



Federal Communications Commission  
Office of Plans and Policy  
1918 M Street NW  
Washington, DC 20554

**OPP Working Paper Series**

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**24** Through the Looking Glass:  
Integrated Broadband  
Networks, Regulatory Policy  
and Institutional Change

**November 1988**

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THROUGH THE LOOKING GLASS:  
INTEGRATED BROADBAND NETWORKS, REGULATORY POLICIES, AND INSTITUTIONAL CHANGE

Robert M. Pepper\*

Office of Plans and Policy  
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Washington, DC 20554  
November 1988

OPP Working Paper No. 24

\* The opinions and conclusions expressed in this paper are those of the author and do not necessarily reflect the views of the Federal Communications Commission or any of its Commissioners or other staff. The author appreciates the helpful comments and suggestions of his colleagues at the Commission. Any errors in this paper, however, are his responsibility.



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## I. INTRODUCTION

1. Two trends appear to be driving future telecommunications networks towards integrated broadband designs. First, today's narrowband voice and data networks, and even tomorrow's integrated services digital (ISDN) networks, may not be sufficient to meet growing user -- especially large user -- demand.<sup>1</sup> Second, fiber optic technology has become the transmission technology of choice for telephone companies in network and feeder plant and promises soon to become the technology of choice for distribution plant as well.<sup>2</sup>

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<sup>1</sup> Current ISDN technology is based on a basic access rate of 144Kbps (two 64Kbps "B" voice channels and one 16Kbps "D" data channel) and a primary access rate of 1.5Mbps (T1 or DS1 rate). Broadband ISDN is being developed to carry transmissions of up to 150Mbps. For a discussion of the development of, and demand for, broadband ISDN, see e.g., L. Anania and R. J. Solomon, "The Beauty and the Beast: Virtual Networking in B-ISDN," Telecommunications, September 1987 at 33-34; S. Weinstein, "Telecommunications in the coming decades," IEEE Spectrum, November 1987 at 62-67; H. Kunimori, "Broad-Band ISDN -- The Next Generation," Telecom '87/OEP at 60-62; A. Kitamura, "ISDN -- narrowband to broadband," Communications International, October 1987 at 64-68; "Gorden Bell calls for a U.S. research network," IEEE Spectrum, February 1988 at 54-57; and K.L. Philips, "ISDN's Built-In Problems," Telecommunications, October 1987 at 55-58.

<sup>2</sup> For a general discussion of fiber optics, see, e.g., G. Friesen, "Optical Fiber for Subscribers," CO, March 1986 at 18-20; P. Kaiser, J. Midwinter, and S. Shimada, "Status and Future Trends in Terrestrial Optical Fiber Systems in North America, Europe, and Japan," IEEE Communications Magazine, 25:10 (October 1987) at 8-13; C. Hoppitt, "ISDN Evolution: From Copper to Fiber in Easy Stages," IEEE Communications Magazine, 24:11 (November 1986) at 17-22; "The Inevitability of Switched Broadband Transmission to the Home," Shooshan & Jackson Inc., Washington, DC, October 1987; "An Engineering and Policy Analysis of Fiber Introduction into the

2. The development of fiber-based broadband networks is creating much excitement in the telephone industry as both carriers and users envision new telecommunications services and applications unbounded by bandwidth or transmission limitations. But before carriers will be willing, or perhaps even able, to make the substantial investments necessary to bring these new networks of the future out of the laboratories, a number of regulatory and institutional barriers will have to be overcome. At the same time, the development of broadband networks raises many difficult policy questions about existing regulatory and institutional arrangements.

3. While it appears that large users will have access to high speed broadband networks in the near future, whether integrated broadband networks -- and the new or improved services they might support -- will be available to small business and residential customers is an important public policy question. A central assumption of this paper is that the public interest will be served if such broadband networks become as widely available as demand requires and costs of providing service permits.<sup>3</sup> Service providers

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Residential Subscriber Loop," M. Sirbu, F. Ferrante, & D. Reed, Carnegie Mellon University, Pittsburgh, PA, May 1988; C. Jackson and L. Arnheim, "A High-Fiber Diet for Television?" National Association of Broadcasters, Washington, DC, April 1988.

3 See 47 U.S.C. § 151.

should be able to select among technological options for meeting their customers' needs; regulators should not be in the position of picking winners and losers. The purpose of this paper is to identify potential regulatory and institutional constraints on broadband network development by local telephone exchange carriers, and regulatory and policy questions that must be answered if the promise of these new networks is to be achieved.<sup>4</sup> It is important that these questions be addressed, because the existing regulatory framework is ill-equipped to cope with the potential economic, political, and social implications of technological changes that already have begun.

4. Section II discusses the two major trends driving future telecommunications networks towards broadband designs integrating voice, data, and video ("integrated broadband networks"): advances in fiber optic technology and increasing large user demand for telecommunications. The section also examines residential demand for broadband services.

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<sup>4</sup> Of course, regulatory and policy constraints often exist because of commercial and competitive reasons. Likewise, policy implications of broadband network development include potential institutional and competitive effects.

An equally important set of regulatory and institutional constraints limits the cable television industry's ability to use its broadband networks to provide non-video programming telecommunications services. While not the focus of this paper, those barriers are as crucial to the development of competitive local telecommunications services to meet user needs as are those confronting the local telephone exchange industry.

5. Section III identifies regulatory barriers to integrated broadband network development and deployment by local telephone exchange carriers (LECs). These regulatory barriers include: telephone/cable television crossownership restrictions; the Modification of Final Judgment; the FCC's Section 214 certification process; and the local cable television franchise requirement.

6. Section IV identifies eight regulatory questions and issues that will arise as broadband networks develop and are deployed including: (1) state/federal jurisdictional questions; (2) pricing and cost allocation questions; (3) the effect of current network design and terminal equipment rules; (4) appropriate regulatory safeguards to prevent anticompetitive abuses by carriers; (5) first amendment questions; (6) implications of carrier actions regarding "976" audiotex services; (7) whether cable copyright would apply to carriers; and (8) social policy questions.

7. Section V identifies the major players and their stakes in integrated broadband network development. These players include: local exchange carriers; cable television operators; broadcasters; program producers/distributors; regulators; and users, including residential consumers. Finally, Section VI presents a summary and conclusions.

## II. BACKGROUND

8. For purposes of this paper, an integrated broadband network (IBN) means a fiber optic<sup>5</sup> transmission network with a minimum transmission rate of 150Mbps permitting voice, data, and video transmission on the same system. The network likely will be switched, but it may not be; some system developers are exploring a bus architecture.<sup>6</sup> And while transmission will be two-way, it probably will be asymmetric -- that is, transmission to the home or small business will be much greater than that originating in the home or small business. Another important assumption is that, if there is sufficient demand for services, broadband networks of the future should, where economically possible, be universally available, and that means serving residential subscribers.

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5 It is possible to build such a high speed network using coaxial copper cable but current thinking appears to point toward fiber as the transmission medium of choice. See infra at para. 10.

6 A network's architecture, or topology, refers to its design and the relationship among the various points in the network. Traditional switched telephone networks are designed as "stars" in which all points can send and receive transmissions from any other point in the network through a switch. A "bus" network has a linear design in which multiple points share a common transmission path. An example of a bus network is a traditional "tree and branch" cable television system serving all subscribers on a street from the same coaxial cable carrying the same programming.

A. Fiber Optics to the Home

9. Fiber optic technology is an important factor in broadband network development. Without such a high capacity medium, broadband networks and services cannot reach customers' premises.

10. Fiber optic's technical and economic advantages over traditional copper technology include: greater bandwidth or transmission rates; longer distances between repeaters (amplifiers in the case of traditional copper technology); expandable capacity; digital transmission with little or no loss of signal quality; lack of susceptibility to A/C induced noise and radio frequency (RF) interference; higher reliability; and lower predicted maintenance costs. These advantages point to fiber's adoption as the primary transmission technology for all new construction to customers' premises in high traffic areas -- including downtowns, large office buildings, office and industrial parks, and research facilities such as universities and hospitals. In addition, these technical and economic advantages shortly will result in fiber replacing copper in residential networks for virtually all new construction such as new housing developments and planned communities.

11. In the telephone industry, interexchange carriers began deploying fiber on high traffic intercity routes in the early 1980s and today rely

entirely on fiber for virtually all new construction.<sup>7</sup> Within the last five years, local exchange carriers began putting fiber into interoffice trunks. And within the last three or four years, fiber was introduced into the local loop -- the subscriber's side of the local switch which represents 90 percent of telephone circuit miles -- in feeder plant between local serving offices and remote terminals.<sup>8</sup> The next, and final, step will be fiber's deployment in distribution plant to the customers' premises.<sup>9</sup> Indeed, it has been estimated that within two to five years, the cost of providing "plain old telephone service" (POTS) using fiber in the local loop will fall below the cost of providing POTS using today's copper technology.<sup>10</sup>

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7 See, e.g., J. Kraushaar, "Fiber Deployment Update-End of Year 1987," Federal Communications Commission, Washington, DC, January 1988.

8 See, e.g., S. Esty, "Fiber in the Feeder Loop," CO, March 1987, at 34-36; G. Friesen, "Optical Fiber for Subscribers," CO, March 1986, at 18-20.

9 Distribution plant is the transmission path between serving area interfaces such as remote terminals that concentrate individual circuits and the subscribers' premises. Feeder plant includes transmission facilities between the local serving office and remote terminals. Distribution plant represents about 50 percent of telephone circuit miles while feeder plant represents approximately 40 percent of telephone circuit miles. For a discussion of the structure of the local telephone network, see Engineering and Operations in the Bell System, AT&T Bell Laboratories, Murray Hill, NJ, 1983 at Chapter 4.

10 This estimate is based upon presentations, including models, of several telephone common carriers. The cost for providing POTS in these presentations ranged from \$1100 to \$1500 per subscriber. See also, e.g., Corning Glass Works Comments in CC Docket No. 87-266, In The Matter of Telephone-Cable Television Cross Ownership Rules, Sections 63.54-63.58 ("Telephone/Cable Crossownership") 2 FCC Rcd 5092 (1987); G. C. Cable, "Fiber Optics is on a Path to the Local Loop," TE&M, July 1, 1988 at 37-47; R.J. Boehm, "Bringing Fiber to the Subscriber," TE&M, December 1, 1987; "Southern Bell thinks fiber can pay for itself without cable TV revenues,"

As a result, telephone companies can be expected to begin using fiber instead of copper pairs for new construction within the next several years. When, and if, fiber will replace the existing copper distribution loop is less certain, however, and will depend upon the embedded plant's age, condition, and capacity; market conditions; and cost compared to replacement copper.

12. As with the telephone industry, the cable television industry is beginning to look to fiber to replace copper transmission facilities --though in the case of cable operators, the plant is primarily coaxial cable rather than twisted copper pairs. Unlike switched telephone networks, cable television systems -- which pass approximately 83 percent of all U.S. households -- are arranged in a bus architecture in which a cable with the same group of analog signals passes all homes, with drop cables tapping into the main cable at each home. In the typical arrangement, there can be as many as 30 to 50 amplifiers between the cable headend and subscribers'

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Cablevision, September 28, 1987 at 16. For recent fiber optic developments see, e.g., S. Esty, "Fiber beats copper in the feeder plant," Telephony, November 16, 1987 at 42-46; M. Warr, "Will fiber find its way home?" Telephony, November 16, 1987 at 36-38; M. Warr, "Fiber gets faster --again," Telephony, November 16, 1987 at 58-60; K. Nakagawa and K. Aoyama, "Fiber optics in Japan," Telephony, November 16, 1987 at 50-55; C. Wilson, "Fiber-to-the-home a financial reality?" Telephony, February 29, 1988 at 10; H. Brody, "The Rewiring of America," High Technology Business, February 1988 at 34-38; P. Kaiser, "Technologies for Future Broadband Networks," presented at panel on HDTV Technologies, L'Aquila, Italy, March 3, 1988; "Lightwave in the loop," Lightwave, April 1988.

premises.<sup>11</sup> Each amplifier introduces noise into the system and decreases signal quality, thus requiring greater channel separation and limiting the system's channel capacity.

13. By using fiber optics to bring signals from the cable headend to each neighborhood, cable companies will be able to eliminate up to 90 percent of existing amplifiers, increase signal quality dramatically, and increase channel capacity by 100 percent and perhaps more.<sup>12</sup> It has been estimated that these quality and capacity improvements can be achieved for as little as \$30 per subscriber and will not require replacing the existing drop cable to subscribers' premises, which comprises a majority of a cable system's plant miles.<sup>13</sup> Thus, for a relatively small cost, a cable operator

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11 For discussion of hybrid fiber/coaxial cable television systems and the limitations of existing coaxial cable technology, see J. A. Chiddix and D.M. Pangrac, "Fiber Backbone: A Proposal for an Evolutionary CATV Network Architecture," NCTA '88 Technical Papers, National Cable Television Association, Washington, DC, 1988; P. Rogan, R. B. Stelle III, and L. Williamson, "A Technical Analysis of a Hybrid Fiber/Coaxial Cable Television System," NCTA '88 Technical Papers, National Cable Television Association, Washington, DC, 1988.

12 Chiddix and Pangrac, supra at n. 11.

13 C. T. Baggett, "Cost Factors Relative to the Fiberoptic Backbone System," NCTA '88 Technical Papers, National Cable Television Association, Washington, DC, 1988. The cost per subscriber would increase to between \$50-\$60 if more amplifiers are eliminated by bringing the fiber closer to subscribers' premises. Therefore, the total cost to the cable television industry to deploy fiber optic backbone to all existing subscribers is estimated to cost between \$1.3 billion and \$2.7 billion depending upon how far fiber is extended. Other estimates project even lower costs. See, e.g., M. Seale, "Cost of Partial FO System Put at \$27 a Subscriber," Multichannel News, June 27, 1988, at 10.

will be able to upgrade its physical plant and bring a fiber quality signal to within one to four amplifiers of all subscribers. The resulting increased capacity and signal quality will enable cable operators subsequently to more easily add high definition television (HDTV) signals, two-way operations, more sophisticated addressability, and programming flexibility in response to evolving market conditions.<sup>14</sup>

14. In contrast, telephone companies will have to spend significant sums to upgrade existing switched telephone plant in order to deliver broadband services to today's residential subscribers.<sup>15</sup> Of course there

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14 See, e.g., Chiddix and Pangrac; F. Dawson, "Seeing fiber optics in a new light: Cable's mindset beginning to change," Cablevision, October 12, 1987, at 48-61; J. Chiddix, "Prepare to meet the fiber challenge," Cablevision, December 7, 1987, at 30,34; F. Dawson, "Fiber systems proliferate as interest grows," Cablevision, April 11, 1988, at 36-40; "ATC To Test Hybrid Fiber Optic Cable System This Summer," Communications Daily, May 3, 1988, at 5-6; F. Dawson, "Cable sees a shortcut the telcos can't follow," Cablevision, August 15, 1988, at 39; J.R. Boyle, "Fiber optics, HDTV Technology Make Cable's Future Bright," Multichannel News, September 12, 1988, at 2; "Telcos and fiber the hot topics in Atlanta," Broadcasting, September 12, 1988, at 33-34.

15 Telephone industry cost targets for bringing fiber to the home for new construction range from \$1,500 per subscriber for switched systems using singlemode fiber down to \$800 per subscriber for bus systems. Current technology trials cost significantly more but costs are expected to drop towards the targets rapidly once components are produced in large volumes. The cost of rebuilds will be greater than new construction -- perhaps significantly -- because of non-technology problems stemming from digging up existing streets and established lawns and gardens.

Using a target cost of \$1500 per subscriber for rebuilds, telephone companies will have to spend more than \$100 billion in 1988 dollars to bring broadband networks to the nearly 74 million homes passed today by cable television plant. National Cable Television Association, Cable Television Developments, August 1988, citing Paul Kagan Associates, Inc., Cable TV

would be significant differences between a cable operator's fiber/copper hybrid bus architecture and a fully switched telephone company fiber optic system, but those differences may not be widely perceived by residential subscribers whose primary use of a broadband network is reception of entertainment video.

15. Because of fiber optic's significant technical and economic advantages, it appears that both the local telephone and cable television industries are adopting fiber as their transmission medium of choice. The questions facing the telecommunications industry and, thus policy makers, are whether these fiber networks will ultimately serve existing residential customers as well as new ones; if so, when; and, will these fiber networks evolve into universal broadband networks? The answers to these questions may affect the kinds of services available to subscribers and may depend upon how regulatory issues are resolved.

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Programming, April 29, 1988, at 10. A recent proposal by Raynet Corp. in conjunction with several regional Bell companies would deploy fiber in a bus architecture for rebuilds and upgrades. Such a system could use copper drops to customers' premises and cost only a fraction of the cost of replacing today's telephone network with a fully switched fiber optic network. However, such a system would not be switched and, at least initially, would be all analog and provide fewer television channels than current coaxial cable systems. A.M. Roussel, "Raynet Corp.'s Fiber System Nets Regional Bells' Attention," Communications Week, July 11, 1988, at 8; Telecommunications Reports, July 11, 1988, at 39. Such a system in limited trials can, however, provide telephone companies a relatively inexpensive way of experimenting with fiber and broadband services.

## B. Demand for Broadband Services

16. Network planners are faced with the question of what services, if any, will require the kind of bandwidth or transmission rates capable on fiber networks? Simply put, are there any current or near-term potential services that will require broadband transmissions in excess of ISDN primary or basic rates? Although local exchange carriers have written about wonderful, new, and innovative broadband services,<sup>16</sup> they fail to be specific in identifying any residential service that will require broadband capacity in the near future, except for entertainment video.

17. Entertainment video, while available in virtually all homes in the United States today, is linked to IBN development in the debate over advanced television (ATV) technologies such as high definition television (HDTV).<sup>17</sup> While some argue that new fiber optic broadband networks will be required to deliver HDTV to the home, others state that HDTV will be deployed over an extended period of time and will use a variety of delivery technologies -- including upgraded cable television systems -- to reach

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16 See, e.g., Comments of BellSouth at 4-5; Comments of the Ameritech Operating Companies at 4-6; and Reply Comments of NYNEX at 4-5 in Telephone/Cable Crossownership.

17 Most discussions about ATV systems assume bandwidth requirements for HDTV will exceed the current 6 MHz needed for NTSC television. See, e.g., Tentative Decision and Further Notice of Inquiry in MM Docket No. 87-268, In the Matter of Advanced Television Systems (released September 1, 1988) ("ATV Proceeding").

consumers.<sup>18</sup> There is little question that broadband networks of the future -- provided either by the cable industry or the telephone industry -- will be able to transport HDTV signals to the home. The question for policy makers, however, is, if there is a government interest in promoting HDTV,<sup>19</sup> whether IBNs will be so critical to the new television technology that there should be a conscious public policy to promote telephone broadband networks. The likely development of alternative delivery technologies --including advanced fiber optic backbone cable systems, DBS, video cassettes and discs, and advanced terrestrial broadcast television systems -- probably makes such a mandate unnecessary. What is clear, however, is that HDTV development is one more disequilibrating factor that will force players to reexamine traditional relationships within and among industries.

18. One reason LECs have failed to identify new, non-video, broadband services is because, given recent advances in two and four wire copper network technology, it is likely that entertainment video will be the only

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18 See, e.g., Ameritech Operating Companies Comments in Telephone/Cable Crossownership at 4-5; Weinstein, "Telecommunications in the coming decades" supra n. 1 at 66; W. F. Schreiber, "Thinking the unthinkable," Broadcasting, July 11, 1988, at 32; "High visibility for high definition at NCTA," Broadcasting, May 9, 1988, at 31; J. Aversa, "Panelists to Operators: Prepare Now for HDTV, MultiChannel News, September 19, 1988, at 28; "HD No Affair of Broadcasters, Asserts Topper of 1125 Prods.," Variety, October 12, 1988, at 74.

19 For a discussion of the public interest considerations surrounding introduction of advanced television (ATV) systems including HDTV, see ATV Proceeding, supra n. 17.

residential service requiring true broadband capacity any time soon.<sup>20</sup> Properly conditioned copper pairs can do almost everything else, including telemetry, meter reading, videotex and other existing and new information services proposed by carriers and information service providers.<sup>21</sup> There may be other good reasons for LECs to deploy universal fiber networks, however, such as lower installation and maintenance costs, but today, only super high speed data transmission and high quality full motion video require fiber's enormous capacity. Future services requiring large bandwidths and very high transmission rates are likely to develop as advanced information services employing expert systems and artificial intelligence develop. New personal computers that will permit browsing video databases combining live action video, sound, graphics and computer power are predicted to be on the market within five years and will require higher speed networks than are available today to most residences.<sup>22</sup>

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20 Business and other large users increasingly will require broadband networks for high speed data, video conferencing, high speed document transfer, and new applications using computer aided design and manufacturing, artificial intelligence, and graphic imaging. Existing, and even future ISDN, networks are insufficient to support these applications. Therefore, broadband networks will be deployed for large users -- if not by carriers then by the users themselves as private networks. The central question addressed by this paper, however, is the extent to which integrated broadband networks will be deployed to serve small business and residential customers.

21 See, e.g., supra n. 16.

22 See, e.g., G.P. Zachary, "Awaiting the Next Generation of Personal Computers," Washington Post, Washington Business Section, July 11, 1988, at 25.

Increases in telecommuting and development of new individual multimedia information and merchandising services, along with multipoint multimedia communications and the need for short end-to-end delay time, may require broadband transmissions of more than T-1 rate.<sup>23</sup>

19. As with many new technological advances, broadband networks will lead to applications and services unknown before increased speed and capacity make those new services possible. Increased capacity and new functionality often have been criticized as having no clear specific applications. But new technologies and services such as direct dial long distance, communications satellites, and interexchange fiber have all stimulated demand and creative new applications unforeseen before the new technology's deployment.<sup>24</sup>

20. There are generally two views regarding broadband network development. First, those who believe that switched fiber broadband

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23 J. Irven, "Broadband ISDN: Multimedia Communications and Information Services," presentation to Seventh International Telecommunications Society Meeting, Cambridge, MA, June 29, 1988. Irven concludes that broadband services such as multimedia communications and merchandising and information browsing are long term broadband applications.

24 In another field, construction of the interstate highway system -- including "beltways" around cities -- was criticized because some critics did not believe that there could possibly be enough traffic to justify the investment. Likewise, when the personal computer was introduced a little more than a decade ago with 64k memory chips, few foresaw software programs that would require 256k let alone today's programs that require 640k memory or more to run properly.

networks will not develop without telephone companies providing video programming; and second, those who believe that fiber networks will develop for plain old telephone service (POTS), whether or not telephone companies provide video programming.<sup>25</sup> In the long run, whether or not telephone companies provide video programming may not make a significant difference in whether LEC's eventually deploy fiber but may significantly affect the timing of such deployment. If current projections are correct that the cost for fiber optics will drop to that of copper in the next two to five years,<sup>26</sup> then based upon new construction, eight to 18 percent of U.S. households will be provided telephone service over a fiber optic network extending to the subscriber's premises by the year 2000.<sup>27</sup> And many, if not most, cable subscribers will be served by systems with fiber optic backbone trunks. Therefore, if telephone plant rehabilitations and cable television rebuilds are included, within twenty years the majority of homes in the United States likely will be connected to at least one fiber optic network -- and possibly two.

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25 See discussion of telephone/cable television crossownership, infra at para. 27.

26 See supra at n. 10.

27 New construction is adding between 1.5 and two percent new households each year depending upon general economic conditions. 1988 Statistical Abstracts of the United States at 683, 688.

21. The question for policy makers and industry planners is whether telephone company fiber networks will provide broadband services and, if they do, under what terms and conditions. A very real possibility, of course, is that the telephone company fiber to the home will be limited in many places -- at least initially -- to providing narrowband voice and data either because demand for broadband services is insufficient or regulations constrain broadband service offerings. But even narrowband fiber applications could be significant if one believes those who tout the intelligent network of the future and fiber's advantages in a digital world.

22. Telephone network fiber optic applications will create the potential for widespread integrated broadband networks. However, the demand for broadband services other than entertainment video is uncertain. Unless regulatory constraints preventing the deployment of local carrier broadband networks are removed, demand for broadband services may never have the opportunity to develop and be tested. Thus, the development and deployment of integrated fiber optic broadband networks by local exchange carriers are intertwined with numerous regulatory questions. The next sections examine two sets of these questions. First, potential regulatory barriers to integrated broadband development and deployment are identified. The section thereafter addresses regulatory questions and implications that are likely to arise when existing rules and regulatory practices are applied in an integrated broadband network environment.

### III. REGULATORY BARRIERS

23. As a guiding principle, regulators should not, without a compelling public policy rationale, skew technological development or choice by putting or keeping in place rules that favor one technology or technological application over another. Yet this is what might happen with broadband network development if lawmakers and regulators are not careful.

24. Because many discussions of fiber broadband network development include claims by telephone companies that if they are ever to find it worthwhile to (1) universally deploy fiber to the home or (2) upgrade narrowband fiber networks to broadband, they will have to carry video programming for consumers, it is not surprising that much of the debate surrounding broadband networks involves telephone/cable television crossownership.<sup>28</sup> In some cases, the telephone industry argues that not

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28 This debate is not unique to the United States. Questions of broadband network deployment and inter-industry competition/cooperation between the telephone and cable television industries are arising in other countries. See, e.g., D. Gilhooly, "The Politics of Broadband," Telecommunications (International Edition), June 1988; L. Jaffee, "Telco Competition Threat Dominates Canadian Show," Multichannel News, June 6, 1988, at 1; "Cross wires," The Economist, June 4, 1988, at 64 (describing British Telecom's joint venture bid in Hong Kong to build a cable television system that could provide the infrastructure to compete with Cable and Wireless' Hong Kong Telephone Company; Cable and Wireless reportedly is also bidding to provide cable service as is BellSouth, see "Bell South (sic) Seeks Chance to Bid On Hong Kong Cable," Variety, August 3, 1988, at 58).

only must telephone companies be permitted to transport video programming to homes, but that the local telephone company also must be permitted to provide that programming -- i.e., become a cable television operator -- if it is to deploy broadband networks.<sup>29</sup>

25. While there are few regulatory or legal barriers to local exchange carriers deploying fiber optic technology in local loops for narrowband voice and data services,<sup>30</sup> there are significant regulatory and legal obstacles to telephone companies expanding those fiber networks into broadband networks if, realistically, the only broadband service they see as worth offering in the foreseeable future is video programming. Regulatory and legal barriers exist whether the local exchange carrier provides the video programming itself or leases transmission capacity to an unaffiliated video programmer. These barriers exist in FCC rules, the

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29 See, e.g., USTA Comments in Telephone/Cable Crossownership.

30 Most local exchange carriers have franchises from their states that include authority to extend service to new areas within their franchise area. Thus, local operating companies usually may serve new communities or housing developments without specific permission from state regulators and may serve these new areas with fiber when it becomes cost effective for POTS. In addition, in virtually all instances, local exchange carriers have authority to replace old plant as it deteriorates with age. Thus, they will be able to replace old copper plant with fiber in rehabilitation construction when the cost of fiber plant declines below the cost of copper plant replacement. The question for state regulators will be when to permit local carriers to replace existing useable copper plant with fiber. This last transition from copper to fiber for POTS may become a regulatory barrier in some states depending upon whether the state commission permits the replacement investment.

Communications Act, and in the Modification of Final Judgement (MFJ) that broke up AT&T.

26. Some parties claim that because of existing industry relationships and historical enmity between the telephone and cable television industries, cable operators are unlikely to lease transmission capacity from local telephone companies even if it would otherwise be in their interest to do so.<sup>31</sup> Therefore, it is argued that if local exchange carriers need a video programmer to lease capacity in order to justify deploying their broadband network, the local telephone company will have to become that programmer itself.<sup>32</sup> Although such self-provision of content may not be necessary for telephone company broadband network development, this section will first discuss regulatory and legal barriers to such an arrangement. Following that, obstacles to common carrier provision of transmission capacity are discussed.

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31 See, e.g., National Cable Television Association Comments in Telephone/Cable Crossownership at 5-25 (discussion of telephone company anticompetitive abuses including pole attachment restrictions); Notice of Inquiry in Telephone/Cable Crossownership, 2 FCC Rcd at 5093 (1987).

32 See, e.g., demand for broadband services supra at paras. 16-21.

A. Barriers to Telephone Company Provision of Video Programming

1. Telephone/Cable Television Crossownership

27. The regulatory/legal world is ruled by definitions. Thus, it is important that Congress defined a "cable system" as any facility providing "video programming directly to subscribers."<sup>33</sup> Both Commission rules and the Communications Act generally prohibit a local telephone company from operating or being affiliated with a cable system in its local telephone franchise area -- this is commonly known as the telco/cable crossownership prohibition. Conversely, there are also state and federal barriers to cable systems competing with franchised telephone companies.

28. The Commission in 1970 promulgated rules prohibiting a local telephone company from providing "video programming to the viewing public in its telephone service area, either directly, or indirectly through an affiliate owned by, or under common control with the telephone" company.<sup>34</sup> The Commission took this action in order to prevent local telephone companies from preempting the development of the cable television market and

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33 47 U.S.C. § 522(6)(C) [Cable Act of 1984 § 602(6)(C)].

34 47 CFR 63.54(a).

extending their monopoly in local distribution through discrimination against non-affiliated cable television operators who needed access to telephone company poles and conduits.<sup>35</sup> In addition, the Commission's rule prohibited a telephone company from providing "channels of communications or pole line conduit space, or other rental arrangements" to any affiliate to provide video programming to the public.<sup>36</sup> And in a footnote to the rule, the Commission defined "affiliate" to bar "any financial or business relationship whatsoever by contract or otherwise, directly or indirectly between the carrier and the customer, except only the carrier-user relationship."<sup>37</sup> By effectively barring the participation of a likely potential entrant, this prohibition on any relationship other than carrier-user may prevent healthy, creative, and fully competitive relationships between local exchange carriers and cable operators and other video programmers.

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35 See generally Applications of Telephone Common Carriers for Section 214 Certificates for Channel Facilities Furnished to Affiliated Community Antenna Television Systems (Final Report and Order), 21 FCC 2d 307, recon. in part, 22 FCC 2d 746 (1970), aff'd, General Telephone Co. of S.W. v. United States, 449 F. 2d 846 (5th Cir. 1971).

36 47 CFR 63.54(b).

37 47 CFR 63.54, Note 1(a). The "carrier-user" relationship has been clarified to mean "indiscriminately hold[ing] . . . out to serve all similarly-situated customers under the same terms and conditions of service." CCI Cablevision v. Northwestern Indiana Telephone Company, Inc., and Northwest Indiana Cablevision, 3 FCC Rcd at 3099, n. 28 (1988).

29. The only exception to this prohibition (added in 1981) established waiver criteria for rural areas with fewer than 2,500 inhabitants.<sup>38</sup> And the rules provide for waivers where cable service "demonstrably could not exist except through a cable system owned by, operated by, controlled by, or affiliated with the local telephone common carrier, or upon other showing of good cause...."<sup>39</sup> such as low density areas with few homes per mile.

30. In 1984, Congress codified the Commission's crossownership rules in the Cable Communications Policy Act of 1984.<sup>40</sup>

31. In August 1987, the Commission initiated a Notice of Inquiry<sup>41</sup> into whether the crossownership rules needed modification in light of changes in the cable television and telephone industries since it last examined the question in 1981.<sup>42</sup> In September 1988, the Commission

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38 47 CFR 63.58. The 2,500 person limit is admittedly arbitrary and avoids any qualitative test or assessment of what is "urban."

39 47 CFR 63.65.

40 47 U.S.C. § 533(b). The only substantive change Congress made was to exempt all rural areas from the crossownership restriction instead of using the Commission's then existing formula determining eligible areas.

41 Notice of Inquiry in Telephone/Cable Crossownership, 2 FCC Rcd 5092 (1987).

42 "FCC Policy on Cable Ownership, A Staff Report," Office of Plans and Policy, Federal Communications Commission, November 1981. The OPP Report recommended retaining the telephone/cable crossownership ban in the pre-AT&T divestiture environment because: (1) there were potential problems of shifting costs from an unregulated cable activity to regulated telephone services; (2) telephone companies could forestall facilities based

released a Further Notice of Inquiry and Notice of Proposed Rulemaking<sup>43</sup> concluding that the public interest would be better served by repealing the crossownership restriction subject to safeguards against anticompetitive practices and, at the same time, seeking comment on possible legislative recommendations to Congress. Because the Commission's rules were codified in 1984 it cannot alone modify or repeal the restrictions. Therefore, any Commission action must take the form of a report to Congress recommending statutory changes. In addition, even if Congress repeals the statutory ban, the Commission would have to issue a notice of proposed rulemaking before modifying its own rules subsequent to Congressional action.

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competition from cable systems if they owned those systems; (3) large telephone companies could dominate the cable television market; and (4) telephone companies control poles and conduits necessary for cable television operation. The report, which was more concerned about permitting cable system competition with telephone companies than telephone competition with cable television, concluded that the crossownership ban be retained until (1) a competitive environment for the local loop exists; (2) equal access to poles and conduits can be assured; (3) it is obvious that cable television will not be a viable competitor with local exchange carriers for local loop service; or (4) the ban is hindering the development of new technologies and services.

43 Further Notice of Inquiry and Notice of Proposed Rulemaking in CC Docket 87-266, Telephone Company/Cable Television Cross Ownership Rules, Sections 63.54-63.58, FCC 88-249 (released September 22, 1988) (Further Notice). The Further Notice proposed establishing criteria for a "good cause" waiver to the crossownership ban based on advanced technologies such as switched integrated broadband technology. The Further Notice also proposed modifying the definition of "affiliate" in 47 CFR 63.54, note(1)(a) to permit carrier involvement in providing cable service so long as participation does not constitute ownership and/or control.

## 2. Modification of Final Judgment

32. In addition to the general bans on cross ownership, the Bell Operating Companies (BOCs) are further constrained by the Modification of Final Judgment (MFJ).<sup>44</sup> Section II(D)(1) of the MFJ prohibits the divested BOCs from providing "information services."<sup>45</sup> Though not specifically addressed in any of the judgment court's decisions, it seems reasonable to assume that cable television is an "information service" under terms of the decree.<sup>46</sup> Thus, the BOCs would appear to be prohibited by the MFJ from providing cable service even where non-Bell independent LECs are permitted

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<sup>44</sup> United States v. AT&T, 552 F. Supp. 131 (D.D.C. 1982), aff'd sub nom. Maryland v. United States, 460 U.S. 1001 (1983). The MFJ required AT&T to divest itself of its twenty-two local Operating Companies. Id. at 226. These twenty-two companies were organized into seven regional holding companies by AT&T in its reorganization plan. Id. at 142, n. 41. The seven regional Bell Operating Companies (RBOCs) are: Ameritech, Bell Atlantic, BellSouth, NYNEX, Pacific Telesis, Southwestern Bell, and US West.

<sup>45</sup> 552 F. Supp. at 227. The MFJ goes on to define "information service" as "the offering of a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information which may be conveyed via telecommunications...." Id. at 229. "Information" is defined as "knowledge or intelligence represented by any form of writing, signs, signals, pictures, sounds, or other symbols." Id.

<sup>46</sup> The judgment court recently reiterated its prohibition on BOC content-based information services including, at a minimum, "electronic publishing," prohibiting "...the provision by a Regional Company of any information which that Regional Company or its affiliates has, or has caused to be, originated, authored, compiled, collected, or edited, or in which it has a direct or indirect financial or proprietary interest, and which is disseminated to an unaffiliated person through telecommunications." United States v. Western Elec. Co., Inc., Civil Action No. 82-0192, slip op. at note 39 (D.D.C. March 7, 1988). In addition, the cable television industry participated before the trial court in the proceeding leading to this decision, arguing that the BOCs be prohibited from providing information

to do so, in rural areas and outside their local service areas.

33. The Court's March 1988 decision to relax the information service restriction to permit the BOCs to offer certain storage and retrieval functions did not lift the prohibition on providing content such as cable service, though it did open the door to providing information service gateways and kiosk-type billing arrangements.<sup>47</sup> Therefore, even if Congress and the FCC lift their crossownership restrictions, Bell Operating Companies, which serve approximately 77 percent of local exchange customers

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services. See, e.g., Memorandum of National Cable Television Association, Inc. In Support of Proposed Order filed in United States of America v. Western Electric Company, Inc., Civil Action No. 82-0192, October 15, 1987.

<sup>47</sup> United States v. Western Elec. Co., Inc., Civil Action No. 82-0192, slip op. (D.D.C., Mar. 7, 1988). Kiosk billing was first developed by France Telecom for its Minitel (Teletel) service and refers to arrangements in which the local carrier bills customers of information services a fee combining charges for transmission and content and where the carrier keeps a fixed amount and passes on the remainder to the information/content provider; the amount paid by the customer will vary depending upon what the information provider charges for the content. See, M. Marchand, The minitel Saga, (Paris, France: Larousse, 1988), at 114. Although approving kiosk billing arrangements, the district court on reconsideration, stated that such approval did not extend to revenue sharing arrangements: "The Court did not grant a blanket endorsement of '976'-like revenue sharing proposals; it merely noted that the kiosk billing system, as employed by Teletel, 'is in many ways comparable to billing arrangements currently use by the Regional Companies for '976' services.' Nor did the Court rescind its earlier prohibition against arrangements that provide for the sharing of revenue." United States v. Western Elec. Co., Inc., Civil Action No. No. 82-0192, slip op. at 4 (D.D.C., June 22, 1988) (citation omitted). Thus, until clarified by the district court in response to a specific set of facts, it is not entirely clear what kinds of kiosk billing arrangements are permissible.

in the United States,<sup>48</sup> will continue to be barred from video programming altogether, unless the MFJ is further modified.<sup>49</sup>

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48 United States Telephone Association, "Phone Facts for the Year 1987," Washington, DC, 1988.

49 Unlike the MFJ bar against electronic publishing by AT&T, the ban on BOC electronic publishing extends beyond using their own lines to any BOC originated content "disseminated...through telecommunications." United States v. Western Elec. Co., Inc., Civil Action No. 82-Q192, slip op. (D.D.C., Mar. 7, 1988) at 32, n. 39. This bar would have been tested if Pacific Telesis had been successful in its bid with TCI (through its United Artists Communications affiliate) for purchase of Rogers Communications U.S. cable systems serving more than 500,000 subscribers. L. Landro, "Two More Firms Are Likely Bidders for Cable Systems," Wall Street Journal, June 6, 1988, at 26; L. Landro and J. Amparano, "Rogers Cable System Price Seen at \$1.3 Billion as Decision Nears," Wall Street Journal, June 24, 1988, at 24; G. Fabrikant, "Prices Continue to Soar for Cable Acquisitions," New York Times, June 27, 1988, at D8. The Pacific Telesis/United Artist bid -- reportedly the highest -- was rejected by Rogers in large part because of legal uncertainties stemming from the MFJ. See, e.g., J. Stilson, "Rogers deal ushers in utilities as cable buyers," Electronic Media, August 15, 1988, at 1; "Utility buys Rogers's cable for \$1.2 billion," Broadcasting, August 15, 1988, at 37; J. Aversa, "NTIA's Chief Decries Barriers That Kept Telco from Rogers Buy," Multichannel News, August 22, 1988, at 14.

Earlier changes in the MFJ eliminated restrictions on most out-of-country business activity. United States v. Western Elec. Co.,

34. In addition to the ban on information services, the MFJ prohibits a BOC from providing interexchange telecommunications services.<sup>50</sup> This restriction has been interpreted by the Department of Justice as prohibiting BOC ownership of satellite receiving equipment for purposes of receiving interstate signals for distribution over a cable television system leasing channel service.<sup>51</sup> If the Court agrees with this interpretation that reception of interstate satellite signals violates the MFJ's interexchange ban, then even if BOCs are permitted to own cable systems out of their local telephone service area, they would not be able to own or operate the equipment necessary to supply their cable system with satellite programming.

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Inc., 673 F. Supp. 525 (D.D.C. 1987). Therefore, U.S. West was able to acquire 10 percent of French cable television company Lyonnaise Communications and a significant share of the cable system in Birmingham, England. See "US West Finalizes 10 Percent Stake in French Firm," Multichannel News, October 3, 1988, at 71; A. Collier, "US West Among Partners With British Franchise," Multichannel News, October 24, 1988, at 52; "U.S. West Among Investors in \$255-Mil Brit Cable TV Franchise," Variety, October 26, 1988, at 40. In addition, Pacific Telesis is reported as investing in the East London Telecommunications cable franchise (with Jones Intercable) which also could offer telecommunications services. "Pacific Telesis and US West Discussing U.K. Cable Investments," Communications Daily, October 6, 1988, at 3.

50 552 F. Supp. at, 227. "Interexchange telecommunications" defined as "telecommunications between a point or points located in one exchange telecommunications area and a point outside an exchange area." Id. at 229.

51 Communications Daily, June 3, 1987, at 10. According to the Department of Justice, although a satellite receive dish is a neutral technology, its use to receive communications originating outside the local exchange area for an unaffiliated party constitutes interexchange service which is prohibited by the decree.

Such a bar could effectively prevent the BOCs from participating in the video distribution business inside or outside their regions on anything other than a common carrier basis. Thus, before a BOC will be able to provide cable television service outside its region, it will have to receive two waiver approvals from the district court: the first to provide an information service and the second to provide interexchange service.

35. Because of the crossownership and MFJ restrictions, if local exchange carriers -- especially the BOCs -- have to wait until they provide video programming themselves before justifying building broadband fiber networks -- or before upgrading narrowband fiber networks to broadband capacity -- it may be a long time before switched broadband networks reach the majority of U.S. homes, even if it would make sense economically to do so.

#### B. Constraints on Common Carrier Transmission

36. Although local exchange carriers -- including the BOCs -- are permitted to build broadband transmission facilities for others to provide video programming, they face constraints even for providing such common carrier services.

1. Section 214 Approval

37. Local exchange carriers are permitted by the Commission's rules and the Cable Act to construct and lease facilities to cable systems on a common carrier basis known as "channel service." Before a local exchange carrier may offer channel service, however, it must file a Section 214<sup>52</sup> application with the FCC showing that the proposed service will serve the "public interest, convenience, and necessity."<sup>53</sup> As part of this application, the carrier must demonstrate that it is not affiliated in any way with the customer for the channel service and that the proposed customer has access to telephone company poles and conduits at reasonable terms and conditions.<sup>54</sup> In the past, the Commission imposed a further safeguard when granting "214s" for channel service by requiring separate books of account for the channel service.<sup>55</sup> In addition, the local company must file a

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52 47 U.S.C. 214(a). The FCC determined that a federal certificate of public convenience and necessity was required for channel service in 1968. General Telephone of California, 13 FCC 2d 448 (1968), aff'd, 413 F.2d 390 (D.D.C.), cert. denied, 396 U.S. 888 (1969).

53 47 CFR 63.01.

54 47 CFR 63.55, 63.57.

55 The Common Carrier Bureau eliminated the separate books requirement in approving Bell Atlantic's Cost Manual stating that Commission action in the Joint Cost Order "establishing an integrated accounting system for regulated and nonregulated activities, implicitly superseded the prior requirement for separate books." Memorandum Opinion and Order, AAD 7-1671, 3 FCC Rcd 109, 119 (1988) citing Report and Order, CC Docket No. 86-111, 2 FCC Rcd 1298, 1339 modified on recon., 2 FCC Rcd 6283 (1987), pet. for further recon.pend.

tariff, since the Commission treats channel service as a regulated common carrier service.<sup>56</sup>

38. Thus, under a common carrier channel service arrangement, a local exchange carrier may wish to construct a broadband fiber network to residential customers -- or expand its narrowband fiber network -- when a video programmer leases capacity to reach subscribers. But further regulatory hurdles remain.<sup>57</sup>

## 2. Local Cable Television Franchise Requirements

39. Perhaps the greatest barrier is the requirement in the Cable Act that no entity may provide cable service without a local franchise.<sup>58</sup> Despite its apparent reasonableness, this requirement is a serious obstacle

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<sup>56</sup> See Common Carrier Tariffs for CATV Systems, 4 FCC 2d 257 (1966). See also In the Matter of Bell Atlantic Operating Companies' Permanent Cost Allocation Manual for the Separation of Regulated and Nonregulated Costs, 3 FCC Red at 119 (1988).

<sup>57</sup> For a discussion of the problems associated with competitors using the Sec. 214 process to slow competition, see National Telecommunications and Information Administration, Video Program Distribution and Cable Television: Current Policy Issues and Recommendations, NTIA Report 88-223 (1988) at 35-43 ("NTIA Report"); Shooshan & Jackson, "Telco-Provided Transport Facilities for Broadband Communications," October 1987, submitted with USTA Comments in Telephone/Cable Crossownership.

<sup>58</sup> 47 U.S.C. § 541(b).

to competitive video program delivery.<sup>59</sup> The Cable Act of 1984 defines "cable service" as "the one-way transmission to subscribers of (i) video programming, or (ii) other programming service."<sup>60</sup> The Act goes on to define "video programming" as "programming provided by, or generally considered comparable to programming provided by, a television broadcast station"<sup>61</sup> and "other programming service" as "information that a cable operator makes available to all subscribers."<sup>62</sup> Thus, any video programmer wanting to provide video programming to subscribers must have a local franchise from the local franchising authority. If that franchised cable operator wants to lease channel service transmission from the local telephone company it may do so subject to the carrier receiving Section 214 approval from the FCC.<sup>63</sup> But anyone else wanting to lease the same common carrier channel service -- from a proposed competing cable system to a stand-alone sports or movie channel or even the local Little League or

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59 The National Telecommunications and Information Administration (NTIA) recently concluded in a report on the cable television industry that "the franchise process, as currently structured, often disserves the public interest" The report went on to recommend that local franchising authorities "no longer grant exclusive cable franchises" but, instead, "permit, even encourage, entry by competitive cable service providers." NTIA Report at 30-31. The report went on to recommend that local exchange carriers be permitted "to lease video channels to anyone, not just franchised cable authorities or franchising authorities;..." at 39.

60 47 U.S.C. § 522(5)(A).

61 Id. at § 522(16).

62 Id. at § 522(11).

63 See supra at para. 37.

theatre group -- must first receive its own cable franchise from the local franchising authority -- usually the city. That's not easy given the incentives of an incumbent cable operator to oppose such an application, pointing out to the city how "unfair" it would be to permit a competitor that did not have to meet the same terms and conditions of operation and contribute a percentage of its gross revenues to the city as a franchise fee.<sup>64</sup> No national video program service will ever develop if it first must go to every city hall in the country and defend itself against claims of unfair competition such as "cream skimming" in order to receive permission for leasing channel service from the local telephone company.

40. The Cable Act's local franchise requirement may not be sustainable, however, when provision of video programming simply means paying to interconnect with a broadband port on a switch.

41. Several recent court cases have cast serious doubt on the constitutionality of various aspects of the cable television franchising process. While most courts have recognized the need for some regulation and a franchise based on the legitimacy of a city's "interests in public safety

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<sup>64</sup> See, e.g., L. Jaffee, "MN Passes Fairness Law Regarding Cable Overbuilds," Multichannel News, May 30, 1988, at 11; L. Jaffee, "Illinois Establishes Overbuild Law," Multichannel News, September 5, 1988, at 15; L. Haugsted, "California Passes Overbuild Bill," Multichannel News, September 5, 1988, at 15; J. Terranova, "NJ Officials Reject Three Overbuild Applications," Multichannel News, September 19, 1988, at 19.

and in maintaining public thoroughfares,"<sup>65</sup> a number of cases have rejected the ability of cities to restrict that franchise to a single operator.<sup>66</sup> In addition, these cases have invalidated access channel and universal service requirements as being content related restrictions infringing on the cable operators' First Amendment rights of free speech.<sup>67</sup> Further, these decisions invalidated certain viewpoint-neutral, or noncommunicative, aspects of the franchise requirements for technical specifications including state-of-the-art technology as failing to meet the test articulated by the Supreme Court in United States v. O'Brien. That test identifies four conditions that the government must meet to justify imposing content neutral regulations on speech (e.g., the provision of video programming): the regulation must (1) be within the constitutional power of the government; (2) it must further an important or substantial governmental interest that (3) is unrelated to the suppression of free expression; and (4) "the

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65 Century Federal, Inc. v. City of Palo Alto, CA, 648 F. Supp. 1465, 1477 (N.D. Cal. 1986) (Century Federal II), citing Preferred Communications, Inc., v. City of Los Angeles, 754 F.2d 1396, 1406 (9th Cir. 1985), aff'd on other grounds, \_\_\_ U.S. \_\_\_, 106 S. Ct. 2034 (1986). See also Group W Cable, Inc. v. City and County of Santa Cruz, No. C-84-7456-WWS, slip op. at 26 (N.D. Cal. 1987) (Group W).

66 See, e.g., Century Federal II; Group W; Pacific West Cable Co. v. City of Sacramento, CA, Civil No. S-83-1034 MLS, slip op. (E.D. Cal. 1987).

67 Century Federal, Inc. v. City of Palo Alto CA, No. C-85-2168 EFL, slip op. at 8-9 (D.N.D. Cal. 1987) (Sept. 1, 1987) (Century Federal III); Group W, slip op. at 33 (public access requirements violate First Amendment). Not all courts, however, agree with these positions. See, e.g., Erie Telecommunications, Inc. v. City of Erie, 659 F. Supp. 580 (W.D. Pa. 1987), aff'd. on other grounds, \_\_\_ F.2d \_\_\_, No. 87-3648, (3rd Cir. 1988).

incidental restriction on first amendment freedoms [must be] no greater than is essential to the furtherance of that interest."<sup>68</sup>

42. If cities derive their authority to grant cable television franchises and regulate cable systems from their "important or substantial governmental interest in minimizing disruption to the public domain...",<sup>69</sup> then what happens when delivery of video programming no longer requires "protecting public safety and maintaining public thoroughfares"?<sup>70</sup> While today's cable systems are physically separate facilities and even telephone carrier channel service is provided over a physically separate facility requiring "disruption to the public domain," tomorrow's channel service over integrated broadband networks will require only electronic access to the carrier's network through a switch or some other device.

43. Where is the "important or substantial government interest" that will enable cities to constitutionally license video programmers in an integrated broadband environment where the telephone network is built under existing state authority and there is no disruption to public safety or

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68 United States v. O'Brien, 391 U.S. 367, 377 (1968).

69 Century Federal II, 648 F. Supp. at 1477.

70 Group W, slip op. at 24.

thoroughfares?<sup>71</sup> This question likely will be litigated by a non-franchised video programmer seeking to lease channel service on an integrated broadband network and, if the California decisions are affirmed, local governments will have an extremely difficult time meeting their burden to show an "important and substantial interest" in licensing speech.

44. Although the local franchise requirement may be constitutionally unsustainable in the face of universal integrated voice, data, and video networks, in the short term, this franchising requirement is a potentially anticompetitive tool that can be used to thwart competitive video programming, thereby affecting broadband network deployment.

45. The franchise requirement for providing video programming may become even more restrictive as traditional data and text services and broadcast television look more alike. For example, broadcast television already includes home shopping channels with still pictures and financial news channels with text and stock prices crawling across the screen and data

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71 The legislative history of the Cable Act of 1984 specifically states that the term "franchise" "does not include any authorization issued under section 214 of the Communications Act of 1934, or under any provision of any state law regarding the construction or extension of the facilities of communications common carriers." Cable Franchise Policy And Communications Act of 1984, Committee on Energy and Commerce, Report 98-934, at 45. Notwithstanding this limitation on the statutory meaning of a "franchise" a video programmer may no longer need a local cable service franchise under the O'Brien test in an integrated broadband environment because the local exchange carrier already is regulated for purposes of protecting the public domain under common carrier regulations.

bases soon may include color graphic images, photographs, and video clips.<sup>72</sup> At what point does videotext become "video programming?" When images are full color and high resolution? Or when those images begin to move? Or when they move very fast? Will cities be deciding who needs a local cable franchise depending on how fast a videotex image changes? If so, then some services available today and soon to be offered may find themselves regulated for the first time.

46. This section has identified regulatory barriers that stand in the way of local exchange carriers deploying integrated broadband technology.<sup>73</sup> Carriers likely will deploy new fiber optic technology despite these barriers,<sup>74</sup> but the pace of deployment may be significantly delayed and the provision of broadband capabilities greatly diminished. Even if these barriers are overcome and integrated broadband networks are deployed, significant regulatory and policy questions will remain. These questions are the focus of the next section.

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72 See, e.g., G.P. Zachary, "Awaiting the Next Generation of Personal Computers," Washington Post Washington Business, July 11, 1988, at 25.

73 As noted earlier (supra at n. 4), significant regulatory barriers limit cable operators' ability to provide facilities and services in competition with local telephone companies. While not the focus of this paper, those barriers are as significant to preventing a competitive environment for local telecommunications as those discussed in this section.

74 See discussion of fiber optic technology supra at para. 10.

#### IV. REGULATORY QUESTIONS AND ISSUES

47. Whether the foregoing regulatory barriers are overcome and integrated broadband networks are deployed relatively rapidly, or the barriers remain and integrated broadband networks evolve over a longer period of time, these new networks eventually will become available to significant portions of the nation. And as these networks begin to be deployed, they will severely strain existing regulatory practices. Indeed, the policy and regulatory implications of broadband network development are so potentially significant that the present way of conducting regulatory business will be challenged and many existing rules and regulatory practices may become superfluous and/or counterproductive.

48. This challenge will arise whether or not telephone/cable crossownership restrictions are modified. Indeed, for the most part, the questions and issues raised in this section deal with common carrier regulation in an integrated broadband environment. Thus, whatever the outcome of the telephone/cable crossownership debate, policymakers will have to address and answer these questions raised by IBN deployment.

49. This section identifies eight areas of regulatory questions or issues regarding IBN deployment: state/federal jurisdiction; pricing and cost allocations; network design and terminal equipment rules; appropriate

regulatory safeguards; carrier first amendment rights; audiotex censorship; copyright; and social policies.

A. State/Federal Jurisdiction

50. Today's procedures for assigning regulatory jurisdiction will have to be reexamined in light of IBN development. Currently, all regulatory aspects of channel service are preempted by the federal government (i.e., the Commission). As integrated broadband networks develop, the question of whether channel service should -- or even could -- remain a preempted service will have to be addressed.

51. In the past, channel service has been provided by telephone companies building a separate coaxial cable network and leasing it to the local franchised cable operator under what looked very much like a special construction tariff. The regulation of channel service was preempted by the FCC because traditional cable television service was based on the retransmission of over-the-air television signals deemed to be interstate by the Communications Act.<sup>75</sup> The Commission's decision was challenged on the grounds that channel service was exempt from FCC regulation because of the

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<sup>75</sup> General Telephone Company of California, 13 FCC 2d 448, 454 (1968), aff'd, General Telephone Co. of California v. F.C.C., 413 F. 2d 390 (D.C. Cir.), cert denied, 396 U.S. 888 (1969).

intrastate reservation of Section 2(b)<sup>76</sup> of the Communications Act. The Court of Appeals upheld the Commission quoting from United States v. Southwestern Cable Co., "The stream of communication is essentially uninterrupted and properly indivisible. To categorize respondents' activities as intrastate would disregard the character of the television industry."<sup>77</sup> The Court also rejected claims that channel service was "telephone exchange service" exempt from Commission jurisdiction but on the basis that "clearly, CATV channel distribution service does not contemplate furnishing subscribers with 'intercommunicating service' of the type usually identified with a telephone exchange."<sup>78</sup> Of course, as cable operators offer "intercommunicating" services, the courts may reinterpret this application of the Communications Act.

52. Important jurisdictional questions are raised by the Section 214 approval process itself. Today, if a local exchange carrier wants to offer channel service it must receive Section 214 approval from the FCC.<sup>79</sup> However, if the local broadband network is built, cost justified, and "proved in" for POTS, based on a local carrier's state authority to

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76 47 U.S.C. § 152(b).

77 413 F. 2d at 401 (quoting from United States v. Southwestern Cable Co., 392 U.S. 157, 169 (1968)).

78 413 F.2d at 401, n. 19.

79 See supra at paras. 37-38.

construct facilities, no federal approval would be necessary. Suppose the carrier upgrades the system to provide broadband transmission and offers channel service or its own video programming if the crossownership rules are relaxed. Is federal approval needed? At the moment, the answer appears to be yes -- at least for the facilities required to provide channel service. But what about in the future when the upgrade may only be a software change? At what point will requiring federal 214 approval be merely perpetuating a fiction (i.e., that there are directly identifiable and assignable costs associated with providing broadband transmission for cable channel service distinct from other broadband services) that is no longer technologically sustainable?

53. The fundamental question, of course, is whether channel service on an integrated broadband network should remain a federally preempted interstate service when other broadband services presumably will not be federally preempted? It could as easily be viewed as an interstate access service or even a local service to be regulated by the states. More basically, in a digital world, how will regulators be able to distinguish one service -- or bit stream -- from another? At a recent NARUC meeting, state regulators passed a resolution calling for state control of fiber

networks<sup>80</sup> as did the Florida Public Service Commission in comments to the FCC on telephone/cable crossownership.<sup>81</sup> As integrated broadband networks are deployed, will some be regulated by the states (with costs allocated to intrastate accounts) while others will be regulated by the FCC (with all costs in interstate accounts) depending merely on whether video programming is offered at the time of construction? Such an outcome makes no sense from a regulatory or public policy point of view. In addition, such an arrangement may present opportunities for carriers to game the regulatory process and shift costs from one jurisdiction to another.

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80 "NARUC Communications Panel Also Authors Resolutions on ONA/CEI, ARCO Order Appeal, Cable/Telco Cross-ownership, Other Issues; Group Tables Praise for AT&T '900' Action," Telecommunications Reports, March 7, 1988, at 14. In passing Resolution #9, NARUC did not consider the jurisdictional separations implications of moving channel service regulation to the states. In addition to passing the telephone/cable crossownership resolution, the convention also passed Resolution #8 calling on Congress to modify the Cable Act of 1984 to permit cities and states to regulate local cable rates again.

81 Florida Public Service Commission Comments in Telephone/Cable Crossownership at 3. ("The FPSC believes that loop facilities should be tariffed in the state jurisdiction and that revenues from all services, with the exception of traditional interstate toll and private lines, should accrue to the state jurisdiction.")

## B. Cost Allocations and Pricing

54. The questions of allocating costs and pricing service are difficult enough today.<sup>82</sup> They will be many more times difficult in an integrated broadband environment when each customer is served by a gigabit or terabit optical pipe the use of which is dynamically reconfigured as the customer uses different services and facilities. Historical methods of measuring relative use become meaningless in such an environment.

55. Traditional channel service is supplied by a physically separate facility for which most costs can be directly assigned and for which the Commission requires separate books of account.<sup>83</sup> The price charged for the

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82 Indeed, some have argued that even without complicating the situation with integrated broadband networks, today's methods are less than precise. For an excellent discussion of historical change in telecommunications costing and pricing practices, see C. L. Weinhaus and A.G. Oettinger, Behind the Telephone Debates (Norwood, NJ: Ablex Pub. Co., 1988); see also A.G. Oettinger, The Formula is Everything: Costing and Pricing in the Telecommunications Industry, P-88-2, Program on Information Resources Policy, Harvard University, Cambridge, MA, 1988. Oettinger concludes in part:

In the mid-1980s it had been more fashionable to seek a more direct tie between prices and costs than in the fashion of other times, more because of the rhetoric of some increasing competition than because of the realities of competition. . . . Fairy tales abound for internal incentive, Internal Revenue, and other diverse purposes; in those realms, too, the formula is everything. Id. at 51.

83 See, e.g., Order and Certificate for Southern Bell Telephone and Telegraph Company to provide channel service in Lake Mary, FL, at 3 (File No. W-P-C-5931) (released July 29, 1987).

service usually is the result of negotiations between the telephone company and the cable operator rather than some cost based tariff. Integrated voice, data, and video over broadband networks will be much more difficult to cost and price using today's procedures.

#### 1. Jurisdictional Separations and Cost Allocation

56. Today, all costs incurred by local exchange carriers are subject to a process called "jurisdictional separations" which divides the costs between the interstate and intrastate jurisdictions. As with Section 214 approval and federal preemption, questions of how to allocate network costs between the federal and state jurisdictions are among the most difficult raised by integrated broadband network development. They are difficult because they are largely arbitrary, driven more by political considerations than by conceptual principles.

57. Virtually all costs and revenues associated with operating a regulated local exchange carrier -- especially Class A companies with over \$100 million in regulated telecommunications revenues -- are subject to Part 32 of the Commission's Rules, the Uniform System of Accounts (USOA).<sup>84</sup> Costs and revenues for unregulated activities are segregated out based on

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<sup>84</sup> 47 CFR 32.1 et seq.

each carrier's Cost Manual, approved according to procedures adopted in the Commission's Joint Cost Proceeding.<sup>85</sup> Once all costs and revenues have been assigned to specific accounts, they are "separated" between the federal and state jurisdictions according to procedures specified in Part 36 of the Commission's Rules.<sup>86</sup> Finally, Part 69 of the Commission's Rules specifies criteria for assigning interstate costs to various interstate access and non-access accounts.<sup>87</sup> The rules for assigning costs to access accounts are very specific (except for special access). Costs left over are assigned to a residual non-access category. Costs associated with non-traffic sensitive (NTS) plant are allocated 25 percent to the interstate jurisdiction.<sup>88</sup>

58. As noted earlier, channel service is a federally preempted and tariffed service. Therefore, all costs associated with channel service are supposed to be allocated to the interstate nonaccess accounts as a result of following Parts 32, 36, and 69 of the Commission's Rules. This is possible in a world of easily identifiable and directly assignable costs when channel

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85 Report and Order in CC Docket No. 86-111, FCC 86-564, 2 FCC Rcd 1298 (1987).

86 47 CFR 36.1 et seq.

87 47 CFR 69.1 et seq.

88 One concern about fiber deployment expressed by interexchange carriers (IXCs) is the extent to which such investment is increasing NTS costs that are recovered by carrier common line (CCL) charges -- usage sensitive access charges levied on IXCs and paid by their customers in the form of higher long distance rates.

service is provided by a separate plant. But what happens when channel service is only one of many dynamically expanding and contracting uses of a gigabit -- or terabit -- fiber pipe into the home? Will there have to be bit meters and special studies to determine average interstate and intrastate bits -- especially when costs are nonvariable?<sup>89</sup>

## 2. Pricing

59. The inherent arbitrariness of old fashioned rate base rate-of-return ratemaking, where tariffs are cost supported by attempting to assign costs to "cost causers," will become even more apparent if such regulation is applied to tomorrow's IBNs. Traditional voice telephony and broadband video transmission are so different that any attempt to price them using the same procedures or measures will likely prove futile. For example, if the future fiber network to the home has a gigabit capacity (a

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89 Indeed, in its Comments to the Commission in Telephone/Cable Crossownership, the Florida Public Service Commission (FPSC) asked the question of how to allocate costs between the interstate and intrastate jurisdictions:

A major issue . . . is one of the allocation of the costs of the fiber loop to be used for cable TV transmission. Historically, the local loop has been used for voice and data communications. The allocation procedures between the state and federal jurisdictions were based on an equitable division of costs between state and interstate voice and data communication. The introduction of fiber raises the issue of equitable cost recovery from a myriad of current and potential services provided over the facilities. Id. at 3.

terabit might be more likely) and a voice telephone call will use only 64kbps or even 32kbps, there will be a lot of capacity left over --something on the order of one billion minus 64 thousand. And if a television signal will require 45Mbps (or 150Mbps if it is high definition TV (HDTV)) and local telephone service is priced at a penny a minute -- the marginal cost of an intraLATA call -- a two hour movie would cost \$843.75 just for transmission.<sup>90</sup> Alternatively, if the broadband video transport is priced at a flat rate of \$15 per month -- comparable to basic cable television rates today -- then flat rate local telephone service would be priced at two cents per month.<sup>91</sup>

60. The notion of trying to set prices based on some measure of relative use becomes even more absurd if they are based on a combination of throughput and actual minutes of use patterns -- the average residential telephone is used only about 23 minutes each day while the average television set is on approximately seven hours daily.<sup>92</sup> Thus, if relative

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90 At 45Mbps, a television transmission requires 703.125 times as much capacity as a 64kbps telephone call ( $45,000\text{kbps}/64\text{kbps}=703.125$ ). If priced based upon the marginal intraLATA telephone cost of \$.01/minute, a minute of television transmission would cost \$7.03 ( $$.01 \times 703.125 = \$7.03$ ) and a 120 minute movie would cost \$843.75 ( $\$7.03 \times 120 = \$843.75$ ). Put another way:  $($.01)(45,000/64)(120) = \$843.75$ .

91 Because a 45Mbps television transmission uses 703.125 times the capacity of a 64kbps telephone transmission, if the monthly flat rate for the television transmission is \$15.00 then, based on relative capacity, telephone service should be priced at \$.021/month ( $\$15.00/703.125$ ). [ $\$15.00/(45,000/64) = \$.021$ ].

92 "1988 Report on Television," A.C. Nielsen Co., Northbrook, IL, at 6.

use is based on time and throughput, the \$15.00 per month basic video charge would translate into flat rate telephone service of one-tenth of a cent per month.<sup>93</sup> The easiest -- though not necessarily cost-based -- pricing solution may be to price access to future integrated broadband networks on a flat rate basis at a level comparable to today's flat rate local telephone service and cable television service combined.<sup>94</sup>

61. The relative use question raises another important technical/policy question. Television viewing patterns are significantly different from residential telephone calling. It has already been noted that the average daily television set use is more than 18 times that of the average residential telephone. But there is another important difference. Local telephone usage is distributed throughout the day with much of the residential calling at times different from peak business use, and the telephone network is engineered to reflect this traffic distribution and

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93  $\$15.00 / (45,000\text{kbps} / 64\text{kbps}) (7 \times 60\text{minutes} / 23\text{minutes}) = \$.0012$

94 Such a solution would result in a flat monthly rate of approximately \$40 a month for residential consumers and slightly more than that for business customers. J.L. Lande, "Telephone Rates Update," Industry Analysis Division, Common Carrier Bureau, Federal Communications Commission, June 30, 1988; "NCTA study shows that post-dereg rates up average 6.7%," Broadcasting, November 30, 1987, at 86; and "Programmed for Growth, Why Cable TV Turns on Viewers and Investors," Barron's, March 28, 1988, at 9. For a discussion of pricing in an ISDN and broadband ISDN (BISDN) environment, see L. Anania and R.J. Solomon, "ISDN: User Arbitrage & the Flat Rate Solution," paper presented at the Seventh International Telecommunications Society meeting, Cambridge, MA, July 1, 1988.

minimize costs -- if everyone tried calling at once the network would become overloaded and most callers would get a busy signal. Television viewing patterns are different. At 9:30 on the average winter evening, 68 percent of the homes in America are watching television.<sup>95</sup> And for special events, such as the SuperBowl, viewing is even higher. The integrated broadband network of the future may use extremely fast packet switches but, until it does and if the broadband network of the future is to be truly switched, it will require a capacity far exceeding switches today.<sup>96</sup> And that leads to questions of how to pay for and allocate the costs of the new technology.

### C. Network Design and Terminal Equipment

62. Another difficult regulatory question raised by fiber based integrated networks is how to prevent rules developed to protect competitive terminal equipment markets in a copper-based POTS and narrowband data environment from dictating technological solutions in an integrated broadband fiber optic environment. Rules designed to govern an analog/electrical network will have to change in an digital/optical environment, or run the risk of skewing technological development. For example, as the fabric of the network evolves and takes on some of the

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95 A.C. Nielsen, "1988 Report on Television," at 5.

96 For a discussion of how fast packet switches and digital compression technology might change the nature of this problem, see Anania and Solomon, "ISDN: User Arbitrage & the Flat Rate Solution," supra at n. 94.

functionality of customer premises equipment (CPE), functional distinctions between terminal equipment<sup>97</sup> and networks blur.

63. The Commission opened the CPE market to competition over time beginning with its Carterfone decision limiting carrier restrictions on terminal equipment to those necessary to prevent technical harm to the network.<sup>98</sup> In 1975 the Commission created its Part 68 registration program under which any user may connect any terminal equipment to the network as long as the equipment is registered with the Commission and will not harm the network.<sup>99</sup> In the Second Computer Inquiry (Computer II),<sup>100</sup> the

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97 The terms "CPE" and "terminal equipment" are used interchangeably referring equipment on the customer's premises ranging from "plain old telephones" to sophisticated private branch exchanges (PBX) that can perform switching and other functions.

98 In the Matter of the Carterfone Device in Message Toll Tel. Service, 13 FCC 2d 420, aff'd., 14 FCC 2d 571 (1968). The earlier Hush-A-Phone decision prohibited restrictions on using non-electrical equipment with telephone company supplied CPE. Hush-A-Phone v. United States, 238 F. 2d 266 (D.C. Cir. 1956).

99 47 CFR 68.1 et seq. Interstate and Foreign Message Toll Telephone, First Report and Order, 56 FCC 2d 593 (1975), modified on recon., FCC 2d 716 (1976), aff'd sub nom. North Carolina Util. Commission v. FCC, 552 F. 2d 1036 (4th Cir.), cert. denied, 434 U.S. 874 (1977).

100 Second Computer Inquiry, Final Decision, 77 FCC 2d 384, modified on recon., 84 FCC 2d 50 (1980), further modified on recon., 88 FCC 2d 512 (1981), aff'd sub nom. Computer and Communications Industry Ass'n v. FCC, 693 F. 2d 198 (D.D. Cir. 1982), cert. denied, 461 U.S. 938 (1983), aff'd on second further recon., FCC 84-190 (released May 4, 1984).

Commission detariffed embedded CPE owned by AT&T<sup>101</sup> but required that it be provided through separate subsidiaries. The Commission then established nonstructural safeguards under which AT&T and the BOCs could offer deregulated CPE.<sup>102</sup>

#### 1. Network Channel Terminating Equipment

64. A particular type of CPE called network channel terminating equipment (NCTE) has presented particular problems for the Commission as it has deregulated CPE, and the advent of fiber optic IBNs is likely to further complicate the situation. NCTE is a generic term for devices located on customers' premises that provide an interface between the network and terminal equipment and perform functions that support digital communications. NCTE often is offered separately from other CPE, but NCTE

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101 Procedures for Implementing the Detariffing of Customer Premises Equipment (Second Computer Inquiry), Report and Order, 95 FCC 2d 1276 (1983) (CPE Detariffing Order), aff'd on recon., 100 FCC 2d 1290 (1985).

102 See Furnishing of Customer Premises Equipment and Enhanced Services by American Telephone and Telegraph Co., Order, 102 FCC 2d 655 (1985) (AT&T Structural Relief Order); modified on recon., FCC No. 86-341 (released August 7, 1986) (AT&T Structural Relief Reconsideration Order); and Furnishing of Customer Premises Equipment by the Bell Operating Telephone Companies and the Independent Telephone Companies, Report and Order, 2 FCC Rod 143 (1987) (BOC CPE Relief Order), modified on recon., 3 FCC Rod 22 (1988).

functions may also be built into terminal equipment.<sup>103</sup> Under current rules, NCTE is treated as unregulated CPE<sup>104</sup> and may not be provided by a BOC as part of its regulated network, with a narrow exception for certain multiplexing functions that include on premises multiplexers facilitating "provision of tariffed basic service offerings of (a) two or more communications channels for a single customer, or (b) individual channels to two or more customers."<sup>105</sup> Other NCTE-like functions, may be provided by carriers as part of their regulated network offering, only if necessary equipment is on the network side of the customer's demarcation point.<sup>106</sup> The Commission will, however, grant waivers of its NCTE rules on a

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103 Amendment of Sections 64.702 of the Commission's Rules and Regulations, CC Docket No. 85-229, Report and Order, 104 FCC 2d 958, 1114, n. 378 (1986) (Third Computer Inquiry) modified on recon., 2 FCC Rcd 3035 (1987) (Phase I Recon Order), further recon., 3 FCC Rcd 1135 (1988) (Phase I Further Recon Order).

104 Amendment of Part 68 of the Commission's Rules, 94 FCC 2d 5 (1983), recon. denied, FCC 84-145 (released April 27, 1984) (NCTE Decision).

105 Amendment of Sections 64.702 of the Commission's Rules and Regulations, CC Docket No. 85-229, Phase II Report and Order, 2 FCC Rcd 3072, 3105-06 (1987) recon. denied, 3 FCC Rcd 1150 (1988) (Phase II Recon), appeal pending People of the State of California v. FCC, Case No. 87-7230 (9th Cir. May 28, 1987). Computer III, Phase II rejected arguments that the multiplexer exception should be expanded. In its LADT Order, the Commission clarified the multiplexer exception by finding that devices such as data subscriber line carriers (DSLCS) located on customer premises that perform multiplexing as well as functions performed by NCTE and modems should be treated as unregulated CPE. International Business Machines Corp., Memorandum Opinion and Order, 58 Rad. Reg. 2d (P&F) 374 (1985).

106 Loopback testing may be provided by equipment on customers' premises, for example, as long as (a) no functions of competitively supplied NCTE are affected and (b) the NCTE functionality provided to supply the loopback test may be used only for that purpose. Third Computer Inquiry, Phase II Report and Order, 2 FCC Rcd at 3105 (para. 232).

case-by-case basis based on a public interest finding that unregulated CPE will not permit "comparable efficiencies."<sup>107</sup>

65. At this point, it is unclear how fiber optic networks fit into the Commission's NCTE rules. Several functions must be performed when fiber is used for transmission all the way to the customer's premises. First, optical signals must be converted to electrical signals. Second, multiple signals must be multiplexed (or demultiplexed). And third, as long as CPE such as television receivers are analog, digital signals must be converted to analog signals where necessary. These steps are necessary whether the fiber network is used for narrowband ISDN or transmission of integrated broadband services.

66. Although the FCC has stated that "carriers may provide versions of SLCs [subscriber loop carriers] that are designed to be used with fiber optic loop plant on customers [sic] premises as part of regulated equipment,"<sup>108</sup> the Commission has not yet comprehensively addressed how fiber optic networks and the equipment necessary to perform essential

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107 Id. (para 234).

108 Computer III, Phase II Recon, 3 FCC Rcd at 1175, n. 242.

interface functions<sup>109</sup> fit into its Part 68 Rules, including those governing NCTE.<sup>110</sup> Questions that will have to be answered include: can such equipment be competitively supplied? Does it make sense to require users --especially residential consumers -- to provide their own interface equipment? Should the necessary interface devices be treated as NCTE or be exempt from NCTE restrictions because they do not perform "traditional" NCTE functions? Should these devices be treated as multiplexers? Should carriers be permitted to supply such equipment as part of basic service if it is on customer's premises but on the network side of the demarcation? Although the Commission has said it will entertain waiver requests on a case-by-case basis from carriers wanting to provide equipment which performs NCTE-type functions on a regulated basis and on customer premises,<sup>111</sup> it eventually will have to answer these questions in a comprehensive way if fiber is to replace copper in any meaningful way.

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109 There are several names used for devices that perform optical/electrical conversions including optical interface unit (OIU) and optical network interface (ONI).

110 The Commission has placed on public notice a petition from EDS asking the Commission to clarify that its Part 68 standards do not apply to digital services provided on non-metallic (i.e., fiber optic) circuits. Report and Order, CC Docket No. 86-423, In the Matter of Petition for Modification of Sec. 68.318(b) of the Commission's Rules, 2 FCC Rcd 6543 (1987). Parties have filed comments and reply comments with most LECs opposed to eliminating NCTE requirements for digital services over fiber optic facilities. "EDS, Most BOCs Opposed on NCTE Requirement for Digital Services Over Fiber Facilities," Telecommunications Reports, December 28, 1987, at 30. In the same docket, the Commission also modified its Part 68 rules to eliminate the requirement that carriers provide line power on 1.544Mbps (T-1) service.

111 Computer III, Phase II Recon, 3 FCC Rcd at 1167.

## 2. Powering Fiber Systems

67. A further question related to terminal equipment is who should be responsible for providing power for a fiber optic system? While today's telephone network provides electrical power over the copper telephone lines sufficient to drive most single-line POTS CPE, including ringing the ringer, a fiber optic system carries no electrical power with it. Therefore, as is true with PBXs and key systems requiring external power, fiber optic terminal equipment, including the customer's interface unit, will require separate power. This is true whether or not the fiber system is used for integrated broadband services or only for narrowband telephony. Because of the powering requirements and the public safety implications (i.e., need to prevent interruption of telephone service), most plans for fiber deployment include back-up batteries that will permit customers to use their telephones for up to eight hours.<sup>112</sup>

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112 Another related question is who will supply the batteries? Will they be part of the network with the carrier responsible for provision, maintenance, and replacement? Or will batteries be considered CPE and be competitively supplied with customers responsible for periodically checking to see if they are still good and replacing them at the end of their five-year life? What happens when some premises are still served by a copper network in which local tariffs include the cost of electricity while other premises are served by a fiber network in which the customer pays directly for all power? Will both customers pay the same rate even though the costs differ (electricity for POTS today has been estimated at about \$.35 per month depending upon how many incoming calls are received -- the greatest draw on power is driving the ringer)? Will electricity be unbundled and supplied only where it is needed or wanted (e.g., a customer who only calls out on a line)? The FCC has not yet formally addressed these

D. Appropriate Safeguards Against Anticompetitive Behavior

68. An important question for policymakers and regulators as local exchange carriers develop and deploy integrated broadband networks is whether -- and if so, what kinds of -- regulatory safeguards are necessary and appropriate to enable technological development while preventing anticompetitive behavior by the carriers. The question exists whether LECs develop broadband networks solely on a common carrier basis or telephone/cable television restrictions are modified and carriers provide video programming within their telephone service areas. In either instance, the regulatory and competitive concern is how to minimize the possibility of unwarranted cross-subsidies and discrimination against some customers -- the content/information service providers. While the questions are the same in either case, the remedies may differ depending upon whether the carrier is also a content/information provider.

69. As long as a LEC has substantial market power, whether or not it is a content/information provider, it should be required to offer broadband transport on its integrated broadband network on a common carrier basis

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questions either and, indeed, some probably are within state jurisdiction and will have to be addressed by state regulators.

under Section 202(a) of the Communications Act which prohibits "any unjust or unreasonable discrimination" among users.<sup>113</sup> Thus, in the case where the local carrier is not in the content business and merely provides transport under tariff in the integrated broadband environment, it should not be permitted to have exclusive arrangements with any content provider such as a franchised cable operator. Unlike today's channel service, which is analogous to a tariffed special construction agreement, once a carrier offers broadband transport such as channel service on an integrated network to any content/information provider, the carrier should be required to provide that service to all legally qualified customers<sup>114</sup> on a nondiscriminatory basis.

70. Where the LEC also is a content/information provider -- if the telephone/cable crossownership rules and MFJ restrictions are relaxed -- the

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113 47 U.S.C. 202(a) reads:

It shall be unlawful for any common carrier to make any unjust or unreasonable discrimination in charges, practices, classifications, regulations, facilities, or services for or in connection with like communication service, directly or indirectly, by any means or device, or to make or give any undue or unreasonable preference or advantage to any particular person, class of persons, or locality, or to subject any particular person, class of persons, or locality to any undue or unreasonable prejudice or disadvantage.

114 Until the local cable franchise requirement is changed by Congress or the courts, only locally franchised cable service will be legally qualified to lease channel service for delivering video programming directly to subscribers. See supra at paras. 39-45.

question of preventing the carrier from discriminating in favor of its own unregulated content/information activities becomes more complicated. These questions are not new; the Commission has in place a set of safeguards designed to prevent cross-subsidies and discrimination where carriers are involved in both regulated and unregulated activities. The Commission's Joint Cost Order<sup>115</sup> established procedures to prevent carriers from shifting costs of unregulated activities to ratepayers of regulated services that could result in cross-subsidization, misallocation of joint and common costs, and improper intra-corporate transfer pricing.<sup>116</sup> In addition, the Commission and many states are considering alternatives to traditional rate-based rate-of-return regulation that would reduce incentives and the

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115 Report and Order in CC Docket 86-111, 2 FCC Rcd 1298 (Joint Cost Order), recon., 2 FCC Rcd 6283 (1987), further recon. pending, appeal pending Southwestern Bell Tel. Co. v. FCC, Case No. 87-1764 (D.C. Cir.) See also applicability of the Joint Cost Order to provision of channel service in Further Notice in Telephone/Cable Crossownership at para. 51.

116 The problems associated with jurisdictional cost allocations discussed above (supra at paras. 56-58) are not nearly as great in identifying and directly assigning interstate costs to regulated and unregulated activities under the Joint Cost Order in today's environment where there is little interstate plant used jointly for regulated and unregulated activities. In a future integrated broadband environment, however, the difficulty of identifying and assigning regulated and unregulated costs is likely to increase. A mitigating factor may be that the Joint Cost rules will require carriers to design and deploy new facilities to facilitate cost assignment.

ability of carriers to shift costs from unregulated to regulated activities.<sup>117</sup>

71. In addition, in the context of its Third Computer Inquiry,<sup>118</sup> (Computer III) the Commission created what might be an appropriate model for providing nondiscriminatory access for broadband content/information service providers. In that proceeding, the Commission required the Bell Operating Companies to submit Open Network Architecture (ONA) plans for providing enhanced service providers access to underlying "basic service elements" necessary to their operation.<sup>119</sup> In addition, if a BOC wants to offer an enhanced service before its ONA plan is approved, it can do so but only after the Commission approves a service specific plan for Comparably Efficient Interconnection (CEI)<sup>120</sup> by competing enhanced service providers. Further Computer III safeguards against discrimination include imposing network

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117 See, e.g., Policy and Rules Concerning Rates for Dominant Carriers, CC Docket No. 87-313, Notice of Proposed Rulemaking, 2 FCC Rcd 5208 (1987), Further Notice of Proposed Rulemaking, 3 FCC Rcd 3195 (1988). For a discussion of why alternatives to rate-of-return regulation are necessary in today's increasing competitive environment see, e.g., J.R. Haring and E.R. Kewerel, "Competition Policy in the Post-Equal Access Market," OPP Working Paper 22, Office of Plans and Policy, Federal Communications Commission, February 1987; and FNPRM in CC Docket No. 87-313, 2 FCC Rcd at 3211-3271.

118 See Supra at n. 103.

119 Phase I Report and Order, 104 FCC 2d at 1059; Phase I Recon., 2 FCC Rcd at 3035. For a discussion of how Computer III safeguards might apply to telephone/cable crossownership, see Further Notice in Telephone/Cable Crossownership at paras. 47-56.

120 Phase I Report and Order 104 FCC 2d at 1018.

disclosure obligations on AT&T and the BOCs<sup>121</sup> and restricting AT&T and BOC use of Customer Proprietary Network Information (CPNI).<sup>122</sup>

72. Computer III safeguards may only be a model for ensuring nondiscrimination where a carrier might provide video programming or other content based information over its own lines because: (1) today, the BOCs are the only local exchange carriers subject to Computer III safeguards; and (2) not all information provision services are enhanced services and thus might not be subject to the Computer III safeguards.<sup>123</sup> To the extent cable services or other content/information services take on characteristics of

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121 Id. at 1077. Phase II Report and Order, 2 FCC Rcd at 3086-93; Phase II Recon. 3 FCC Rcd at 1158-61.

122 Phase II Report and Order, 2 FCC Rcd at 3093-99; Phase II Recon., 3 FCC Rcd at 1161-64.

123 Section 64.702 defines "enhanced service" as, services, offered over common carrier transmission facilities used in interstate communications, which employ computer processing applications that act on the format, content, code, protocol or similar aspects of the subscriber's transmitted information; provide the subscriber additional, different or restructured information; or involve subscriber interaction with stored information.

47 CFR 64.702. While very similar, the MFJ defines "information service" as,

the offering of a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information which may be conveyed via telecommunications, . . .

552 F. Supp. at 229. In addition, the Court's March 7, 1988, Opinion refined the subset of information service, "electronic publishing" as a prohibited BOC activity:

. . . the provision by a Regional Company of any information which that Regional Company or its

enhanced services, however, their offering by a BOC would be subject to Computer III safeguards. Until that occurs, the Commission and state regulators will have to establish appropriate mechanisms to ensure nondiscriminatory access to LEC networks for provision of competitive broadband content/information services.

73. A question related to appropriate safeguards is whether local exchange carriers should be permitted to enter the business of providing content by buying incumbent competitors (i.e., cable television operators)? And, if so, what safeguards are necessary to protect and/or foster competition in providing information/content such as video programming? If local exchange carrier entry into the information/content business merely means acquiring existing cable systems -- as some in the telephone industry have indicated<sup>124</sup> -- then competition would not be advanced. Thus, unless

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affiliates has, or has caused to be, originated, authored, compiled, collected, or edited, or in which it has a direct or indirect financial or proprietary interest, and which is disseminated to an unaffiliated person through telecommunications.

United States v. Western Elec. Co., Inc., Civil Action No. 82-0192, slip op. at 32, n. 39 (D.D.C. March 7, 1988). Therefore, while provision of traditional cable service as the one-way transmission of video programming that is comparable to broadcast television (47 U.S.C. §§ 522(5),(16)), is an electronic publishing information service under the MFJ, it probably is not an enhanced service under the Commission's Rules. Future cable services provided over switched integrated broadband networks, however, may entail "subscriber interaction with stored information" or may restructure information. If that is the case, those cable services would come under the definition of enhanced services and be subject to Computer III safeguards.

<sup>124</sup> See, e.g., "Lee Cox: The industry's more-feared man tells why PacTel wants in cable," Multichannel News, August 15, 1988, at 46.

exchange carrier entry into information/content provision is conditioned on the kinds of open access safeguards discussed above, carrier entry will not necessarily promote the public interest.

74. One type of access not addressed by these safeguards is access to LEC poles and conduits -- pole attachments. As long as there is a competitive cable television industry that requires access to utility poles and conduits to reach their subscribers, discrimination is a potential problem especially if the utility also competes in delivering video programming. Although the Communications Act was amended to permit the FCC or the states to regulate pole attachment rates, terms, and conditions,<sup>125</sup> and the Commission has pole attachment regulations,<sup>126</sup> there is no federally guaranteed right of access to utility poles and conduits. While there are some state laws guaranteeing access, this question needs to be addressed to ensure that LECs cannot, through control of poles and conduits, anticompetitively affect incumbent cable operators or stymie new potential competitors.

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125 47 U.S.C. § 224.

126 47 CFR 1.1401-1415.

## E. Common Carriers and the First Amendment

75. In addition to the questions surrounding the constitutionality of the cable television franchising process in an integrated broadband environment addressed above,<sup>127</sup> regulators and policymakers may have to address the question of what first amendment rights, if any, does a common carrier have when it is both a utility providing nondiscriminatory transport for others and, at the same time, a speaker. While this question has not been addressed directly by the Supreme Court<sup>128</sup> or by regulatory agencies,<sup>129</sup> it has been raised by the telephone industry in the Commission's Telephone/Cable Crossownership Inquiry.<sup>130</sup> The question, however, is if LECs are allowed into the business of providing content over their regulated common carrier facilities, will precedents from cable television cases invalidating access requirements<sup>131</sup> extend to safeguards

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127 See supra at paras 41-43.

128 The AT&T trial court rejected BOC arguments that restrictions on information services violate their first amendment rights. 673 F. Supp. at 586, n. 273.

129 For an initial discussion by the Commission see Further Notice in Telephone/Cable Crossownership at paras. 75-78.

130 See, e.g., USTA Comments in Telephone/Cable Crossownership, at 39-53.

131 See supra at paras. 41-42. A further question is how, if at all, cable television first amendment protections would apply in cases where telephone companies acquire traditional cable systems?

imposed on LEC broadband networks? Will such an interpretation result in foreclosing LEC entry into content/information services because, once allowed, safeguards become unconstitutional? What, for example, are the implications, if any, of the Supreme Court's recent ruling invalidating a municipal ordinance regulating newspaper vending machines, holding that "even if the government may constitutionally impose content-neutral prohibitions on a particular manner of speech, it may not condition that speech on obtaining a license or permit from a government official in that official's boundless discretion."<sup>132</sup>

#### F. Audiotex Censorship by Telephone Companies

76. Local exchange carriers have created an additional issue related to the first amendment: censorship of non-LEC audiotex information services. Adult dial-it services, also know as "dial-a-porn" have become extremely controversial for carriers and regulators alike. The FCC recently issued notices of apparent liability for \$600,000 each against two audio information services for transmitting obscene messages in violation of the

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<sup>132</sup> City of Lakewood v. Plain Dealer Publ. Co., \_\_\_U.S.\_\_\_\_, 56 USLW 4611, 4615 (June 17, 1988) (emphasis supplied). Similarly, the Court's decision in Frisby v. Schultz held that a municipal ban on picketing in front of a particular residence is content neutral and therefore constitutional, while an ordinance permitting only some messages would be content based and, therefore, unconstitutional. \_\_\_U.S.\_\_\_\_, 56 USLW 4785 (June 27, 1988).

Communications Act<sup>133</sup> and one of those services has signed an agreement with the Commission agreeing to pay \$50,000 and cease operations.<sup>134</sup> In addition, Congress recently passed new legislation banning all dial-a-porn calls and increased penalties for obscene commercial dial-a-porn to \$250,000 and/or imprisonment of up to two years and, for indecent commercial dial-a-porn, to \$50,000 and/or six months imprisonment.<sup>135</sup> A number of state commissions are looking into adult 976 dial-it services,<sup>136</sup> and several regional BOCs have either banned or otherwise regulated dial-a-porn services.<sup>137</sup> The criteria used by carriers in determining which audiotex services are "objectionable" can be very subjective. For example, Michigan Bell is

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133 47 U.S.C. § 223(b). Notice of Apparent Liability, Intercambio, Inc., File No. ENF-88-03, FCC 88-158 (released July 6, 1988); and Notice of Apparent Liability, Audio Enterprises, Inc., File No. ENF-88-04, FCC 88-159 (released July 6, 1988).

134 "Agreement Reached With Audio Enterprises to Enforce 'Dial-A-Porn' Law," FCC Press Release 426, November 7, 1988.

135 "Harsher Penalty for Obscene Dial-A-Porn in Drug Bill; Telephone Liability Discussed," Telecommunications Reports, November 7, 1988, at 45.

136 See, e.g., "'976' Keeps States, Companies Busy; SW Bell Disconnects Live Lines After Court Victory," Telecommunications Reports, February 8, 1988, at 46; "States Still Busy with '976' Blocking; New York PSC to Probe Market Changes, Blocking," Telecommunications Reports, February 15, 1988, at 11; "NARUC has released survey of 976 services," Communications Daily, February 26, 1988, at 7; "Information Services Subject to Restrictions, Criticisms in Alabama, Arizona, New York," Telecommunications Reports, July 4, 1988, at 21.

137 See, e.g., K. Kilette, "Bell Atlantic Demands Limited Dial-Up Access," Communications Week, August 15, 1988, at 25; M. Fisher, "C&P Steps Up Attack on Party Lines," Washington Post, August 3, 1988, at B3; M. Fisher, "New Rules May Disconnect Area's 976 Calls," Washington Post, July 24, 1988, at A1; "Encouraged by Justice Letter to Pacific Telesis, US West Excluding 976 Sex Messages," Telecommunications Reports, May 30, 1988, at

reported to refuse billing customers for services that are: "inflammatory and likely to offend ethnic, gender, racial, or religious groups; lewd, lascivious, indecent, or obscene; . . . or likely to have a detrimental effect on Michigan Bell's image or reputation."<sup>138</sup> Does that mean that Michigan Bell could refuse to bill for a 976 audiotex consumer hotline that consistently complained about the telephone company's rates and service?

77. Given that one of cable television's attractions is the carriage of unedited adult movies that, while not obscene, have resulted in state censorship attempts, what confidence should a cable operator or other video programmer have that telephone companies will not censor broadband channel service just as they do 976 audiotex? If telephone companies permit only "non-objectionable" programming on their network will they be competitive

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35; J. Amparano, "US West to Ban 'Dial-a-Porn' Services on Its network; Other Bells May Follow," Wall Street Journal, May 31, 1988, at 2; "Phone Companies Take Steps Against Dial-a-Porn Services, New York Times, January 19, 1988, at A25.

138 "Michigan Bell Refuses to Bill for 'Objectionable' Services Under Ameritech Criteria," Telecommunications Reports, May 16, 1988, at 27. US West also has said that it "no longer will bill for any service that we believe could harm our reputation." See, A.M. Roussel, "Telcos Continue Quest for Answers to 976-Services Fray," Communications Week, February 29, 1988, at 25. And, Omnicall, an audiotex information service provider, has filed complaints with the Department of Justice against BellSouth and Bell Atlantic for policies against live 976 services including termination of service in Kentucky by South Central Bell which reportedly stated that it would "not provide billing and collection for live information services because of harm to its reputation." "Omnicall Writes Justice To Enlist Help Against BellSouth, Bell Atlantic '976' Limits on Live Service," Telecommunications Reports, August 29, 1988, at 14.

with today's cable systems -- and even over-the-air broadcasters<sup>139</sup> -- in developing the kind of audience targeted programming broadband networks make possible? Have carriers too easily agreed to take over what should be the responsibility of government (i.e., enforcing obscenity laws)<sup>140</sup> and, therefore, put themselves in a position antithetical to becoming or serving first amendment speakers? Carrier dial-a-porn actions may come back to haunt them in an integrated broadband environment.<sup>141</sup>

### G. Copyright

78. If restrictions on local exchange carriers providing video programming are relaxed, what will be their copyright liabilities? Will

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139 See, e.g., "The Morton Downey Show."

140 See, e.g., "Audiotext Standards Pose Complex Problems," Communications Daily, July 26, 1988, at 2,3; "Porn Providers Keep Pacific Bell In Court Over Disconnection, Charging 'State Action,'" Telecommunications Reports, July 11, 1988, at 21; "Judge Wants Proof of PUC Coercion in Cal. Dial-a-Porn Case," Communications Daily, July 7, 1988, at 4; "Dial-It Information Providers Cautioned on Increasing Content Rules," Communications Daily, June 3, 1988, at 3; M. Gartner, "Dial-a Porn Ban Is Obscene," Wall Street Journal, April 28, 1988, at 29.

141 See, e.g., "More cable-telco debate," Broadcasting, September 26, 1988, at 40. Washington communications attorney Philip Verveer noting that because local carriers are subject to rate regulation dependent upon the "goodwill" of public officials, they might "exercise extraordinary caution" carrying content that might be deemed "objectionable."

copyright regimes such as the cable compulsory license extend to local exchange carriers providing video programming?<sup>142</sup> What about the copyright liability of others leasing channel service from a carrier or merely interconnecting with a carrier's broadband switch? These and other copyright questions will have to be answered as traditional industry and institutional boundaries blur and erode with the deployment of integrated broadband networks.

#### H. Social Issues

79. Integrated broadband network development also will raise social policy questions. While not of the same nature as the regulatory and legal questions raised above, social policy considerations will be prominent in arguments made to regulators. Some of these questions initially may work to slow broadband development while others may work to speed its eventual deployment. First, there will be those who oppose broadband networks for residential customers because "they don't need them." The question will be, why should residential telephone subscribers pay extra for something they already get today or, alternatively, will not want in the future? There

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<sup>142</sup> For a discussion of the compulsory license, see Notice of Inquiry, Compulsory Copyright License for Cable Retransmission, 2 FCC Rod 2387 (1987). See also Action in Docket Case: Repeal of Compulsory License for Distant Signals Recommended (Gen Docket 87-25), FCC Press Release (October 27, 1988). For a more general discussion of cable copyright issues, see NTIA Report at 108-124.

will be concerns that broadband deployment will benefit large users but residential ratepayers will end up paying for it through higher local rates.

80. Once broadband networks begin to develop, however, the social policy questions are likely to take on a different character. If it is correct that fiber costs will drop below those of copper and LECs begin deploying fiber optic networks to residential customers within the next two to five years for new construction,<sup>143</sup> and if successful new services are provided over these new networks that are not available to the rest of the community, then social policy questions may shift to ensuring all residential customers benefit from the new technologies and services. If, however, no new services are developed, or those developed are not successful with consumers, then the pressure to equalize access to integrated broadband networks may not develop. Thus, successful integrated broadband networks and services for new -- and often upscale -- communities may create demands to redefine universal service beyond POTS in terms of new information services.<sup>144</sup> If this occurs, then the problem for LECs shifts

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143 See supra at paras. 11.

144 See, e.g., the recommendations of Pacific Telesis' Intelligent Network Task Force which was a broadbased group of Californians who looked at the telephone network of the future. The Task Force made 12 recommendations including redefining universal service to include access to a functionally rich "intelligent network." "The Intelligent Network Task Force Report" October 1987, and Pacific Bell's Response to the Intelligent Network Task Force Report," Pacific Telesis, Sacramento, CA, 1988.

from justifying investment for replacing existing plant to meeting regulators' demands for equity in network development.

81. Because rebuilding the telephone network is viewed as affecting the nation's future and, at the same time will be extremely expensive, the political debate surrounding integrated broadband network development cannot avoid social policy questions. The concern of public policymakers, however, should be to minimize as far as possible the exploitation of social issues by competing industry interests to "game the process" to gain an advantage in regulatory and political arenas. The next section addresses the major players potentially affected by IBN development, their positions, and how they appear to be "playing" the regulatory/policy "game."

## V. PLAYERS AND STAKES<sup>145</sup>

82. Much of the debate surrounding telephone company broadband network development in the United States revolves around potential telephone industry competition with the cable television industry -- the incumbent that already passes about 83 percent of all U.S. households with an analog broadband system providing the typical customer with at least 30 channels of entertainment video.<sup>146</sup> Because, at least for the short term, the primary and perhaps only residential service requiring broadband transmission is entertainment video, it is no wonder that the two major protagonists in the broadband debate are the telephone and cable television industries.

83. There are other major players, however, who stand to be affected -- some significantly -- depending upon how broadband networks develop in the future. In addition to telephone and cable television companies, they

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<sup>145</sup> The term "player" is used instead of "stakeholder" because the latter term identifies the neutral third party entrusted with the "stakes" of bettors (or the disputed property) while a bet or dispute is being resolved. Therefore, "stakeholders" do not have an interest in, or a "stake" in a bet or dispute. Webster's Ninth New Collegiate Dictionary (Springfield, MA: Merriam-Webster Inc., 1986), at 1147.

<sup>146</sup> Eighty-one percent of cable subscribers are served by cable systems with 30 or more channels; and about 18 percent of subscribers can receive 54 or more channels. "Cable Television Developments," National Cable Television Association, Washington, DC, August 1988, at 14.

include: broadcasters; program producers and distributors; other large and small users; and regulators at the local, state, and federal levels.

84. The institutional and economic implications of broadband network development are enormous. A universal broadband network threatens some existing players while providing new opportunities for others. At the same time, existing institutional relationships will change.

A. Local Exchange Carriers

85. Local Exchange Carriers see the development and deployment of broadband networks as important to their future.<sup>147</sup> For the reasons discussed above,<sup>148</sup> demand from large users for high capacity transmission, coupled with technological developments in fiber optics and digital electronics are driving the telecommunications carriers to develop broadband networks. While some LECs have stated that fiber shortly will replace copper to the home for POTS, others state that delivery of entertainment

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<sup>147</sup> See, e.g., S.B. Weinstein, "Telecommunications in the coming decades," IEEE Spectrum, November 1987, at 62; D. Gilhooly, "The Politics of Broadband," Telecommunications (International Edition), June 1988; "Cable Cross-Ownership, Fiber-to-Home-Race with Cable TV Firms Coninate USTA Discussion; Telcos Told Freedom to Provide Cable Programming Important to Support Fiber Deployment," Telecommunications Reports, October 17, 1988, at 10-13; and Comments of Ameritech (at 5), BellSouth (at 4-5), Southwestern Bell Telephone (at 8-9), in Telephone/Cable Crossownership.

<sup>148</sup> See supra at paras. 10-11. See also supra at n. 1.

video is necessary to fiber deployment. There is general agreement among LECs, however, that the ability to deliver video programming will accelerate fiber deployment and broadband network development for residential subscribers served by today's copper network.<sup>149</sup>

86. Some LECs would prefer to remain in the transmission business, leasing broadband transport to cable operators and other video programmers. Others believe that the telephone/cable crossownership rule must be repealed or modified in order to permit the LECs to ensure there will be a customer for their broadband service. These LECs fear that historical enmity between the telephone and cable television industries will keep cable companies from leasing channel service even if it is more economical than building or rebuilding a separate cable system. These LECs are also concerned that cable operators will use their influence to prevent programmers from leasing capacity directly from a telephone company. Thus, these LECs want to "prime the pump" by guaranteeing a minimum use of any broadband network.

87. Still other LECs want to be in the cable television business because they see it as a good business with high cash flows and competitive returns far exceeding those of today's regulated telephone business.<sup>150</sup> They

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<sup>149</sup> See, e.g., Comments of BellSouth and Southwestern Bell Telephone in Telephone/Cable Crossownership; and L. Jaffee, "Telcos' Presence Conspicuous at Telecom Convention," Multichannel News, October 3, 1988, at 84.

<sup>150</sup> Historically high returns may not be maintained, however, as the cost of buying new systems increases. As one banker put it: "Clearly, at these

also see revenue from video programming contributing to defraying the cost of upgrading the existing network thereby making it easier to receive permission from state regulators to replace existing plant. Some of these LECs see cable television -- inside or outside of their service areas -- as a profitable, related line-of-business to which they can bring expertise as they diversify and invest billions of dollars in profits.

88. Some LECs have taken advantage of the ability to own and operate cable television systems outside their local telephone service areas (out-of-region). For example, Centel, the fourth largest non-Bell telephone company -- and therefore not subject to the MFJ -- is a major cable television multiple system operator (MSO), with about 500,000 subscribers in seven states.<sup>151</sup> And Pacific Telesis has been an unsuccessful bidder for out-of-region cable systems.<sup>152</sup> Other Bell Regional Holding Companies

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high prices the returns are no longer the 25 and 30 percent returns that one could have looked forward to in the past." "The state of M&A today," Cablevision, May 23, 1988, at 53. Likewise, future returns might not be as high if LEC entry is through construction of competing systems rather than acquisition of existing operations.

151 Centel Corporation Comments in Telephone/Cable Crossownership.

152 See, e.g., "PacTel had its eye on Storer," Broadcasting, May 9, 1988, at 53; L. Landro, "Two More Firms Are Likely Bidders for Cable Systems," Wall Street Journal, June 6, 1988, at 26; and "Utility buys Rogers's cable for \$1.2 billion," Broadcasting, August 15, 1988, at 37. See also "Lee Cox: The industry's most-feared man tells why PacTel wants in cable," Cablevision, August 15, 1988, at 46.

(RHCs) also have been reported to be interested in acquiring out-of-region cable television operations, including overseas.<sup>153</sup>

89. In addition to seeing such ventures as a profitable way to diversify and invest available cash, LECs, especially the RHCs, are interested in out-of-region cable television operations for several reasons. First, LECs see out-of-region cable operations as a good way to learn about the entertainment video business until (if ever) they are allowed to enter the business within their local service areas (within-region).<sup>154</sup> Second, having out-of-region cable operations puts LECs in a position to form strategic alliances with cable operators and programmers that could lease within-region broadband transmission even if the crossownership ban is not lifted. Third, as cable systems are upgraded with fiber backbone trunks,<sup>155</sup> out-of-region cable service would provide LECs -- especially RHCs -- with a presence for offering exchange telecommunications services outside their local service areas as some RHCs do today with cellular radio services.<sup>156</sup>

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153 See supra at notes 28, 49.

154 As discussed below, out-of-region cable television investment, if large enough, may change incentives for LECs to push for repealing existing regulatory barriers to within-region entry. See infra at para. 96.

155 See supra at paras. 12-14.

156 The MFJ does not prohibit the BOCs from offering exchange telecommunications outside their regions. The trial Court waived what it believed to be such a restriction with regard to cellular radio telephony. On appeal, the Court of Appeals went further and ruled that no such limitation existed, thus eliminating the need for waivers. United States v. Western Elec. Co., Inc., 797 F.2d 1082 (D.C. Cir. 1986). See also L. Hays

90. Such competition could finally achieve the kind of local distribution competition envisioned at the time of the original telephone/cable television crossownership ban and the 1981 FCC Staff Report for several reasons.<sup>157</sup> LECs might be more likely than traditional cable operators to expand cable television systems into fully competitive local telecommunications networks, especially for large users, because they understand the exchange telecommunications market, have the expertise and resources to build such a network, and, perhaps most importantly, are used to dealing with state regulatory commissions.<sup>158</sup>

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and M.L. Carnevale, "Regional Phone Firms Bend Rules and Invade Each Other's Territory," Wall Street Journal, March 9, 1988, at 1.

<sup>157</sup> OPP Report at 160-61, 176-77. For a discussion of policy issues surrounding cable television local distribution competition in a pre-Cable Act of 1984 environment, see R. Pepper, "Competition in Local Distribution: The Cable Television Industry," in Understanding New Media: Trends and Issues in Electronic Distribution of Information, B.M. Compaine, ed. (Cambridge, MA: Ballinger Publishing, Co., 1984) at 147-194.

<sup>158</sup> Two major reasons cable television operators have not more fully exploited their opportunities of competing in local telecommunications are (1) regulatory barriers created by state commissions at the behest of local telephone carriers; and (2) the fear of becoming regulated at the state level. See, e.g., Cox Cable Communications, Inc., 102 FCC 2d 110 (1985), petitions for recon. dismissed as moot and vacated, 1 FCC Rcd 561 (1986). Related to the second point, a cable operator's local cable television operations might be at risk if its telecommunications services resulted in classification as a telephone company and the application of the telephone/cable television crossownership rules.

91. The implications of such out-of-region local exchange competition are enormous for the telephone industry, regulators, and the public. The implications may become even more significant if, through Open Network Architecture requirements,<sup>159</sup> cable systems are permitted to interconnect with local LEC switches. If such competition from cable systems for telephone-like service develops, it will become increasingly difficult to justify keeping incumbent LECs from providing within-region video programming. Indeed, asymmetric regulation may threaten the viability of incumbent local exchange carriers.

92. Local exchange carriers also are concerned about local competition from existing cable systems, especially as those systems deploy fiber technology.<sup>160</sup> Of particular concern is the potential for AT&T to develop strategic alliances with cable operators, building fiber optic systems and providing subscriber automatic number identification (ANI) for pay-per-view programming along with billing in exchange for cable system transport between large business customers and AT&T's interexchange point-of-presence

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159 Open Network Architecture is an antidiscrimination requirement in the FCC's Third Computer Inquiry that the Bell Operating Companies design their basic network facilities and services to permit all users of the basic network to interconnect to specific functions and interfaces on an unbundled and "equal access" basis. See supra at para. 71.

160 See, e.g., "Warner Cable Notifies PSC of Plans to Offer Two-way Voice Transmission in Milwaukee," Telecommunications Reports, June 13, 1988, at 20; "Telcos Wary Over Cable's Wanting to Offer Telephone Service," Communications Daily, July 7, 1988, at 3, (reported that Warner Cable's application to the Wisconsin PSC was withdrawn as a mistake).

(POP). Some examples of cable systems buying AT&T fiber technology include applications to link up several cable systems in a metropolitan area.<sup>161</sup> Such networks could be used by the cable operators to provide extended area private line service or even intraLATA toll service in conjunction with AT&T and other interexchange carriers. While not yet a reality, such potential competitive alliances are seen as a threat by some LECs.<sup>162</sup>

#### B. Cable Television

93. The cable television industry potentially stands to lose the most from LEC broadband network development -- and it is acting accordingly.<sup>163</sup> The broadband environment of the future likely will mean more than one broadband wire into the home. Some cable operators may elect to lease channel capacity from local exchange carriers while others will retain their

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161 K. Clayton, "Centel, Continental Take the Fiber Plunge," Multichannel News, May 9, 1988, at 12; "AT&T Files '800 Information Forwarding-1' Service for Pay-per-view Cable Industry," Telecommunications Reports, May 9, 1988, at 24.

162 The question for regulators is whether such competition will provide an opportunity to relax regulation in favor of competition, or whether they will feel compelled to expand regulation to protect competitors. See, e.g., N.W. Cornell, D. Kelley, and P.R. Greenhalgh, "Social Objectives and Competition in Common Carrier Communications: Incompatible or Inseparable?" Federal Communications Commission, Office of Plans and Policy Working Paper No. 1, April 1980, at 47-50.

163 See, e.g., "NCTA votes 15% dues surcharge to fund telco fight," Broadcasting, October 3, 1988, at 29; "Telcos, fiber top Eastern Show agenda," Broadcasting, September 5, 1988, at 40.

own broadband network into the home -- a network that increasingly may be fiber. But whichever way the local cable operator chooses to go, there will be competition -- unless of course the franchising requirement of the Cable Act of 1984 remains in force and cities do not grant competitive cable television franchises.<sup>164</sup>

94. A major potential problem for the cable television industry is maintaining or increasing the market value of cable systems in the face of potential competition. Recent sales of cable systems have been reported for between \$2000 and \$3000 per subscriber, up from \$900 five years ago.<sup>165</sup> But there is concern that widespread overbuilding -- new cable systems competing for subscribers with existing systems -- especially as a result of telephone company provision of cable service, may reduce the per subscriber value of cable systems.<sup>166</sup> Indeed, one study states that de facto local

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164 See supra at paras. 39-45.

165 See, e.g., J. F. Siler "A \$420 Million Cable TV Deal Is Set," New York Times, June 24, 1988, at 24 (\$2,000/subscriber); "Cablevision Industries buys Wometco for \$720 million," Cablevision, June 6, 1988, at 21 (\$2,315/subscriber); S. Sugawara, "Partnership Buying Area Cable Systems," Washington Post, June 1, 1988, at C3 (\$2,700/subscriber); "Cablevision Buying Viacom Cable Systems and 5% of S/MC," Communications Daily, August 17, 1988, at 1 (\$2,750/subscriber); G. Fabrikant, "Prices Continue to Soar for Cable Acquisitions," New York Times, June 27, 1988, at D8 (estimates as high as \$3,000/subscriber for smaller systems); "\$3,500 a sub?" Cablevision, September 26, 1988, at 11.

166 See generally "The state of M&A today," Cablevision, May 23, 1988, at 49; Cablevision, June 6, 1988, at 56; M. Seale, "Overbuild Threat Looms Large, Cable Lawyers Agree," Multichannel News, August 8, 1988.

monopoly franchises is one reason cable systems sell for between two and three times replacement cost when the average ratio of market price to replacement cost for all non-financial corporations is about .81,<sup>167</sup> which implies that competitive entry would drive the market price of cable systems towards the replacement cost of \$800-\$1,000 per subscriber. If this were to occur, the value of cable companies would drop correspondingly as would the value of stock of publicly traded cable companies.<sup>168</sup> Cable operators -- or investors -- who borrowed money based on today's high multiples and an implicit low expected probability of competition could find themselves in dire financial straits; not unlike farmers who borrowed money when land was

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167 For an extended discussion of the meaning of a high ratio of market price to replacement cost ("q ratio"), see study submitted with USTA Comments in Telephone/Cable Cross Ownership, "Opening The Broadband Gateway: The Need for Telephone Company Entry Into the Video Services Marketplace," Shooshan & Jackson Inc., October 1987 (discussing the q ratio and its application to the cable television industry); Reply Comments of Tele-Communications, Inc. (TCI), December 16, 1987 (criticizing the Shooshan & Jackson study for its application of the q ratio and the conclusions it drew about cable television's market power); and "Opening the Broadband Gateway: The Need for Telephone Company Entry Into the Video Services Marketplace; Rebuttal to Reply Comments of Tele-Communications, Inc.," (Rebuttal) January 20, 1988 (response to TCI's critique in which Shooshan & Jackson, while rejecting them as incorrect, nevertheless applied TCI's suggested numbers and still arrived at a q ratio nearly twice that of the rest of the non-financial community; Rebuttal at 15). See also L. Jaffee, "Analysts: Rising System Prices Make Overbuilds More Attractive," Multichannel News, October 26, 1987, at 3.

168 There is some evidence that fear of telephone company competition may have contributed to the drop in the price of shares of at least one MSO. One Wall Street analyst has stated, however, that he finds it "incredible that [the threat of telephone company competition] would scare investors to the point that they would value cable subscribers in the stock market at \$1,200 each, or about half their private market value." See V.M. Kahn, "TCI stock skids, off 33% from high," Cablevision, August 29, 1988, at 54.

selling for \$3,500 per acre, only to have their loans called when the price of land dropped significantly only a few years later. Cable operators are especially concerned that, if permitted into the cable television business, telephone companies could subsidize their cable operations from regulated ratepayer revenue and -- within-region -- would once again have the incentive to discriminate against competing cable operators on access to telephone poles and conduits.<sup>169</sup> It is not surprising, therefore, that overbuilds and potential competition -- from telephone companies and others -- are major topics among cable operators.<sup>170</sup>

95. While almost uniformly opposing repeal of the telephone/cable crossownership rule preventing within-region LEC video programming, the cable industry is divided on whether local exchange carriers should be permitted to provide cable service outside their telephone service areas.<sup>171</sup> Many cable operators, including the largest, TCI, have said they do not

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169 See, e.g., Comments of National Cable Television Association, Cablevision Systems Corp, and Time, Inc. in Telephone/Cable Crossownership.

170 See, e.g., T. P. Southwick, "Cable Industry Faces Increased Threat of Overbuilds," Multichannel News, September 21, 1987, at 20; "Computing the overbuild equation," Broadcasting, October 26, 1987, at 48; R. Berman, "Making the case against overbuilds," Cablevision, January 4, 1988, at 24; L. Haugstead, "Overbuilds, Regulation Seen as Ops' Top Threats," Multichannel News, February 22, 1988, at 16; T. Kerver, "Overbuilds Scaring Buyers," Cable Television Business, June 1, 1988, at 44; M. Seale, "Overbuild Threat Looms Large, Cable Lawyers Agree," Multichannel News, August 8, 1988.

171 See, e.g., "Cable wrestles with possible Pactel entry into business," Broadcasting, July 4, 1988, at 32-34.

oppose LEC entry into the cable television business outside their telephone service areas.<sup>172</sup> Indeed, within four weeks of TCI's statement to Congress, it was reported in the press that TCI-controlled United Artist Communications, Inc. was joining with Pacific Telesis to bid for Rogers Communications, Inc.'s U.S. cable systems with more than 500,000 subscribers.<sup>173</sup>

96. LEC out-of-region entry into cable television through purchasing existing cable operations has two important potential advantages for the cable television industry. First, telephone company entry -- especially by the seven Bell regional holding companies -- would significantly increase the number of large, cash rich firms seeking to buy into the cable business. This could bid up cable system prices significantly and provide the cable television industry with a new pool of buyers willing and able to pay premium prices when today's investors are ready to "cash out." Secondly, if telephone companies buy out-of-region cable systems with significant numbers of subscribers at premium prices, then telephone company incentives

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172 "TCI's Malone Endorses Limited RHC Entry Into Cable," Communications Daily, May 12, 1988, at 2; and "Cable TV Operator Tells Markey He Welcomes Out-of-Area Telephone Company Competition," Telecommunications Reports, May 16, 1988, at 20. An example of such an arrangement is non-Bell LEC and National Cable Television Association member Centel.

173 L. Landro, "Two More Firms Are Likely Bidders for Cable Systems," Wall Street Journal, June 6, 1988, at 26. The bid ultimately was unsuccessful, in part because of the significant regulatory hurdles facing Pacific Telesis. See supra at n. 49.

to push for relaxing within-region restrictions may change in order to protect their multi-billion dollar investments at \$2,500 to \$3,000 (and more) per subscriber -- i.e., as major cable television owners, telephone companies may be less likely to want to see overbuild competition from local exchange carriers that likely would drive the market price for cable systems down towards replacement cost.<sup>174</sup> What happens, for example, to historical institutional arrangements when Pacific Telesis, or another regional Bell company becomes a NCTA board member?<sup>175</sup> The question for public policy, however, is whether such an arrangement forestalling competition would be in the public interest?

97. It is important to note that the cable television industry may be confronted with competition even if the crossownership restrictions remain in force. Local telephone companies may lease transmission capacity to franchised video programmers today -- and a franchise may not be required in all cases in the future.<sup>176</sup> Indeed, the threat to cable may be even greater if broadband transport is offered on a common carrier basis permitting any and all comers to compete for viewers. A tightly restricted, telephone

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174 See supra at para 94.

175 NCTA and USTA member Centel, for example, split with the rest of the telephone industry and sided with the cable television industry supporting retention of the crossownership rule in its Comments to the Commission in Telephone/Cable Crossownership.

176 See, e.g., supra at paras. 40-43.

company video programming service -- if the crossownership ban were lifted without common carrier access for additional video programmers -- might be less threatening. Even better for the local cable operator would be to enter into an exclusive joint arrangement with the local exchange carrier to lease channel service on some equity sharing basis -- again assuming no ownership or MFJ restrictions. In other words, cable operators may give telephone companies incentives to limit competition in order to get cable's cooperation in building IBNs. Such an arrangement, if it were to occur, would not increase competition beneficial to either program producers or consumers and, indeed, would reduce the threat of publicly beneficial competition to incumbent cable operators and local exchange carriers.

### C. Broadcasters

98. Whether broadcasters stand to gain from universal broadband networks depends upon how they view their business. If they see their business as emitting non-ionizing radiation from the tops of red and white towers, then they may be in trouble. But if they see their business as producing, selecting, and packaging television programming that attracts audiences to be delivered to advertisers, then they may benefit from a universal broadband network that reaches nearly all homes.

99. Broadcasters have expressed concern, however, that telephone companies might become competitors and put them "out of business" if they

use their broadband networks for entering the "television business."<sup>177</sup> Broadcasters are especially worried about local telephone companies using their networks to deliver high definition television.<sup>178</sup> The cable television industry has fostered this fear,<sup>179</sup> hoping to enlist the broadcasting industry in the fight to retain the telephone/cable television crossownership rules.<sup>180</sup>

100. Ever since the Commission's "must-carry" rules requiring cable systems to carry local television stations were found by the courts to be unconstitutional,<sup>181</sup> broadcasters have been seeking guaranteed access to American homes. It should be remembered that more than half of all homes in

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177 "Fritts warns broadcasters: The telcos are coming," Broadcasting, September 12, 1988, at 27. See also D. Halonen, "Broadcasters alarmed by attack on cable law," Electronic Media, September 12, 1988, at 1.

178 NAB president Eddie Fritts, for example, has stated: "Telco entry into HDTV poses a double threat to broadcasters by offering both a new delivery mechanism, fiber optic cable, and improved HDTV pictures." L. Stein, "Fritts frets over telcos in cable," Cablevision, September 26, 1988, at 12.

179 See, e.g., "Telcos and fiber the hot topics in Atlanta," Broadcasting, September 12, 1988, at 33 (statements made by cable industry representatives at a recent cable television convention).

180 See, e.g., "Mooney sees cable and broadcasting fighting telcos together," Broadcasting, September 19, 1988, at 46; "Telco tete-a-tete," Broadcasting, October 17, 1988, at 6.

181 Quincy Cable TV, Inc. v. FCC, 768 F.2d 1434 (D.C. Cir. 1985), cert denied sub. nom. National Association of Broadcasters v. Quincy Cable TV, Inc., 106 S. Ct. 2889 (1986); Century Communications Corp. v. FCC, 835 F.2d 292 (D.C. Cir. 1987), clarified, 37 F.2d 517 (D.C.Cir. 1988).

the U.S. receive their television -- including local broadcast signals -- primarily over a wire rather than over-the-air.<sup>182</sup> Local broadcasters have expressed a desire to reach viewers through a common carrier broadband network instead of having to rely on cable operators who are beginning to compete for local advertising revenue.<sup>183</sup> Not all broadcasters seem to understand -- or want to accept -- that in the telephone business it is traditional to pay for transport; some, for example, have stated they deserve access to all homes for free.<sup>184</sup> Indeed, the telephone industry has been attacked by the president of the National Association of Broadcasters for one telephone industry executive suggesting "that a payment of a million dollars a year might not be unreasonable for a major station in Los Angeles

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182 "Cable Penetration Hits 52%: Nielsen," Multichannel News, June 6, 1988, at 13. In addition to receiving television signals over a wire, the majority of cable homes own a VCR ("Study Shows VCR Usage At Average 7 Hours Per Week," Variety, March 16, 1988, at 73) and an undetermined number have "A/B" switches permitting them to watch local broadcast stations directly over-the-air.

183 See, e.g., Reply Comments and Request for Further Notice of Inquiry, Association of Independent Television Stations, Inc. (INTV), in Telephone/Cable Crossownership.

184 See, e.g., INTV Comments in Telephone/Cable Crossownership at 19; and Remarks of Preston R. Padden, President, Association of Independent Television Stations, before the Federal Communications Bar Association, Washington, DC, June 22, 1988. The goal that broadcast television licensees receive free access over telephone networks may be very difficult to achieve. It is difficult to imagine broadcasters successfully arguing to regulators -- especially at the state level -- why residential telephone subscribers who traditionally have been recipients of subsidies from business users -- including small business -- should begin subsidizing broadcasting companies with millions of dollars in profits, billions of dollars in assets and the ability to buy and sell television stations for hundreds of millions of dollars.

to pay for access to their [telco] future gateway system."<sup>185</sup>

101. Broadcasters have not yet decided whether they will benefit from LEC broadband networks -- and, therefore, should support LEC entry -- or whether such networks should be fought because they will increase competition.<sup>186</sup> At least one broadcaster,<sup>187</sup> however, has stated that an incentive to convert from a spectrum user to reaching viewers via a universal broadband fiber network is to be able to relinquish his broadcast license and thereby get out from under the public interest obligations and content regulation applied only to broadcasters -- though he probably would not want his freed-up spectrum going to another broadcaster. This broadcaster raises an important question: at what point, if ever, will enough people be able to receive television over a wire that it will be possible to reclaim the VHF and UHF spectrum for uses other than terrestrial broadcasting?

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185 L. Jaffee, "NAB's Fritts Concerned over Telcos," Multichannel News, September 12, 1988, at 51.

186 For example, INTV Preston Padden was quoted as stating "the number one issue of our time is deciding whether to fight, fight, fight against telco entry or, perhaps bowing to the inevitable, whether we should work out a strategic alliance." "Fritts warns broadcasters: The telcos are coming," Broadcasting, September 12, 1988, at 27. See also "INTV board ponders telco entry," Broadcasting, October 10, 1988, at 40; "NAB backs TV promotion, hears update on telco-cable ownership study," Broadcasting, November 7, 1988, at 34.

187 This broadcasting group president expressed this thought at a "not for attribution" industry roundtable.

D. Program Producers/Distributors

102. Program producers and distributors benefit from being able to choose among multiple distribution channels and, therefore, have expressed an interest in the possibility of universal broadband networks. Today program producers have limited places to go to distribute their programming directly to viewers at home: television networks -- though the number is increasing; individual television stations through the program syndication market; cable networks; and, for some kinds of programming, video rental/sales outlets. If a producer or distributor wants to create his or her own network they either must sign up several hundred television stations, such as ABC, CBS, and NBC have done and Fox Television is trying to do, or convince cable operators to carry their network. In the future, direct broadcast satellite (DBS) may provide an alternative distribution medium. But today, the options are limited. A universal broadband network would give producers access to viewers that would permit direct marketing of their movies, series, and other programming without having to go through intermediaries -- something the major Hollywood studios really have not been able to do since the Department of Justice forced the major studios to sell their theaters in 1948.<sup>188</sup> Thus, some Hollywood studios, and other

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<sup>188</sup> United States v. Paramount Pictures, Inc., 334 U.S. 131 (1948). Some of the major Hollywood studios, however, recently have received approval

producers, see potential large benefits from a common carrier broadband network.

103. Producer/distributors will not benefit if LEC out-of-region acquisition of cable systems reduces, or does not increase, competition. Merely trading one de facto monopoly for another does not provide program distributors with alternative means of reaching consumers. Indeed, if the result reduces the likelihood of within-region competition, producer/distributors will be worse off because "the mere potential for [LEC broadband network] entry can presumably have very salutary effects in forcing incumbent suppliers to behave in a competitive fashion."<sup>189</sup>

104. It should be clear that deployment of universal broadband networks not only will affect individual players but also will upset existing institutional arrangements in the video marketplace. Who buys programming from whom, how revenue is generated, and where revenue flows, likely will change. If broadband fiber networks are ever deployed, the video world may never be the same.

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from the Department of Justice to own theaters. See, e.g., A.L. Yarrow, "The Studios' Move on Theaters," New York Times, December 25, 1988, at D1; W. Tusher, "WB, PAR Closer To Theater Marriage," Variety, August 10, 1988, at 3.

<sup>189</sup> J.R. Haring, "Broadband Networks: Competition and the Video Marketplace," paper presented at MIT/Belcore Industry Forum, "A Universal Broadband Infrastructure for the U.S.," Salt Lake City, UT, April 8, 1988.

## E. Users

105. Telecommunications users -- whether residential or large business -- have an important stake in the development of integrated broadband networks. Even before new broadband services are developed, all users will benefit to the extent that IBN deployment increases the quality of existing service through the introduction of optics and digital transmission technology. All data communications users, including residential and corporate computer users, for example, will benefit from widespread deployment of fiber optic technology associated with IBNs.

106. Residential and small business users may have the most to gain if rapid IBN development and deployment leads to new services unavailable or difficult to provide over today's narrowband network. Residential users could be the first to see significant benefits if IBN deployment leads to a more competitive video marketplace with greater program choice at a wider range of prices. Small business users -- and some residential users -- will also benefit should IBN deployment result in new broadband as well as narrowband services otherwise available only with sophisticated and expensive terminal equipment. Therefore, the extent to which regulatory constraints retard IBN deployment and thus make it difficult to develop and discover whether there is demand for new services, users -- especially small users -- lose.

107. Large users -- including corporations, government agencies, universities, and hospitals -- also stand to gain from IBN deployment. New fiber optic digital broadband networks would permit faster and more ubiquitous connectivity for "dial-up" high speed data and video communications, with applications ranging from computer aided design and manufacturing to video conferencing. While potentially benefiting significantly from IBN deployment, however, large users are less dependent on future public IBNs for their advanced telecommunications needs. Large users, especially the largest corporations and government agencies, have access to private networks, including fiber optic and satellite networks, as well as very sophisticated terminal equipment that can meet their telecommunications needs if IBNs do not develop. Small residential and business users, on the other hand, may have few, if any, alternatives.

108. All users, however, may suffer if IBNs are not permitted to stimulate new services and customers. IBN deployment could potentially lower communications costs because of the advantages of fiber optics.<sup>190</sup> Under ratebase rate-of-return regulation, however, if LEC IBNs incur large costs that cannot be recovered directly from IBN users because of a lack of either new services or customers for those services, ratepayers may find themselves paying higher rates for existing services. If unrecovered costs

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190 See supra at paras. 10-11.

compel higher rates, it is not clear which users will bear the brunt: while it will be politically more difficult to increase residential and small business rates, large users have alternative telecommunications options if their rates increase too much.

#### F. Regulators

109. Some of the greatest effects of integrated broadband network development will be felt by regulators at the federal, state, and local levels. State and federal telecommunications common carrier regulators will be forced to reexamine some of the fundamental ways they have done business for at least forty years. And, local cable regulators may find that they no longer have the ability to control entry of video programmers through the local franchising process. Depending upon how regulatory issues are resolved, federal, state, and local regulators will gain or lose power and influence as authority shifts among jurisdictions.

110. The FCC will have to adjust its regulation of channel service in light of integrated broadband networks. The Commission will have to adapt or replace its tariffing and cost allocations procedures in an integrated broadband environment where historical methods of determining relative use will be difficult, if not impossible, to apply to customer-controlled, dynamically expanding and contracting, services. In addition, the

Commission will have to examine its preemption of channel service when "cable service" or "video programming" may be only one of many broadband content/information services using integrated broadband networks to reach customers. The Commission also will have to concern itself with how very large LEC investments might affect interstate revenue requirements. As long as traditional rate-of-return procedures remain in place, the Commission will have to be involved in investments that have the potential of affecting the interstate jurisdiction.<sup>191</sup> If integrated broadband networks result in a total restructuring of the telecommunications industry that results in local loop competition, federal policymakers may be able to deregulate interstate access. In the meantime, the Commission will have to find new methods of fulfilling its statutory responsibilities, including working more closely with the states.

111. State regulators are faced with many of the same issues as the FCC in an IBN environment. In addition to having to develop new accounting, costing, and pricing methods -- including looking for alternatives to traditional rate-based rate-of-return -- the states also will have to consider for approval carrier requests to replace existing copper plant with

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<sup>191</sup> Likewise, interexchange carriers will become concerned about these costs because they could result in increased carrier common line charges.

fiber integrated networks costing billions of dollars. Some states may resist over concerns of burdening residential ratepayers with costs for services they will not want and will not use. Other states -- or the same ones later on -- may be concerned that their regulated carriers are not deploying integrated broadband networks fast enough, or are deploying them in inequitable ways; that is, they may be asked to redefine universal service to include access to integrated broadband networks. States also may be confronted with increased local loop competition if local cable systems are acquired by out-of-region telephone companies, especially regional Bell companies. State regulators may be asked to certificate competing local telephone companies and/or confront the possibility that the notion of an exclusive local telephone franchise may be a thing of the past. If local distribution competition grows in this fashion, states likely will become concerned about the possible loss of traditional subsidies for local residential rates. Because these issues involve many traditional telephone regulatory questions, state telephone regulators also may try to take authority for overseeing local cable franchises from cities.

112. Local cable franchising authorities -- usually cities -- may find their authority considerably circumscribed. First, their ability to franchise all cable services may be limited by the courts if franchises for video programming services delivered over integrated broadband networks are

found to be unconstitutional. While cities may retain authority over franchising traditional cable television systems, their ability to do so, and to obtain the kinds of concessions received in the past, may no longer be possible in the face of potentially competitive unfranchised services. Secondly, if out-of-region LEC cable system acquisition results in significant local distribution competition, states may reassign cable franchising to the state regulatory commissions.

113. The perceived importance of cities to the outcome of the telephone/cable television crossownership debate has led to unaccustomed attention being paid to local regulators by the telephone and cable television industries.<sup>192</sup> Telephone interests point to increasing local video distribution competition. Cable operators argue cities will lose control and be eliminated from the decision-making process. For their part, many cities want to regain leverage over local cable operators and see increasing competition as one way of achieving that goal. Whether local

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<sup>192</sup> See, e.g., L. Jaffee, "Cable Ops Court NATOA," Multichannel News, October 3, 1988, at 1; L. Jaffee, "Telcos' Presence Conspicuous at Telecom Convention," Multichannel News, October 3, 1988, at 14; "NATOA sees cable grip slipping," Broadcasting, October 3, 1988, at 60 (descriptions of the "bizarre backdrop" at the recent annual conference of the National Association of Telecommunications Officers and Advisors where representatives of both the cable and telephone industries were vying for the cities' attention and support).

video distribution is provided by a LEC or a cable company,<sup>193</sup> cities want to retain their franchising authority. It is unlikely they will give up this authority without a fight;<sup>194</sup> but then again, they might not have a choice.

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193 The National League of Cities' Transportation and Communications Steering Committee recently voted to support repeal of the telephone/cable crossownership restrictions subject to continued "local control" and safeguards against cross-subsidization and discriminatory access. See ; J. Aversa, "League of Cities Panel Backs Telcos," Multichannel News, October 24, 1988, at 5; "Cities want changes in Cable Act," Broadcasting, October 24, 1988, at 34.

194 See, e.g., L. Jaffee, "League of Cities Plans Updating Cable Policy," Multichannel News, October 3, 1988, at 10; and "Cities fighting back to keep franchising power," Broadcasting, October 3, 1988, at 63. See also, "NTIA Says Municipal Franchising of Cable Disserves Public Interest," Communications Daily, June 16, 1988, at 1; J. Aversa "U.S. Agency Raps Franchising, Urges Greater Role for Telcos," Multichannel News, June 20, 1988, at 44; and "Differing points of view on NTIA's study," Broadcasting, June 20, 1988, at 38 (response of National League of Cities to NTIA Report calling for an end to franchising for LEC delivered video services).

## VI. SUMMARY AND CONCLUSIONS

114. This paper identifies regulatory, policy, and institutional questions that will surround the development and deployment of universal integrated broadband networks by local exchange carriers. While broadband networks of one form or another will be deployed for large telecommunications users, the difficult policy questions relate to whether those networks will reach and serve residential and small business users.

115. Section II discusses the development of fiber optic technology and growing demand for increased telecommunications capacity as the two major trends driving future telecommunications networks towards integrated broadband designs for large users. The paper concludes that if fiber and broadband technology continue to develop as rapidly in the future as it has over the last decade, fiber will become the transmission medium of choice for loop distribution plant for new POTS (plain old telephone service) construction within two to five years. Fiber deployment for existing plant upgrade and rebuilds is another question, one that will depend upon the age and quality of the plant in addition to relative costs and demand for new services requiring new plant. There also is strong evidence that, for a very low cost, existing cable television systems will be able to replace backbone trunks with fiber, enabling them to increase both the quality and capacity of their existing analog broadband networks.

116. If cable operators upgrade their systems with fiber trunks, and telephone companies deploy fiber for POTS, then it is very likely that many, if not most households will be served by two fiber networks in the near to mid-term. Whether telephone company fiber networks evolve into integrated broadband networks will depend on what services, if any, require broadband capacities and transmission rates. Today, the only residential service requiring broadband capacity is high quality full motion video --television. Future services may require broadband access, and it is probable that the availability of broadband capacity will stimulate the development of new broadband services. Until that occurs, however, entertainment video will be the primary -- perhaps only -- service requiring broadband networks. Thus, whether LEC broadband networks will be used for video distribution may determine how rapidly those networks develop to serve more than a small portion of residential and small business customers. Therefore, the major constraints on LEC's ability to explore the full potential of broadband network development -- and whether there is significant demand for broadband services -- appear to be regulatory.

117. Section III identifies regulatory barriers to LEC integrated broadband network development. Barriers discussed include: (a) telephone/cable television crossownership restrictions; (b) the Modification of Final Judgment (MFJ); (c) the Section 214 process; and, (d) the local cable television franchise requirement. The first two barriers restrict

telephone companies from becoming video program suppliers while the last two constrain telephone companies from providing common carrier transmission to unaffiliated video programmers.

118. The local cable television franchise requirement is perhaps the greatest regulatory barrier to competitive video program delivery, whether by an independent video programmer wishing to lease channel service from a LEC, or by a LEC itself if crossownership and MFJ restrictions are relaxed. Although the local franchise requirement may not be constitutional in an integrated broadband environment, until it is eliminated by Congress or the courts, it is a potentially anticompetitive tool that can prevent competitive video programming, thus affecting broadband network development.

119. Section IV identifies eight regulatory questions and issues that will arise as broadband networks develop and are deployed. These questions, for the most part, are independent of whether local exchange carriers are permitted to provide video programming within their regulated telephone service areas. They include: (a) state/federal jurisdictional questions, including whether channel service should remain a federally preempted service in an integrated broadband environment; (b) cost allocation, including jurisdictional separations, and pricing questions; (c) the effect of current network design and terminal equipment rules, including NCTE and powering fiber systems; (d) appropriate safeguards to prevent anticompetitive abuses by carriers as they deploy integrated broadband networks; (e) questions about the first amendment and common carriers in an

integrated broadband environment; (f) questions raised by carrier actions censoring '976' audiotex services; (g) applicability of cable copyright to video programmers leasing channel service on broadband networks; and (h) social policy issues.

120. Section V identifies the major players and their stakes in integrated broadband network development. LECs see integrated broadband network development and deployment as important to their future as major telecommunications service providers. While they disagree over whether they have to be able to provide cable programming themselves, the LECs generally agree that video programming -- by someone -- will accelerate fiber deployment and broadband network development for residential subscribers. Therefore, it is important to LECs that the local franchising restriction be relaxed. Some LECs state that they need to arrange for video programming themselves in order to "prime the pump" for broadband services. Others see out-of-region cable services as a good business that would give them experience with broadband technology and the entertainment business. Such out-of-region service could result in increased local exchange competition as carrier-owned cable systems rebuild with fiber technology.

121. The cable television industry has the most to lose in the long-term from LEC integrated broadband networks whether LECs or independent programmers provide video programming to customers. The competitive threat to the cable industry is even greater if the local de facto monopoly franchise requirement is relaxed by Congress or invalidated by the courts.

In the short to medium-term, over the next five to 15 years, however, the threat to today's cable television industry is more perceived than real. Local carrier integrated broadband networks will be deployed incrementally reaching perhaps eight to 18 percent of households by 2000. In addition, the cable industry has marketing experience and institutional ties to the programming industry and the ability to upgrade its networks to compete better with new LEC networks and services. And, for the moment, they are relatively protected by the local franchise requirement in the Cable Act. Furthermore, cable television operators stand to gain significantly if telephone companies, especially the regional Bell companies, move aggressively to acquire existing out-of-region cable systems. Such a move by carriers could substantially bid up cable system prices and change carrier incentives so that they would oppose within-region entry in order to maintain the value of their out-of-region investment. Such out-of-region carrier-cable alliances also could enable cable operators to develop new competitive non-video telecommunications services.

122. Broadcasters -- though worried about increased competition -- and other program producer/distributors stand to gain from integrated broadband network development. Common carrier access to such networks could give broadcasters and other producer/distributors direct access to subscribers without going through the intermediary cable television operator; or, for programmers, through a broadcaster. In order for broadcasters to gain from this direct access, however, they have to view their business as more than emitting non-ionizing radiation from towers. Rather, they have to view

their business as producing, selecting, and packaging video programming that attracts audiences for delivery to advertisers. Neither broadcasters nor other producer/distributors (e.g., Hollywood) will gain from LECs' acquiring out-of-region cable systems at premium prices if such acquisitions fail to increase competition. Indeed, if the result reduces the likelihood of with-in region competition, broadcasters and producer/distributors will be worse off because even the threat of competition presumably can have the effect of forcing incumbent suppliers to behave more competitively.

123. Users -- residential, small business, and large business/organizations -- will be affected by integrated broadband networks, and the kind of restrictions placed on their use. On balance, users, particularly small users, should reap substantial benefits from the widespread introduction of IBNs. Residential and small business users stand to gain more than large organizations because users such as corporations, government agencies, and universities can meet many of their telecommunications needs through private networks and expensive terminal equipment. Small users are more likely to have to rely on the public network for their services. To the extent that IBNs permit and foster new services, small users will benefit. To the extent regulatory constraints prevent IBNs from developing and, therefore, make it difficult to develop and discover whether there is demand for new services, users lose.

124. Some of the greatest effects of integrated broadband network deployment will be on federal, state, and local regulators. Federal and state common carrier regulators will have to find new ways of doing business. The jurisdictional questions will become more complicated requiring greater cooperation. Existing procedures for identifying and assigning costs may become unworkable, as may traditional methods of pricing services. Integrated broadband networks also may accelerate the need to find alternatives to traditional ratebase rate-of-return regulation. At the local franchising level, city cable regulators may find themselves without the ability to franchise cable service and other video programming delivered over common carrier broadband networks. Cities may, however, play a pivotal role in determining whether telephone/cable television crossownership restrictions are modified.

125. It should be clear that development and deployment of integrated broadband networks will put traditional institutional relationships and arrangements under enormous pressure. The question for policymakers is how to promote the public interest by permitting new institutional arrangements to develop that will result in the best technological solutions and deployment of new services. The alternative is allowing players to "game the process" -- use the regulatory, policy, and political processes to thwart potential competitors -- resulting in less competition and few, if any, benefits for customers -- both consumers and content/information service providers.

126. While it always is dangerous and difficult, if not impossible, to predict the future, it appears likely that local distribution fiber optic technology will come out of the laboratories and will be deployed by both the telephone and cable television industries over the next two to five years. The questions for public policymakers are: who will deploy the technology; for what purposes; and under what terms and conditions.

127. If it is true that fiber optic integrated broadband networks promise to become the electronic infrastructure of an information dependent economy and society in the next century, it is important that such networks be permitted to evolve free of unnecessary government constraints. Today, however, significant regulatory barriers exist to integrated broadband network development and deployment. In addition, other regulatory and policy questions create additional uncertainty that may slow broadband deployment. Policymakers should remove regulatory barriers and uncertainties and replace them with a framework that will permit technological and service development while ensuring a competitive environment.

128. The requirement to have a local franchise for providing video programming is perhaps the most significant barrier to new integrated broadband network services including business and educational video applications not available today. If the new technologies are to flourish and new services develop, Congress will have to repeal or, the courts strike

down, this anticompetitive restriction, at least for services delivered over integrated broadband networks.

129. The question of whether the telephone/cable television crossownership restrictions should be relaxed to permit local exchange carriers to provide video programming within their regulated telephone service areas is a closer call. On the one hand, it can be argued that telephone companies can deploy integrated broadband networks without providing any of the content themselves. While this view probably is correct in the long run, it fails to recognize the utility of allowing local exchange carriers the ability to "prime the pump" by ensuring the availability of broadband services and, therefore, stimulating the development and growth of competitive services. Indeed, the within-region bar on content provision may be stimulating local exchange carriers to make out-of-region cable television investments that might have anticompetitive effects. The question should not be whether local exchange carriers should be permitted to have a role in content provision but, rather, the terms and conditions under which they should be permitted to enter.

130. The question of safeguards is critical. Integrated broadband networks present the opportunity to greatly increase competition among content/information service providers. Local exchange carriers should not be permitted to use these networks to reduce competition. Likewise, LEC entry into out-of-region cable service merely through the acquisition of

existing cable systems at premium prices may not increase competition unless such a move fosters competitive local exchange telecommunications.

131. Because of the potential technological, competitive, and public interest benefits associated with integrated broadband network development, the burden should be on those who want to retain regulatory barriers. With the proper safeguards, relaxing the restrictions on within-region content provision could have the beneficial effects of facilitating broadband deployment, stimulating demand and use by other content/information service providers, and enabling local exchange carriers to more fully compete with cable systems owned by other (out-of-region) LECs -- especially regional Bell companies -- that provide competitive local exchange service.

132. In the long-term, integrated broadband network development probably implies the fundamental restructuring of the domestic U.S. telecommunications and mass media industries. Institutional relationships and arrangements will be under pressure, historical alliances may change, and new regulatory structures will have to evolve. This is an unstable environment in which no existing player is guaranteed an outcome. Therefore, the tendency is to protect the past, rather than look forward. If policymakers permit this backward view to prevail, a significant opportunity to advance our telecommunications infrastructure and industries may be lost.





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