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**Jason D. Oxman**
**Vice President and Assistant General Counsel**

20 November 2002

Ms. Marlene Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: *Triennial* ***Review.*** WCB Docket No. 01-338

Dear Ms. Dortch:

Covad Communications Company (Covad), by its attorneys, hereby respectfully submits this *ex parte* letter and attached declaration in response to rhetorical claims made by certain incumbent telephone companies that the FCC's linesharing rules have not benefited consumers. In stark contrast lo these unsubstantiated claims, the facts on the record in this proceeding demonstrate conclusively that the linesharing UNE has been directly responsible for an explosion in broadband deployment, and a pro-consumer reduction in broadband prices, since 1999. Not only is broadband deployment exploding overall, but also digital subscriber line (DSL) services in particular are posting heretofore unseen growth levels. Just this week, on the third anniversary of the FCC's Linesharing Order, Telecommunications Reports released its quarterly Online Census, which found that the growth of the DSL customer base in the U.S. is significantly outpacing cable modem services. For example, DSL customers now make up more than 43 percent of broadband subscribers – up from 33 percent only one year ago.[1] Today, 6.5 million Americans subscribe to DSL services, a growth rate of more than 47 percent since March 1 of this year (compared to only 12 percent cable modem growth), and a growth rate of 83 percent in the last year (compared to 62 percent cable modem growth).[2]

In short, the three short years since the FCC required incumbent LECs to unbundle the upper frequencies of loops has been marked by unparalleled growth in DSL services in this country. Consumers and small businesses have been the beneficiaries of the Commission's linesharing rules: as the attached declaration sets out, consumer welfare of over ***one*** *billion dollars* is the direct consequence of linesharing rules. The simple explanation for this consumer welfare is competition: in a competitive market, all players have incentive to deploy service as widely as possible and offer competitive

[1] TR Online Census **at** I **(attached).**
[2] *Id.*

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prices and innovative services to woo potential customers. As Covad has argued to the Commission in great detail, DSL competition is only possible through linesharing, and that basic fact is unchallenged on the record.

In order to ensure that the Commission has the best possible economic data available on the record in this proceeding, Covad hereby submits the analysis of economists Stephen Siwek and Su Sun of Economists, Inc. These experts analyze the consumer welfare benefits of the FCC's linesharing rules, and conclude that consumers have already enjoyed over a *billion dollars* in economic benefit from linesharing, and that benefit will continue to grow only if the FCC's linesharing rules remain in place. In addition, the attached declaration examines the benefits of linesharing to deployment of both ILEC and CLEC broadband services, and concludes that a broadband duopoly – which would result if the FCC were to eliminate its linesharing rules -- would lead to higher prices and decreased deployment of broadband services. In short, this expert economic analysis reaches the same conclusions that the Commission Itself has reached in numerous proceedings – the broadband competition made possible by linesharing is bringing consumers lower prices, innovative service offerings, and widespread broadband deployment from a variety of facilities-based providers, incumbents and competitors alike.

Please do not hesitate to contact me if I can provide any further information

Respectfully submitted,

Jason D. Oxman

**BEFORE THE**
**FEDERAL COMMUNICATIONS COMMISSION**
**WASHINGTON, D.C. 20554**



In the Matter of

| | | |
|---|---|---|
| Review of the Section 251 Unbundling Obligations of Incumbent Exchange Camers | ) | CC Docket No. 01-338 |
| Implementation of the Local Competition Provisions of the Telecommunications Act of 1996 | ) | CC Docket No. 96-98 |
| Deployment of Wireline Services Offering Advanced Telecommunications Capability | ) | CC Docket No. 98-147 |

# DECLARATION OF STEPHEN E. SIWEK AND SU SUN
## ECONOMISTS INCORPORATED
## WASHINGTON, DC

**NOVEMBER 2002**

# I. Introduction

## A. Qualifications

1. My name is Stephen E. Siwek. I am a Principal at Economists Incorporated, a private research and consulting firm specializing in the economic analysis of antitrust, regulation, and economic damages issues. The firm is located at 1200 New Hampshire Avenue, NW, Washington, D.C. 20036.

2. My areas of specialization include the assessment of lost profit damages, the economic pei-formance of US industries that depend on copyright protection, and the economic and financial analysis of telecommunications and other regulated industnes. I have been continuously involved in consulting since 1975, and 1 have testified as an expert witness on more than 60 occasions before regulatory bodies and courts.

3. I am experienced in the economic and financial issues that are relevant to the analysis of telecommunications pricing, costing and competition. 1 have testified as an expert witness on telecommunications issues before the state regulatory commissions of Arizona, Utah, Connecticut, Wyoming, Pennsylvania, West Virginia, Minnesota, Iowa, Maryland, the District of Columbia, California, Illinois, Massachusetts, Louisiana, New

Jersey, Delaware, New Mexico, Maine, Vermont. New York, New Hampshire, Colorado, Rhode Island and Arkansas.

4. I have also testified in court proceedings where telecommunications products or services were at issue. I have testified in such matters in U.S. District Courts and in state courts in Florida, Maryland, Tennessee, the District of Columbia, Pennsylvania and New Jersey. Finally, I have submitted affidavits and declarations to the Federal Communications Commission in a variety of proceedings including two recent complaint proceedings before the Market Disputes Resolution Division of the Enforcement Bureau.

5. I hold a Bachelor of Arts (Economics) from Boston College and a Master of Business Administration from the George Washington University in Washington DC. My testifying experience and the publications that I have written are summarized in Appendix 1.

6. My name is Su Sun. I am a Senior Economist at Economists Incorporated. My areas of specialization include economic analysis of electricity, natural gas and other regulated industries, assessment of competitive impact of mergers and acquisitions, economic modeling of firm competition, and econometric analysis of damages. I have been involved in consulting since 2000.

7. I am familiar with the methodology of evaluating consumer savings from government policies. I have co-authored an article evaluating the antitrust agencies' estimates of consumer savings from their merger enforcement. [1]

8. I hold a Bachelor's degree in economics from the Renmin University of China and a Master's from the Ohio State University. I have reached the Ph.D. candidacy and expect to receive my Ph.D. from the University of Michigan in 2003. My experience and publications are summarized in Appendix 2.

## B. Covad's DSL Services

9. In this proceeding, we are representing Covad Communications Company ("Covad"). Covad is a leading national broadband service provider of high-speed Internet and network access using digital subscriber line ("DSL") technology. Covad offers DSL. T-1, managed security, IP and dial-up services directly and through Internet Service Providers, ("ISPs") resellers and telecommunications carriers.

10. Covad's best-selling DSL offering is known as Asymmetric DSL ("ADSL"). Other forms of DSL service include HDSL (high speed digital subscriber line), UDSL (universal digital subscriber line), VDSL (very-high speed digital subscriber line), and RADSL (rate-adaptive digital

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[1] Philip Nelson and Su Sun, *Consumer Savings from Merger Enforcement: A Review of the Antitrust Agencies' Estimates*, Antitrust Law Journal, Vol. 69, Issue 3.2002.

subscriber line). Covad's "TeleSpeed" service utilizes SDSL (symmetric digital subscriber line) technology to provide business subscribers with equally fast upload and download speeds.[2]

11. Covad's DSL services are currently available to small and medium sized businesses and home users in **94** of the largest Metropolitan Statistical Areas ("MSAs") in the United States. Covad's network currently covers more than 40 million homes and businesses and reaches nearly 45 percent of all homes and businesses in the United States.[3]

12. ADSL broadband service offers consumers and small/medium sized businesses high-speed connectivity over unbundled loops and through line sharing and unbundled interoffice transport. Covad maintains collocated facilities in over 1800 central offices and serves over 350,000 customers nationwide.[4]

13. Loops are the "transmission facility between **a** distribution frame (or its equivalent) in an incumbent LEC central office and the loop demarcation point at an end-user's customer premises, including inside wire owned by the incumbent LEC."[5] Loops that are compatible with DSL signals are no different than the copper loops over which Incumbent Local Exchange Carriers ("ILECs") offer POTS and other voice services to end users

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[2] See http://www.covad.com/businessservices/telespeed.shtml.

[3] Comments of Covad Communications Company, April 5.2002, page **5.**

[4] Id. page 6.

[5] 47 C.F.R. 51.319(a)(1).

except that they do not contain load coils or excessive bridge tap. Load coils in particular are used to compensate for signal decline when a local loop exceeds 18,000 feet in length. In the longest loops, ADSL service cannot be provided. However, at loop lengths below 18,000 feet, different companies provide different offerings with Covad generally providing service at greater distances than that available from ILECs. Engineers can differ in their assessment of the feasibility of providing DSL service to a given subscriber. For this reason, the length of a customer's local loop can in fact determine whether that customer has one or more than one potential provider of DSL service to his home or business.[6]

14. In line sharing, the high frequency spectrum needed to provide broadband DSL service travels over the same physical facility that the ILECs use to provide local telephone service to end users. In providing its ADSL service, nearly all of Covad's residential customers are served over loop facilities that are shared with the local ILEC. A significant number of Covad's small office/home office ("SOHO") customers are similarly served over line-shared loops. In these arrangements, the ILEC continues to provide voice telephone services to the same customer.

## C. Summary

[6] It is my understanding, that rhe ILECs generally will not provision ADSL at loop lengths above 15,000 feet but that Covad routinely will offer to provision ADSL services at loop lengths beyond 15.000 feet where it is technically feasible to do so.

**15.** In this declaration, we address four issues that relate to the DSL data services that CLECs and ILECs currently provide over shared lines to residential and small business customers in the United States.

16. First, we analyze the competitive significance of CLEC-provided data services such as DSL, in relevant product markets for internet-access and for broadband internet-access services to residential and small business subscribers in the US.[7] In this analysis, we review and present subscriber statistics, pricing data, customer survey data and other relevant information relating to the following alternative services: non-broadband, dial-up services, fiber to the home alternatives, satellite and fixed wireless services, cable modem services and ILEC-provided DSL services.

17. Among other things, wc document the extent to which lack of competition plus the potential "cannibalization" of ILEC second line revenues for 56 Kbps, dial-up access acted to delay ILEC expansion into DSL services throughout the mid-1990s. Prior to 1996, there were also significant pressures for the ILECs not to deploy DSL, lest it cannibalize other, more lucrative forms of higher-speed access including T1 and ISDN services.

18. We also show how CLEC-provided DSL services played a critical role in increasing the availability of broadband Internet access services to residential and small business consumers throughout the United States.

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[7] For a variety of reasons, the definition of an appropriate market for the Commission's current purposes may not necessarily he the same as it would he in other contexts. Because the statutory mandate in Section 706 of the Telecom Act is to focus on the deployment *of* "advanced telecommunications capability," and the issue is the ability to provide advanced technology, we focus on why CLEC-provided DSL *is* essential to reasonable competition in providing such (broadband) services. In fact, the ILEC's control over access to the Internet is even greater than their control over broadband access.

19. Our competitive analysis also demonstrates that where available. cable modem service increasingly represents the only real broadband alternative to DSL service for most residential customers. Importantly, the dominant providers of both of these inter-modal technologies offer broadband not as the primary focus of their business, but as an "add-on" service. For this reason, the incentives of these dominant firms to deploy new technologies, to enter new regions and to satisfy the demands of both wholesale and retail customers are inevitably balanced against their dissimilar and even contrary incentives to preserve profits in the regulated voice telephone and cable TV markets. We conclude that CLEC-provided intra-modal competition in DSL service has been and will be critical to advancing the deployment of broadband infrastructure and services in the United States.

20. Second. we analyze the implications of the findings set forth above in terms of their implied market concentration levels. **As** set forth in the *Horizontal **Merger Guidelines*** of the US Department of Justice and the Federal Trade Commission ("FTC"), the more concentrated the market, the greater the ability of participants to raise prices above competitive levels and to reduce output below competitive levels. In this analysis, we show that, under any reasonable set of market shares as between ILEC-only DSL services (i.e. no DSL competition)[8] and cable modem services, the resulting concentration levels remain far higher than the concentration

[8] For example. the absence of line sharing may literally force all remaining CLEC competition out of business as ILECs raise their rivals' costs beyond the point of competition. Another possibility is that it will force prices back up to the point where the ILECs exact a non-competitive rent without actually affording their competitors a profit. In either event, the elimination of line sharing should be assumed in order to take CLEC Competition out of the equation.

levels that, in merger analysis, the Justice Department and FTC would recognize as "highly concentrated" markets.

21. We also demonstrate that if the circumstances were reversed and an ILEC now sought to increase concentration for Internet access and broadband Internet access, through the acquisition of a single large and successful CLEC, the US antitrust authorities would almost certainly oppose such a transaction because the increased concentration that would result from the proposed merger would dramatically exceed the *Horizontal Merger Guidelines*.[9] Accordingly, we conclude that absent CLEC competition in DSL services, there is little reason to believe that ILEC prices will ever be set at or even near competitive levels. We also show how continued CLEC entry into the Internet access market should dramatically improve concentration levels and thereby increase consumer welfare through lower prices and greater service availability and innovation.

22. Third, we evaluate the likely impact that line-sharing-based DSL services will have on future investment levels for DSL services in the United States. We explain that because of the extreme concentration levels that now exist for broadband services in the US, absent line sharing, there is little reason to believe that future ILEC investment in DSL equipment would even remotely approach the investment levels that the ILECs would be required IO make in order to compete successfully with CLECs in DSL

[9] Note that rhe potential acquisition o f a small or unsuccessful CLEC might be unchallenged by the antitrust authorities if such an acquiririon added little appreciable change to market concentration levels (e.g. a change in HHI of less than 50 points) or conceivably because such a CLEC mighr represent a failing firm.

markets. Competition not only lowers prices, it enlarges markets and larger markets in turn require increased investment.

23. Moreover, even if one were to accept the ILECs' so-called ***Investment Deterrence Hypothesis,*** that hypothesis would clearly not hold for the line-shared portion of existing local loops. Loop investments that have already been made arc sunk and will not be affected by emerging policy changes with respect to line sharing.[10]

24. Accordingly, the existing local loop plant will continue to exist and it is reasonable to assume that with line sharing, future investments by ILECs and CLECs combined will increase significantly as compared with an alternative scenario in which line sharing were not permitted.

25. Fourth, we quantify the benefits to residential and small business consumers from CLEC entry by conservatively estimating realized and expected gains in consumer surplus. This methodology is supported by microeconomic theory and is used by antitrust agencies to quantify consumer savings from merger enforcement. Our estimates show that from 1999-2002, CLEC entry resulted in over $1 billion of benefits to residential and small business customers using the ADSL service. Our estimates also show that in the coming four years from 2003-2006, competition from CLECs using line sharing will result in least another $1.6 billion of benefits to such consumers.

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[10] In addition. the denial of CLEC ability to access unbundled ILEC fiber-fed loops would likely affect total investment negatively in markets served by such loops. Absent unbundling of such loops, prices would not decline to competitive levels, output would not increase and new investment would not be required to meet higher demand for low priced DSL services.

# 11. Internet and Broadband Access Service Alternatives

## A. Internet Access Services

26. From the earliest days of the Internet, residential and small business telephone subscribers generally relied not on broadband technology, but on narrowband 56 Kbps dial-up facilities and ISDN lines to send e-mail and to reach the world wide web. Dial-up access grew particularly popular in the mid to late-1990s when ILEC annual access line growth nearly reached annual double-digit rates.

27. As shown in Schedule 1, the Bell Operating companies reported 120,909,662 pre-subscribed access lines in 1996 while, in the same year, all carriers reported 135,122,838 analog main access lines. By 1998 however, the Bell companies were reporting 138,488,145 loops (an increase of 17.6 million lines or more than 14.5%). In the same year, all telephone camers now reported 143,728,291 analog main access lines (an increase of 8.6 million lines of 6.4%). Much of this profitable growth in ILEC access lines was clearly driven by the emerging demand for dial-up access to the Internet during this time frame.

28. In more recent years however, with the introduction of competitive broadband technologies by cable television providers and by CLECs, consumer demand has begun to shift away from narrowband dial-up access and *in* favor of broadband access to the Internet. This evolution in the marketplace has tended to reduce ILEC access line growth relative to years past. From 1998 to 2000, analog main access lines reported by all camers have increased by only 1,696,660 lines or 1.1%. (See Schedule 1).

29. Nevertheless, many US households still use dial-up services for Internet access. According to 2001 data that are reproduced in Schedule 2, the percent of US families that used dial-up access in 2001 exceeded 80% of all US households that reported Internet access of any kind. While the dial-up penetration rate appeared to vary by region (highest in the Midwest and South, lower in the Northeast and West) this basic penetration rate in excess of 80% did not vary appreciably as afunction of family income. (See Schedule 2). As these data reveal, the number of US households that still rely on 56 Kbps Internet access far exceeds the number of US households that use non-dial-up Internet access of any kind.[11]

30. Interestingly, the technologies needed by the ILECs to deploy commercial broadband DSL services were available well before the ILECs began to realize the financial benefits of second line growth for dial-up access. For example, DSL service was first contemplated by Bell Atlantic in October 1992. (See Schedule 3) However, Bell Atlantic chose not to deploy DSL services commercially until October 1998, some six years later. In the interim period, cable companies and more importantly CLECs (occasionally known as "DLECs") had already launched broadband.

31. As shown in Schedule 3, during the thirteen-month period October 1996 through November 1997, consumers in the Bell Atlantic states witnessed

[11] See also *Hearing Designation Order.* In the Matter of Application of EchoStar Communications Corporation (a Nevada corporation), General Motors Corporation, and Hughes Electronics Corporation and EchoStar Communications Corporation (a Delaware Corporation), FCC CS Docket No. 01-348, Adopted October 9,2002, Par. 221. (Hereinafter "EchoStar").

the launch of cable modem services by Time Warner, Cablevision Systems, Media One and Adelphia. In the same time frame, only one CLEC, Vitts Network, deployed DSL services in a single Bell Atlantic state. Bell Atlantic had no competitive response to these cable entrants throughout this entire period.

32. By contrast, beginning in March 1998, DSL services were launched in the Bell Atlantic states by Covad, HarvardNet and NorthPoint. In response, Bell Atlantic now decided to announce its InfoSpeed DSL service in June 1998 and to rollout its own DSL services in Washington DC and in Pittsburgh beginning in October 1998.

33. The timeline in Schedule 3 clearly establishes two facts with respect to broadband competition in DSL services. First, when faced with multiple competitive entry by cable modem providers, ILECs do not react with competitive alternatives of their own. Second, when faced with multiple competitive entry by non-ILEC DSL providers, the ILECs respond quickly and in multiple markets.

**34.** By 1998, the ILECs also began to worry about losing the second line revenues that they had acquired back in the mid-1990s. In particular, the ILECs faced (and continue to face) powerful incentives to avoid "cannibalization" of their own second line revenues through the introduction of ILEC DSL. **As** one analyst recently found with respect to SBC, "The cost of a second line, coupled with a monthly payment for

internet access to an ISP approximates the monthly cost of DSL service making it a viable alternative to dial-up service for some consumers."'*

35. Because of the threat of cannibalization, from an ILEC's perspective, the economics of DSL roll-out in the mid-to-late 1990s differed dramatically from the costs and benefits perceived by a CLEC in the same time frame. For the ILECs these economics began to change only when customer substitution to CLEC DSL broadband services began in earnest in the later 1990s.

36. This brief history offers two important lessons: First, it is clear that without the spur of competition, an incumbent carrier will not automatically decide to introduce new and innovative services to customers even if the demand for those services is high. This is particularly true if the new services potentially can "cannibalize" the carrier's existing services, including second-line access and more lucrative ISDN and T-1 services.

37. Second, the comparisons of broadband lines by technology type that are discussed in the next section of this Declaration do not accurately portray each technology's share of the residential and small business markets for Internet access services. In the markets for Internet access services, broadband shares clearly understate the relative importance of the ILECs even today.

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[12] David W. Barden, Banc of America Securities, *SBC Communications Inc. Coverage Initiated with a Rating of Market Performer*, September 20. 2002, page 20.

## B. Broadband Internet Access Services

38. In Section 706 of the Telecommunications Act, Congress directed this Commission to encourage deployment of advanced telecommunications capability in the United States on a reasonable and timely basis." As part of that effort, the Commission initiated a data collection program designed to gather information on subscnbership to high-speed services including "advanced services, from wire-line telephone companies, cable providers, terrestrial wireless providers, satellite providers and any other facilities-based providers of advanced telecommunications capability." [14]

39. The Commission released the fifth and most recent such report on July 23, 2002. According to that report, total "high-speed lines" in the United States grew 33% from 9,616,341 lines in June 2001 to 12,792,812 lines in December 2001.[15] (See Schedule 4). In the same time frame, residential and small business "high-speed lines" increased 40.9% from 7,812,375 lines in June 2001 to 11,005,396 lines in December 2001 (See Schedule 4).

40. The dramatic growth rates identified by the Commission in turn combined disparate growth trends from five different broadband technology groups. These were: ADSL; other wire-line services including non-asymmetric DSL and traditional telephone company high-speed services; coaxial cable

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[13] Federal Communications Commission, *High Speed Services for Internet Access: Status as of December 31, 2001*. July 2002, page 1. (hereinafter "FCC Broadband Report")

[14] Id.

[15] A high speed line is a connection to an end user that is faster than 200 kbps in at least one direction.

including the typical hybrid fiber-coax ("HFC") architecture of upgraded cable TV systems; optical fiber to the subscriber's premises (e.g. Fiber-to-the-Home); and satellite or fixed wireless." Line counts for each technology groups are reproduced in Schedule 4.

41. With respect to both the total high-speed line category and the residential and small business high-speed line category, coaxial cable and ADSL were the clear broadband leaders. In total high-speed lines, the Commission now reports 7,059,598 coaxial cable lines (55.2% share) and 3,947,808 ADSL lines (30.9% share) as of the end of 2001. Since June 2001, coaxial cable lines in the total high-speed line category have risen 36.2 % while DSL lines have increased by 46.6%. (See Schedule *4).*

42. The dominance of cable and ADSL broadband technologies is even more pronounced in the residential and small business high-speed line category. For the categories of residential and small business customers combined, the Commission **now** reports 7,050,709 coaxial cable lines (64.1%) and 3,615,989 ADSL lines (32.9%) as of the end of 2001. Since June 2001, coaxial cable lines in the residential and small business category have risen 41.1% while DSL lines have increased by 45.2%. (See Schedule **4).** Thus, according to the FCC, coaxial cable and ADSL together account for approximately 96.9% of the total residential and small business high speed lines in the United States."

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[16] FCC Broadband Report, Table 1, Table 3, fin 2.

[17] Because the data provide one number rhar includes both residential and small business customers together, it actually overstates the effect of cable competition. For several reasons. including the fact that cable is primarily a medium for television and never focused its build **out** on businesses. and the fact that

*Fiber to the Home*

43. As shown in Schedule 4, there are now 494,199 fiber-to-the premises high-speed lines in place in the United States as of the end of 2001. Importantly however, there arc now only 4,139 fiber-to-the-home lines in place at residential and small businesses in the United States. The FCC's report that there are only 4,139 fiber-to-the-home lines out of 11,005,396 total residential and small business broadband lines is significant. Fiber represents less than one-tenth of one percent of residential and small business broadband services. Clearly, with only one tenth of one percent penetration, fiber-to-the-home simply does not provide a viable competitive alternative for residential and small business customers in the United States.

*Other Wire-line Services*

44. Other wire-line broadband services represent another broadband technology category reported by the FCC. However, this category combines traditional telephone company broadband offerings with emerging non-asymmetric forms of DSL service.[18] For this reason, the reported trends combine technologies of different vintages and capabilities and are, for that reason, difficult to interpret.

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security and speed degradation problems pose even more significant problems for business customers than they do for residential, cable is not a meaningful alternative for small businesses at all. Accordingly. to the extent that the existence of small business competition is fueled by the existence ot line sharing, the prospect without line sharing is no alternative besides the ILEC.

[18] As noted earlier in this Declaration, Covad's own "TeleSpeed" service features Symmetric Digital Subscriber Line ("SDSL") technology.

45. Nevertheless, in the total high-speed line category, the FCC reports 1,078,597 "other" wire-line facilities in place in December 2001, a decline of more than 9,000 lines since June 2001 (See Schedule **4).** For the combined residential and small business category, the FCC reports 139,000 other wire-line broadband lines, a more dramatic decline of 36,860 lines 21% since December 2000. While this technology's share of lines remained above 1% of all residential and small business customers, recent declines in the absolute line counts for other wire-line services clearly suggest that at least some of the disparate technologies included in this category are in rapid decline for the residential and small business broadband sector.

46. We suspect that in 2001, the traditional telephone company high-speed services within the other wire-line category were rapidly losing favor, while ILECs delayed CLEC deployment of symmetric forms of DSL services.

47. It is also worth noting again that Covad competes with ILECs for business customers and has long offered SDSL services to business customers in direct competition with ILECs, who have chosen not to make SDSL service offerings themselves.

*Fixed Wireless and Satellite*

48. **As** shown in Schedule 4, the FCC reports 212,210 satellite or fixed wireless broadband lines (1.7% of total high-speed lines) in the total high-speed line category as of the end of 2001. The Commission also shows 194,897 satellite or fixed wireless broadband lines (1.8% of residential and

small business high-speed lines) in place to serve residential and small business subscribers. As with the "other" wire-line category, the satellite and fixed wireless grouping combines disparate technologies. It is not clear what percentage *of* these totals represents fixed wireless services and what percentage represents satellite services. Nevertheless, even on a combined basis, the FCC's own statistics show that the two technologies account for well under 2% of total residential and small business broadband Internet access services in the United States.

49. Focusing initially on fixed wireless services, it is clear that recent changes in the investment climate for telecommunications firms in general, have dramatically reduced the number and financial viability of the major fixed wireless players in the United States. It is important to note that carriers such as Winstar and Teligent attempted to create powerful wireless nerworks that were targeted not at residential and small business customers, but at large business and government customers.[19] Importantly, many of these carriers have more recently decided to restructure their fixed wireless businesses or to stop selling wireless entirely.

50. In Schedule 5, we reproduce various press releases relating to the fixed wireless operations of AT&T, Winstar and Telegent. As shown in Schedule 5, AT&T shut down its money losing fixed wireless business (formerly known as "Project Angel") in late October 2001. At its height, the AT&T fixed wireless operation had 47,000 customers.

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[19] See Joint Declaration of Anjali Joshi, Eric Moyer. Mark Richman, **and** Michael Zulevic on Behalf of Covad Communications, Par. 22. (Hereinafter "Joshi et.al.")

51. In March *2002,* IDT Corp. announced that its Winstar Communications unit would exit the fixed wireless business in smaller markets and the wire-line telephone business as well. While Winstar would continue to expand its fixed wireless business to large building customers, the company also announced that it would cut its non-sales workforce by 65%.

52. In *2002,* fixed wireless carrier Teligent filed for protection from its creditors under Chapter 11. In May 2002, Teligent revealed a proposed reorganization plan under which the company's secured lenders and its bank creditors –led by Chase Manhattan Bank would own stock in the combined company.

53. Importantly, the fixed wireless services offered by these struggling firms generally were not even directed toward the needs of residential and small business customers to access the Internet. For the most **part,** they were aimed instead at large businesses. For all of these reasons, it is clear that fixed wireless services do not now provide a viable competitive alternative to residential and small business broadband customers in the United States.

**54.** As regards broadband Internet access services by satellite, the Commission itself has recently had occasion to analyze this alternative in considerable detail. In its recent Hearing Designation Order in the *EchoStar* matter, the Commission found that; "While most residential Internet access service is provided over narrowband connections, Americans are increasingly subscribing to broadband Internet access. Such services today are predominantly provided by cable operators using cable

modem technology, and secondarily by telecommunications carriers using DSL. By contrast, current satellite-provided Internet access services constitute only a small percentage of all Internet service accounts."[20] (Emphasis added).

55. In its ***Order.*** the Commission found that "current Internet access services provided with the Applicants' Ku-band systems may exceed 200 Kbps only in the downstream direction-upstream transmissions are advertised as approximately 128 and 150 Kbps."[21] Indeed, limits on transmission speed is but one of many technical issues now facing satellite broadband technology. Many current satellite services do not even provide two-way communications paths. Home satellite dishes are frequently too small to provide adequate bandwidth in the upstream direction and service providers use telephone lines to provide two-way communications.[22]

56. While it is true that satellite broadband services could, in principle, provide viable Internet access to the millions of **US** households that do not now have access to DSL and cable modem services, the actual commercial value of current (Ku-band) satellite broadband service offerings seems quite limited indeed.[23] In describing these services EchoStar/DirecTV characterized their own current broadband offerings as "..expensive

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[20] EchoStar Order. Par. 221

[21] EchoStar Order. Par. 223

[22] Joshi et.al., Par. 24.

[23] In the EchoStar matter, the Applicants claimed that more than 40 million households currently lack access to DSL and cable modem services. See EchoStar Order, par. 232.

'niche' products that are hampered by several constraints, do not even satisfy the Commission's definition of an 'advanced service' and have attracted fewer than 150,000 subscribers combined."[24] The Applicants concluded that "Satellite broadband today is not fully comparable to cable modem and DSL..."[25]

57. It is also worth noting that even the deployment of new Ka-band satellites does not appear to offer much in the way of potential new options for broadband Internet access. In its *EchoStar* Order the Commission also considered this possibility and resolved it as follows. "Applicants' position that the merger will result in increased deployment of satellite broadband services is based primarily on the projected provision of broadband Internet services using Ka-band spectrum. Such services, however, are not only nascent, in nearly every case they are months, if not years away from public availability. The facilities to deploy broadband Internet access service using Ka-band spectrum are not yet deployed. Substantial uncertainties remain as to the likely quality and prices of such services"[26] (Emphasis Added).

*Cable* ***Modem Services***

58. **As** shown in Schedule 4, there are 7,059,598 coaxial cable high-speed lines in place in the United States as of the end of 2001. Cable modem

[24] EchoStar Order, f/n 568 quoting Applicants' Reply Comments at iv.

[25] EchoStar Order, f/n 568 quoting Applicants' Reply Comments at 85

[26] EchoStar Order, **Par.** 247.

lines have grown by more than 36% since June 2001 and the technology represents 55.2% of the total high-speed lines in the **US.** In the residential and small business sector, there are 7,050,709 cable modem high-speed lines or 64.1% of the total residential and high-speed line reported by the FCC as of the end of 2001. Comparing the number of coaxial cable broadband lines in the residential and small business high speed line category to the cable modem line counts in the total high speed line category, one can calculate that 99.9% of coaxial cable lines for broadband Internet access serve residential or small business customers. This percentage is not surprising since the original wiring of cable TV networks targeted residential customers and not commercial business centers.[27] The inability of cable broadband services to reach many business Subscribers is one of a number of ways in which coaxial cable services differ from DSL services.

59. The National Cable & Telecommunications Association ("NCTA") reports somewhat higher (and more current) figures for cable modem subscribers in the United States. According to NCTA figures, (See Schedule 6) there were 9,200,000 cable modem subscribers in the United States on June 30,2002. The Association also estimates that there are 16,800,000 digital cable subscribers in the US and that 75,000,000 **US** home are now passed by cable modem service (Schedule ***6).***

*ADSL **Services***

[27] Joshi et. al. Par. 15.

**60.** In its most recent filing the FCC reports that there are **3,947,808** high-speed **ADSL** lines in place in the United States as of the end of **2001** (Schedule **4**). **ADSL** lines have grown by more than 46% since June 2001 and the technology now represents **30.9%** of the total high-speed lines in the US. In the residential and small business sector, there are now **3,615,989** high-speed **ADSL** lines or **32.9%** of the total residential and high-speed line reported by the FCC. **As** these statistics illustrate, in 2001, the ratio of cable modem lines to **ADSL** lines in the United States was approximately **1.8-to-1.0** This shortfall in part reflects the consequences of ILEC delays in the deployment of **DSL** technology as described earlier in this Declaration, and, Covad believes, anticompetitive action that thwarted CLEC competition. Nevertheless, since June 2001, **ADSL** lines are increasing more rapidly than cable modem lines in the total high-speed line category (**46.6%** growth for **ADSL** vs. **36.2%** growth for cable modems) and in the residential and small business high-speed line category (45.2% growth for **ADSL** vs. **41.1%** growth for cable modems).

*Combined Share: **ADSL** and Cable Modem Services*

**61.** The FCC reports cited above clearly demonstrate that the two broadband technologies of **ADSL** and cable modems now dominate residential high speed Jnternet access. In the total high-speed line category, **ADSL** plus cable modem lines account for **86.0%** of total high-speed lines (Schedule **4**). In the residential and small business high-speed line category, ADSL plus cable modem lines account for an astounding **96.9%** of the total residential and small business high-speed lines in the United States. In view of these figures, it is clear why the Commission could conclude, as it

did in the *EchoStar* Order, that broadband Internet access services are "..predominantly provided by cable operators using cable modem technology, and secondarily by telecommunications carriers using DSL."[28]

C. **DSL vs.** Cable Modems: Features **and Prices**

*Features*

62. In a recent Jupiter/NPD customer survey (See Schedule 7), home Internet users were asked about the types of Internet access that they relied on and the service feature that were most important to them. Mirroring the NTIA statistics cited previously in this Declaration, 78.4% of the respondents reported that they connected to the Internet using a dial-up connection, 8.4% reported use of **a** cable modem while another 4.4% of respondents used ADSL. (Schedule 7).

63. The same respondents reported that the most important advantage they perceived from using their current Internet Service Provider ("ISP") was that the ISP provided a local telephone number for access. The next two most important advantages were "ease of establishing connection" and "lowest price." With respect solely to "broadband' Internet services, the features that respondents found most appealing included; "downloading a web page instantaneously," "having a computer always connected to the Internet," and "downloading large files (such as MP3, music video, software) faster. **As** these responses indicate, Internet users value ease of

[28] EchoStar Order, Par. 221

connection to the Internet, always-on connections, low prices and download speed.

**64.** When considering the features of ADSL and cable modem Internet access, it is useful first to set aside an important similarity between the two services. Both ADSL and cable modem services differ from conventional 56 Kbps dial-up access in that both ADSL and cable modems are "always-on." In this respect either service provides a dramatic improvement over dial-up modem services where, as noted above, ease of connection is a major concern of many Internet access customers.

65. Other Internet access features noted above that were of particular importance to broadband users included "downloading a web page instantaneously" and "downloading large files." These concerns fundamentally relate to download speed and in this respect, the ADSL and cable modem technologies are somewhat difficult to compare. Cable modem technology features "shared" bandwidth while ADSL provides access over "dedicated" bandwidth. This distinction is fundamental to the two technologies and gives rise to conflicting claims as regards download speed.

66. With a shared bandwidth network, the quality of service will tend to degrade during peak hours. In addition, since the capacity limits of cable networks exist at the neighborhood level rather than at the backbone level, it is more difficult in cable networks to engineer for the peak traffic loads that will actually affect the user's experience. For certain broadband applications, such as on-line computer games and home offices, the peak hour service degradation problems associated with cable moderns can be

serious. By contrast, ADSL users do not share bandwidth with each other in their local access lines and connection speeds remain more consistent throughout the day. Cable modem networks can also be subject to service interruptions. In Schedule 8, we reproduce several comments from cable modem users in a recent Covad-supported survey that highlight these particular difficulties.

67. There are other important differences between ADSL and cable modem services that have been noted in the Declarations submitted by other Covad witnesses in this proceeding. One such difference relates to the lack of security that is both inherent in a shared cable network architecture and of particular concern to small business and home office users. In contrast with cable networks, DSL networks operate on a point-to-point basis between the subscriber and the service provider. DSL networks do not therefore present the same opportunity for one subscriber to view another's traffic.[29]

68. In addition, unlike most cable modem services, a fixed IP address is available with Covad's ADSL service , which facilitates hosting, videoconferencing and virtual private network ("VPN") capabilities. DSL's dedicated connection to the carrier's DSLAM also provides the capability to offer different speeds at different price points. By contrast, cable modem providers typically market a shared connection running at the same speed for everyone.

[29] Joshi et. al. Par. 14

69. Finally, as noted earlier in this Declaration, cable networks often cannot reach business subscribers because cable TV systems originally were established to serve residential subscribers only.

*Prices*

70. In its recent *EchoStar* Order, the Commission reviewed data submitted by the Applicants regarding average price levels for broadband satellite, ADSL and cable modem services today. According to the Commission, the Applicants "note that the $60 to $70 monthly fee for existing satellite-provided broadband Internet access services is 'significantly' higher than monthly fees for cable modem and standard DSL service, which can be as low as $30 and $45 respectively."[30] Similarly, the Applicants stated that installation fees in excess of $700 for satellite-provided broadband Internet services could be compared to installation fees as low as $200 or $250 for "some cable modem and DSL providers, respectively."[31]

71. Notwithstanding these quotations, more current data suggest that the Commission's price estimates were somewhat low with respect to cable modem services and somewhat high with respect to DSL services. In particular, the Commission's average installation price for DSL services seems much higher than current offerings by the carriers.

72. In Schedule 9, we reproduce two trade press articles from ***Network World Fusion*** and *ZDNET* that describe a cable modem price- restructuring plan

[30] EchoStar Order, Par. 238.

[31] EchoStar Order. Par. *1-38.*

announced by AT&T Broadband in June 2002. **As** these articles explain, in June 2002, the base price in effect for cable modem services provided to nearly all of AT&T Broadband's customers had been $35.95 per month. (See Schedule 9). This "base" price was six dollars per month more than the $30 per month price cited by the FCC in the ***EchoStar*** Order. For those AT&T customers who also chose to rent cable modems from AT&T, the base pncc was $10 more or $45.95 per month. In the restructuring, AT&T announced that, effective July 1, 2002, its base price, without cable modem rental would increase $7 per month to $42.95 per month. This new price is nearly $13 more than the $30 per month price cited by the FCC. AT&T also announced that, for cable modem renters, the company would decrease its rental fee from $10 to ***$3*** per month. Thus, for renters, the total cable modem price would remain at $45.95 per month ($42.95 plus $3.00).

73. In Schedule 10, we reproduce DSL prices levels, speeds and other data reported for DSL providers at an online periodical known as Broadband Reports." At least with respect to Covad, as we explain below, even these price data appear somewhat out of date. Nevertheless, as shown in Broadband Reports, the lowest monthly price reported for any DSL service was the DSL service then provided by Covad featuring 384 Kbps downstream speed and 128 Kbps upstream speed. That service was available for $40 per month with **a** $99 installation fee. In the same source, ILEC DSL services resold by ISPs such as EarthLink and even by Direct

[32] www.broadbandreporrs.com

TV DSL were available for $49 per month with free installation. For its lowest speed DSL service, SBC Pacific Bell and SBC Southwestern Bell each charged $42 per month with a $99 installation fee.

74. In June 2002, Covad reduced its DSL prices below even the price levels shown in Schedule 10. Covad announced that its TeleSurfer Link ADSL product would be priced at $21.95 per month for the first four months and $39.95 thereafter with free equipment and installation with no annual contract.[33] Some months thereafter, SBC announced new DSL pricing at $29.95 for the introductory months and $42.95 per month thereafter.[34]

75. As these trends make clear DSL prices are now in a period of rapid decline driven largely, as we argue below, by intra-modal competition from CLECs like Covad.

[33] Letter to William Maher, Chief, Wireline Competition Bureau, Federal Communications Commission from Jason D. Oxman, Vice President and Assistant General Counsel, Covad Communications Company, October 11, 2002, page 4.

[34] Id.