a number of telecommunications services, including long distance through its Telecommunications Group, and wireless HICAP services through the Wireless Group, to businesses in the Florida market. In 1994, WinStar Communications acquired Avante-Garde Telecommunications (AGT) and the rights to its 30 licenses in the 38 GHz bandwidth. Wireless Fiber is a digital wireless service that functions on a line-of-sight basis for up to five miles. The radio receivers are located on the roofs of buildings or on towers. WinStar offers wireless dedicated access services as well as point to point private line DS1 or DS3 links to other CAPs, IXCs, and directly to large corporate and institutional users, like MCImetro and MFS.

During the fourth quarter 1996, WinStar announced an expansion of its product portfolio to include switched access services, business local exchange services and long distance service, and began direct marketing to medium and small businesses as a "single source for telecommunications services".

Future Florida Wireline Facilities-based ALECs

In addition to the 28 currently operational wireline facilities-based ALECs in Florida, many more have announced their intentions to construct and operate network facilities for providing facilities-based local exchange services to Florida telecommunications customers in 1999. The following is a brief outline of the announced plans and current progress of some of the ALECs that had taken actions to enter the Florida market before the end of 1998. It in no way includes details of each and every potential Florida wireline facilities-based competitor.

Frontier Local Services

Frontier Local Services, Inc. is a wholly owned subsidiary of Frontier Corporation of Rochester, NY. Utilizing its own switching facilities, Frontier offers facilities-based local exchange and long distance services primarily to business, governmental, and multi-family residential customers. Customer connection and transport facilities are leased from other ALECs, IXCs, and provided by BST as UNEs.

Level 3 Communications

Level 3 Communications is a wholly owned subsidiary of Peter Kiewit Son's Inc., the founders of MFS. In January 1998, Level 3 Communications announced plans to build and operate the nation's first IP protocol telecommunications service network to offer full service local exchange and long distance services end-to-end. During the first half of 1998, it obtained right-of-way agreements and rapidly constructed its nationwide intercity fiber optic network to link local exchange switches in major markets.

NorthPoint Communications

NorthPoint Communications refers to itself as the "National Data ALEC". NorthPoint's business model involves partnering with other local ALECs, ISPs, and broadband data service providers to connect business customers over NorthPoint's digital IP-based loop, transport, and switching facilities. NorthPoint offers high quality wholesale IP-based telecommunications services to other providers and directly to business end users over ADSL or SDSL leased loop facilities.

FLORIDA WIRELESS LOCAL SERVICE COMPETITION (PCS)

During the initial expansion of wireless cellular services into the general telecommunications services marketplace, the new mobile services could be viewed as primarily complimentary adjunct services to traditional wireline service offerings. With the exception of isolated applications, primarily in the business and industrial market sectors, wireless services generally did not totally replace end-user reliance on copper-based wireline communications. However, as wireless services have evolved from the analog cellular duopoly to multi-provider digital offerings and even newer PCS spectrum-based services, the price performance, grade of service, transmission quality, and available coverage areas of wireless based communications have improved dramatically, to the point that, for an increasing number of users, these wireless services offer a real competitive alternative to traditional wireline communications.

Indeed, recent TV, radio, and print advertisements increasingly hammer home such marketing slogans as "with a rate plan so good its the only phone you'll need" (AT&T's new Digital rate plan for PCS). A PowerTel PCS service radio ad airing in Atlanta ended with a father's relief at learning that his daughter has called surrounding states not via traditional wireline long distance, but rather using PowerTel flat rate long distance service ($15 monthly

for unlimited long distance calling within PowerTel's 12 state PCS service areas). Another national TV ad depicts Dad using a wireless phone because someone is on the phone in the house. Clearly, new facilities-based wireless providers such as PCS providers see wireless as a viable replacement to traditional wireline local services, wireline long distance services, and second residential lines. AT&T is now also offering reductions in its wireline service as part of its One Rate Plan.

CONCLUSION

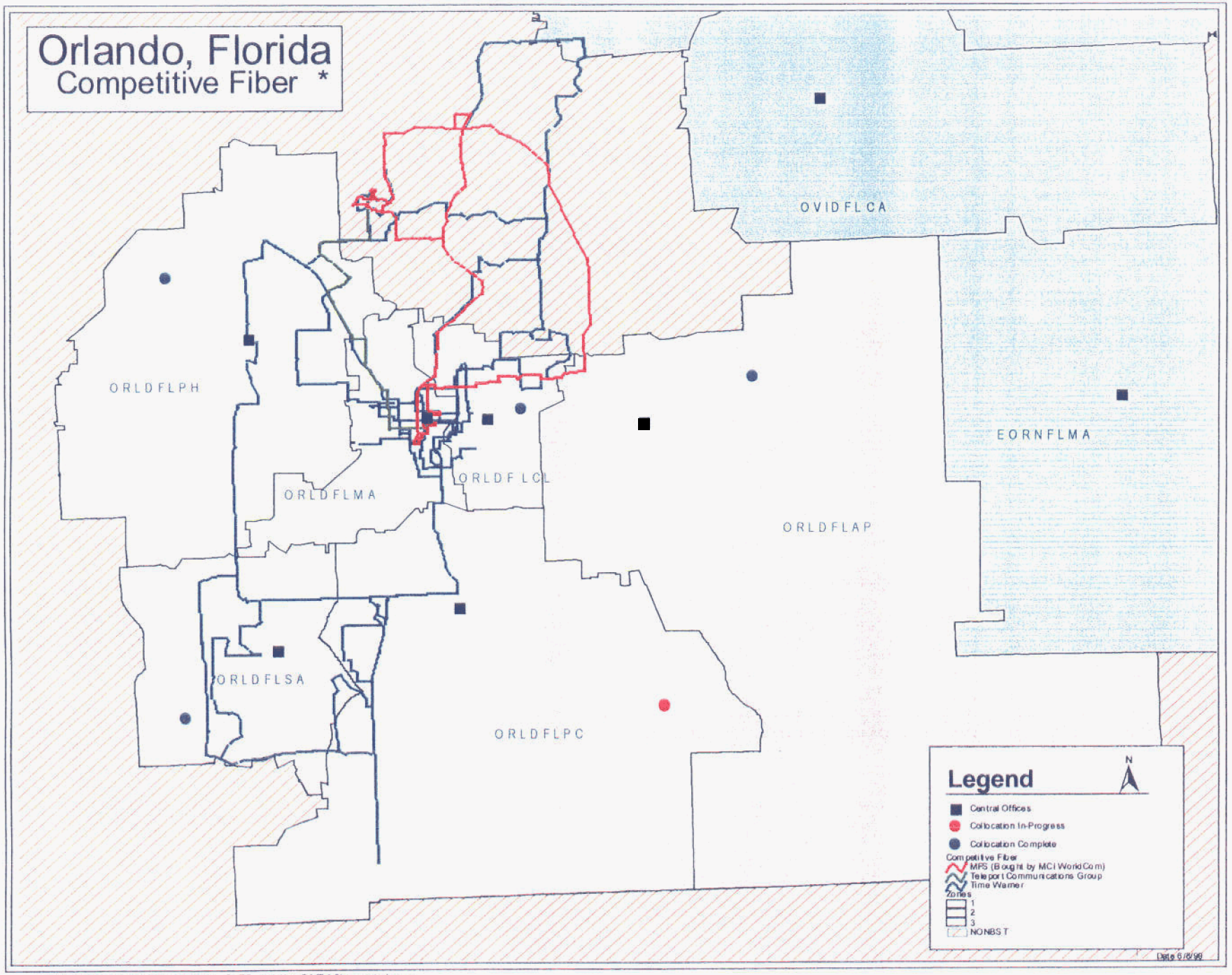
Florida's local exchange market is currently open to competition on facilities-based and resale bases to both wireline and wireless competitors. This report demonstrates the successes achieved to date by the Florida Public Service Commission, BellSouth, the FCC, and the ALEC industry in bringing competitive choices to the people of Florida. A strong statewide infrastructure is in place. Multiple local networks are in operation in Florida's major business centers. ALECs have invested, and continue to invest, hundreds of millions of dollars in their own facilities as well as teaming, cooperating, and sharing network infrastructure and capacity with other ALECs to assure their combined success. Microwave, fiber, PCS, coaxial cable, and other technologies in use provide statewide facilities-based coverage capable of competing for the vast majority of BST's current Florida local exchange service customers. BST has provided Florida ALECS nondiscriminatory access to its statewide network facilities and services in order to assist them in delivering services over their own network facilities; using their network facilities in combination with elements of BST's network; and through the resale of BST provided retail service offerings.

Strong, well funded and highly successful ALECs, both wireless and wireline, have flocked to Florida and more are entering the market on a regular basis. CATV companies and CAPs have increased their substantial revenue streams by adding business and residential local exchange services to their product offerings. ALECs bundle facilities-based and resold local exchange services for all customers into packages that include long distance, Internet access, wireline and wireless services, and other enhanced telecommunications services.

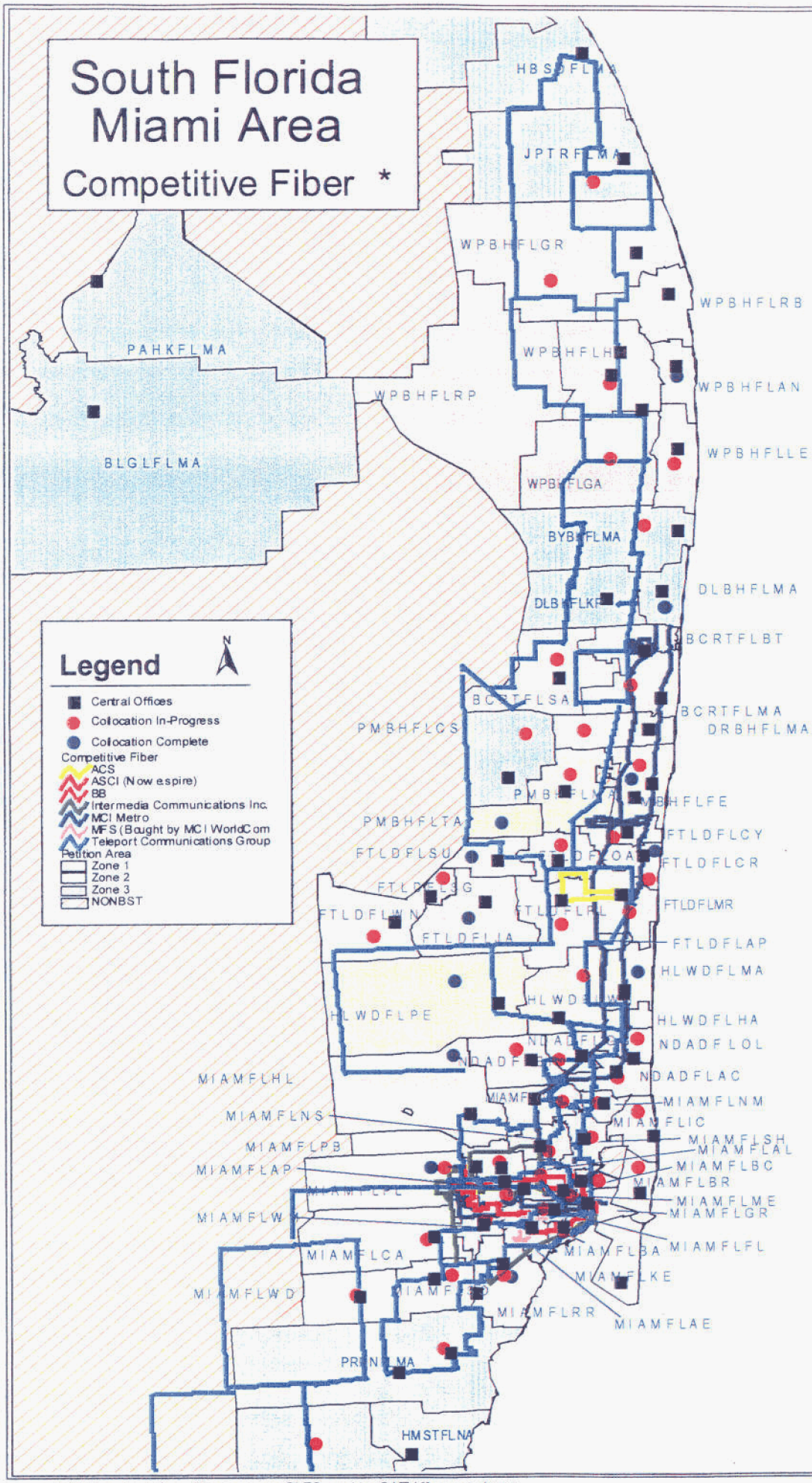
Competition is widespread throughout the state. Wireline competitors currently provide local service to over 200,000 business and residential lines and customers. ALECs also provide additional local exchange line equivalents over dedicated facilities which have not been reported as local exchange service lines in this analysis but, as the hunger for greater

bandwidth grows among business and residential customers alike, clearly replace traditional switched local exchange services at an ever increasing rate. Cable modem service, dedicated access services to the Internet or interstate long distance carriers continue to replace traditional switched local exchange service daily across the entire state of Florida. In the intraLATA toll market alone, BST has lost over **a million** Florida customers who have selected a competitor as their intraLATA long distance service provider. Wireless services increasingly replace traditional wireline local exchange services. The Florida local exchange service market is, without question, irreversibly open to competition.

EXHIBIT 1



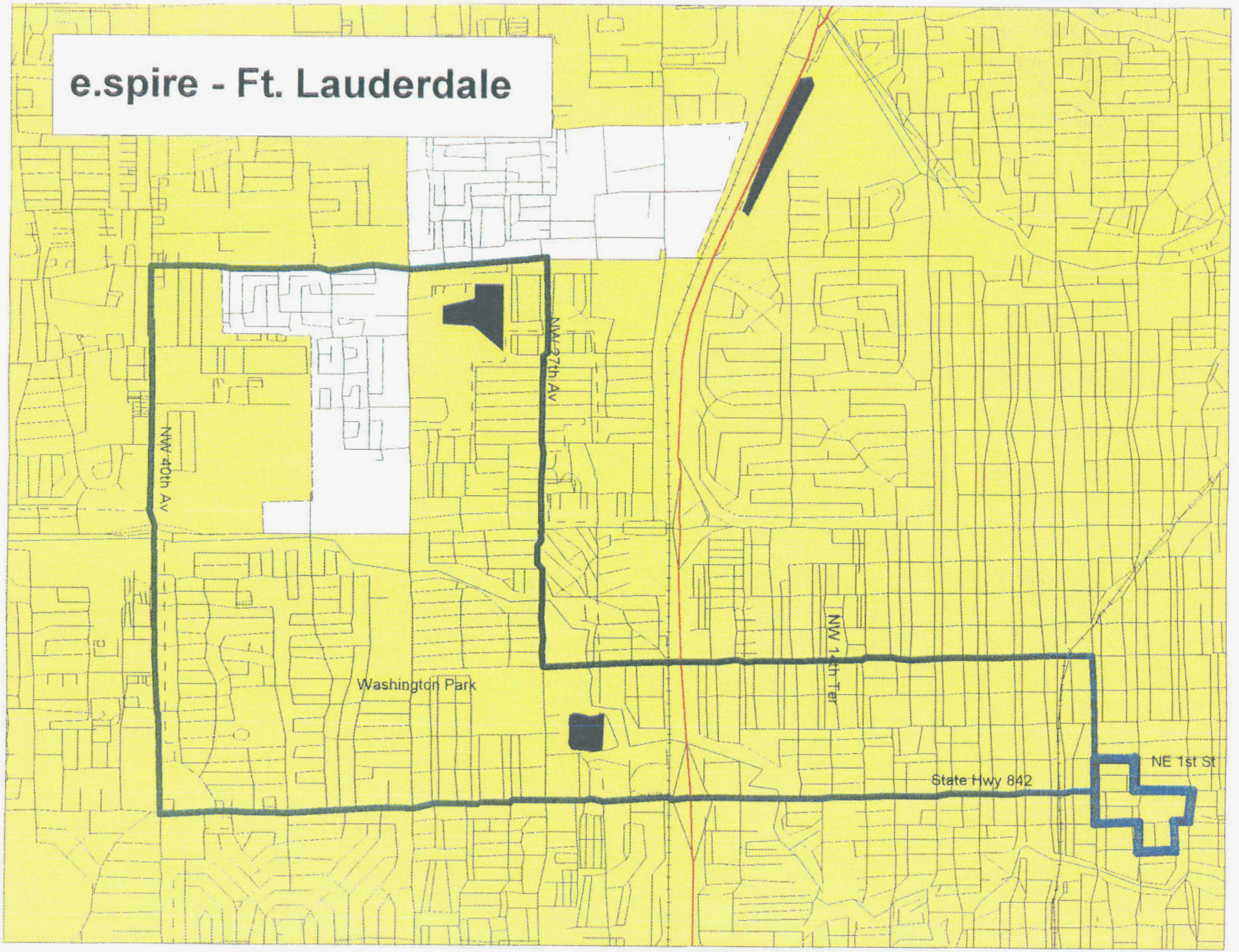
* Additionalexisting utility company, CLEC, and/or CATV fiber not shown

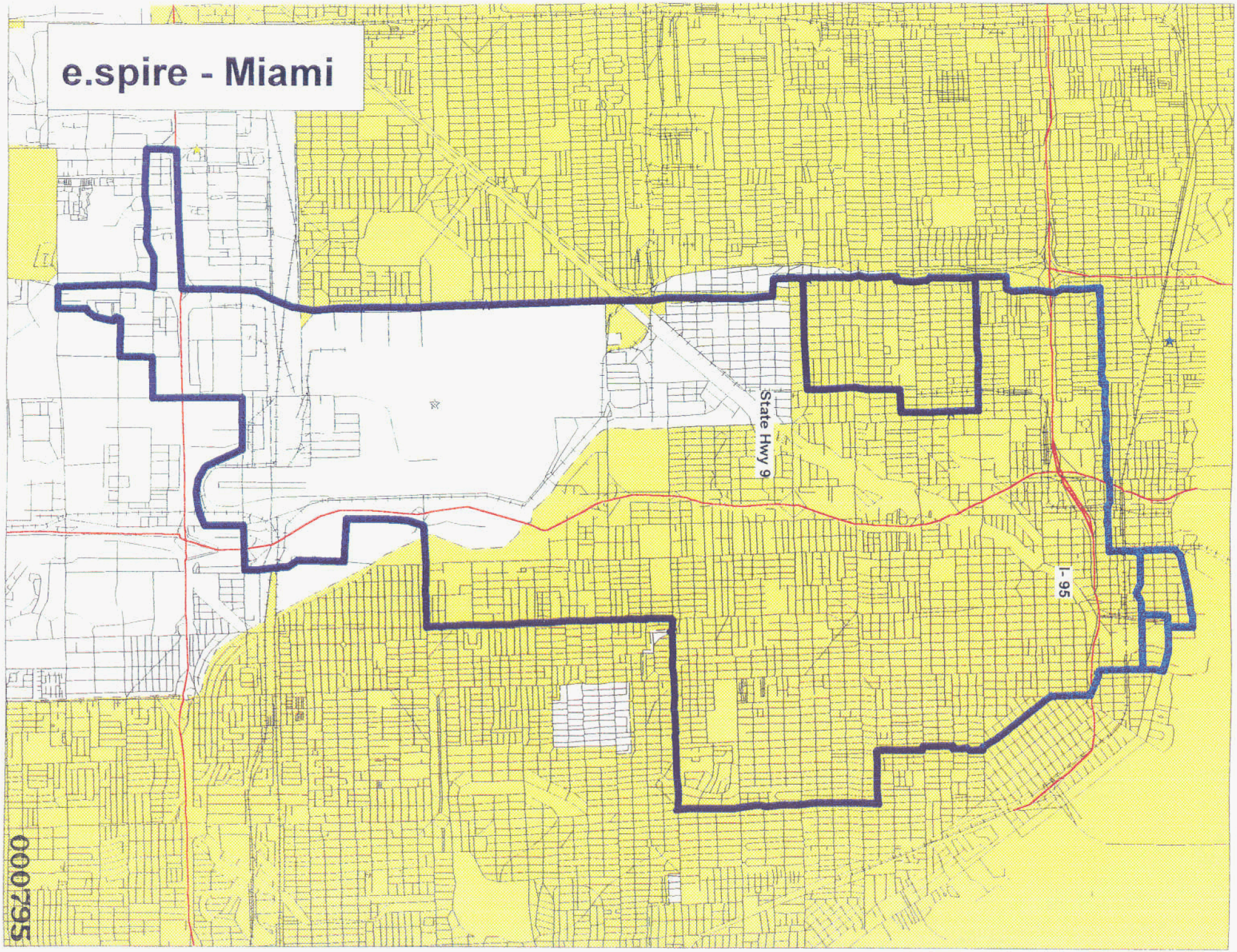


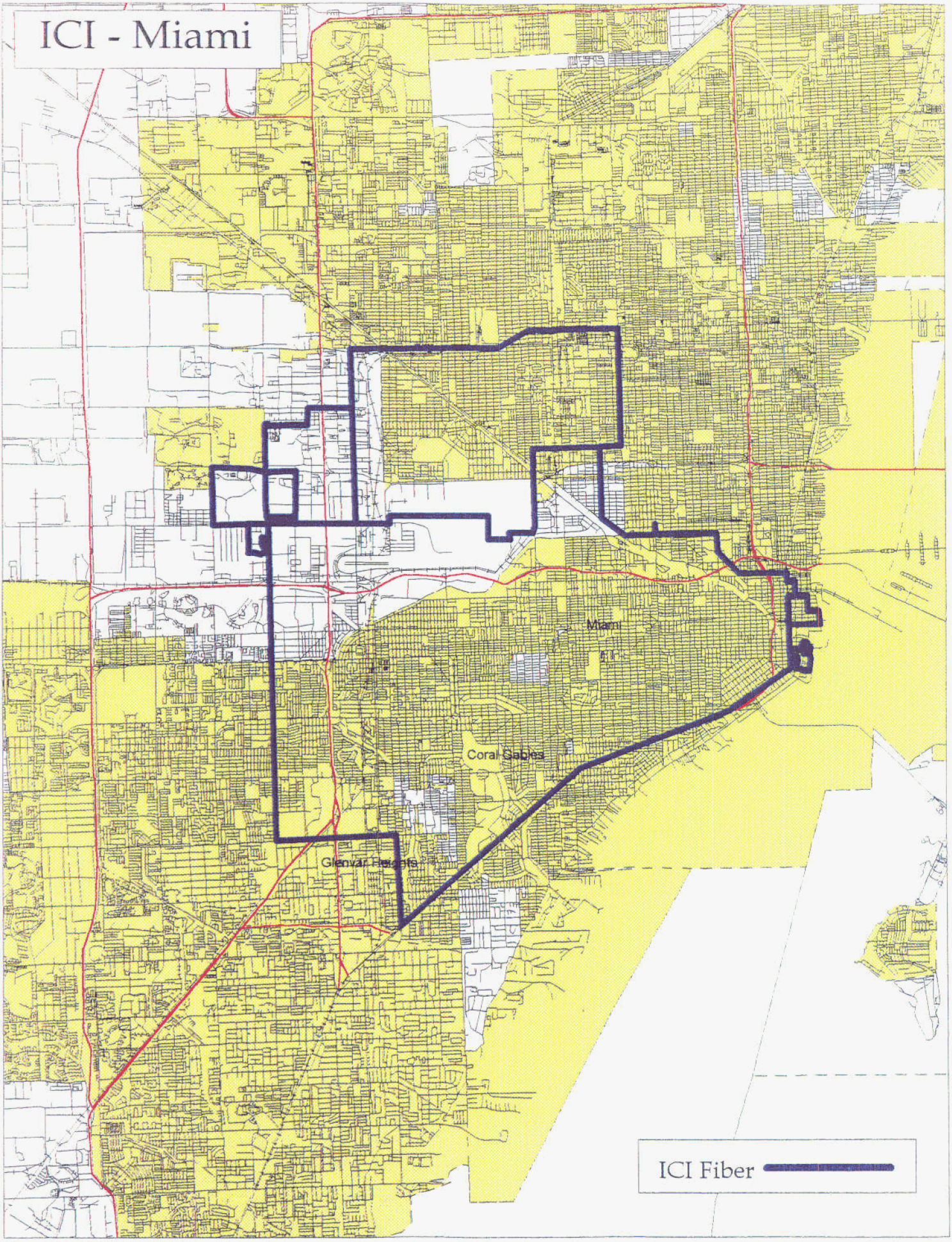
Date 6/9/99

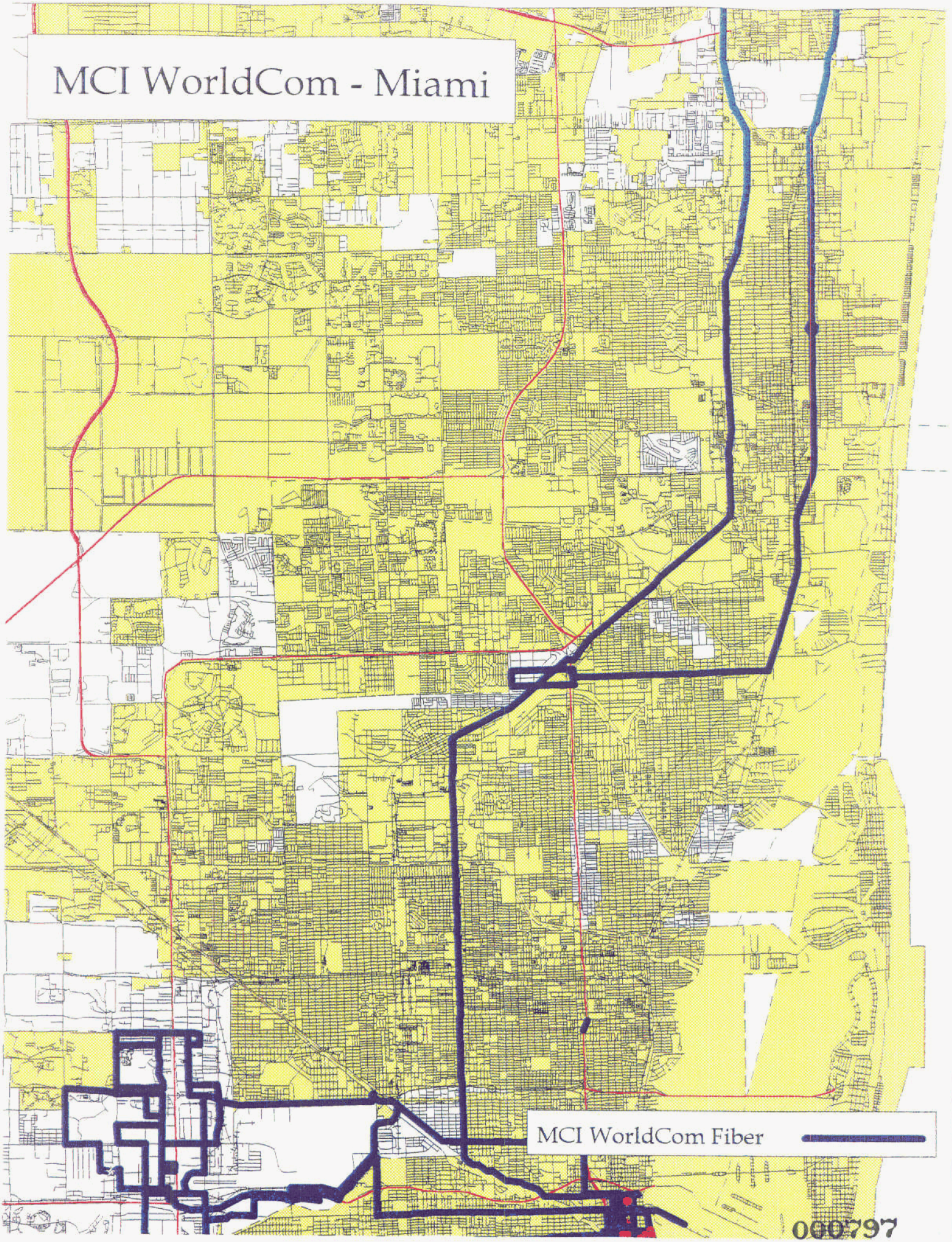
* Additional existing utility company, CLEC, and /or CATV fiber not shown

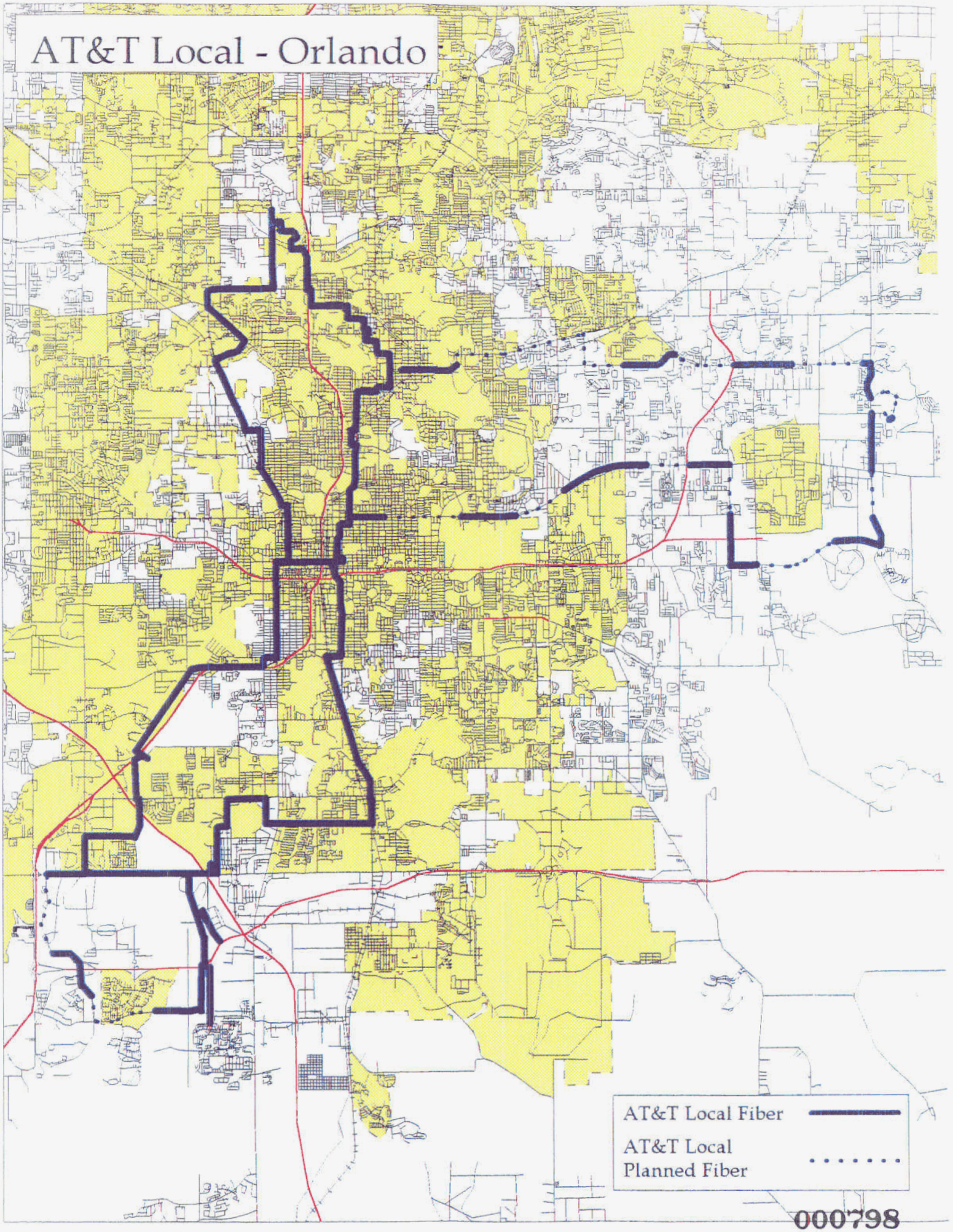
C00793


e.spire - Ft. Lauderdale
NW 40th Av
NW 37th Av
NW 14th Ter
Washington Park
State Hwy 842
NE 1st St


e.spire - Miami
State Hwy 9
I- 95
000795

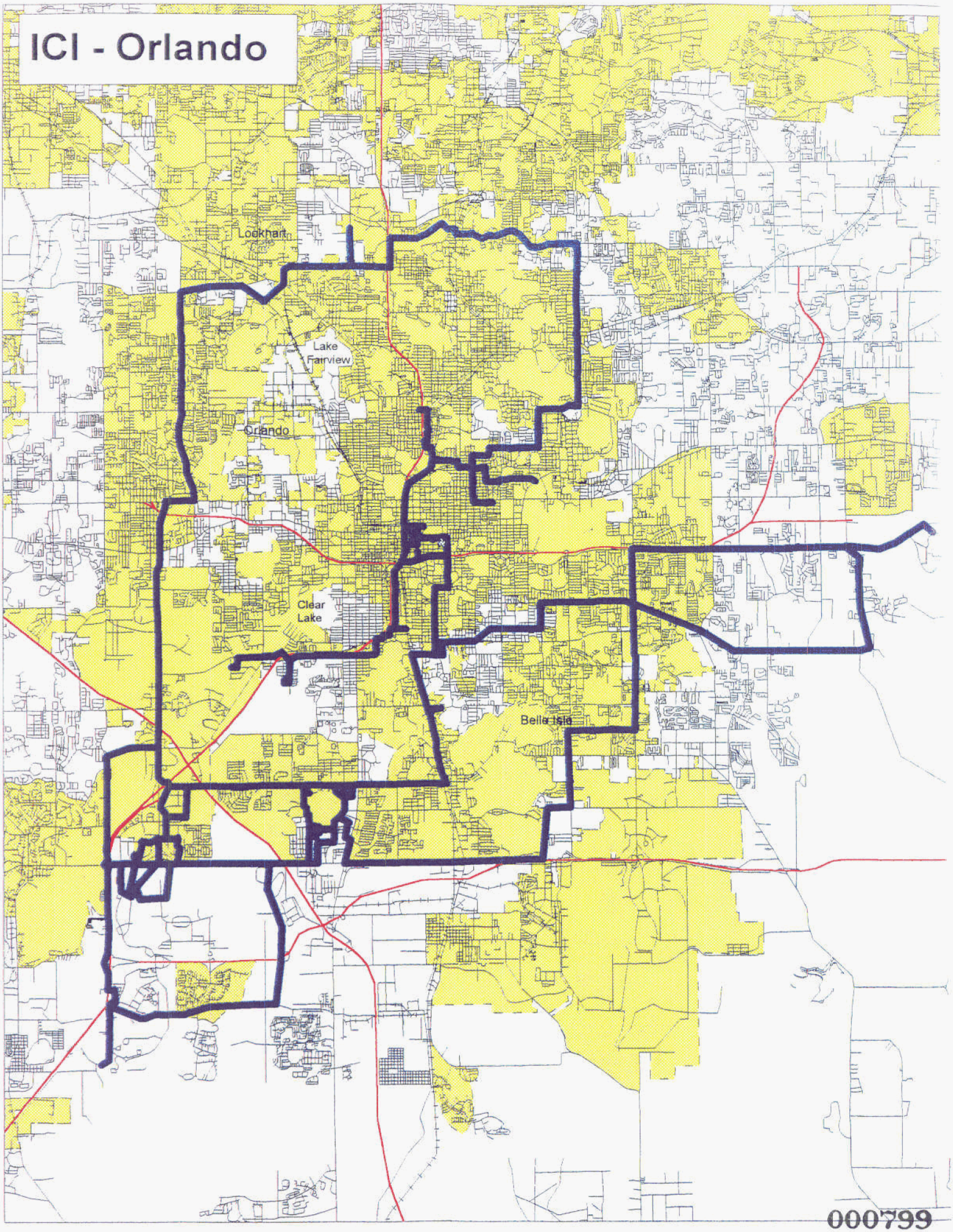

ICI - Miami
Miami
Coral Gables
Glenvar Heights
ICI Fiber


MCI WorldCom - Miami
MCI WorldCom Fiber

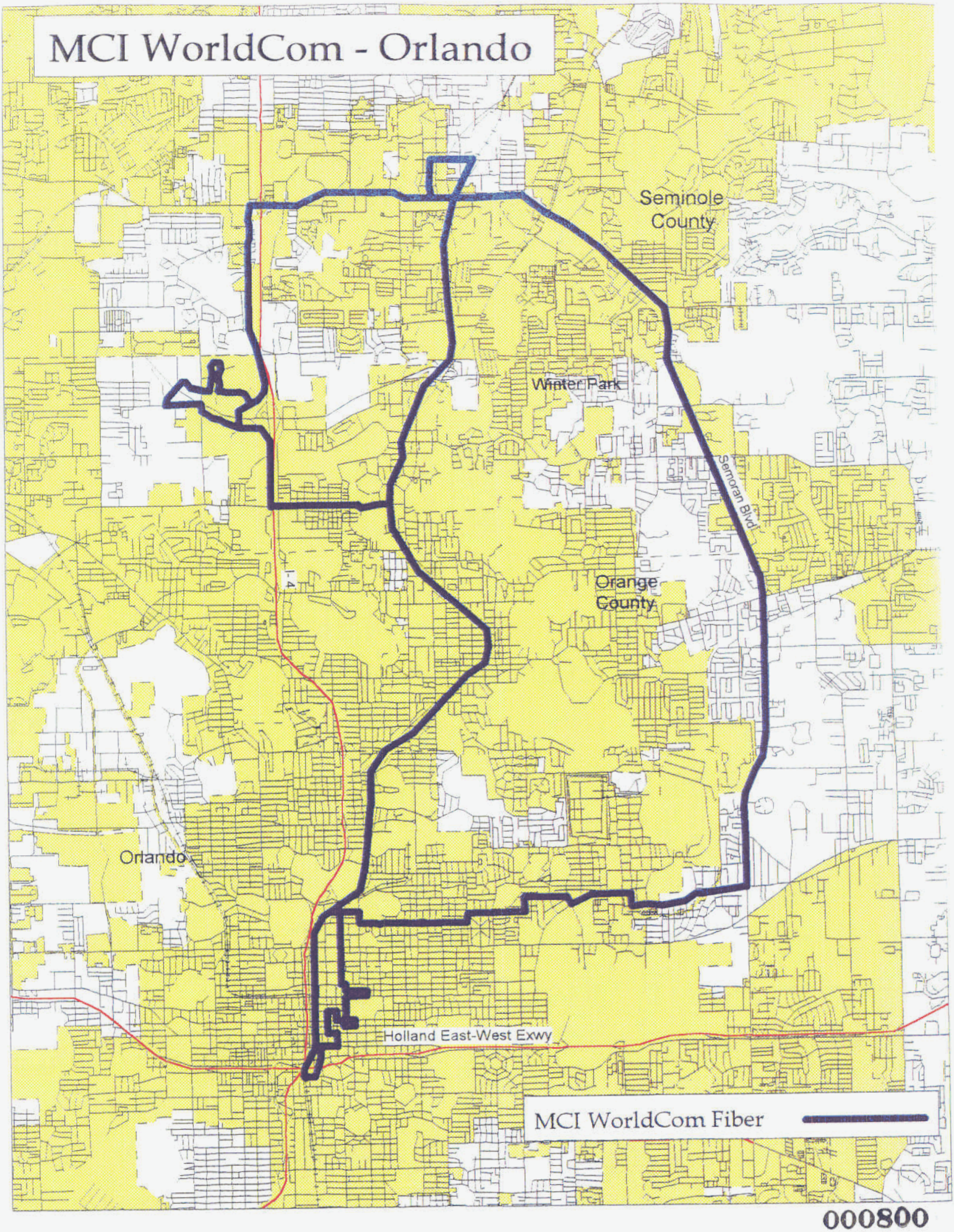


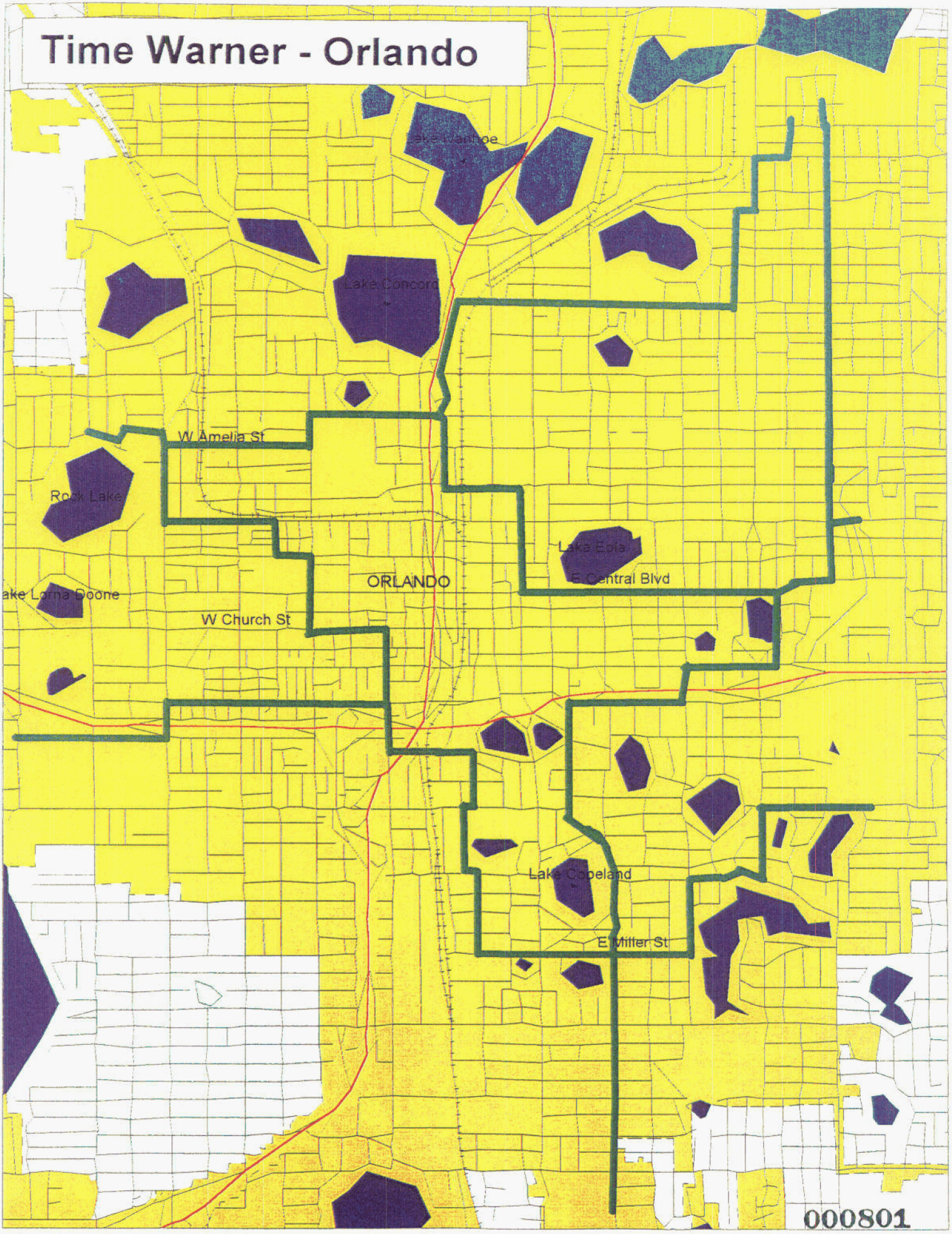
000798

ICI - Orlando

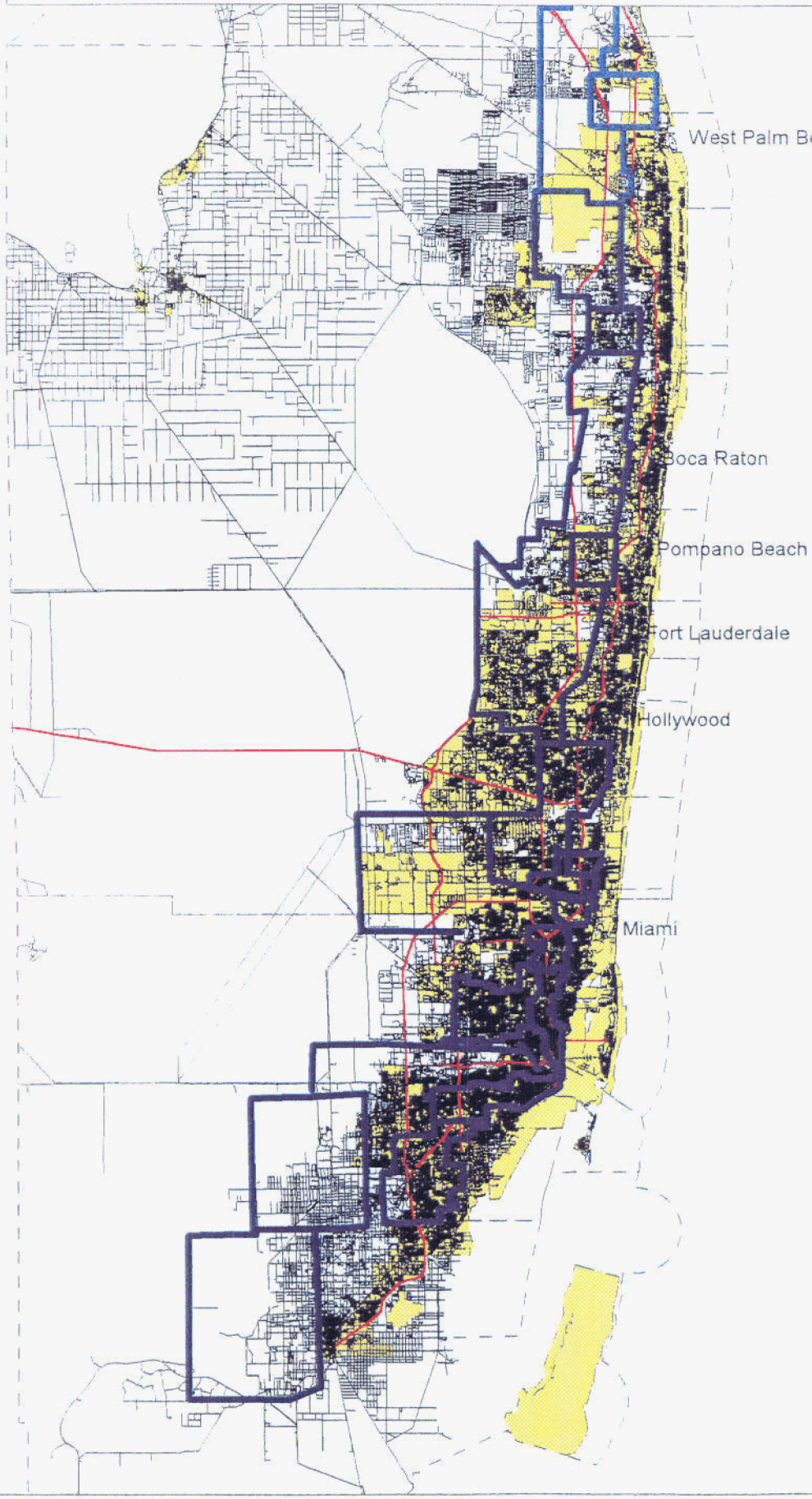


000799

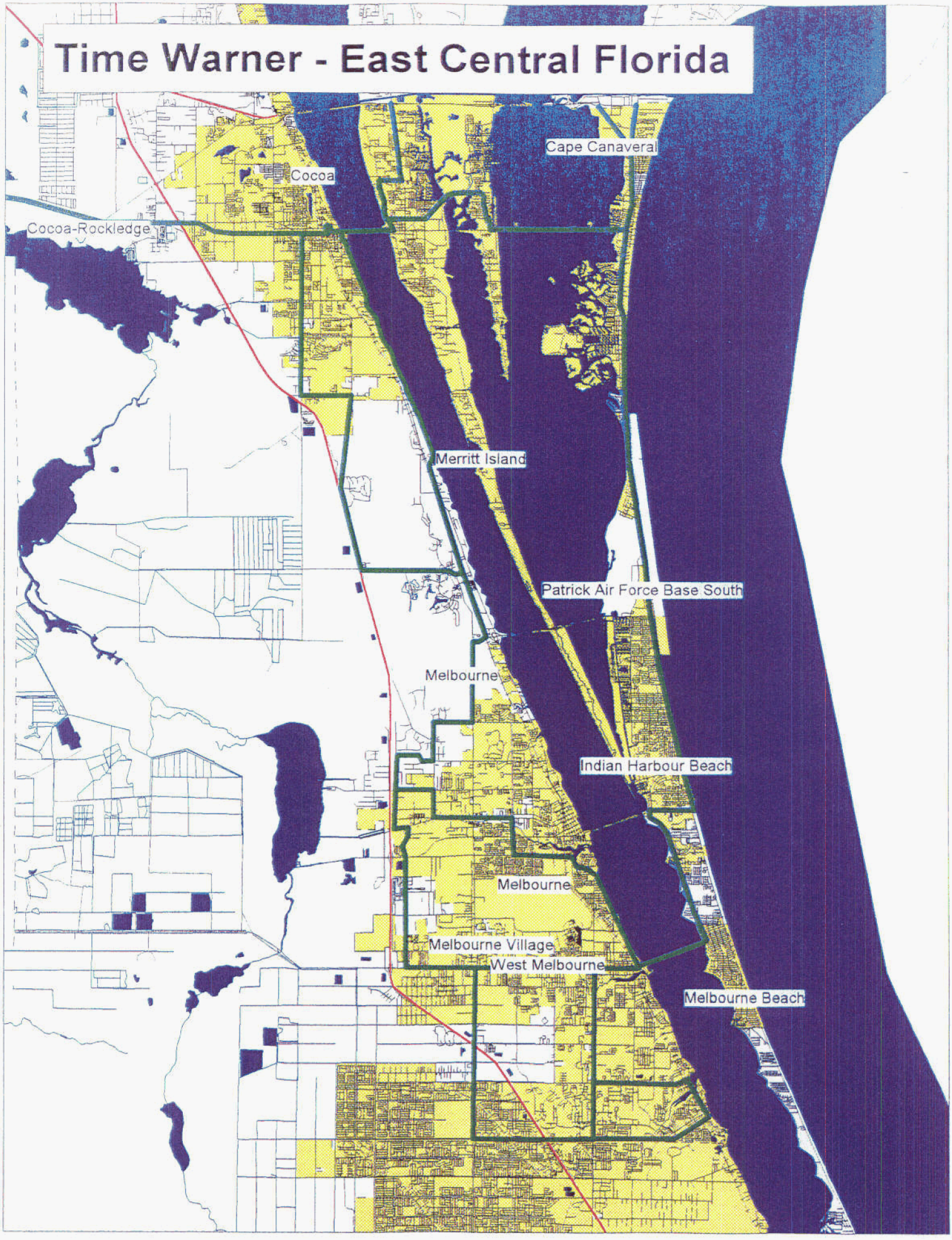

MCI WorldCom - Orlando
Seminole County
Winter Park
Semoran Blvd
I-4
Orange County
Orlando
Holland East-West Exwy
MCI WorldCom Fiber


Time Warner - Orlando
Lake Ivanhoe
Lake Concord
W Amelia St
Rock Lake
Lake Eola
E Central Blvd
ORLANDO
W Church St
Lake Copeland
E Miller St
000801

AT&T Local Services - South Florida



Time Warner - East Central Florida



000803

EXHIBIT A

General Info				Virtual				Physical			
State	City	Central Office	CLLI	Collocators	App	In Prog	Comp	Collocators	App	In Prog	Comp
Florida	Boca Raton	Boca Teeca	BCRTFLBT	5		3	2				
		Main	BCRTFLMA					10	3	3	4
		Sandalfoot	BCRTFLSA					3	1	1	1
	Boynton Beach	Main	BYBHFLMA					2	1	1	
	Brooksville	Jefferson St	BKVLFLJF					1		1	
	Cocoa	Main	COCOFLMA	1		1	1				
			COCOFLME	1		1					
	Daytona Beach	Main	DYBHFLMA	4		1	3	1		1	
		Ormond Beach	DYBHFLOB	1		1					
		Port Orange	DYBHFLPO	1		1					
	Delray Beach	Kings Point	DLBHFLKP					1	1		
		Main	DLBHFLMA					2	2		
	Deerfield Beach	Main	DRBHFLMA	1			1	6		5	1
	Eglin	Bowe Gardens	EGLLFLBG	1		1					
	Ft. Lauderdale	Main-Relief	FTLDFLMR	3		1	2	16	4	5	7
		Coral Ridge	FTLDFLCR	1		1		5	3		2
		Cypress	FTLDFLCY	2		1	1	9	4	2	3

008005

		Jacaranda	FTLDFLJA								
		Oakland Park	FTLDFLOA	1			1		8	1	4	3
		Plantation	FTLDFLPL	1			1		9	2	3	4
		Sunrise	FTLDFLSU						10	4	3	3
		Sawgrass	FTLDFLSG						2		1	1
		Weston	FTLDFLWN						1	1		
	Gainesville	Main	GSVLFLMA	3		1	2		2	2		
		North West	GSVLFLNW	1	1				4	2	2	
	Gulf Breeze	McClure	GLBRFLMC									
	Hollywood	Hallendale	HLWDFLHA	1		1			1	1		
		Main	HLWDFLMA	3	1	1	1		1	1		
		West Hollywood	HLWDFLWH	1			1		3		2	1
		Pembroke Pines	HLWDFLPE	1			1		10	3	4	3
	Homestead	Main	HMSTFLHM	1		1			10	1	6	3
	Jacksonville	Arlington	JCVLFLAR	3	1		2		1		1	
		Beachwood	JCVLFLBW	4	2		2		1	1		
		Clay Street	JCVLFLCL	6	1	1	4		6	2	1	3

908006

	Fort Caroline	JCVLFLFC	1			1				
	Normandy	JCVLFLNO	2	1		1	2	1		1
	Riverside	JCVLFLRV	3	1		2	1	1		
	San Jose	JCVLFLSJ	4	1		3	5	2	2	1
	San Marco	JCVLFLSM	2			2	6	3		3
	J.T. Butler	JCVLFLJT(So.Pnt)	1			1				
	Wesconnett	JCVLFLWC	1			1				
Jacksonville Bch	Main	JCBHFLMA	1			1	1		1	
Jupiter	Main	JPTRFLMA					1		1	
Key West	Main	KYWSFLMA					1	1		
Lake Mary	Main	LKMRFLMA	2		2		1	1		
Mandarin	Avenues	MNDRFLAV	1			1				
	Loretto	MNDRFLLO	1			1				
Melbourne	Main	MLBRFLMA	3			3	2	2		
Miami	Alhambra	MIAMFLAE	4		1	3	14	5	3	6
	Allapattah	MIAMFLAL					1		1	
	Airport	MIAMFLAP					3		3	
	Bayshore	MIAMFLBA					5	2	3	

008027

Miami Beach	MIAMFLBR								
Biscayne	MIAMFLBC	1			1	6	2	3	1
Canal	MIAMFLCA	1			1	2	1	1	
Flagler	MIAMFLFL					9	2	5	2
Grande	MIAMFLGR	5			5	3		3	
Hialeah	MIAMFLHL	1		1		17	5	3	9
Indian Creek	MIAMFLIC					11	4	3	4
Key Biscayne	MIAMIFLKE					3	1	1	1
Metro	MIAMFLME					1		1	
North Miami	MIAMFLNM					2	1	1	
Northside	MIAMFLNS					5	2	3	
Miami Shores	MIAMFLSH					2		1	1
Opa Locka	MIAMFLOL					2		1	1
Palmetto	MIAMFLPL	6		4	2	1			1
Poinciana	MIAMFLPB					4	1		3
Red Road	MIAMFLRR	1			1	7	1	4	2
Silver Oaks	MIAMFLSO	1			1	10	3	4	3
						7	1	3	3

808000

	West Dade	MIAMFLWD					3	1	2	
	West Miami	MIAMFLWM	1			1	9	3	5	1
North Dade	Arch Creek	NDADFLAC					5	2	2	1
	Brentwood	NDADFLBR					4	1	3	
	Golden Glades	NDADFLGG	8		3	5				
	Oleta	NDADFLOL					4	1	2	1
Orlando	Azalea Park	ORLDFLAP	2			2	4	1	2	1
	Colonial	ORLDFLCL	2			2	6	2	2	2
	Magnolia	ORLDFLMA	8		1	7	13	4	2	7
	Pinecastle	ORLDFLPC	3		1	2	5	2	1	2
	Pine Hills	ORLDFLPH	4		1	3	5	2	2	1
	Sandlake	ORLDFLSA	4		1	3	5	2	2	1
Oviedo	Central Ave.	OVIDFLCA					2	1	1	
Pompano Beach	Coral Springs	PMBHFLCS					5		2	3
	Federal	PMBHFLFE	1			1	7	3	1	3
	Margate	PMBHFLMA	1			1	7	2	3	2
	Tamarac	PMBHFLTA	1		1					
Panama City	Main	PNCYFLMA					2		1	1

608000

Panama City Bead	Beach	PCBHFLNT	1	1			1		1	
Pensacola	Belmont	PNSCFLBL	5		1	4	3		3	
	Ferry Pass	PNSCFLFP	1			1	4	1	2	1
	Warrington	PNSCFLWA	1			1	1		1	
Perrine	Main	PRRNFLMA	1			1	8	2	3	3
Ponte Vedra Beac	Main	PNVDFLMA					1		1	
Sanford	Main/O-WS	SNFRFLMA	1			1	3		3	
St. Augustine	Main	STAGFLMA	1		1		1		1	
Titusville	Main	TTVLFLMA					1		1	
Vero Beach	Main	VRBHFLMA	1			1				
W. Palm Beach	Gardens	WPBHFLGR	6	1	3	2				
	Greenacres	WPBHFLGA					5	3	1	1
	Haverhill	WPBHFLHH	1			1	6	3	1	2
	Lake Worth	WPBHFLLE					1		1	
	Main Annex	WPBHFLAN	3		1	2	8	4	3	1
	Riviera Beach	WPBHFLRB					3	2	1	
	Royal Palm Bch	WPBHFLRP					3	2	1	

000810

Sum	104			11	39	97		126	154	115

	Virtual	*Physical*		*Total*
Total	147	395		542
Completed	97	115		212
In Progress	39	154		193
App Only	11	126		137

Central Offices with Completed Virtual Collocation	52
Central Offices with Completed Physical Collocation	48
Total Central Offices w/Collocation Activity	104

As of July 1, 1999

000811

EXHIBIT B

DATE		FLORIDA
6/30/99	**CLEC Certifications (Wireline)**	
	PSC Approved	267
	Pending	51
6/30/99	**Operational CLECs**	**93**
	Resale Only	70
	Facility-based Only	7
	Both	16
6/30/99	**Operational Switches**	**49**
	Planned Switches	**28**
6/30/99	**Total Local Interconnection Trunks****	**119,493**
	CLEC-to-BST Trunks	55,317
	BST-to-CLEC Trunks	64,176
6/30/99	**Access and Transport****	**1,457**
	Directory Assistance	584
	Operator Services incl. Verification	525
	E911	320
	Intercept	28
6/30/99	**Collocated Interconnectors**	**34**
6/30/99	**Collocation Arrangement (activity)**	**542**
	Physical	395
	Virtual	147
6/30/99	**Wire Centers with Collocation**	**104**
6/30/99	**Total Ported Numbers (estimated)****	**55,872**
	Ported Res. Lines	6,042
	Ported Bus. Lines	49,830
6/30/99	**Total Unbundled Loops***	10,217
6/30/99	**Total Unbundled Ports***	158
6/30/99	**Total Resold Lines***	**126,203**
	Resold Bus. Lines	75,395
	Resold Res. Lines	45,262
	Resold ISDN Lines	353
	Resold PBX Trunks	4,661
	Resold Multiserv Lines	65
	Resold Private Lines/Data CKTs	467
6/30/99	**Total Facility-Based Lines (estimated)**	**75,682**
	Facility-based Business	64,953
	Facility-based Residential	10,729
6/30/99	**Total CLEC-Provided Access Lines**	**201,885**