

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of)
)
SBC Communications Inc. and)
AT&T Corp. Applications for) **WC Docket No. 05-65**
Approval of Transfer Of Control)
)
)

DECLARATION OF SIMON WILKIE

I. INTRODUCTION

1. My name is Simon J. Wilkie. I am a Senior Research Associate in Economics at the California Institute of Technology. Prior to joining the faculty at the California Institute of Technology, I was a Member of Technical Staff at Bell Communications Research. I have also held the positions of Affiliated Scholar of the Milken Institute, and Visiting Assistant Professor at Columbia University. Over the past fifteen years, my academic research has focused on the areas of mechanism design, regulation, and game theory, with a particular emphasis on the telecommunications industry. I received a Bachelor of Commerce degree in Economics from the University of South Wales, and an M.A. and Ph.D. in Economics from the University of Rochester.

2. From 2002 to 2003 I served as Chief Economist at the Federal Communications Commission (“FCC” or “Commission”). In that capacity I oversaw the economic analysis performed by the Commission staff, and advised the Chairman and Commissioners on issues involving economic analysis. Major items before the Commission during my tenure included the EchoStar/DirecTV transaction, the Comcast/AT&T Broadband transaction, the Triennial Review of Unbundling Obligations, and the Biennial Review of Media Ownership rules.

3. I have been asked by Cbeyond Communications, Conversent Communications, Eschelon Telecom, Nuvox Communications, TDS Metrocom, XO Communications, and Xspedius Communications (collectively “Joint Petitioners”) to review the pending Applications for Approval of the Transfer of Control (“Application”) of AT&T Corporation and its subsidiaries (“AT&T”) to SBC Communications (“SBC”)

(AT&T and SBC together, the “Applicants”) and provide an analysis of the public interest issues raised by the proposed transaction.

4. The Application for approval of the transfer of control of AT&T to SBC represents a pivotal point in communications policy. If approved, it will reverse the separation that has been in place since the 1984 Consent Decree and undo the foundations of the 1996 Act. The proposed merger compels the Commission to undertake the most detailed and careful economic analysis of the possible effects of the merger on consumers.

5. Applicants propose to consolidate the first and second largest providers of long distance telecommunications services in approximately 40 percent of the nation, combine the first and second largest providers of retail local exchange services in the same region, and merge the owner of the largest holder of local network facilities in SBC region with the owner of one of the two largest sets of CLEC local networks in that region. When considered in the broader context of the proposed Verizon-MCI merger, the situation is even more complicated as that transaction would result in the loss of the third largest competitor in the region as well, with no other competitive service providers of sufficient size and scale available to replace them in the marketplace.

6. The Applicants compete vigorously in several markets, most notably in the wholesale markets for local access facilities and circuits. AT&T’s wholesale offerings compete directly with SBC’s special access products. By removing the competitor with one of the two largest sets of CLEC local networks in the SBC region, the merger would likely lead to significant increases in these prices. This will raise SBC’s rivals’ costs and that in turn will reduce competition in the retail markets for the

sale of voice and data to business customers.

7. The Applicants have failed to demonstrate any credible public interest benefits from the transaction. Therefore in my opinion, the Commission should block the merger or condition its approval on a suitable remedy that will restore the role played by an independent AT&T in the relevant wholesale access markets.

II. THE BUSINESS MARKETS

8. The Applicants assert that the proposed merger will not harm consumers. The Applicants begin by dividing the business customers into three classes: small, medium, and large. The basis of their claim that the proposed merger will not harm business customers is that AT&T serves primarily the large customer class, while SBC serves mostly the small and medium classes. The different classes are characterized not just by their expenditures but also by the types of services that they typically purchase. In the business markets, there are a greater number of facilities-based competitors than in the residential market, and these firms tend to specialize in serving one business class (i.e., small, medium, or large). Thus, the Applicants argue, if each customer class is a separate economic market, there is no increase in concentration from the merger.

9. However, even accepting the different classes of customers, this scenario is misleading. The merger threatens the viability of facilities-based competition by its impact on wholesale markets for local access facilities and circuits that the CLECs and others competing with SBC for business require in order to serve their retail customers. In the downstream markets, CLECs, interexchange carriers (“IXCs”), and data companies compete for providing services to business customers. To provide these services they

must be able to reach the customer and deliver the customers' voice or data traffic to its destination. No one firm has the infrastructure to provide all these services in any geographic area except for the ILEC, which has circuits interconnecting every central office and connecting to virtually every building location. All other competitors must complement their own facilities with loops, interoffice transport, and entrance facilities purchased from other suppliers. The default option for the downstream firm is to purchase the required input from the ILEC, in this case SBC, at special access rates. Absent an alternative supply, the ILEC has the incentive and ability to price these circuits at supra-competitive prices in order to foreclose competition or extract monopoly rents from the entrant.

10. Historically, because of these concerns, special access rates were regulated, most recently under a price cap regime.¹ However since 1999, in the 140 largest metropolitan areas, those very geographical regions that contain the vast bulk of the business markets, special access pricing has been largely deregulated. This "pricing flexibility" regime allows the ILEC to set prices without a cap and engage in price discrimination. Since pricing flexibility was instituted, special access rates have risen dramatically.² In the last few years, despite the "telecom crash," revenues in the special access market have increased from \$4 billion to over \$14 billion a year. In stark contrast, on long-haul routes where there are multiple competing transport providers, rates have fallen over 90 percent. Consider the market for DS3 (45 Mbps) level transport from New

¹ See, e.g., Patrick Rey and Jean Tirole, "Foreclosure," in Mark Armstrong and Rob Porter, eds. (2005), *HANDBOOK OF INDUSTRIAL ORGANIZATION: VOLUME III*, North Holland.

² See, e.g., Noel D. Uri & Paul R. Zimmerman, "Market Power and the Deregulation of Special Access Service by the Federal Communications Commission," 13 *INFORMATION & COMMUNICATIONS TECHNOLOGY LAW* 129-173. See also Federal Communications Commission, "Current ARMIS Instructions," <http://www.fcc.gov/wcb/armis/instructions/> (Apr. 1, 2005) (main menu).

York to Los Angeles, a distance of approximately 2,500 miles. In June 1999, such a circuit would be leased for \$55,000 per month. In February 2004, the price was \$3,500 per month. This represents a decline of over 90 percent.³

11. The structure of these tariffs is such that the largest purchasers, AT&T and MCI, obtain substantial discounts relative to the smaller CLECs. This is due apparently to AT&T's and MCI's scale and scope and extensive local facilities, which appear to give them much more bargaining power and a more credible threat to deploy their own facilities. Smaller competitors have much less bargaining power, and, because typically they are closer competitors with the ILEC in focusing on the smaller and medium sized customers, the special access rates they pay are significantly higher.

12. There has been significant investment by CLECs in deploying their own local transport facilities. When the economies of scale are sufficient to justify the sunk costs and the financing is available, it is reasonable to assume that a competitor will self deploy. Because of the nature of fiber deployment, with large sunk costs and very low marginal costs, the ILEC and a competitor will typically lay down much more fiber than current demand requires. Thus on some links, there is apparently duplicative fiber installed and so an alternative to the ILEC special access tariff could be available.

13. Thus, for a competitive entrant that needs to connect to customer facilities in a local market, there are three options: self deploy, pay the special access tariff, or conduct an auction to obtain competitive bids for these circuits. Because the special access rates available to smaller competitors are so high, there has developed a

³ See PrimMetrica, Inc., Telegeography Bandwidth Pricing Database Services, available at <http://www.telegeography.com/products/bandwidth_pricing/index.php> ("Telegeography Bandwidth Pricing Project"). All prices quoted here are from that database.

substantial wholesale market for sourcing these circuits. These are examples of what economists call a “bid market.” A firm that requires a circuit or many circuits in a particular area puts out a request for proposal (“RFP”) requesting bids for the required circuits. The bids typically will be composed of a monthly recurring charge (“MRC”) and a non-recurring charge (“NRC”). A firm may put out a request for a price for providing a given circuit or the right to provide the required circuits in an entire MSA or even an entire LEC region.

14. My understanding is that the two largest bidders by far in these wholesale bid markets are AT&T and MCI. They are direct competitors with the ILEC for its special access business. Thus, the proposed transaction is a horizontal merger in wholesale local access markets, and we need to examine the unilateral effect of this merger on prices in these markets and consider the possibility of coordinated effects, especially given Verizon’s proposed acquisition of MCI.

15. Despite the fact that the ILEC is the only firm with a ubiquitous presence and so can bid on every contract, my understanding is that they rarely actively underbid the posted special access rates. If this is the case, we can infer from its current bidding behavior that it is more profitable for SBC to maintain high special access rates and raise rivals’ costs than to undercut, for example, MCI’s bids. Notice that after the merger, because the merged entity will have an even larger share of the business markets, the incentive to raise rivals’ cost or foreclose entry will be even greater.

16. My understanding is also that MCI and AT&T are by far the most active bidders in the market to undercut the special access rates. AT&T boasts in its

Application that it is “the top-ranked wholesale telecommunications vendor.”⁴ A description of MCI’s business practices in the wholesale market is provided in the declaration of Jonathan Powell and Stephen Owens in the MCI/Verizon filing.⁵ It is my understanding that, when a contract is sufficiently large, the ILECs occasionally enter the market and bid. However, when compared with their ubiquitous presence in the market, their participation is paltry and their win rate almost nil. Thus, we can examine the bidding behavior in these markets and assess the unilateral effect of the proposed merger with the removal of AT&T as an independent competitor on wholesale prices. I begin by examining the importance of AT&T and MCI on the supply side.

17. I understand that both AT&T and MCI make available to wholesale customers in a MSA a map of their “on net circuits,” that is those circuits that can be delivered using their own facilities. In these markets bids composed of just “on net circuits” are labeled Type I circuits, and those bids that use resold ILEC facilities are labeled “Type II” circuits.⁶ Thus, AT&T and MCI compete in local wholesale access markets by providing circuits over their own facilities or by exploiting their special access volume discounts and reselling ILEC circuits to smaller competitors. In the latter role, MCI and AT&T act as efficient aggregators, essentially aggregating the demand of the smaller CLECs to facilitate CLEC entry to serve business customers through the volume discounts in the special access tariff that MCI and AT&T obtain.

⁴ Declaration of Dennis W. Carlton and Hal S. Sider, *SBC Communication, Inc. and AT&T Corp. Applications for Approval of Transfer of Control*, WC Dkt No. 05-65 (F.C.C. Feb. 21, 2005), at 9 (citing Yankee Group).

⁵ See generally Declaration of Jonathan P. Powell and Stephen M. Owens, *Verizon Communications, Inc. and MCI, Inc. Applications for Approval of Transfer of Control*, WC Dkt No. 05-75 (F.C.C. Mar. 9, 2005).

⁶ I have been told that, other things being equal, buyers have a preference to purchase Type I circuits to avoid any reliance on the ILEC who may degrade quality or be unresponsive to service problems.

18. To assess the role of AT&T in these markets, it is instructive to look at what portion of the potential competitive supply to business buildings they constitute. AT&T has the largest number of building presences (counting those AT&T serves using both Type I and Type II circuits) in every market I have examined to date. Moreover, MCI has the second-largest CLEC building presence (again, counting those MCI serves using both Type I and Type II circuits), and the third largest firms have much smaller shares. It is instructive to view a few sample markets to appreciate how substantial AT&T and MCI are in these wholesale markets. For example if we look at the Cleveland Metropolitan Statistical Area (“MSA”), there are 3,039 commercial buildings served by CLECs using Type I or Type II circuits. The impact of removing AT&T as a supplier of alternative access to building is shown in Table One below.⁷

⁷ The source for the commercial building data cited in this Declaration is GeoResults, Inc., a leading vendor of U.S. telecommunications demand and network equipment data. As the firm advertises, “GeoResults provides a unique and proprietary set of telecommunication bandwidth estimates and circuit demand estimates at the individual business establishment level . . . Using our nationwide proprietary Telecom Competitive Infrastructure Reports, GeoResults can identify, locate and spatially profile all buildings that are currently being served by a specific competitive service provider. These buildings will include all central office collocation sites, all commercial office buildings and all potential network interface and carrier hotel sites.” GeoResults, Inc., “National Business Databases,” <http://www.georeresults.com/Databases.htm> (Apr. 22, 2005).

TABLE ONE

County	Pre Merger CLEC Bldgs	Post Merger CLEC Bldgs	% Decline
Cuyahoga, OH	2,699	1,267	52.5%
Geauga, OH	26	10	61.5%
Lake, OH	344	132	61.6%
Cleveland Total	3,039	1,409	53.6%
Cleveland CBD	248	160	35.5%
Cleveland Non CBD	2,791	1,249	55.2%
Source: GeoResults			

19. If we remove those buildings in which AT&T and/or MCI are the only competitive suppliers, there are 1,170 buildings remaining. Thus, removing AT&T and MCI as independent competitors to SBC in this bid market reduces the number of buildings with competitive supply by 61.5 percent. The effect on the competitive supply in other MSAs is similar.

20. The effect on the Milwaukee MSA of removing AT&T is a 64 percent decline as shown in Table Two below.

TABLE TWO

County	Pre Merger CLEC Bldgs	Post Merger CLEC Bldgs	% Decline
Milwaukee	1,819	665	63.4%
Ozaukee	168	59	64.9%
Washington	197	52	73.6%
Waukesha	1,108	410	63.0%
Milwaukee Total	3,292	1,186	64.0%
Milwaukee CBD	245	129	47.3%
Milwaukee Non CBD	3,047	1,057	65.3%
Source: GeoResults			

21. Thus, the total supply of buildings with circuits accessing buildings outside the control of SBC will be significantly reduced, causing a substantial diminution in competition in these markets. Moreover, post merger AT&T will no longer offer its discounted special access services.

22. The question then arises as to how much competitive harm will result from the proposed merger. To evaluate this, I have examined bid data provided to me by the Joint Petitioners. To evaluate the likely competitive effects, one needs to consider both the unilateral effects and the coordinated effects. Unilateral effects are the effects on equilibrium prices that will result from the removal of AT&T as an independent competitor with SBC. Coordinated effects refer to the possibility that the remaining firms may have the incentive to jointly change their behavior, either tacitly or explicitly. Jointly with this proposed transaction and the proposed MCI/Verizon transaction, the possibility of coordinated effects is very real.

23. To examine the unilateral effect, at first one can look at the bid data and ask, "What would the price be absent AT&T's bid given the bids of the others?" However, this significantly underestimates the likely competitive effect of the proposed merger, as with one less competitor the remaining bidders will bid less aggressively to win and thus raise the equilibrium price. Auction theory provides us with the formula for how much the expected prices will rise.

24. As an illustrative example, consider an auction with which I am familiar for the provision of Fast Ethernet service to a particular location in Chicago. This auction had three bids. SBC bid a \$6,580 MRC and a \$3,060 NRC, the second lowest bidder bid \$4,000 MRC and a \$2,000 NRC, while AT&T bid \$2,755 MRC and a \$1,220 NRC.

Thus, removing AT&T from the bidding would cause harms of \$1,245 per month and a one-time \$780 harm due to the increase in the NRC. However, this is not the end of the analysis as it is not the change in the *equilibrium* bid. If SBC is just bidding its posted special access rates (or a fixed discount from them), then the second bidder can win by just undercutting SBC by a small amount. The proposed merger would cause the equilibrium MRC to increase by approximately \$3,800, an 87 percent price increase. Moreover, even if the MRC only increased to \$4,000, SBC would have succeeded in raising its rivals' costs and perhaps foreclosing competition to this customer location entirely if \$4,000 is above the CLECs' choke price.

25. The adverse competitive effects of the proposed merger in the downstream retail voice and data markets depend on the building specifics. Consider the case of a business in a building that currently has AT&T as the only alternative wholesale supplier. In this case any CLEC can reach the customer using, for example, AT&T's wholesale access facilities or *via* SBC's special access service. The downstream business thus can solicit bids from any CLEC based on their ability to serve the customer using the competitive AT&T price for the access circuit. Given the retail offerings from various firms including SBC, the downstream firm will choose the best offering. Now consider what happens post merger. There is no competition from AT&T and other access providers to discipline SBC's special access price. Thus, SBC could charge an access price that would foreclose the CLECs and so charge the monopoly price to the customer and earn the monopoly rent for SBC's service. The customer suffers from both a higher price and the loss of their first (and perhaps even second or third choice) provider in the market. Therefore, if SBC charges an access price that allows a CLEC to win the

customer, it must make at least as much profit on the wholesale offering as the profits it makes under foreclosure. Thus, even if the customer's first choice CLEC can still serve the customer, the customer will suffer a higher price due to the increase in the CLEC's marginal costs, and SBC will extract its monopoly rent.

26. I have been able to reach some salient conclusions from the bid data I have reviewed to date.

- Winning bids are on average 50 percent to 60 percent lower than ILEC special access charges.
- The RBOC is almost never the lowest bidder.
- AT&T and MCI are by far the most frequent bidders.
- AT&T or MCI is the low price bidder most of the time.
- There is a significant difference between the winning price and the second lowest price.
- As AT&T has moved to a wholesale business strategy, it has been bidding more aggressively in these markets over the last year. Indeed, one wholesale customer has seen a 25 percent reduction in average winning DS1 MRC since last September. Therefore the use of historical data may underestimate the merger specific harms.

27. I conclude that the removal of AT&T as an independent competitor to SBC in local wholesale access markets will cause significant consumer harm. In particular for those circuits where competition is eliminated and the requesting carrier is left with special access tariff, prices will rise approximately 100 percent. One recent study estimated that cost of a DS1 loop circuit amounts to about one third of a wireline CLEC's incremental costs and that a 100 percent increase in costs would in fact make it uneconomic for the CLEC compete, causing that firm to exit the market. Thus, by this model, and the sample data from Cleveland and Milwaukee, it would be feasible for SBC

to foreclose competition for businesses located in tens of thousands of locations throughout its area, and so enable the ILEC to raise prices to those business customers.

28. We now turn to the issue of coordinated effects, in particular the issue of “tacit collusion” between SBC and Verizon in wholesale access markets across their respective regions. Tacit collusion occurs when firms through equilibrium behavior (rather than explicit agreement) act in a coordinated way to raise prices or reduce competition. Thus, for example, suppose it would be profitable for firm A to enter firm B’s market and compete. However, firm A does not enter because of the possible retaliation that B would enter and compete down price in A’s market. In this case, market A and B are characterized by tacit collusion. Economists have identified the market characteristics that make tacit collusion more likely as the market outcome. The key factors include (1) small number of firms, (2) repeated interaction, (3) multi-market contact, that is the same firms compete in many different geographic or product markets, (4) barriers to entry such as sunk costs, (5) distinct geographic areas that make it easy to coordinate by “dividing the market,” and (6) posted prices or publicly available price information.⁸ Since these factors are present in local wholesale access markets, the combination of SBC controlling AT&T and Verizon controlling MCI creates a “perfect storm” for tacit collusion with the resulting coordinated effects harming consumers.

29. The empirical literature on tacit collusion is now quite large. For example Fournier and Zeuhlke examine airline pricing and find that when carriers are paired with multi-market contact where one firm has an advantage in one market (a city pair where

⁸ See Fudenberg and Tirole (1994), “Game Theory,” Cambridge, MA: MIT Press. The classic reference on multi-market contact is B.D. Bernheim M.D. Whinston (1990), “Multimarket Contact and Collusive Behavior,” 21 RAND JOURNAL OF ECONOMICS 1–26.

one city is a hub for the carrier) and has a small presence in a second city pair market while a second firm has a hub in the second market but has a smaller presence in the first, then prices are 9 percent to 12 percent higher than would be expected.⁹ Busse examines cell phone pricing in the duopoly era and finds that prices in markets where the firms had multiple market contact prices were 7 percent to 10 percent higher than expected, all else equal.¹⁰ Other industries in which economists have examined tacit collusion include banking and bidding in the FCC spectrum auctions.¹¹

30. This type of tacit collusion is orchestrated by a simple strategy: “I will not undercut your special access rates to competing carriers in your territory if you do not undercut my special access rates to competing carriers in my territory.” The strategy is consistent with the behavior of SBC and Verizon in other markets. In fact there are possible coordinated effects in both wholesale local access markets and retail business markets.

31. ILECs have market power in special access markets, where there is no competition but the current special access prices are (somewhat) constrained by AT&T and MCI’s cost of self deployment, which is lower than the self deployment cost to the smaller competitors. Post merger, SBC will have the incentive to raise rivals’ costs in wholesale local access markets by removing AT&T from the wholesale circuit bid auctions in SBC’s territory. This is the unilateral effect identified above. However, this

⁹ Gary M. Fournier and Thomas Zuehlke (Nov. 2004), “Price Effects of Reciprocal Multi-Market Contacts Among Airline Carriers,” Department of Economics Florida State University Working Paper.

¹⁰ Meghan R. Busse (2000), “Multimarket Contact and Price Coordination in the Cellular Telephone Industry,” 9 JOURNAL OF ECONOMIC AND MANAGEMENT STRATEGY 287-320.

¹¹ A.A. Heggestad and S.A. Rhoades (1978), “Multi-market Interdependence and Local Market Competition in Banking,” 60 REVIEW OF ECONOMICS AND STATISTICS 523–532, and Crampton, P. and J. Schwartz, 2002, “Collusive Bidding in FCC Spectrum Auctions,” *Contributions to Economic Analysis and Policy*, Vol. 1, No. 1.

still leaves Verizon/MCI as a potential bidder. Adverse coordinated effects caused by the proposed mergers would result if SBC/AT&T stopped competing with independent carriers in wholesale bid markets by undercutting Verizon's special access tariff in its territory, and Verizon/MCI stopped bidding in SBC territory. This combination of decisions by SBC and Verizon would produce the coordinated effects in the wholesale markets.

32. In this case the strategy of competing only in one's own territory is mutually beneficial and self enforcing when (1) the discounted present value of the gains in their home markets from higher special access revenues, and raising the costs of CLECs and thereby reducing their competitive pressures on retail prices, exceed (2) the lost profits from bidding in the wholesale/resale markets in the other firm's territory. In particular, the incumbent ILEC could always threaten that if the tacit agreement is broken, it will compete down the price on the out-of-region ILEC's owned circuits in its territory, thereby reducing any wholesale margins. This analysis does not imply that SBC buys AT&T's assets and chooses not to use them. Thus, to check that this is indeed equilibrium conduct the key variables are the profit margins in each market and the size of the "home territory." For example Sprint, has a much smaller home business market than SBC or Verizon, so it is somewhat less likely that Sprint would cede Sprint's share of the national wholesale market for an increase in market share and prices in its small home territory, but for Verizon and SBC the special access market is so large and the extent of CLEC facilities in their home territory is sufficiently high that I am confident that the potential for tacit collusion should be a very serious concern.

33. The net result of this tacit collusion is to raise the costs of all other

carriers, disadvantaging them as competitors. However because SBC only has to pay its true marginal cost in its home territory it will capture a greater market share and/or can raise final prices. Thus the tacit collusion results in harms in the downstream business market from both higher prices and, to the extent that some carriers are foreclosed from the markets, customers lose their "first best choice" in the market,. Again notice that the result does not require SBC to exit the markets in Verizon's territory, it still maintains a competitive presence and will compete for large national customers and those who are "on net." The harm is that the level and effectiveness of competition compared with an independent AT&T is diminished.

34. The second effect, taking place in the retail business market, was first identified by Laffont, Rey, and Tirole.¹² They model competition in a network industry where two firms compete for final customers. Each firm requires access to the other's network to deliver service. They show that with unregulated access prices, if the firms are sufficiently symmetric there is an equilibrium where both firms charge very high access prices and capture the monopoly rent on input prices even though the price for the final good is competed down to cost. Thus the firms tacitly collude through their choice to accept the high access charges of the other. These high access costs can be used as a barrier to entry in the transition to competition.

35. The adaptation to the case at hand is straightforward. Suppose now SBC post-merger raises special access prices above the current levels. This gives SBC/AT&T a further cost advantage in its own territory and it will capture more market share of firms whose demands are heaviest in its home territory. A similar analysis holds for

¹² J.J. Laffont, P. Rey, and J. Tirole (1998), "Network Competition: Overview and Nondiscriminatory Pricing," 29 RAND JOURNAL OF ECONOMICS 1-37.

Verizon/MCI, if Verizon raises special access rates in its home territory. Under the current pre-merger market structure an independent MCI would react to SBC's price hike by deploying more fiber loops and transport to avoid the price hike and preserve its market share. However to carry out the threat requires an investment in sunk costs that are highly visible, and so post merger the obvious coordinated strategy is "I won't invest in new competing fiber links in your territory if you don't in mine." Again this works if the benefits (higher retail prices and greater market share in the ILEC's home territory) exceed the costs (the loss of market share outside the ILECs home territory). Again the bigger the home territory as a fraction of the national market, the easier it is to sustain this pair of strategies as an equilibrium.

36. The net result of this tacit collusion is to raise the costs of all other carriers, disadvantaging them as competitors. However because SBC only has to pay its true marginal cost in its home territory it will capture a greater market share and/or can raise final prices. Thus the tacit collusion results in harms in the downstream business market from both higher prices and, to the extent that some carriers are foreclosed from the markets, customers lose their "first best choice" in the market. Again notice that the result does not require SBC to exit the markets in Verizon's territory, it still maintains a competitive presence and will compete for large national customers and those who are "on net." The harm is that the level and effectiveness of competition compared with an independent AT&T is diminished.

37. That these concerns are not just hypothetical can be seen in the behavior of SBC and Verizon. For example, one of the conditions imposed by the FCC in the SBC/Ameritech merger was that SBC had to invest in competitive facilities in markets

outside its territory. SBC did invest substantial sums in its “National-Local Strategy,” but then retreated from their investment. Thus SBC has a history of being willing to forgo large revenues rather than compete with another RBOC in that firm’s core market.

38. Similarly SBC and Verizon divide the DSL and residential voice market in Los Angeles based on historical territories. Both firms operate in Los Angeles and both firms offer almost identical DSL service. However, there currently is a \$10 discrepancy between the monthly price charged by Verizon and the price charged by SBC.¹³ One of the fundamental tenets of economic competition is the “law of one price,” that is, identical products sold in the same market should have the same price. Here the law of one price fails, indicating a lack of competition. The reason is straightforward: SBC is forgoing arbitrage profits because it will not sell DSL to customers in “Verizon territory” and similarly Verizon will not sell to customers in SBC’s territory. Thus, the two firms have tacitly divided the market. SBC also will not provide bundled voice service for a number in Verizon’s territory.

39. Finally it is instructive to again look at the dearth of competition between Verizon and SBC in the business market in Los Angeles. There CLECs are present in about 20,000 locations, 13,111 in SBC territory and 7,369 in Verizon territory.¹⁴ Of these 20,480 appearances, despite their massive cost advantage from their installed network bases, Verizon accounts for only 146 competitive appearances in SBC territory and SBC accounts for a mere 113 appearances in Verizon territory. If their performance as competitors in Los Angeles is indicative of what will happen nationally once they

¹³ See generally company websites of Verizon Communications, Inc. and SBC Communications, Inc.

¹⁴ The source of data is GeoResults, Inc.

control both AT&T and MCI, then the public interest will be seriously harmed.

III. RESIDENTIAL MARKETS

40. Three classes of products are sold to residential customers: local, long distance, and the bundled product of unlimited local and long distance for a flat fee. In the pure local product market, there is scant evidence that competition from AT&T has lowered prices. Given that the states continue to regulate SBC's mass market telephone service offerings, it is difficult to gauge the extent to which the presence of AT&T as a competitor in this market has affected retail prices. Nevertheless, the key issue is whether such competition would, over time, diminish the need for such state regulation.

41. In the residential long distance market the economic evidence shows that SBC acts a competitor to AT&T. For example, a study by Hausman et al. found that the entry of SBC and Verizon into long distance markets after 271 approval lowered residential long distance prices by eight percent to eleven percent.¹⁵ Thus the removal of SBC as an independent competitor would significantly raise prices. Indeed to assess the impact of SBC in the market for long distance residential service, one can do no better than to quote Marius Schwartz:

It stretches credulity to argue that a BOC has nothing to add relative to other competitors in long distance, such as the hundreds of resellers. BOC advantages that were discussed in section 3.1.3 for providing integrated services—reputation, customer relations, and scale—would also make the BOC a potent competitor in long distance, especially to serve low-volume customers.¹⁶

42. The case of the bundled unlimited calling wireline product is even more

¹⁵ See Jerry A. Hausman, Gregory K. Leonard, and J. Gregory Sidak (2002), "Does Bell Company Entry Into Long-Distance Telecommunications Benefit Consumers?," 70 ANTITRUST LAW JOURNAL 463-484.

¹⁶ See Marius Schwartz (2000), "The Economic Logic for Conditioning Bell Company Entry into Long Distance on the Prior Opening of Local Markets," AEI-Brookings Working Paper No. 00-04.

problematic, as three firms SBC, AT&T, and MCI control almost all the market in SBC's region. Thus, the merger is a classic three to two merger, with the further complication that MCI may exit the market if purchased by Verizon. My understanding is that the Applicants bear the burden of proof for their claim that the proposed merger will not harm the public interest. Given the high level of market concentration, this burden is substantial. However, the Applicants do not provide a formal economic market analysis, such as defining the geographic and product markets correctly by examining the data for the degree of substitutability.¹⁷ Instead, they provide unsubstantiated claims about intermodal competition, e.g., from wireless and VOIP services. Such competition may be increasing, but the relevant question is, given the effect of intermodal competition, will the merged entity have the incentive and ability to raise prices profitably? A formal antitrust economic analysis is required to answer this question.

43. In conducting such an analysis one begins by defining a relevant product market. Using the "smallest market principle," we begin with products sold by the merging parties and ask whether a hypothetical monopolist would find it profitable to impose a small but significant and non-transitory increase in price.¹⁸ If the answer is yes, we are finished and that is the extent of the relevant product market. If the answer is no, then we include the next best substitute for the merging parties' products as revealed by market behavior such as the diversion ratio. Here the product of interest consists of the bundled "all distance" circuit switched wireline offerings of the merging parties. Given the number of customers and the known churn rate data, the next best substitute to AT&T

¹⁷ See U.S. Department of Justice and the Federal Trade Commission, *Horizontal Merger Guidelines*, issued April 2, 1992 (revised April 8, 1997), hereinafter "Horizontal Merger Guidelines."

¹⁸ See *Horizontal Merger Guidelines* at Section 1.1.

and SBC's wireline bundled product appears to be MCI's Neighborhood product.¹⁹ If it would be profitable for a hypothetical monopolist to raise the price of this product, then we are finished and the wireline bundled product is a relevant antitrust product market. If not, then the issue of intermodal competition is raised.

44. However, this issue has been settled in recent proceedings. Every credible academic economic study of which I am aware has shown that wireless does not induce sufficient substitution from primary wireline service to be counted in the same relevant product market.²⁰ Indeed in the recent FCC and Department of Justice review of the Cingular/AT&T Wireless transaction, Cingular's (which is 60 percent owned by SBC) economic testimony was that wireline and wireless are separate markets, and the Commission once again re-affirmed that at this point in time wireless is a separate antitrust product market.²¹ This finding is supported by the fact that since 1994, the price of wireless service has fallen a dramatic 80 percent and yet only 6 percent of households have been induced to "cut the cord." Thus, the current elasticity of substitution for primary line service is insignificant.²²

¹⁹ See, e.g., John C. Hodulik et al., UBS Investment Research, *Wireline Postgame Analysis 10.0* (Mar. 17, 2005), at 5 (regarding shrinkage of UNE-P base among Regional Bell Operating Companies and retail access line losses).

²⁰ See, e.g., Mark Rodini, Michael R. Ward, and Glenn A. Woroch (Dec. 2002), "Going Mobile: Substitutability Between Fixed and Mobile Access," Haas School of Business, University of California at Berkeley, Center for Research on Telecommunications Policy Working Paper CRTP-58, reproduced at <http://ssrn.com/abstract=379661>, and the references cited therein. The authors find meaningful evidence of second line substitution.

²¹ See Memorandum Opinion and Order, *Applications of AT&T Wireless Services, Inc. and Cingular Wireless Corporation for Consent to Transfer Control of Licenses and Authorizations*, 19 F.C.C. Rcd 21522 (Oct. 26, 2004), at ¶ 74 ("we find that there are separate markets for interconnected mobile voice and mobile data services, and also for residential and enterprise services"). See also Declaration of Richard J. Gilbert, *Applications of AT&T Wireless Services, Inc. and Cingular Wireless Corporation for Consent to Transfer Control of Licenses and Authorizations*, WT Dkt No. 04-70 (F.C.C. Mar. 17, 2004).

²² See Memorandum Opinion and Order, *Applications of AT&T Wireless Services, Inc. and Cingular Wireless Corporation for Consent to Transfer Control of Licenses and Authorizations*, 19 F.C.C. Rcd

45. In the case of VOIP, there are approximately one million VOIP lines in the U.S. compared with 180 million traditional voice lines. Thus at this point in time, and likely for the next two years, sales of VOIP are too small to exert substantial price discipline on the bundled “all distance” wireline offerings of the merging parties. The situation is even more problematic in that one needs a broadband connection, either by means of DSL or cable modem, to use VOIP technology. Thus, the degree of substitutability differs for households with and without a broadband connection. Moreover, the largest provider of broadband connections in SBC’s territory is SBC itself through its DSL service. Indeed in some states, such as California, there are more DSL subscribers than cable modem subscribers. Moreover SBC engages in the practice of tying broadband to voice by refusing to sell so called “naked DSL.” That is, in order to “switch” to VOIP to avoid a SBC price hike, a residential consumer must also purchase a voice product from SBC, and to get the benefit of the discount DSL price you must buy a SBC bundled voice product. Thus, there cannot be any substitution at all. This leaves alternative DSL providers, e.g., Covad, which has largely exited the residential market, and cable service. However, the availability of VOIP over cable or cable telephony service varies widely by geographic market. In sum, the Applicants must provide the Commission with an analysis of their churn data and diversion ratios broken down by the appropriate geographic markets so as to facilitate definition of the relevant product markets.

46. Given the appropriately defined markets, a merger simulation would

21522 (Oct. 26, 2004), at ¶ 241 (citing U.S. Census Bureau estimates “that six percent of households have cut the cord nationwide”); Ninth Report, *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services*, 19 F.C.C. Rcd 20597 (Sept. 28, 2004).

answer the question as to what are the likely welfare consequences of the merger. However, if the product market is the wireline bundled product market, then the answer is straightforward. Assuming that Verizon merges with MCI, the merged entity would find it profitable to raise prices. If we assume Bertrand equilibrium with differentiated products, then using (1) the Lerner condition that the percentage markup equals the inverse of the firm-specific elasticity of demand and (2) data on rates of churn, we can check if a price increase would be profitable.²³ One number frequently used as an approximation for markup factor is the EBITA to revenue ratio. For AT&T's wireline services, this ratio for 2004 equals approximately 25 percent, and for SBC the 2004 wireline EBITDA margin was 31.4 percent.²⁴ Estimates of the diversion ratio are that 50 percent to 80 percent of customers who leave AT&T churn to SBC. Therefore a 5 percent increase in AT&T's price will lead to a loss of 20 percent of its customers, however given the churn data, at least half of them or 10 percent will churn to SBC. Since SBC's margin is at least as high as AT&T's, the net result to the merged firm is only a loss of 10 percent of AT&T customers, the price rise induces an increase in joint profits.

47. The merged entity, therefore, would have the incentive and ability to raise price. Econometric estimates of the elasticity for a primary wireline connection are extremely low, approximately 0.1. Estimates of the price sensitivity of minutes of use are approximately two.²⁵ Since the bundled product combines a connection with unlimited

²³ If the products are homogeneous then a price increase will be always be profitable.

²⁴ Churn and EBITDA data taken from *UBS Report*, pages 5 and 25.

²⁵ Glenn A. Woroch, "Local Network Competition," in Martin Cave, Sumit Majumdar, and Ingo Vogelsang, eds. (2002), *HANDBOOK OF TELECOMMUNICATIONS ECONOMICS – VOLUME 1: STRUCTURE, REGULATION AND COMPETITION*, Elsevier Scientific Publishers.

usage, the elasticity for this product is unlikely to be greater than two. Therefore the merger will induce significant consumer harms in the market for mass wireline service. SBC has over 32 million residential lines (23 million primary lines) and \$24 billion in local voice and long distance revenues. Thus, a 5percent increase in SBC's and AT&T's residential prices in SBC's region after the merger would cause over a billion dollars of consumer harms per year. Furthermore, the withdrawal of competition would be on a national level. The national wireline market for 2004 (summing local and long distance service of the BOCs AT&T, MCI, and Sprint) exceeds \$114 billion. Thus a 5 percent increase in these prices would cause approximately \$5.7 billion dollars in consumer harms per year.

48. The Applicants' undocumented claim of intermodal price discipline rests on the implicit assumption of churn and an elasticity of demand outside the known bounds. In particular, their claim implies that a 5 percent increase in consumers' wireline bills (\$2.50 for the \$50 bundled service or \$1.00 for a \$20 local service) would induce several million additional households to cut their primary line service and switch to either VOIP or wireless only. By comparison eight years after the 1996 Act, only six million households have cut the cord, despite wireless prices falling 80 percent. Moreover, there are only 3.5 million cable telephony subscribers, including VOIP.²⁶

²⁶ See Memorandum Opinion and Order, *Applications of AT&T Wireless Services, Inc. and Cingular Wireless Corporation for Consent to Transfer Control of Licenses and Authorizations*, 19 F.C.C. Rcd 21522 (Oct. 26, 2004), at ¶ 241; Ninth Report, *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services*, 19 F.C.C. Rcd 20597 (Sept. 28, 2004). See also CNet News.com, "Cablevision Rings in 270,000 Phone Customers," http://ecoustics-cnet.com.com/Cablevision+rings+in+270,000+phone+customers/2100-1034_3-5587465.html (Feb. 23, 2005) (top four cable MSOs provide telephony to approximately 3.5 million subscribers nationwide); Industry Analysis and Technology Division, Wireline Competition Bureau, Federal Communications Commission, *Local Telephone Competition: Status as of June 30, 2004* (Dec. 2004), at 3 (3.3 million cable telephony subscribers as of June 2004).

49. The Applicants claim that SBC and AT&T no longer compete relies heavily on the recent declaration of AT&T that it no longer seeks new customers in the residential market. Relying on this declaration to justify this merger is highly problematic, since there is no assurance that, absent the transaction, AT&T would not re-enter the residential market. Thus, at a minimum, the transaction removes the largest potent potential competitor from the marketplace. Moreover, the Applicants' claim is troubling given recent regulatory decisions. The basis of SBC's arguments for relief from its unbundling obligations was that CLECs in general and AT&T and MCI in particular were not impaired without access to UNE switching and local transport. If this correct, then by the FCC's definition of impairment, it must be that AT&T and MCI can profitably enter the residential market absent the UNEs, and so as rational firms, they will.²⁷ Thus, if the assumed factual basis, as represented to the Commission and the Courts by SBC, is correct, then by definition AT&T will have the incentive and ability to re-enter the market, and so is indeed a competitor with significant market share. However, if AT&T's and MCI's withdrawal from the residential market is genuine, as the then CLECs are impaired without access to these elements and the logical basis for relaxing the unbundling requirement is false. In that case, it is troubling that a sequence of regulatory decisions based on apparently incorrect assumptions about competition should lead to the implication that SBC can now merge with AT&T.

IV. BENEFITS

50. Against the clear and demonstrable harms caused by the proposed merger,

²⁷ See the *FCC Triennial Review and Order* adopted February 20, 2003, at Section V.B.

the Applicants have an obligation to provide clear and demonstrable benefits. They have failed to do so. Indeed, many of the claimed benefits are unsupported or likely symptoms of harms. I will discuss each of these in turn.

51. First the Applicants claim “synergies” of \$15 billion; however, the failure of synergies to materialize from mergers has led to voluminous academic literature in finance and economics. Such efficiencies are almost never realized, and it well known that merging firms making such claims generally underperform the market. Indeed, the history of recent transactions before the Commission provides a litany of such failures, e.g., AOL/Time Warner and USWest/Qwest.

52. It is particularly instructive to revisit the USWest/Qwest merger, as a combination of an IXC and BOC. In that case, Qwest did not own the vital local infrastructure that competes with the ILEC facilities that generates harms in the case at hand. In the *Qwest/USWest Order*, the Commission clearly recognized the possible competitive harms from allowing such a merger, but accepted the Applicants’ claimed public interest benefits: (i) a greater incentive to advance DSL and advanced technology because of the relative synergies between Qwest IP technology and USWest’s DSL experience, and (ii) that the merger would create a better competitor by giving Qwest a greater incentive to open its markets, thus speeding the Section 271 approval.²⁸ In fact, pre-merger, the states primarily served by USWest led those of the other Regional Bell Operating Companies in DSL deployment, but now generally lag the country in DSL

²⁸ See Memorandum Opinion and Order, *Qwest Communications International Inc. and US WEST, Inc.*, 15 F.C.C. Rcd 5376 (Mar. 10, 2000).

deployment.²⁹ In addition Qwest was the last BOC to receive any Section 271 approval, with Qwest's first approval coming nearly three years after the earliest approvals. Similarly, Qwest was the last to finish the process, receiving Section 271 approval for Arizona in December of 2003.³⁰ Thus, not only did the purported gains not materialize, but the merged firm actually performed worst among its peers.

53. Similarly any claims of telecommunications company mergers inducing productivity gains should be viewed with skepticism. A recent study compared the growth in productivity for 38 Bell Operating companies over the period 1991-2000, comparing the total factor productivity of merged firms, Bell Atlantic/Nynex and SBC/Pacific Telesis, with that of firms that were not involved in a merger. The analysis showed that mergers have a negative or at best a zero impact on productivity. Moreover, the authors found no evidence of any economies of scale or scope, but they did find that the mergers probably raised total costs.³¹ History tells us one must seriously doubt these efficiency claims. The Commission is correct to demand further documentation.

54. Moreover to the extent that the claimed benefits are cost savings due to increased firing of personnel, it is not clear that they should be counted as a benefit under the Commission's public interest standard. In particular, the relevant question is to what extent such cost savings will they be passed on to consumers. Thus, as the Commission found in Echostar/DirecTV, the key issue is to what extent do the claimed cost savings

²⁹ Industry Analysis and Technology Division, Wireline Competition Bureau, Federal Communications Commission, *High-Speed Services for Internet Access: Status as of June 30, 2004* (Dec. 2004), at Table 9.

³⁰ See Federal Communications Commission, "RBOC Applications to Provide In-Region, InterLATA Services Under §271," http://www.fcc.gov/Bureaus/Common_Carrier/in-region_applications/ (Feb. 25, 2005).

³¹ Nakil Sung and Michael Gort (2003), "Estimating the Efficiency Effects of U.S. Telecommunications Mergers," reproduced at <http://ssrn.com/abstract=448660> (working paper).

reduce the merged firm's *marginal costs*.³² Changes in marginal cost will be reflected in prices and so have an effect on consumer welfare. Cost reductions that affect fixed costs will not be passed on to consumers, and so do not offset potential consumer harms. Indeed the Applicant's description of the cost savings in the transaction is in reducing overlapping overhead and administrative personnel. These costs are counted as endogenous fixed costs by economists and part of overhead by accountants. Since changes in these costs do not affect the firms' marginal costs, cost savings will not flow to consumers in the form of lower prices. Indeed, to the extent that a reduction in marketing and customer support personnel is caused by a diminution of competition, the claimed benefit is actually a *symptom* of the anti-competitive harms.

55. However, the Applicants' most troubling claim is "the elimination of duplicate facilities."³³ Thus the heart of the facilities based CLEC infrastructure is to be eliminated. The very links that provide the greatest resource for competition to evade the ILEC's bottlenecks and so offer better services to customers will after the merger be redundant and so be eliminated. This is a classic example of the fallacy that runs through much of the Applicant's Public Interest Statement – cost savings do not necessarily translate into lower prices or higher social welfare. In a market with substantial fixed costs, a second firm with "redundant costs" may increase industry average costs, but by providing competition the firm lowers the equilibrium price and increases social welfare.

56. Another public interest benefit claimed by the Applicants is that, by

³² See Hearing Designation Order, *Application of EchoStar Communications Corporation, (a Nevada Corporation), General Motors Corporation, and Hughes Electronics Corporation (Delaware Corporations)*, 17 F.C.C. Rcd 20559 (Oct. 18, 2002).

³³ See, e.g., "Description of the Transaction, Public Interest Showing, and Related Demonstration," *Merger of SBC Communications, Inc. and AT&T Corp*, WC Dkt No. 05-65 (F.C.C. Feb. 21, 2005), at 44.

combining SBC's extensive local network with AT&T's backbone, the merger will lead to an improved IP network. I am not in position to judge the engineering basis of the claim, but assuming that such a benefit exists, it is not merger specific. In particular, assuming the Applicants' hypothesis that SBC and AT&T are no longer competitors, they should be able to obtain any such benefits by contracting in the marketplace. Indeed the history of the internet shows that a series of voluntary contracts is more efficient than some super owner in order to coordinate decisions. Absent a compelling demonstration of transaction costs that would thwart any such ability to contract, these claimed benefits are not merger specific. Moreover, SBC could acquire Level 3 or Wiltel, both of which have a national IP backbone network, without the attendant competitive harms. For example Level 3 states: "The Level 3 Network was the first international network in the world built to be continuously upgradeable and fully optimized for Internet Protocol. Because the network was constructed with multiple conduits, Level 3 can deploy new generations of optical fiber and equipment far more quickly and economically than its competitors – a critical capability in an era of rapid technological change."³⁴

57. Finally, the Applicants' claim that the merger is required in order for SBC to avail itself of AT&T's R&D. Economists, in particular since Ronald Coase, have argued that the "limits of firm" are defined by transaction costs.³⁵ That is, a transaction should only be done inside the firm when some "transaction cost" limits the ability of the parties to make the transfer through a commercial contract. Thus, the Applicants' discussion of how applying AT&T's technology to a wider customer base will produce

³⁴ Level 3 Communications, "The Level 3 Network," <http://www.level3.com/673.html> (visited Apr. 22, 2005).

³⁵ Ronald Coase (1937), "The Nature of the Firm," 4 *ECONOMICA* 386-405 (1937).

benefits reduces to the claim that if it is merger specific, then AT&T and SBC can not agree on the terms of a royalty contract. What is surprising about this claim is the fact that the history of the industry shows the exact opposite. AT&T spun off Bell Labs as part of Lucent, thereby relying on commercial contracts rather than ownership. SBC and its Bell siblings sold off Bellcore, the RBOC research joint venture they obtained from Bell Labs in divestiture. In these cases contracts were a more efficient solution than ownership. Similarly, Qualcomm is able to develop and fund R&D via license agreements rather than being owned by Sprint or Verizon Wireless.

58. A more fundamental issue is the fact that SBC is the wireline incumbent with large sunk investments in legacy technology that generate enormous cash flows. Nobel Prize winner Ken Arrow identified what has become known as the “replacement effect,” i.e., an incumbent earning rents from an existing installed technology or large will lose the legacy rents from installing new technology.³⁶ That is, the opportunity cost of investing in a new technology is higher for the incumbent because by investing it is “replacing” or competing with himself. Therefore, entrants will have a higher incentive to innovate than the incumbent. This phenomenon has been well documented. For example recently, it has been adapted by Clayton Christensen and labeled “The Innovator’s Dilemma” in reference to companies with a large installed customer base.³⁷ Thus, as a matter of economic theory, we should question the claimed benefit. Furthermore, the economic literature shows that SBC and the BOCs have additional incentives to delay investments because they are in a strategic game with regulators from

³⁶ See Jean Tirole (1997), *THE THEORY OF INDUSTRIAL ORGANIZATION*, Cambridge, MA: MIT Press, at 390-392.

³⁷ See Clayton Christensen, *The Innovators Dilemma*, Harvard Business School Press.

who they wish to extract concessions. These papers find that gaming by firms and regulators has delayed the adoption of some innovations for periods of years.³⁸ For example the rollout of ISDN was delayed for at least ten years and SBC delayed the widespread roll out of DSL to the consumer for several years.³⁹

V. CONCLUSIONS

59. Given the demonstrable public harms, most notably in wholesale markets for local circuits, and the resulting downstream harms in the business market, coupled with the lack of tangible merger-specific benefits, in my opinion the merger as it stands cannot be found in the public interest. However, several remedies could be considered to ameliorate the harms. In particular the Commission would need to craft a remedy that would undo the harms by restoring the role that an independent AT&T plays in the wholesale market, one that replaces the role of AT&T both as a competitive provider of its own inputs and as an efficient aggregator and reseller of special access in the wholesale market.

I declare under perjury under the laws of California that the foregoing is true and correct to the best of my knowledge.

Dated this 25th day of April, 2005, at Pasadena, California.

_____/s/_____
Simon J. Wilkie

³⁸ See Prieger, James E., "The Timing Of Product Innovation And Regulatory Delay" (September 17, 2001). University of California, Davis - Department of Economics Working Paper No. 01-9.

³⁹ See, e.g., Patrick Flanagan, "DSL and the Access Race," TELECOMMUNICATIONS ONLINE, <http://www.telecommagazine.com/default.asp?journalid=2&func=articles&page=dsl&year=1999&month=5>.