

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of
Inquiry Concerning the Deployment of
Advanced Telecommunications
Capability to All Americans in a Reasonable
and Timely Fashion, and Possible Steps
to Accelerate Such Deployment
Pursuant to Section 706 of the
Telecommunications Act of 1996
CC Docket 98-146

NOTICE OF INQUIRY

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By the Commission: Commissioners Ness and Powell issuing separate statements

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I. INTRODUCTION

1. This proceeding concerns the arrival of the broadband communications services of the twenty-first century -- what Congress has called the "deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans." We intend for advanced technology to have every opportunity to flourish and herein we seek comment on ways to make its deployment more efficient and more inclusive. Advanced capability and services can create investment, wealth, and jobs. They can meaningfully improve the nation's productivity and educational, social, and health care services. They can create a more productive, knowledgeable, and cohesive nation.

2. Many signs point to a demand for advanced services. The Internet is one of the wonders of the decade. The computer industry, promoters of leading edge technologies, and millions of ordinary consumers are clamoring for high-speed access to it. More generally, demand for more "broadband" or "high-speed bandwidth" is increasing exponentially. Methods for delivering digital information at high speeds are emerging in all segments of the communications industry -- wireline telephone, terrestrial and satellite wireless, cable, and broadcast, to name only a few.

3. There are two sets of challenges standing between today and the availability of advanced services to all Americans. The first set is technical. Much of today's network, especially the copper wire that ends in the residential consumer's premises -- the so-called "last mile" -- is not broad or fast enough to be called "advanced." No matter how fast the rest of the network is, a slow last mile can deny the promise of advanced telecommunications capability. If advanced services are to be available to every American, there must be more bandwidth in the last mile to the home. In addition, rural areas must have a broadband "backbone" (long distance) facility close enough to make accessing it a local call, just as it is for most consumers.

4. Second, our regulatory system is uneven in its treatment of different technologies. Our statutes and rules contain separate regimes for wireline and wireless, for local and long distance, for telecommunications, broadcast, and cable television, and so on. Digitization and packet-switching, however, may lead these industries to compete with each other. At some point, it may distort the performance of the market to have separate regimes of regulation for competitors in a converging market. We intend to assess the suitability of the varying regulatory regimes and we will work with Congress to ensure that our rules serve the public interest.

5. We intend to rely as much as possible on free markets and private enterprise to deploy advanced services. We recognize, at the same time, that Congress has instructed us to promote the availability of telecommunications services generally and advanced services in particular to specific segments of the population, including low income people, people in rural areas, schools, classrooms, libraries and health care facilities. We underscore our commitment to following this instruction while also seeking to promote the deregulatory and procompetitive goals of the 1996 Telecommunications Act ("the Act").

A. Statutory Framework

6. Section 706 of the Act¹ is a Congressional mandate to the Commission to examine the availability of advanced telecommunications capability to all Americans.² Section 706(a) directs the Commission and each state commission to "encourage the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans." The statute defines "advanced telecommunications capability," "without regard to any transmission media or technology, as high-speed, switched, broadband telecommunications capability that enables users to originate and receive high-quality voice, data, graphics, and video telecommunications using any technology."³

7. In section 706(b), Congress specifically directs the Commission to begin this inquiry, within thirty months of enactment of the 1996 Act, to find out whether advanced telecommunications capability is being deployed to all Americans in a "reasonable and timely fashion." The Commission must complete the inquiry within 180 days, and must take

¹ Pub.L. 104-104, Title VII, § 706, Feb. 8, 1996, 110 Stat. 153, reproduced in the notes under 47 U.S.C. § 157. It provides:

SEC. 706. ADVANCED TELECOMMUNICATIONS INCENTIVES.

(a) **IN GENERAL.**--The Commission and each State commission with regulatory jurisdiction over telecommunications services shall encourage the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans (including, in particular, elementary and secondary schools and classrooms) by utilizing, in a manner consistent with the public interest, convenience, and necessity, price cap regulation, regulatory forbearance, measures that promote competition in the local telecommunications market, or other regulating methods that remove barriers to infrastructure investment.

(b) **INQUIRY.**--The Commission shall, within 30 months after the date of enactment of this Act, and regularly thereafter, initiate a notice of inquiry concerning the availability of advanced telecommunications capability to all Americans (including, in particular, elementary and secondary schools and classrooms) and shall complete the inquiry within 180 days after its initiation. In the inquiry, the Commission shall determine whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion. If the Commission's determination is negative, it shall take immediate action to accelerate deployment of such capability by removing barriers to infrastructure investment and by promoting competition in the telecommunications market.

(c) **DEFINITIONS.**--For purposes of this subsection:

(1) **ADVANCED TELECOMMUNICATIONS CAPABILITY.**--The term "advanced telecommunications capability" is defined, without regard to any transmission media or technology, as high-speed, switched, broadband telecommunications capability that enables users to originate and receive high-quality voice, data, graphics, and video telecommunications using any technology.

(2) **ELEMENTARY AND SECONDARY SCHOOLS.**--The term "elementary and secondary schools" means elementary and secondary schools, as defined in paragraphs (14) and (25), respectively, of section 14101 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 8801).

² "Section 4 of the Bill [later section 706 of the 1996 Act] states clearly that this bill is intended to establish a national policy framework designed to accelerate rapidly the private sector deployment of advanced telecommunications." S. Rep. 104-23 at 27, March 30, 1995.

³ 47 U.S.C. § 157 note.

"immediate action to accelerate the deployment" of advanced telecommunications capability by removing barriers to infrastructure investment and by promoting competition in the telecommunications market if the inquiry determines that such capability is not being deployed in a reasonable and timely fashion.

B. Overview

8. This Notice of Inquiry (NOI) begins the inquiry called for by section 706(b). After defining some statutory terms, our first step (in Section II.A) is to learn more about the status and broadband capabilities of existing and planned networks. We invite commenters to describe the advanced services that they want to provide. We also examine, and we invite others to comment on, the assets, abilities, and incentives of the companies that own the networks. We are asking: "Who is able and motivated to deploy advanced services soon, especially to residential consumers?" Are there market incentives, or will ones soon exist, that will induce firms to reach schools and classrooms, people in rural areas and inner cities, and other customers who are traditionally thought to be less profitable? We emphasize that our inquiry transcends all boundaries among today's industries and segments and classes of services, and extends to information service providers, electric utilities, privately owned systems, and any other business firm that can offer advanced services.

9. In Section II.B, we seek comment on how to determine whether advanced telecommunications capability is being deployed in a "reasonable and timely fashion" to all Americans. To what extent are advanced services being offered? Who offers them? What form does demand actually take? Does experience here, or in other nations, point the way to speedy deployment over this country in general and in specific instances such as schools and libraries.

10. In Section II.C, we invite proposals for action, especially "removing barriers to infrastructure investment and . . . promoting competition in the telecommunications marketplace,"⁴ that we may take in the future if we determine that advanced telecommunications capability is not being deployed in a reasonable and timely fashion. We ask whether, in order to create and maintain a robustly competitive market for advanced facilities and services, a fundamental change in our statutes is needed.

11. This item is one of two items we are adopting contemporaneously. The companion item is an Order and Notice of Proposed Rulemaking (NPRM).⁵ That item is issued in response to six Petitions suggesting action we should take today or in the near future to speed

⁴ *Id.*

⁵ Petition of Bell Atlantic Corporation for Relief from Barriers to Deployment of Advanced Telecommunications Services, CC Docket No. 98-11, *Memorandum Opinion & Order & Notice of Proposed Rulemaking*, FCC 98-188, adopted August 6, 1998.

the deployment by wireline carriers of advanced telecommunications capability.⁶

12. This proceeding is concerned with the longer-term future. We urge all segments of the communications and related industries, including cable, telephony, terrestrial wireless, satellite, broadcast and others referenced in paragraph 8 to participate. We especially welcome comment from those who could be directly affected by the outcome of this proceeding, such as consumers, schools and libraries, and rural health care providers. We also welcome comment from manufacturers and vendors of equipment, research laboratories, academics, securities and investment analysts, and market research firms. We want ideas that are not shaped narrowly by the interests of any incumbents, and presentations from companies that are not traditional telecommunications firms. It is critical that the analysis and debate surrounding section 706 focus not just on the more traditional, wired telecommunications network, but also on other emerging technologies for delivering higher bandwidth services. We also ask commenters to tell us how we can give the private sector the confidence to invest in new high-bandwidth technologies and to deploy them throughout this country.

II. DISCUSSION

A. "Advanced Telecommunications Capability"

1. Statutory Terms

13. Section 706(c)(1) defines "advanced telecommunications capability," "without regard to any transmission media or technology, as high-speed, switched, broadband telecommunications capability that enables users to originate and receive high-quality voice, data, graphics, and video telecommunications using any technology."⁷ We seek comment on the meaning of these terms. Does the statute, its legislative history, or industry usage and custom provide any guidance to the meaning of such terms as "video telecommunications"? How do we determine whether a particular facility or service fits within the statutory definition of advanced

⁶ See, e.g., Petition of Ameritech Corp. to Remove Barriers to Investment in Advanced Telecommunications Capability, *Petition of Ameritech Corp.*, CC Docket No. 98-32, dated March 5, 1998; Petition of Bell Atlantic Corp. for Relief from Barriers to Deployment of Advanced Telecommunications Services, *Petition of Bell Atlantic*, CC Docket No. 98-11, dated Jan. 26, 1998 (Bell Atlantic Petition); Petition of Southwestern Bell Tel. Co. *et al.* for Relief from Regulation Pursuant to Section 706 of the Telecommunications Act of 1996 and 47 U.S.C. § 160 for ADSL Infrastructure & Service, *Petition of Southwestern Bell Tel. Co. et al.*, CC Docket No. 98-91, dated June 9, 1998 (SBC BOCs Petition); Petition of U S West Communications, Inc. for Relief from Barriers to Deployment of Advanced Telecommunications Services, *Petition for Relief*, CC Docket No. 98-26, dated Feb. 25, 1998 (U S West Petition). In this NOI, citations to filings (Comments, Reply Comments, Oppositions, *etc.*) are, unless specified otherwise, to filings made in response to one or all of these Petitions. See also *infra* note 75.

⁷ 47 U.S.C. § 157 note.

telecommunications capability or is an "advanced service"?⁸ Does advanced telecommunications capability include electronic program guides? We also note that section 706 concerns 'all Americans' and contains no reference to their fixed locations or mobile uses of telecommunications. We seek comment on whether advanced telecommunications capability that is provided using mobile or fixed technology should be distinguished for purposes of section 706.

14. The statute does not define the terms "broadband" and "high-speed." We seek comment on how we should define such terms. One possibility might be to define broadband to refer to "facilities with sufficient bandwidth (*i.e.*, speed) to offer the capability of transporting multiple channels of service." Another option might be to define these terms to refer to facilities with sufficient bandwidth to convey an amount of information in less than a certain amount of time or at a rate greater than a certain specific rate. We invite parties to comment on these definitions and to propose other possible definitions.

15. Parties should also consider whether Congress intended the meaning of "advanced telecommunications capability" to change over time, including new technologies as they are developed and excluding ones that were once cutting-edge but have since become conventional. For example, under such an interpretation, touch-tone technology might have been "advanced" in 1960. It would not be today, but technology for high-speed Internet access might be. We request comment about these interpretations, and more generally on how the Commission should evaluate and respond to the expansion of new technologies and their deployment in the mass market.

16. The statutory definition of advanced telecommunications capability also specifies "originate and receive." We ask whether this means to exclude one-way telecommunications. Second, we note that certain types of "push technologies" allow consumers to subscribe to data that is regularly refreshed. These arrangements allow subscribers to vary at will the data to which they subscribe. We seek comment on whether advanced telecommunications capability includes solely the origination and reception of data on a real-time basis, or whether it was intended to encompass such subscriber relationships as push technologies. Third, we ask whether advanced telecommunications capability includes content, such as web pages, in addition to the ability to reach content.

17. Finally, we welcome comment on the meaning of any other statutory terms. We invite clarification and definition of statutory terms such as "reasonable and timely." We also welcome comment about the relationship between sections 706(a) and 706(b), specifically whether action under one subsection should or must precede the other.

⁸ We distinguish between advanced telecommunications capability and services derived from it ("advanced services"), as in the distinction between infrastructure and applications, or between facilities and services offered to end users. We ask that commenters observe this distinction.

2. Current and Future Deployment of Advanced Telecommunications Capability

18. In this Section, we survey the industries we oversee and several related industries. We examine what appear to us to be each one's assets, abilities and incentives to deploy advanced telecommunications capability and advanced services. We are most interested in learning others' perspectives on these matters. What existing or planned facilities will be capable of deploying some or all elements of advanced telecommunications capability, and what advanced services are being offered or planned? We request interested parties to inform us about their own (and other companies') present facilities, current construction, plans, and ideas. We welcome details: we urge all commenters to supply us, as appropriate, with depictions of existing networks, plans for new ones, technical descriptions, deployment schedules, maps, and cost projections. (Methods of disclosure of confidential information are discussed below in paragraph 90.) Particularly welcome would be estimates of the cost of the different kinds of "backbone" and "last mile" facilities (both wire and wireless),⁹ perceptions of risk associated with each of them, and predictions about the willingness of the capital markets to finance any or all of them.

19. Incumbent Local Exchange Carriers (incumbent LECs): Last Miles. The incumbent LECs possess wire facilities that go the last mile to nearly every home and business in the United States. The last part of these last miles generally consists of copper that, as now used, lacks advanced telecommunications capability. The other parts of the incumbent LECs' last miles (those beyond the first point of concentration of copper loops in a neighborhood) are increasingly high-capacity fiber. This collection of facilities we have just described, as it is now used, is capable of providing "plain old telephone service" (POTS) and data communications and Internet access via dial-up modems. They are the only facilities that go to almost every home in this country and now provide POTS. For these facilities to provide certain advanced services, they would need either expensive improvement by new last miles, probably consisting of fiber or wireless connections,¹⁰ or new software or technology that will derive increased bandwidth from the existing twisted pair copper cable.¹¹

20. Technology affording such increased bandwidth exists, is known as digital subscriber line (DSL), and takes many forms (collectively, xDSL).¹² To date, the most

⁹ For simplicity's sake, in this NOI we will use the terms "backbone" and "last mile" as shorthand for interoffice/long distance/international and local facilities and services, respectively.

¹⁰ LELAND J. JOHNSON, TOWARD COMPETITION IN CABLE TELEVISION 29-35 (1994).

¹¹ *Id.* at 38-41.

¹² DSL uses digital signal processing techniques to make possible the provision, on existing copper loops, of high-speed data communications without interfering with the carriage of voice service. DSL allows a copper loop to be used simultaneously for high-speed data service and ordinary voice service, and keeps the data capability available 24 hours a day. SBC BOCs Petition at 6-10; Comments of Ameritech Corp. on Bell Atlantic Petition at

prominent forms are ADSL (asymmetric DSL) and HDSL (high-speed DSL). xDSL technology is capable of increasing the capabilities of the incumbent LECs' existing copper plant, and may be capable of offering many advanced services.¹³

21. Some incumbent LECs have unveiled plans to offer, or have begun to offer, xDSL service in some areas.¹⁴ SBC expresses interest in offering it in inner-city and rural areas "if there is a proper balance of incentives, risk, and possible reward."¹⁵ Other parties, however, question the incumbent LECs' incentive to deploy xDSL and other new technologies quickly. They point to what they allege are the incumbent LECs' huge investment in current technology¹⁶ and their alleged history of being sluggish to deploy other new technologies, such as ISDN.¹⁷ Some of these parties also dispute that xDSL is better for high-speed data service, or advanced services generally, than a number of other technologies.¹⁸

22. We ask for detailed information about whether incumbent LECs are deploying

4, 6 (April 6, 1998); Joint Comments of APK Net, Ltd., *et al.* on RBOC Petitions, n.5 at 3, 10 ("all [DSL] needs to work is a relatively clean, short, unswitched copper communications path. Copper. Point-to-point. No switching. No multiplexing. No fiber optics. No SONET. No intelligent network. No SS7. Just clean, unswitched, basic copper telecommunications paths, with xDSL equipment on both ends.") (April 6, 1998); Reply Comments of Comcast Corp. at 13 (xDSL "does not work on loops that have multiplexing systems . . . in the feeder portion; it does not work on loops that have 'load coils' on them; and beyond a certain point, xDSL delivers progressively lower data rates as circuit length increases until, ultimately, it does not work at all") (May 6, 1998).

¹³ For technical information about xDSL, *see, e.g.*, BELLCORE, NOTES ON THE NETWORKS (Special Report-2275), Issue 3, Ch. 12 (Dec. 1997).

¹⁴ *See, e.g.*, *Bell Atlantic Jumps into ADSL Market with 3 Offers for Home Users*, COMM. DAILY, June 4, 1998, available at 1998 WL 10696558.

¹⁵ SBC BOCs Petition at 34-35.

¹⁶ *See, e.g.*, Comments of Covad Communications Co. at 6 (April 6, 1998) (doubting that the ILECs, with "market power in local circuit-switched services . . . [will] immediately jump at the opportunity to obsolete that equipment").

¹⁷ *See, e.g.*, Comments of the Commercial Internet Exchange Association on Bell Atlantic Petition at 9 (April 6, 1998) ("the rate of innovation on the [traditional network], which has been Bell Atlantic's proving ground for decades, is far less impressive. For example, the ILECs' slow rate of ISDN deployment may be a harbinger of ILEC xDSL service roll-out."); Reply Comments of Level 3 Communications, Inc., at 6 (May 6, 1998) ("The BOCs either did not have the [advanced] technology, or did not want to make the technology available for fear of cannibalizing more profitable business"). *See also* Opposition of MCI Telecommunications Corp. to U S West Petition at 16 (April 6, 1998) ("with the exception of voicemail, the BOCs have almost nothing to show for their innovation plans in the area of information services").

¹⁸ Reply Comments of Comcast Corp. at 18 (May 6, 1998) ("there does not appear to be any practical, market-based reason to promote xDSL deployment in comparison to other high-speed access technologies. [A]t any given time industry observers have different views about which of these systems is best suited to mass consumer demand.").

advanced telecommunications capability, both within their present territories and outside them. We seek information concerning the number of incumbent LECs' exchange lines that are now capable of providing xDSL and advanced services generally. We understand that loops' usefulness for xDSL is greatly reduced if their length exceeds 18,000 feet or if they are encumbered by such common features as digital loop carrier, bridged taps and loading coils. How widespread are these attributes, and are they common enough to make xDSL effectively unavailable to a large number of customers at present? For those exchange lines over which the incumbent LECs cannot provide xDSL, we ask for comment on the cost of changing them to have that capability. We also ask for incumbent LECs' plans about future deployment of advanced telecommunications capability and the capability to provide xDSL.

23. Much of the incumbent LECs' fiber is not now in use.¹⁹ We ask how much of this "dark fiber" is the "other part" of the last mile (beyond the first point of concentration of copper loops in a neighborhood) and how much of it is interoffice. We ask how much dark fiber capacity is present with existing optics and electronics and how much additional capacity could be realized with upgraded optics and electronics and at what cost? We also ask whether the deployment of advanced telecommunications capability would be advanced by our requiring that dark fiber be leased. What is preventing its deployment to meet any demand for advanced telecommunications capability?

24. We ask for comment on the effect of mergers and other consolidations on the deployment of advanced telecommunications capability. Will they speed or slow the development by the merged companies and their competitors? Will the net effect on advanced services be more or fewer choices, and lower or higher prices, for American consumers?

25. Incumbent LECs: Backbone. Some regional Bell operating companies (RBOCs) claim that there is a shortage of backbone facilities that are capable of providing Internet-related services and advanced services generally, and that they can fill it.²⁰ Other parties dispute the existence of any shortage. They also see the marketplace filling the need for more backbone on its own, and faster than Commission inquiry and rulemaking proceedings could possibly move.²¹ We seek comment on both these perspectives and specific identification of any areas where there is a shortage of backbone. For example, is any shortage relatively greater in intraLATA or interLATA routes?

¹⁹ Their total spare or "dark" fiber, as a percent of their total fiber deployment, was approximately 66% in 1991, 63% in 1992, 70% in 1993, 65% in 1994, 68% in 1995, 68% in 1996, and 67% in 1997. FCC ARMIS Report 43-08 (1991-97).

²⁰ See, e.g., Bell Atlantic Petition at 13-16 & accompanying Declaration of Professor Thomas W. Hazlett at 2-10.

²¹ See, e.g., Reply Comments of Comcast Corp. at 5-6 (May 6, 1998) ("major backbone providers are taking steps to double their capacity approximately every three to four months.").

26. The deployment of advanced telecommunications capability in rural areas is of particular concern to us. We welcome comments from both consumers and potential suppliers about rural areas. For example, do parties believe that xDSL technology is cost-effective in low-density service areas, so that no incentives are needed to stimulate investment in rural markets?²² Is there any reason to expect a shortage of backbone or last-mile advanced telecommunications capability with access to, or in, rural areas?

27. Incumbent LECs: New Markets. Incumbent LECs may also enter new product and geographic markets, such as telecommunications in neighboring or faraway territories, the market of multichannel video program distributors (MVPDs),²³ and the market of information services providers (ISPs). If an incumbent LEC did that by building a broadband network to offer a bundle of services (such as telecommunications, high-speed Internet access and MVPD) in a neighboring territory, that might constitute the deployment of advanced telecommunications capability. It might also inject significant new competition into major uncompetitive markets. Most incumbent LECs, however, have avoided entering other territories or the MVPD market. We request comment on incumbent LECs' incentives to enter such new markets and on the implications of such entry on the deployment of advanced telecommunications capability.

28. We request comment on the soundness of the above analysis of the incumbent LECs' opportunities, incentives, and track record in deploying advanced telecommunications capability. We are interested in comments about both RBOCs and other incumbent LECs. Are non-RBOC incumbent LECs, in fact, deploying more advanced telecommunications capability than the RBOCs? If they are, is the difference attributable to the RBOCs' legal burdens, the other incumbent LECs' greater entrepreneurship or relatively small territories, or some other cause(s)? Whatever the reason, should we expect one group of incumbent LECs to have a greater incentive and ability to deploy advanced telecommunications capability?

29. Competitive LECs. Competitive LECs generally possess no market power, are relatively free of regulatory obligations, and typically lack installed, POTS-oriented, circuit-switched facilities. As a class, they do not lack resources. In 1997, the capital markets provided them with billions of dollars in funding.²⁴ We ask for comment, nevertheless, on whether there are competitive LECs that lack reasonable access to adequate capital and whether there are any steps the Commission could take to address this concern.

²² Intermedia Communications, Inc. Comments Opposing Deregulation of Incumbent Local Exchange Carrier Networks & Services at 16-17 (April 7, 1998).

²³ 47 U.S.C. § 522(13) defines an MVPD as "a person such as, but not limited to, a cable operator, a multichannel multipoint distribution service, a direct broadcast satellite service, or a television receive-only satellite program distributor, who makes available for purchase, by subscribers or customers, multiple channels of video programming."

²⁴ See, e.g., Teleport Communications Group Inc., *Memorandum Opinion & Order*, FCC 98-169 n.127 at ¶ 39 (released July 23, 1998); J P Morgan Securities Inc., *Telecoms in the Age of the Internet* at 9 (April 24, 1998); Paine Webber, *Pressures Mounting on RBOC EPS Growth* at 21, May 14, 1998.

30. The competitive LECs are providing some services that duplicate the incumbent LECs', but are lower-priced in most cases, and other services that have capabilities in excess of the incumbent LECs'. Competitive LECs are deploying facilities on a large scale, mostly to serve large and medium-sized business customers, typically in central business districts in urban areas and suburban rings. A few competitive LECs also serve the work-at-home market.²⁵ The facilities that competitive LECs are deploying are mainly switches and interoffice lines, not substitutes for the copper in the last mile to the small business and residential customer's premises (the mass market). Thus, most competitive LECs remain dependent on the incumbent LECs' copper for the last mile. There are also several existing and potential competitive LECs that use radio spectrum for their last miles. For convenience's sake, we discuss them below under the heading High-Bandwidth Wireless, in paragraphs 42-44.

31. We ask for comment on the extent to which the competitive LECs are deploying advanced telecommunications capability. We particularly ask for comment on whether their abilities and incentives are likely to be limited to certain areas and kinds of customers, to certain elements of advanced telecommunications capability, and to supplementing incumbent LEC facilities rather than replacing them. Are competitive LECs likely to enter the mass market, and especially to become full, facilities-based competitors to the incumbent LECs on a large scale? In particular, we seek comment on whether competitive LECs are utilizing and installing technologies that will bypass incumbent LECs' essential facilities such as the local loop.

32. Interexchange Carriers (IXCs). There are several hundred IXCs. A few of them own most of the interLATA long distance telecommunications facilities in this country. These facilities were built primarily to provide voice and data telecommunications services and now serve as the basic transmission medium for Internet backbone traffic. We request comment, first, on whether these facilities constitute, in their present form or with minor enhancements, advanced telecommunications capability. Second, what advanced services are IXCs now offering or planning to offer on their interexchange facilities?

33. Third, is there, in fact, a shortage of Internet backbone? What are the construction plans of existing and emerging backbone providers? Is any shortage more acute in backbone running to rural communities or other areas in particular? Or is there, in reality, no 'shortage,' but simply the occasional, transient lack of supply that is to be expected in any market undergoing unanticipated and explosive growth in demand?

34. Fourth, can an IXC be considered to be deploying advanced telecommunications capability if it relies entirely on the facilities of an incumbent LEC to reach end users? Fifth, we invite comment on the extent to which IXCs are likely to deploy new last miles of advanced

²⁵ Comments of Covad Communications Co. at 4 (April 6, 1998) ("Covad's facilities-based, DSL network extends extensively to residential areas."). See also SBC BOCs Petition at 15-17 (Covad and others).

telecommunications capability, especially to serve the mass market.²⁶ Sprint recently announced a nationwide, local offering, Integrated On-Demand Network (ION), based on asynchronous transfer mode technology. Sprint describes ION as including what may be many facets of advanced telecommunications capability.²⁷ We invite comment on whether ION includes advanced telecommunications capability directed at the mass market.

35. We are also interested in the amount and adequacy of backbone between the United States and other countries. Advanced services desired by Americans may well begin or end in another country, and we want ample transport capacity on international routes as much as we do within the United States. We know, for example, that significant amounts of new backbone (especially in submarine cables) are being constructed, or could be constructed, on certain US-foreign country routes.²⁸ Will this additional backbone capacity be sufficient? Do new entrants have access to the new, high-capacity backbones? Is there any evidence that existing owners of backbone are restricting access to it? What are the barriers to deployment of additional international backbone facilities?

36. We also seek comment on the relationship between last miles in other countries and the development of advanced telecommunications capability and advanced services that American consumers and businesses may desire. Are there regulatory issues related to the deployment of advanced telecommunications capability that arise internationally but not in the U.S.? Are the pro-competitive commitments of the World Trade Organization Agreement on Basic Telecommunications allowing new entrants to access necessary facilities in foreign countries at reasonable rates? Are broadband networks in the United States and other countries compatible? Will widespread deployment of advanced telecommunications capability outside the U.S., via technology that is compatible with that used in the U.S., stimulate e-commerce involving companies in the U.S., reduce the per unit cost of equipment used by consumers in the U.S., and otherwise accelerate the deployment of advanced telecommunications capability in the U.S.?

37. ISPs. This class of companies includes all providers of information services. These include, but are not limited to, the more than 4,000 providers of Internet access. The latter provide their customers with access to Internet content (such as web pages) and services

²⁶ See Bell Atlantic Reply Comments at 20 (May 6, 1998) ("The major long distance carriers will not deploy xDSL to residential customers anytime in the foreseeable future. AT&T, MCI, WorldCom and Sprint have attacked the lucrative local market for business services but have abandoned residential customers."), 21.

²⁷ *Sprint Wins Access Agreements with 4 Incumbent LECs for New Network*, COMM. DAILY, June 18, 1998, available at 1998 WL 10696675; *Sprint's Big Bang*, WIRED NEWS, <http://www.wired.com/news/news/business/story/12668.html>, visited 6/4/98 ("Sprint today announced a US\$2 billion upgrade of its network that its [sic] says will provide 'virtually unlimited bandwidth over a single existing telephone line for simultaneous voice, video calls, and data services.'").

²⁸ See e.g., "1996 Section 43.82 Circuit Status Data" (Int'l Bur. December 1997). See also MCI Communications Corp., *Memorandum Opinion & Order*, 12 FCC Rcd 15351, 15405-06 (1997).

(such as e-mail). The typical retail customer subscribes to the service of an Internet access provider, pays a monthly fee, and obtains access via a personal computer. Some Internet access providers, however, have also constructed or acquired some of their own Internet backbone facilities. Also, a few Internet access providers have begun to offer phone-to-phone interexchange telecommunications service via Internet backbone facilities, thereby bypassing the conventional IXCs' networks.²⁹ Likewise, some Internet access providers have created affiliates to be certificated as competitive LECs.

38. We ask for comment on how the Commission can ensure that customers are free to choose their own ISPs, especially in markets where the in-region incumbent LEC, or an affiliate of it, is the only provider of advanced telecommunications capability, such as xDSL. What, if anything, should the Commission do to promote provisioning of xDSL by incumbent LECs that does not bundle and does not direct customers to the incumbent LECs' affiliated ISPs?³⁰ Regardless of whether an incumbent LEC or an affiliate offers xDSL service, should the Commission require this service to be provided to independent ISPs and the affiliated ISP only on equal terms and conditions? How can the Commission ensure that independent ISPs are able to obtain efficient and competitively priced local transport services from incumbent LECs?

39. MVPDs - Cable Television. Incumbent cable television systems now pass virtually every home in this country and provide cable television service to approximately 66% of them.³¹ The 34% of residences that choose not to subscribe to cable service do so, for the most part, for reasons other than lack of money.³² Incumbent cable television systems continue to dominate the MVPD market, although competition for them is growing.³³ Their principal offering is the one-way transmission of channels of television programming to residential customers for a fee.³⁴ Parts of these offerings are regulated by this Commission and state and local governments. In some circumstances, regulators enter into agreements with system operators in which the operators agree to improve and expand the services they offer.³⁵ Some

²⁹ Federal-State Joint Board on Universal Service, CC Docket No. 96-45, *Report to Congress* (FCC 98-67) at ¶¶ 88-93 (released April 10, 1998).

³⁰ See *infra* note 90 and accompanying text.

³¹ Annual Assessment of the Status of Competition in Markets for the Delivery of Video Programming, *Fourth Annual Report*, 13 FCC Rcd 1034, 1049 & nn.21-22 (1998) (Fourth Cable Competition Report).

³² See, e.g., ROBERT W. CRANDALL & HAROLD FURCHTGOTT-ROTH, *CABLE TV: REGULATION OR COMPETITION*, Apps. A & B *passim*, 147 & Table B-9 (1996).

³³ Fourth Cable Competition Report, 13 FCC Rcd at 1038.

³⁴ *Id.* at 1050.

³⁵ For example, Arlington County, Virginia, and its cable system operator may execute a new franchise agreement that will lead to a hybrid fiber-coaxial system allowing high-speed Internet access for all customers and, for public schools, cable modems and free Internet access. *Arlington To Weigh Cable TV Proposal*,

cable television systems are starting to offer telephone service and digital video services, and Internet access at speeds faster than are available over traditional telephone lines.³⁶ Newly developed modems are the primary devices that are making the latter services available. Speeds of 10-27 megabits per second (Mbps) are common. The speed of cable modems offers a many-fold increase in terms of speed of connection and data transmission over the dial-up modems currently used by most subscribers to connect to online services, the Internet and the World Wide Web.

40. Do the technical improvements to a cable television system that make possible the digital video services and Internet access mentioned in the preceding paragraph permit the deployment of advanced telecommunications capability or advanced services? We specifically request detailed information about the capabilities of modems and set-top boxes, whether supplied by cable operators or others, for deploying advanced telecommunications capability, especially to residential customers.

41. MVPDs - Other. Other MVPDs may deploy advanced telecommunications capability to offer advanced services to residential customers. A supplier of "wireless cable," CAI Wireless Systems, Inc.,³⁷ now offers high-speed Internet access service³⁸ and claims that the wireless cable industry "has the potential to support two-way voice and data services including high-speed 27 Mbps Internet access services that are not widely available today."³⁹ We request comment on whether the capability to provide these services would constitute advanced

WASHINGTON POST, May 21, 1998, at V-1, available at www.washingtonpost.com/wp-s...te/1998-05/21/0721-052198-idx.html, visited May 26, 1998. Also, through Commission-approved social contracts, cable operators have agreed to complete system upgrades and, in some cases, to provide Internet access to schools and libraries. Implementation of section 703 (e) of the Telecommunications Act of 1996, *Report & Order*, 13 FCC Rcd 6777, 6794 n.125 (1998) & cases cited therein; Social Contract for Comcast Cable Communications, Inc., *Order*, 13 FCC Rcd 3612 (1997).

³⁶ Fourth Cable Competition Report, *supra* note 31, 13 FCC Rcd at 1063-69. The telephone services are sometimes provided over cable tv facilities. See, e.g., Comments of United Homeowners Association *et al.* on Bell Atlantic Petition, Attachment 2 at 5 (April 6, 1998).

³⁷ "Wireless cable" service is formally classified as Multichannel Multipoint Distribution Service.

³⁸ Reply Comments of CAI Wireless on Bell Atlantic Petition at 2 & n.2 (May 6, 1998) ("Reply Comments of CAI Wireless") ("CAI currently offers a high-speed Internet access service that provides a downstream data rate of 27 Mbps, which is orders of magnitude faster than Internet services using traditional telephone-based modems," while noting that "a regular telephone line is used for the return path" and asking for regulatory changes that would obviate the need for such a line). New wireless cable services may also be provided on the recently licensed LMDS spectrum, *infra* note 41.

³⁹ Reply Comments of CAI Wireless at 2 & n.2. See also Amendment of Parts 1, 21 & 74 to Enable Multipoint Distribution Service & Instructional Television Fixed Service Licensees to Engage in Two-Way Transmissions, *Notice of Proposed Rulemaking*, released Oct. 10, 1997, summarized at 62 Fed. Reg. 60025 (Nov. 6, 1997).

telecommunications capability, and on the regulatory or other barriers to wireless cable providers' ability to deploy it widely.⁴⁰ For example, would a wireless cable system have the capacity to provide different streams of data at 27 Mbps simultaneously to multiple customers? We also ask for information about the barriers to deployment of advanced telecommunications capability by other MVPDs.

42. High-Bandwidth Wireless - Terrestrial. The Commission has auctioned large quantities of high-bandwidth spectrum to terrestrial users, and intends to auction more, in quantities that appear large enough to support advanced telecommunications capability.⁴¹ Some licensees are using, and other would-be licensees have expressed interest in using, this spectrum to offer the last mile and backbone of several services that seem advanced.⁴² The majority of these services appear to be targeted at the small and medium-size business market. The companies offering these services claim that their services, compared to those offered by other last-mile and backbone providers, have speedy deployment at low cost, high speeds for data communications, and high quality of service.⁴³

43. We ask, first, whether these high-bandwidth terrestrial wireless systems and services would effect the deployment of advanced telecommunications capability and advanced services, respectively. Second, we request comment on the extent that such services are offered today, and on the likelihood, and timeline, that they will be expanded to serve the mass market. What regulatory and other barriers exist to greater, more widespread deployment of high-bandwidth wireless systems? Might such systems effect deployment of advanced telecommunications capability to currently underserved areas, such as rural areas, and to other areas where access to the customer may present logistical difficulties? Finally, we request comment on whether the spectrum that has been made available to date is adequate to allow wireless carriers to compete with wireline providers. If commenters believe additional spectrum

⁴⁰ Wireless cable offerings are one-way. Conventional telephone lines are used for the return communications. Reply Comments of CAI Wireless n.2 at 2 ("Full-motion video, audio, and data from the Internet is downloaded via the [wireless cable] channel, while a regular telephone line is used for the return path").

⁴¹ See, e.g., Rulemaking to Amend Parts 1, 2, 21, & 25 of the Commission's Rules to Designate the 27.5-29.5 GHz Frequency Band, to Re-Allocate the 29.5-30.0 GHz Frequency Band, to Establish Rules & Policies for Local Multipoint Distribution Service & for Fixed Satellite Services, *Second Report & Order, Order on Reconsideration, & Fifth Notice of Proposed Rulemaking*, 12 FCC Rcd 12545 (1997) (1.3 GHz at 27.5-28.35 GHz, 29.1-29.25 GHz, and 31.0-31.3 GHz for virtually any service), *aff'd*, *Melcher v. FCC*, 134 F.3d 1143 (D.C. Cir. 1998).

⁴² See, e.g., Fred Dawson, *WinStar to Deploy Point-to-Multipoint Network*, MULTICHANNEL NEWS, Nov. 3, 1997, available at 1997 WL 8742459; John T. Mulqueen, *Winstar to Expand Long Distance, Internet & Wireless Services*, COMM. WEEK, Sept. 15, 1997, available at 1997 WL 12653283.

⁴³ See generally Implementation of Section 6002 (b) of the Omnibus Budget Reconciliation Act of 1993 & Annual Report & Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services, *Third Report*, FCC 98-91 at App. F (released June 11, 1998) (Third CMRS Competition Report).

is needed, they should identify candidate spectrum bands and recommend bandwidths that will be necessary to allow providers to offer advanced telecommunications capability.

44. In the near future, we will explore generally competition in the local exchange by providers of both fixed and mobile wireless telecommunications services. As part of that initiative, we will inquire into any barriers that may exist to wireless competition with the incumbent LECs, and what we can do to reduce or eliminate such barriers. To the extent these issues pertain specifically to the availability of advanced telecommunications capability or services, commenters are invited to address such issues in this proceeding.

45. High-Bandwidth Wireless - Satellites. Several satellite system operators now offer advanced voice, data, and video services (including applications such as distance learning and tele-medicine) in the United States.⁴⁴ Present users of two-way services are typically institutional or business interests with substantial and recurring needs for advanced services. Residential consumers are typically in very thinly populated areas where there is no lower-cost terrestrial-based service. Mass market services, such as Direct Broadcast Satellite services, are primarily one-way.

46. In recent years, the Commission has authorized additional satellite systems that plan to offer a wide range of services to both businesses and consumers.⁴⁵ Prices for satellite terminals and services that use them have declined as the number of terminals sold has increased, reflecting economies of scale. At least one observer expects satellite-based systems to become "the dominant means of delivering multimedia to most users outside urban areas."⁴⁶ However, the price of satellite services, including necessary ground equipment, is viewed by some industry analysts as a significant factor limiting mass-market deployment.⁴⁷ We seek comment on

⁴⁴ Several of the better known satellite-based Internet access providers use an "asymmetric" architecture, in which data are sent to the end user using a high-bandwidth satellite link, while communications from the end user go on a traditional narrowband telephone line.

⁴⁵ The Commission continues to authorize C- and Ku-Band systems at new orbital locations. In 1997, the Commission authorized 13 companies to provide service using Ka-Band geostationary satellites. See Assignment of Orbital Locations to Space Stations in the Ka-Band, *Order*, 13 FCC Rcd 1030 (Chief, Int'l Bur. 1997); *Order*, 12 FCC Rcd 22004 (Chief, Int'l Bur. 1997). The Commission licensed its first non-geostationary Fixed Satellite Service in 1997. See Teledesic Corp., *Order & Authorization*, 12 FCC Rcd 3154 (Chief, Int'l Bur. 1997). The Commission has also initiated additional proceedings to authorize service in previously unused frequency bands. See, e.g., Public Notice, Applications Accepted for Filing; Cut-Off Established for Additional Space Station Applications and Letters of Intent in the 36-51.4 GHz Frequency Band, 12 FCC Rcd 10450 (1997).

⁴⁶ Merrill Lynch, *Global Satellite Marketplace 98*, 120-21 ("satellites are the least cost solution for serving regions with low subscriber density" and defining "multimedia" to include such telecommunications applications as "High-speed corporate data, Internet access, Push data services, . . . Video conferencing, [and] Basic telephony.") (April 22, 1998).

⁴⁷ See J. Careless, VSATS: *On the Brink of Global Domination*, VIA SATELLITE at 32 (Dec. 1997); G. Francis, *Satellite Statistics: Charting New Directions*, VIA SATELLITE at 46 (June 1998); Merrill Lynch, *Global*

whether there are regulatory or other barriers to the development of equipment that would provide full interactive capabilities, either through the use of two-way satellite communications paths, or by supplementing one-way satellite communications paths with terrestrial wireless or wireline systems? More generally, we ask for comment on the extent to which satellite systems have deployed or are planning to deploy advanced telecommunications capability. Will satellites be more capable than other technologies of providing advanced services faster, over broader areas, and internationally? Will satellites provide, or are they providing, a cost-effective means of delivering broadband services to rural areas, in particular remote elementary and secondary schools and classrooms such as in Native American areas or the Alaskan Bush? Finally, we direct parties' attention particularly to novel proposals that share characteristics of both terrestrial and satellite systems, such as Sky Station International's proposed use of platforms located in the stratosphere to build a global stratospheric telecommunications system.⁴⁸

47. Over-the-Air Broadcasting. Each existing over-the-air, terrestrial television broadcaster has been allotted a second 6 MHz channel for use in the conversion to digital television. Each licensee must provide at least one free over-the-air television service on that new channel, but may use a portion of its digital bitstream to provide a variety of ancillary or supplementary services that may be advanced services.⁴⁹ Some television broadcasters have discussed the possibility of using some of their digital television bitstream to provide data services.⁵⁰ We request comment on the likelihood of over-the-air broadcasters doing so and of such activities constituting the deployment of advanced telecommunications capability and the offering of advanced services. In particular, would broadcasters' data services be two-way and switched? This would be significant if we decide that those characteristics are necessary elements of advanced telecommunications capability.

48. Utilities. Like the incumbent LECs, utility companies, especially those providing electric service, reach the vast majority of American homes. A growing number of utilities are using their conduit space and the telecommunications systems they built for their own internal

Satellite Marketplace 98 at 121, 126.

⁴⁸ See, e.g., Amendment of Parts 2, 15, & 97 of the Commission's Rules to Permit Use of Radio Frequencies Above 40 GHz for New Radio Applications, *Second Report & Order*, 12 FCC Rcd 10571, 10580-81 (1997).

⁴⁹ See 47 C.F.R. § 73.624(b, c); Advanced Television Systems & Their Impact Upon the Existing Television Broadcast Service, *Fifth Report & Order*, 12 FCC Rcd 12809 (1997), *on reconsideration*, *Memorandum Opinion & Order on Reconsideration of the Fifth Report & Order*, 13 FCC Rcd 6860 (1998).

⁵⁰ *Welfare for Broadcasters*, N.Y. TIMES, Aug. 17, 1997, § 4, at 1, available at 1997 WL 7999860 ("Sinclair, ABC and no doubt many more broadcasters will now split up their new spectrum into several channels, with each channel using the standard digital format. . . . Viewers will soon be offered new over-the-air services, like Internet communications, paging and financial or sports data. A broadcaster could become a mini-cable service."). The permitted services include data services, aural messages, teletext, interactive materials, paging services, audio signals, and subscription video.

needs to enter telecommunications and MVPD markets. These include both private⁵¹ and municipal utilities.⁵² They now offer, or could offer, mobile services and the last mile of telephone and Internet access.⁵³ We seek comment on the feasibility of such offerings. What technology would be employed, and at what cost? We also request comment on whether these present and planned activities constitute the deployment of advanced telecommunications capability. We also ask whether utilities have an incentive to begin providing advanced services on a wide scale. Some observers see such an incentive coming from the ongoing deregulation of the energy market and the utilities' consequent need to diversify into new lines of business.⁵⁴ Are utilities particularly promising entrants into advanced services for the mass market because of their existing fiber optic plant, conduits, rights of way, billing and customer service operations, experience with complex communications systems for their internal operations, and brand names and reputations? Are there any special regulatory or other barriers that utilities face in entering the market for advanced services?

49. Commercial Mobile Radio Services (CMRS). CMRS providers include cellular, personal communications services (PCS), specialized mobile radio, and paging companies. They generally offer narrowband voice and data telecommunications services to business and residential customers. We understand that data services by cellular and PCS companies are "still fairly new"⁵⁵ and that the bandwidth of CMRS channels may be too narrow to support high-speed data communications at present. However, international negotiations are now taking place on the development of so-called "third generation" wireless systems and services, which are

⁵¹ *RCN Sees Strong Results in Washington Market*, PR NEWSWIRE May 28, 1998; Martha M. Hamilton, *The Power To Link Masses?; Pepco Venture to Offer Phone, Cable, Online Service*, WASH. POST, May 22, 1998, at D-1, available at 1998 WL 11581775 ("a joint venture [StarPower] of Potomac Electric Power Co. . . . and phone company RCN Corp. of Princeton, N.J., began offering Washington area consumers local and long-distance telephone service and Internet connections at the end of April. By the end of the year, the company hopes to have built a network that will let it offer cable television and high-speed Internet connections as well."). The Southern Co. of Atlanta is beta-testing wireless services for businesses "on top of" its private specialized mobile radio network. *ADTRAN Ships Tracer for Wireless TI Transmission; Ideal for PCS, International & Other Fast-Growing Wireless Markets, Tracer Delivers*, BUSINESS WIRE, Feb. 23, 1998.

⁵² *See, e.g., City-Owned Electric Company to Overbuild TCI System in Tacoma, Wash.*, WARREN'S CABLE REG. MONITOR (May 26, 1997), available at 1997 WL 10096974; Pat Blake, *Competition Rounds the Bend*, TELEPHONY (Aug. 14, 1995), available at 1995 WL 10013349.

⁵³ Reply Comments of Comcast Corp. at 12 n.30 (May 6, 1998) ("It is also possible to deliver high-speed Internet data over electric power lines"). *See also* the web page of the Utilities Telecommunications Council, <<http://www.utc.org/>>, "Business Development" & "Publications" pages.

⁵⁴ *See, e.g., Report Suggests Utility Involvement in Telecom at Some Level is Inevitable*, ELEC. UTIL. WK. DEMAND SIDE REP. 5 (Feb. 26, 1998), available at 1998 WL 10028664 ("As the electric industry becomes more competitive, utilities will have no choice but to become involved in at least the edges of the telecommunications business to maintain market share and profitability.").

⁵⁵ Third CMRS Competition Report, *supra* note 43, at 60.

expected to feature data and multimedia applications as one of their main components.⁵⁶ Also, several CMRS companies are planning to deploy fixed services, variously known as "fixed wireless access" or "wireless local loop," in addition to their mobile offerings.

50. We welcome comment on the ability and incentives of CMRS carriers to deploy advanced telecommunications capability in both fixed and mobile wireless applications. We are also interested generally in the potential for advanced telecommunications capability to be deployed on spectrum below 2.5 GHz, and especially in the potential for that spectrum to be a substitute for wireline last miles. Is any of this spectrum unused? Is any current user likely to have an economic incentive to use it for advanced telecommunications capability? We ask for comments on regulatory barriers that stand in the way of greater use of CMRS spectrum for advanced services, whether fixed or mobile. Can such services offer advanced services on a par with, or better than, wireline services? Commenters who answer in the negative should identify any regulatory barriers and suggest how they can be removed.

51. Private Systems. Many large consumers of telecommunications, such as government entities and large businesses, operate private wire and radio communications systems for their own internal activities (deliveries, maintenance in the field, metering, *etc.*).⁵⁷ We ask, first, whether these private systems contain the raw materials for a significant amount of advanced telecommunications capability, both backbone and last mile. We ask whether operators of these private systems have an incentive to deploy advanced telecommunications capability and offer advanced services on a large scale to the mass market. Do private systems, as presently configured, access the mass market, or are they mostly internal to business and government premises? If a private user wishes to enter the mass market, are there legal, technical, or regulatory barriers that could prevent private systems from offering commercial service to the general public or other private users?

52. We also note that private data networks, many of which use different technologies, appear to be relying increasingly on the public, switched telecommunications network (PSTN) to interconnect their high-speed backbones.⁵⁸ The interconnection of different technologies can sacrifice efficiency significantly.⁵⁹ We ask for comment on whether there are efficiency problems that can be corrected through standardization of technology interfaces. If there are such problems, should the Commission encourage such standardization? Would such activity by the Commission increase interconnectivity and thereby further the deployment of

⁵⁶ See International Telecommunication Union, Final Acts of the World Radiocommunication Conference, 1997, Res. 721, "Agenda for the 1999 World Radiocommunication Conference," item 1.6. See also Paula Bernier, *Cellular Industry Looks to Promise of 3G*, X-CHANGE MAGAZINE, <<http://www.vpico.com/xc/articles/822feat5.stm>, visited Feb. 26, 1998.

⁵⁷ Some of these entities are the utilities mentioned in ¶ 48 above.

⁵⁸ See, e.g., DARREN L. SPOHN, DATA NETWORK DESIGN 755 (1997).

⁵⁹ *Id.* at 729-31.

advanced telecommunications capability?

53. "The Last Hundred Feet." In addition to the last mile, we ask for comment about the "last hundred feet" for advanced telecommunications capability, such as inside wire within retail customers' premises or wireless local area networks, and demarcation points where inside wire ends and a service provider's network begins.⁶⁰ For example, many owners of office buildings, multiple dwelling units (MDUs), and trailer parks control the wiring within their buildings or premises. Does current law or regulation provide any basis on which to open up access to the last hundred feet in office buildings, MDUs, and other non-residential settings to ensure that customers have easy access to the choices they want? What are the advantages and disadvantages of mandating such access?

54. We also ask for comment on whether the spectrum we have made available for unlicensed operations⁶¹ or spread spectrum technology will allow for more "last hundred feet."⁶² Does this spectrum have the bandwidth necessary for advanced telecommunications capability?⁶³ Do our existing rules about unlicensed spectrum, or our Part 15 and 68 rules,⁶⁴ our network disclosure rules,⁶⁵ or our recently adopted rules about MVPD set-top boxes⁶⁶ affect the deployment of advanced telecommunications capability? If any of these rules or others could be made more accommodating to advanced telecommunications capability, we ask for specific proposals to that end.

⁶⁰ See 47 C.F.R. § 68.3; Implementation of the Cable Television Consumer Protection & Competition Act of 1992, Cable Home Wiring, *Report & Order*, 8 FCC Rcd 1435 (1993).

⁶¹ See, e.g., Amendment of Parts 2, 15, and 97 of the Commission's Rules to Permit Use of Radio Frequencies Above 40 GHz for New Radio Applications, *Memorandum Opinion & Order and Fourth Notice of Proposed Rule Making*, 12 FCC Rcd 12212 (1997); Amendment of the Commission's Rules to Provide for Operation of Unlicensed NII Devices in the 5 GHz Frequency Range, *Report & Order*, 12 FCC Rcd 1576 (1997).

⁶² We also request comment whether any unlicensed spectrum could be used for last miles.

⁶³ For example, unlicensed point-to-point links currently operate at 900 MHz, 2.4 GHz and 5.8 GHz at data rates in the T1 range.

⁶⁴ 47 C.F.R. §§ 15.1 *et seq.*, 68.1 *et seq.*

⁶⁵ 47 C.F.R. §§ 64.1, 68.1, 51.325 *et seq.*

⁶⁶ Commission Adopts "Navigation Devices" Rules Creating Consumer Market for Set Top Boxes & Other Equipment Used With Video Programming Systems, Report No. CS 98-11 (June 11, 1998), available at 1998 WL 306795. Although this proceeding was recently concluded, the record may not have included full consideration of the relationship between such devices and advanced telecommunications capability.

55. Others. We welcome comment on other types of companies that would have the assets, abilities and incentives to deploy advanced telecommunications capability and, at the retail level, to offer advanced services to retail consumers, especially residential ones. These might include alarm companies, foreign telecommunications companies, and foreign public utilities.

56. In General. We are struck by the large number of companies that assert they have or soon will have the capability to deploy what appear to be major elements of advanced telecommunications capability and many advanced services. These companies may produce a significant degree of competition, conceivably even for rural access to backbones and for rural and residential last miles. Is such an optimistic scenario realistic? If it is, how can we create incentives for such competitive entry? Conversely, how will creating such incentives affect the deployment of advanced services in the longer term?

57. Does any company, or any class of companies, have significantly more elements of advanced telecommunications capability than others, and a significantly greater incentive to deploy them promptly? Does it appear that "the race" to deploy advanced telecommunications capability is one that only one runner or a few runners can win (that is, a natural monopoly or oligopoly)? Or is the market, especially the last mile market, one that seems capable of supporting many entrants?

58. It is also possible to conclude from the above discussion that individual companies have different assets, and different abilities and incentives to deploy different elements of advanced telecommunications capability, especially in the last mile, in different locations and at different speeds. We ask for comment on this possibility and, if it is likely, on its implications. Should we expect that in one area a cable television company will be first to deploy and offer an advanced service (perhaps an advanced data and video network designed to appeal to residential customers), while in another an incumbent LEC will be first (perhaps offering broadband data communications for businesses)? We also ask for comment on whether the large-scale deployment of advanced telecommunications capability, especially in the last mile, will start in each area, or nationwide, with an initial spark of deployment by one entrant? For example, when a cable television system deploys cable modem service, will the incumbent LEC promptly deploy xDSL?

B. Reasonable and Timely Deployment

59. Section 706(b) requires that the Commission "determine whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion." We ask, first, how to make the statutory determination whether deployment is occurring "in a reasonable and timely fashion." For example, is the event whose occurrence we must detect the deployment of new facilities, or the actual use of services by subscribers? Second, must we, or should we, adopt a time-specific schedule or set objective targets to meet this requirement? If we should, what would the schedules or targets be? Also, we recognize that the Act requires that we promote deployment of advanced services in a competitive, deregulatory environment. To what extent should the time frames for deploying other technologies inform our interpretation of reasonable, timely deployment? What technologies should we look to for guidance regarding these time frames?

60. It appears to us that, in determining whether advanced telecommunications capability is being deployed in a reasonable and timely fashion, we should have the clearest possible idea of the demand for it and for advanced services -- of actual responses by consumers. We therefore request comment on the nature of the demand for advanced telecommunications capability and advanced services. Does the explosive growth of the Internet indicate an immediate demand for Internet access at higher speeds than are now standard, and for other forms of advanced services? Are there other retail applications of advanced telecommunications capability for which there is an equally or more demonstrable demand and need at present? More broadly, will demand for advanced services tend to be homogeneous, or will it tend to vary among different regions, neighborhoods, and types of customers (based on age, education, income, *etc.*), each wanting a different mix of voice, data, graphics, and video? We request comment on whether, if the precise demand for advanced telecommunications capability is unclear, the best general policy would be to stimulate the deployment of "raw" capability that would be fungible enough to satisfy whatever demand evolved. Would a policy that encouraged the creation of capability that could offer data if it turns out the greatest demand is for data, or offer video if it turns out the greatest demand is for video, best serve the public interest? Conversely, we seek comment on the extent to which we should allow the market to satisfy such demand.

61. We invite parties to tell us the extent to which advanced telecommunications capability and advanced services are already deployed in this country, are being deployed, or are likely to be deployed. Where exactly has deployment occurred, by whom, in what form, and for what customers? Are any companies now providing, or close to providing, all the elements of advanced telecommunications capability (backbone, last mile, content)? Does it appear, so far, that initial deployment will be largely limited to business customers and in urban areas, and will only later reach less immediately profitable markets? Are there indications that some elements of advanced telecommunications capability will, like cable television, appeal mainly to residential customers? Does it appear that the deployment of advanced telecommunications capability and the growth of demand for advanced services will occur slowly in the early years,

as was the case with cable television and cellular service?⁶⁷ If so, what conclusions should we draw from this? What are the advantages and/or disadvantages of possible regulatory actions by the Commission to ensure that these services reach less profitable customers? Would these actions be consistent with section 706 and the overall framework of the Act?

62. We seek information about instances in which advanced telecommunications capability has been deployed in other countries. We invite comment on the precise forms of demand that have materialized, whether this demand was satisfied in whole or in part by private investment, and what government policies (if any) helped or hurt the deployment.⁶⁸ For example, some reports indicate that use of the Internet is particularly intense in Scandinavian countries.⁶⁹ Is this true and, if so, what are the underlying factors? Are fiber-to-the-home and packet-switched networks being built in other countries for large users and for the mass market? What steps, if any, are being taken to extend such networks into rural and low-income areas and to educational institutions? If such networks are being built in other countries but not here, is one reason that they lack our universal copper-based and circuit-switched network, so they have greater incentive to start with newer technologies? For this and other reasons, does it seem that foreign experiences are, or are not, transferrable to this country? To what extent would the regulatory measures adopted in other countries, if we adopted them here, be consistent with section 706 and the overall framework of the Act?

63. Indications of demand would be particularly useful if they include data about consumers' willingness to pay. Without indications of prices that consumers actually paid, estimations of demand (and related decisions about supply) will lack an important degree of reality. For example, while there seem to be many potential deployers,⁷⁰ if there is not enough demand at prices that will enable them to make a competitive profit, then there would be no economic incentive for them to enter the market.

64. Schools and Classrooms. Section 706 directs particular attention to elementary and secondary schools and classrooms. We welcome comments about their particular needs,

⁶⁷ In 1984, decades after the introduction of cable television, it had only 37 million subscribers. In June 1997, subscribers numbered over 64 million. In 1989, five years after the first commercial offering of cellular service, there were only 2.7 million subscribers. Today, subscribership is over 55 million. See Competition, Rate Deregulation & the Commission's Policies Relating to the Provision of Cable Television Service, *Report*, 5 FCC Rcd 4962, 5039 (1990); Fourth Cable Competition Report, *supra* note 31, 13 FCC Rcd at 1039; Third CMRS Competition Report, *supra* note 43, at Table 1.

⁶⁸ See, e.g., Thomas J. Duesterberg, *Addicted to Data: The Need for More Bandwidth on the Information Superhighway* at 2, Jan. 8, 1998, available at <http://www.hudson.org/bandwidth.html>, visited May 13, 1998 ("France, Germany, and some Scandinavian countries have universally available ISDN service.").

⁶⁹ *IDC: Internet Connections in Europe Will Reach 30.5 Million by 2001 Forecasts IDC*, M2 PRESSWIRE, Feb. 18, 1998, available at 1998 WL 10217048.

⁷⁰ See *supra* paragraphs 18-55.

now and in the near future, and about reasonable and timely deployment for them. Are schools' needs for advanced telecommunications capability, in terms of both quantity and quality, likely to be the same as those of the areas surrounding them? If so, is it likely that private companies' deployment of advanced telecommunications capability to most or all businesses and government offices in an area will extend also to elementary and secondary schools and classrooms there? If it is unlikely, why and to what extent will elementary and secondary schools and classrooms not be reached? Will some schools and classrooms be reached, but not others? Is the problem simply financial? Or is it that the service needs of elementary schools and classrooms are different from those of other consumers (*e.g.*, will require different technology or kinds of facilities) and are not large enough to justify private investment? To the extent that private investment does not meet the needs of schools and classrooms, will any shortage be made up by other government programs, such as ones to afford Internet access to schools and libraries, or by special private initiatives? We also request comment on the issues raised in this paragraph, but as they apply to libraries.

65. Rural Areas. We are also concerned about the demand for advanced telecommunications capability in rural areas. Today, are rural communities more dependent on telecommunications services than other communities? In general, what forms of advanced telecommunications capability will rural areas need most? Are they the same as, or different from, those in other communities? We ask that commenters address the possibility that there will be adequate supply of advanced telecommunications capability in some rural areas (*e.g.*, affluent ones, ones relatively near major population centers), but not others.⁷¹ We also ask that commenters consider the possibilities that wireless communications (terrestrial or satellite) will provide a cost-effective way of serving remote rural areas.

66. Possible Reasons for Slow Deployment. To the extent that any party believes that advanced telecommunications capability is not being deployed in a reasonable and timely fashion, or foresees that it will not be, we ask that it state the reasons why. Reasons could

⁷¹ Telephone service in rural areas, when it was "advanced," spread faster under competition than under the previous regime of unregulated monopoly and the later regime of regulated monopoly. John Brooks, TELEPHONE: THE FIRST HUNDRED YEARS 116 (by 1907, "the states with the densest concentrations of telephones per population were not the eastern states where telephony had begun, but Iowa, Nebraska, Washington, California, and Nevada") (1976); Milton Mueller, Jr., UNIVERSAL SERVICE 8, 25, 60, 65, 67-68 (between 1902 and 1912, "telephone penetration in the farm areas surpassed that of the urban areas") (1997). It is also an historical fact, though, that in some rural areas telephone service did not appear until affirmative government action, in the form of the Rural Electrification Administration, subsidized it starting in the 1930s. Antitrust & Communications Reform Act of 1994, House of Representatives Committee on the Judiciary, REPORT 103-559, Part 2 at 32 & n.43 at 32-33:

. . . the Bell System left rural service to the independent telephone companies, mutual telephone companies, and home-made, one-wire 'farmer lines.' . . . Even with all this independent and mutual activity and self-help effort, in 1945 less than one-third of America's farms has telephone service. . . . To respond to the rural void left by the Bell System, Congress amended the Rural Electrification Act (REA) to authorize long-term, low-interest loans for telephone organizations to extend and improve rural service. [paragraphing and citations omitted.]

include a lack of capital, lack of technology, unavailability of necessary inputs held by the government or industry incumbents, and barriers created by law and regulation. If a party claims lack of capital as a basic cause, we ask it to explain whether the basic problem is that demand is so unclear that investors will not finance it. If a party believes that lack of technology is the basic cause of a shortage of supply of advanced telecommunications capability, we ask it to examine the prospects for development of that technology. Does the technology exist, but not at an affordable price for most or all Americans? Would the price be affordable if a mass consumer acceptance and demand developed, as has been the case over time with long distance and mobile service? To what extent can the Commission adopt solutions to these problems consistent with the deregulatory, market emphasis of the Act?

67. If a party claims that the government is withholding necessary inputs for advanced telecommunications capability, we ask for as specific identification as possible of the governmental unit (especially if it is this Commission) and the input (spectrum, licenses, rights of way,⁷² franchises, roof space, other antenna locations, *etc.*). If a party believes that a law or regulation is the cause of a slow deployment of advanced telecommunications capability, we ask that it specify the law or regulation and suggest specific corrective measures. We ask that parties, in specifying such measures, strike a sensible balance between encouraging innovation and experimentation and thwarting inefficient regulations on the one hand and, on the other hand, weakening useful tariff and regulatory structures and such policy goals as universal service and network reliability.

68. We are particularly interested in the potential for new entrants to build new last miles to homes and small businesses. What deregulatory and pro-competitive incentives will lead to the deployment of more last miles of advanced telecommunications capability? Is serving inner cities a rational business decision for CMRS and wireless cable companies? Are there regulatory barriers to the wide use of prepaid service plans that might speed deployment of advanced services to low income Americans -- the advanced services equivalent to prepaid calling cards and prepaid wireless services?

C. Removing Barriers to Infrastructure Investment and Promoting Competition

69. Section 706(a) requires that, in order to encourage the deployment on a reasonable and timely basis of advanced telecommunications capability, the Commission use price-cap regulation, regulatory forbearance, measures that promote competition in the local telecommunications market, or other regulating methods that remove barriers to infrastructure investment. We ask for comment about how in particular we might apply each of these techniques to aid the deployment of advanced telecommunications capability. In the case of forbearance, from what statutory provisions or rules should the Commission forbear, and how

⁷² Letter from Larry Irving, Assistant Secretary for Communications and Information, United States Department of Commerce, to William E. Kennard, Chairman, FCC, July 17, 1998, at 3 (NTIA Letter)

would such forbearance satisfy the necessary statutory criteria?⁷³

70. Other Methods. We invite suggestions for other changes in our rules, and in statutes, that would use regulatory forbearance, would remove barriers to infrastructure investment, or would promote competition so as to speed the deployment of advanced telecommunications capability. Do our regulations discourage investment, especially in one particular technology or by one particular class of companies?⁷⁴ If a commenter believes that a law or regulation should be repealed, we ask that it explain how such a repeal might stimulate the deployment of advanced telecommunications capability.

71. Many actions by the Commission might speed the deployment of advanced telecommunications capability. The Alliance for Public Technology, for example, has suggested that, if it appears likely that there will be a long-lasting shortage of advanced telecommunications capability in some areas, such as inner cities or low-income rural areas, the Commission should use social contracts with incumbent LECs similar to those with cable operators, place conditions on mergers and acquisitions, and encourage community-based organizations to create a "demand pull."⁷⁵ APT calls for a federal/state/community-based "partnering" to help rural and low-income areas fill the void that competitive entities will leave because they need to go where demand and willingness to pay are highest. APT suggests such a partnership is a necessary complement to a market-based system, because the market for advanced telecommunications capability will likely not be a perfect one.⁷⁶ We ask for comment on APT's proposals. Is the great shortage envisioned by APT likely to occur? Is APT's partnering an efficient and effective way to fill it and encourage the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans by utilizing price cap regulation, regulatory forbearance, measures that promote competition in the local telecommunications market, or other regulatory methods that remove barriers to infrastructure investment? What are the advantages and/or disadvantages of measures like those proposed by APT? Would these measures be consistent with section 706 and the overall framework of the Act?

72. APT also urges "pricing reform" as another way to remove barriers to the

⁷³ See 47 U.S.C. § 160.

⁷⁴ The Economic Strategy Institute, for example, has directed attention particularly to our rules about depreciation accounting, cost allocation, interconnection, and separate subsidiaries. Letter from Lawrence Chimerinbe, Senior Vice President and Chief Economist, Eric Olbeter, Director, Advanced Telecom & Information Technology Program, and Larry C. Darby, Visiting Fellow, Economic Strategy Institute, to William E. Kennard, Chairman, FCC, July 30, 1998, at 4, available at <http://www.econstrat.org/esi706.htm>.

⁷⁵ Petition of the Alliance for Public Technology Requesting Issuance of Notice of Inquiry & Notice of Proposed Rulemaking to Implement Section 706 of the 1996 Telecommunications Act, *Petition of the Alliance for Public Technology* at 27-41 (Feb. 18, 1998) (APT Petition).

⁷⁶ *Id.* at 35-38.

deployment of advanced telecommunications capability. It states:

New entrants naturally respond to the economic signals. Today those signals, stemming from price regulation that sets residential prices far below business prices without sufficient cost justification, have been a factor contributing to market forces which are skewing competitive entry and investment very largely toward the business market. Where states like New York have instituted reforms to close this gap and bring residential rates more in line with costs, competitors have responded by beginning to offer local service to residential subscribers.⁷⁷

We ask for comment on this analysis, and on the broader issue of the relationship between section 706, which focuses on the deployment of advanced telecommunications capability, and the provisions of the 1996 Act that concern universal service, especially section 254.⁷⁸ We are interested in knowing the degree, if any, to which the goals of section 706 might be fulfilled by the Commission's actions under section 254. To what extent do universal service support mechanisms help ensure access to advanced services -- if not generally, then with regard to schools, classrooms, libraries and rural areas in particular? In its rules implementing section 254(h) of the Act, the Commission has established a mechanism to support the provision of telecommunications services, Internet access, and internal connections to eligible schools and libraries. The Commission did not, however, specifically address the question of whether such services constitute advanced telecommunications capability, and left it to the schools and libraries themselves to determine which telecommunications services would best meet their needs and budgets.⁷⁹ Therefore, we are interested in knowing whether the Commission's current

⁷⁷ *Id.* at 25-26 (footnote omitted).

⁷⁸ In implementing the universal service provisions of the Act, the Commission noted that "section 706 reinforces the goals of section 254." Federal-State Joint Board on Universal Service, *Report & Order*, 12 FCC Rcd 8776, 9091-92 (1997) (Universal Service Order). *Compare* Section 706 with 47 U.S.C. § 254(b)(2) ("Access to advanced telecommunications and information services should be provided in all regions of the Nation."), (3) ("Consumers in all regions of the Nation, including low-income consumers and those in rural, insular, and high cost areas, should have access to telecommunications and information services, including . . . advanced telecommunications and information services, that are reasonably comparable to those services provided in urban areas and that are available at rates that are reasonably comparable to rates charged for similar services in urban areas"), 6 ("Elementary and secondary schools and classrooms, health care providers, and libraries should have access to advanced telecommunications services as described in subsection (h)."), (h)(2) ("The Commission shall establish competitively neutral rules-- (A) to enhance, to the extent technically feasible and economically reasonable, access to advanced telecommunications and information services for all public and nonprofit elementary and secondary school classrooms, health care providers, and libraries; and (B) to define the circumstances under which a telecommunications carrier may be required to connect its network to such public institutional telecommunications users.").

⁷⁹ In the Universal Service Order, the Commission established that it was not conditioning the receipt of universal service support on an entity choosing a particular bandwidth or technology. *See, e.g.*, Universal Service Order, 12 FCC Rcd at 9019-20 (stating that "a situation in which certain technologies were favored over others would violate the overall principle of competitive neutrality adopted for purposes of section 254"). *See also id.* at

rules implementing section 254(h)(1), as well as other sources of funding, are resulting in the deployment of advanced telecommunications capability to schools, libraries and rural health care providers.

73. More broadly, is there a point at which a form of advanced telecommunications capability, or an advanced service, should qualify for inclusion in universal service? What is the right balance between the accomplishment of Congress' goals for universal service and section 706's reliance on companies' private profit motivations to invest in and deploy advanced telecommunications capabilities?⁸⁰ Should the goals of section 706 be considered in interpreting the word "evolving" in section 254's definition of universal service?⁸¹

74. Wireless deployment of advanced telecommunications capability might be significantly advanced by auctioning more spectrum, by the widest possible definition of the services that can be provided on spectrum, by speedier methods to make encumbered spectrum free for new uses, by increased spectrum sharing and overlay use on spectrum, and by added incentives for CMRS and high-bandwidth licensees to deploy advanced telecommunications capability. Can and should the Commission use its authority pursuant to sections 256 and 259 of the Act (concerning, respectively, coordination for interconnectivity and infrastructure sharing) to make the deployment of advanced telecommunications capability more uniform?⁸² Have other countries removed economic or regulatory barriers to advanced telecommunications capability in ways that can be fruitfully applied in the U.S.?

75. We also note that some of the potential suppliers of advanced telecommunications capability use asymmetric architecture.⁸³ This usually entails high speeds downstream (from the advanced service provider to the end user) and slow speeds upstream. We ask whether advanced telecommunications capability or any type of advanced service is best provided via asymmetric architecture. Is there any Commission rule or policy that favors symmetric architecture in cases where it might be cheaper, more efficient, or otherwise beneficial to consumers to use asymmetric architecture, or vice versa? Will asymmetric architecture be deployed most easily

9006-07 (stating that, pursuant to section 254(h)(1)(B), schools and libraries can choose whichever telecommunications technologies best meet their telecommunications needs). *See also id.* at 8801-03 (discussing the principle of competitive neutrality).

⁸⁰ NTIA Letter, *supra* note 72, at 3.

⁸¹ 47 U.S.C. § 254(c)(1) ("Universal service is an *evolving* level of telecommunications services that the Commission shall establish periodically under this section, taking into account advances in telecommunications and information technologies and services.") (italics added). On or before January 1, 2001, the Commission will convene a Federal-State Joint Board to review the current definition of universal service. Universal Service Order, *supra* note 78, 12 FCC Rcd at 8790, 8807, 8834-35.

⁸² 47 U.S.C. §§ 256, 259.

⁸³ *See, e.g., supra* n.44.

through partnering among companies in different industry segments rather than within companies? How could our rules or policies be amended to leave the choice of architecture to market forces?

76. We also welcome comment, transcending the segment-by-segment pattern of Section A.2 above, on the deployment of advanced telecommunications capability. On the whole, how much deployment of advanced telecommunications capability is occurring in the U.S., and is it occurring in a reasonable and timely fashion? Overall, what is the composition of such activity, and what trends in it are discernible? What are the determinants of investment in advanced telecommunications capability?

77. We also request comment about the basic legal and regulatory model that will best foster the deployment of advanced telecommunications capability. At present, we use several different models for different industries. These include a "telephone model" (common carriage of bundled and unbundled packages), a "cable tv model" (multiple channels bundled with content, free of common carrier obligations), a "broadcast model" (single channels bundled with content, with specific content-based public interest obligations), a "resale/UNE" model to promote competition in local exchange voice telecommunications, and a "facilities-based" model to promote competition in the MVPD market. Congress, when it enacted the Act, created or retained these models and thereby endorsed their continued use. It may be, however, that as discrete industries and services begin to converge, the application of different regulatory models to competing services will have effects on the marketplace. We ask for comment on such effects. Will they improve or distort market performance? At what point will the use of different regulatory models impair market performance more than they improve it?

78. More broadly, we ask for comment on whether any of the models described in the preceding paragraph is likely to lead to speedier deployment of advanced telecommunications capability. If one model is, how might we apply it more broadly than we do now, from the point of view of both legal authority and regulatory practice? Would some other regulatory model, different from the ones noted above, lead to speedier deployment? Conversely, what negative consequences, if any, will measures adopted to accelerate deployment have in the long term? What can the Commission do to avoid those negative consequences? We welcome suggestions, both about models and about how to apply them to all entrants into advanced telecommunications capability.

79. Also, most ISPs depend, for access to their retail customers, on the last mile facilities of others, especially LECs. There are thousands of ISPs, but only a few providers of last miles that have achieved mass acceptance -- in most places, the incumbent LEC and the cable television provider. Many of the latter have, or will have, their own internal ISP operations. Assuming that there will always be far more ISPs than there will be providers of last miles in an area, we ask for comment on whether interactions between ISPs and providers of last

miles will require regulatory intervention.⁸⁴ For example, is access by retail customers to thousands of ISPs in the public interest? Is an unregulated market likely to give the holders of last miles the ability and incentive to discriminate against all ISPs or in favor of their own ISP operations, to the detriment of consumers? If such conduct is likely, what is the appropriate regulatory remedy, if any?⁸⁵ What can and should the Commission do to preserve efficient peering arrangements among Internet companies, especially in the face of consolidations of large proprietary gateways? We ask for comment whether the Commission should monitor or have authority over peering arrangements to assure that the public interest is served.

80. Looking into the future, we ask what, if any, system of regulation might best fit the market for advanced telecommunications capability. Enacting such a system might require major amendments to the Act. For example, it is reasonable to question a policy of regulating several competitors in a market differently -- wireline common carriers under Title II, conventional television broadcasters under Title III, wireless common carriers under Titles II and III, MVPDs under Title VI, public utilities under their industry models, and so on.⁸⁶ How, if at all, can these different regimes be reconciled? In this regard, we ask parties to consider the Internet industry as a model of what a maturing market for advanced telecommunications capability and advanced services might be. The Internet industry can be said to consist of four parts: (a) networks consisting of high-speed digital communications facilities or bandwidth, both backbone and last mile, (b) software and content to comprise a vast array of services, (c) packaging of services into combinations that will be attractive to different groups of retail customers, and (d) "information appliances" on customers' premises, including the features and functions from among telephones and other telecommunications terminals, computers, radio and television sets, and set-top boxes.

81. We ask, if the business of advanced telecommunications capability and advanced services evolves into a similar structure, what, if any, degree of economic regulation might be needed for it to serve the public interest?⁸⁷ If there is true choice in the supply of last miles to residential consumers, would any economic regulation be needed? Such a market might be as

⁸⁴ We ask the same question about interexchange carriers, although at present there are more of them available in an area than there are providers of last miles.

⁸⁵ In the Further Notice of Proposed Rulemaking in the Computer III Remand, we are considering whether to grant ISPs the same rights as competitive LECs to UNEs vis-a-vis incumbent LECs and RBOCs. *Computer III Further Remand Proceedings, Bell Operating Company Provision of Enhanced Services, Further Notice of Proposed Rulemaking*, 13 FCC Rcd 6040, 6091 (1998).

⁸⁶ Dividing each competitor's offerings into common carrier, broadcast, *etc.*, elements and regulating each part under a different system is an equally questionable alternative.

⁸⁷ By "economic regulation," we mean regulation of entry and exit, service offerings, prices, and profits. We presume that "consumer protection" regulation will be necessary.

competitive as many markets that in this country are "regulated" only by the antitrust laws.⁸⁸ A limited governmental role might be needed, for example, to foster network reliability, access, interconnection and standard-setting where that would promote efficiency and where private bodies would not be as efficient. We seek comment on these issues.

82. What, if any, other regulation would be needed? Is it unrealistic to expect companies, many of whom have possessed and exercised market power for decades, to behave like the non-network parts of the Internet industry (b-d in paragraph 80 above)? Will interconnection occur, naturally or by operation of the antitrust laws, among advanced networks deployed by LECs, MVPDs, and ISPs? Would there be a need for regulatory involvement to ensure the kind of reliability and security that people have come to expect from POTS? Would there be network externalities, and if so, would they justify governmental stimulation of demand? To the extent there was a monopoly or oligopoly at the network level, would the best use of regulatory powers be to remove barriers to entry and to ensure fair access by participants in downstream segments (b-d in paragraph 80 above)?⁸⁹ Would there be bundling of monopoly or oligopoly services with either new services (information services) or customer premises equipment? Are there reasons to depart from our longstanding prohibition of bundling transmission services on the one hand with, on the other, customer premises equipment and/or enhanced services?⁹⁰ Would disputes among industry members be adequately resolved as they are in most industries, without involvement by regulators, as in the case of peering among Internet backbone providers until recently? Would any or all of the regulation described above be consistent with section 706 and the overall framework of the Act?

83. Cooperation with State Authorities. Section 706(a) calls on "[t]he Commission and each State commission" to encourage the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans.⁹¹ We welcome comment on the role that this Commission's cooperation with state governments can play in removing barriers to investment in infrastructure and promoting competition under section 706. For example, NARUC has stated that "the advanced services at issue consist of both inter- and intrastate services and the statute clearly

⁸⁸ For example, 6 companies manufacture over 90% of the automobiles sold in the United States. No one suggests, however, that there be a Federal Car Commission that regulates entry, retail prices, *etc.*, in that business. Gregory L. White, *U.S. Vehicle Sales Rose 12% in May, GM's 13%*, WALL ST. J., A-3 (June 4, 1998), available at 1998 WL 3496693.

⁸⁹ Segment (a) of the business is the only one that resembles traditional common carrier activities. In general, common carrier obligations were adopted for persons performing functions that were essential to society, especially when such persons had little or no competition. *See generally* *Munn v. Illinois*, 94 U.S. 113 (1876).

⁹⁰ *See, e.g.*, 47 C.F.R. § 64.702.

⁹¹ 47 U.S.C. § 157 note (*italics added*).

contemplates coordinated FCC and State actions."⁹² The International Telecomputing Consortium suggests that states expand "local" dialing areas to make the Internet more accessible to rural residents, allowing rural entities to aggregate their demand, and using state and local governments as "anchor customers" of the Internet.⁹³ We request comment on how this Commission can best interact with the states to achieve the goals of section 706. In particular, how can the Commission satisfy its obligation to promote the deployment of advanced services without intruding upon the state's obligation to do the same? We also ask if there are any parts of the task set by section 706 that are, as a matter of law, exclusively within the jurisdiction of either this Commission or the state commissions.

84. Information Gathering. The decisions that section 706 may call on the Commission to make will require information, perhaps in detail. One general subject of that information might be the deployment of backbone and last-mile plant containing advanced telecommunications capability, including specifics about different locations, numbers and/or percentages of potential customers passed, and the ability of plant to support xDSL and other broadband operations at different rates of speed. Plant might also be divided into such categories as sunk and fungible, fixed and movable, loop and interoffice. We welcome comment on whether this or other detailed information would be useful in measuring the achievement of the goals of section 706, and on how the Commission could obtain such information. To what extent are our current reports, such as ARMIS 43-07 about the infrastructure development of price cap incumbent LECs, useful for this purpose? We repeat the invitation we extended in paragraph 18 to all parties to furnish us with information -- technical, financial, and marketing -- about their and others' plans to deploy advanced telecommunications capability.

III. CONCLUSION

85. Upon commencing this inquiry into advanced telecommunications capability, we have several initial impressions. First, encouraging the deployment of advanced telecommunications capability for all Americans on a reasonable and timely basis must be a top priority for this Commission and for the quality of this country's life in the coming century. Second, there is a large number of potential suppliers and, from all that appears, a large demand. These circumstances would normally make us predict a well performing marketplace. This Commission is determined that this will occur -- that technology will be allowed to flourish, that bottlenecks will be made accessible (or, better, multiplied out of existence), and that regulation

⁹² Comments of the National Association of Regulatory Utility Commissioners at 4 (April 6, 1998). See also Comments of Pennsylvania Public Utility Commission on Bell Atlantic's Section 706 Petition at 21 (May 6, 1998).

⁹³ *Affordable Access, Rural Online: Overcoming Barriers to Rural Access: Some Preliminary Policy Recommendations*, International Telecomputing Consortium, <http://www.itc.org/aaron/preliminaryrecommendations.html>, visited June 22, 1998.

will speed, not slow, progress. We are also committed to implementing Congress's vision that the promise of advanced telecommunications capability extend to all Americans -- including those in schools, rural areas, inner cities, and on reservations. We intend to accomplish these aims consistently with the deregulatory, market emphasis of the Act. We call for the aid of all in this great national effort.

IV. PROCEDURAL MATTERS

86. Pursuant to Sections 1.415, 1.419, and 1.430 of the Commission's rules, 47 C.F.R. §§ 1.415, 1.419, 1.430, interested parties may file comments on or before **September 8, 1998**, and reply comments on or before **October 8, 1998**. Comments may be filed using the Commission's Electronic Comment Filing System (ECFS) or by filing paper copies. See Electronic Filing of Documents in Rulemaking Proceedings, 63 Fed. Reg. 24,121 (1998).

87. Comments filed through the ECFS can be sent as an electronic file via the Internet to <<http://www.fcc.gov/e-file/ecfs.html>>. Generally, only one copy of an electronic submission must be filed. If multiple docket or rulemaking numbers appear in the caption of this proceeding, however, commenters must transmit one electronic copy of the comments to each docket or rulemaking number referenced in the caption. In completing the transmittal screen, commenters should include their full name, Postal Service mailing address, and the applicable docket or rulemaking number. Parties may also submit an electronic comment by Internet e-mail. To get filing instructions for e-mail comments, commenters should send an e-mail to ecfs@fcc.gov, and should include the following words in the body of the message, "get form <your e-mail address.>" A sample form and directions will be sent in reply.

88. Parties who choose to file by paper must file an original and four copies of each filing. If more than one docket or rulemaking number appear in the caption of this proceeding, commenters must submit two additional copies for each additional docket or rulemaking number. All filings must be sent to the Commission's Secretary, Magalie Roman Salas, Office of the Secretary, Federal Communications Commission, 1919 M St. N.W., Room 222, Washington, D.C. 20554.

89. We note that there are many other proceedings now underway at the Commission that include issues that could affect a company's, or class of companies', incentive and ability to deploy advanced telecommunications capability.⁹⁴ If commenters wish to refer to

⁹⁴ See, e.g., authorities cited *supra* nn.41, 45, Amendment to Parts 2, 15, & 97 of the Commission's Rules to Permit Use of Radio Frequencies Above 40 GHz for New Radio Applications, *Memorandum Opinion & Order & Fourth Notice of Proposed Rule Making*, 12 FCC Rcd 12212 (1997); 1998 Biennial Regulatory Review - Testing New Technology, *Notice of Inquiry*, CC Docket No. 98-94, released June 11, 1998; Amendment of the Commission's Rules to Relocate the Digital Electronic Message Service From the 18 GHz Band to the 24 GHz Band & to Allocate the 24 GHz Band for Fixed Service, *Memorandum Opinion & Order*, FCC 98-155 (released July 17, 1998) (spectrum allocation at 24 GHz that removed sharing constraints on terrestrial and satellite

their filings in another proceeding, they must provide in their comments to this proceeding a complete recitation of the pertinent information and also attach a copy of the document to which they refer.

90. Subject to the provisions of 47 C.F.R. § 1.1203 concerning "Sunshine Period" prohibitions, this proceeding is exempt from *ex parte* restraints and disclosure requirements, pursuant to 47 C.F.R. § 1.1204(b)(1). Because many of the matters on which we request comment in this NOI may call on parties to disclose proprietary information such as market research and business plans, we suggest that parties consult 47 C.F.R. § 0.459 about the submission of confidential information.

91. For additional information regarding this proceeding, contact John W. Berresford, Senior Antitrust Attorney, Industry Analysis Division, Common Carrier Bureau, at 202-418-1886 or jberresf@fcc.gov.

V. ORDERING CLAUSE

92. Accordingly, IT IS ORDERED that, pursuant to section 706 of the Telecommunications Act of 1996, this Notice of Inquiry IS ADOPTED.

FEDERAL COMMUNICATIONS COMMISSION

Magalie Roman Salas
Secretary

systems); Petition of Bell Atlantic Corporation for Relief from Barriers to Deployment of Advanced Telecommunications Services, CC Docket No. 98-11, *Memorandum Opinion & Order & Notice of Proposed Rulemaking*, FCC 98-188, adopted August 6, 1998.

**SEPARATE STATEMENT OF
COMMISSIONER SUSAN NESS**

Re: Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, CC Docket No. 98-146; Deployment of Wireline Services Offering Advanced Telecommunications Capability, CC Docket No. 98-147

In Section 706(a) of the Telecommunications Act, Congress directed the FCC to "encourage the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans." This provision of the law is an explicit direction to anticipate and prepare for the future. Fulfilling the hopes and needs of citizens in the 21st Century will require widespread availability of much greater bandwidth than has traditionally been available through "plain old telephone service."

Today we begin the task of ascertaining the progress of, and prospects for, deployment of broadband capabilities throughout this country. We must ensure that high-bandwidth services roll out as quickly as the technology and the economics allow. Progress must not be impeded by inadequate competition or excessive regulation.

I hope to learn in this proceeding what we can do not only to promote the deployment of advanced telecommunications capability but also to facilitate consumer choice among broadband service suppliers. Although we have several pending petitions filed by incumbent telephone companies or their would-be competitors, we need to take a broader view. In the deployment of advanced telecommunications capability, multiple industry sectors can play a role.

Our notice of inquiry properly recognizes the multiplicity of potential bandwidth suppliers -- ILECs, CLECs, cable, wireless, and satellite companies, digital broadcasters, etc. The notice asks questions that will permit us to understand better how each industry sector can participate effectively in the bandwidth race, what advantages and disadvantages the various participants bring to the contest, and which barrier-reducing and competition-promoting steps the Commission can and should take. It also explores what special measures may be needed to meet the special needs of rural areas or to serve elementary and secondary schools and classrooms. I will welcome the development of a full record on these issues.

In our companion order and notice of proposed rulemaking, we demonstrate that we are prepared to do more than just ask questions. On certain issues, we have already developed a considerable record, as a result of various pending petitions, and this enables us to render certain threshold decisions and to tender several concrete proposals.

As I see it, the key issue we address today is whether advanced telecommunications capability is subject to the competitive framework so carefully established by Congress in Sections 251 and 271 of the Communications Act. The answer is yes. I don't believe that

Congress wrote detailed amendments to the Communications Act only to address voice, but not data, services. To the contrary, I believe a forward-looking and increasingly Internet-savvy Congress crafted a framework to promote competition and deregulation throughout all telecommunications markets as we enter a new chronological and technological millennium.

The Telecommunications Act is rooted in a strong belief in the power of competition, and in a recognition that the networks constructed over the past century by the incumbent LECs need to be "opened up" to enable competitive entry. What I like most about this order and notice of proposed rulemaking is that it both (1) requires incumbent LECs to open their networks in ways that allow multiple providers to offer high-bandwidth services and (2) provides a path for ILEC affiliates who are willing to compete on their merits, rather than on the basis of affiliation, to avoid regulation to the same degree as do their competitors. The goal is to expedite full and fair competition between a multiplicity of bandwidth providers, including ILEC affiliates, and thereby speed the availability of high-quality, reasonably priced, advanced telecommunications capability throughout the nation.

**SEPARATE STATEMENT OF
COMMISSIONER MICHAEL K. POWELL**

Re: Memorandum Opinion and Order and Notice of Proposed Rulemaking, Petition of Bell Atlantic Corporation for Relief From Barriers to Deployment of Advanced Telecommunications Services et al. (CC Docket Nos. 98-11 et al.).

Re: Notice of Inquiry, Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996 (CC Docket No. 98-146).

In this combined statement, I write separately to explain the bases upon which I support this *Order/NPRM* and *Notice of Inquiry*.

I am very pleased to support the *Order/NPRM*. First, I think the item evidences our desire to devise ways that *all* interested firms can participate in the deployment of advanced services -- even incumbents that possess market power in certain communications markets. Make no mistake: as a strong proponent of vigorous antitrust enforcement, I believe that government must continue and intensify its efforts to contain and ameliorate the negative effects of such market power where warranted. We should, in particular, be sensitive to the power such companies have over truly essential facilities. We should not fail, however, to recognize that these companies also may be well-positioned to provide services of enormous value to consumers. Simply put, we cannot relegate BOCs or other big companies to the sidelines in the data services "race" unless we are prepared to deny the economy and consumers of the benefits of these companies' expertise and capital.

Second, and relatedly, I applaud the *Order/NPRM* for what it signals. In particular, it signals that the Commission is willing to allow incumbent LECs to provide some services through a separate affiliate on a relatively unencumbered basis, subject primarily to our enforcement mechanisms. I am committed, personally and firmly, to ensuring that this alternative, "deregulatory pathway" is available to the extent permitted under the law.

As I have noted on many occasions, communications policy historically has emphasized prospective, prophylactic regulation. Yet such regulation tends to stifle innovation and impede the beneficial operation of market forces. We should look to performance measurement and vigorous enforcement, more often than prospective regulation, as a means to protect the public against certain identifiable harms. This approach will avoid hindering companies from improving their existing offerings and entering new markets that lie outside their traditional regulatory boundaries, and will usher in a more effective and efficient regulatory process.

The separate affiliate approach, if carefully implemented, offers the prospect of allowing us to police potential anticompetitive conduct more easily. As such, I believe this approach takes the Commission another step away from the traditional regulatory model toward one that is

more consistent with a rapidly evolving competitive marketplace. I applaud the Common Carrier Bureau and my colleagues for taking this important, deregulatory step with respect to encouraging the development of competition in advanced services.

Third, I believe the separate affiliate pathway will serve as a good example of how the Commission can promote congruence between our policy goals and private firms' self-interest. There is an unfortunate tendency in communications policy to rely on policies that depend for their implementation upon a company or an industry acting against its self-interest. This reliance is entirely misplaced. Firms are economic actors, not moral beings. Indeed, the market depends for its effectiveness on firms pursuing their economic self-interest. We must accept these premises and craft policies consistent with them. I am committed to pursuing the idea of a separate affiliate pathway because I believe it constitutes an important move in this direction. As the *Order/NPRM* notes, the requirement that an incumbent treat its advanced services affiliate only as well as it treats its competitors should give the incumbent a greater incentive to improve its processes and provide unbundled elements and collocation space as quickly and cheaply as possible to all competitors.

I should add that I am very cognizant of some of the fears expressed regarding the separate affiliate approach, particularly fears about the continued soundness of universal service support and new entrants' fears that allowing incumbents to use separate affiliates will somehow allow incumbent LECs to leverage their dominance in the local telephone market to control the market for advanced services. These fears are not unfounded. With respect to universal service, however, I would point out that it is my understanding that an incumbent's advanced services affiliate would have the same obligation to contribute to universal service as any other telecommunications carrier. With respect to new entrants' fears, I would urge us to consider the alternative to establishing a separate affiliate pathway. The dynamism and demand in the advanced services market is such that incumbents that do not provide these services through separate affiliates will surely do so on a highly integrated basis. If that happens, our ability to enforce interconnection, unbundling and other requirements with respect to advanced services will be as difficult and, I fear, as uphill a battle, as our enforcement of these requirements for traditional circuit-switched services. Thus, I submit that even if the separate affiliate approach may involve risks -- which I am committed to addressing -- the alternative may not put us in any better position to promote competition in advanced services.

I also support the adoption of this *Notice of Inquiry*. Encouraging deployment of advanced telecommunications services promises both to challenge our conventional understanding of technology within the existing statutory and regulatory framework and to usher in exciting new communications capabilities for average Americans. The trick is getting from here to there; that is, we must overcome the various technological, legal and economic impediments to deployment in order to let consumers and organizations appreciate fully the possibilities advanced communications services offer. Indeed, section 706 requires not only that these services be deployed, but that the Commission and each state Commission encourage such deployment on a reasonable and timely basis to all Americans. Moreover, we must do so consistent with the deregulatory, market emphasis of the Act.

I invite parties commenting on the *Notice* to help us conduct a thorough review of where we have been, where we are, and where we need to be in order to encourage the deployment of advanced services. I hope that, in using this information, we will be sensitive to the fact that requiring certain firms to provide access to their facilities or services to other firms or even to end users may have some negative consequences. In particular, I think we should search for ways to promote innovation and competition in the provision of "last mile" transmission to homes and businesses. While mandating access is a useful tool and can bring about short-term gains in retail competition, it also may undermine incentives for developing new ways to circumvent the power of incumbents over distribution.

Both the *Order/NPRM* and the *Notice of Inquiry* offer evidence that the Commission understands that neither competition nor innovation is the product of the well-meaning regulatory policies we adopt, even if our policies create the appearance of competition in the short-term; rather, competition and innovation are the result of self-interested actors struggling in the marketplace to provide consumers with new and better products and services. I firmly believe that our policies should continue to take account of this fact. I believe we also must focus more on the longer-term future in carrying out Congress' instruction that we encourage the deployment of advanced communications. I wish to underscore my personal commitment to following this instruction at the same time we seek to promote the deregulatory and pro-competitive goals of the Act.

I praise the Bureau's efforts, as well as those of my colleagues, on this critical and challenging subject. And I look forward to working with everyone at the Commission, in the States and in Congress to help make our effort to encourage the deployment of advanced communications a success.