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Access to the Internet: Regulation or Markets?

By David B. Kopel*

The explosive growth of broadband Internet services for residential users is revolutionizing access to the Internet. This study asks whether, in light of these changes, regulation or markets are more likely to serve consumers best now and in the years ahead.

The explosive growth of broadband services for residential users is revolutionizing access to the Internet.

Part 1 examines the political and judicial battle currently taking place over access to the Internet. It quickly describes the technological changes that give rise to the debate, identifies the key players, and summarizes the current state of affairs in the legal and political arenas. Part 2 presents the arguments being made for forcing cable companies to make their lines available on equally favorable terms to all Internet Service Providers, a proposal being promoted as "Open Access" but more accurately called "Forced Access." The shortcomings of these arguments make clear that the real case for Forced Access, if one exists, requires deeper investigation.

Part 3 describes the companies and technologies that are creating competition in the Internet access marketplace, making it unlikely that cable and long-distance phone companies can secure a monopoly (or duopoly) over access to the Internet. Digital Subscriber Line (DSL) offers some important advantages over cable, as do satellite and terrestrial wireless technologies. Even electric

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utilities are getting into the broadband communications business. The diversity among broadband providers means the market is competitive and is likely to remain so in the future.

Part 4 takes a closer look at the companies that are lobbying for Forced Access to see if they do business according to the principles they claim are motivating their campaign. It does not appear to be so.

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Part 5 examines the technological feasibility of Forced Access and finds a major impediment to the Forced Access cause. Part 6 asks if antitrust law should be brought to bear against AT&T and cable companies, and concludes that such law provides no rationale for Forced Access. Part 7 describes the negative effects on future investments in Internet and telecommunications infrastructure that would follow from adoption of Forced Access. Part 8 closes the study with a summary and concluding remarks. A glossary of terms and acronyms used in the study follows.

PART 1

Introduction to Broadband and Forced Access

A. Understanding Broadband

In a broadband transmission, a single medium can carry several channels simultaneously. For example, an ordinary cable television line can carry 57 channels at once. In a narrowband transmission, the medium can carry only a single signal, and the medium's whole bandwidth is dedicated solely to that single channel. For example, if you placed a long-distance phone call from New York to Los Angeles in 1930, an entire cross-country line—from the New York phone to the Los Angeles phone would be dedicated solely to transmitting the call.

Today, most Internet data move on a broadband. For example, an e-mail transmission may travel across the country on trunk lines that can carry many different messages at once. But when e-mail (or anything else on the Internet) travels the "last mile"[1] to a family's home computer, the transmission is on a narrowband. In other words, the family has used a dial-up modem to connect via copper telephone lines to an Internet Service Provider (ISP). The family's connection is via a dedicated telephone line; so long as the family computer is logged onto the Internet, the phone line that connects the home computer to the ISP cannot be used for anything else.

The largest single complaint about the Internet today is slowness and inefficiency, leading some to call the Web the "world wide wait."

Typically, a home computer will connect to the Internet via a narrowband modem that can send and receive data at the rate of 28 or 56 kilobits per second (kbps).[2] These narrowband rates are fine for sending and receiving simple items, but are often frustratingly slow for items containing more data—such as a World Wide Web page with lots of graphics, or an Internet video program. Unsurprisingly, the largest single complaint about the Internet today is slowness and inefficiency,[3] leading some to call the Web the "world wide wait."

For people who use the Internet often, broadband service is preferable. It is at least twice as fast as the fastest analog modem, and can be dozens of times faster. Broadband also allows line sharing—so that several computers can use the Internet while sharing a single telephone line, or

[1] The "last mile" is also called the "access network," the "local drop," or the "local loop." The "last mile" is, of course, not necessarily a full mile long. It is as long as the distance of the branch that leads away from the main line and into the customer's home.

[2] A bit is a unit of digital information (a 1 or a 0). There are eight bits to a byte. A 56.6k modem transmits 56.6 kilobytes—56,600 bytes, or 56,600 x 8 bits —per second.

[3] Microsoft research, http://www.Microsoft.com/presspass/trial/102098.htm.

so that a voice telephone call can be made even while a computer is connected to the Internet. At transmission speeds achieved by even the slowest forms of broadband, one can browse World Wide Web pages as fast as turning pages in a book.

Compared to telephones, television, and cellular communications, broadband is advancing more rapidly. That broadband is still in its "launch period" does not mean there is anything wrong or that requires government intervention.

In the Telecommunications Act of 1996, Congress ordered the FCC to report to Congress periodically about the development of broadband. The FCC's most recent report, released in January 1999, stated that broadband development and deployment were proceeding rapidly, and no government intervention was required.[4]

The FCC compared broadband to four earlier technologies: telephones in the 1870s, black-and-white television in the 1940s, color television in the 1950s, and cellular communications in the mid-1980s. For each of these, the FCC found that there was initially a "launch period" of gradual growth, as the technology was sold mainly to early adopters. Then, demand and usage began to "take off" rapidly, so that the product became common throughout the United States. Finally, the market was saturated, and further growth leveled off. Compared to each of these four technologies, the FCC found, broadband is advancing more rapidly. That broadband is still in its "launch period" does not mean there is anything wrong or that requires government intervention.[5]

B. Looking Ahead

In the near future, the fast transmission speeds of broadband will allow consumers to use remote storage, if they choose, rather than having to store everything on their computer's hard disk. For example, a set of 36 photographs from a digital camera takes up several megabytes of hard disk storage. Since most home computers have a few gigabytes or less of storage space, compiling a large digital photo album is impractical. Because broadband allows the rapid storage and retrieval of large amounts of data, home computer users could store their photo albums at remote sites—thus making the full photo album available to any family member or friend (no matter how far away) to whom the photographer gives access.

In the longer run, residential broadband will encourage the development of many forms of videoconferencing. Perhaps the most significant of these is telemedicine. Thanks to two-way videoconferencing, a patient could meet with a doctor without having to travel to the doctor's office. Inexpensive monitors could allow the doctor to check the patient's heart rate, or to analyze

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[4] *In the Matter of: Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996*, FCC 99-5, February 2, 1999 (hereinafter "FCC Report").

[5] FCC Report, pages 12-16.

a urine sample, without the need for an office visit.[6]

Broadband's potential for home-based businesses and for home-based learning is enormous. For example, even a small company will be able to distribute full-color catalogues to its customers. These catalogues can be interactive, and tailored to the customer's interests (e.g., showing clothing in particular sizes).

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At higher broadband speeds (starting at around 1 to 2 megabits per second (mbps)), services such as movies on demand become possible. The consumer is no longer limited to watching only what is in the inventory of the local video store.

Similarly, broadband will encourage the development of Internet music libraries. Instead of having to own compact discs, listeners can simply download albums or songs whenever they wish.

In addition to speed, one of the great advantages of broadband is that it is always on. The user does not need to spend time dialing up a connection and waiting for her modem to handshake with an ISP's modem. This makes it easier for telecommuters and other corporate users to be closely linked to the parent company's intranet. For example, a salesperson working from home can have real-time access to the company's warehouse inventory and shipping—without making the customer wait while the computer dials, connects, and logs into the corporate intranet. Residential access to broadband, then, promotes telecommuting (and geographic dispersal of the workforce) by allowing home workers to have fast access to corporate intranets.

Always-on also facilitates "tablet PC" devices such as the new Intel Web Pad—a portable screen the size of an Etch-a-Sketch™. The device communicates with a family's main computer by radio signals, and can be carried from room to room. So a person in the kitchen can check a recipe on the Internet, or a person in the living room can retrieve stock prices or an update on a baseball game—rather than having to go downstairs to the office where the main computer is, dial up, log on, and wait for the information.[7]

The always-on broadband connection will foster the development of smart home appliances. A "smart appliance," such as an air conditioner, can check the weather report an hour before people are scheduled to arrive home, and can start cooling (or stay at rest) depending on weather information from the Internet. Likewise, a homeowner can use her office computer, or her personal digital assistant, to turn on the furnace an hour before she arrives home, to have music playing on the stereo, and to deactivate the security system before her teenage children come home from school.

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[6]Some industry experts, however, have lower expectations for the telemedicine industry.

[7] William McCall, "Pass the Net, Please," *Chicago Sun-Times*, May 25, 1999, page 32.

The number of residential broadband users will soon exceed one million, thanks primarily to cable television companies rolling out broadband Internet access via cable lines. Crossing the one-million user threshold will spark new software designs. Leslie Kagan, senior broadband analyst with Paul Kagan & Associates, explains: "Deployment numbers under a million don't mean anything to Silicon Valley. Once they've passed the million mark, which @Home [a cable broadband provider] alone should do this year, then we can expect to see software and applications designed to exploit the high bandwidth market."

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Although broadband users will still be a minority of the Internet-using public, they will help drive the market. Broadband Internet services are already ubiquitous and readily available in many large and medium-sized companies.[8] But broadband is only just beginning to become available to residential computer users and small companies.

Cable television companies have now begun offering consumers broadband Internet access through cable television lines. Eventually, consumers will be able to use cable television lines not just for Web surfing, but also for telephone calls—thus bypassing local telephone companies. For example, AT&T has recently acquired controlling interests in two cable television companies: TCI and MediaOne.[9] AT&T is making cable modem broadband Internet service available to its cable television customers—for an extra fee of about $40 a month. Time Warner, Inc., which also has large cable television holdings, is doing the same, as are many other cable television companies. Currently, dozens of cable companies are offering cable modem broadband services all over the United States.[10]

C. Broadband and the Campaign for "Open Access"

The new cable broadband services pose a very large competitive threat to companies—such as America Online (AOL), or Mindspring—that provide Internet services over narrowband dial-up telephone lines. Cable broadband also threatens local telephone companies.

Led by AOL, a number of companies financially endangered by cable broadband have begun fighting back—by lobbying for congressional and local restrictions on the cable broadband companies.

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[8]FCC Report, page 6: "Many large and medium sized-business and government customers have had access to broadband for years, and in this proceeding we have heard few complaints from such customers that they, as a group, do not have access to broadband technologies."

[9] The TCI purchase has been consummated; the MediaOne purchase is in progress.

[10] An updated list is available at the Cable Modem Info Center, http://www.cabledatacomnews.com/cmic/cmic7.html.

If a cable television consumer buys broadband Internet access, the cable television company will usually provide Internet services through a wholly or partially owned or affiliated Internet Service Provider. Thus, a consumer who signs up for broadband cable from TCI or MediaOne would receive Internet services from @Home (pronounced "At Home")—an Internet Service Provider that is 58 percent owned by AT&T.[11] When the home computer user enters the Internet via a cable television line owned by TCI/AT&T, the first Web page he or she sees is a page belonging to @Home. This page can be customized by the user.[12]

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Similarly, if a consumer purchased broadband cable access from Time Warner, then TimeWarner's subsidiary RoadRunner would be the Internet Service Provider.[13] If the consumer wants an extra Internet Service Provider (such as America Online), then the consumer must pay an additional fee to the additional ISP; for example, the consumer would pay the regular $40 monthly fee to AT&T/TCI, and then an additional $9.95 required by AOL.[14]

Since cable consumers already get an Internet Service Provider (e.g., @Home or RoadRunner) included in their monthly $40 broadband fee, many consumers choose not to pay extra for a second ISP. On the other hand, some consumers do choose to pay for the second ISP because they want something the ISP has—such as proprietary content (as in the case of AOL or Prodigy), or a "start page" (also known as a "portal") with some particular customization features.

America Online and some other companies are now demanding Forced Access to cable broadband; they want AT&T, Time Warner, and other cable television companies to be forced to offer consumers cable broadband from *any* Internet Service Provider (e.g, AOL, Mindspring) for exactly the same price that the consumer can buy cable broadband from the cable company's own Internet Service Provider (e.g, @Home, RoadRunner).

In a market economy, AOL, Mindspring, and other ISPs are perfectly free to sit down with

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[11] @Home's exclusive contract with AT&T/TCI expires in 2002. @Home and Road Runner provide cable ISP services to other cable television companies as well.

[12] The page also offers various shopping opportunities, although nothing requires the user to buy from an @Home affiliate rather than any other Internet vendor.

[13] AT&T also controls a large share of RoadRunner, through MediaOne. Like @Home, RoadRunner also provides services to other cable companies.

[14] AOL charges $9.95 for use of its content by persons who already have Internet access. (This is AOL's "Bring Your Own Access" program.) If the user needs AOL to provide Internet access, the monthly charge is $21.95.

the cable companies and negotiate terms to be included in the cable companies' broadband offerings.[15] Such an arrangement would involve the ISPs paying some kind of price for access to the cable television company's customers. Nothing today prevents any ISP from entering into a freely negotiated arrangement with any cable television company.

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But instead of negotiating an agreed-upon price, AOL and other companies are lobbying for laws that would *force* cable television companies to offer access to *every* ISP in the country at the same price as the cable company's own ISP. AOL and its allies claim they are willing to pay a "fair price"[16]—although this price is necessarily less than the price they would have to pay if they simply negotiated an agreement (which they could do today) with the cable companies.

The companies that want to force their way into the cable broadband systems call their plan "Open Access," and their lobbying group calls itself the "OPENNET Coalition."[17] This study uses the term "Forced Access"—since AOL and its allies are lobbying for cable television companies to be forced to provide access to other companies. The "OPENNET Coalition" is a misnomer, since the Internet is already open, and will remain open, to all companies and individuals based on freely negotiated terms at mutually agreed prices.

D. Current Status of the Forced Access Debate

Forced Access advocates are working for their proposals at the state, local, and national levels. At the state level, they have had no success so far, even in legislatures such as California's, which are generally pro-regulation. Likewise unsuccessful have been efforts to prod state public utilities commissions to assert regulatory authority over cable broadband, based on the commissions' existing authority over local phone companies.[18]

At the local level, Forced Access has scored several victories. The Broward Country, Florida, County Commissioners have voted 4-3 to impose Forced Access on cable television in

[15] Indeed, AOL has negotiated with AT&T, but they have not come to mutually agreeable terms. Charles Cooper, "Why the Free Market Should Decide," *ZDNN*, July 12, 1999 (interview with David Pine, Vice President of Excite@Home).

[16] Ronald Nehring, *Washington and Silicon Valley at the Crossroads* (Americans for Tax Reform, May 19, 1999), page 5.

[17] The Coalition includes AOL, Prodigy, Mindspring, MCI, Cable and Wireless, U.S. West, and other companies.

[18] John Borland, "States May Join Open Access Debate," *CNET News*, July 21, 1999.

the county.[19] Governments in San Francisco and Seattle have voted to impose or to consider Forced Access if the principle is upheld in court.[20] In Denver, the telephone company U.S. West (a member of the OPENNET Coalition) is lobbying to defeat voter approval of changes to cable provider TCI's charter, which would allow TCI to bring broadband to Denver. Massachusetts may see a forced access ballot measure in the year 2000.

The first city government to impose Forced Access was Portland, Oregon. The city refused to allow TCI a "transfer of control" of its cable operating certificate to AT&T unless TCI/AT&T agreed to Forced Access for the cable modem service that TCI/AT&T intended to provide.

At the local level, Forced Access has scored several victories. San Francisco and Seattle have voted to impose or to consider Forced Access if the principle is upheld in court.

AT&T sued in federal district court, claiming that Portland violated various federal statutes, as well as the United States and Oregon Constitutions. The federal district court rejected AT&T's claims, while making no judgment about the wisdom of Portland's policy.[21] The Ninth Circuit Court of Appeals has granted AT&T's request for an expedited appeal. The new Broward County, Florida, law has generated its own lawsuits, by Comcast and by AT&T.[22]

At the federal level, Rep. Edward Markey (D-Massachusetts, ranking Democrat on the House Commerce Committee's subcommittee on Telecommunications, Trade and Consumer Protection) has urged the Federal Communications Commission to develop regulations imposing Forced Access nationally.[23] In the summer of 1999, Markey submitted a proposal to Congress calling for the FCC to "treat broadband access to the Internet over cable systems as telecommunications systems." In other words, rather than reducing regulation of telephone companies to the level of cable companies, the government would move cable television

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[19] Thomas E. Weber, "AOL Lobbying Move in Cable Fight is Paying Off," *Wall Street Journal*, July 15, 1999, page B6.

[20] Corey Grice, "San Francisco Considers Open Access Rules," *CNET News.com*, June 23, 1999; Corey Grice, "Oregon Ruling May Fuel Open Access Fight," *CNET News.com*, June 4, 1999 (Seattle provision goes into effect if the Portland district court's ruling is upheld); Karen J. Bannan, "Cable Access Remains Open Question," *Inter@ctive Week Online*, June 23, 1999. See also Corey Grice, "Cities Take Open Access Fight to the FCC," *CNET News.com*, June 21, 1999 (quoting Mario Goderich, director of consumer protection for Miami-Dade, threatening to act even though the Miami-Dade Board of County Commissioners rejected Forced Access proposals).

[21] *AT&T Corp. v. City of Portland*, CV 99-65-PA (D. Or., 1999). The case has been taken up by the Ninth Circuit Court of Appeals on an expedited basis. The National Association of Counties has adopted a resolution supporting local governments' authority to impose Forced Access. "FCC to Fight Open Cable Access," *Wired News*, July 21, 1999.

[22] "Comcast Sues over Cable Access Issue," *Reuters*, July 22, 1999.

[23] Rep. Ed Markey, open letter to William Kennard, Chairman of the FCC, January 21, 1999, http://www.house.gov/markey/pr12199.htm; *Wall Street Journal*, January 26, 1999.

companies to the more restrictive level of regulation currently applied to phone companies. Under Markey's resolution, the FCC would be required, within 180 days, to complete a proceeding to regulate broadband access under the provisions of the Telecommunications Act of 1996.

But the Federal Communications Commission has rejected requests from the OPENNET Coalition and its allies to study or impose Forced Access regulations. In fact, the FCC has filed an amicus brief before the Ninth Circuit Court of Appeals in the Portland case, arguing that federal law prohibits local governments from mandating Forced Access.[24] FCC Chairman William Kennard explained why he believes that imposition of Forced Access is destructive:

> The broadband market is fertile, but still undeveloped. The future is bright, but still glimmering in the distance. We are about 50 meters into a race that is sure to be a marathon.
>
> Sometimes people talk about broadband as though it is a mature industry. But, the fact is that we don't have a duopoly in broadband. We don't even have a monopoly in broadband. We have a NO-opoly. Because, the fact is, most Americans don't even have broadband.
>
> We have to get these pipes built. But how do we do it? We let the marketplace do it.
>
> If we've learned anything about the Internet in government over the last 15 years, it's that it thrived quite nicely without the intervention of government. In fact, the best decision government ever made with respect to the Internet was the decision that the FCC made 15 years ago NOT to impose regulation on it. This was not a dodge; it was a decision NOT to act. It was intentional restraint born of humility. Humility that we can't predict where this market is going.
>
> Who among us could have predicted the incredible advances of the past few years? Who at the beginning of this decade could have predicted the embrace of e-mail by all ages, the birth of the World Wide Web, the advances in communications technology?
>
> In a market developing at these speeds, the FCC must follow a piece of advice as old as Western Civilization itself: first, do no harm. Call it a high-tech Hippocratic Oath.
>
> So with competition and deregulation as our touchstones, the FCC has taken a hands-off, deregulatory approach to the broadband market. We approved the AT&T-TCI deal without imposing conditions that they open their network. [25]

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[24] William E. Kennard, Chairman, FCC, "The Unregulation of the Internet: Laying a Competitive Course for the Future," Remarks before the Federal Communications Bar, Northern California Chapter, San Francisco, July 20, 1999, http://www.fcc.gov/Speeches/Kennard/spwek924.html.

[25] William E. Kennard, Chairman, FCC, Remarks before the National Cable Television Association, Chicago, June 15, 1999, http://www.fcc.gov/Speeches/Kennard/spwek921.html; "FCC Opposes Local Cable Internet Rules," *Investor's Business Daily*, June 16, 1999. Kennard does believe that the FCC has legal authority to impose Forced Access, should it choose to do so. Declan McCullagh, "Kennard Takes up AOL's Cause," *WiredNews*, May 21, 1999, http://www.wired.com/news/news/politics/story/19778.html.

In Kennard's view, the FCC's job is not to determine how technology will develop: "In this atmosphere, where technology is like popcorn on a hot skillet, government's role is to stoke the coals and encourage growth, not to try to mandate how or when these kernels will pop."[26]

AOL's lobbying has nevertheless succeeded in putting Forced Access high on the congressional agenda. In the spring and summer of 1999, the Senate Commerce Committee, the Senate Judiciary Committee, and the House Judiciary Committee all held hearings on Forced Access.

Louisiana Republican Billy Tauzin and Michigan Democrat John Dingell have introduced a bill to prohibit local governments from imposing Forced Access.

Representatives Bob Goodlatte and Rick Boucher (both of whom represent Virginia, the home state of AT&T competitor AOL) have introduced legislation to compel nationwide Forced Access.[27] On the other side, Louisiana Republican Billy Tauzin and Michigan Democrat John Dingell have introduced a bill to prohibit local governments from imposing Forced Access. Their Internet Freedom and Broadband Deployment Act would also bar the Federal Communications Commission from regulating high-speed access providers.[28]

In Canada, Forced Access has already won, as the Canadian Radio-Television & Telecommunications Commission has ordered cable television companies to let rivals use their cable lines.[29]

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[26] John Borland, "Feds Struggle with New Cable Landscape," *CNET News.com*, March 23, 1999.

[27] H.R. 1685 specifies that in a Sherman Act (15 U.S.C. sections 1-3) antitrust suit, the plaintiff may prevail by showing "that a broadband access transport provider that has market power in the broadband service provider market has offered access to a service provider on terms and conditions, other than those justified by reasonable cost differentials, that are less favorable than those offered by the operator to itself" or to its affiliates, or to any other ISP. Another section of HR. 1685 (503, after 502) makes the aforesaid conduct unlawful. A companion bill, H.R. 1686, does the same, in sections 102 and 103.

[28] In addition, the bill would open the door for RBOCs (Regional Bell Operating Companies, such as U.S. West and Bell Atlantic) to compete in the high-speed access market. RBOCs have worked at a disadvantage in the high-speed network access market compared with cable companies, because the phone companies face regulations cable providers do not.

[29] David Akin, *Financial Post*, April 23, 1999. The Commission has not specified when the cable companies must begin allowing access.

PART 2

The Case for Forced Access

The advocates of Forced Access offer a variety of dire warnings about what will happen if their policy is not adopted immediately. While most of these warnings are not credible, some are. Let us examine them one-by-one.

A. Cable Modem's Early Lead Will Result in an Unbreakable Monopoly

The advocates of Forced Access offer a variety of warnings about what will happen if their policy is not adopted.

By purchasing TCI and MediaOne, "AT&T will have full or partial control of more than 60 percent of all cable service into American homes."[30] Forced Access supporters cite a report that predicts cable modems will have 86 percent of wireline broadband by 2002.[31] Do these two facts, combined, show that AT&T will have a near-monopoly on broadband? Actually, the 86 percent figure does not account for *wireless* broadband, an important and growing part of the market that will be discussed later.

Although other researchers expect alternative types of technology to have much more than 14 percent of the wireline broadband Internet market in the next few years, let us assume that the 86 percent prediction is reasonable. Does this mean "consumer choice will be history," as Marc Jacobson, head of the ISP Prodigy Internet warns?[32] William Barr, of GTE, agrees:

> The policy of open access thus not only is necessary, but is necessary **now**. Those who are taking a "wait and see" attitude with respect to open access to the Internet are wrong. Once a firm gets a head start in closing off competition—as AT&T is attempting to do in the Internet access and ISP markets—the results can take years to undo. In fast-growing, network industries, anticompetitive tactics can lead to disastrous results very quickly. It is therefore imperative for legislators and regulators to act now to ensure open access. [33]

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[30] Opennet Coalition press release, "Opennet Urges Los Angeles to Require Competition in High-Speed Cable Internet," June 21, 1999, http://www.opennetcoalition.org/news/929992187.shtml.

[31] Forrester Research study, cited in *Los Angeles Times*, cited in Erik Stein, Portland City Council Member, testimony on H.R.1685, Committee on the Judiciary, United States House of Representatives**,** June 30, 1999.

[32] Opennet Coalition press release, supra note 30.

[33] William P. Barr, executive vice president and general counsel, GTE Corporation, Testimony on H.R. 1685 and H.R. 1686, Committee on the Judiciary, United States House of Representatives**,** June 30, 1999.

The Federal Communications Commission, however, takes the opposite view:

> We believe it is premature to conclude that there will not be competition in the consumer market for broadband. The preconditions for monopoly appear absent. Today, no competitor has a large embedded base of paying residential consumers. The record does not indicate that the consumer market is inherently a natural monopoly. Although the consumer market is in the early stages of development, we see the potential for this market to accommodate different technologies such as DSL, cable modems, utility fiber to the home, satellite and terrestrial radio. The facts that different companies are using different technologies to bring broadband to residential consumers and that each existing broadband technology has advantages and disadvantages as a means of delivery to millions of customers opens the possibility of intermodal competition, like that between trucks, trains, and planes in transportation. By the standards of traditional residential telecommunications, there are, or likely will soon be, a large number of actual participants and potential entrants in this market. Anti-competitive coordination among competitors is difficult in such markets.[34]

But suppose that the FCC is wrong, and cable broadband Internet, much of which will be owned by AT&T, does garner an overwhelming market share. Will it ever be possible for AT&T to be dislodged from its dominant position? To believe that AT&T, once in the lead, will necessarily stay in the lead permanently, one must ignore case after case in which one company, with a superior product, cornered an overwhelming share of the relevant market—but lost its dominant position a few years later to innovative competitors. For example:

To believe that AT&T will stay in the lead permanently, one must ignore case after case in which one company, with a superior product, cornered an overwhelming share of the relevant market—but lost its dominant position to innovative competitors.

- Before 1990, intraoffice computer networks were dominated by IBM and its 20 million installed "3278 terminals." Today, office networks are created with a wide variety of different computers and different networking software. The 3278 standard is used only for backwards compatibility, so that newer computers can access data on old mainframes.[35]

- The dominant producer of operating systems for personal computers used to be Digital Research. But IBM eventually beat Digital Research with IBM-DOS, and then Microsoft (which had helped make DOS for IBM under an outsource contract) created its own version of DOS, and then took over the market lead by introducing Windows.[36]

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[34] FCC Report, pages 25-26.

[35] Kim Maxwell, *Residential Broadband: An Insider's Guide to the Battle for the Last Mile* (New York, NY: Wiley, 1999), page 61 (hereinafter, Maxwell, *Residential Broadband: An Insider's Guide*).

[36] Windows 1.0 and 2.0 were market failures, but Windows 3.0 and its successors proved immensely successful.

- The first company to introduce modems in large numbers to small businesses and home consumers was Hayes. Other modem companies had to advertise that they were "Hayes compatible." Today, Hayes no longer exists.

- The first broadly used business software application was the Visicalc spreadsheet. But Visicalc was displaced by Lotus 123, which in turn was displaced by Excel.

The clear lesson of the last 20 years is that companies with leading products stay in the lead only if they continue to produce superior products.

- Wordstar was the dominant program for word processing—until WordPerfect made a better product. And when WordPerfect failed to bring out new products for Windows, WordPerfect gave way to Word.[37]

- In the early 1990s, Intel had a commanding market share in the production of microprocessors for personal computers. But for computers selling for less than $1,000, Intel has lost its leading market position to AMD, manufacturer of the K6 chip, and has also lost significant market share to Cyrix, manufacturer of the Cyrix M II. Intel is now losing its high-end chip dominance to AMD.[38]

- The Mosaic Web browser, introduced in September 1993, provided a graphical interface that made it easy for ordinary computer users to "browse" the Internet—rather than having to rely on text-based, often-confusing Web file management programs such as "Gopher." The Mosaic browser helped create the World Wide Web we know today . . . but Mosaic itself is mostly forgotten, having long been supplanted by superior products.

The clear lesson of the last 20 years is that companies with leading products stay in the lead only if they continue to produce superior products.[39] There is no realistic danger that cable companies will dominate the broadband market, unless the companies consistently deliver better value to the consumer than does the competition.

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[37] WordPerfect did not bring out a Windows-based word processor until several years after Windows 3.0 was introduced. WordPerfect took nearly a year after the introduction of Windows 95 to produce a compatible version. The first time, WordPerfect underestimated the popularity of Windows compared to DOS. The second time, WordPerfect underestimated the popularity of Windows 95 compared to IBM's OS/2 operating system.

[38] James DeTar, "K7 Chip May Let AMD Battle Intel in High End," *Investor's Business Daily*, June 21, 1999, page A6.

[39] For additional examples, see Stan J. Liebowitz and Stephen E. Margolis, *Winners, Losers and Microsoft* (Oakland, CA: The Independent Institute, 1999).

B. ISP Employees Will Lose Jobs

As companies like AT&T and Time Warner introduce cable broadband, employees of smaller Internet Service Providers will lose jobs, the OPENNET Coalition warns.

While competition often means that employees of inefficient firms lose jobs, it also means that more successful firms will expand their hiring. The net impact on total employment will not necessarily be negative.

It is true that superior technologies can reduce the number of jobs available in obsolete professions. Faxes and e-mail have reduced the demand for bicycle couriers. Automobiles devastated the blacksmith business. For that matter, the more people who sign up with AOL, the fewer customers for the smaller ISPs. Yet "this process of Creative Destruction is the essential fact about capitalism."[40] The mass marketing of telegraph services put many Pony Express riders out of business, and the mass marketing of broadband will eventually put many ISPs out of business—unless they find new ways of bringing value to the consumer.

But the inability of ISPs to meet the competitive pressure from broadband need not mean lower employment in the Internet provider industry overall. While competition often means that employees of inefficient firms lose jobs, it also means that more successful firms will expand their hiring. The net impact on total employment will not necessarily be negative and, in fact, total employment might even increase.

C. Forced Access Will Improve Competition

Several Forced Access supporters have written to the FCC claiming that without FCC-imposed Forced Access, electronic commerce will be "driven not by the dictates of a free and open market, but by the self-interested decisions of monopoly providers."[41]

Similarly, a Forced Access advocate in Los Angeles makes his case in terms of fostering competition:

> [O]pen access ensures consumer choice, competition and innovation in the marketplaces for high-speed Internet access. Without open access, there is no level playing field; cable companies

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[40] Joseph A. Schumpeter, *The Theory of Economic Development* (Cambridge: Oxford University Press, 1963), page 83. Schumpeter, an Austrian economist, coined the phrase "creative destruction." See *Capitalism, Socialism and Democracy* (New York, NY: Harper & Row Publishers, 1942; third edition 1950), pages 81-86.

[41] Center for Media Education, Computer Professionals for Social Responsibility, Consumer Federation of America, Consumer Project on Technology, Consumers Union, Media Access Project, letter to William Kennard, Chair, FCC, January 28, 1998, http://www.nogatekeepers.org/archive/19990127-1.shtml.

> will control every aspect of high-speed Internet access (i.e., price, transport/ conduit, packaging, interface, content, cost, technical standards, customer service, innovation, etc.). In fact, in the case of high-speed cable Internet access, the playing field does not even exist; there are no competitors and cable companies can do whatever they desire.[42]

Competition can occur only when competitors offer *different* things to the consumer. If cable broadband is eliminated as a competitive tool (since every ISP can offer it), then companies will not be competing over improved broadband hardware.

The FCC acknowledges that Forced Access advocates have a point here. If the cable companies had to let any ISP use their system, there would immediately be greater competition among ISPs to serve the customers who were being delivered by the cable lines. But in the long run, competition would be harmed, the FCC explains: "While mandating access can bring about short-term improvements in retail competition, it also may undermine incentives for developing new methods to circumvent the influence of incumbents over distribution."[43]

As the FCC recognizes, competition can occur only when competitors offer *different* things to the consumer. If cable broadband is eliminated as a competitive tool (since every ISP can offer it), then companies will not be competing over improved broadband hardware.

As Supreme Court Justice Stephen Breyer has observed: "Rules that force firms to share *every* resource or element of a business would create, not competition, but a pervasive regulation, for the regulators, not the marketplace, would set the relevant terms."[44] Forced Access is just the kind of rule described by Justice Breyer: the entire "last mile" from the Internet to the consumer's residence would be shared; hence, there would be no competitive advantage for the property owner to improve or maintain the property.

As for the rhetoric about level playing fields, John Berresford writes for the Economic Strategy Institute:

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[42] Robert Duggan, letter of resignation to Mayor Richard Riordan, June 17, 1999, http://www.opennetcoalition.org/news/929992187-resign.shtml.

[43] FCC Report, Separate Statement of Commissioner Michael K. Powell, pages 3-4.

[44] *AT&T v. Iowa Utilities Board*, 143 L. Ed. 2d 34 (1999) (Breyer, S., dissenting). Justice Breyer's words were written in dissent, in a case involving Forced Access for telephone companies (the Incumbent Local Exchange Carriers, who formerly had legal monopolies in their territory). That Justice Breyer's words came in a dissent does not prove that the majority of the Supreme Court disagrees with him; the *Iowa* case involved statutory interpretation of a law (the Telecommunications Act of 1996) that was plainly intended to impose Forced Access on the ILECs. (The issue in the case was exactly how much Forced Access the badly drafted and contradictory statute was meant to impose.) That the Court majority did not agree with Justice Breyer about the meaning of particular words in a particular statute does not undermine Justice Breyer's broader point about Forced Access.

> The "playing field" is never "even" to begin with, and bringing in a lot of regulatory landscape architects and earth-moving equipment will, in most cases, only postpone the emerging competition and the benefits it will bring to consumers . . . all the other competitors will find something unfair to them and will want their valleys to be filled and their mountains and hills to be brought low. The process can become an endless one, and if carried to its logical conclusion, makes the regulator into a cartel manager. This guarantees jobs for regulators, lawyers and lobbyists, and oligopoly for the so-called competitors, but it will do little for consumers.[45]

In short, it is Orwellian to allow the word "competition" to mean "protection of politically influential companies from competition."

D. Cable Companies Will Be Able to Control Content

The ultimate bogeyman in the Forced Access debate is that cable companies will be able to use their market lead in broadband Internet to control the content of the Internet. Although Internet censorship is popular in some quarters, most Internet supporters recognize that the wide-ranging, free content of the Internet is one of its most important benefits. Thus, scaring consumers about Internet content control is a superb tactic. For example, a collection of pro-Forced Access groups run a joint Web site topped by a picture of a computer in chains, along with the caption "Cable and phone companies could restrict the content you can see on the Web."[46]

Cable and phone companies *could* give all their profits to Satanists; . . . they *could* try almost anything. But the Coalition presents no evidence that cable or phone companies have actually tried to limit their customers' access to Internet content.

This message is undoubtedly frightening to Web surfers, but it is misleading. Cable and phone companies *could* give all their profits to Satanists; cable and phone companies *could* refuse to transmit any content from Web sites that disparage Barney the Dinosaur; cable and phone companies *could* charge customers one million dollars a day for Web access; cable and phone companies *could* try almost anything. But the Coalition presents no evidence that cable or phone companies have actually tried to limit their customers' access to Internet content. The only thing that could even arguably be called a limitation is the current cable limit on ten minutes of streaming video (discussed below), which has nothing to do with the content of the video; it is simply a limitation based on cable's limited bandwidth, and the need to preserve the vast majority of that bandwidth for television signals.

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[45] John Berresford, *Future of the FCC: Promote Competition, Then Turn Out the Lights?* (Economic Strategy Institute, May 1997), pages 21-22.

[46] Center for Media Education, Computer Professionals for Social Responsibility, Consumer Federation of America, Consumer Project on Technology, Consumers Union, Media Access Project, http://www.nogatekeepers.org/.

One method cable companies are using to improve Internet access speed is sometimes claimed to be "content control," but the claim is wrong. Suppose that Internet surfers want to watch a trailer for a new movie; the trailer consists of ten minutes of streaming video. If consumers simply access the trailer by clicking on the movie studio's Web site in southern California, then the ten minutes of video data will be sent cross-country (for one consumer at a time), to consumers in Boston, Montgomery, Minneapolis, and so forth. All these cross-country trips eat up a lot of Internet bandwidth. And the farther the data must travel, and the more switches and routers along the Internet backbone that are necessary, the slower the delivery of the movie trailer to the consumer's computer screen.

To alleviate this problem, the Internet Service Provider (such as @Home, or AOL, or any other national ISP), makes a deal with the movie studio. The studio will pay the ISP a fee. Then, the ISP will make copies of the movie trailer, and store them on local servers. So the consumer in Boston who wants to watch the trailer will not have to wait for the trailer to travel all the way from Hollywood to Boston; the data for his trailer will travel from the ISP's server in Boston to the consumer's home in Boston. By "caching" a copy of the movie trailer, the ISP makes the trailer available to the consumer more efficiently.

Does caching lead to content control? Plainly not—or America Online would *already* control Internet content.

Everyone is better off with caching. Consumers get the movie trailer faster; more people watch the trailer, since they don't have to wait for a cross-country download. The movie studio gets more people to watch the trailer (and thus more people attend the movie, and give money to the studio). The ISP gets more money in the short run from the studio, and more money in the long run from contented customers. Everyone else who uses the Internet benefits too; since the Internet is not clogged with the movie trailer moving cross-country, the Internet is that much faster for everyone else to use—including people who don't like movies, and who don't use the particular ISP.

Caching is currently common on the narrowband Internet. AOL is among the most notable practitioners.[47] The cable ISPs, such @Home and RoadRunner, will also practice caching. Again, caching does not restrict Internet content in any way; it simply makes certain popular content available faster.

Does caching lead to content control? Plainly not—or America Online would *already* control Internet content. America Online owns about half of the current consumer Internet market (much more than cable could ever realistically hope to have). Has caching given AOL control over Internet content? Since the answer is obviously "no," there is no reason to fear that similar caching by cable television broadband providers will enable them to control content.

[47] Maxwell, *Residential Broadband: An Insider's Guide*, page 114.

Similar fears were raised when Microsoft began using its Windows 95/98 and Internet Explorer programs to highlight content from certain Web sites. Internet Explorer 4.0 and 5.0 both have something called "channels," which allow content from a Web site to be delivered to a user's computer at a convenient time (such as midnight); later, the computer user can browse the delivered content, without having to log onto the Internet. Although any Web site can turn itself into a channel (by inserting some simple code), Microsoft creates preset channels for certain sites (e.g., Disney, CBS Sportsline) that pay Microsoft to do so. Microsoft's operating system (which now includes Internet Explorer) is ubiquitous, and if any company has the market presence to control content, it should be Microsoft.

But channels have been a failure, and have not interested most Web users. Content on the World Wide Web today is just as free and wide-open (in fact, more so) as when Microsoft began pushing selected channels.

There is no realistic risk that cable broadband (which will probably never have even half of the total Internet access market) will be able to control content.

If neither Microsoft (with over 90 percent of new personal computer operating systems) nor AOL (with almost half the current ISP business) can use a market-leading position to control content, there is no realistic risk that cable broadband (which will probably never have even half of the total Internet access market) will be able to control content.

This is not to say that the cable companies will not do their best to make as much money off content as possible. Telecommunications analyst Anna-Maria Kovacs explained to Congress:

> It does not take much imagination to envision the potential for a player like AT&T that controls access to the majority of cable homes in the U.S. through its own properties or its affiliates . . . finding ways to advantage its own content and sites on its own network. But it also does not take much knowledge of history to understand that in a competitive market that is likely to be a highly self-destructive strategy. Consumers who, at comparable prices and speeds, can get unlimited choice of content over the telcos vs. limited choice over their cable network are not likely to opt for the cable network. Beta vs. VHS and Apple vs. Microsoft both tell us that customers primarily care about content and applications and will flock to the vendor that gives them the best and widest selection of each. Thus, if AT&T were inclined to try to limit the number of ISPs and the content on its network, it would be punished severely by the marketplace, assuming there is another choice in that marketplace. Most Internet access would happen over the telcos' DSL pipes. [DSL is discussed below.] Given the enormity of AT&T's investment in cable systems and its inability to earn adequately over those systems without a hefty penetration of cable-modems and telephony, its stock would suffer severely if it maintained a closed-access strategy once DSL is readily available in the marketplace.[48]

[48] Anna-Marie Kovacs, Testimony before the United States Senate Committee on the Judiciary, hearing on "Broadband: Competition and Consumer Choice in High-Speed Internet Services and Technologies," July 14, 1999.

E. Telecommunication Monopolization in the Early Twentieth Century

William Barr, former U.S. Attorney General and currently the executive vice president of GTE, argues that Forced Access is appropriate in part because of AT&T's behavior at the start of the twentieth century, when AT&T established a telephone monopoly in most urban areas.[49] AT&T did indeed create a monopoly, but this monopoly was established through three methods not available today.

At the start of the twentieth century, AT&T did create a phone monopoly in most urban areas. But this monopoly was established through three methods not available today.

First, the Bell Companies bought out many of the smaller competitive telephone service providers.[50] This precedent might be relevant if AT&T were buying out small ISPs today, but AT&T is doing no such thing. It is introducing a new form of competition, not buying out any competitors.[51]

Second, AT&T refused to interconnect with telephone exchanges that it did not own.[52] In other words, if a customer was served by a small local phone company, and the person wanted to place a long-distance call to someone in another town (where AT&T owned the exchange), AT&T would not connect the call. Similar behavior would occur today if AT&T refused to deliver e-mail from Mindspring (not owned by AT&T) to a customer for @Home (40 percent owned by AT&T). But AT&T is not refusing to carry traffic from outside providers. Indeed, if AT&T/@Home customers could send e-mail only to other AT&T/@Home customers, almost no one would become an @Home customer in the first place.

The third key to the establishment of the Bell Companies' monopoly was state legislation outlawing local phone competition; much of this legislation was pushed by the Bell Companies themselves.[53] Today, though, it is not AT&T that is asking for the government to help it suppress competition; it is AOL, GTE, and the other Forced Access lobbyists who want the government to suppress another company's competitive advantage.

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[49] William P. Barr, supra note 33.

[50] *AT&T v. Iowa Utilities Board* (Thomas, C., concurring and dissenting on other grounds), citing Robert Garnet*, The Telephone Enterprise: The Evolution of the Bell System's Horizontal Structure, 1876-1909* (Baltimore, MD: Johns Hopkins University, 1985), pages 146-53.

[51] Barr's criticisms might be better directed at GTE itself and the RBOCs. After the break-up of the Bell System, there were seven RBOCs. Today, there are only three, thanks to mergers. Each merger eliminates a strong potential competitor for local telephone service. Once Pacific Telesis merged with SBC, there was no risk that one company would attempt to compete with the other in the other's home territory.

[52] Maxwell, *Residential Broadband: An Insider's Guide*, page 287.

[53] *AT&T v. Iowa Utilities Board*, supra note 44 (Thomas, C., dissenting), citing Kenneth Lipartito, *The Bell System and Regional Business* (Baltimore, MD: Johns Hopkins University, 1989), pages 185-207.

PART 3

New Broadband Technologies and New Competitors

The most prominent argument made by those who favor Forced Access is that it is necessary to prevent a monopoly: unless the cable companies are required to let other companies use their "pipes," consumers will no choice about broadband Internet access. While superficially persuasive, this claim is fundamentally at odds with the growth of the cable broadband industry and the emergence of its many competitors. Thanks to competing technologies—such as the many varieties of DSL, as well as various wireless technologies—there is little chance that cable broadband will establish a monopoly. To the contrary, the rapid growth of cable broadband is spurring the introduction of many different, affordable technologies; these technologies are in some ways superior to cable broadband.

Thanks to competing technologies—such as the many varieties of DSL, as well as various wireless technologies—there is little chance that cable broadband will establish a monopoly.

A. Cable Modems

Currently, 106 million homes have cable television; of those, about a quarter presently have the ability to obtain broadband Internet access through a cable modem.[54] So far, about 750,000 cable modems have been installed, and the new installation rate has reached one million per year.[55] By the end of 1999, there probably will be about 1.6 million cable modem subscribers, and about 7.3 million by 2003.[56]

[54] Steve Kichen, "Cable Guys," *Forbes*, May 3, 1999, page 230. The cable modem does not interfere with television use; one person can watch cable television while another person uses a computer to surf the Internet. An installer splits the existing cable line, so that one line goes to the television, and another to someplace near the computer. The cable modem is installed at the end of the line to the computer. The computer itself must have a Network Interface Card (also known as an Ethernet card, available for well under $100).

[55] "FCC Opposes Local Cable Internet Rules," *Investor's Business Daily*, June 16, 1999; Steve Kichen, ibid.

[56] For an up-to-date list of cities with cable modem service, see Commercial Cable Modem Launches in North America, http://www.cabledatacomnews.com/cmic/cmic7.html.

Cable television lines are many times faster than the 28.8 or 56.8kbps speed of analog modems.[57] For downstream (to the consumer) transmission, cable modem speeds start at 1.2mbps, and range up to 27mpbs downstream. Upstream (from the consumer) speeds start at 28.8 kbps and can reach as high as 10 mbps upstream.[58] Many installed cable modems are one-way, using a regular telephone line and modem for upstream communications. While all the major cable companies are upgrading their systems, it may be three years or more before one-way cable modems are no longer in common use.

The monthly cost is generally $29.95 to $62.95.[59] The "early adopters" who are currently using these modems are the most eager for broadband service, and therefore are the least cost-conscious. As cable companies attempt to expand their user base beyond highly motivated technophiles, prices can be expected to drop.

As cable companies attempt to expand their user base beyond highly motivated technophiles, prices can be expected to drop.

A monthly cable modem subscription includes an e-mail account and unlimited Internet access. Usually, the cable company will take care of installation.

Since unlimited Internet access from an old-fashioned analog modem typically costs around $20 per month (AOL is $21.95), the marginal monthly cost of broadband cable modem service may be only $10 more than the monthly cost of narrowband.

Nevertheless, cable technology has certain limits that will prevent it from developing into the optimal broadband medium. The cable lines themselves can carry only so much data, and most of the bandwidth is taken up by television content. A typical cable line (such as Time Warner's) has a 750 MHz bandwidth, of which 6 MHz is leased by the Internet Service Provider (such as RoadRunner).[60]

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[57] Cable television lines typical use coaxial cable to connect the consumer to the trunk lines, and then coaxial or fiber-optic cable for trunks.

[58] Department of Commerce, *The Emerging Digital Economy*, http://www.ecommerce.gov, page A2-14. @Home currently caps upstream rates at 128 kbps.

[59] The monthly cost may or may not include rental of the cable modem. Charles DuBow, http://www.forbes.com/tool/html/99/feb/0210/feat.htm. Cable modems are not easily purchased by the consumer; manufacturers generally sell them only to cable television providers, at prices ranging between $200 and $400 each. Even if cable modems were readily available for consumer purchase, it would be unwise to do so. Only recently have cable modems been standardized; the modem that works with one cable system would probably not work with a different provider's system.

[60] Credit Suisse First Boston Corp., *The Battle over Cable Broadband Access: Much Ado About Nothing*, June 7, 1999. A 750 MHz line carries the equivalent of 110 analog cable channels. With digitization, the number of channels is much larger.

The cable bandwidth is shared by each user on a particular hub. For example, if 200 houses are all on the same hub, then an e-mail message (or Web content) sent to a recipient at one house is actually sent to each of the 200 homes. Password protection and similar encoding keeps the other 199 homes from being able to read the e-mail, or even learn of its existence.

Likewise, any Web page or multimedia Web program (a video, or a song) sent to one home on the hub is actually delivered to every home. The other homes will not know what the content is, or even that it exists, but the content does take up part of the shared bandwidth.

So if too many homes that feed off the same cable branch line used their cable modem all at once for high-bandwidth content (e.g., watching an interactive video on the Internet), then the cable line would get too crowded: Internet transmission speeds would no longer be fast.

To allow every ISP to use a cable company's bandwidth would quickly clog the bandwidth so badly that cable would hardly be faster than old-fashioned analog modems.

Thus, the @Home and RoadRunner cable modem services do not allow their customers to watch more than 10 consecutive minutes of streaming video at once.[61] And @Home has experienced slow or interrupted service problems at various times already.[62]

The bandwidth contention problem has two major implications for the Forced Access issue:

- First, bandwidth contention explains why Forced Access is, as a practical matter, impossible. To allow every ISP to use a cable company's bandwidth would quickly clog the bandwidth so badly that cable would hardly be faster than old-fashioned analog modems. (This issue is discussed in more detail below.)

- Second, bandwidth contention means that cable modem is at a severe competitive disadvantage vis-a-vis broadband delivery systems that do not have bandwidth contention (such as systems that use telephone lines; more on these below). The bandwidth limitation ensures that cable broadband—while holding an initial lead in deployment—is unlikely to maintain a long-term lead as the major broadband medium.

While bandwidth contention can be addressed—by adding hubs to the system, for example, or by devoting more cable channels to Internet access—it nevertheless represents a significant limitation on cable modem technology. Thus, even when cable modems become a mature

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[61] In the olden days (e.g., 1995), a person who wanted to watch a video clip or listen to an audio clip would have to download the complete audio or video file to his computer. These files were very large. "Streaming" technology allows the first part of the video (or audio) to begin playing before the later parts have been received. After the streaming broadcast is over, there is no file left over on the consumer's computer.

[62] Corey Grice, "AOL Sows High-Speed Seeds Around AT&T," *CNET News*, July 22, 1999.

technology, their share of the U.S. Internet market is expected to reach only about 15 percent. Far from being a monopoly, cable television companies will face stiff competition from the other 85 percent of the market. On the low end, analog modems will be cheap. Indeed, during the first six months of 1999, all of the cable broadband Internet companies combined installed 500,000 new customers; during the same period AOL gained two million new customers for its narrowband service.[63] On the high end, other broadband media will be faster and wider.

> Cable modems are expected to reach only about 15 percent of the total U.S. Internet market. And that 15 percent will not belong exclusively to giants such as AT&T/TCI and Time Warner.

The 15 percent of the U.S. Internet market that cable television companies eventually will service will not belong exclusively to giants such as AT&T/TCI and Time Warner. Currently, dozens of cable companies are providing cable modem service. Even in regions where cable television companies have held quasi-monopolies, competition is coming from new cable television companies. For example, in north and central Chicago, 21st Century Telecom is laying down cable lines that will compete directly with AT&T's cable system—giving Chicago customers the choice of two cable companies, both of which will offer a variety of television, telephone, and Internet options. Ameritech New Media will offer similar competition in southern Chicago.[64]

B. Digital Subscriber Line (DSL) and ISDN

Digital Subscriber Line (DSL). Existing old-fashioned copper telephone lines can now be used for broadband—thanks to a technology known as DSL (Digital Subscriber Line).[65] By using complex modulation programs, DSL dramatically increases the amount of data that can be carried on telephone wires. DSL is a "last-mile" technology; that is, DSL is used to create a broadband link between a residence and the telephone company's central office. (Once the data reach the central office, they are retransmitted onto the Internet's backbone, which is already broadband.)

Like cable modems, Digital Subscriber Lines can have multiple simultaneous users. So in a DSL home, a teenager could use his computer to play an interactive game on the Internet, while the father used his own computer to watch an investment video on the Internet, while the mother

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[63] Kinetic Strategies, Inc., "Cable Modem Customers Count Tops One Million," August 2, 1999, http://www.kineticstrategies.com/1million.html.

[64] Robert Manor, "Cable Challenger Set to Wire City Homes," *Chicago Sun-Times*, June 10, 1999.

[65] DSL comes in a variety of flavors and speeds. There are, for example, Symmetric DSL (SDSL); High-bit-rate DSL (HDSL); and Asymmetric DSL (ADSL), which improves speed by allowing downstream to be faster than upstream; this makes sense because most computer users on a broadband will want to receive large files [e.g. video clips] quite often, but only rarely would need to transmit large files. The very fastest is Very-high-bit-rate DSL (VDSL, also called BDSL), which has an upstream rate of 13 mbps, and a downstream rate of 52 mbps. For even more varieties, see the Aware company's "DSL Glossary," http://www.aware.com/Glossary/index.htm.

talked on the telephone—and all this could be on a single telephone line.[66] As *Forbes* put it, "It's easy to understand why DSL is called 'copper wire on steroids'."[67]

No rewiring is required for DSL, but the telephone company does need to send an installer for the DSL modem. Approximately 70 percent of existing telephone access lines can accommodate DSL.[68] DSL speeds start a 144kbps (three times faster than standard modems), and go up to 8 mbps.

Although DSL started out as an expensive service, companies such as U.S. West (a regional Bell in 14 western states) is offering DSL for as low as $20 a month.[69] At this price, DSL is less than the cost of adding a second phone line.[70] Users who want the fastest versions of DSL pay more, of course. Installation costs are $200 to $400, and are sometimes waived for consumers who make subscription commitments of a year or more.

DSL modems are getting less expensive. Recent chipset developments allow the production of ADSL[71] modems costing less than $100, with 8 mbps downstream and 640 kbps upstream capability.[72] New "G.lite" modems for DSL will cut costs further. Conventional DSL modems must be installed at the end of the phone line by a service technician who splits the phone wire between the voice line and the data line; but the simpler G.lite modems eliminate the "truck roll." They can be installed by the consumer—thus reducing costs by about $200 for both the provider

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[66] The computer users would be using the digital part of the line, while the mother would be using the analog part of the line. A DSL line still allows only one analog use at a time; thus, a DSL could not accommodate two simultaneous voice telephone calls.

[67] Charles DuBow, "The RBOCs' Secret Weapon," *Forbes.com*, http://www.forbes.com/tool/html/99/feb/0210/feat.htm.

[68] Department of Commerce, supra note 58, page A2-14. Phones that are more than 18,000 feet—a little over three miles— from a phone company's central office cannot use DSL. Moreover, some phone lines have wires with electronic signal enhancers—called "loading coils"—that interfere with DSL. (These coils can be removed.) Some digital loop carriers (DLCs) between the central office and the home may interfere with DSL (although some DLCs support it).

[69] The speed is 256 kbps. After two hours online, the user must log on again, which can be accomplished simply by opening Web browser software. As with conventional dial-up modems, there will be more subscribers than there are modems, so a subscriber may experience a busy signal. Subscribers who want an "always-on" 24-hour connection, with no possibility of busy signals, need only pay $10 more per month for a higher grade DSL. John Borland, "DSL Discounts Come at a Price," *CNET News.com*, July 7, 1999.

[70] DSL also helps the local phone company; data to and from Internet users can be routed directly into the Internet backbone (where all data is packet-switched), without using any part of the Public Switched Telephone System (PSTN) over which voice telephone calls are connected.

[71] "Asymetric DSL," meaning that downstream (to the consumer) transmission speed is faster than upstream (from the consumer) speed.

[72] Integrated Telecom Express Web site, http://itexinc.com.

and the consumer.[73] BellSouth has just begun deploying G.lite modems, and GTE will begin next year.[74]

DSL deployment so far is small—only 92,000 lines as of July 1999.[75] But spurred by the rapidly developing threat of cable modems, large local telephone companies have started deploying DSL. All of the Baby Bells (also known as Regional Bell Operating Companies, or RBOCs) and GTE[76]—have announced plans to start selling DSL technology—in order to avoid losing market share to competitors offering high-speed Internet access. For example, SBC will make DSL service available to 8 million residences by the end of this year.[77] Bell Atlantic says it will have DSL available for 7.5 million customers this year. By the end of 1999, GTE will have converted 31 million old-fashioned copper loops to DSL loops.[78] By 2002, 94 million phone lines owned by the RBOCs and GTE will have DSL available.[79]

The main reason for the big local phone companies' sudden interest in DSL is competition from cable television companies deploying cable modems.[80] Until the cable modem roll-out began in early 1999, the local telephone companies were very slow to deploy DSL—even though the

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[73] Carol Wilson, "Is 'Lite' ADSL the Real Thing?" *Inter@ctive* Week, November 2, 1998. The consumer just installs the G.Lite modem into her computer, and then connects the modem to a phone outlet with an ordinary phone wire. G.Lite is also called "DSL-Lite" or UADSL (Universal Asymmetric Digital Subscriber Line).

[74] BellSouth is a Regional Bell Operating Company (RBOC), and GTE is being acquired by one, Bell Atlantic.

[75] John Borland, "SBC Merger Could Boost DSL Competition," *CNET News.com*, July 6, 1999. Most of the 92,000 lines serve businesses rather than homes. It is important to note that the telephone companies have overestimated their DSL deployment figures in the past, making the 92,000-line figure not necessarily reliable.

[76] The RBOCs are the seven local telephone providers created by the break-up the Bell System. Along with GTE (the local telephone service of Sprint), the RBOCs control most of the local telephone service in the United States. Mergers have reduced, and will probably continue to reduce, the number of RBOCs. In addition to the RBOCs, there are hundreds of smaller telephone companies that have had local telephone service monopolies. The smaller monopolies, along with the RBOCs and GTE, are called Incumbent Local Exchange Companies (ILECs). Companies that now compete with ILECs for local phone service are called Competitive Local Exchange Companies (CLECs).

[77] SBC is the parent of Pacific Bell, Southwestern Bell, Nevada Bell, and SNET.

[78] Written Statement of C. Michael Armstrong, chairman and CEO, AT&T Corp., Testimony before the United States Senate Committee on the Judiciary, hearing on "Broadband: Competition and Consumer Choice in High-Speed Internet Services and Technologies," July 14, 1999, http://www.senate.gov/~judiciary/71499cma.htm.

[79] C. Michael Armstrong, ibid.

[80] FCC Report, page 22 ("All this investment, especially by cable television companies and competitive LECs, appears to have spurred incumbent LECs to construct competing facilities."); Charles DuBow, supra note 59.

technology is a decade old. The companies instead focused on providing broadband service to high-paying businesses, via T1 lines. (Business users are much more profitable, since businesses tend to be concentrated in a small geographic area, and to demand services for which premium prices can be charged.)

As regulated quasi-monopolies (slowly shedding their monopoly status), the incumbent local telephone companies were generally not used to getting technology into the hands of residential customers quickly. But once it became clear that most cable television residential customers would soon have access to broadband cable Internet, the telephone companies recognized the residential broadband train was leaving the station—and the highest-spending, most technologically oriented customers were on that train. DSL deployment began immediately.

Once it became clear that most cable television residential customers would soon have access to broadband cable Internet, the telephone companies recognized the residential broadband train was leaving the station. DSL deployment began immediately.

Meanwhile, the Baby Bells and GTE have begun to face a new form of competition in the business broadband market. New telephone companies providing local telephone service are called CLECs (Competitive Local Exchange Carriers). The CLECs are especially focused on small to medium-sized businesses, including home offices.

Currently, CLECs hold about 5 percent of the local telephone market by revenue, and about 3 percent by access lines.[81] By 2000, the CLECs are expected to have 13 percent of the business market.[82] The research firm Atlantic-ACM of Boston predicts that by 2003, CLECs will have one-fourth of local telephone business.[83]

Already, 150 CLECs are in operation.[84] And while the CLECs will continue to lag in the market for Plain Old Telephone Service (POTS), analysts expect that starting in 2001, the CLECs will be earning half of all revenues from DSL and wireless broadband (more on wireless below).[85]

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[81] Ronald J. Binz, president, Competition Policy Institute, Testimony before the Subcommittee on Antitrust, Business Rights, and Competition, of the Committee on the Judiciary, U.S. Senate, Hearings on S. 467, The Antitrust Merger Review Act, April 13, 1999, page 18.

[82] Doug Tsurouka, "Waiting . . . And Waiting for Effects of '96 Telecom Act," *Investor's Business Daily*, June 9, 1999, page A4.

[83] Atlantic-ACM, "CLEC Market Analysis: Profiles, Sizing, and Share 1999-2003."

[84] Reinhardt Krause, "Web Weaving Its Way Through Telecom Industry," *Investor's Business Daily*, June 9, 1999, page A4.

[85] Ibid., citing research from the New Paradigm Resources Group, Inc. (Chicago).

In the long run, DSL (no matter who provides it) has several major advantages over cable modems.

Among the leading CLECs are Covad Communication Group (which offers DSL in 37 metropolitan areas, with plans for 14 more soon[86]), and RhythmsNet Connection (currently offering service in Los Angeles, Chicago, Boston, Washington, Baltimore, Portland, Seattle, Phoenix, Denver, and Minneapolis).[87] Their least expensive version of DSL operates at 144kbps (upstream and downstream), and DSL service up to 1 mpbs is available.

Notably, Portland, Oregon—the first place where a local government attempted to impose Forced Access on the cable broadband— now has DSL service, thanks to Covad Communications,[88] and to U.S. West (the local Baby Bell).

But you don't have to be a phone company to offer DSL service. Internet Service Providers such as HarvardNet (Boston) and InterAccess (Chicago) now provide DSL. And brand-new companies built just for DSL are in business, such as Philadelphia's SiteLine, which specializes in apartment buildings. Increasingly, DSL providers are installing DSL concentrators in office buildings or apartments—thus obviating the need for a DSL connection to a telephone company's Central Office (CO).[89]

CLECs offer more than just voice telephone and Internet broadband. For instance, RCN Corporation (a CLEC and cable television company in Newark) is already providing bundled telephone, television, and Internet services in New York, New Jersey, Boston and other Massachusetts communities, and Pennsylvania, with plans to add services in the Washington, DC, region, in conjunction with Potomac Electric Power Co.[90]

In the long run, DSL (no matter who provides it) has several major advantages over cable modems:

- It can be installed by the consumer, without need for a professional installer.

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[86] Covad Corporation, press release, *Covad Broadens Portland's Choice of DSL Service to Area Businesses and Homes*, July 12, 1999, http://www.covad.com/about/press_releases/press_071299.html.

[87] FCC Report, page 30; Ted A. Jacobs, senior telecommunications analyst, Sanford C. Bernstein & Co., Testimony on H.R. 1685 and H.R. 1686, before the Committee on the Judiciary, U.S. House of Representatives, June 30, 1999; http://www.house.gov/judiciary/jaco0630.htm.

[88] Covad Corporation, supra note 86.

[89] The users connect to the concentrator. The concentrator connects to the Internet either by a T1 wire line, or by wireless transmitters.

[90] Decker Anstrom, National Cable Television Association, Testimony before the Subcommittee on Antitrust, Business Rights, and Competition, of the Committee on the Judiciary, U.S. Senate, January 27, 1999, http://www.ncta.com/test012799.html.

- The equipment cost for the consumer is lower.
- Its monthly subscription cost is generally lower.
- Since DSL providers (unlike cable modem providers) do not require users to subscribe to a proprietary ISP, a consumer can keep his existing e-mail address.
- Users do not "compete" with each other. Every DSL user has a dedicated connection to the Internet (starting with the phone line that runs into his home). But cable modem users must share a fixed bandwidth with other nearby cable modem and cable television users.[91]

Thus, *Ziff-Davis News* concludes that DSL's "potential audience and rate of deployment far surpasses other high-speed options."[92] Given the superiority of DSL, it is unlikely that cable broadband will ever develop into a monopoly. And since any company—not just a Baby Bell—can offer DSL, there is little risk that cable and DSL could together develop into a duopoly.

Cable modems do have one important competitive advantage: A cable modem user can be 30 miles away from the cable provider, but the DSL user can be only a little more than three miles from the phone company.

Still, cable modems do have one important competitive advantage: A cable modem user can be 30 miles away from the cable provider, but the DSL user can be only a little more than three miles from the phone company.

Integrated Services Digital Network (ISDN). So for consumers who live more than three miles from a phone company's central office, the main immediate competition to cable modems will come from ISDN (which stands for Integrated Services Digital Network). ISDN is an older technology than DSL, and it is slower. ISDN speeds range from 56 to128 kbps, and 230 kbps is under development.[93] ISDN is available almost everywhere now, and is common in small businesses. But the cost of installation and equipment, as well as monthly fees, make ISDN an inferior choice to cable modems for most consumers.

In regions without DSL, the much stronger mid-term competition to cable modems will come from wireless technologies, the subject of the next section.

Current law requires the old local telephone monopolies (ILECs: the Incumbent Local Exchange Carriers, which include the Baby Bells, GTE, and smaller companies) to allow anyone

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[91] FCC Report, Appendix A, page 2.

[92] "DSL for Your Internet Access," *Ziff-Davis News*.

[93] Department of Commerce, supra note 58, page A2-14.

(including a dial-up ISP) to use their network for transmission. For example, if a new local telephone company wants to offer voice telephone services in an area covered by U.S. West, U.S. West must lease its lines to the new company.

If there is a regulatory asymmetry between the heavily regulated local telephone industry and the budding cable broadband industry, the solution is to reduce regulation, rather than to start regulating cable broadband.

But for non-traditional services, such as DSL, the ILECs do not currently have to share their lines with competitors such as the CLECs or other DSL providers. Thus, a CLEC that wishes to offer DSL must buy a separate phone line, which means that CLECs cannot match the lowest prices offered by ILECs (which just use the existing phone lines they themselves own). The Federal Communications Commission has tentatively found that it would be technically feasible for ILECs to allow competing DSL on a shared line. (So that a consumer might have voice service from Bell Atlantic, and DSL service from Covad on the same phone line.) If the FCC follows up with a formal ruling (which is not expected until the end of 1999), then the ILECs would have to offer DSL to competing DSL companies on the same terms offered by ILECs to their internal DSL entities.[94]

Is this Forced Access policy for the ILECs the right policy? A detailed analysis is beyond the scope of the current study.[95] But there are important differences between cable television companies and ILECs.

For one, the cable television infrastructure was built exclusively with private money, rather than with tax dollars, though some cable television companies benefit from preferred access to easements, power of eminent domain, and exclusive franchises. And the government has never guaranteed that cable companies will earn a profit.

Still, general principles regarding any form of Forced Access remain the same: as discussed below, Forced Access reduces the incentives of property owners to improve their property, and reduces the incentives of competitors to build or improve their own property. If there is a regulatory asymmetry between the heavily regulated local telephone industry and the budding cable broadband industry, the solution is to reduce regulation, rather than to start regulating cable broadband under the obsolete regulatory model of local telephone companies.

The ILECs' sudden interest in residential DSL is plainly a direct result of the competition caused by AT&T/TCI and Time Warner's introduction of broadband cable Internet service. But better Internet access is not the only competitive benefit from the cable companies' upgrade of

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[94] John Borland, "SBC Merger Could Boost DSL Competition," *CNET News.com*, July 6, 1999.

[95] Likewise beyond the scope of this study are proposals for Forced Access in other contexts, such as electricity or medicine. Proposals to require compulsory licensing of patents for "essential" medical technologies are being pushed by the Consumer Project on Technology, and others. *March 1999 Meeting on Compulsory Licensing of Essential Medical Technologies*, http://www.cptech.org/march99-cl/.

their equipment. AT&T's acquisition of TCI and MediaOne set cable television industry records because the acquisition's cost per cable subscriber acquired was about a thousand dollars per subscriber higher than in any previous sale of a cable television company. Why was AT&T so determined to get cable customers, at an extraordinarily high price?

The answer is that soon the ILECs (again, the local incumbent telephone companies, such as Bell Atlantic and U.S. West, which until 1996 had a legally protected monopoly) will be allowed to offer long-distance telephone service. These companies will be able to offer one-stop shopping for local and long-distance service. If AT&T remains only a long-distance carrier, then it will not be able to compete well. So by acquiring cable lines—and then spending billions to upgrade them for digital service—AT&T will be able to use those cable lines to provide local and long-distance telephone service. AT&T's plan to bypass the local telephone exchange was in turn spurred by the RBOCs' use of their regulated monopoly to thwart competitive entry. AT&T's entry into the local telephone market will offer the ILECs some of the stiffest competition they have ever faced.

Here we see how deregulation ratchets up competition to higher and higher levels. AT&T (long distance only) worries that ILECs (local telephone service only) will be able to offer local plus long distance. So AT&T responds with a plan to provide long distance plus local telephone service *plus* broadband Internet. The ILECs immediately begin rolling out their own broadband Internet services—with better connections (no streaming video limits) than AT&T offers, *plus* unlimited choice of Internet Service Providers.

> If Forced Access were imposed nationally, "the biggest loser would be the average consumer, as the national deployment of broadband Internet access could be delayed by many years. . . ."
>
> *Credit Suisse*

What would happen if Forced Access, as upheld by the District Court in Oregon, were imposed nationally? The investment firm Credit Suisse forecasts:

> If this ruling were to escalate to a national level, the deployment of broadband Internet access is likely to stall on both the cable and the ADSL side, affecting every Internet company under the sun. The biggest winners would be the narrowband ISPs, especially AOL, which controls half the market. Under this scenario, the biggest loser would be the average consumer, as the national deployment of broadband Internet access could be delayed by many years. . . .
>
> ADSL Deployment would slow: We believe that any delay in the infrastructure upgrade and roll-out of cable Internet access would likely slow the deployment of ADSL as the RBOCs would no longer feel the same sense of urgency in responding to the cable access threat. If the roll-out of cable were materially delayed, RBOCs would likely focus their efforts on lucrative T-1 line sales rather than the costly residential deployment of ADSL.[96]

[96] Credit Suisse First Boston Corporation, supra note 60.

In other words, mandating Forced Access is a sure way to stifle broadband development and eliminate the competitive threat that AT&T and other cable companies pose to the large local phone companies.

Consumers are the beneficiaries of all this competition—but not if investment incentives are undermined by government.

In contrast to AT&T, the other cable television companies have little or no long distance telephone business to worry about. But they, too, face severe competition. Ten years ago, cable television was the only game in town for most consumers who wanted multi-channel television. Today, two-thirds of consumers who are buying multi-channel television for the first time purchase it from a satellite company, instead of a cable company. By 2003, Direct Broadcast Satellite (DBS) is expected to have 22 percent of the multi-channel television market in the U.S.[97]

Plainly the cable companies need to match the growing channel selection of satellites. Broadband Internet services (for which cable has a temporary technological lead over satellite; see below for more on satellites) are one important way of fighting back. And so are the other services cable companies can offer from digital upgrades of their lines—such as targeted advertising or customized news channels tailored to households' interests.

Consumers are the beneficiaries of all this competition—but not if investment incentives are undermined by government.[98]

C. Wireless Communications

The early winners in the broadband race will be cable modems and DSL. But in the longer term, the leading broadband medium may be wireless. Dan Taylor, an analyst with Giotte Perspectives (a Boston firm that studies broadband), explains: "If you consider the fact that there are 100 million households in the U.S., even the widely projected numbers for eight years from now show about 20 to 30 million households with cable modems or DSL. That's just one in five households. Wireless could be put into place very quickly and overtake those numbers."[99]

Moreover, cable and DSL broadband cannot reach a significant fraction of consumers. Up to a third of U.S. households, particularly in rural areas, may not have access to cable modems or to DSL lines.[100] These homes are in areas not served by cable television and more than 18,000 feet from a telephone company Central Office.

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[97] Decker Anstrom, supra note 90.

[98] Ted A. Jacobs, supra note 87.

[99] "Get Ready for the Gale," June 29, 1999, *Ziff-Davis News*.

[100] "AOL Looks to Space for Bandwidth," *Red Herring*, June 24, 1999.

By far the largest growth potential in communications formats in the next decade is in wireless. Currently, about one billion people worldwide use fixed (wired) telephone lines; 200 million people use the Internet; and 300 million use wireless phones. (There is obviously a very large overlap among these groups.) The Motorola Corporation predicts that by the year 2005, the number of wireline users will have remained stagnant, but the number of wireless and Internet users will have increased to one billion each.[101]

Wireless enjoys some huge advantages over cable or telephone lines. The capital investment to wire a home is a permanent investment. If a home has cable television installed one year and cancels cable service the next year, it is economically unfeasible for the cable television company to go dig up the cable it laid for the home. Moreover, wiring a new neighborhood requires the installation of trunk lines to which the "last mile" home lines will connect.

In places such as Asia or Africa, where installation of land lines would be hugely expensive, wireless offers the opportunity for individuals to move from primitive methods of communications into the twenty-first century, in one giant leap.

The installation costs for wireless are dramatically lower: Just give the consumer a small satellite dish, or antennae, and the consumer is ready to connect to the network. If the consumer cancels his service, the dish or antennae can be collected and used elsewhere. In places such as Asia or Africa, where installation of land lines would be hugely expensive, wireless offers the opportunity for individuals to move from primitive methods of communications into the twenty-first century, in one giant leap.

And like cable broadband, wireless broadband communication allows competing providers to bypass the ILECs' wireline telephone networks;[102] wireless companies can offer both Internet and voice services, with no need for a connection to the local telephone company's lines.

Satellite Wireless

At present, anyone who can place a 21-inch satellite dish (the size of an extra-large pizza) so that the dish can have a clear view of the southern sky can have broadband Internet access at the rate of 400 kbps[103]—eight times faster than ordinary modems.

The service is supplied by DirecPC, which is owned by Hughes Network Systems. The

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[101] William J. Holstein, "A Motorola Coaster," *U.S. News & World Report*, June 21, 1999.

[102] Reinhardt Krause, "MCI Worldcom is in Line to Expand Wireless Efforts," *Investor's Business Daily*, June 14, 1999, page A6.

[103] Department of Commerce, supra note 58, p. A2-14.

consumer must buy a mini-dish and a satellite modem, for around $250 (depending on installation options, rebates, and the like). The satellite modem is easily installed in a home computer, like a traditional analog modem.[104] The subscription cost starts at $20 per month, and increases depending on how many hours of monthly service are purchased. (Unlike cable modems/DSL/ISDN, satellite broadband does not yet allow unlimited 24-hour-a-day usage.)[105]

Receiving Internet data from a satellite is little different from receiving television programming from a satellite. In both cases, a large amount of data is beamed from the satellite, received by a small satellite dish, and then decoded by a computer. (The satellite television box that consumers have is really a small computer.) And like satellite television reception, satellite Internet reception may be degraded by heavy snowstorms or rain.

The Internet is a two-way medium; every time the Web surfer clicks on a link, he is sending a message back to the Web page's host computer—asking that another page be sent.

But there is one important difference between television and the Internet. Currently, television is only a one-way ("half-duplex") medium. The television viewer does not transmit anything back to the television company; the viewer transmits nothing more than a "change channel" signal, sent from his remote control to his satellite box. But the Internet is a two-way medium; every time the Web surfer clicks on a link, he is sending a message back to the Web page's host computer—asking that another page be sent.

Until very recently, only the most expensive satellite systems, widely used by corporations since the early 1980s, have been able to accommodate two-way communications. For at-home consumers, the Web surfer using a broadband satellite connection (to receive information) also needs a connection through an ordinary phone line (to send information). Of course the phone line connection is included in the price that the user pays to the satellite company (which may then lease line usage from local phone companies).

This arrangement works well currently, since most users do not send large amounts of data upstream; their upstream communications may consist only of clicks for display of new Web pages, or an order form for a product. But in the future, consumers may want to send much larger data sets upstream—such as a video of their new baby. Fortunately for these consumers, two-way satellite Internet communication is coming soon; Hughes has already launched satellites that allow two-way communication and increase data speed to 2 mbps—five times the current satellite broadband speed, and 45 times the current standard modem speed. These satellites will begin mass consumer service in 2002. In 2003, Teledisc's "Internet-in-the-sky" satellite network will

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[104] "How Residential Satellite Service Works," *Ziff-Davis News*. A dish that can also receive television signals costs $150 extra. "What You Need and Getting Connected," *Ziff-Davis News*. The dish can be bought at retail chains such as CircuitCity, Good Guys, and Staples; from independent retailers; and from online retailers such as MicroWarehouse, CDW, and PC Connection.

[105] "How Residential Satellite Service Works," ibid.

begin offering consumers Internet access at 64 mbps from 288 low-Earth-orbit satellites.[106] Between 1998 and 2002, private companies will spend approximately $27 billion to build a global broadband satellite network.[107]

Satellite modems share one weakness with cable modems: both are "shared bandwidth pipes." So the more users of a given satellite (or cable television line) at a given time, the slower the transmission speed. This may be particularly noticeable during early evenings—the peak usage time.[108]

The tremendous potential of satellite wireless access is well known to Internet companies. America Online, for example, recently announced plans to provide Internet service via DirecTV's home satellite dishes.

The tremendous potential of satellite wireless access is well known to Internet companies. America Online, for example, recently announced plans to provide Internet service via DirecTV's home satellite dishes.[109]

Terrestrial Wireless

Instead of using a wireless connection to a satellite, terrestrial wireless connects the user to a radio tower or other Earth-based transmitter/receiver. Terrestrial wireless is familiar to anyone who uses a cellular or digital telephone.

Terrestrial wireless currently competes with the wire-based telephone companies. Some young people who are setting up their first household are not buying wireline phone service at all, but instead a cellular or digital phone. Other people choose a wireless phone as their second telephone,[110] rather than purchasing a second phone line.

Terrestrial wireless also competes today with cable television and satellite television; television by terrestrial wireless is sometimes called "wireless video," "wireless cable" (an

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[106] "Where It's Going," *Ziff-Davis News.*

[107] Department of Commerce, supra note 58, page 11.

[108] "How Residential Satellite Service Works," supra note 104.

[109] Jared Sandberg, "Some Counter Programming from AOL," *Newseek*, May 24, 1999, page 56.

[110] By contrast, a simple portable phone (not a cellular or digital) is "wireless" only for the radio connection between the handset and the receiver, which is connected by telephone wire to a telephone jack. This *Policy Study's* discussion of wireless phone technology does not count simple portable phones as true wireless phones.

oxymoron), or, more properly, MMDS: Multichannel Multipoint Distribution Service.[111] In MMDS, a broadcast tower transmits wireless signals to an antenna at the subscriber's home or business. (Or for an apartment or office building, to a shared antenna). BellSouth is selling 160-channel wireless MMDS in Orlando, New Orleans, and Atlanta, with plans to move into Miami, Jacksonville, and Daytona soon.[112] MMDS is currently available to several million consumers from New York City to Jackson, Mississippi, to the San Francisco Bay area.[113] There are currently one million MMDS subscribers in the United States, and nine million worldwide.[114]

By contrast to satellite wireless, "wireless cable" is already two-way in many systems.[115]

For terrestrial wireless, the main marketing focus is currently on small and medium-sized business users, but mass residential marketing is expected by 2004.

Many companies are working to introduce broadband Internet service via terrestrial wireless. Sprint is now beginning to offer a terrestrial wireless "Integrated On-Demand Network" (ION), which provides voice telephony, broadband Internet, and videoconferencing—and eliminates the subscriber's need for a local telephone line. Motorola and Sun are teaming up to invest a billion dollars in infrastructure for wireless digital networks capable of providing voice, data, and video.[116]

For terrestrial wireless, the main marketing focus is currently on small and medium-sized business users, but mass residential marketing is expected by 2004.[117] (Sprint ION is currently being marketed to residential customers.)

Terrestrial wireless has the advantage of very high bandwidth: 1.5mbps, which far surpasses a low-end DSL line.[118] But terrestrial wireless has the same problem as satellite wireless and cable: bandwidth contention. The more users on the system, the slower the system.

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[111] LMDS is a short-distance variant of MMDS.

[112]Decker Anstrom, supra note 90.

[113] FCC Report, page 30.

[114] Wireless Communications Association International, "Fixed Wireless Broadband . . . an Introduction," http://www.wirelesscabl.com/.

[115] Elizabeth Clark, "Pulling the Plug on the Local Loop," *Network Magazine*, June 1999, page 39.

[116] Howard Wolinsky, "Unwiring the Future," *Chicago Sun-Times*, June 10, 1999, page 56.

[117] FCC Report, page 23.

[118] Department of Commerce, supra note 58, page A2-14.

D. Electric Companies

In addition to the companies currently competing to offer residential broadband, a major new group of competitors is coming. Electric utilities are getting into communications. They already have wired access to 95 percent of American homes and almost 100 percent of businesses. Electric wires can currently carry one megabit per second of voice/data/ video/Internet—over 30 times faster than conventional 28.8 kbps telephone modems. Speeds up to 10mbps may be possible eventually.[119]

Above-ground electric lines are, however, subject to radio interference, and there are other technical problems to overcome, such as interference from electric transformers. In the short term, some electric companies may find it easier to have their grids used for transport within the Internet, rather than for delivery of content to consumers. Still, some utilities are offering broadband services directly to customers in major northeastern cities, in San Francisco, and in small towns such as Cedar Falls, Iowa.[120]

Far from appearing to be the likely scene of monopoly or duopoly, the Internet access marketplace is virtually a model of market-based competition and consumer choice.

E. Conclusion

None of today's broadband contenders is superior in every feature. Some are faster, some are less expensive, some allow 24-hour access, some are available almost everywhere, some are immune to the weather. Consumers will choose which system best fits their needs. This diversity of features, advantages, and shortcomings means the market is competitive and will remain so in the future.

Given the rapid changes in technology, enormous capitalization of key players, and announced strategies of those players, there is little possibility that one medium will establish a monopoly over access to the Internet, or even that two will establish a duopoly.

This part of the study was long and sometimes technical, but it conveys the tremendous amount of change, innovation, growth, and risk-taking that is taking place in the Internet access industry today. This marketplace is rich with players and has relatively few barriers to entry that cannot be overcome by new players with better technology. Far from appearing to be the likely scene of monopoly or duopoly, the Internet access marketplace is virtually a model of market-based competition and consumer choice. There is no apparent basis for government intervention to protect consumers from monopolies.

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[119] Khali Henderson, "No New Wires: Fulfilling the Promise of Power Line Telecom," *PHONE+*, June 1, 1999.

[120] FCC Report, page 29.

PART 4

A Closer Look at the OPENNET Coalition

The leader of the campaign for Forced Access is America Online, the company that dominates the dial-up narrowband Internet access market. About half of dial-up narrowband users in America use AOL or its subsidiary, CompuServe. With over 18 million customers, two-thirds of all new narrowband customers, and 44 percent of the total narrowband dial-up market in the U.S,[121] no company has more to lose from the rapid introduction of broadband than does AOL.

With over 18 million customers, two-thirds of all new narrowband customers, and 44 percent of the total narrowband dial-up market in the U.S., no company has more to lose from the rapid introduction of broadband than does AOL.

AOL's vulnerability to competition was recently demonstrated in Nashville, where AT&T's introduction of cable modems cost AOL one-sixth of its customers.[122] There, AOL's general market share was 57 percent; but when @Home cable Internet access was introduced, AOL's share of customers who had a choice of cable or AOL fell to 47 percent.[123] "AOL is starting to see the impact of these services. Where they are available, it tends to be the primary victim" explains Michael Harris, an analyst with Kinetic Strategies.[124]

According to AOL and other members of the OPENNET Coalition, the cable broadband providers should be required to sell bandwidth to every Internet Service Provider who wants access, and to sell to every ISP at the same price.

In the latest volley in the Forced Access wars, AT&T announced in August that, for a limited time only, it would waive the $9.95 monthly broadband access fee for AOL customers. At the end of the subsidy period, AT&T hopes the AOL customers will be so enthusiastic about cable broadband that they will choose to keep it, in one of two ways: by defecting from AOL to AT&T's Excite@Home Internet Service Provider; or by agreeing to pay the extra $9.95 a month to AOL to have the AOL interface for their cable broadband service.[125]

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[121] Robert La Franco, "If You Can't Join 'Em, Bear 'Em," *Forbes*, May 3, 1999, page 53.

[122] Ibid.

[123] Ibid.

[124] Ibid.

[125] Louis Trager, "AT&T Picks Up Cable-Modem Tab," Inter@ctive Week, August 30, 1999, page 14.

AOL appears to be an easy target. While telephone companies, cable television companies, and wireless companies are working frantically to build and expand broadband infrastructure, AOL has invested little in infrastructure. In 1995 AOL announced plans to build a national network, but in 1997, AOL sold its infrastructure to WorldCom.[126]

Indeed, AOL's failure to invest in infrastructure was responsible for the worst access problems in the history of the Internet, in late 1995 and early 1996: "America Online got in trouble when it advertised a flat rate service before it could accommodate the predictable increase in usage. AOL had 40 subscribers for each incoming line, or about half the minimum [number of incoming lines] according to industry standards. What AOL did was indefensible from the standpoint of under investment in its own facilities."[127] The resulting phone snafus not only created "AO Hell" for many AOL customers, but tied up telephone exchanges all over the country, as customers dialed and dialed and dialed to attempt to get on-line.

Nothing prevents AOL from building its own broadband infrastructure to compete with cable broadband. AOL's market capitalization is over $140 billion—larger than the Chase Manhattan Bank or General Motors.

Nothing prevents AOL from building its own broadband infrastructure to compete with cable broadband. AOL's market capitalization is over $140 billion—larger than the Chase Manhattan Bank or General Motors. This is surely large enough for AOL to construct its own facilities, rather than demanding that government force other companies to let AOL use their equipment. Compared to AOL's enormous 18 million subscriber base, the subscriber base of companies like @Home and RoadRunner (less than a million combined) is tiny. Grover Norquist compares AOL's Forced Access campaign to Goliath asking for government help in crushing David.[128]

In May 1999, AOL invested $1.5 billion in Hughes Electronics, as part of a "strategic partnership" for AOL to be given preferred status on Hughes' Internet satellite network. AOL's belated interest in broadband technologies investment appears to be the beneficial result of the competitive threat of cable broadband.

Some Wall Street analysts speculate that AOL's motive on the Forced Access issue is simply a bargaining tactic—to force the cable television companies to sell AOL bandwidth for less than AOL would have to pay through free negotiations. Others note that Forced Access moves

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[126] Rajiv Chandrawekaran, "AOL Shifts Its Strategic Direction," *Washington Post*, September 9, 1997.

[127] James Love, director, Consumer Project on Technology, "A Consumer Perspective on Bandwith, Network Congestion, Network Architecture and Regulatory Reform," Presentation to National Association of Regulatory Utility Commissioners (NARUC), Washington, DC, February 22, 1997, http://www.cptech.org/afr/nf.html.

[128] Grover Norquist, "Hypocrisy Going High Tech," *Washington Times*, December 14, 1998, page A17.

competition away from AOL's weaknesses (hardware and technology) into areas of AOL's strength (content and software). Although these factors are undoubtedly present, much more is involved.

While AOL's OPENNET Coalition complains loudly and self-righteously about potential monopolization by cable television companies, AOL's true objection to the cable companies is that they are blocking AOL's efforts to build its own monopoly. Here is a summary of a meeting between AOL President Steve Case and executives from Sun Microsystems:

> Steve has concerns about AOL's ability to be included in the TCI/Time Warner type cable networks. He believes that cable companies are currently overestimating their ability to provide the AOL customer with AOL-like services and expects the Telco's to be more receptive (with DSL). He hopes customer demand for AOL will cause cable companies to include AOL on their networks.
>
> But, Steve stresses that AOL wants to be the "owner" of the consumer, and not just another channel on the cable network (i.e., the consumer gets to the cable network through AOL, not vice-versa.) This is obviously in conflict with the cable company business model.
>
> AOL must become the "ubiquitous" choice of consumers seeking online info/services to become main portal to cable/telco networks—hence the "AOL Anywhere" initiative. Big challenge.[129]

Forced Access moves competition away from AOL's weaknesses (hardware and technology) into areas of AOL's strength (content and software).

In other words, whether the consumer wants broadband from a cable television company or a telephone company, the consumer will go through AOL to get it—because AOL is the "owner" of the consumer. It is astonishingly hypocritical for AOL to use the government to disable a competitor (based on hypothetical claims about "monopoly"), while at the very same time AOL attempts to create its own monopoly.

AOL claims that its OPENNET Coalition has 36,000 consumer supporters. In fact, those "supporters" have done nothing more than supply an e-mail address for a form that states "Individuals and others interested in receiving updates on the status of this issue can also join our email list."[130] While these 36,000 "supporters" include many people (such as this author) who were only "interested in receiving updates on the status of this issue," some of the individuals on

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[129] Woody Mewborn, Sun Microsystems, e-mail dated June 8, 1999, describing the meeting he attended with Case; quoted in Elliot Zaret and Brock N. Meeks, "AOL's Epic Aim: To Slay Microsoft," *MSNBC*, June 16, 1999.

[130] http://www.opennetcoalition.com/join/

the e-mail list do believe that AOL is fighting against monopoly.[131] How disappointed they might be if they found out about AOL's meeting with Sun, and learned that AOL's main objection to the (non-existent) cable monopoly is that it interferes with AOL's attempt to build a monopoly of its own.

AOL is currently lobbying Congress for laws that would force cable television companies to sell bandwidth to every Internet Service Provider who wants access, and to sell to every ISP at the same price. Does AOL really believe in this "one price for everyone" Forced Access principle? Apparently not, since AOL has entered into business arrangements that are directly contrary.

AOL has negotiated agreements with telephone companies to use their lines to provide high-speed Internet access. And AOL has used its volume to garner itself huge discounts. For example, according to Bell Atlantic's tariff filed with the FCC, Bell Atlantic will sell DSL service to an ISP for $36/customer/month for 5,000 customers. (The customer would pay $36, plus whatever the ISP charges for its own profit and services.) Larger ISPs could get a discount, bringing their final price to $30/month. But AOL will pay Bell Atlantic only about $20 per customer, and Bell Atlantic will conduct joint marketing with AOL.[132] Under the Bell Atlantic/ AOL deal, AOL will be promoted to Bell Atlantic customers as the broadband ISP of choice.

The "level playing field" remains useful rhetoric against AT&T, but it is not a principle of business when AOL deals with Bell Atlantic or SBC or Ameritech or DirecTV.

Similarly, AOL has negotiated a special promotional deal with the satellite broadband company DirecTV, owned by Hughes Electronics. Is AOL pressuring Congress to forbid satellite companies from giving AOL a better deal than the companies offer to smaller ISPs? If not, then why should Congress (or a city council) forbid cable television companies to give @Home or RoadRunner a better deal than is given to AOL?

Simply put, AOL's commitment to a "level playing field" vanishes the moment AOL can get a deal on better terms. The "level playing field" remains useful rhetoric against AT&T, but it is not a principle of business when AOL deals with Bell Atlantic or SBC or Ameritech or DirecTV.

AOL was recently presented with a perfect opportunity to show its true commitment to open access. AOL has developed a proprietary "instant messenger" program. A person on the Internet who activates the program will receive instant notification whenever a friend (identified from a list the user creates) logs onto the Internet. The two friends can communicate instantaneously, with pop-up messages on each other's computer screens. Instant messaging is especially popular among teenagers. The appeal of AOL's instant messaging software extends far beyond the 18

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[131] As do various pro-regulatory organizations aligned with the OpenNet Coalition, such as Consumers Union and the Consumer Federation of America.

[132] Tom Steinert-Threlkeld, "AOL Clearing A Path," *Inter@ctive Week*, June 14, 1999. AOL also has an agreement to be the lead ISP for SBC's and Ameritech's new DSL service.

million people who use AOL as their ISP; AOL's instant messaging programs serve some 80 million users.

AOL could have shown its commitment to the open access principle—by welcoming the introduction of a new instant messaging product integrated with AOL's proprietary programs.

In July 1999, Microsoft introduced its own instant messaging program. The Microsoft program allowed users to instant message with anyone else using the Microsoft program, the AOL program, or any other programs. Here, AOL could have shown its commitment to the open access principle—by welcoming the introduction of a new product integrated with AOL's proprietary programs. Instead, AOL claimed Microsoft was infringing AOL's property rights, and immediately modified AOL's delivery system to prevent AOL users from receiving Microsoft messages. Microsoft responded with a new version of the Microsoft program designed to defeat AOL's message blocking. Within the first five days of the Microsoft product's introduction, Microsoft had been through five rounds of product upgrades in order to get its messages past each new iteration of AOL's message blocking.[133]

AOL has likewise blocked instant messages from programs created by Yahoo and by Prodigy.[134]

Scott Cleland, an analyst with Legg Mason Precursor Group, has testified before Congress in favor of AOL's position on Forced Access for cable broadband lines. But Cleland readily acknowledged the inconsistency of AOL's instant message blocking with AOL's pieties about open access. "Open is open," Cleland stated. "When you're denying consumers a choice of something, it looks bad in any case."[135]

AOL got to its current huge size in part by incessant distribution of sign-up disks. CD-Roms for AOL sign-up are ubiquitous in general interest magazines, in computer magazines, in junk mail, in Sunday newspaper wrappers, at Barnes & Noble checkout desks, and many other places. This is a legitimate form of marketing, but if AOL really bought into its own rhetoric about "a level playing field," shouldn't AOL also distribute sign-up disks for other ISPs, or put links to other ISPs on its own disks? Shouldn't there be a law to force AOL to do so? After all, small local ISPs can hardly match AOL's broad distribution scheme.

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[133] Rajiv Chanrasekaran, "Microsoft, AOL Offer Terms for Peace," *Washington Post*, July 27, 1999, page A 1.

[134] Ibid.

[135] "AOL's Quandry," *Wired News*, July 27, 1999.

It might be objected that AOL pays 100 percent of the costs of the creation and distribution of the disks—so AOL has every right to include nothing but AOL content on the disk. If some other ISP wants to be on the AOL disks, then the ISP ought to pay AOL to share the disk space. All these points are reasonable—and they apply just as fully to the cable television companies' property rights to their own cables. There is one important difference, though: Every improved cable television line is a significant, permanent improvement to the national telecommunication infrastructure, while the large majority of AOL disks end up in landfills.

While AOL is the creator of and main engine behind the OPENNET Coalition, the Coalition is also supported by large telephone companies (such as MCI/Worldcom, SBC, GTE, and U.S. West) also threatened by cable broadband.[136] Like AOL, all these companies are large enough to take care of themselves, and to build or upgrade their own networks, rather than appropriating AT&T/TCI's property.

Every improved cable television line is a significant, permanent improvement to the national telecommunication infrastructure, while the large majority of AOL disks end up in landfills.

Audrie Krause, the executive director of NetAction (a San Francisco group that promotes use of the Internet for grassroots political involvement) explains that consumer utility is hardly the objective of the RBOCs' effort to impede cable broadband:

> As a longtime consumer advocate, I've seen my share of corporate hypocrisy. The current attempt by two of the nation's biggest monopolies and the Internet's top gatekeeper to force regulation on the emerging market for high-speed Internet access, however, takes the cake.
>
> . . . SBC, which owns Pacific Bell, and GTE are the very same companies that have maintained monopoly control of local phone service by using every regulatory and legal trick in the book to avoid opening their own networks to competitors—as they were mandated to do three years ago when Congress enacted the Telecommunications Act of 1996.
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> . . . If SBC and GTE were truly interested in high-speed open access to the Internet, their own networks would be fully open to competitors by now and consumers would already have a wide choice of high-speed Internet access options. Instead, they waited until competition developed via broadband cable modems and then demanded that government regulate the new technology. This is nothing more than a ploy to slow down competition for both Internet access and local phone service.
>
> . . . At a recent Legislative hearing in Sacramento, Senator Debra Bowen noted that Pacific Bell and GTE dropped the price of their high-speed DSL service from $89.95 to $39.95 after Redwood City-based AtHome introduced competition via high-speed cable modem—for $39.95.
>
> Without government regulation, the Internet has evolved rapidly, and literally every day there

[136] Ronald Nehring, "Washington and Silicon Valley at the Crossroads," Americans for Tax Reform, May 19, 1999, page 7.

are new services, goods and opportunities available to consumers. Compare this to the telecommunications industry, where regulation has clearly failed to open local phone service to competition.

If the so-called "open access" advocates succeed in getting local, state, and federal officials to regulate cable Internet access, consumers can expect a similarly long wait for high-speed cable Internet access.[137]

"It never occurred to me to go to government for a solution," says EarthLink founder Sky Dayton. "It seems barbaric. A medieval solution to a Net-age problem."

By contrast to AOL and its allies, many of AT&T's other competitors are not trying to use politics to gain a competitive advantage. EarthLink, one of the largest national Internet Service Providers, scoffs at the OPENNET Coalition. "It never occurred to me to go to government for a solution," says EarthLink founder Sky Dayton. "It seems barbaric. A medieval solution to a Net-age problem." Dayton predicts that consumer demand will eventually force companies like AT&T to give consumers a choice of any ISP.[138] And if not, EarthLink is working out deals with telephone DSL wireline, wireless, and other companies. Meanwhile, EarthLink picks off customers from AOL by offering transitional guidance for consumers ready to graduate from AOL into a freer Internet environment. PSINet.Inc., another major national ISP, also testified against Forced Access proposals during the 1999 Congressional hearings.[139]

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[137] Audrie Krause, "Why Monopolies Want 'Open Access' to Cable TV," *San Francisco Examiner*, July 4, 1999; http://examiner.com/990704/0704viewpoint.html.

[138] Seth Lubove, "Libertarian.net," *Forbes*, June 14, 1999, page 50.

[139] Bill Schrader, chairman & chief executive officer, PSINet Inc.:

> . . . while I agree wholeheartedly that cable plant should be open to competition, government regulation is not the appropriate way to ensure that goal. Cable companies must make massive investments in their infrastructure to deliver reliable, two-way Internet access. Once that investment is made, if cable operators refuse to open their systems to those of competing Internet service providers, then I am convinced that consumers will turn their backs on cable Internet access. If the market for broadband Internet access eventually becomes a "duopoly" (instead of the current ILEC-dominated local monopolies), perhaps there will be a role for Government to address that situation. But in the meantime, I believe that the market, not regulation, will most effectively "open" the cable plant to a variety of Internet service providers.

Testimony on Broadband Competition and Consumer Choice in High Speed Internet Services and Technologies, before the Senate Committee on the Judiciary, July 14, 1999, http://www.senate.gov/~judiciary/71499bsc.htm.

Anna-Maria Kovacs, first vice president of Janney Montgomery Scott, told Congress on July 14, 1999, not to worry that the free market will limit consumer choice:

> The ability of cable to offer high-speed is spurring telcos' deployment of comparable speed even though it is not necessarily economic at this early stage in DSL's learning curve. I believe that the deployment of DSL, in turn, will spur the cable industry to insure that it offers consumers a choice in content, content providers, and gateways that is comparable to what the telcos can offer. In other words, I believe that consumers, given a choice of two media which offer equally high speed at comparable prices, will select the provider that gives them the content and ISP of their choice. The best guarantee that consumers will enjoy the benefits of broadband and the content of their choice, and that content providers will have access to all consumers, is to do everything possible to encourage both sides to deploy as vigorously as technology, human resources, and capital allow. [140]

Despite the publicity generated by the OPENNET Coalition, it is telling that there are over 5,000 ISPs in the United States, and the OPENNET Coalition has only 70 members. Barbara Dooley, president of an ISP trade association, states, "We believe competition and market pressure will get better results without the regulatory costs and distortions."[141]

Despite the publicity generated by the OPENNET Coalition, it is telling that there are over 5,000 ISPs in the United States, and the OPENNET Coalition has only 70 members.

Directly contrary is the position of AOL President Steve Case: "Over the next five years, I believe the future of this medium will be determined more by policy choices than by technology choices."[142] Should Forced Access be imposed, the precedent for full realization of Case's vision of a government-directed Internet will be established.

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[140] Testimony at http://www.senate.gov/~judiciary/71499amk.htm.

[141] Bryan Gruley, "AOL Leads Lobbying Campaign to Gain Access to 'Broad-Band' Cable-TV Lines for the Internet," *Wall Street Journal*, January 26, 1999.

[142] Ronald Nehring, supra note 136, page 1.

PART 5

The Technical Feasibility of Forced Access

Whatever the theoretical deficits of Forced Access, there is one overwhelming practical argument against it: It cannot work. It would, in fact, cripple cable broadband. Of course, this would not be a bad result from the viewpoint of those companies that are threatened by cable broadband.

The technology to accommodate Forced Access *does not presently exist*.

As noted above, cable broadband is a "shared network technology" that necessarily suffers from "bandwidth contention": If too many users are on the system (especially users of high-bandwidth services like video), the network will slow dramatically. A typical cable Internet channel can accommodate a flow of 27mbps of data; this flow must be shared by everyone using that particular hub. So if a hub serves 500 customers, and 27 of those customers are logged on at the same time, each customer can receive about 1 mbps of data simultaneously. The more customers who log on at once, the slower the data flow for everyone.[143]

The problem of bandwidth contention exists in any cable Internet system. And when users start sending data *upstream* (to the Internet), it becomes especially difficult to manage data traffic. But the problem becomes far worse if the system must accommodate Forced Access:

> Cable networks are shared pipes. Because they are shared, it becomes difficult to control the actual speed any user will enjoy when multiple users are on-line. @Home and Road Runner are able to some extent to control bandwidth allocation, to ensure that a few customers do not hog the entire pipe and exclude all others. There is today no network management system that can do that bandwidth-allocation job when many ISPs are providing service over the cable network directly to the end user during periods when the network is carrying a full load. It is likely that such an operating system could be developed for cable networks, but it is not here today. Hence, the cable industry's insistence that other ISPs use @Home or Road Runner as their gateway to the customer.[144]

In other words, the technology to accommodate Forced Access *does not presently exist*. It might exist one day in the future, and cable companies with excess capacity on their broadband lines have incentives to develop the technology, so that they can re-sell part of their bandwidth to

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[143] George Abe, *Residential Broadband: A Comprehensive Introduction* (Indianapolis: Cisco Press, 1997), page 189.

[144] Anna-Marie Kovacs, Testimony before the United States Senate Committee on the Judiciary, hearing on "Broadband: Competition and Consumer Choice in High-Speed Internet Services and Technologies," July 14, 1999.

other ISPs. But to impose Forced Access today is to insist that the cable companies do the impossible: provide genuine (fast) broadband access to an unlimited number of users.

The federal district court in Portland rejected AT&T's arguments about the technical impossibility of Forced Access for all ISPs; the judge noted that the local government had simply ordered AT&T to provide Forced Access, but not required AT&T to use any particular method. Exactly how to provide Forced Access was up to AT&T. But this argument is nonsense. The Portland City Council could have ordered AT&T to build a perpetual motion machine, while leaving the technical implementation up to AT&T. That a company has free choice about how to do something that is presently impossible does not make the act any more possible.

That a company has free choice about how to do something that is presently impossible does not make the act any more possible.

Two recent shared access experiments have been conducted, which supposedly prove the feasibility of Forced Access:

- The Australian Capital Territory Electricity and Water company is voluntarily providing open access, and claims to be very happy with it. But the ACTE&W company is currently serving 200 homes[145]—far too few to prove anything about mass Forced Access.

- In Clearwater, Florida, Forced Access supporters AOL and GTE[146] conducted an experiment they said shows that cable modem systems can easily be modified for open access, at fairly low cost.[147] GTE is a local phone company that also owns cable television systems in Florida and California. In Clearwater, GTE's cable modem service (GTE.net) allowed AOL and AOL's subsidiary CompuServe to access GTE.net. GTE said the upgrade necessary to accommodate open access cost only $60,000 for 80,000 customers—less than a dollar per customer.[148]

But the practicalities of a cable company allowing *one* other Internet company to use its cable lines are obviously very different from allowing *every* Internet company to use the lines, as Forced Access would require. Indeed, with Forced Access, the number of ISPs could increase exponentially; since the cable company would have to provide almost all of the hardware, becoming an ISP (in effect, doing little more than re-selling access to the cable lines) would be simple.

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[145] Stewart Taggart, "Aussies: Open Access Not Hard," *Wired News*, June 29, 1999, http://www.wired.com/news/news/technology/story/20448.html.

[146] The entry of cable television companies into the communications business poses a threat to GTE's local telephone interests.

[147] Zona Research, Inc., *Cable Wars Revisited: GTE and AOL*, June 17, 1999.

[148] "GTE, AOL Say Tests Show Open Cable Systems Work," *Reuters*, June 15, 1999.

Even if Forced Access were simple and possible, the case for Forced Access cannot be made by proving how easy it is for the trespassers to force their way in. Like Forced Access advocates, trespassers who want to establish a tent colony on a farmer's land could point out that the farmer would have to spend little or no money to make his land suitable for the tent colony.

The invasion of property is what is wrong. Even if the property owner does not have to spend a penny, the wrongful invasion is still wrongful.

The invasion of property is what is wrong. How much the victim of the invasion is forced to spend by the invaders may be relevant to the question of damages—but even if the property owner does not have to spend a penny, the wrongful invasion is still wrongful.

Moreover, the cost of conversion is the least of the costs imposed on the victim property owner. By far the larger cost is the loss of the power to exclude, which is the very essence of property rights.[149] As a result, the property owner must sell access to his property at a price determined by government intervention—rather than at a price, likely to be higher, agreed to in a free market.

[149] "[O]ne of the most essential sticks in the bundle of rights that are commonly characterized as property—[is] the right to exclude others." *Hodel v. Irving*, 481 U.S. 704, 716 (1987).

PART 6

Antitrust Law and Forced Access

Although proponents of Forced Access frequently use the language of antitrust, the principles of American antitrust law are contrary to Forced Access. To begin with, one must remember that antitrust laws are meant for the "protection of competition, not competitors."[150] Supreme Court Justice Stephen Breyer explained:

> [A] practice is not "anticompetitive" simply because it harms competitors. After all, almost all business activity, desirable and undesirable alike, seeks to advance a firm's fortunes at the expense of its competitors. Rather, a practice is "anticompetitive" only if it harms the competitive process. It harms that process when it obstructs the achievement of competition's basic goals—lower prices, better products and more efficient production methods.[151]

Cable broadband is promoting, not harming, the basic goals of competition identified by Breyer. It has already dramatically lowered prices for broadband, leading to cuts of 50 percent or more in DSL prices. It is offering a product far superior to the narrowband access most consumers must use today. And it is making production more efficient because it moves the "last mile" transmission of Internet data off old-fashioned voice telephone lines and voice telephone switches, and onto a system optimized for pure data transmission.

Cable broadband is promoting, not harming, the basic goals of competition: lower prices, a superior product, and more efficient production.

A. What Is the Relevant Market?

Legislation such as H.R. 1685 and 1686 (the national Forced Access bills) would automatically define as an antitrust violation a cable television company's decision not to accept Forced Access. A preliminary inquiry in any antitrust case is how much power the alleged violator has in the "relevant market." Sears may have a monopoly on "Sears Craftsman Tools," but the relevant market is not "Sears Craftsman Tools"; the relevant market is "home workshop tools."

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[150] *Brown Shoe Co. v. United States*, 370 U.S. 294, 320 (1962).

[151] *Town of Concord v. Boston Edison Co.*, 915 F.2d 17, 25-26 (1st Cir. 1990). (At the time of this case, Stephen Breyer was a judge on the First Circuit Court of Appeals.)

In the case of cable Internet access, the relevant market is "Internet access." In this relevant market, no cable television company could possibly have "market power." Even by 2003, "seventy five percent of the market will be narrowband because people want it as easy and inexpensive as possible," according to AOL President Steve Case.[152] Cable Internet access will have only a fraction of the remaining 25 percent of Internet access.

Arguably, the relevant market could be defined as "broadband Internet access," rather than "Internet access" in general. Even there, cable television providers will not have market power; they face strong competition from DSL and wireless right now, and will continue to do so for years to come.

The cable companies do not have market power in any "relevant market" defined by ordinary antitrust law. That is why H.R. 1685 and 1686 must create an artificial definition of the "relevant market"

But H.R. 1685 and 1686 get around this problem by constructing an artificial definition of the "relevant market." According to these bills, the "relevant market" consists only of cable broadband access. By this odd definition, the cable Internet companies are defined into being a monopoly, since most localities have only one cable television company. It is as if the "relevant market" for Mercedes-Benz automobiles were defined not as "automobiles" or as "luxury automobiles," but as "Mercedes-Benz automobiles."

Right now, competitors of the cable companies have every legal right to bring antitrust suits against the cable companies. But these potential plaintiffs face the problem of having to prove (as a starting point) that the cable companies have "market power" in the "relevant market." Under traditional antitrust caselaw, these plaintiffs could not survive a motion for summary judgment, since the cable companies do not have market power in any "relevant market" defined by ordinary antitrust law. That is why H.R. 1685 and 1686 must create a statutory definition of the "relevant market"—in order to prevent courts from making normal antitrust inquiries into what the relevant market really is.[153]

[152] Steve Case, CNBC, September 28, 1998.

[153] Interestingly, H.R. 1685 and 1686 would appear to outlaw the types of arrangements AOL has been making with ILECs. The bill makes it a presumptive antitrust violation for a broadband provider to offer different terms to different ISPs. AOL's arrangements for DSL with SBC, Bell Atlantic, and Ameritech all give AOL much better terms than are given to other ISPs.

B. Is Cable Broadband an "Essential Facility"?

Another step in the antitrust chain of reasoning is the "essential facilities" doctrine.[154] This doctrine requires that the holder of an "essential facility" make the facility open to other companies on a commercially reasonable basis. For example, if the only way in or out of a particular valley is via a single railroad, then the railroad will have to transport agricultural products grown by farmers in the valley—even if the railroad would prefer to ship products only from farms that the railroad owns.

Although, as Supreme Court Justice Breyer observes, essential facilities is "a doctrine that this Court has never adopted,"[155] the doctrine does play an important role in current antitrust law. In the Portland case, the federal district court held that AT&T/TCI's cable broadband was in fact an "essential facility."

In the Portland case, the federal district court held that AT&T/TCI's cable broadband was in fact an "essential facility." But this holding is plainly erroneous.

But this holding is plainly erroneous. First, there are currently many ways (in Portland and elsewhere) to obtain Internet access—first and foremost through the many narrowband ISPs. Even if one makes the leap that broadband Internet access is "essential" (rather than simply desirable or advantageous), there are still other ways to obtain broadband Internet access—as detailed in Part 3. In Portland, for example, one may obtain broadband Internet access via DSL from U.S. West, via DSL from Covad (a CLEC), and via satellite from DirectTV.

AT&T/TCI's broadband services are, then, hardly "essential" when there are at present three competing providers for the same service. That AT&T/TCI's service may in some respects be superior (arguably) or less expensive does not transform AT&T/TCI's service into an "essential facility." The "essential facility" label should not be a punishment inflicted for providing a better product.

C. Does Bundling Violate Antitrust Laws?

Vertical integration allows the integrator to reduce transactions costs, reduce risk, and capture certain economies of scale.[156] For example, a vertically integrated oil company that has a secure supply of oil for its retail outlets can deliver its product at a lower price when supply

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[154] An essential facility may not exclude competitors unless there is a "legitimate business reason for the refusal." *City of Anaheim v. Southern California Edison Co.*, 955 F.2d 1373, 1370 (9th Cir. 1992).

[155] Supra note 44.

[156] R.H. Coase, "The Theory of the Firm," *Economica*, November 1937, reprinted in Coase, *The Firm, The Market and the Law* (Chicago: University of Chicago Press, 1988).

interruptions might be forcing its competitors to charge more. The vertically integrated company does this not to be nice to its consumers, but in order to sell more of its product.

Vertical integration works in the same way in the market for Internet access, and it already is reducing Internet prices. For example, while AOL charges consumers $21.95 per month for Internet access, MCI sells Internet access for just $14.95 to consumers who also use MCI's long-distance telephone service.[157]

To force a vertically integrated company to make its facilities available to rivals at the same price the company uses internally would destroy the advantages and economies created by vertical integration.

To force a vertically integrated company to make its facilities available to rivals at the same price the company uses internally would destroy the advantages and economies created by vertical integration. For example, disagreements within a company over how much to charge for a certain service or use of a particular asset can be resolved by unit managers, in the CEO's office, or finally in the board room. But if other companies have an entitlement to use those services or assets, disputes are far more likely to be settled in court, in front of regulators, or by lobbying Congress. These dispute settlement methods are far more costly to the parties than those that are internal to the company. Consequently, the price mandated under Forced Access would be too low to allow the company to earn its expected rate of return.[158]

D. Why Forced Access and Antitrust Don't Mix

Although the Portland district court used antitrust law as a rationale for the Forced Access mandate, Forced Access is a particularly bad solution even when there are genuine antitrust problems. Federal Trade Commission Chairman Robert Pitofsky explains why:

> Antitrust rarely mandates access for several reasons:
>
> (1) If access is too easy, companies will be inclined to lay back and take no risks on the assumption that they can free ride on the earlier investment and energy of their competitors;
>
> (2) Permitting easy access for competitors can dampen the incentives for firms to undertake risky and costly investments in the first place, unless there are countervailing first-mover advantages; and

[157] William F. Shughart II, *The Government's War on Mergers: The Fatal Conceit of Antitrust Policy* (Cato Institute, Policy Analysis #323, October 22, 1998), page 16.

[158] Ibid., pages 15-16.

(3) It achieves little to mandate access unless there is also provision to insure that price and other conditions of sale are "reasonable;" otherwise the monopolist can grant access but introduce terms that are so onerous that as a practical matter it is unavailable. But regulating price and other terms of sale on a continuing basis is exactly the thing that antitrust (as opposed to the regulatory agency with ongoing oversight of firms in the industry) is ill-equipped to manage.[159]

In sum, antitrust law provides no rationale for the imposition of Forced Access on the cable television companies. Cable broadband is not a monopoly or an essential facility. Vertical integration is pro-consumer. Forced Access undermines competition and requires continued, inappropriate, judicial micromanagement of a company's affairs. For this last reason, even if Forced Access were thought to be a wise policy, Forced Access should be imposed via regulation by the Federal Communications Commission, rather than though antitrust lawsuits (as H.R. 1685 and H.R. 1686 would do).

Antitrust law provides no rationale for the imposition of Forced Access on the cable television companies. Cable broadband is not a monopoly or an essential facility. Vertical integration is pro-consumer.

[159] Robert Pitofsky, chairman, FTC, *Competition Policy in Communications Industries: New Antitrust Approaches* (Glasser LegalWorks Seminar on Competitive Policy in Communications Industries, March 10, 1997), http://www.ftc.gov/speeches/pitofsky/newcomm.html (paragraph formatting changed from the original).

PART 7

Impact of Forced Access on Infrastructure Development

Everyone agrees that expanding the broadband communications infrastructure is desirable. The best way to *discourage* investment in, and creation of, any type of property is to destroy the property rights of the investors and creators of that property. A good example of this phenomenon is rent control.

Forced Access for cable broadband is a high-tech version of rent control—a "solution" that will cause tremendous problems, and discourage the creation and improvement of infrastructure.

During World War II, New York City began an experiment with a version of Forced Access known as "rent control" and "rent stabilization." The government decided what prices could be charged for apartment rentals and forbade apartment owners to lease their property to customers who would pay free-market rates.

The results on New York City's housing stock were catastrophic. Apartment building owners sharply curtailed investments in low-priced apartments, property upgrades, and maintenance, since they would not be allowed to recover these costs through market-determined rents. People who would have moved into new construction or single-family homes chose instead to stay in their current apartments to enjoy below-market rates, further decreasing the supply of affordable housing. As low-priced apartments crumbled or were withdrawn from the market, New York City's housing became less and less affordable for low- and middle-income renters.[160]

Forced Access for cable broadband is a high-tech version of rent control—a "solution" that will cause tremendous problems, and discourage the creation and improvement of infrastructure.

A. Lowering the Rate of Return on Technological Investment

Without the slightest bit of thought or creativity, any business can invest money in Treasury Certificates of Deposit or in AAA-rated corporate bonds. For a rational company to choose to invest its money in infrastructure improvements, the company must believe the investment will yield a higher return than will a simple investment in government or corporate bonds. Moreover, investing in government or high-rated corporate bonds runs only a tiny risk that the investment will not be repaid. But the investment in infrastructure might fail entirely, and pay back nothing (or only a little). Thus, the potential return from the infrastructure investment must be high

[160]Thomas Sowell, *Knowledge and Decisions* (New York, NY: Basic Books, 1980), pages 176-182.

enough to compensate for risk of failure.

What sensible company would invest millions or billions in developing new broadband technology, if it knew that AOL or other politically connected competitors might use federal or local political power to help themselves to the company's physical assets? What bank would build a network of Automated Teller Machines if the bank's competitors (which invested nothing in the physical capital) could have guaranteed use of the ATMs—at a price set by political officials (rather than at a price mutually agreed by the banks)?

What sensible company would invest millions or billions in developing new broadband technology, if it knew that AOL or other politically connected competitors might use federal or local political power to help themselves to the company's physical assets?

The development of ATMs provides an important lesson for the development of broadband. Today, ATMs are highly interoperable; almost any ATM will allow withdrawals from almost any bank. This interoperability was achieved naturally, because of free-market economic incentives. In the early days of ATMs, the machines were *not* interoperable. An ATM card issued by a particular bank would work only at an ATM owned by the bank. Because the government did not mandate Forced Access, banks (or groups of banks) that had not yet built ATMs had a strong incentive to build their own. Thus, ATMs proliferated.

Eventually, different banks found it economically advantageous to make interoperability agreements with other banks. Later, these ATM banking groups found it advantageous to make interoperability agreements with other ATM groups. These agreements made sense precisely because there was now so much ATM infrastructure; each bank (or group of banks) had a large installed infrastructure of ATMs. Because the government did not interfere with the property rights of ATM owners, competing banks had strong incentives to build many ATMs. Once ATMs were ubiquitous, competing banks had strong incentives to let each other's customers use their networks.

Now imagine that the Forced Access model had been imposed on banks. As ATM leaders (such as Citibank) began building their proprietary ATM networks, competing banks (which had not built ATMs) would demand that Citibank ATMs process transactions from these other banks. And the government would force Citibank to let other banks use its ATMs. Thus, Citibank's competitive advantage in building ATMs would be curtailed. And the smaller banks would have no competitive incentive to build their own ATM networks.

Similarly, in the early days of e-mail, systems were not interoperable. A CompuServe customer could easily send e-mail to another CompuServe customer, but sending e-mail to someone on another system (e.g., a university network) was difficult or impossible. This gave larger providers with many customers (e.g., CompuServe, AOL, or MCI) a competitive advantage; a new customer who signed up with a big company would be able to send mail to many people, but a new customer of a small company could not send e-mail so broadly.

Today, e-mail is fully interconnected. Any e-mail user can e-mail any other e-email user. This was accomplished with absolutely no government intervention. Can we be sure that we would have arrived at this happy state so quickly if the government had forced access—for example, if CompuServe (now owned by AOL) had been required to carry traffic from smaller companies, and to give the traffic the same priority that CompuServe's own e-mail received? Would the companies that now provide the backbone for e-mail traffic have invested so heavily in creating and upgrading that backbone if smaller companies had been able to help themselves to the fruits of the larger company's labor?

Because cable television companies have (so far) not had to worry about the government forcing them to share their infrastructure with competitors, cable's infrastructure investment has been immense. Between 1984 and 1992, the cable television industry spent $15 billion wiring the United States—the largest private construction project since World War II.

Because cable television companies have (so far) not had to worry about the government forcing them to share their infrastructure with competitors, cable's infrastructure investment has been immense.

To digitize that infrastructure, AT&T is spending $1.8 billion to upgrade the TCI cable lines to bring broadband Internet to 10.8 million homes, and $600 million to upgrade the lines serving 4.2 million MediaOne homes.[161] Comcast (another cable company) is spending $1.2 billion for its broadband upgrade.[162] Time Warner is spending $4 billion.[163] These investments would not have been made if these companies could not legally exclude other companies from free-riding off their investments. Should Forced Access become public policy nationwide, it is highly unlikely that this rate of investment would continue.

B. Risk, Reward, and Free Riders

In his classic article, "The Tragedy of the Commons," Garrett Hardin described how the absence of well-defined and properly enforced property rights can lead to less wealth for everyone. Hardin described a hypothetical village whose residents could graze their sheep for free on the town commons. The arrangement meant everyone had an incentive to graze as many sheep as possible, and no one had an incentive to cultivate the grass. The result was overgrazing, damage to the grass, and many starving sheep. A better system would have been to sell or assign tradeable grazing rights to each resident, and then let the resulting market allocate access to the

[161] Scott Woolley, "A Two-front War," *Forbes*, May 31, 1999, page 55.

[162] FCC Report, page 18, citing Comcast data.

[163] Timothy Boggs, senior vice president, Time Warner, Inc. H.R. 1685 hearings. One cause for the large cost is that cable companies must, according to their contracts with cities, upgrade an entire service area, even if demand is likely to be low in some neighborhoods. Cable companies also must wire public schools for free.

commons as well as raise the funds necessary to cultivate the grass.[164]

More recently, economists Gregory Sidak and Daniel Spulber studied the telecommunications industry and found there the same problem Hardin had described.[165] If Forced Access turns private broadband resources into communal property, then no one will have an incentive to produce more broadband resources, and everyone will have an incentive to consume the most broadband possible.

In an efficient economic system, risk and reward go together. Whoever takes the risk of failure should reap the reward of success. If a company must bear all the risks, but must share much of the rewards with its competitors, the company will stop taking risks.[166]

If Forced Access turns private broadband resources into communal property, then no one will have an incentive to produce more broadband resources, and everyone will have an incentive to consume the most broadband possible.

As cable companies upgrade their cable lines to allow digital broadband Internet service, they pay all of the costs, and they face all of the risks. If consumers are less interested in broadband than the cable companies hope they are, or if other technologies such as DSL or wireless take away too many of the potential cable broadband customers, or if a recession curtails consumer demand for luxuries like broadband, or if the cable broadband technology does not work well enough, the cable television companies will absorb every bit of the losses. Not a penny of the losses will be subtracted from the balance sheets of OPENNET Coalition members such as AOL, Mindspring, and the rest.

Companies clamoring for Forced Access are demanding the right to use another company's property. But they are unwilling to assume any of the risks from the creation and improvement of that property. If broadband cable turns into an economic disaster, the companies that built or upgraded the cable lines will suffer *all* of the loss. The members of the OPENNET Coalition will certainly not chip in to help AT&T/TCI or Time Warner pay off their wasted investments.

Why should any reasonable company invest hundreds of millions or billions of dollars to improve or build a facility, when there is a significant chance that regulators will give some of the facility to free-rider competitors? Why not just invest the money in certificates of deposit—whose rewards will belong only to the company and the tax collector?

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[164]Garret Hardin, "The Tragedy of the Commons," in Hardin, editor, *Managing the Commons* (New York, NY: W.H. Freeman, 1977).

[165] J. Gregory Sidak and Daniel F. Spubler, *Deregulatory Takings and the Regulatory Contract: The Competitive Transformation of Network Industries in the United States* (Cambridge University Press, 1998).

[166] Frank Easterbrook, "The Court and the Economic System," 98 *Harvard Law Review* 4 (1984).

C. Do the Foxes Have the Hens' Best Interests at Heart?

OPENNET leader Charles Brewer (head of the narrowband ISP Mindspring) claims that cable television companies' current policy "actually slows investment in broad-band services by blocking investment by Internet service providers that are willing and able to pay to offer high-speed services to the millions of subscribers they have today."[167] But OPENNET Coalition members are not clamoring to actually *invest* in the cable companies' equipment upgrades. If they wanted to invest in the upgrades, they could work out joint ventures with, or simply buy stock in, cable companies.

> OPENNET Coalition members should buy a cable company, invest hundreds of millions in improving the cable lines, and then give away "open access" to those cable lines.

If Mindspring and the rest of the OPENNET Coalition are so sure that cable companies can make more money in the long run by letting free riders use the cable companies' property, then they should buy a cable company, invest hundreds of millions in improving the cable lines, and then give away "open access" to those cable lines. AOL and the RBOC members of the OPENNET Coalition have large enough market capitalizations to buy several cable television companies. Indeed, OPENNET Coalition member U.S. West used to own the cable company MediaOne, which AT&T is currently buying. No one prevented U.S. West from retaining ownership of MediaOne, upgrading its lines, and then letting other firms have open access to those lines.

D. Resale Competition versus Real Competition

Forced Access encourages potential new competitors to operate forever on a "resale" model[168]: They will buy product (e.g., bandwidth) from whoever created the product and is being forced to sell it through Forced Access. The "competitor" then repackages the product and re-sells it to the consumer. This static model might make sense if it were impossible for new products to be created, but this is clearly not the case with the rapidly changing and highly innovative Internet access market. Resale competition makes it harmful for the property owner to spend money to upgrade the property, since both the property owner and its "competitors" benefit from the upgrade, but only the property owner incurs the cost.

Contrast resale competition with facilities-based competition, whereby each competitor builds its own facilities and competes by offering facilities that are superior to (or more cost-effective than) the facilities of other competitors. Unlike resale competition, facilities-based competition encourages the construction and improvement of facilities. The benefits for

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[167] Charles Brewer, "Why Hurry Up and Wait?" *USA Today*, April 5, 1999.

[168] 47 U.S.C. 251(c)(defining resale competition as one competitor leasing a part of a network, and reselling the network services under its own name).

broadband, under the current system of facilities-based competition, are clear: Improvements in cable facilities have led directly to better (and cheaper) broadband facilities being constructed or improved by telephone and satellite companies.

The Telecommunications Act of 1996 has not produced the hoped-for results in competition. But where a massive, complex federal statute has failed, innovative, aggressive companies are succeeding. "The growth of the broadband data market is a bigger factor driving the industry than a slow-paced march toward deregulation," explains Bob Fax, the chief telecommunications analyst for Mercer Management Consulting.[169]

Is competition to be a zero-sum game, in which the government should allocate resources among competitors? Or is competition a win-win game that enriches society by encouraging innovation, cooperation, and risk-taking?

Ultimately, the Forced Access debate is a choice between the resale competition model and the facilities-based competition model. Do we want the Internet to be run like a public utility, for which a large government bureaucracy controls prices and forces the utility to make its facilities available to everyone? Do we want the Internet to be a world of ratepayers, or a world of consumers? Is competition to be a zero-sum game, in which the government should allocate resources among competitors? Or is competition a win-win game that enriches society by encouraging innovation, cooperation, and risk-taking?

Do we want broadband to be run the way the personal computer business has been, with almost no regulation, continually declining costs, and continually increasing quality? Or do we want broadband to be run like defense procurement, where decision-making is ponderously slow and heavily influenced by politics?

[169] Reinhardt Krause, "Web Weaving Its Way Through Telecom Industry," *Investor's Business Daily*, June 9, 1999, page A4.

PART 8

Summary and Conclusion

Suppose that you owned a restaurant. And suppose that you created a brand-new type of stove: It prepared food better and faster. Customers began to flock to your restaurant because of its high quality and fast service. Although your market share was growing, it was still tiny compared to that of the chain restaurants in your town. (Indeed, the largest chain in town had half of all restaurant customers.)

There is something profoundly wrong with a lobbying campaign built on so unfair a premise.

Perceiving a threat to its profits by your new invention, the large restaurant chain creates the "OPENFOOD Coalition" consisting of itself, a few of its regular customers, and a few of your other competitors. The OPENFOOD Coalition demands that the local city council grant every restaurant in town the legal right to use your stove, on your premises, in return for a fee based on how much it costs you to operate your stove. The big chain and its allies proclaim themselves to be acting in the public interest by using government force to gain access to your kitchen, since this will foster competition, promote fairness, and prevent you from establishing a monopoly.

You point out that your stove, even though it cooks very fast, cannot accommodate the needs of every restaurant customer in the entire town. The Coalition admits you are correct, but says you should be able to invent a "technical work-around." You offer to sell use of the stove, and even the design of the stove, to competitors at prices to be freely negotiated, but the OPENFOOD Coalition insists it should not have to negotiate for those things or bear the risk of investing in stoves of its own.

Is this story too ridiculous to be believed? Perhaps. But a similar scenario is taking place right now in Congress and in city councils around the country.

The victims of the Forced Access campaign are innovative cable television companies, who want to offer high-speed broadband Internet access through cable television lines. The lobbying campaign for government-imposed Forced Access is called the OPENNET Coalition and its leader, America Online, is trying to protect its dominant position in slow narrowband Internet access.

Forced Access, as this hypothetical example illustrates and as this study has documented, is a species of theft in which some businesses hope to use government coercion to plunder property being built and improved by their competitors. There is something profoundly wrong with a lobbying campaign built on so unfair a premise.

Forced Access isn't necessary. With the explosive growth of residential broadband, new levels of economic growth and consumer satisfaction are coming. Competition is intense within the cable television industry, and among the different industries using differing technologies to provide people with high-speed access to the Internet. In this instance, markets are plainly working, attracting new investors and new organizational forms, driving down prices, and holding producers accountable to their consumers.

Forced Access would be counterproductive. It would cripple the growth of broadband Internet services for consumers and small businesses. Because Forced Access has not yet been forced on the cable television companies, broadband competition among many different providers is thriving. Forced Access would remove the most important competitive pressure on all other broadband providers. In the last five years, a free and open Internet, based on voluntary exchange rather than bureaucratic regulation, has contributed to unprecedented productivity growth and prosperity for America.

Ultimately, the Forced Access proposal requires America to choose between a thriving free-market Internet and one based on regulation and politics.

Ultimately, the Forced Access proposal requires America to choose between a thriving free-market Internet and one based on regulation and politics. Keeping the Internet free and growing requires that judges and elected officials not commit the fatal conceit of believing that they can substitute their own judgment for the wisdom of millions of Internet users, entrepreneurs, and investors. That means relying on markets, not regulations.

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APPENDIX

Glossary of Internet Terms

Excerpted from http://www.matisse.net/files/glossary.html

ARPANet
(Advanced Research Projects Agency Network) — The precursor to the Internet. Developed in the late 1960s and early 1970s by the U.S. Department of Defense as an experiment in wide-area-networking that would survive a nuclear war.
See Also: Internet

Backbone
A high-speed line or series of connections that forms a major pathway within a network. The term is relative as a backbone in a small network will likely be much smaller than many non-backbone lines in a large network.
See Also: Network

Bandwidth
How much stuff you can send through a connection. Usually measured in bits-per-second. A full page of English text is about 16,000 bits. A fast modem can move about 15,000 bits in one second. Full-motion full-screen video would require roughly 10,000,000 bits-per-second, depending on compression.
See Also: Bps, Bit, T-1

Baud
In common usage the baud rate of a modem is how many bits it can send or receive per second. Technically, baud is the number of times per second that the carrier signal shifts value - for example a 1200 bit-per-second modem actually runs at 300 baud, but it moves 4 bits per baud (4 x 300 = 1200 bits per second).
See Also: Bit, Modem

Bit
(Binary DigIT) — A single digit number in base-2, in other words, either a 1 or a zero. The smallest unit of computerized data. Bandwidth is usually measured in bits-per-second.
See Also: Bandwidth, Bps, Byte, Kilobyte, Megabyte

Bps
(Bits-Per-Second) — A measurement of how fast data is moved from one place to another. A 28.8 modem can move 28,800 bits per second.
See Also: Bandwidth, Bit

Browser
A Client program (software) that is used to look at various kinds of Internet resources.
See Also: Client, URL, WWW, Netscape, Mosaic

Byte
A set of Bits that represent a single character. Usually there are 8 Bits in a Byte, sometimes more, depending on how the measurement is being made.
See Also: Bit

Cable modem
A modem that receives data from a cable television line.
See Also: Modem

Client
A software program that is used to contact and obtain data from a Server software program on another computer, often across a great distance. Each Client program is designed to work with one or more specific kinds of Server programs, and each Server requires a specific kind of Client. A Web Browser is a specific kind of Client.
See Also: Browser, Server

DSL
(Digital Subscriber Line) — A method for moving data over regular phone lines. A DSL circuit is much faster than a regular phone connection, and the wires coming into the subscriber's premises are the same (copper) wires used for regular phone service. A DSL circuit must be configured to connect two specific locations, similar to a leased line.

A commonly discussed configuration of DSL allows downloads at speeds of up to 1.544 megabits (not megabytes) per second, and uploads at speeds of 128 kilobits per second. This arrangement is called ADSL: "Asymmetric" Digital Subscriber Line.

Another common configuration is symmetrical: 384 Kilobits per second in both directions.

In theory ADSL allows download speeds of up to 9 megabits per second and upload speeds of up to 640 kilobits per second.

DSL is now a popular alternative to Leased Lines and ISDN, being faster than ISDN and less costly than traditional Leased Lines.
See Also: bit, bps, ISDN, Leased Line

Email or E-mail
(Electronic Mail) — Messages, usually text, sent from one person to another via computer. E-mail can also be sent automatically to a large number of addresses.

Ethernet
A very common method of networking computers in a LAN. Ethernet will handle about 10,000,000 bits-per-second and can be used with almost any kind of computer.
See Also: Bandwidth

Gateway
The technical meaning is a hardware or software set-up that translates between two dissimilar protocols, for example Prodigy has a gateway that translates between its internal, proprietary e-mail format and Internet e-mail format. Another, sloppier meaning of gateway is to describe any mechanism for providing access to another system, e.g. AOL might be called a gateway to the Internet.

Gigabyte
1000 or 1024 Megabytes, depending on who is measuring.
See Also: Byte, Megabyte

Gopher
A widely successful method of making menus of material available over the Internet. Gopher is a Client and Server style program, which requires that the user have a Gopher Client program. Although Gopher spread rapidly across the globe in only a couple of years, it has been largely supplanted by Hypertext, also known as WWW (World Wide Web). There are still thousands of Gopher Servers on the Internet and we can expect they will remain for a while.
See Also: Client, Server, WWW, Hypertext

Host
Any computer on a network that is a repository for services available to other computers on the network. It is quite common to have one host machine provide several services, such as WWW.
See Also: Network

HTML
(HyperText Markup Language) — The coding language used to create Hypertext documents for use on the World Wide Web. HTML looks a lot like old-fashioned typesetting code, where you surround a block of text with codes that indicate how it should appear; additionally, in HTML you can specify that a block of text, or a word, is linked to another file on the Internet. HTML files are meant to be viewed using a World Wide Web Client Program, such as Netscape or Mosaic.
See Also: Client, Server, WWW

HTTP
(HyperText Transfer Protocol) — The protocol for moving hypertext files across the Internet. Requires a HTTP client program on one end, and an HTTP server program on the other end. HTTP is the most important protocol used in the World Wide Web (WWW).
See Also: Client, Server, WWW

Hypertext
Generally, any text that contains links to other documents—words or phrases in the document that can be chosen by a reader and which cause another document to be retrieved and displayed.

Internet
(Upper case I) The vast collection of inter-connected networks that all use the TCP/IP protocols and that evolved from the ARPANET of the late 1960s and early 1970s.
See Also: internet

internet
(Lower case i) Any time you connect 2 or more networks together, you have an internet - as in inter-national or inter-state.
See Also: Internet, Network

intranet
A private network inside a company or organization that uses the same kinds of software that you would find on the public Internet, but that is only for internal use.

As the Internet has become more popular many of the tools used on the Internet are being used in private networks, for example, many companies have web servers that are available only to employees. Note that an intranet may not actually be an internet — it may simply be a network.
See Also: internet, Internet, Network

ISDN
(Integrated Services Digital Network) — Basically a way to move more data over existing regular phone lines. ISDN is rapidly becoming available to much of the USA and in most markets it is priced very comparably to standard analog phone circuits. It can provide speeds of roughly 128,000 bits-per-second over regular phone lines. In practice, most people will be limited to 56,000 or 64,000 bits-per-second.

ISP
(Internet Service Provider) — An institution that provides access to the Internet in some form, usually for money.
See Also: Internet

Kbps
Kilobits per second.

Kilobyte
A thousand bytes. Actually, usually 1024 (2^10) bytes.
See Also: Byte, Bit

Leased Line
Refers to a phone line that is rented for exclusive 24-hour, 7 -days-a-week use from your location to another location. The highest speed data connections require a leased line.
See Also: T-1, T-3, DSL

Mbps
Megabits per second.

Megabyte
A million bytes. Actually, technically, 1024 kilobytes.
See Also: Byte, Bit, Kilobyte

Modem
(MOdulator, DEModulator) — A device that you connect to your computer and to a phone line, that allows the computer to talk to other computers through the phone system. Basically, modems do for computers what a telephone does for humans.

Mosaic
The first WWW browser that was available for the Macintosh, Windows, and UNIX all with the same interface. Mosaic really started the popularity of the Web. The source-code to Mosaic has been licensed by several companies and there are several other pieces of software as good or better than Mosaic, most notably, Netscape.

Netscape
A WWW Browser and the name of a company. The Netscape (tm) browser was originally based on the Mosaic program developed at the National Center for Supercomputing Applications (NCSA).

Netscape has grown in features rapidly and is widely recognized as the best and most popular web browser. Netscape corporation also produces web server software.

Netscape provided major improvements in speed and interface over other browsers, and has also engendered debate by creating new elements for the HTML language used by Web pages — but the Netscape extensions to HTML are not universally supported.

The main author of Netscape, Mark Andreessen, was hired away from the NCSA by Jim Clark, and they founded a company called Mosaic Communications and soon changed the name to Netscape Communications Corporation.
See Also: Browser, Mosaic, Server, WWW

Network
Any time you connect 2 or more computers together so that they can share resources, you have a computer network. Connect 2 or more networks together and you have an internet.
See Also: internet, Internet, Intranet

NIC
(Networked Information Center) — Generally, any office that handles information for a network. The most famous of these on the Internet is the InterNIC, which is where new domain names are registered.

Another definition: NIC also refers to Network Interface Card which plugs into a computer and adapts the network interface to the appropriate standard. ISA, PCI, and PCMCIA cards are all examples of NICs.

Packet Switching
The method used to move data around on the Internet. In packet switching, all the data coming out of a machine is broken up into chunks, each chunk has the address of where it came from and where it is going. This enables chunks of data from many different sources to co-mingle on the same lines, and be sorted and directed to different routes by special machines along the way. This way many people can use the same lines at the same time.

Portal
Usually used as a marketing term to described a Web site that is or is intended to be the first place people see when using the Web. Typically a "Portal site" has a catalog of web sites, a search engine, or both. A Portal site may also offer email and other service to entice people to use that site as their main "point of entry" (hence "portal") to the Web.

Router
A special-purpose computer (or software package) that handles the connection between 2 or more networks. Routers spend all their time looking at the destination addresses of the packets passing through them and deciding which route to send them on.
See Also: Network, Packet Switching

Server
A computer, or a software package, that provides a specific kind of service to client software running on other computers. The term can refer to a particular piece of software, such as a WWW server, or to the machine on which the software is running, e.g. “Our mail server is down today, that’s why e-mail isn’t getting out.” A single server machine could have several different server software packages running on it, thus providing many different servers to clients on the network.
See Also: Client, Network

T-1
A leased-line connection capable of carrying data at 1,544,000 bits-per-second. At maximum theoretical capacity, a T-1 line could move a megabyte in less than 10 seconds. That is still not fast enough for full-screen, full-motion video, for which you need at least 10,000,000 bits-per-second.
See Also: Bandwidth, Bit, Byte, Ethernet, T-3

T-3
A leased-line connection capable of carrying data at 44,736,000 bits-per-second. This is more than enough to do full-screen, full-motion video.
See Also: Bandwidth, Bit, Byte, Ethernet, T-1

TCP/IP
(Transmission Control Protocol/Internet Protocol) — This is the suite of protocols that defines the Internet. Originally designed for the UNIX operating system, TCP/IP software is now available for every major kind of computer operating system. To be truly on the Internet, your computer must have TCP/IP software.
See Also: IP Number, Internet, UNIX

Terabyte
1000 gigabytes.
See Also: Byte, Kilobyte

UNIX
A computer operating system (the basic software running on a computer, underneath things like word processors and spreadsheets). UNIX is designed to be used by many people at the same time (it is multi-user) and has TCP/IP built-in. It is a common operating system for servers on the Internet.

URL
(Uniform Resource Locator) — The standard way to give the address of any resource on the Internet that is part of the World Wide Web (WWW). A URL looks like this:
http://www.matisse.net/seminars.html
or telnet://well.sf.ca.us
or news:new.newusers.questions
etc.
The most common way to use a URL is to enter into a WWW browser program, such as Netscape or Internet Explorer.
See Also: Browser, WWW

Web
See: WWW

WWW
(World Wide Web) — Frequently used (incorrectly) when referring to "The Internet", WWW has two major meanings - First, loosely used: the whole constellation of resources that can be accessed using Gopher, FTP, HTTP, telnet, and some other tools. Second, the universe of hypertext servers (HTTP servers) which are the servers that allow text, graphics, sound files, etc. to be mixed together.
See Also: Browser, FTP, Gopher, HTTP, Internet, Telnet, URL, WAIS

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