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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	)	CC Docket No. 96-98
of 1996	)	
	)	

Affidavit of William L. Fitzsimmons

on Behalf of Ameritech

May 26, 1999

PUBLIC VERSION

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I. QUALIFICATIONS

I hold a Ph.D. in Resource Economics from the University of Massachusetts, Amherst. My industry experience prior to joining LECG in 1994 includes two years modeling demand for private line services for AT&T and six years building financial simulation models for BellSouth. At LECG, my work is focused on the analysis and financial modeling of a wide range of telecommunications issues.

After the passage of the Telecommunications Act in 1996, I worked extensively on the development of the LECG Simulation Model. This model simulates the financial impacts on large local exchange carriers from changing interconnection prices and conditions. A copy of a paper describing the model and results was filed with the FCC on behalf of the Unites State Telephone Association. I later worked with Stentor to revise the model to simulate impacts on Canadian telecommunications carriers. Beginning in 1996, I worked closely with Dr. Robert G. Harris of LECG to assist U S WEST in reviewing and revising its cost models, and in 1997 and 1998 I testified on behalf of U S WEST in numerous interconnection arbitrations, consolidated cost dockets, and universal service proceedings. In these proceedings, I presented analyses of total element and total service long run incremental cost modeling issues. Earlier this year I worked with Dr. Debra J. Aron to develop financial simulations of competitive self-supply of high capacity services in the Chicago metropolitan area. Results from this analysis were filed with the FCC by Dr. Aron in her recent Section 10 forbearance affidavit on behalf of Ameritech. My curriculum vita is provided in Attachment WLF-1.

II. OVERVIEW

Is self-supplied switching by competitive local exchange carriers financially viable? This is an empirical question. Drs. Aron and Harris present compelling evidence that competitors have already invested in 112 local switches to address 85 percent of Ameritech's access lines. (see Aron and Harris) My analysis demonstrates that providing

competitive local service with self-supplied transport and switching is viable and profitable. Entry and expansion by competitive local exchange carriers (CLECs) provide opportunities to enjoy significant financial benefits. These opportunities are available in large and small metropolitan areas and extend to wire centers many miles from competitors' local switches, which are typically placed in high density business districts, within easy reach of numerous business customers.

For my analysis I used the LECG Entry Model to simulate the financial performance of reasonably efficient competitive entrants in selected geographic areas under the assumptions that:

a) Unbundled loops are available from the incumbent local exchange carrier (ILEC) at current prices;
b) Entrants build and lease their own local transport;[1] and
c) Entrants install their own local switches.

In the Columbus, Toledo, and Indianapolis metropolitan areas, where competitive local exchange carriers (CLECs) have already installed local switches, my analysis demonstrates that CLECs have opportunities to earn healthy profits with self-supplied transport and switching. Results from the LECG Entry Model validate CLEC investment decisions and demonstrate that unbundled local transport and switching are not needed for competitors to thrive in these metropolitan areas.

In the Anderson-Muncie (Indiana) metropolitan area, where no competitors have installed local switches, my analysis demonstrates that competitors have opportunities to earn significant profits by extending transport facilities to connect these wire centers to local switches in Indianapolis, over forty miles away. In fact, two carriers have indicated the intent to do just that. The Local Exchange Routing Guide (LERG) shows that Time Warner and AT&T have local switches currently in Indianapolis with assigned phone

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[1] In the *Baseline View* CLECs self-supply all transport rings used to collect traffic from the ILEC's wire centers and lease DS1s at tariffed prices to return traffic to other carriers' networks.

numbers in the Anderson and Muncie wire centers.[2] Results from the LECG Entry Model therefore validate the revealed strategies of these CLECs.

The LECG Entry Model was also designed to develop general guidelines for determining where CLECs have opportunities for value-positive entry without access to unbundled local switching and transport. These guidelines are based on transport distances, numbers of access lines in target wire centers, and general revenue and cost characteristics.[3] Although it was not possible to complete this analysis in the time allotted for comments in this proceeding, I have established some preliminary guidelines for assessing the expected financial viability of local entry. This was accomplished by using the model to explore alternative configurations of the Columbus and Indianapolis metropolitan areas. The methods and results of this process are described in Section V.[4]

The purpose of this analysis is not to predict the financial performance of CLECs in selected metropolitan areas; it is to demonstrate that CLECs enjoy strong financial opportunities, even without unbundled switching and transport. The analysis demonstrates this point with conservative assumptions related to CLECs' financial opportunities. Conservative inputs were adopted to increase the confidence in the simulation results, which show that unbundled switching and transport are not needed to support a positive business case. Going forward it may prove instructive to populate the model with less conservative assumptions. In the following section, I describe the conservative assumptions adopted in my analysis.

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[2] Although switches are assigned to rate centers, I refer to the Anderson and Muncie wire centers here because network builds are based on wire centers and because for both Anderson and Muncie, there is a one-to-one correspondence between the rate center and the wire center.

[3] Transport distances are estimated with a straightforward process using the publicly available information in the Local Exchange Routing Guide (LERG).

[4] Because the model adapts automatically to a wide range of demand and distance inputs, it is relatively straightforward to run the model for a large number of metropolitan areas. Once a state data file is created with standard price and cost information, it is simple to apply the model to selected wire centers in other metropolitan areas in the state using readily available information.

Entry simulation begins with the creation of a *Baseline View* of competitive entry by multiple competitors in the mid-sized and small metropolitan areas in Ohio (Columbus and Toledo) and Indiana (Indianapolis and Anderson-Muncie). In the model, market quantities and prices are based on historical market growth rates and pricing policies. Line counts and the lists of wire centers included in the analysis are provided in Attachment WLF-2. The model estimates annual cash flows for CLECs by combining volumes and prices for specific services; network investment and operating costs for switching, transport, collocation, and loops; and non-network costs.

Larger cities, such as Chicago and Detroit, are not included in my analysis for two reasons: 1) there are already active facilities-based entrants operating in these metropolitan areas; and 2) evidence of the financial viability of facilities-based entry for smaller metropolitan areas is even stronger evidence for the viability of this entry in larger metropolitan areas, where more customers are clustered closer together.

III. LOCAL EXCHANGE ENTRY PROVIDES A NUMBER OF BENEFITS

It is reasonable to posit that qualified entrants are basing their competitive entry strategies on business plans that demonstrate that entry presents attractive financial opportunities. Access to the business plans of competitors who have already invested in local switching and collocation, or have announced plans to invest, would provide the most compelling evidence about the financial benefits that CLECs expect in my study areas, or areas with similar profiles. In the absence of access to competitors' business cases, I devise reasonable business strategies and populate the model with conservative assumptions to demonstrate that entry presents attractive financial opportunities to multiple entrants.

A. Entry is attractive for a number of reasons.

1. Local service revenues represent a substantial portion of the total revenues available in telecommunications.
2. The availability of unbundled network loops permits entrants to use low risk, high value entry strategies. If entrants perceive an advantage to facilities based entry,

they are afforded the opportunity of limiting their capital investment to switching and transport, and they can even choose to lease high quality transport facilities from the ILEC.

3. IXC entrants, such as MCI-WorldCom and AT&T, have an interest in reducing access charges paid to local carriers. Even without investing in loop facilities, CLECs can avoid substantial switched access costs by leasing loops from ILECs and providing their own switching. CLECs can also gain switched access revenue from other carriers by providing their own local switch.

4. Combining services into bundled packages appeals to the large segment of the population that prefers one-stop shopping. Taking advantage of customer preferences for one-stop shopping is especially valuable for firms with large costs for acquiring and re-acquiring subscribers due to high churn, such as wireless and the interLATA providers.

5. Bundling services, such as local and long distance, enables CLECs to capture static and dynamic economies of scale and scope and provide greater marginal returns from sales and marketing efforts. AT&T, for one, already has a sales force in place in many LATAs and is spending hundreds of millions of dollars each year to advertise its services nationwide. Including local service in its advertised offerings for bundled service plans may actually provide a large enough incremental benefit for other services that the effective marketing expense for local service is close to zero.[5]

6. Customers, revenues, and contributions are highly concentrated, both geographically and among customers, which provides opportunities for entrants to gain substantial market shares and net income quickly with targeted entry. Entry patterns and rapid growth of CLECs lends credence to the attractiveness of this strategy.

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[5] In this analysis, I make the conservative assumption that all entrants make substantial marketing expense commitments.

B. Conservative Assumptions

I do not attempt to model all of the financial benefits expected by CLECs from local entry. My analysis demonstrates that even without capturing every benefit, CLEC's enjoy significant financial opportunities from local entry and expansion in metropolitan areas that include the vast majority of Ameritech's access lines and revenues. (see Aron/Harris) It is possible to demonstrate this point with conservative assumptions. Some of the conservative assumptions in my analysis are:

1. Market Opportunities are Understated

a) Benefits from Internet services, advanced services such as xDSL, other data related services, and new custom calling services are excluded. AT&T's John Zieglis reinforced the fact that this is a conservative assumption when he stated that "we intend to add Internet service, information services, we intend to add anything that requires local connectivity." (John Zeglis, AT&T Investment Community Meeting, March 3, 1997)[6]

b) Ameritech's 1998 customer base is used to size the competitive opportunities for CLECs; competitive gains by CLECs for business customers, intraLATA toll, and other services prior to 1999 are ignored in the analysis. The overall market opportunities for existing services are, therefore, understated in the financial simulations.

c) In the model, CLECs win average revenue customers, even though CLECs today target above average customers. Revenue per line opportunities are, thus, understated.

d) Incremental gains from dedicated high capacity customer services are excluded.

e) Benefits that entrants may realize by including PCS or traditional wireless service

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[6] Also consider the following: "Although lower network costs are a certain result, service innovation through the creation of new applications is where the strategic shift will be most re[w]arding for service providers." 1999 Annual CLEC Report™, New Paradigm Resources Group, Inc., Chapter 4, p. 7.

in their entry strategies are ignored.

f) In the model, CLECs gain or retain interLATA revenue for only 20 percent of local customers added. Improved financials for long distance providers are, therefore, understated.

g) The model does not depict entrants as providers of bundled service to other resellers. Wholesale opportunities for CLECs are, thus, understated.[7]

2. Costs are Overstated

a) CLECs are expected to incur the cost of leasing loops, even in business districts where they have fiber networks and connections to customer locations and in residential areas where CLECs have CATV facilities that can be used to self-supply loops.

b) Lower network costs projected from the adoption of packet switching technologies are excluded. "How does packet networking help? For starters, it eliminates the need for all the TDM multiplexers. That means lower equipment cost, faster set up and configuration time, fewer equipment failures and less maintenance time."[8]

c) All collocation costs are considered incremental in the model, even though CLECs are already collocated to many ILEC wire centers in metropolitan areas for reasons other than local entry. (see Aron-Harris)

d) In the *Baseline View*, CLECs self-supply transport rings to collect traffic from Ameritech's wire centers, even when it would be cheaper to lease facilities from Ameritech.

3. Market Shares are Conservative

a) The maximum market share for a CLEC in any geographic area is 12 percent by

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[7] The fact that CLECs are also providers of wholesale service was demonstrated in the Illinois Commerce Commission's May 19, 1999 Open Meeting when they approved MCI's wholesale tariff.

[8] 1999 Annual CLEC Report™, New Paradigm Resources Group, Inc., Chapter 4, page 5.

year 10. Compare this with the projection by Merrill Lynch that "[o]ur forecast of AT&T gaining 16% market share by '03...is consistent with our long-held view concerning RBOCs and GTE.'" (Merrill Lynch, 2/1/99)

b) Only market share gains in Ameritech's serving area are considered. Adjacent properties that are excluded may include markets served by other ILECs, such as GTE.

IV. LECG ENTRY MODEL

A. Model Overview

For the valuation of each CLEC's entry in each metropolitan area, my analysis includes cash flow estimates for ten years and terminal values for the period exceeding the ten-year horizon. The first step in the analysis is the projection of the size of the local exchange market for a specified metropolitan area. The size of the market is projected in terms of service quantities, prices, and revenues for the next ten years. As discussed earlier, this is clearly a conservative view of CLECs' market opportunities. Next, market share trajectories for CLECs are established and applied to overall market size to derive projections of CLECs' volumes and revenues. In the model, CLECs serve all of their demand by either reselling ILEC services or leasing unbundled loops and transporting the traffic to and from their own switches. Network costs for providing facilities-based switching and self-supplied transport are estimated in the model's network section. This section was constructed in collaboration with Ameritech's engineers to estimate the cost for providing high quality transport rings that connect CLECs' collocation locations in Ameritech's wire centers. Non-network costs are added to complete the cash flow calculations. Cash flows are used to calculate the net present value for each entrant. The net present value of the cash flow for any entrant is a conservative estimate of the value of local entry.

I use the model's net present value estimates to simulate the self-supply versus resale decisions facing each CLEC as it considers installing facilities over a three-year period. CLEC local switches are installed in year one. In the *Baseline View* CLECs self-supply all transport rings used to collect traffic from Ameritech's wire centers and lease DS1s at tariffed prices to return traffic to other carriers' networks. In year one of the entry simulation the CLEC installs a local switch and builds-out its backbone network to self-supply local switching in the largest wire centers near the center of the specified metropolitan area. In year two, the CLEC considers building a second transport ring to collect traffic from the next group of ILEC wire centers in terms of distance from the downtown area. In the simulation, the CLEC transports traffic from this second group of wire centers to the switch location that it established in the first year of entry. If establishing the collector ring(s) increases the net present value of local entry, I assume that the CLEC self-supplies switching for the second group of wire centers; otherwise the CLEC would continue to serve its customers in these wire centers by reselling the ILEC's local service. In year three of the entry simulation, the CLEC follows a similar decision process when it considers extending transport to gather traffic from the remaining targeted wire centers in the metropolitan area.

B. CLEC Revenues

1. Size of the Overall Market (Size of the pie to divide among the ILEC and CLECs)

The simulation begins with the assumption that the ILEC's volumes and revenues represent the entire market for the relevant services today. Wire center specific data and tariff information form the basis for initial prices, quantities, and revenues for the services included in the simulation. Business and residential line growths are based on trends from Ameritech's state specific ARMIS data.

2. Relevant Services for Incremental Revenues and Costs

The model is restricted to families of services that are clearly incremental for a competitive CLEC. The following services are included in the model, split into business and residential categories:

a) **Basic Exchange Service:** This service includes the provision of an end user access line and dial tone and is billed at a monthly flat price. I account for different prices and quantities for residential and business services and differences between price zones. Business customers connect to the local switched network with basic service, Centrex, and PBX-trunk based service. In the initial years of entry, I assume that competitors will offer a 10 percent discount on basic service and local usage. As entrants become established in year 4, their prices converge to prevailing market prices.

b) **Vertical Services:** These include services such as Call Waiting, Call Forwarding and Caller ID.

c) **Ancillary Services:** These comprise Number (e.g., directory assistance), Premium (e.g., voice mail and Line-Backer Maintenance Plan)[9] and Dial "0" (credit card and collect) services.

d) **Local Usage:** I account for local usage separately if customers pay for local usage separately. For example, in Indianapolis almost all residential local usage is included in the price of flat rate local service, but in Ohio, there is a significant amount of residential local usage that is billed separately.

e) **IntraLATA Usage:** IntraLATA usage is priced per minute-of-use, and customers can now presubscribe to their carrier of choice. The Telecommunications Act requires widespread presubscription for this service as of February 8, 1999. To the

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[9] This refers to a maintenance plan for "Customer Premises Wire for a monthly recurring rate or in lieu of the Maintenance Service Charge on a repair visit when the service difficulty is determined to be in customer-provided FCC registered terminal equipment or associated accessory." See Ameritech Tariff for Wisconsin Bell Inc., P.S.C. of W. 20, Part 8, Section 8, Original Sheet No. 12.

extent that CLECs have already won a share of the intraLATA toll minutes and are expected to continue to gain shares, even without local facilities-based entry, incremental benefits expected from winning intraLATA toll minutes are limited in the model. Specifically, I assume that each CLEC carries 6 percent of total intraLATA toll traffic prior to Year 1 and carries 20 percent of intraLATA toll revenue by Year 10 without local facilities-based entry. These revenues are excluded from the benefits of local entry.[10]

f) **Switched Access:** For IXCs, local exchange entry will provide a cost saving by providing a lower cost alternative for this service. For other entrants switched access is a new source of revenue. Given the uncertainty about the future of access charge reform, including possible changes to the subscriber line charge and presubscribed interexchange carrier charge, I assume that changes from the current access charge structure are revenue neutral for the CLEC.

g) **InterLATA Usage:** I assume that IXC-based entrants, such as AT&T and MCI-WorldCom, will experience small gains in interLATA customers that they either win or retain as a result of providing local service within their service bundles. For every five local customers that they gain, I assume that they gain or hold one interLATA customer. I assume that the CLECs have a twenty percent operating margin on interLATA service.

Table 1 shows the average business and residential revenue in the Indianapolis metropolitan area. The market revenues were extracted from Ameritech's data. CLEC average incremental revenues per line are lower than the market levels due to expected early year pricing discounts and the fact that not all long distance revenues are incremental for CLECs.

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[10] For example, in Year 10, the CLEC receives incremental revenues for 80 percent of intraLATA toll calls made by its local customers.

Table 1
Year 1 Projections of Market and CLEC
Monthly Revenues per Line in Indianapolis

	Market	CLEC
Residential		
Local	$31.99	$29.24
InterLATA	$12.55	$2.51
Total	$44.53	$31.75
Business		
Local	$42.58	$36.43
InterLATA	$39.07	$7.81
Total	$81.65	$44.24

3. Market Shares

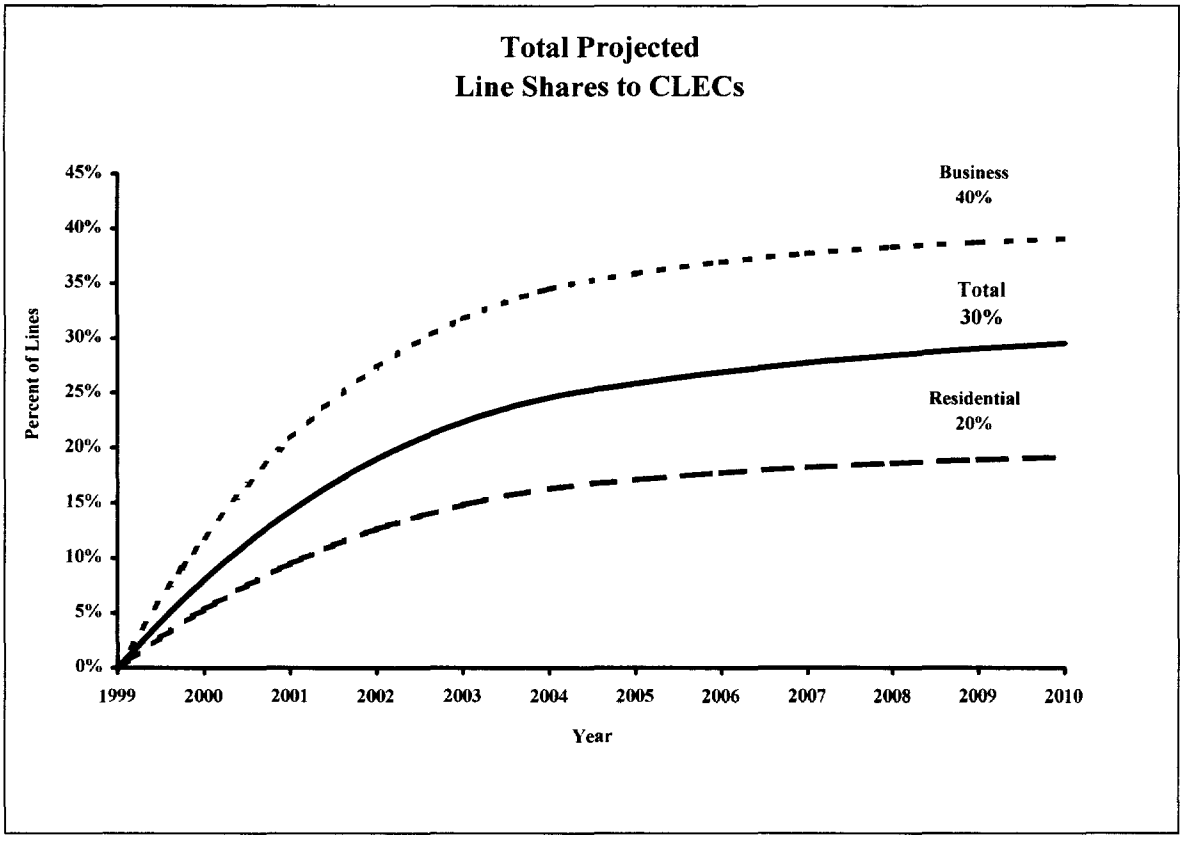
I base the market share trajectories for the competitors on: 1) stock market analysts' projections; 2) a review of statements by local exchange entrants; and 3) the expectation that entrants will act as economically rational competitors. The following statements are drawn from recent stock market analyst reports.

> "Our forecast of AT&T gaining 16% market share by '03...is consistent with our long-held view concerning RBOCs and GTE.'" (Merrill Lynch, 2/1/99)

> "We continue to believe that the CLECs will gain approximately 40% of the business local market by 2008." (Goldman Sachs, January 1999)

As shown in Chart 1 and Table 2, my baseline market share projections are within the range of those projected by these industry analysts.

Chart 1



An examination of entry into the interLATA business and comments by local competitors support the expectation of analysts that market share losses will occur most rapidly in the first several years. AT&T's long distance market share declined approximately 30 percent from 1984 to 1994, with the rate of loss in the first five years nearly double the rate of loss in the next five years. In the *Baseline View*, CLEC market share gains are nearly flat by the ninth year, which allows the model to stabilize by the end of its ten year horizon. Based on rational and witnessed entry by competitors in these and other jurisdictions, I

project fastest entry into the high revenue, low cost central business district wire centers and faster market share gains for business versus residential customers. [11]

For each metropolitan area, I examine Tier 1 and Tier 2 entrants. Tier 1 competitors are very large firms with integrated nationwide strategies, such as MCI-WorldCom and AT&T. In the model, Tier 1 competitors win approximately 12 percent of the access lines by year 10. Tier 2 competitors include somewhat smaller and less integrated firms, such as Intermedia and Allegiance. In the model, Tier 2 CLECs win one-half as many lines as the Tier 1 competitors. Assuming a market where there are three CLECs and the ILEC in ten years, I assume that the two Tier 1 entrants each win approximately 12 percent of the access lines and the Tier 2 entrant gains approximately 6 percent of the lines. This is shown in Table 2 for the Indianapolis metropolitan area.

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[11] Also note that AT&T lost 30 percent of its market share, even though it was facing relatively small and, at the time, unknown entrants into a telecommunications industry that was new to competition. Today's local exchange incumbents are facing well known and tested telecommunications firms with financial resources that, in the case of at least two entrants, dwarf their own. In addition, these competitors already serve many of their target customers in some communications capacity and are entering into a market environment where customers are accustomed to making decisions among competitors. Contrast this to the early years of interLATA competition when many customers were reluctant to go with small companies such as MCI and Sprint.

Table 2
Tier 1 and Tier 2 CLECs in the Indianapolis Metropolitan Area
Baseline View for Year 10

	CLEC 1	CLEC 2	CLEC 3	Total
Share of Lines				
Res	8%	8%	4%	20%
Bus	16%	16%	8%	40%
Total	12%	12%	6%	30%
Lines				
Res	50,271	50,271	25,136	125,678
Bus	111,235	111,235	55,618	278,088
Total	161,506	161,506	80,753	403,766
Revenues (Millions)				
Res	$24.6	$24.6	$12.3	$61.4
Bus	$71.1	$71.1	$35.5	$177.7
Total	$95.7	$95.7	$47.8	$239.1

C. Network Investments and Expenses

In my analysis, as CLECs phase in their facilities in a geographic area, they make value-based decisions between extending transport and switching facilities and reselling ILEC local service. I separate the ILEC wire centers into three groups, beginning with wire centers in the downtown areas and extending outward to wire centers that are further apart and on average have fewer access lines. Two important factors that determine the value of building successive phases are the distances of transport necessary to connect wire centers and the amounts of access lines and revenues that a CLEC can gather at the ILEC's wire centers. The cost of providing resold service is determined to a great extent by the retail prices, the resale discounts established in regulatory proceedings in each state, and the incremental retail costs incurred by the CLEC. For facilities-based entry, network costs include the price of unbundled loops, collocation costs, self-supplied or leased transport, self-supplied switching, and operations, administration, and maintenance of the network.

1. Loops

In my analysis CLECs lease loops from the ILEC at the prices established in each state. Table 3 shows the loop prices for basic two-wire loops used to provide service in Indiana and Ohio. There are also non-recurring costs associated with unbundled loop service orders and connection. I provide this information by state in Attachment WLF-3.

Table 3
Basic Unbundled Loop Prices
($/month)

	Indiana	Ohio
Low Density	$8.99	$9.52
Medium Density	$8.15	$7.97
High Density	$8.03	$5.93

(1) Prices for ground-start loops used to provide PBX trunks are higher than basic loops by $0.20 to $0.95

(2) The Ohio prices do not reflect the lower prices agreed to in the Ohio Merger Stipulation Agreement

2. Collocation

CLECs incur a nonrecurring cost of $60,000 and a recurring cost of $2,500 per month for each collocated wire center.

3. Transport

Transport rings are established over a period of three years. In the *Baseline View,* the transport rings described below are self-supplied by competitors. Results for the case when a Tier 2 competitor leases facilities from Ameritech are presented in Section V.

Year 1: CLECs establish *backbone rings* connecting the downtown ILEC central offices to each other and the CLEC local switch (see Chart 2)

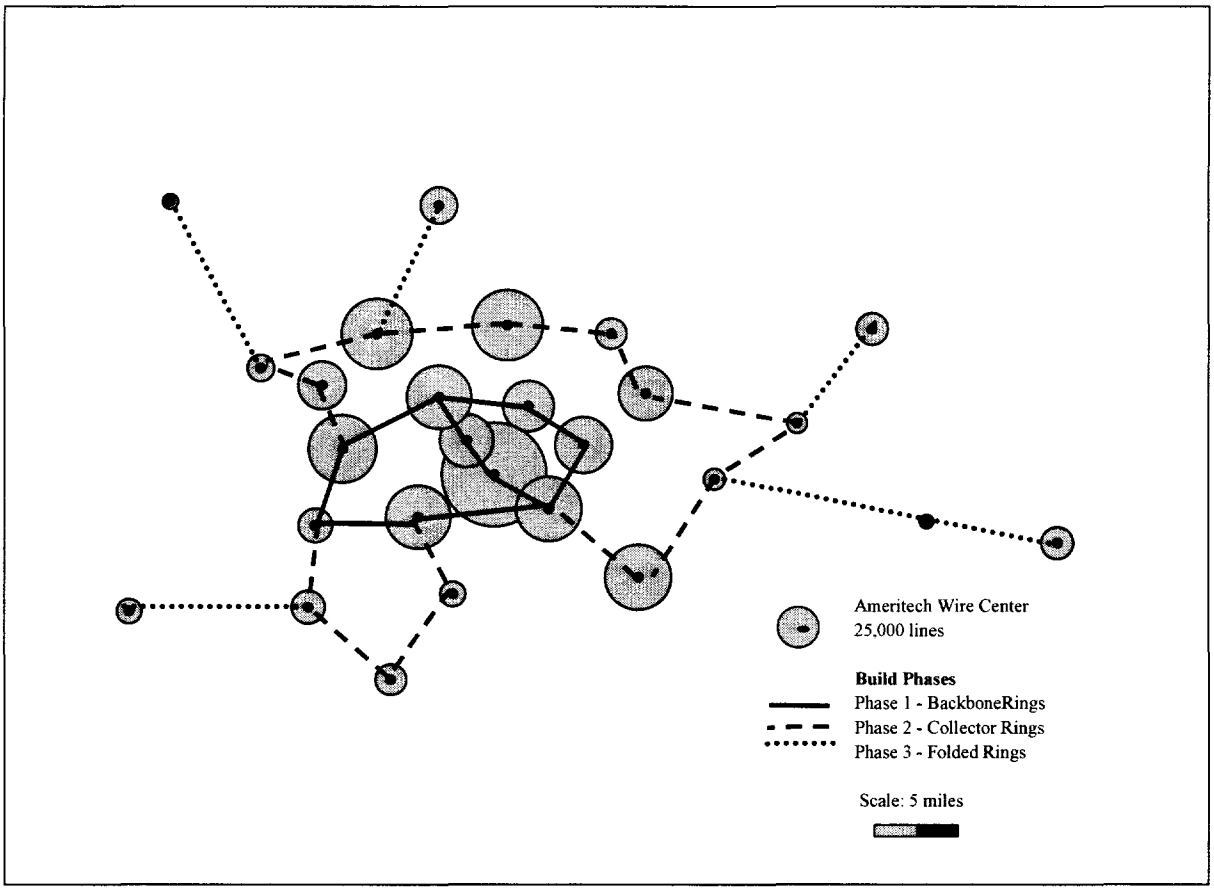
Year 2: CLECs establishes *collector rings* connecting the ILEC central offices, that are outside of the backbone ring, to each other and the backbone ring

Year 3: CLECs establishes *folded rings* to outlying wire centers

Fiber and right of way costs are a function of distance, numbers of lines, and the portion of the costs that are incremental to local entry. The issue of cost sharing received a great deal of consideration during cost proceedings that were held throughout the country over the past couple of years. During these proceedings cost analysts reasoned correctly that some of the costs of outside plant facilities should be attributed to other services that use the facilities and other network providers that share in the cost of placement. The portion of fiber costs that are incremental to a CLEC's local exchange entry is diminished to the extent that the CLEC: 1) already has fiber in place to service high capacity routes; 2) can lease conduit from the ILEC and other CLECs; and 3) can share costs with other network providers. My analysis attributes 40 percent, 50 percent, and 60 percent of the fiber costs to local entry for build-out phases 1, 2, and 3 respectively. This is in line with evidence that we are entering a future with multiple facilities-based providers and many CLECs already have extensive and growing fiber networks. Maps of CLEC fiber routes in Indianapolis and Columbus are included in Attachment WLF-4.

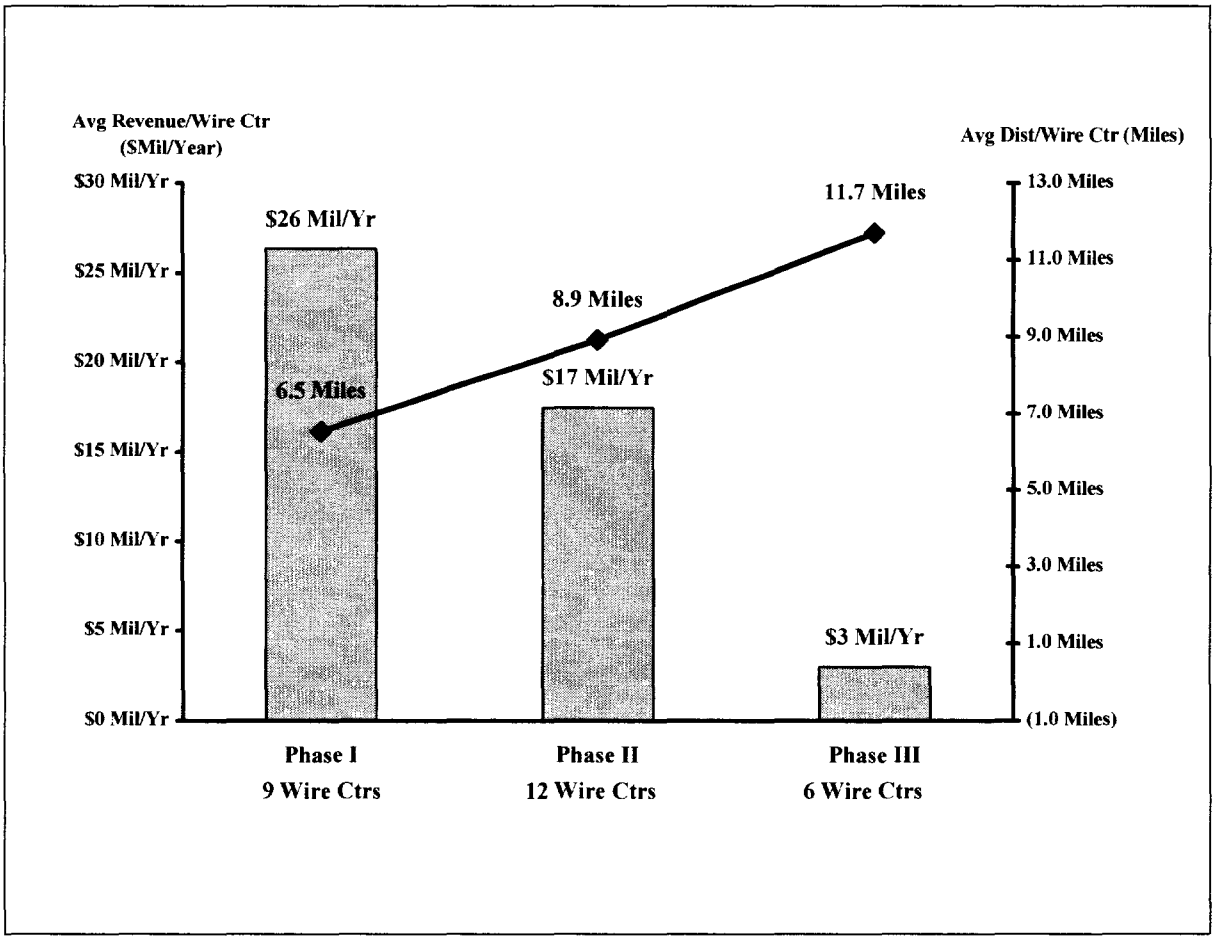
Chart 2 depicts the simulated CLEC transport network in Indianapolis. A later chart shows how the Phase 2 build-out for Indianapolis can be extended to serve the Anderson and Muncie wire centers. Diagrams of the Phase 1, 2, and 3 wire centers for Columbus and Toledo are in Attachment WLF-5.

Chart 2
CLEC Fiber Build-Out for Indianapolis



The build-out for Indianapolis shown above follows a rational strategy of building first to the wire centers that have the greatest amount of revenue and least amount of transport distance and cost. Chart 3 describes this relationship for Indianapolis. Wire centers connected by the Phase 1 backbone rings generate an average revenue of $26 million per year and require an average route distance of 6.5 miles per wire center. The Phase 3 wire centers generate only $3 million per year and require 11.7 miles of transport per wire center.

Chart 3
3 Phase Build-Out
Average Wire Center Revenues and Distances
for Indianapolis



The network design was constructed in collaboration with network engineers from Ameritech. Table 4 shows the cumulative ten year capital spending that the model estimates for Tier 1 and Tier 2 CLECs in each market to self-supply transport and switching. This information is provided for all study areas used in this analysis in Attachment WLF-6.

Table 4
Cumulative Capital Spending Through Year 10
($M)

	Tier 1	Tier 2
Cumulative Capital Spending		
Fiber	$12.0	$12.0
Equipment	$25.5	$13.3
Switch	$18.9	$9.5
Total	$56.4	$34.8

4. Switching

In my analysis all CLEC supplied local switching costs are incremental to CLEC local entry. I followed the Joint Board recommendation of a start-up cost for the switch of $150,000 and an incremental cost of $110 per line.[12] I specify a maximum size for a switch of 100,000 lines and place additional switches as needed at the same location as the initial switch. If CLECs can benefit by placing switches in multiple locations they can improve on the financial results estimated in the model.

D. Other CLEC Costs

1. Other Network Expenses

Costs for network operations, administration, and maintenance (OA&M) are added as 15 percent of gross plant. This is a generous amount of cost, considering the fact that two of the leading CLECs, AT&T and MCI-WorldCom, supported OA&M amounts of less than 10 percent of gross plant in the HAI model in proceedings across the country.

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[12] Further Notice of Proposed Rulemaking, Federal State Board on Universal Service, DA 96-45 (rel. 7/18/97), p. 50, paragraph 128.

2. Retail Costs

Retail costs comprise costs for marketing and general and administrative activities that are incremental to local entry. It can be argued that incremental marketing expense for the major IXCs should be small. The ability to include local service in current advertising campaigns increases the value of the current advertising significantly while adding little or no incremental expense. Increasing the value of the ongoing advertising by the major IXCs, is a benefit of local entry that could be represented by a negligible incremental marketing expense in this model. I take the much more conservative approach of assigning substantial incremental marketing expense to each entrant. This begins at 20 percent of revenues in year one and declines to 10 percent by year three. General and administrative expenses are assessed with a charge of 20 percent of revenue in year one, dropping to 10 percent by year three. The total SG&A from year three onward is 20 percent. [13]

3. Remaining Service Specific Costs

Costs that are not captured in the network costs or the cost categories described immediately above are accounted for as percentages of initial revenue. These percentages, which are shown in Table 5, are in addition to the network costs, operations and maintenance expenses, and retailing expenses.

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[13] Referring back to comments by AT&T's Mr. Zeglis, it is clear that AT&T believes that it can lower retail costs as a percentage of revenue by including the services in my analysis with local entry. Mr. Zeglis' comments are included in Attachment WLF-7.

Table 5
Remaining Service Specific Costs for Local Service
(as a percent of revenue)

CO Services:	5%
Number and Dial 0:	45%
Premium Services:	25%

The final cost specified in the model is the additional operating cost of providing incremental interLATA usage. This is specified as 60 percent of revenue and is added to the overall SG&A expense, which begins at 40 percent of revenue and tapers to 20 percent by year three. The steady state revenue margin for interLATA service is, therefore, specified at 20 percent.

V. RESULTS AND CONCLUSIONS

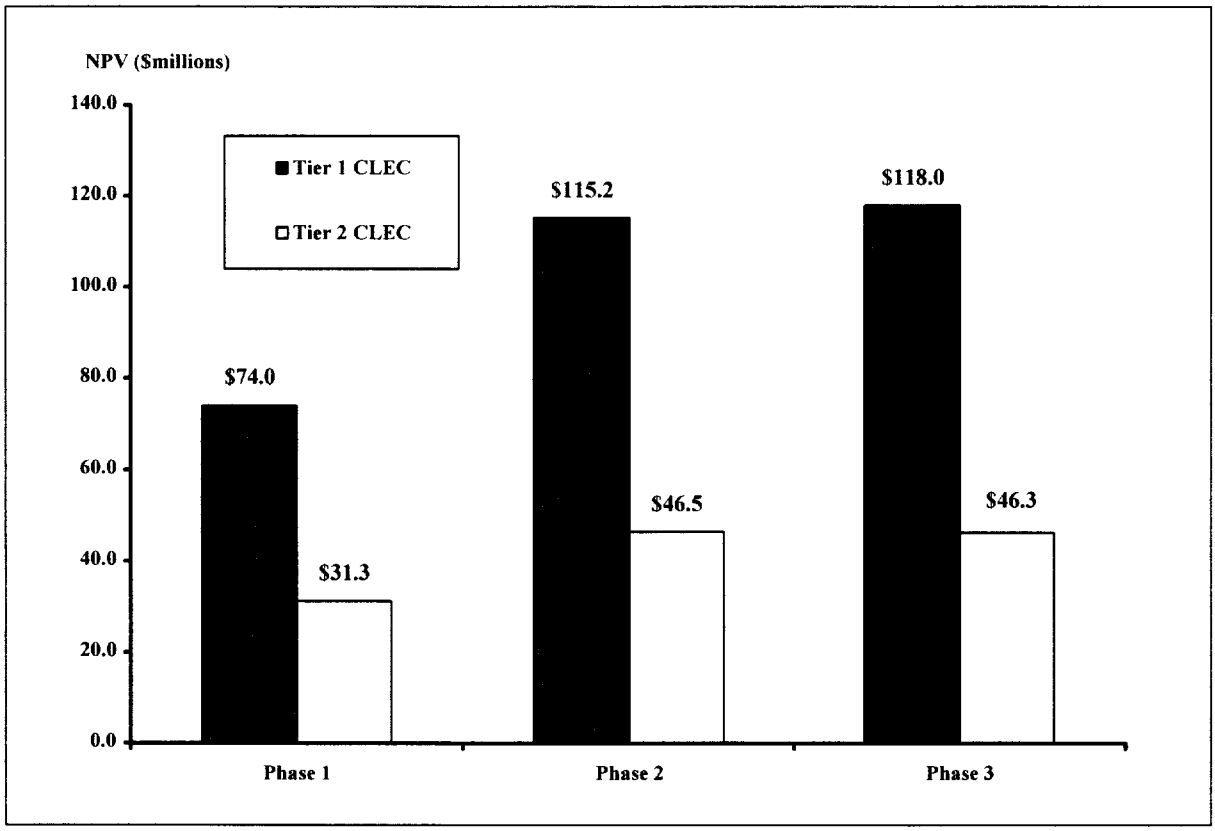
After determining representative costs of capital for CLECs, net present values are calculated for a Tier 1 and a Tier 2 entrant in each metropolitan area. The baseline cost of capital is 12 percent. I examine the sensitivity of the projected net present values (NPVs) of entry for a range of costs of capital. I present my results in two sections. In the first section I show the baseline results for four metropolitan areas, Columbus, Toledo, Indianapolis, and Muncie-Anderson. Next, I present a preliminary methodology for developing functional rules to determine where (i.e., what distance from the competitor's switch) and under what demand and cost conditions it is not necessary to provide unbundled local switching and transport. Using the model to explore alternative configurations of the Columbus and Indianapolis, it is possible to establish general guidelines for other metropolitan areas in Ohio and Indiana.

A. Results for Specific Metropolitan Areas

1. Results for Indianapolis, Columbus, and Toledo

The results for Indianapolis are shown in Chart 4.

Chart 4
Value of Local Entry
Indianapolis, 12% Cost of Capital



For the nine wire centers in central Indianapolis that make up Phase 1, it is clear that local entry provides very attractive financial opportunities for two Tier 1 CLECs and one Tier 2 CLEC. Even with the conservative assumptions in my analysis, the value of the Phase 1 local entry in central Indianapolis for a top tier CLEC that self-supplies transport and switching is approximately $74 million. With half as much market share, the value of local entry for the Tier 2 CLEC is still a healthy $31 million. The financial opportunities in

phase two of the build-out are also very attractive. The incremental values for self-supplying transport and switching to the twelve Indianapolis wire centers in Phase 2 are $41 million and $15 million.

The Tier 1 entrant adds another $2.8 million from building out to the final six targeted wire centers in Indianapolis (Phase 3). With only 6 percent of the lines, and the conservative assumptions in my analysis, the Tier 2 CLEC's value decreases by $0.1 million from the Phase 3 build-out. Our conservative assumptions not withstanding, the results suggest the possibility that only two competitors will extend facilities to wire centers that are further apart and on average have fewer access lines. Table 6 provides the phase specific incremental values for each metropolitan area. For Phases 2 and 3, these are the values that are added by extending facilities to each phase after building the previous phase. The results are similar in shape and vary as expected by the sizes of the metropolitan areas under study and the price and cost conditions. For example, Toledo has only 40 percent as many lines as Columbus. Indianapolis has more lines than Columbus, but this is offset by lower central business district unbundled loop prices in Ohio.

Table 6
Incremental Value of Local Entry
Three Phase Build-out, 12% Cost of Capital, ($M)

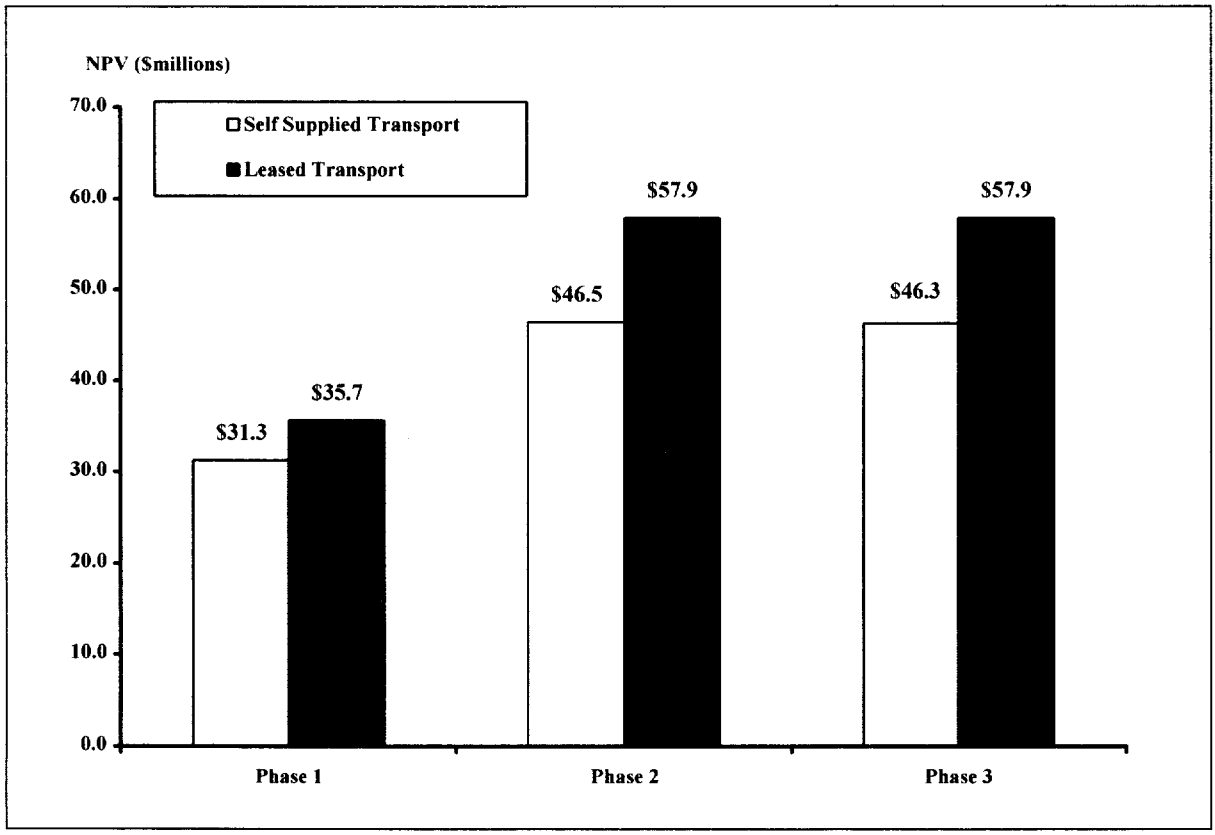
	Tier 1			Tier 2		
	Phase I	**Phase II**	**Phase III**	**Phase I**	**Phase II**	**Phase III**
Columbus	$83.2	$30.7	$6.9	$36.6	$12.1	$1.8
Toledo*	$21.4	$13.0	--	$7.5	$3.8	--
Indianapolis	$74.0	$41.1	$2.8	$31.3	$15.2	-$0.1

* Transport to the target wire centers in Toledo is built-out in two phases.

2. *Indianapolis Results for a Tier 2 CLEC with Leased Transport*

It is possible for competitors to lease transport facilities from Ameritech out of existing tariffs. This may prove to be the preferred strategy for some competitors, especially smaller competitors that do not have existing fiber networks. Results for the Tier 2 competitor in Indianapolis with self-supplied transport and transport purchased from Ameritech are shown in Chart 5. Leasing transport from Ameritech increases the overall value of entry for the Tier 2 CLEC from $46.3 million to $57.9, an increase of 25 percent.

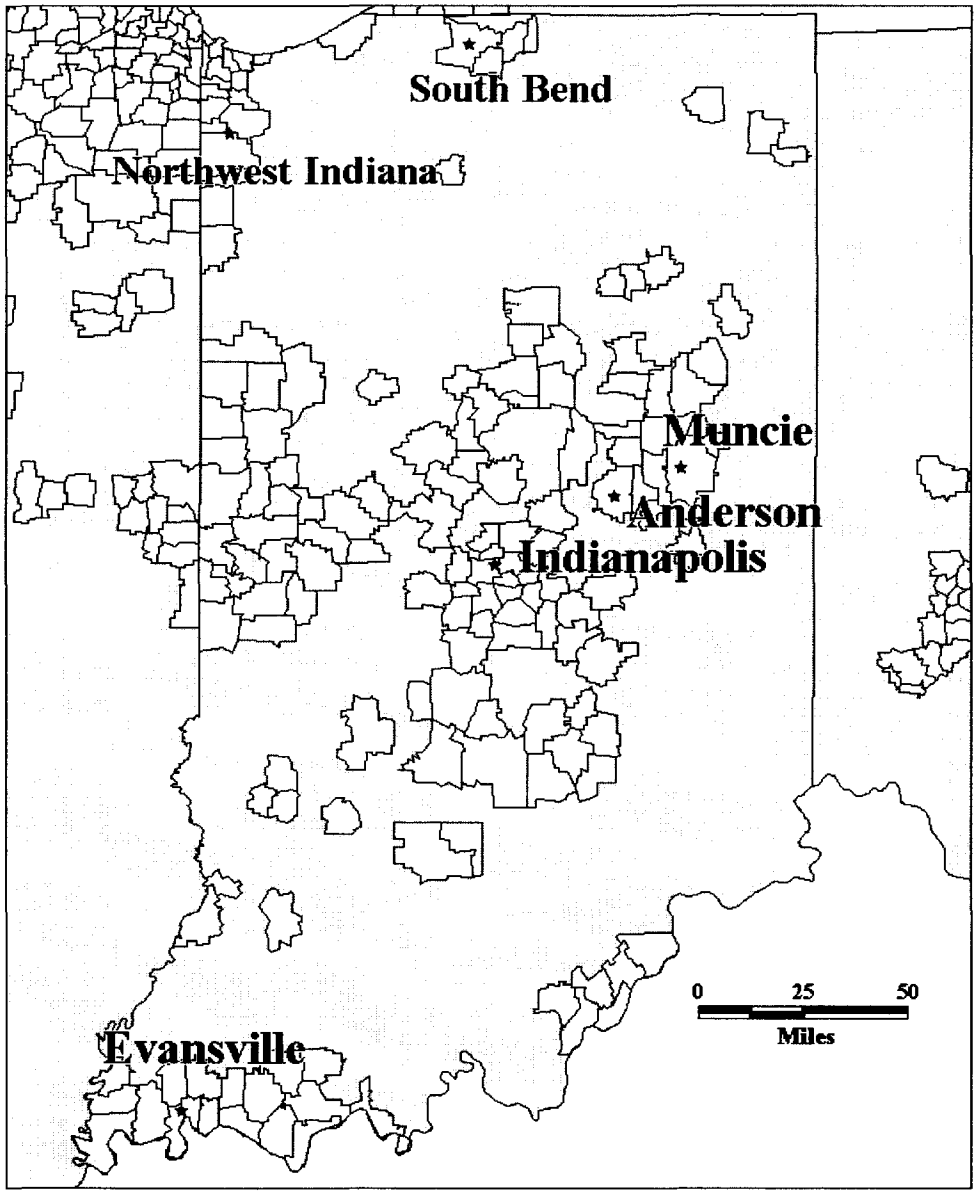
Chart 5
Value of Local Entry With Self-Supplied and Leased Transport
(Tier 2 CLEC in Indianapolis, 12% Cost of Capital)



3. Results for Extending Transport Facilities to Anderson-Muncie

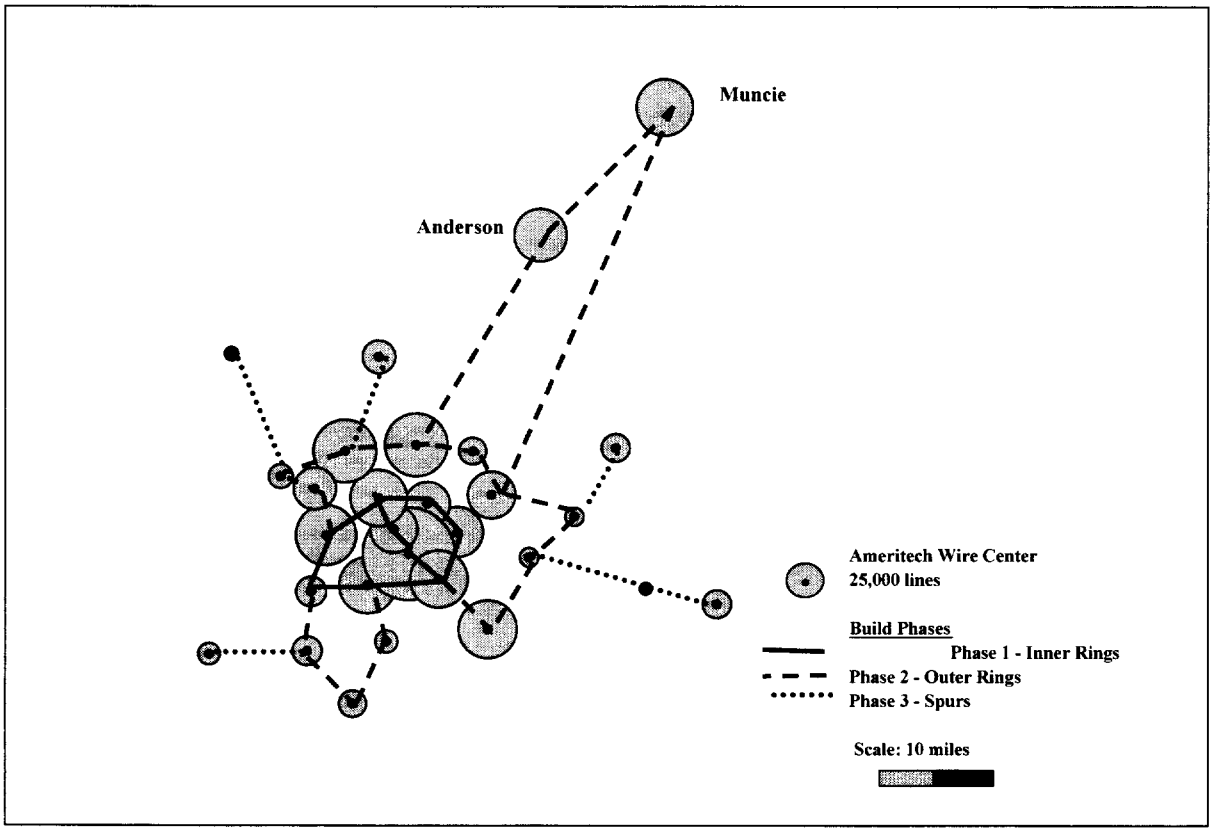
There are no competitive local switches in the Anderson-Muncie metropolitan area, but the LERG shows that there are two switches in Indianapolis that competitors have designated to serve the Anderson and Muncie wire centers.

Figure 1
Ameritech's Wire Centers in Indiana



The model was used to test the viability of serving Anderson and Muncie from CLEC switches in Indianapolis. Chart 6 depicts the same transport network for Indianapolis that was depicted in Chart 2, with the addition of a collector ring (Phase 2) to serve Anderson and Muncie.

Chart 6
CLEC Fiber Build-Out for Indianapolis
With Extended Build-Out to Anderson and Muncie



Model results validate the CLEC strategy of extending facilities-based service to Anderson and Muncie. Extending a Tier 1 CLEC's facilities to serve Anderson and Muncie as part of its Phase 2 build-out for Indianapolis increases the value of its Indianapolis simulation by $4 million with self-supplied transport and $11 million with leased transport. As shown in Table 7, the Muncie wire center is 48 air miles from the center of the Phase 1 ring in

central Indianapolis; building this ring doubles the Phase 2 route distance. Nonetheless, including Anderson and Muncie significantly increases the overall net present value of facilities-based entry in Indianapolis for a Tier 1 CLEC. With leased transport, even extending a Tier 2 CLEC's facilities to serve Anderson and Muncie increases the value of the Indianapolis simulation by almost $5 million. Results of the model's conservative simulations suggest the possibility that only two competitors will self-supply transport facilities to mid-sized wire centers, such as Anderson and Muncie, that require significant distances of additional transport. In the model, the difference between a Tier 1 and Tier 2 CLEC is strictly a function of the difference in market share. The Tier 1 results extend to any entrant that can achieve the market share of 12 percent by year 10.

Table 7
Two Tier 1 CLECs can Serve the Anderson-Muncie Wire Centers from Indianapolis

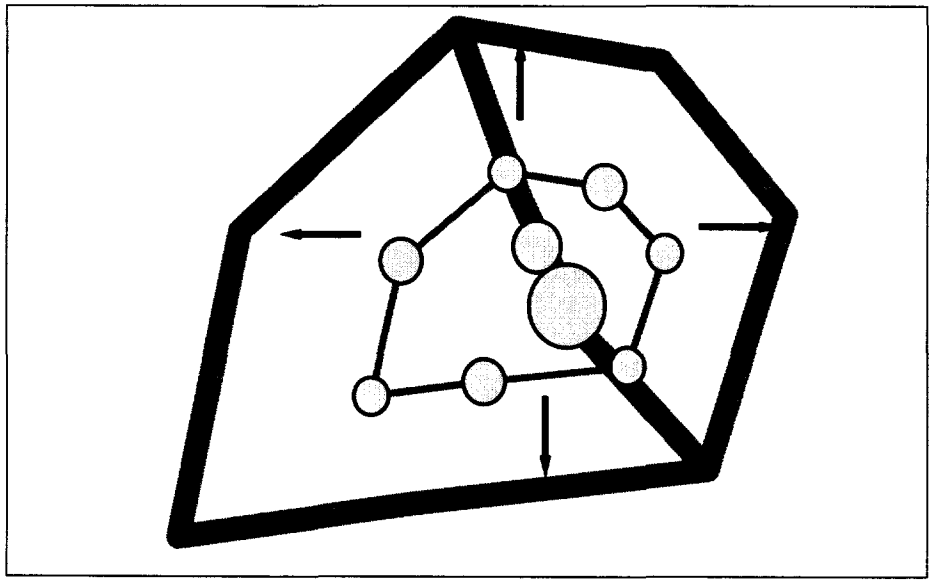
	Self Supplied Transport		Leased Transport	
	Tier 1	Tier 2	Tier 1	Tier 2
Incremental Value of Local Entry				
Indianapolis Value	$118.0	$46.3	$128.5	$57.9
w/ Anderson & Muncie	$122.7	$44.6	$139.9	$65.0
Increase	$4.7	-$1.7	$11.4	$7.1
Phase 2 Route Miles				
Indianapolis	82			
w/ Anderson & Muncie	164			
Air Distance from Center of Indianapolis to Muncie Wire Center (miles)	48			

B. Generalizing from Columbus and Indianapolis

The LECG Entry Model is designed to provide a method for developing functional guidelines that can be used to determine where CLECs have opportunities to prosper without access to unbundled local switching and transport. These guidelines are based on transport distances, numbers of access lines in target wire centers, and general revenue and cost characteristics. I have established some general guidelines by using the model to explore alternative configurations of the Columbus and Indianapolis metropolitan areas. To establish these guidelines I reran the model using alternative wire center line counts and transport distance estimates for the Phase 1 build-outs in Indianapolis and Columbus. All of the results presented in this section are with self-supplied transport.

The first step in the generalization process was to "stretch" the Phase 1 areas for Indianapolis and Columbus. The object of this step is to determine how large these geographic areas could become before the cost of transport reduces the value of the Phase I build-outs to zero. I depict this process in Figure 2 and show the results in Table 8.

Figure 2
Expanding the Distances Between Phase 1 Wire Centers



The top three rows in Table 8 show the values for Phase 1 entry, the total route miles of transport, and the approximate radii of the phase one build-outs prior to stretching the geographies of Indianapolis and Columbus. The bottom rows show the largest numbers of route miles and the approximate radii that can be achieved and still maintain positive values for Phase 1 build-outs. In this stage of the analysis, the access lines per wire center are held constant. The interpretation of these results is that the radii of the Phase 1 areas for Indianapolis and Columbus could be stretched from 5-6 miles to over 60 miles before the simulated values for facilities-based entry would become zero or negative.

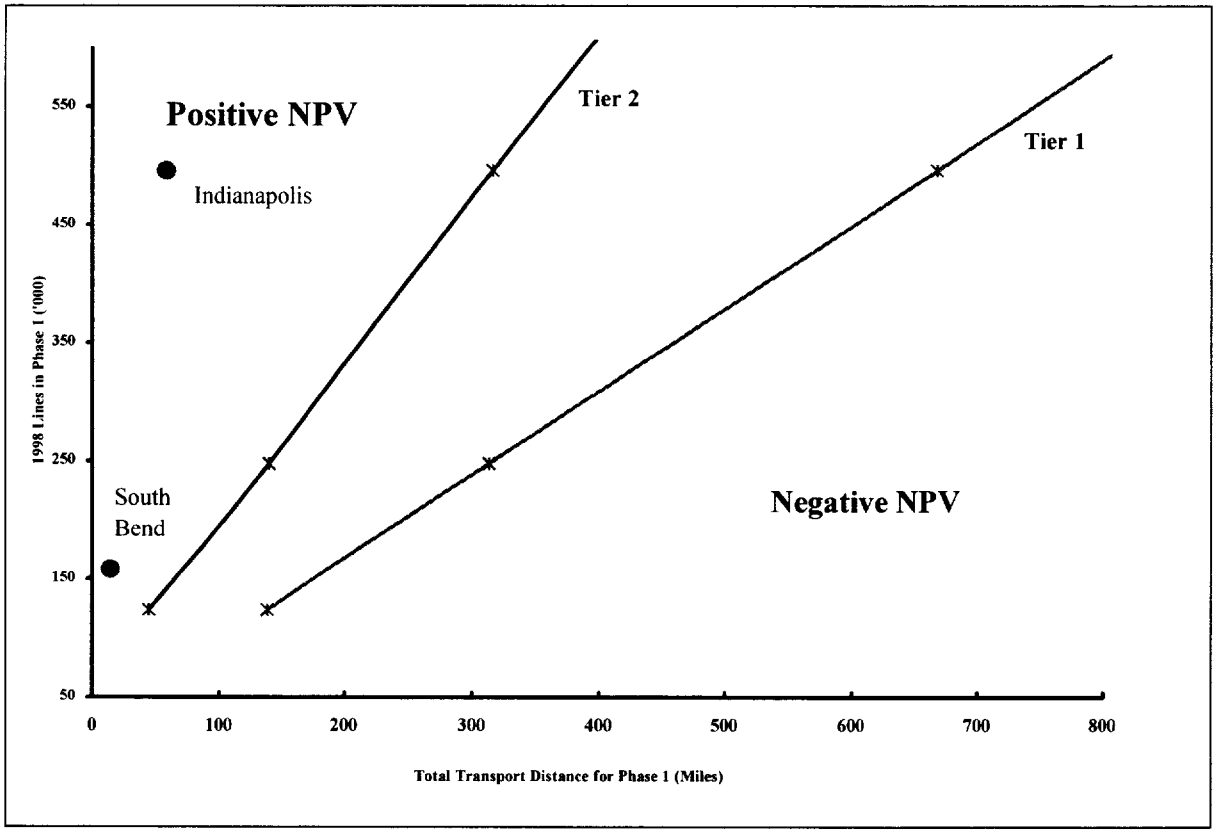
Table 8
Expanding the Distances Between Phase 1 Wire Centers

	Tier 1	Tier 2
	Indianapolis	**Columbus**
Baseline		
CLEC Baseline Value ($M)	$74	$83
Baseline Total Transport Route Miles	59	51
Approximate Radius (miles)	5.7	6.5
Expanded Wire Center Distance		
CLEC Value ($M)	$0	$0
Largest Route Mileage w/Positive NPV	668	736
Approximate Radius (miles)	65	94

By also changing the numbers of lines per wire center, it is possible to create a set of points where the distances between wire centers and the number of lines per wire center provide a series of scenarios with approximately zero value. Charts 7 and 8 provide graphs of these value neutral points for Columbus and Indianapolis. Plotted on the same charts are a number of other metropolitan areas in Ohio and Indiana. Given more time, the process of generalizing the results of the LECG Entry Model can be extended to include: 1) additional

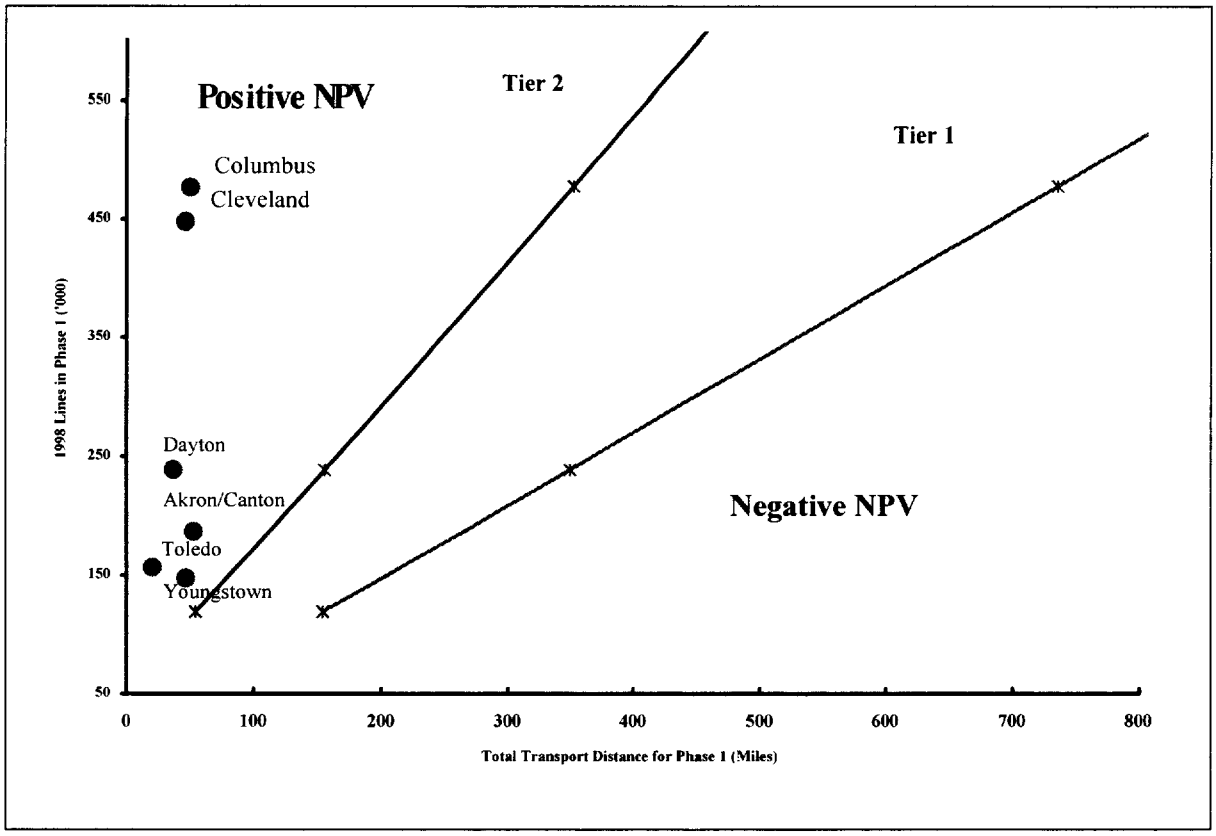
geographic areas; and 2) the numbers of network nodes, which has an impact on the costs of self-supplying transport.

Chart 7
Generalization for Indiana from Indianapolis Results



This chart provides guidelines based on building a transport ring to connect wire centers. If, for instance, it would take less than 100 miles of transport distance to connect wire centers in Indiana that have a total of 100 thousand access lines, the chart above indicates that two Tier 1 CLECs and a Tier 2 CLEC could build a viable business without access to unbundled transport and switching.

Chart 8
Generalization for Ohio from Columbus Results



C. Conclusion

My analysis demonstrates that competitors enjoy significant financial opportunities from local entry and expansion, even without access to unbundled transport and switching. These opportunities are available in large and small metropolitan areas and extend to wire centers many miles from competitors' local switches.

This analysis does not predict the financial performance of CLECs. Conservative inputs are used to avert debate that would otherwise distract attention from the specific purpose of this affidavit. Even the generalized guidelines are understated by the conservative inputs adopted in the model. The model is capable of testing the changes in values for relaxing several of the conservative assumptions. Preliminary analysis indicates that adopting less

conservative assumptions for a small number of inputs will have a significant upward impact on the value of entry for the Tier 1 and Tier 2 CLECs.

Even with conservative assumptions, results from the LECG Entry Model demonstrate that unbundled local switching and transport are not required for the financial success of reasonably efficient competitors in many metropolitan areas. These results are consistent with the evidence of facilities-based entry in Indianapolis, Columbus, and Toledo, and they are consistent the designation of Anderson and Muncie as wire centers that AT&T and Time Warner intend to serve from Indianapolis.

I declare under penalty of perjury that the foregoing is true and correct to the best of our knowledge and belief.

William L. Fitsimmons

Subscribed and sworn before me this 24th day of May, 1999

JACQUELINE O'NEILL
Commission # 1119125
Notary Public — California
Alameda County
My Comm. Expires Dec 6, 2000

Notary Public

My commission expires: 12/6/00