

communities in 14 states covering 5.43 million homes.¹⁰³ This activity results almost entirely from LECs entering the market as permitted by the 1996 Act.¹⁰⁴

34. *Stock Prices.* During the 3rd Quarter of 1997, market valuation of the cable industry experienced a sharp increase. Analysts attribute the increase to Microsoft's investment in Comcast,¹⁰⁵ the dissolution News Corp.'s planned venture with EchoStar and subsequent alliance of its ASkyB assets with Primestar,¹⁰⁶ and the rollout of the new cable data service, @Home.¹⁰⁷ Analysts expect an increase in the market value of cable stocks to continue, and expect that future appreciation will be driven primarily by accelerating revenue and cash flow growth.¹⁰⁸

35. While the Standard and Poor's Index 500 ("S&P 500") has steadily increased since January 1992, with more significant increases beginning mid-way through 1995, the prices of cable stocks, as represented by the Kagan MSO Index, have also generally increased, though with some fluctuation.¹⁰⁹ The Kagan MSO Index remained almost even with the S&P 500 throughout most of 1992, but rose sharply above it in November 1992 following enactment of the 1992 Cable Act. The Kagan MSO Index remained above the S&P 500 until shortly after the 1996 Act in February 1996, fell below the S&P 500 in April 1996, and remained below the S&P though June 1997.¹¹⁰

¹⁰³*Id.* This includes all franchises currently in operation.

¹⁰⁴This is discussed in more detail at paras. 112-115 *infra*.

¹⁰⁵See para. 48 *infra* for more details on Microsoft's investments in MSOs.

¹⁰⁶After News Corp.'s proposed \$1 billion acquisition of EchoStar Communications Corp. failed to materialize, News Corp. decided to sell its satellite assets to PrimeStar for \$1.1 billion and, in turn, PrimeStar, a partnership controlled by six media companies, will reorganize its ownership structure to become a public entity. ASkyB (of which News Corp. owns 80%, MCI owns the other 20%) will own 20%, non-voting stake in PrimeStar. As for the ownership structure of PrimeStar, TCI's Satellite Entertainment subsidiary will control about 38%; Time Warner Inc., 30%; Comcast, 10%; US West's MediaOne, 10%; Cox, 10%; and GE Co., 2%. See Robert Liu, *Murdoch Sells Satellite Ops*, CNNfn at <http://cnnfn.com/hotstories/deals/9706/11/primestar/html>

¹⁰⁷Richard Bilotti, *et al.*, Morgan Stanley, Dean Witter, Discover & Co., *Third-and Fourth Quarter 1997 Cable Television Preview: Recent Rally May be Just the Tip of the Iceberg*, Oct. 10, 1997, at 1.

¹⁰⁸*Id.*

¹⁰⁹Some of the events that have coincided with sharp increases in the Kagan MSO Index include the enactment of the 1992 Cable Act which caused the Kagan MSO Index to rise sharply above the S&P 500, the September 1993 announcement of a proposed Bell Atlantic/TCI merger, and Microsoft's \$1 billion investment in Comcast earlier this year. Some of the events that have coincided with dramatic decreases in the Kagan MSO Index include the 1992 Cable Act benchmark order (first) rate rollback of 10%, the (second) rate rollback of 7% pursuant to the same benchmark order, the Bell Atlantic/TCI Breakup, and the 1996 Act.

¹¹⁰Although the Kagan MSO Index was below the S&P 500 between April 1996 and June 1997, it has begun mimic S&P trends around March 1997.

5. *Price Survey and Cable Rate Issues*

36. Section 623(k) of the Communications Act requires the Commission to publish annually a statistical report on average rates for the delivery of basic cable service, other cable programming services, and equipment.¹¹¹ Specifically, Section 623(k) directs the Commission to compare prices charged by cable systems facing effective competition with those not facing effective competition.¹¹²

37. The Commission recently issued its annual report for 1997 based on results of a survey of cable industry prices conducted in the summer of 1997.¹¹³ The survey requested data as of July 1, 1995, July 1, 1996, and July 1, 1997.¹¹⁴ Cable operators were asked to provide price data on cable services and to explain any change in rates between July 1, 1995, and July 1, 1996, and between July 1, 1996, and July 1, 1997. After the data were collected, the Commission supplemented the survey data with information about the respondents' regulatory status to compare prices and channel capacity between noncompetitive regulated and unregulated cable operators as well as competitive and noncompetitive operators.¹¹⁵

38. Based on 485 completed questionnaires, the Commission found: (a) the average monthly charge for programming services and equipment rose for both the competitive and noncompetitive groups, with the noncompetitive group charging higher average monthly rates than the competitive group in each of the time periods studied;¹¹⁶ (b) subscribers that purchase cable services from regulated operators

¹¹¹Section 623(k) was added to the Communications Act by the 1992 Cable Act, 47 U.S.C. § 534(k).

¹¹²Under the 1992 Cable Act, effective competition exists in these three situations: (1) where the franchise area is served by at least two unaffiliated multichannel video programming distributors, each of which "offers comparable video programming" to at least 50% of households, and at least 15% of households subscribing to programming services offered by an MVPD subscribe to services other than those offered by the largest MVPD; (2) where fewer than 30% of the households in the franchise area subscribe to the cable service of a cable system; or (3) where a municipal cable system offers service to at least 50% of the households in the franchise area. § 623(l)(1)(A)(B)(C), 47 U.S.C. § 543(l)(1)(A)(B)(C). The 1996 Act added a fourth test for effective competition: when a local exchange carrier or its affiliate (or any MVPD using the facilities of such carrier or its affiliate) offers video programming services (other than direct-to-home satellite services) in the franchise area of an unaffiliated cable operator, but only if the services so offered are comparable to the services provided by the cable operator. § 623(l)(1)(D), 47 U.S.C. § 543(l)(1)(D).

¹¹³*Implementation of Section 3 of the Cable Television Consumer Protection and Competition Act of 1992. Statistical Report on Average Rates for Basic Service, Cable Programming Services, and Equipment*, MM Dkt. No. 92-266, Report on Cable Industry Prices, FCC 97-409 (released Dec. 15, 1997).

¹¹⁴This report represents the fifth survey of cable rates conducted by the Commission since 1992.

¹¹⁵Regulated cable operators are those whose rates are regulated under the Commission's rules. Unregulated operators are operators that are not regulated because local regulatory authorities have not obtained certification to regulate rates pursuant to 47 C.F.R. § 76.910, and no complaint has been filed with the Commission concerning their cable programming services tiers. (The category of unregulated operators in this report excludes operators that are not regulated because they are subject to effective competition.)

¹¹⁶When "low penetration" systems are omitted from the competitive group, that disparity grows even wider.

typically pay less, on a per channel basis, for programming services and less for equipment than subscribers that purchase services from unregulated operators; (c) both competitive and noncompetitive operators attribute most of their rate increases to inflation, increased programming costs, channel additions, and system upgrades, although competitive and unregulated operators also attribute portions of their rate increase to increased equipment costs; (d) both competitive and noncompetitive operators increased their average channel capacity, now offering subscribers additional satellite channels, and had corresponding reductions in their average monthly rates per channel.¹¹⁷

39. *Comparison of Prices Charged by Cable, DBS, and MMDS.* The Commission found that the average monthly rate charged by cable operators, as of July 1, 1997, was \$26.33 for programming services (including basic and expanded basic services, but excluding New Product Tiers ("NPTs"), premium, and pay-per-view services) and \$2.52 for equipment. The average monthly rate for programming and equipment combined was \$28.83. On average, cable industry subscribers received 49.4 channels at an average monthly rate per channel of \$0.63.

40. While it is difficult to make a direct meaningful comparison between rates charged by cable operators and other MVPDs, such as DBS and MMDS, because the offerings are not directly comparable, it is possible to make a rough comparison since there are similarities. A comparison of monthly charges for cable, DBS, and MMDS services is shown in Table B-10. The level of service from DBS that would be most comparable to typical cable service would be the basic service without premium channels. On average, that level of service from DIRECTV and Primestar, the two DBS providers with the largest number of subscribers, was \$27.49 as of July 1997. This rate was for programming service only, not including equipment, and was for a basic programming package of 47 channels, for an average monthly cost of \$0.66 per channel. The average monthly rate for MMDS service was \$21.29 for an average programming package of 22.7 channels, or an average monthly cost of \$0.94 per channel. This rate includes the cost of equipment.

41. It is difficult to compare the cost of equipment since service from DIRECTV requires the purchase of equipment. Service from Primestar and from MMDS providers includes \$10 for the cost of equipment. Cable service does not involve purchasing equipment, but does include the rental of equipment. As of July 1997, the one time cost of equipment for DIRECTV was, on average, about \$200. However, for purposes of making a comparison, if we assume the cost of equipment can be spread over five years (or 60 months) and without considering the time value of money, we can estimate an "equivalent" cost for equipment on a monthly basis of \$3.33. This would result in a combined average cost for programming and equipment of \$30.82 per month for DBS service, or \$0.66 per channel. As indicated, however, this rate does not take into account the upfront installation costs associated with DBS and the cost for service to additional television sets which must be considered before making a comparison to the per channel rate for cable given above.

42. There are several caveats to consider when making this comparison. Cable service includes the retransmission of local broadcast channels, while DBS service typically does not include local channels. Depending on a number of factors including terrain and their location relative to the station's

¹¹⁷However, regulated operators offer more channels than unregulated operators, and subscribers of regulated operators pay substantially less on a per channel basis than subscribers purchasing services from unregulated operators.

transmitter, subscribers to DBS service can receive local broadcast channels over-the-air without charge if they have an antenna, or if they prefer, they can subscribe to basic cable service as a way of receiving local broadcast channels. As of July 1997, cable basic-only service cost on average \$11.20 per month. The comparison also does not include the cost of installation. On average, cable installation cost \$39.59, as of July 1997, and DBS installation costs varied from \$50 for a do-it-yourself kit to about \$150 to \$200 for professional installation. The average MMDS installation charge as of July 1997 was \$35.¹¹⁸ When comparing MVPD prices, a number of other factors should be considered. Cable service is typically analog service while DBS service is digital, and the DBS digital-quality picture and sound are superior to analog cable transmission. MMDS service is also typically analog service and the number of channels that can be offered over analog MMDS service is limited. In addition, DBS subscribers usually do not take the basic-only service package because the level of service that most DBS subscribers are interested in includes the more complete programming packages with additional premium movie channels and sports programming channels.

43. *Tier Adjustments.* Year-to-year comparisons in cable, or in MVPD rates more generally, suffer from the fact that the nature of the service in question continues to evolve so that rates, rather than being for a constant level of service, are for somewhat different service offerings. Estimating a price per channel is one means of trying to take this change into account, although it is clear that all channels are not perceived to be equally valuable. Shifts in desirable programming from premium or pay channels to basic or CPS tier channels may also reflect a change in the quality of the service measured. NCTA, for example, states that sports is an area of competition among MVPDs, and that in response to sports channels carried in the DBS basic package, virtually all cable systems have migrated their regional sports networks from premium service tiers to basic and CPS tiers.¹¹⁹ According to NCTA, of the approximately 10,750 cable systems nationwide, regional sports networks are carried as a basic or expanded basic service on approximately 4,259 systems, as compared with 41 systems that carry them as premium services.¹²⁰ Similarly, the Disney Channel, originally a premium service, is now carried as a basic or CPS tier channel on cable systems serving more than 22 million subscribers. MediaOne indicates that it has shifted premium channels, such as regional sports services and the Disney Channel, to CPS tiers.¹²¹ In the Northeast, MediaOne has moved SportsChannel New England from a premium tier to its expanded basic tier. In Michigan, it is repositioning Pro-Am Sports Service ("PASS") from partial premium carriage to full-time cable programming service tier carriage. On MediaOne's Stockton, Yuba City, and Fresno, California, systems, SportsChannel Pacific was formerly carried as a premium service, but is now carried as part of the CPS tier.¹²²

44. Regional sports programming channels and other premium service migration typically results in a price increase for tier service, but a rate decrease for those who subscribed to the channel prior to its migration. For example, in Montgomery County, Maryland, cable customers who previously

¹¹⁸See App. B, Tbl. B-10.

¹¹⁹NCTA Comments at 27.

¹²⁰*Id.*

¹²¹US West Comments at 1.

¹²²*Id.*

purchased Home Team Sports ("HTS") as a premium service have experienced an overall reduction in their cable rates. Prior to the July 1, 1997, migration of HTS to the "preferred" tier, customers paid \$42.35 monthly for preferred service plus HTS received as a premium service. Effective July 1, 1997, those same customers began paying \$34.39 for the preferred service that included HTS.¹²³ However, customers who had not subscribed to the HTS as a premium service experienced an increase in their rates from \$31.39 for their preferred service to \$34.39 for preferred service that now included HTS.¹²⁴ Comcast's SportsNet is expected to be distributed to subscribers without their being assessed a separate charge and to replace services offered on a premium basis. System operators themselves will pay as much as a \$1.50 a subscriber for this service, a cost they will either absorb or pass on to subscribers.¹²⁵

6. *New Services*

45. Several cable operators are beginning to provide digital video, data, and voice services over their cable systems. Cable operators have generally needed to upgrade their cable plant and equipment prior to providing digital video, cable modem, or cable telephony services, particularly the two-way services.¹²⁶ Digital signal transmission, for example, is less tolerant of system interference than is analog signal transmission. Accordingly, cable systems previously providing only analog service may require upgrading to eliminate poor electronic connections and other sources of interference prior to carrying digital signals. In addition, operators may increase system capacity prior to commencing digital transmission. As an alternative to providing new services over existing cable plant, several cable operators are marketing non-video services, such as cellular telephone services, or leased-line telephone services, provided over non-cable facilities in addition to cable video services.

46. *Digital Video Services.* Compared to the analog signal transmission historically used in cable systems, digital signal transmission can provide superior video picture quality and, through digital compression techniques, increased channel capacity.¹²⁷ Subscriber reception of digital video signals requires a set-top device to decompress and decode incoming signals and to translate the digital signals into the analog signals used by current television sets. MSOs beginning to offer digital video service

¹²³NCTA Comments at 28.

¹²⁴Manuel Perez-Rivas, *Cable Rates Not a Hit in Montgomery*, Washington Post, May 22, 1997, at A-1.

¹²⁵Mike Bruton, *Comcast Scores Big With Sports Network*, Philadelphia Inquirer, July 22, 1997, at 1.

¹²⁶See paras. 30-31 *supra*.

¹²⁷In allocating bandwidth to digital video, an MSO must determine the number of analog or otherwise unused channels to devote to digital video. In attempting to maximize the number of digital program channels per available bandwidth, MSOs have tried to maximize digital compression ratios. Some MSOs -- including TCI and Adelphia -- appear to be settling on a 12:1 digital to analog compression ratio which, for these MSOs, appears to provide adequate picture quality. Joel Brinkley, *Cable TV in Digital Push to Get in More Channels*, New York Times, Nov. 10, 1997, at D7. The picture quality provided by a 12:1 digital to analog compression ratio may be approximately equal to that provided by analog cable service, but is not as good as that provided by DBS systems' digital service or by lower compression ratios on other cable systems.

include TCI,¹²⁸ Cablevision Systems,¹²⁹ Comcast,¹³⁰ Cox,¹³¹ Time Warner,¹³² and US West's MediaOne.¹³³ Adelphia and Jones also plan to begin offering digital video service in selected markets.¹³⁴ TCI is using a 12:1 digital to analog compression ratio to provide 36 digital channels in its current digital video service.¹³⁵

47. *Internet and High Speed Data Services.* Internet and other data can be transmitted faster over some cable systems, using cable modems,¹³⁶ than over current twisted-pair telephone systems, using telephone modems¹³⁷ or integrated services digital network ("ISDN"),¹³⁸ asymmetrical digital subscriber

¹²⁸Hartford, Connecticut; Arlington Heights, Illinois; Fremont, Richmond, Perris, Pinole, Newbury, Pittsburgh, and Castro Valley, California; Bellvue, Washington; Corvallis, Oregon; Greely, Denver, Avon, and Ft. Collins, Colorado; Topeka, Kansas; Richmond, Indiana; and Mamaroneck, New York. TCI's digital video service passes 2.2 million homes covering most or all of the TCI homes passed in these markets. Telephone interview with Colleen Abdoulah, Assistant to Chief Operating Officer, Vice President of Digital Television, TCI, November 18-19, 1997 ("Abdoulah Interview, Nov. 18-19"); Ellis, Leslie and Joe Estrella. *TCI Rolls Out All TV In More Areas*, Multichannel News, July 14, 1997, at 8.

¹²⁹Boston, Massachusetts, and Los Angeles, California.

¹³⁰Orange County, California. Strategis Group, *Digital and Advanced Analog Set-Top Trials and Deployments*, Cable Trends: 1997, May 1997.

¹³¹Orange County, California. Telephone interviews with Alex Netchvolodoff, Vice President for Public Policy, Cox Enterprises, (Oct. 23, and Dec. 2, 1997) ("Netchvolodoff Interviews, Oct. 23 and Dec. 2").

¹³²San Diego, California and San Antonio, Texas. Strategis Group, *Digital and Advanced Analog Set-top Trials and Deployments*, Cable Trends: 1997, May 1997.

¹³³Richard Bilotti, *et al.*, Morgan Stanley & Co., Inc., *Multichannel Metamorphosis II: Digital Derby - Rounding Turn #1*, Apr. 25, 1997, at 64, 69, 79, and 84. Some industry analysts predict that cable operators' digital video services will generate substantial revenue (1 million to 1.5 million digital video subscribers for each of the seven listed firms within two to three years); Strategis Group predicts \$2.5 billion in digital cable revenues per year by 2002 from 14 million digital cable subscribers out of 63.4 million homes passed by digital cable, or 14% of homes passed or 20.4% of cable subscribers; Strategis Group, *Cable Trends 1997*, at 1-1; Morgan Stanley predicts \$3 billion in digital cable revenue by 2002 from 14 million digital video subscribers; Telephone interview with Marc Nabi, Research Assistant, Morgan Stanley & Co., Inc. (Oct. 22, 1997) ("Nabi Interview, Oct. 22")

¹³⁴Joel Brinkley, *Cable TV in Digital Push to Get in More Channels*, New York Times, Nov. 10, 1997, at D7. Jones offers digital video in Tucson, Arizona. Jammu Interviews, Oct. 27 and Dec. 3.

¹³⁵Abdoulah Interview, Nov. 18-19.

¹³⁶See *1996 Report*, 12 FCC Rcd at 4413-14 ¶ 103. TCI reports its cable modems as capable of sustained downstream transmission of 27 Mbps (27,000 Kbps) (for a shared network). Abdoulah Interview, Nov. 18-19. The current generation of personal computer Internet cards appears to be limited to approximately 10 Mbps.

¹³⁷Price Waterhouse, *EMC Technology Forecast 1998*, at 129.

line ("ADSL"),¹³⁹ or high-bit rate digital subscriber line ("HDSL") technology and equipment depending on the architecture.¹⁴⁰ MSOs offering cable modem service in 1997 include U.S. West's MediaOne, TCI, Time Warner, Comcast, Cox, Jones Intercable, Cablevision Systems, and Adelphia.¹⁴¹ TCI provides cable modem service throughout its systems in Hartford, Connecticut, Arlington Heights, Illinois, and Fremont, California, providing both upstream and downstream data transmission over its two-way plant in these areas.¹⁴² TCI plans to offer cable modem service in six to twelve additional markets during 1998.¹⁴³ US West's MediaOne offers data service marketed as "MediaOne Express," to approximately 10,000-20,000 customers in a widespread offering.¹⁴⁴ Other MSOs conducting cable modem market trials include Century, Charter, Fanch, Marcus, Media General, and Prime Cable.¹⁴⁵ There are currently about 50,000

¹³⁸(...continued)

¹³⁸ISDN is a technology used by telephone companies to deliver much higher data rates over one common twisted-pair than provided over a telephone line using conventional technology. Equipment is required at the consumer's home and in the telephone company's central office to effect the service, but the network remains the same as with plain old telephone service ("POTS"). The transmission is completely digital from end to end, as opposed to POTS. The Yankee Group, *Bringing Broadband Home: New Networks for New Services*, Dec. 1995, at 15. Basic-rate ISDN provides two "B" channels of 64 Kbps each (combined 128 Kbps) and one administrative "D" channel of 16 Kbps for exchanging call setup information. The B-channels provide circuit-switched, end-to-end digital channels for customer communications; they can be used to interface with the voice telephone network. A standard ISDN line can carry up to 128 Kbps - or 64 Kbps plus a voice telephone call. Primary rate ISDN provides twenty-three 64 Kbps "B" channels and one 64 Kbps "D" channel achieving the T-1 speed of 1.544 Mbps. Price Waterhouse, *EMC Technology Forecast 1998*, at 126.

¹³⁹ADSL is a technology that offers downstream data rates of up to 6 Mbps and upstream rates between 64 and 600 Kbps over standard copper telephone wires. It does this through one of two competing ADSL technologies: Carrierless Amplitude and Phase-16 (CAP-16) and Discrete Multi-Tone (DMT). The Yankee Group, *Bringing Broadband Home: New Networks for New Services*, Dec. 1995, at 18. ADSL delivers data at a speed of 1.5 Mbps to 6 Mbps. Price Waterhouse, *EMC Technology Forecast 1998*, at 126.

¹⁴⁰Similar to ADSL, HDSL uses two copper twisted pairs to deliver the equivalent of a T-1 line (1.544 Mbps), with equal downstream and upstream bandwidth. This application is used by telephone companies to supply T-1 lines. The Yankee Group, *Bringing Broadband Home: New Networks for New Services*, Dec. 1995, at 18. HDSL delivers data at a speed of 1.5 Mbps to 6 Mbps. Price Waterhouse, *EMC Technology Forecast 1998*, at 126.

¹⁴¹See App. B, Tbl. B-11. These firms use cable modems from General Instrument, LAN City, Motorola, and Zenith.

¹⁴²Abdoulah Interview, Nov. 18-19. TCI provides @Home cable modem service for \$35 per month (unlimited usage, modem equipment included).

¹⁴³*Id.*

¹⁴⁴Telephone Interview with Jim White, Regulatory Counsel, US West's MediaOne, (Nov. 21, 1997) ("Jim White Interview, Nov. 21").

¹⁴⁵"Select Cable Modem Market Trials in North America: As of October 1, 1997" at <http://CableDatacomNews.com/cmhc8.htm>. Several industry analysts project that cable modem service will generate substantial revenues for cable operators. Strategis Group, *Cable Trends 1997*, at 1-1 (\$3 billion in annual revenues from cable modem service from 6 million subscribers out of 24 million homes passed by high-speed data-ready cable plant).

cable modem subscribers as of October 1997, which is projected to grow to 197,000 next year as the service becomes more widely available.¹⁴⁶

48. Several systems are upgrading to improve their ability to provide these services. Indeed, cable systems' ability to transfer data at high speeds may give cable operators a strategic advantage in competing for revenues associated with Internet and other data services. Microsoft's \$1 billion investment in Comcast this June in exchange for a 11.5% interest in the company¹⁴⁷ may indicate the importance of cable operators to future competition in this area. Microsoft is reportedly considering investing in other cable companies as well.¹⁴⁸

49. Cable modem subscribers may benefit from numerous new services designed to take advantage of their high data transfer speeds. It is local and regional networks together that provide the high speed network to the subscriber and distinguish these systems from traditional dial-up on-line services which operate at much slower speeds.¹⁴⁹ The @Home local network, for example, has its own routing and caching (storage) servers which allow the most frequently accessed material from its own content centers and from the Internet to be transferred from the source to these storage areas.¹⁵⁰ @Home provides service for Comcast, Cox, TCI, InterMedia Partners, Marcus, and Cablevision Systems customers, as well as Canadian MSOs Rogers and Shaw.¹⁵¹ Service is currently available in numerous localities in Maryland,

¹⁴⁶Jeff Peline, "Cable Modem Users Growing," C/Net News.com, Oct. 16, 1997, at <http://www.news.com/News/Item/0,4,15359,00.html>.

¹⁴⁷David Bank, *Microsoft, Time Warner and US West Discuss High-Speed Internet Service*, Wall Street Journal, Nov. 6, 1997, at B8. and John Markoff, *Microsoft Seems Near Deal to Invest in US West Cable TV*, New York Times, Nov. 5, 1997, at D1.

¹⁴⁸Microsoft is expressing interest in investing as much as \$1 billion in US West's MediaOne cable operations, and is reportedly in talks with TCI, Time Warner and Cox about future investments. See Kim, James, *Microsoft Charts Course into Cable*, USA Today, Nov. 6, 1997 at 2B. It has been reported that Microsoft's talks with Time Warner and US West's MediaOne specifically have involved the creation of a high-speed Internet access service that would compete with @Home Corp. See David Bank, *Microsoft, Time Warner and US West Discuss High-Speed Internet Service*, Wall Street Journal, Nov. 6, 1997, at B8.

¹⁴⁹Richard Bilotti, *et al.*, Morgan Stanley & Co., Inc., *Deploying High-Speed Cable Data Modems*, June. 21, 1996, at 10.

¹⁵⁰At Home Corp. was founded by TCI and venture capital firm Kleiner Perkins Caufield & Byers in May 1995. In June 1996, Comcast, Cox, and in 1997, Cablevision Systems all acquired equity investments in @Home. Two Canadian MSOs, Rogers and Shaw, along with Sun Microsystems purchased equity in @Home through a private stock placement in April 1997. The company went public in July 1997. InterMedia Partners, and Marcus Cable plan to distribute the service though they are not investors. A customer is not required to subscribe to cable television service to receive @Home Internet service. "Cable Internet Service Providers and Systems Integrators: @Home," at <http://CableDatacomNews.com/cmhc5.htm> and "@Home Availability & Live Demonstrations," at <http://www.home.net/home/availability.html>. and John M. Higgins, *Cablevision gets piece of @Home*, Broadcasting & Cable, Oct. 6, 1997, at 20.

¹⁵¹*Cable Internet Service Providers and Systems Integrators: @Home*, at <http://CableDatacomNews.com/cmhc5.htm>. and *@Home Availability & Live Demonstrations*, at <http://www.home.net/home/availability.html>.

New Jersey, California, and Connecticut.¹⁵² The Road Runner service,¹⁵³ rather than building its own national network backbone and customer service infrastructure, has formed a partnership with MCI to provide these services.¹⁵⁴ MCI is providing the high speed Internet connections to the local cable system headends, managing a network operations center to monitor performance of local cable system data networks, and is operating a specialized help desk to provide technical support to subscribers.¹⁵⁵ Road Runner provides service for Time Warner Cable and several MSO affiliates including Cablevision Systems Corp., Century Communications, and Fanch Communications.¹⁵⁶ A number of other providers, such as WebTV, WorldGate, ICTV, NetChannel and Wink TV, are introducing services that will provide Internet content over television sets.¹⁵⁷

50. In September 1997, Cable Television Laboratories launched its "OpenCable" initiative to encourage development of interactive set top boxes. These boxes may include greater computing power, two-way capabilities, interactive programming guides, graphics accelerators and cable modems.¹⁵⁸ As cable operators convert to digital technology, the industry has made a major commitment to establishing an open standard for the next generation of cable boxes. CableLabs received 23 responses from computer and consumer electronics companies and other vendors to its OpenCable request for information.¹⁵⁹ The shift from proprietary technology to an open standard may lead to more manufacturers of the boxes, may spur a retail distribution market, and may prompt new high speed data and Internet service providers like those described here.

51. *Cable Telephony.* Cable telephony requires sizeable and expensive upgrades and presents a number of technical and regulatory obstacles.¹⁶⁰ Because other services can provide greater immediate

¹⁵²*Id.*

¹⁵³The Road Runner Group was formed by Time Warner Cable and Time Inc., as a separate business unit to spearhead the development and deployment of high-speed cable data services. The Road Runner Group has leveraged a host of Time Warner content for its broadband service, including *Time*, *Money*, *People*, and *Sports Illustrated* Magazines, CNN, and Warner Bros. studios. Cable Internet Service Providers and Systems Integrators, "The Road Runner Group," See <http://CableDatacomNews.com/cmhc5.htm>.

¹⁵⁴Cable Internet Service Providers and Systems Integrators, "The Road Runner Group," See <http://CableDatacomNews.com/cmhc5.htm>.

¹⁵⁵*Id.*

¹⁵⁶*Id.*

¹⁵⁷ *Who's Who in Silicon Valley*, Cablevision, Dec. 8, 1997, at 26-60.

¹⁵⁸Price Colman, *Making Sense of Set-Tops*, Broadcasting & Cable, Oct. 27, 1997, at 51.

¹⁵⁹Telecommunications Reports, *Video Competition Report*, Dec. 15, 1997 at 7-8.

¹⁶⁰Strategis Group, *Cable Trends 1997*, at 1-9, and Leslie Cauley, *Mile-High Melee: US West Takes Over A Huge Cable Firm. Then Angers Its Brass*, Wall Street Journal, Aug. 29, 1997, at A1.

revenue streams, many cable operators have limited their telephony efforts.¹⁶¹ Some analysts predict that cable telephony is not expected to be a significant revenue source in most markets for the industry in the near future.¹⁶² Cable telephony, however, is currently being offered by a few operators in several test markets. Among the MSOs offering telephone service are: Cox, US West's MediaOne, Cablevision Systems, Jones Intercable, TCI, and Time Warner.¹⁶³ Cox is currently offering voice telephone service over its own network¹⁶⁴ to more than 24,000 residential customers in Orange County, California, and expects to offer residential voice telephony service to almost 225,000 households in various markets by the end of 1997 including Omaha, Nebraska.¹⁶⁵ A number of public statements have been made by members of the cable industry indicating that a reassessment of the industry's ambitious proposals to enter the telephone business is taking place. Cox offers telephone service to business customers in Oklahoma City, Oklahoma, Hampton Roads, Virginia, and New Orleans, Louisiana, over leased telephone networks.¹⁶⁶ Cablevision System's cable telephone trials are being marketed to 115,000 households on Long Island, New York, with 5,000 subscribers as of March 1997.¹⁶⁷ Additionally, US West's MediaOne launched cable telephony¹⁶⁸ to one-third of the households in its Atlanta cable franchise area during 1997. Although this rollout is being described as a "commercial launch," it appears to be more of a trial.¹⁶⁹ TCI's telephone service over its own fiber network is currently available to 90,000 households in Hartford, Connecticut, Arlington Heights, Illinois, and Fremont, California. TCI plans to offer telephone service over its own plant to an estimated 250,000 households by the end of 1997.¹⁷⁰ TCI currently has 1,000 telephone subscribers.¹⁷¹ Jones Intercable offers telephone service to 20,000 customers in Alexandria, Virginia, and in Maryland's Prince George's County. By the end of 1997, Jones Intercable plans to reach

¹⁶¹*Id.*

¹⁶²Strategis Group, *Cable Trends 1997*, at 1-9.

¹⁶³NCTA Comments at Apps. A1-A3.

¹⁶⁴Cox offers its residential customers telephone over its own HFC network (fiber to the node and coaxial cable to the residence).

¹⁶⁵Netchvolodoff Interviews, Oct. 23 and Dec. 2.

¹⁶⁶*Id.*

¹⁶⁷Jessica Reif Cohen et al., *Media & Entertainment*, Merrill Lynch, Mar. 7, 1997, at 19.

¹⁶⁸US West's MediaOne offers cable telephony using fiber to the node technology where fiber-optic cable is used to carry telephone transmission to community nodes. From those nodes, MediaOne states it transports telephone service via their cable plant. Jim White Interview, Nov. 21.

¹⁶⁹Dennis H. Leibowitz et al., *Broadcasting & Cable*, Cable Industry Outlook '97, Donaldson, Lufkin, & Jenrette, Apr. 17, 1997, at 11.

¹⁷⁰Jessica Reif Cohen et al., *Media & Entertainment*, Merrill Lynch & Co., Mar. 7, 1997, at 17.

¹⁷¹*Id.*

30,000 customers.¹⁷² Currently, Jones provides telephone service over its own fiber network to MDUs and uses the existing copper twisted pair wiring inside the buildings to offer the service to customers.¹⁷³ It plans to begin offering service over the coaxial cable already installed for their cable customers soon.¹⁷⁴

52. *Multi-Service Offerings.* Several MVPDs are beginning to combine their video service offerings with other services (e.g., offering video programming with local or long distance telephony, cable modem and Internet access, and digital video). Cox announced plans in September to launch one of the largest multiservice offerings, including cable video, telephone, and Internet access to 25,000 renters in Irvine, California, apartment communities.¹⁷⁵ Additionally, Cox currently offers cable data service bundled (over one cable wire only) with their cable service to approximately 714,000 households in various markets, and expects to increase that number to over one million by the end of 1997.¹⁷⁶ As indicated in the previous paragraph, TCI is currently offering cable television and cable telephone to in selected markets.¹⁷⁷ Jones Intercable currently offers Internet access to 41,000 of its cable television customers in Alexandria, Virginia. As indicated above, Jones also offers telephone service to its cable television customers in Alexandria and in Maryland's Prince George's County.¹⁷⁸

53. Some analysts maintain that the success of offering multiple services through broadband cable wires may be threatened by technological difficulties (e.g. software bugs, disconnects, bad connections).¹⁷⁹ US West's MediaOne, for example, is reported to be having software problems adding telephone service to certain systems, although it states that the overall technical approach is still on track.¹⁸⁰ Ameritech reportedly does not plan to use its cable systems to offer telephony, at least in the near term, because it is seen as prohibitively expensive and technically difficult.¹⁸¹ To the extent that bundling emerges as technologically feasible and economically desirable for MVPDs, it has the potential to affect competition in markets for the delivery of multichannel video programming.

¹⁷²Jammu Interviews, Oct. 27 and Dec. 3.

¹⁷³*Id.*

¹⁷⁴*Id.*

¹⁷⁵Huffstutter, P.J., *Cox Bundling Phone, Internet Services for Irvine Renters*, The Los Angeles Times, Sept. 26, 1997, at B5.

¹⁷⁶Netchvolodoff Interviews, Oct. 23 and Dec. 2.

¹⁷⁷Jessica Reif Cohen et al., *Media & Entertainment*, Merrill Lynch, & Co., Mar. 7, 1997, at 17.

¹⁷⁸Jammu Interviews, Oct. 27 and Dec. 3.

¹⁷⁹Andrew W. Davis, *Switched Network vs. Hybrid Fiber Coaxial for Two-Way Video From Telcos or Cable*, *Advanced Imaging*, Mar. 1, 1996, at 65. and Leslie Cauley, *Mile-High Melee: US West Takes Over A Huge Cable Firm, Then Angers Its Brass*, *Wall Street Journal*, Aug. 29, 1997, at A1.

¹⁸⁰*Id.*

¹⁸¹*Id.*

B. Direct Broadcast Satellite Services

54. *DBS Service Providers.* Direct broadcast satellite ("DBS") operators use satellites instead of broadband wires or terrestrial microwave stations to transmit their programming to subscribers, who must buy or rent a parabolic "dish" antenna that is approximately 18 inches in diameter, and pay a subscription fee to receive the service.¹⁸² Each DBS operator transmits its programming services to subscribers from specific orbital locations. Permissible orbital locations are established by international telecommunications regulations and Commission rules.¹⁸³ DIRECTV, United States Satellite Broadcasting ("USSB"), and EchoStar currently offer DBS video programming.¹⁸⁴ Primestar is a medium powered fixed satellite service ("FSS") that shares many of the attributes of DBS operators.¹⁸⁵ As with DBS, subscribers to Primestar must buy or rent a parabolic dish antenna and pay a subscription fee to receive service, though the Primestar dish is approximately three feet in diameter.

55. *Subscribership.* DBS systems serve more subscribers than any type of MVPD other than franchised cable system operators.¹⁸⁶ The four DBS providers furnished programming to nearly 5.1 million subscribers as of June 1997.¹⁸⁷ This is an increase of more than 2.2 million subscribers since July 1996, and 400,000 more subscribers than the 1.8 million subscribers DBS providers gained in the previous

¹⁸²1996 Report, 12 FCC Rcd at 4376 ¶ 36.

¹⁸³See Table C-1 for allocation of orbital locations assigned by the United States.

¹⁸⁴Alphastar, a medium-powered FSS provider owned by Tee-Comm Electronics, Inc., filed for Chapter 11 bankruptcy protection in May 1997 and ceased transmitting to its 50,000 subscribers at 3:00 a.m. EDT on August 8, 1997. *AlphaStar Goes Dark, PrimeStar Prepares To Go West*, SkyREPORT, Aug. 1997, at 4; James Careless, *DBS Service AlphaStar Files for Chapter 11*, Multichannel News, June 2, 1997, at 46. DIRECTV has announced that it will give a satellite dish and integrated reception device ("IRD") receiver free to each former Alphastar subscriber who purchases DIRECTV programming. Subscribers must also pay for installation. See Paul Kagan Associates, Inc., *DIRECTV to the AID of SKYLINK*, Private Cable Investor, Aug. 31, 1997, at 12.

¹⁸⁵In the 1997 Report, as in previous years, we include a discussion of Primestar Partners, L.P. ("Primestar"), a medium-powered Ku-band Fixed Satellite Service ("FSS"), together with our high-powered Ku-band DBS providers, DIRECTV, USSB and Echostar, as DBS providers. Unless otherwise noted, our discussions of attributes of DBS providers includes Primestar. Tables C-1, C-2, C-3, C-4 and C-5 provide certain transmission, channel, programming, subscriber and price information for these four firms. At this time, all direct-to-home ("DTH") satellite services use two different frequency bands for transmission, Ku-band and C-band. In the Ku-band (12/14 GHz), service is provided in two different portions of the band. Primestar provides medium power service while high powered DBS service is provided in another portion of the Ku-band. C-band service (4/6 GHz), is often distinguished by its larger antennas with diameters typically around seven and one-half feet (approximately 2.5 meters).

¹⁸⁶NCTA Comments at 1. SBCA Comments at 3; Dennis H. Leibowitz et al., *Satellite Industry Conference*, Donaldson, Lufkin & Jenrette, Aug. 1997, at 12; See Table E-1. See also 1996 Report, 12 FCC Rcd at 4376 ¶ 38.

¹⁸⁷USSB subscribers are not reported as a group by SkyREPORT, *DTH Subscribers*, Sept. 1997, at 4. DIRECTV and USSB are complimentary services because subscribers use the same equipment to receive each service and the services offer different programming. According to SkyREPORT, only a small portion of USSB subscribers do not also receive DIRECTV.

12 months, July 1995 to July 1996.¹⁸⁸ Predictions vary regarding the continued growth of DBS. Some industry analysts expect the DBS industry growth to continue, reaching 15 million subscribers by 2001 (14.5% of the total television market).¹⁸⁹ However, while DBS is gaining about 6,000 subscribers daily, some service providers have lowered their projections for the future, with at least one forecaster lowering its projection to 14.6 million subscribers by 2002.¹⁹⁰ In addition, DIRECTV, which had projected that it would have 10 million customers by 2000, no longer expects to meet this figure.¹⁹¹

56. DBS services offer many features which consumers rate highly, such as digital picture quality, compact disk sound clarity, increased channel capacity, near video on demand ("NVOD") movies and other interactive programming and data services.¹⁹² According to a Nielsen Media Research survey, on a scale of one to five (with five being the most satisfied), 80% of DBS subscribers rate overall satisfaction with their satellite service as a four or a five. By comparison, 45% of cable subscribers rate overall satisfaction with their cable service as a four or a five. The large number of channels and programming variety, especially sports¹⁹³ and movies,¹⁹⁴ are also cited as reasons for consumers choosing

¹⁸⁸See Tables C-3, C-4 and C-5. SBCA Comments at Appendix A; *DTH Subscribers*, SkyREPORT, Aug. 1997, at 8.

¹⁸⁹Richard Bilotti et al., *Telecommunications, Cable Television, Multichannel Metamorphosis II, Digital Derby-Rounding Turn #1*, Morgan Stanley, Apr. 25, 1997, at 2.

¹⁹⁰Video Week, Warren Publishing, Aug. 4, 1997; Dennis H. Leibowitz et al., *Direct Broadcast Satellite(DBS) Industry*, Donaldson, Lufkin & Jenrette, Nov. 21, 1997 at 11, citing Paul Kagan Associates.

¹⁹¹*Id.*

¹⁹²Stuart Levin, *Programmer Spotlight, Digital Cable Television is Here: Just in Time to Meet the DBS Threat to Cable*, Independent Cable News, June 1997, at 12; Leslie Ellis et al., *TCI Rolls Out All TV in More Areas*, Multichannel News, July 14, 1997, at 8; *Consumer Communications, Cable TV's Changing Competitive Landscape*, The Yankee Group White Paper, Mar. 1997, at 2; Dennis H. Leibowitz et al., *Broadcasting & Cable, Telecommunications, Inc. (TCOMA), The New Game Plan*, Donaldson, Lufkin & Jenrette, Dec. 23, 1997, at 5.

¹⁹³According to a poll by Bruskin/Goldring Research, 47% of those surveyed and 52.4% of the male subscribers cited sports as the reason they subscribed to DBS. DIRECTV and Primestar offer as many as 29 channels of sports programming, including ESPN's "Full Court" collegiate basketball and "GamePlan" collegiate football channels, the 24 FOX SPORTSCHANNELs and HTS regional sports channels, and the full, regular season professional league sports networks. Other sports entertainment events have included this summer's USSB's Tyson-Holyfield boxing match (see DIRECTV, Inc. Comments, *Programming Lineup*; Primestar website at <<http://www.primestar.com/ezget/news/articles/facts/65new.htm>>; Dennis H. Leibowitz et al., *Satellite Industry Conference*, Donaldson, Lufkin & Jenrette, Aug. 1997, at 17, 18. The league channels include not only the NHL's Center Ice, the MLB's Extra Innings and the NBA's League Pass, but also new sports programming such as soccer that has been added this year (see MLS/ESPN SHOOTOUT, <<<http://www.directv.com/programming/compare.html>>>). The NFL's Sunday Ticket is only carried by DIRECTV. DIRECTV, Inc. Comments, *Programming Lineup*; Primestar website at <<http://www.primestar.com/ezget/news/articles/facts/65new.htm>>. Primestar is also marketing special "niche" sporting events like rodeos and NASCAR auto races (see *DTH Game Plan for Sports, Services Use Packages, Channels to Secure Attractive Subscriber Base*, SkyREPORT, Aug. 1997 at 1-3). Furthermore, as a continuing part of its emphasis on sports programming, DIRECTV has created a magazine called *ON - Official Magazine of DIRECTV* (continued...)

one of the DBS services.¹⁹⁵ However, DBS's advantages may be minimized once cable systems install digital technology and can offer comparable programming features.¹⁹⁶

57. Among consumers' main concerns regarding DBS are (a) multiple pricing strategies for hardware and programming, (b) the inability to receive local broadcast stations, and (c) the need to purchase additional equipment to receive programming on additional television sets.¹⁹⁷ A May 1997 study by USSB of 11,320 consumers found that 600 of those surveyed had shopped "recently" for digital satellite system, and 70% of those did not buy the service,¹⁹⁸ which may, in part, explain the lowered projections for new subscribers.¹⁹⁹ A recent study reports that only 68 of 647 cable subscribers surveyed indicated that they were "very likely" to switch to DBS.²⁰⁰

58. Impediments to carriage of local broadcast signals by DBS services reduce the satellite services' ability to compete effectively with cable television.²⁰¹ However, the DBS industry is working on at least a partial solution to this situation, and is developing antennas to improve over-the-air broadcast

¹⁹³(...continued)

Sports for subscribers who take its Total Choice Gold, Total Choice Platinum or other collegiate or professional sports programming packages (Ted Hearn, *DIRECTV Seeking FCC Nod for Six New Satellites*, Multichannel News, June 30, 1997 at 24; the magazine will feature sports articles and provide sports program listings).

¹⁹⁴Movies are another program offering which attracts subscribers to DBS. USSB advertises itself as the DBS service with the most movie channels, its way of distinguishing itself from its DBS competitors (USSB webpage @www.USSB.com). USSB's movie channels include premium and multiplex movie channels HBO 1-5 and Showtime 1-4 as well as The Movie Channel, Cinemax, and FLIX (see *DIRECTV, Inc. Comments, Programming Lineup*; Primestar website at <<http://www.primestar.com/ezget/news/articles/facts/65new.htm>>; Dennis H. Leibowitz et al., *Satellite Industry Conference, USSB*, Donaldson, Lufkin & Jenrette, Aug. 1997, at 17, 18. See, e.g., *USSB Channels*, <<<http://www.ussbtv.com/channel/content/content.html>>>).

¹⁹⁵*Beyond Video, DIRECTV & DISH Say They'll Have New Interactive Services by Christmas*, SkyREPORT, Jul. 1997, at 3.

¹⁹⁶See, e.g., *Video Week*, Warren Publishing, August 4, 1997 at 4.

¹⁹⁷*Video Week*, Warren Publishing, August 4, 1997 at 4.

¹⁹⁸*Id.*

¹⁹⁹See para. 55 *supra*.

²⁰⁰Chilton Research Services Survey conducted August 11-15, 1997, as reported in *Cablevision*, Sept. 22, 1997 at 71.

²⁰¹SBCA Comments at 19; NRTC Comments at 12-13; Primetime24 Comments at 2; Heather Fleming, *Sky Goes to Capital Hill for Quick Copyright Fix*, *Broadcasting & Cable*, Mar. 17, 1997 at 35; Rick Westerman et al., *Direct Broadcast Satellite*, UBS Securities, Mar. 4, 1997, at 7; DBS subscribers can only obtain local broadcast signals using conventional over-the-air antennas or through basic cable subscriptions. According to one consumer survey, more than 87% of those surveyed cited the inability to receive local stations as major reason for not buying a DBS system, and 60% cited the need for additional equipment in order to receive programming on other television sets in the household (*Video Week*, Warren Publishing, August 4, 1997, at 4).

transmission reception for DBS subscribers. Also, the launch of Echostar III and IV, will increase channel capacity and, according to Echostar, facilitate the possibility of retransmission of local channels to some of Echostar's markets.²⁰² Capitol Broadcasting Company, Inc. ("Capitol") has announced its "Local TV on Satellite" plan for retransmitting local signals by satellite.²⁰³ Capitol states that it will operate a satellite in the Ka-band with 61 spotbeams that will cover the continental United States, Alaska and Hawaii.²⁰⁴ Capitol intends to offer DBS providers a local station package of all over-the-air, full power, commercial television stations within a given station's designated market area.²⁰⁵

59. The "upfront costs" to subscribers that DBS operators may charge are an additional disincentive for some consumers considering DBS service.²⁰⁶ The costs for the basic equipment, installation, and one month of programming range from \$185 for Primestar service, where the consumer rents equipment, up to \$379 for DIRECTV's service.²⁰⁷ There may also be a \$300 cost for the additional integrated reception device ("IRD") antenna that is required in order to view different channels on other televisions in the household and an additional basic programming package for \$5 per month per television.²⁰⁸ Industry observers expect the cost of IRDs to decline. This decline, however, may be offset by continued monthly charges for service to additional televisions in the household.²⁰⁹

60. To overcome the "upfront costs," DBS providers also have developed a number of discount programs and equipment plans to increase demand for their programming services. In the 1996

²⁰²See Dennis H. Leibowitz *et al.*, *Satellite Industry Conference*, Donaldson, Lufkin & Jenrette, Aug. 1997, at 12-13. For example, Emerson advertises its "Dishmate UHF/VHF Antenna" as designed specifically to function with the DBS antenna (*My TV Reception Is So Clear, You'd Think I had a 50-foot Antenna on My Roof*, Advertisement in the New York Times Magazine, Aug. 31, 1997, at 63). Echostar has recently introduced a more technically sophisticated dish receiver which can integrate off-air broadcast signals with the satellite transmission, eliminating the separate A/B switch mechanism (Kent Gibbons *et al.*, *Future is Near for PrimeStar Service*, Multichannel News, July 28, 1997, at 7; Tammy J. Fluette, *A Decade of Difference, SBCA Celebrates Ten Years of Service*, Private Cable & Wireless Cable, Sept. 1997, at 40).

²⁰³See Statement of Capitol Broadcasting Company, Inc., before the Subcommittee on Courts and Intellectual Property of the Committee on the Judiciary, U.S. House of Representatives, Hearing on the Copyright Licensing Regimes Covering Retransmission of Broadcast Signals License (Oct. 30, 1997).

²⁰⁴*Id.*

²⁰⁵*Id.*

²⁰⁶Bruskin & Goldring Research, *DTH Barriers to Purchase Study, Wave III*, SBCA, June 1997, at 33.

²⁰⁷Primestar's cost includes \$150 for professional installation and monthly charges of \$34.99 for the programming package, \$10 of which is the equipment rental. DIRECTV's cost includes \$199 equipment, \$150 professional installation and monthly charges of \$29.99 for the basic programming package. See Table C-3.

²⁰⁸An IRD antenna can provide multiple channels of satellite programming to 2-3 sets simultaneously. An additional IRD antenna is needed to provide multiple channels of satellite programming to 4-5 sets simultaneously.

²⁰⁹Richard Bilotti *et al.*, *Telecommunications, Cable Television, Multichannel Metamorphosis II, Digital Derby-Rounding Turn #1*, Morgan Stanley, Apr. 25, 1997, at 8, 12; Jimmy Schaeffler, *The State of DBS: Circa July, 1997*, Private Cable & Wireless Cable, July 1997, at 18.

Report, we noted that the prices charged for digital satellite system ("DSS") equipment used to receive programming from DIRECTV, USSB and EchoStar declined, with the price of the basic mode DBS antenna dropping to just \$199 in some cases,²¹⁰ as also noted in Table C-3 of this report. This decline has continued. Discount retailers, such as WalMart, are selling equipment for \$49 and some mail order firms are offering the equipment for as little as \$25.²¹¹ In June 1997, EchoStar dropped its requirement that new subscribers pay the \$300 annual programming fee in advance to purchase the \$199 DBS receiver and other equipment. Some DBS customers can now buy programming on a month-to-month basis.²¹² EchoStar also plans to introduce a \$129 "no frills" second-set receiver, and will provide customers with self-installation kits or offer \$100 off the professional installation charge.²¹³ In July 1997, DIRECTV eliminated its pre-paid programming requirement, but dropped its \$200 equipment rebate.²¹⁴ To attract new customers, DIRECTV offered a 50% discount off the \$159 price for NFL Sunday Ticket to new subscribers.²¹⁵ *Video Magazine* subscribers could buy a six-month subscription to DIRECTV's Total Choice Platinum programming package by October 15, 1997, and be eligible for the free equipment offer.²¹⁶ Thomson Consumer Electronics, maker of the RCA DSS equipment, offered its own promotion, giving anyone who buys an RCA large-screen television the DSS equipment for free.²¹⁷ Primestar announced a discount on installation and one month of free programming this fall.²¹⁸ In addition to offering discounted equipment and programming prices, DBS providers are heavily marketing their services.²¹⁹ The four DBS companies were expected to spend approximately \$1 billion (including the cost of discounts) to promote their products in 1997.²²⁰

²¹⁰1996 Report, 12 FCC Rcd at 4382 ¶ 43.

²¹¹*Retailers Cheer Exit of \$200 DSS Rebate, But Establishments Wait for DIRECTV's Next Move*, SkyREPORT, July 1997, at 10-11.

²¹²*Inside the Industry*, SkyREPORT, June 1997, at 11; *Satellite and International*, Comm. Daily, May 19, 1997.

²¹³Kent Gibbons *et al.*, *Future is Near for PrimeStar Service*, Multichannel News, July 28, 1997, at 76.

²¹⁴*Beyond Video, DIRECTV & DISH Say They'll Have New Interactive Services by Christmas*, SkyREPORT, July 1997, at 3. DIRECTV's DSS equipment manufacturers sponsored the \$200 rebate to compete with ECHOSTAR's \$199 equipment offer. *Satellite and International*, Comm. Daily, May 19, 1997.

²¹⁵DIRECTV Homepage at <<www.DIRECTV.com/>

²¹⁶*DIRECTV Expands Free DSS Equipment*, Multichannel News, Sept. 8, 1997, at 14.

²¹⁷*Id.*

²¹⁸Kent Gibbons *et al.*, *Future is Near for PrimeStar*, Multichannel News, July 28, 1997, at 1, 76.

²¹⁹Already DSS retailers can track DSS and DIRECTV sales data through the Electronic Activation Software (EAS) program, launched in Jan. 1997; Jimmy Schaeffler, *The State of DBS: Circa July, 1997*, Private Cable & Wireless Cable, July 1997, at 18; *Satellite and International*, Comm. Daily, Mar. 26, 1997.

²²⁰Jimmy Schaeffler, *The State of DBS: Circa July, 1997*, Private Cable & Wireless Cable, July 1997, at 17.

61. Consumers can purchase DBS equipment from various sources, including electronics retailers, and individual DBS operators' toll free numbers and Web sites.²²¹ Primestar also offers consumers the option of renting, rather than purchasing, equipment. Consumers can choose to install the equipment themselves, or can contact the DBS provider or an electrician to perform the installation.²²² DBS programming service can generally be purchased from an authorized dealer such as Best Buy, Circuit City and WalMart, or can be purchased directly from the DBS provider.

62. *Marketing Telecommunications with Information Services.* In the 1996 Report, we indicated a trend toward marketing satellite video programming with telecommunications and information services.²²³ Results of this trend are mixed. For part of 1997, AT&T was marketing DIRECTV/USSB's satellite programming and equipment with its long-distance services. In December 1997, AT&T sold its interest in DIRECTV, stating that it was difficult to sell a relatively "big-ticket" item such as satellite equipment through telephone solicitations, and that it faced faster than expected reductions in DBS prices due to increased competition from other providers.²²⁴ However, Cincinnati Bell experienced a strong response to its DIRECTV sales campaign when it added a 36 month no-interest equipment purchase plan. Recently, Bell Atlantic and DIRECTV announced an agreement to market DIRECTV to Bell Atlantic's customers in the Northeast. Industry observers predict DBS may provide the means for Bell Atlantic to offer video programming quickly in its newly expanded northeastern territory.²²⁵

63. DBS providers have announced plans to launch various new video and data access products. DIRECTV plans to develop a satellite-delivered PC-based video programming and Internet service ("DIRECPC"), with a telephone return path.²²⁶ Hughes Network Systems ("Hughes"), DIRECTV's affiliate, is retailing the DIRECPC's Internet service through consumer electronics stores to compete with the cable industry's deployment of high speed cable modems.²²⁷ In addition, Hughes recently announced the launch of DIRECDUO, a dual-functioning DBS antenna, which consumers can use to receive both DIRECTV video programming and DIRECPC Internet and interactive data access services.²²⁸ Echostar

²²¹See Table C-3 for a listing of equipment sources for the four DBS firms.

²²²Primestar requires that subscribers that rent equipment must have the equipment professionally installed.

²²³1996 Report, 12 FCC Rcd at 4383 ¶ 45.

²²⁴AT&T Sells Back 2.5% Stake in DIRECTV for \$162 Million, Comm. Daily, Dec. 9, 1997.

²²⁵Kent Gibbons, *Can Telco Ring DBS Bells That AT&T Couldn't?* Multichannel News, July 7, 1997, at 3, 47. As a result of the recent merger between Bell Atlantic and NYNEX, Bell Atlantic has added to its service territory the area formerly served by NYNEX (see *In the Applications of NYNEX Corporation and Bell Atlantic Corporation for Consent to Transfer Control of NYNEX Corporation and its Subsidiaries*, File No. NSD-L-96-10, Memorandum Opinion and Order (rel. Aug. 14, 1997)).

²²⁶DIRECTV Comments at 12.

²²⁷*DirecPC: Out of the Closet*, SkyREPORT, July 1997, at 4.

²²⁸DIRECTV, Inc. Comments at 12; *DirecPC: Out of the Closet*, SkyREPORT, July 1997, at 4.

plans to launch interactive services by the end of this year,²²⁹ and is working with content providers CNN, MTV, ESPN, and Bloomberg Information TV to supply programming.²³⁰ Echostar also plans to carry Data Broadcasting Corp.'s Signal real-time quote service, which provides data directly from the equity, futures and options exchanges to the user's personal computer.²³¹ In 1998, Echostar plans to add late night broadcasts of Internet content by satellite to interactive set-top boxes for morning access.²³²

64. Information technology companies are developing products for the DBS market. For example, Adaptec has developed software that gives DTH customers access to financial data, games and videos through their dish antenna, using a telephone "return path."²³³ Microsoft will incorporate a DIRECTV interactive link in its Windows 98 software.²³⁴

65. *Recent Developments* Primestar began transmitting its programming from a new, GE2 satellite in April 1997, which enables Primestar to increase its service from 95 to 160 medium-powered channels.²³⁵ In June 1997, MCI agreed to assign the authorization for ASkyB's high-power DBS service at 110° west latitude and two satellites to Primestar.²³⁶ Primestar has announced plans to use the 110° west latitude position to offer a 225 channel service in 1998.²³⁷ Consummation of the agreement is subject to Commission approval. The parties have filed applications with the Commission, and a number of parties have filed objections to the applications.

²²⁹*Beyond Video, DIRECTV & DISH Say They'll Have New Interactive Services by Christmas*, SkyREPORT, July 1997, at 3.

²³⁰*Id.*

²³¹*EchoStar to Carry Signal*, Private Cable & Wireless Cable, Sept. 1997, at 45.

²³²*Beyond Video, DIRECTV & DISH Say They'll Have New Interactive Services by Christmas*, SkyREPORT, July 1997, at 3. The set-top boxes will feature a filter mechanism which scans content for information based on customer zip codes.

²³³*Id.*; Jimmy Schaeffler, *The State of DBS: Circa July, 1997*, Private Cable & Wireless Cable, July 1997, at 15. DBS providers even anticipate integrating their services with standard household utilities like lighting.

²³⁴*A Very Good Month...*, SkyREPORT, July 1997, at 13.

²³⁵*Headendings, Primestar Makes "Big Switch,"* Broadcasting & Cable, Apr. 28, 1997 at 43; Alan Breznick *et al.*, *Primestar Packing More Program Punch*, Cable World, Mar. 3, 1997, at 1, 44. The additional channels will feature ten regionalized weather channels from MSNBC Weather, eight regional sports channels, 20 pay-per-view channels, two Showtime channels, American Movie Classics, Court TV and several other networks.

²³⁶Primestar is a joint venture of TCI Satellite Inc. ("TSAT"), Time Warner, Cox Enterprises, Comcast, MediaOne and GE American Corporation. Prior to reaching this agreement with Primestar, MCI had entered into an agreement with News Corporation to form a joint venture, known as American Sky Broadcasting ("ASkyB"), to provide service using this authorization.

²³⁷*Headendings, Primestar Makes "Big Switch,"* Broadcasting & Cable, Apr. 28, 1997 at 43; Alan Breznick *et al.*, *Primestar Packing More Program Punch*, Cable World, Mar. 3, 1997, at 1, 44.

66. EchoStar plans to expand its services by offering more channels with the launch of two more satellites. EchoStar III was launched in October 1997 to provide service at 61.5° west latitude. EchoStar IV's launch is planned for September 1998.²³⁸ As noted in paragraph 58 above, this expansion may facilitate retransmission of local broadcast channels to some of EchoStar's markets.

67. *Other DBS Entrants.* Continental Satellite Corporation ("Continental"), and Dominion Video Satellite, Inc. ("Dominion") each hold licenses but have not launched any satellites. Tempo launched a satellite in March 1996 at 119° west latitude and is authorized to provide 11 channels of service from that position and a second orbital location at 166° west latitude (a total of 22 transponders);²³⁹ Continental is authorized to provide 11 channels of service from 61.5° and 166° west latitude (a total of 22 transponders); and Dominion is authorized to provide eight channels of service from 61.5° and has an application pending to provide eight channels of service at 166° west latitude (a total of 16 transponders).²⁴⁰ Of the three, only Tempo's 11 transponders at 119 west latitude are positioned at a full continental United States view ("CONUS") slot.²⁴¹ In addition, the Commission has authorized Televisa International, LLC., to operate one million receive-only earth stations in the United States to receive DTH-FSS television services from Mexico's Solidaridad II satellite operating at 113° west latitude, signaling the first stages of direct competition for the United States DTH market from foreign companies.²⁴²

C. Home Satellite Dishes

68. *Programming.* Unlike DBS and Primestar subscribers, home satellite dish ("HSD") subscribers must employ relatively large (4 to 8 foot) dishes and must often purchase programming through program packagers that are licensed by programmers to facilitate subscribers' receipt of programming transmitted from various C-band satellites.²⁴³ Typically designed to receive programming from satellites at several different orbital locations, most HSDs include motors that permit the receiving dishes to rotate and receive signals from more than one satellite. HSD owners have access to 500 channels of programming on C-band satellites, of which 350 channels are scrambled and approximately

²³⁸Rick Westerman and Edward T. Hatch, *Direct Broadcast Satellite, Outlook*, UBS Securities LLC, Mar. 4, 1997, at 10-11.

²³⁹Tempo is a wholly owned subsidiary of TCI Satellite Entertainment. See Rick Westerman and Edward T. Hatch, "Table 3: DBS Industry Licensed Number of Transponders," *Direct Broadcast Satellite, Outlook*, UBS Securities, Mar. 4, 1997, at 9.

²⁴⁰See Table C-1.

²⁴¹Rick Westerman and Edward T. Hatch, "Table 3: DBS Industry Licensed Number of Transponders," *Direct Broadcast Satellite, Outlook*, UBS Securities, Mar. 4, 1997, at 9. "CONUS" indicates that the signal transmissions from satellites in these orbital slots are capable of reaching all parts of the United States.

²⁴²See *In the Matter of Televisa International, LLC., Application for Blanket License for Receive-Only Earth Stations in the Fixed Satellite Service for Direct-to-Home Subscription Television Service*, File No. 330-DSE-L-97, Call Sign E970096, Order and Authorization, DA 97-1758 (rel. Aug. 18, 1997).

²⁴³SBCA Comments at 6.

150 are unscrambled.²⁴⁴ HSD owners can watch the unscrambled channels without paying a subscription fee, subject to section 705(b) of the Communications Act.²⁴⁵ To receive scrambled channels, an HSD owner must purchase an IRD from an equipment dealer and pay a subscription fee to an HSD programming packager. Nationwide, approximately 20 to 25 HSD program packagers assemble programming from individual program services which they make available in packages ("one-stop shop") to subscribers.²⁴⁶ Like DBS systems, however, HSD program packagers do not provide local broadcast signals.

69. *Subscribership.* As the Commission has reported in previous years, it is difficult to obtain accurate estimates of the total number of HSD users, which include: (a) viewers who subscribe to a packaged programming service that affords them access to most of the same programming provided to subscribers of other MVPDs; (b) viewers who receive satellite programming services illegally without subscribing; and (c) viewers who receive only non-subscription programming. Industry analysts estimate that there are approximately 3.8 to 4 million HSD users.²⁴⁷ The number of subscribers most relevant to an assessment of the MVPD market is the figure for authorized subscribers who receive much of the same programming generally provided to cable and other MVPD subscribers. HSD package programming subscribership has declined by 93,290, or 4.1%, from 2,277,760 reported in December 1996 to 2,184,470 subscribers reported on June 30, 1997.²⁴⁸ According to one report, sales of HSDs fell to below 200,000 last year from 642,000 in 1994.²⁴⁹

70. Much of the decline in HSD subscribership results from owners switching to DBS services in order to receive digital programming.²⁵⁰ Not only have DBS equipment prices become less expensive than the typical HSD equipment,²⁵¹ but DBS firms like DIRECTV have launched aggressive advertising and promotional campaigns encouraging consumers to switch to DBS service.²⁵² Responding to consumers preference for digital programming, HSD provider General Instrument has introduced a digital receiver, the 4DTV, capable of receiving both digital and analog signals for HSD subscribers who want to upgrade

²⁴⁴Telephone interview with Harry W. Thibedeau, Manager of Industry Affairs, SBCA (Sept. 27, 1997).

²⁴⁵See 47 U.S.C. § 605(b) (satellite cable programming for private viewing).

²⁴⁶SBCA Comments at 6-7.

²⁴⁷Telephone interview with Harry W. Thibedeau, Manager of Industry Affairs, SBCA (Sept. 27, 1997).

²⁴⁸See Table E-1.

²⁴⁹Jeff Bailey, *Air Waves*, Wall Street Journal, Oct. 15, 1997, at A1.

²⁵⁰SBCA Comments at 6.

²⁵¹See Table C-3; Bruskin & Goldring Research, Home Satellite Dish Owner Survey for SCBA, Mar. 1997 at 15.

²⁵²*Satellite and International*, Comm. Daily, Aug. 26, 1997. For example, DIRECTV's campaign, "DIRECTV Delivers," offers free DSS equipment and programming packages to commercial HSD subscribers through November 30 of this year.

their HSD systems to receive digital quality pictures.²⁵³ However, there are reports of delays in getting the 4DTV equipment, and some program packagers do not yet have access to programming for the digital equipment, though negotiations between programmers and programming packagers are currently underway.²⁵⁴ These concerns may be diminishing as at least one program provider recently announced that it is adding several digital channels of programming for HSD subscribers with the 4DTV receiver.²⁵⁵

D. Wireless Cable Systems

I. Multichannel Multipoint Distribution Service

71. MMDS systems, often referred to as "wireless cable," transmit programming to subscribers through 2 GHz microwave frequencies, using Multipoint Distribution Service ("MDS") and leased excess capacity on Instructional Television Fixed Service ("ITFS") channels.²⁵⁶ An MMDS system's transmission range is dependent upon the transmitter's power, the kind of receiving antenna, and the presence of a line-of-sight ("LOS")²⁵⁷ path between the transmitter or signal booster and the receiving antenna.²⁵⁸ MMDS operators have a maximum of 33 microwave channels available in each market, including 13 MDS channels and 20 ITFS channels.²⁵⁹

72. The Commission authorized digital MMDS use in July 1996.²⁶⁰ Digital compression permits MMDS operators to provide six or more digital channels of programming, with an increased range

²⁵³ *4DTV's Slow Trip to Store Shelves, Some Dealers Have a Lot of It, Some Keep Waiting for Product*, SkyREPORT, Jun. 1997 at 10; GI Comments at 2.

²⁵⁴ *4DTV's Slow Trip to Store Shelves, Some Dealers Have a Lot of It, Some Keep Waiting for Product*, SkyREPORT, Jun. 1997 at 10-11.

²⁵⁵ *Programming, HBO Delivers to C-Band Market*, Private Cable & Wireless Cable, Sep. 1997, at 44. HBO will add 16 digital channels of its MultiChannel HBO and Cinemax programming.

²⁵⁶ *Amendment of Parts 21 and 74 of the Commission's Rules with Regard to Filing Procedures in the Multipoint Distribution Service and in the Instructional Television Fixed Service and Implementation of Section 309(j) of the Communications Act - Competitive Bidding*, MM Dkt. No. 94-131 and PP Dkt. No. 93-253, Report and Order ("*MDS Auction Order*"), 10 FCC Rcd at 9589, 9593 ¶ 7 (1995); *1996 Report*, 12 FCC Rcd at 4386 ¶ 51 n.152.

²⁵⁷ "Line-of-sight" refers to the "straight eyesight line between two locations, often between a radio frequency receiver (MMDS antenna) and radio frequency (MMDS) transmitter." Glenn R. Jones, *Jones Cable Television and Information Infrastructure Dictionary*, Englewood, CO: Jones International, Inc., 1994, at 115.

²⁵⁸ *MDS Auction Order*, 10 FCC Rcd at 9593 ¶ 6.

²⁵⁹ *Id.* ¶¶ 6-7.

²⁶⁰ *Request for Declaratory Ruling on the Use of Digital Modulation by Multipoint Distribution Service and Instructional Fixed Service Stations*, DA 95-1854, Declaratory Ruling and Order ("*Digital Declaratory Ruling*"), 11 FCC Rcd 18839 (1996), *petitions for clarification and partial recon. pending*; *1996 Report*, 12 FCC Rcd at 4386 ¶ 51.

of service, on what was previously a single analog channel.²⁶¹ In addition to increased channel capacity,²⁶² digital technology is expected to improve picture and audio quality,²⁶³ and to permit two-way data transmission services.²⁶⁴ The Commission has also proposed to amend its rules to facilitate the ability of MMDS operators to provide two-way transmission of Internet and other digital high-speed data services that may further enhance the competitiveness of wireless cable with other MVPDs.²⁶⁵ However, implementation of digital MMDS technology has been slow because of technical and financial considerations.²⁶⁶

73. *MMDS Service Areas.* There were an estimated 252 MMDS systems in operation in July 1997²⁶⁷ compared to the estimated 200 MMDS systems serving 900,000 subscribers in July 1996.²⁶⁸ The Commission awarded MMDS license rights to 493 Basic Trading Areas ("BTAs") in auctions completed in March 1996, and subsequently authorized auction winners to provide MMDS service in 465 of these

²⁶¹*Digital Declaratory Ruling*, 11 FCC Rcd at 18842 ¶ 5 n.11. Digital compression allows the transmission of several digital programs in the bandwidth required to transmit a single analog program, although the number of digital channels which can be accommodated by the bandwidth of a single analog channel varies with the digital bandwidth demands of the specific programming. At a six to one ratio, 198 digital channels could be delivered using the bandwidth allocated to the 33 MMDS analog channels.

²⁶²Joe Schlosser, *Pac Bell's Low-Key Digital*, *Broadcasting & Cable*, Oct. 6, 1997, at 62. Digital compression will enable MMDS operators to offer additional programming features such as numerous pay-per-view channels to their subscribers.

²⁶³Andrew Kreig, *Insider, Dawn of Digital*, *Private Cable & Wireless Cable*, June 1997, at 94; *Digital Declaratory Ruling*, 11 FCC Rcd at 18842 ¶ 5.

²⁶⁴*Amendment of Parts 1, 21 and 74 to Enable Multipoint Distribution Service and Instructional Television Fixed Service Licensees to Engage in Two-Way Transmissions*, MM Dkt. No. 92-217, Notice of Proposed Rulemaking ("*Two-Way NPRM*"), FCC 97-360 (rel. Oct. 10, 1997), summarized at 62 Fed. Reg. 60025 (Nov. 6, 1997); *1996 Report*, 12 FCC Rcd at 4392-4393 ¶ 64.

²⁶⁵*Two-Way NPRM* ¶¶ 1-2.

²⁶⁶WCAI Comments at 8; K. C. Neel, *Where's Wireless Cable? Very Up in the Air*, *Cable World*, June 2, 1997, at 1, 46; BellSouth Comments at 8; *Strategic Direction*, People's Choice TV Corp., SEC Filing, June 30, 1997 (filed Aug. 13, 1997), at 1; *1996 Report*, 12 FCC Rcd at 4391-4392 ¶¶ 62-63.

²⁶⁷WCAI Comments at 8. The ten largest MMDS operators (by subscribers) are Heartland Wireless Communications, Inc. (194,100), AmericanTeletcasting, Inc. (141,600), Wireless One (114,200), People's Choice TV (75,200), Wireless Broadcasting Systems of America (69,000), CAI Wireless Systems, Inc. (65,700), CS Wireless Systems, Inc. (46,860), Pacific Bell Video Services - Pacific Telesis Group (56,000), BellSouth Wireless Cable, Inc. (33,500), and Videotron/Wireless Holdings (21,000). *Top 10 Wireless Cable MSOs*, WCAI Facsimile, Nov. 14, 1997.

²⁶⁸*1996 Report*, 12 FCC Rcd at 4388 ¶ 54 n.166.

BTAs.²⁶⁹ The MMDS auctions were designed to distribute unused spectrum through competitive bidding while protecting the service area of incumbent MMDS providers within the BTAs.²⁷⁰

74. *MMDS Capacity to Serve Television Households.* The potential commercialization of digital MMDS technology noted in the *1996 Report*²⁷¹ has proceeded slowly. This has tended to limit MMDS operators' significance as alternative sources of MVPD services. The number of homes with a serviceable line of sight to an MMDS operator's transmission facilities grew from 58,900,000 at the end of 1995 to 60,300,000 at the end of 1996, an increase of 2.4%, and remained unchanged through the end of the first half of 1997.²⁷² The number of homes capable of receiving an MMDS operator's signal (commonly referred to as "homes seen") grew from 29,200,000 at the end of 1995 to 31,500,000 at the end of 1996, an increase of 7.8%, but it has remained unchanged through the end of the first half of

²⁶⁹*MDS Auction Order*, 10 FCC Rcd at 9608 ¶¶ 34-35. BTAs vary in size and shape and typically include a population center (city or large town) and the surrounding rural area. See also *1996 Report*, 12 FCC Rcd at 4387 ¶ 52.

²⁷⁰*MMDS Auction Order*, 10 FCC Rcd at 9591 ¶¶ 1-2, recon., Memorandum and Order on Reconsideration, 10 FCC Rcd 13821 (1995). Under the post-auction licensing plan, a BTA authorization is granted to the auction winner for the entire BTA, and separate conditional station licenses are awarded for each single channel or channel group at each site location within the BTA. The BTA authorization holder is able to construct facilities over any vacant MDS channels within its BTA, provided its engineering design meets the Commission's interference protection standards. To date, the Commission has processed over 700 applications for individual MMDS stations within the BTAs. In 1996, the Gulf Coast MDS Service Company petitioned the Commission to recognize the Gulf of Mexico as an additional MMDS service area and to hold an auction to license MDS service there. See Petition for Rulemaking, MM Dkt. No. 94-131 and PP Dkt. No. 93-253 filed by Gulf Coast MDS Service Company, May 21, 1996.

²⁷¹*Digital Declaratory Ruling*, 11 FCC Rcd at 18840, 18842-18843 ¶¶ 1-2, 5-6; *1996 Report*, 12 FCC Rcd at 4386, 4391-4392 ¶¶ 51, 62. The Commission authorized digital MMDS use in July 1996.

²⁷²*Id.*; Paul Kagan Associates, Inc., *Wireless Cable Sub Count and Revenue Projections, 1996-2000*, Wireless Cable Investor, Dec. 31, 1996, at 10-11; Telephone interview with Andrew Kreig, President, Wireless Cable Association, Nov. 13, 1997. MMDS has developed primarily in large and medium-sized cities. MMDS systems also serve many smaller communities in the western states. The transmission range depends upon the transmitter power, the type of receiving antenna, and the presence of a line-of-sight path between the transmitter or signal booster and the receiving antenna. *MDS Auction Order*, 10 FCC Rcd at 9593-9594 ¶¶ 7, 9. MMDS operators' technical ability to increase the number of homes seen by MMDS signals within their licensed areas is limited in part by the time consumed in siting MMDS transmission facilities, although in many circumstances this may be accomplished with relative speed. *Digital Declaratory Ruling*, 11 FCC Rcd 18853 at ¶ 23; *Amendment of Parts 21, 43, 74, 78, and 94 of the Commission's Rules Governing Use of the Frequencies in the 2.1 and 2.5 GHz Bands Affecting: Private Operational-Fixed Microwave Service, Multipoint Distribution Service, Multichannel Multipoint Distribution Service, Instructional Television-Fixed Service, and Cable Television Relay Service*, Report and Order ("*Wireless Cable Order*"), 5 FCC Rcd at 6410, 6422 ¶¶ 75-76 (1990). Various obstructions, e.g., topography, foliage, tall buildings and other man-made features, also have restricted the potential deployment of MMDS systems, although digital technology tends to improve reception. *Wireless Cable Order*, 5 FCC Rcd at 6418, 6422 ¶¶ 50, 78; *Digital Declaratory Ruling*, 11 FCC Rcd at 18842 ¶ 5.

1997.²⁷³ The proportion of television homes seen by MMDS increased from 30.4% at the end of 1995 to 32.5% at the end of 1996, and remained unchanged, at 32.5%, through the end of June 1997.²⁷⁴ These measures show MMDS operators' capacity to serve television households lags behind cable and DBS operators' capacity to serve those homes.²⁷⁵

75. *Subscribership and Capacity Usage.* MMDS subscribership grew from 851,000 at the end of 1995 to 1,180,000 at the end of 1996, an increase of 38.6%, and declined to 1,100,000 at the end of June 1997, a decrease of 6.8%.²⁷⁶ MMDS penetration (the proportion of homes seen that actually subscribe) increased from 2.9% at the end of 1995 to 3.7% at the end of 1996, and decreased to 3.5% at the end of June 1997. Decreases in the number of MMDS subscribers and lack of growth in the number of homes seen by MMDS appear to result in part from MMDS operators' suspension of analog MMDS marketing in some markets in anticipation of the availability of digital MMDS transmission and reception equipment (thus allowing operators to avoid the expense of deploying analog MMDS reception equipment which operators may then be required to replace upon commencing digital transmission).²⁷⁷ The MMDS industry expects this trend to reverse itself when a number of the larger MMDS operators begin to launch digital wireless cable systems.²⁷⁸

76. *Financial Performance.* The wireless cable industry's total revenues for 1996 were \$420 million, a 38.8% increase from the \$303 million that the MMDS industry earned in 1995.²⁷⁹ The

²⁷³Paul Kagan Associates, Inc., *Wireless Cable Sub Count and Revenue Projections, 1996-2000*, Wireless Cable Investor, Dec. 31, 1996, at 10-11; Telephone interview with Andrew Kreig, President, Wireless Cable Association, Nov. 13, 1997. The difference between the number of homes with a serviceable line of sight and the number of homes seen is due to the presence of buildings, terrain, and foliage that may tend to obstruct MMDS signals and prevent many homes from being able to receive the MMDS signals.

²⁷⁴See Table E-1.

²⁷⁵See paras. 14-15 and 54-55 *supra* for capacity data for cable and DBS operators, respectively.

²⁷⁶WCAI Comments at 8; Table E-1.

²⁷⁷See, e.g., WCAI Comments at 8; K. C. Neel, *Where's Wireless Cable? Very Up in the Air*, Cable World, June 2, 1997, at 1, 46. For example, People's Choice TV Corp. notes in its SEC Filing that this year "the Company's strategy is to conserve capital pending the implementation of digital video compression technology." *SEC Filing, 10-Q*, People's Choice TV Corp., June 30, 1997 (filed Aug. 13, 1997) at 1.

²⁷⁸WCAI Comments at 8-9. Analysts have revised their forecasts to project MMDS subscribership in the range of 1.4 million to 3.7 million subscribers by 2002. See, e.g., Veronis, Suhler & Associates, Inc., *Subscribers to Subscription Video Services, Communications Industry Forecast*, 1997, at 156 (1.4 million); *Financial Benchmarks in the Cable TV Industry: 1997*, The Strategis Group, Aug. 1997, at 8 (3.7 million); Dennis H. Leibowitz *et al.*, *U.S. Cable Television Industry, Multichannel Penetration Model*, Cable Industry Outlook '97, Donaldson, Lufkin & Jenrette, Apr. 17, 1997, at 6. These projections indicate slower MMDS subscriber growth than did the analyst projections current at the time of our last report. See *1996 Report*, 12 FCC Rcd at 4387-4388 ¶ 53. Uncertainties associated with the implementation of digital MMDS appear to limit the value of MMDS subscriber projections.

²⁷⁹Paul Kagan Associates, Inc., *Wireless Cable Sub. Count and Rev. Projections, 1996-2000*, Wireless Cable Investor, Dec. 31, 1996, at 11; *Wireless Cable Industry Projections*, Wireless Cable Investor, Jan. 31, 1996, at 3.

industry's negative cash flow position worsened, however, from negative \$3.9 million at the end of 1995 to negative \$40.5 million at the end of 1996.²⁸⁰ MMDS operators have had difficulty raising capital, in part because MMDS stock prices have generally declined in 1997.²⁸¹

77. *Digital MMDS Services.* The introduction of digital MMDS technology should increase the ability of MMDS operators to compete better with cable systems. Digital technology, as noted above, increases channel capacity, thereby expanding potential programming features (e.g., a higher number of channels and more service offerings). Thus, digital technology will permit MMDS operators to provide additional programming features such as numerous pay-per-view channels to their subscribers.²⁸² Digital technology also improves the audio and video components of programming transmission, giving the viewer increased picture clarity and compact disc quality sound.²⁸³

78. *Internet and High-Speed Data Services.* In 1996, several MMDS companies began testing technology that would allow them to provide high-speed Internet access and other digital data services similar to high-speed data services offered by other MVPDs.²⁸⁴ The Commission has proposed to amend its rules to allow MDS and ITFS licensees to provide two-way communications services in both service frequencies in response to a petition for rulemaking filed by a group of over 100 participants in the wireless cable industry.²⁸⁵ The proposed rulemaking is intended to facilitate the most efficient use of the affected spectrum, to enhance the competitiveness of the wireless cable industry, and to provide benefits to the educational community through the use of two-way services. Although the primary use of MDS

²⁸⁰*Id.* For a description of cash flow calculations, see para. 25 *supra*.

²⁸¹John M. Higgins, *Wireless Operators Scale Back*, *Broadcasting & Cable*, Sept. 22, 1997, at 63; Paul Kagan Associates, Inc., *Wireless Cable Investor*, Sep. 30, 1997, at 1, 12. For example, the Sept. 30, 1997 closing stock prices for six of the nine companies in Paul Kagan Associates, Inc.'s "Wireless Cable Average" were below the stocks' closing prices for Dec. 31, 1996. These companies include Heartland Wireless, Wireless One, American Telecasting, People's Choice TV, Tel-Com Wireless Cable and TV Filme, Inc.

²⁸²Joe Schlosser, *Pac Bell's Low-Key Digital*, *Broadcasting & Cable*, Oct. 6, 1997, at 62.

²⁸³Andrew Kreig, *Insider, Dawn of Digital*, *Private Cable & Wireless Cable*, June 1997, at 94; *Digital Declaratory Ruling*, 11 FCC Rcd at 18842 ¶ 5.

²⁸⁴1996 Report, 12 FCC Rcd at 4392-4393 ¶ 64; Glenn Gamber, Hundt, *CAI, Educators Unveil School HSA Wireless Internet*, *Spectrum*, WCAI, May 1997, at 1, 3.

²⁸⁵*Two-Way NPRM* at ¶ 11. "Petitioners propose that [the Commission]...create a regulatory system authorizing the use of response stations and response station hubs to enable the two-way operation of wireless cable systems. Response stations would be the means of transmission from a subscriber's premises and could be implemented as separate transmitters or as parts of a transverter (combined transmitter and receiver) and could use either separate transmitting antennas for return paths or combined transmitting/receiving antennas. Response stations would serve as the collection points for signals from the response stations in a multipoint-to-point configuration for upstream signal flow." See also Petition for Rulemaking to Amend Parts 21 and 74 of the Commission's Rules to Enhance the Ability of Multipoint Distribution Service and Instructional Television Fixed Service Licensees to Engage in Fixed Two-Way Transmissions, RM 9060, filed Mar. 14, 1997.