

**VOICE, VIDEO AND
BROADBAND:
THE CHANGING
COMPETITIVE LANDSCAPE AND
ITS IMPACT ON CONSUMERS**



**U.S. DEPARTMENT OF JUSTICE
NOVEMBER 2008**

VOICE, VIDEO AND BROADBAND: THE CHANGING COMPETITIVE LANDSCAPE AND ITS IMPACT ON CONSUMERS



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The Department especially recognizes the contribution of the late Honorable Jane Lawton as a speaker at the Symposium. Delegate Lawton was a dedicated public servant who demonstrated exemplary energy and commitment to the development and implementation of sound public policy.

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EXECUTIVE SUMMARY

Increasing competition in the telecommunications industry has produced substantial benefits for consumers, and has the potential to generate even greater benefits in the future. Companies that once provided voice telephony or video services alone are increasingly competing against each other across a wide variety of products. Cable companies today offer telephone services to more than 100 million U.S. households (or over 80 percent of households) and have upgraded their facilities to increase Internet broadband speeds and provide a wider array of programming. At the same time, telephone companies are rapidly building and expanding fiber-optic networks to provide a wide range of services to an increasing number of customers, including multichannel video programming and increasingly robust Internet access. In addition, competition among providers of mobile wireless voice and data services is resulting in rapidly rising access speeds, dramatically expanding the functionality of mobile devices, and potentially altering the future competitive dynamic between wireless and wireline services. As telecommunications firms expand their offerings, lines between once well-delineated industry segments blur, and consumers see greater competitive options.

Antitrust will continue to play an important role in this process. Antitrust law protects the competitive process, which in turn protects consumers. In the telecommunications industry, the competitive process has helped generate innovation to bring consumers a wider range of choices of products and services. The Department of Justice protects competition through its roles as both enforcer of the antitrust laws and advocate for sound competition policy. The Department's competition advocacy is particularly important in the telecommunications industry, where government regulations significantly shape the competitive landscape.

To enhance its ability to fulfill those responsibilities, in November 2007 the Department hosted a Symposium focusing on competition among providers of video programming delivery, local telephony, and broadband services. Industry executives, economists, analysts, and local government officials participated at the Symposium and through written submissions, offering a variety of perspectives. This report summarizes their views.

Chapter I provides an overview of developments in the three industry segments addressed at the Symposium – video, telephony, and broadband. The most significant development in video programming delivery is entry by telephone companies seeking to compete with cable and direct broadcast satellite providers. Trends in local telephony include a decline in the number of residential landlines, primarily as a result of consumers discontinuing second lines, and entry by cable firms. Broadband services have experienced explosive growth. The number of homes receiving broadband services increased twenty-fold between 2000 and 2007. Symposium participants expected continued growth and competition among telephone providers, cable companies, and other technologies, including wireless services.

Following an overview of economic principles affecting telecommunications competition, Chapter II addresses the competitive effects of the industry's changing dynamics. There was broad consensus at the Symposium that competition provides consumers with significantly more choice today than they have had in the past: more providers, greater variety

in video entertainment, and a wider selection of devices to access the Internet. Participants addressed challenges faced by new broadband entrants and technologies and other issues important to competition in telecommunications, including the competitive effects of bundled discounting (the practice of offering a bundle of services at a price lower than the combined price at which each item in the bundle is offered on a stand-alone basis), the degree of competition between wireline and wireless telephone services, and the effect of new competition on price.

Chapter III discusses potential obstacles to entry. Poorly designed regulations have the potential to deter entry and harm consumers. Symposium participants discussed specific regulatory issues affecting each of the three segments, as well as whether conduct by incumbent providers is deterring entry.

Chapter IV discusses the Department's future competition advocacy and enforcement activities. Mergers, unilateral conduct, and concerted action in the telecommunications industry all can raise competitive concern, and the Department remains committed to monitoring the industry vigilantly, investigating alleged antitrust violations, and enforcing the antitrust laws against anticompetitive practices harming consumers. In its enforcement decisions, the Department will continue to rely on evidence of actual market conditions and take into account changing industry dynamics.

The report concludes with several proposals for further action:

- In assessing the legality of conduct in the telecommunications industry under the antitrust laws, the Department will continue to give particular attention to the effects of convergence and increasing substitution among services.
- To aid its ability to enforce the antitrust laws in the telecommunications industry efficiently and effectively, the Department will continue to monitor industry trends and developments. Because effective review requires reliable data, however, the Department recommends that regulators review and, where appropriate, improve the way they collect and report data to capture the effect of changes that are blurring lines between formerly distinct industry sectors.
- Increased efforts to obtain relevant data and further refine economic analysis would advance the Department's ability to evaluate competitive conditions. Potential subjects of future study include review of the competitive implications of bundled pricing, substitution patterns, and quality-adjusted pricing trends.
- In its role as advocate for sound competition policy, the Department will continue to seek the removal of regulatory barriers that unreasonably impede competition.

The Symposium advanced the Department's understanding of the complex competitive forces at work in the telecommunications industry, furthering its ability to make sound, pro-consumer enforcement decisions and to fulfill its duty to advocate sound competition policy more effectively. The Department also hopes that this report will serve as a valuable reference.

INTRODUCTION

Telecommunications services¹ – which allow consumers to communicate through traditional voice conversations and by sending and receiving data and other information, including video, from an ever-widening array of sources – are a critical component of the U.S. economy. The telecommunications industry has experienced significant technological, economic, and regulatory changes since the breakup of the Bell System in 1984² and passage of the Telecommunications Act of 1996 (“1996 Act”).³ Many of these changes have been beneficial for consumers and competition. Technological development has increased rivalry among providers of traditional telephone and video services, while also bringing widespread access to more advanced telecommunications services (such as mobile data and broadband Internet access). Cable television providers now offer residential voice telephone services throughout much of the United States, and some telephone carriers have begun to compete with incumbent cable systems and satellite-based providers in the delivery of multichannel video programming. There is also widespread discussion of other possible alternatives for the delivery of broadband to consumers, including use of mobile and fixed wireless services⁴ and broadband over power line. Moreover, voice telephony, broadband, and multichannel video programming are frequently being offered to consumers as bundles, often at discounts from stand-alone service prices.

In the decade since the passage of the 1996 Act, federal laws and government policy increasingly have favored the provision of telephone services and delivery of multichannel video programming on a competitive basis, which generally represents the best method of ensuring that consumers receive low-priced, high-quality products and services, greater choice among providers, and continuing innovation. However, not all consumers have access to competitive alternatives, nor are all benefitting from new technologies or the entry of new providers. Concerns have been expressed about remaining barriers to entry into the delivery of telecommunications services. Such barriers – whether arising from regulatory restrictions, the

¹ In this report, the term “telecommunications” encompasses voice telephone services, services providing multiple channels of video programming such as cable television, and high speed data services that are commonly referred to as “broadband.” A glossary of technical terms used in this report is provided in Appendix A.

² See *United States v. American Telephone & Telegraph Co.*, 552 F. Supp. 131 (D.D.C. 1982), *aff’d sub nom. Maryland v. United States*, 460 U.S. 1001 (1983).

³ Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56 (1996), *codified at* 47 U.S.C. § 151 *et seq.*

⁴ “Wireless” services are delivered to the customer using radio spectrum: electromagnetic waves propagated through space on specific frequencies. This spectrum is used in various forms of communications, including with cellular telephones and other wireless devices as well as in television and radio broadcasting. “Fixed” wireless refers to technologies that are limited to serving a customer at a particular location, while “mobile” wireless refers to technologies that a customer can continue to use while moving about, such as cellular telephone technology. In contrast, “wireline” or “landline” services (these terms are used in the report interchangeably) connect to the customer by physical means (such as a copper loop, coaxial cable or fiber) and are by definition fixed, since the wireline cannot follow a moving customer.

conduct of established providers, or inherent economic and technical limitations – may tend to restrict the number of competitors for these services.

To better understand these issues and help inform its enforcement efforts, in November 2007 the Department hosted a public Symposium in Washington, D.C.⁵ The Symposium covered a wide range of topics, such as the impact of convergence among traditionally distinct lines of activity (such as video delivery, landline telephony, and wireless services), the competitive importance of service bundles, and the existence of regulatory and other obstacles to competitive entry. Participants included industry executives, economists, analysts, representatives of industry associations, and local government officials.⁶ In addition, the Department requested and received comments from the business community and other interested parties.⁷

One objective of the Symposium was to enable industry participants to present information about developments in the industry that could impact future enforcement decisions and/or competition policies. The Department analyzes mergers using the framework outlined in the *Horizontal Merger Guidelines*,⁸ which provide a methodology for defining relevant product and geographic markets. In past merger investigations involving telecommunications services, the Department concluded that services delivered by wireless technologies were not close economic substitutes for wireline services⁹ and that some types of telecommunications services (such as local, long distance, and international telephony) were separate product markets¹⁰ even though they might be marketed to consumers in a package. In addition, many geographic markets have been defined to be local, as opposed to national or regional.¹¹ Because of the rapidly changing telecommunications landscape, including the advent of new technologies and services, expansion by existing providers into new geographic areas and services, and changes in

⁵ The Symposium record, including agenda, presentations, and written submissions, is available on the Department's website at <http://www.usdoj.gov/atr/public/hearings/telecom2007/index.htm>.

⁶ A list of the participants in the hearings, along with their affiliations at the time of their participation, is provided in Appendix B.

⁷ A list of the entities that submitted written comments is provided in Appendix C.

⁸ U.S. Dep't of Justice & Fed. Trade Comm'n, *Horizontal Merger Guidelines* (rev. ed. Apr. 8, 1997) ("*Horizontal Merger Guidelines*"), available at <http://www.usdoj.gov/atr/public/guidelines/hmg.pdf>.

⁹ See, e.g., Complaint, *United States v. WorldCom, Inc.*, No. 1:00-CV-01526, ¶ 57 (D.D.C. filed June 26, 2000) (alleging wireless phones are not a close substitute for long distance calls originating from wireline phones).

¹⁰ *Id.* at ¶¶ 50-56, 80-86 (alleging, among others, product markets of domestic and certain international long distance services).

¹¹ See, e.g., Complaint, *United States v. EchoStar Communications Corp.*, No. 1:02-CV-02138, ¶¶ 30-31 (D.D.C. filed Oct. 31, 2002) (alleging that each residence constitutes a separate geographic market, but aggregating for ease of analysis residences that face the same choice of providers); Complaint, *United States v. Verizon Communications Inc.*, No. 1:08-CV-00993, ¶ 15 (D.D.C. filed June 10, 2008) (alleging that the United States comprises numerous local geographic markets for mobile wireless telecommunications services).

how consumers purchase these services, when evaluating future mergers the Department will need to assess whether these past conclusions continue to be true.

Another objective of the Symposium was to help inform the Department about industry trends and the views of industry participants and observers, thereby enhancing the Department's ability to advocate sound competition policy in the telecommunications industry. The Department plays an important role in the United States as an advocate of sound competition law and policy before courts and in consultation with government agencies and legislatures.¹² The information obtained through the Symposium will help the Department evaluate the current roles of the various telecommunications providers, examine potentially emerging technologies, and continue the process of monitoring competition and the need for, or impact of, deregulation in telecommunications markets.

This report analyzes and synthesizes the Symposium statements and submissions in an effort to consider how future enforcement decisions and/or competition policies may be influenced by developments in the industry. The report is divided into four chapters.

Chapter I provides an overview of telecommunications sectors and participants. Chapter II addresses several issues related to the effects of entry by new providers on consumers, including impact on price and quality, prospects for future broadband competition, the effects of bundling services, and wireless substitution for wireline services. Chapter III explores potential obstacles to entry for various types of providers. Chapter IV offers conclusions and recommendations.

¹² For example, the Department has advocated regulatory and legal changes that will make entry into video programming delivery and telephone services more likely. See, e.g., Comments of the U.S. Dep't of Justice, *Proposed Modifications to the Application Form for Approval of Authority to Offer, Render, Furnish or Supply Telecommunications Services to the Public in the Commonwealth of Pennsylvania*, Pa. Pub. Util. Comm'n, Docket No. M-00960799 (filed Mar. 27, 2007) ("*DOJ Pennsylvania PUC Comments*") (recommending reform of Pennsylvania's procedures for certification of competitors to provide facilities-based telephony services in rural areas to promote more rapid entry); *Ex Parte* Submission of the U.S. Dep't of Justice, *In the Matter of Implementation of Section 621(a)(1) of the Cable Communications Policy Act of 1984 as amended by the Cable Television Consumer Protection and Competition Act of 1992*, FCC MM Docket No. 05-311 (May 10, 2006) ("*DOJ Cable Ex Parte Submission*") (requesting the FCC to address what would constitute an "unreasonable refusal" by a local franchising authority to award a competitive video franchise, and expressing concern about certain demands made by these authorities). Other actions taken by the Department to promote competition and remove barriers to entry are referenced on the Symposium website.

I. OVERVIEW OF SECTORS AND PARTICIPANTS

A. Video Programming Delivery Services

According to the Federal Communications Commission (“FCC”), 95.8 million households, or almost 87 percent of the 110.2 million U.S. households with televisions, subscribed to a multichannel video programming distribution (“MVPD”) service in 2006.¹² MVPD providers include: (1) the incumbent cable television companies, each franchised to serve a distinct geographic area; (2) the two direct broadcast satellite (“DBS”) service providers, DirecTV, Inc. and Echostar Communications Corp. (dba “DISH Network”), which have been providing nationwide service for approximately 15 years; and (3) a mix of smaller wireline, wireless, and satellite dish-based service providers operating in various geographic areas. The following table summarizes the nationwide subscriber totals and shares that were reported by the FCC as of June 2006. Due to the dynamic nature of this industry, these shares may not accurately reflect the current or future significance of any provider.

Table 1: MVPD Provider Subscriber Totals and Nationwide Shares

Type of Provider	Subscribers in U.S.	Nationwide Aggregate Share
Cable TV Incumbents	65.3 million	68.2%
DBS Service Providers	27.8 million	29%
Others ¹³	2.5 million	2.6%

Source: FCC Press Release on Thirteenth Annual MVPD Report

More recent data suggest that cable’s share of subscribers decreased slightly after 2006, while the number of DBS subscribers continued to grow, as did the number of video customers served by local telephone companies.¹⁴ Many of the alternatives to cable and DBS currently have limited geographic availability. The relatively small nationwide aggregate shares do not

¹² Press Release, F.C.C., FCC Adopts 13th Annual Report to Congress on Video Competition and Notice of Inquiry for the 14th Annual Report, FCC MB Docket Nos. 05-255, 06-189, 07-269, at 3 (Nov. 27, 2007) (“FCC Press Release on Thirteenth Annual MVPD Report”). Approximately 13-14 percent of TV households received only over-the-air television broadcasts. *Id.*

¹³ Other MVPD service providers include telephone companies, broadband service providers (“BSPs”), wireless cable (multichannel multipoint distribution service or “MMDS”), Satellite Master Antenna Television (“SMATV”), C-band providers, and utilities.

¹⁴ Subscriber totals for DBS services grew to 30.8 million as of the first quarter of 2008. See Press Release, DISH Network, DISH Network Reports First Quarter 2008 Financial Results, May 13, 2008, available at <http://dish.client.shareholder.com/releasedetail.cfm?ReleaseID=309956> (13.8 million subscribers as of end of 1st Quarter 2008); Press Release, DIRECTV Group, The DIRECTV Group Announces First Quarter 2008 Results, at 3, May 7, 2008, available at http://files.shareholder.com/downloads/DTV/328103421x0x193985/58be3faf-803f-4ef5-b350-10e42e33552c/DTV_News_2008_5_7_General_Releases.pdf (“DIRECTV 1st Q Press Release”) (17 million subscribers as of end of 1st Quarter 2008). See *infra* this chapter for the most current subscriber estimates for telephone companies and subscriber shares for cable companies.

reflect the considerably larger market shares individual providers may have in the geographic areas where they operate.

The most significant development in regard to MVPD in the past three years is entry by the principal local telephone companies. Although incumbent telephone companies still account for only about 1.5 percent of all nationwide MVPD subscribers, the number of subscribers will increase as the telephone companies deploy their video-capable networks in additional areas of their service regions. Where incumbent local exchange carriers (“ILECs”) have entered, they have often achieved considerable success.

The most significant development in MVPD is the entry of the ILECs.

Verizon Communications, Inc., for example, is spending \$23 billion to roll out its fiber-to-the-home (“FTTH”) network, “FiOS,” over which it delivers MVPD service as well as telephony and broadband Internet access.¹⁵ Verizon began offering service in Keller, Texas, in September 2005.¹⁶ Since then Verizon has gradually rolled out its FiOS service in sixteen states throughout its local telephone service area. It is projected to reach 18 million homes and businesses by 2010.¹⁷ By the end of January 2008, Verizon had approximately one million FiOS video customers, representing 17 percent of the six million homes to which it then marketed its video service.¹⁸ In the areas where Verizon has been marketing its FiOS video service the longest, its penetration rate (the percentage of customers to whom a service is available that subscribe to the service) is as high as 30 percent.¹⁹ Analysts predict that 25 percent of customers that can subscribe to Verizon’s FiOS service will do so by the end of 2009.²⁰

AT&T, Inc. is deploying a hybrid FTTH and fiber-to-the-neighborhood or node (“FTTN”) network over which it offers MVPD and other services to residential customers under

¹⁵ Thorne, Symposium Transcript (“Tr.”) at 17. (All references to transcript pages refer to the Symposium transcript unless otherwise noted.) This total investment figure is exclusive of the amount Verizon is saving from avoidance of maintenance costs on its legacy copper plant. *Id.*

¹⁶ Twelfth Annual Report, *In the Matter of Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming*, FCC MB Docket No. 05-255, 21 FCC Rcd 2503, 2508 (rel. Mar. 3, 2006) (“*FCC Twelfth Annual MVPD Report*”).

¹⁷ Written Comments on Behalf of Verizon Communications Corp., for inclusion in the 2007 DOJ Telecommunications Symposium, Nov. 20, 2007, at ii, 1 (“*Verizon Submission*”).

¹⁸ Supplemental Submission of Verizon, re: 2007 DOJ Telecommunications Symposium, Feb. 19, 2008, at 9 (“*Verizon Supp. Submission*”).

¹⁹ *Id.* See also Letter from Hal J. Singer, President, Criterion Economics, L.L.C., to Yvette Tarlov, Antitrust Division, U.S. Dep’t of Justice, re: Questions for Panel 1, Jan. 7, 2008, at 2 (“*Singer Supp. Comments*”) (noting that six months after Verizon’s entry into Keller, Texas, nearly one-third of Verizon’s telephony customers had signed up for Verizon’s video service).

²⁰ *Verizon Supp. Submission*, at 9 (citing R. Dezego et al., Bank of America, *Battle for the Bundle: 3Q07 Wrap Up* at 18 (Nov. 20, 2007)).

the brand name “U-Verse.”²¹ AT&T reportedly plans to spend between \$4.5 and \$6.5 billion on U-Verse to reach 17 to 18 million households by the end of 2008.²² As of the third quarter of 2007, it already passed about 5.5 million households with U-Verse services (that is, had facilities in place to make services available at those locations).²³ AT&T intends to reach 30 million homes by the end of 2010.²⁴ By the end of the first quarter of 2008, AT&T’s total number of U-Verse TV video subscribers reached 379,000, putting AT&T on track to reach its target of one million subscribers by the end of 2008.²⁵ On average, AT&T has achieved a 7.3 percent penetration rate for video three to six months after entry, and a 13.4 percent video penetration rate one year after entry, in the areas where it provides video service.²⁶

Qwest Communications International Inc. and a number of smaller ILECs offer, or plan to offer, MVPD service over their existing infrastructures using very high-speed digital subscriber line (“VDSL”) or asymmetric digital subscriber line (“ADSL”) technologies, or over fiber networks using Internet protocol.²⁷ As of 2007, Qwest provided MVPD services to nearly 60,000 customers in Arizona, Colorado, Nebraska, and Utah,²⁸ using both hybrid fiber-coaxial and FTTH networks.²⁹

Rural ILECs are also entering the video business. The National Telecommunications Cooperative Association (“NTCA”), a trade association for rural local telephone companies, believes that 63 percent of its members already offer video.³⁰ This figure includes telephone

²¹ Nat’l Telecomm. & Info. Admin., *Networked Nation: Broadband in America 2007*, at 25 (Jan. 2008) (“*NTIA Broadband Report*”).

²² *NTIA Broadband Report*, at 25, 34; *AT&T Says Costs Rise for TV System’s Launch*, WALL ST. J., May 8, 2007, at B4.

²³ *NTIA Broadband Report*, at 25.

²⁴ AT&T, *2007 Annual Report* (2008), at 4, available at http://www.att.com/Investor/ATT_Annual/downloads/07_ATTar_FullFinalAR.pdf.

²⁵ Press Release, AT&T, AT&T Ramps Revenue Growth, Delivers Strong First-Quarter Results, Apr. 22, 2008, available at <http://www.att.com/gen/press-room?pid=4800&cdvn=news&newsarticleid=25526>.

²⁶ *AT&T Satisfied with Progress in Video Rollout*, COMM. DAILY, Feb. 28, 2008, at 9-10.

²⁷ *FCC Twelfth Annual MVPD Report*, 21 FCC Rcd at 2563.

²⁸ Report and Order and Notice of Proposed Rulemaking, *In the Matter of Implementation of the Cable Television Consumer Protection and Competition Act of 1992: Development of Competition and Diversity in Video Programming Distribution: Section 628(c)(5) of the Communications Act: Sunset of Exclusive Contract Prohibition*, FCC MB Docket Nos. 07-29, 07-198, 22 FCC Rcd 17,791, 17,806-07 (rel. Oct. 1, 2007) (“*FCC Exclusivity Sunset Report & Order*”), appeal docketed, *Cablevision Systems Corp. v. FCC*, No. 07-1425 (D.C. Cir. filed Oct. 19, 2007).

²⁹ *FCC Twelfth Annual MVPD Report*, 21 FCC Rcd at 2563.

³⁰ Canfield, Tr. at 117; see also Nat. Telecomm. Coop. Ass’n, *NTCA 2007 Broadband/Internet Availability Survey Report*, at 4, 12 (Sept. 2007), available at <http://www.usdoj.gov/atr/public/workshops/telecom2007/submissions/228008.htm> (“*NTCA Broadband Survey*”) (reporting that out of the 63 percent of NTCA survey

incumbents that own the incumbent cable provider in the same area and, thus, are not video entrants.³¹ The NTCA believes that those members without any video plans primarily serve low-population rural areas where they do not face competition from cable providers.³²

Broadband service providers³³ (such as wireline overbuilders) currently pass 4.1 million households. Members of the Broadband Service Providers Association (“BSPA”) currently have 1.2 million customers, 89 percent (or nearly 1.1 million) of which subscribe to video services.³⁴ This number represents slightly more than one percent of the FCC’s total of all nationwide MVPD subscribers.³⁵

In contrast to wireline, usage of older technologies – such as wireless cable³⁶ and SMATV private cable systems³⁷ – continues to decline, accounting for about one million subscribers combined in 2006.³⁸ Usage of C-band or large home satellite dish services similarly

respondents offering video, 72 percent were offering cable TV, 37 percent were offering Internet protocol-based television (“IPTV”) and 4 percent were offering DBS).

³¹ See Section 652(a)-(d) of the Telecommunications Act of 1996, *codified at* 47 U.S.C. § 572, requiring separation of the incumbent telephone and cable systems in the same geographic area, with exceptions for rural areas or areas with few subscribers.

³² Canfield, Tr. at 117-18.

³³ These companies typically have built new networks in areas already served by incumbent cable companies and provide video, voice telephony, and broadband services. BSPA members include Everest Connections, Hiawatha Broadband, Knology, PrairieWave Communications, RCN, and SureWest Communications. Written Comments, Broadband Service Providers Association (BPSA), for inclusion in the 2007 DOJ Telecommunications Symposium, Nov. 29, 2007, at 2 n.1 (“*BSPA Submission*”).

³⁴ *BSPA Submission*, at 9. All BSPs, including non-BSPA members, were reported by the FCC as having 1.4 million subscribers as of June 2006. *FCC Press Release on Thirteenth Annual MVPD Report*, at 3.

³⁵ *FCC Press Release on Thirteenth Annual MVPD Report*, at 3.

³⁶ Wireless cable (also known as MMDS) system operators use radio frequencies to transmit video programming and broadband services to residential subscribers. Wireless cable systems require an unobstructed line-of-sight from the subscriber’s premises to the transmitting tower, limiting the usefulness of this technology to certain regions of the country. The FCC has found that wireless cable systems provide video competition “only on a limited basis.” *FCC Twelfth Annual MVPD Report*, 21 FCC Rcd at 2565. Wireless cable is distinct from video programming offered by commercial mobile radio services and other providers through wireless handheld devices, such as cell phones.

³⁷ SMATV system operators receive programming via a satellite dish placed atop multiple dwelling units, such as apartments and condominiums, as well as multiple tenant units, such as hotels and office buildings. The programming is distributed to subscribers throughout the building by wire. *FCC Twelfth Annual MVPD Report*, 21 FCC Rcd at 2564.

³⁸ *FCC Press Release on Thirteenth Annual MVPD Report*, at 4 (reporting that the number of private cable or SMATV subscribers was about 900,000 in 2006, a decline of ten percent from 2005, whereas the number of subscribers to wireless cable had dwindled to 100,000 in 2006, from a peak of 1.2 million in 1996).

continues to decline.³⁹ All these alternative technologies in combination accounted for only about one percent of MVPD subscribers. Some electric and gas utilities also provide video services on a limited basis.⁴⁰

The development of competitive video alternatives over the past decade has been significant. In 1996, only one out of ten customers purchased MVPD services from a competitor to the incumbent cable television operator. Today, that number is one out of three.⁴¹ See Graph 1 – Shares of MVPD Households Served by Competing Technologies. However, the non-DBS alternatives to cable television still account for less than four percent of MVPD subscribers, or only about 3.7 to 3.9 million subscribers.⁴² While cable television’s market share has fallen to 67 percent, cable’s share of MVPD subscribers still exceeds 75 percent in 52 out of 210 Designated Market Areas (“DMAs”).⁴³ In November 2007, the FCC concluded that “[i]ncumbent cable operators are still by far the dominant force in the MVPD business, with . . . the ability to impose steadily rising prices.”⁴⁴

B. Local Telephone Services

Prior to the 1996 Act, local exchange telephony was a legal monopoly in many states; however, the market-opening provisions of the 1996 Act and regulation by the FCC and the states have fostered the development of substantial competition in many local voice markets.

³⁹ C-band home satellite dishes, sometimes referred to as “backyard dishes,” typically measure six to ten feet in diameter. They receive C-band signals from satellites that operate in the fixed satellite system (“FSS”) frequencies. These FSS satellites are distinguishable from the broadcast satellite system (“BSS”) satellites operated by the DBS companies, DirecTV and Echostar, which broadcast on different frequencies and require a much smaller dish. As of June 2005, a total of 206,358 households were authorized to receive service via C-band or backyard satellite dishes, a decline of 38.5 percent from 2004. *FCC Twelfth Annual MVPD Report*, 21 FCC Rcd at 2544.

⁴⁰ No subscriber numbers for utility-provided video services are reported in the FCC data. It is not clear how comparable these utility video services are to the services of cable, DBS, telephone companies, and BSPs, although the FCC has classified them as MVPD. As of 2005, 102 public power entities in the United States were reportedly offering some type of video service. *FCC Twelfth Annual MVPD Report*, 21 FCC Rcd at 2507.

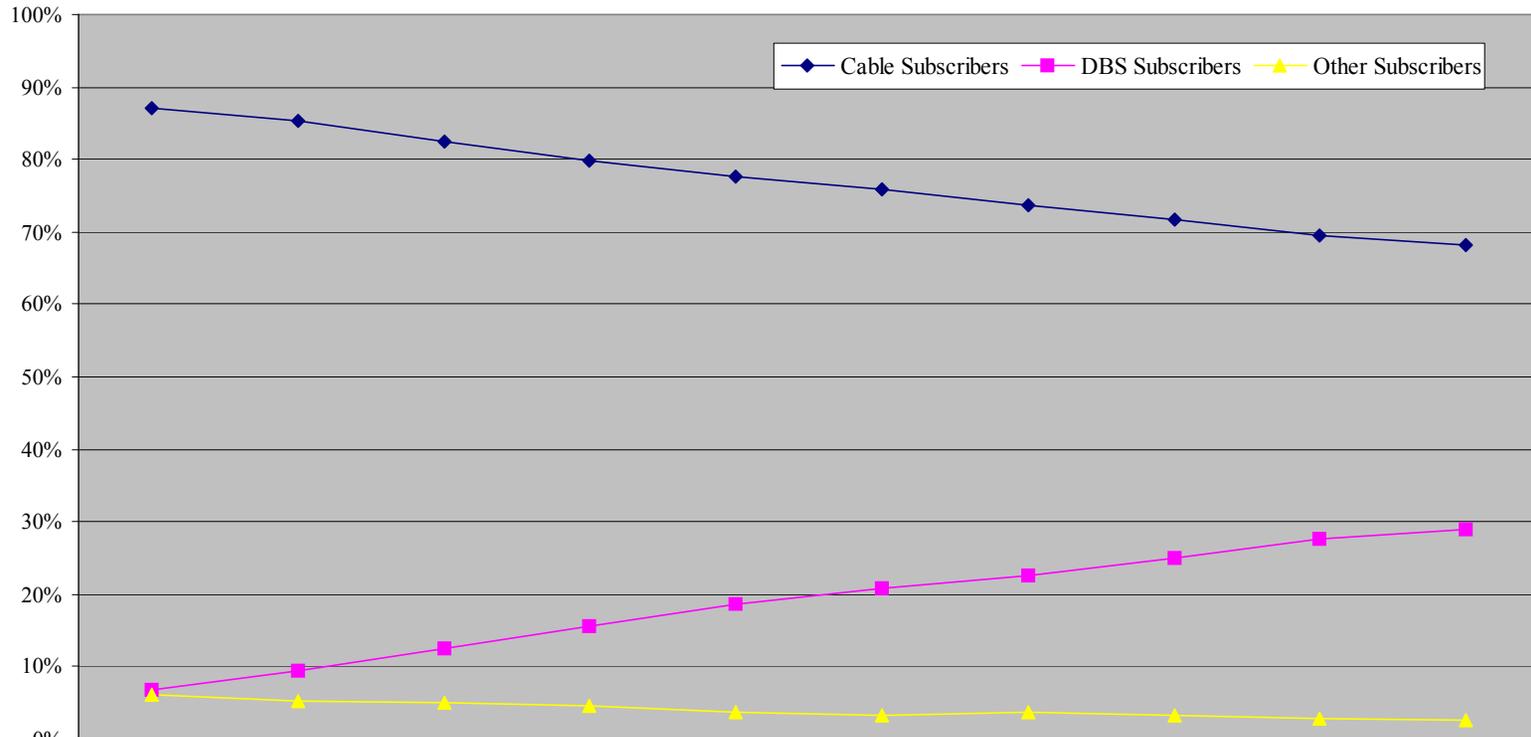
⁴¹ Comments of the Nat’l Cable & Telecomm. Ass’n, *In the Matter of Review of the Commission’s Program Access Rules and Examination of Programming Tying Arrangements*, FCC MB No. 07-198, at 3 (filed Jan. 4, 2008) (“*NCTA Program Access Comments*”).

⁴² This number is larger than shown on Graph 1 because it reflects more recent estimates of more than 1.4 million video subscribers for telephone companies and 1.1 to 1.3 million video subscribers for BSPs, along with the 1.2 million subscribers for all other MVPD technologies (SMATV, wireless cable, and C-Band) identified by the FCC.

⁴³ *FCC Exclusivity Sunset Report & Order*, 22 FCC Rcd at 17,827-28, n.277. These include sixteen of the top 50 most-populated DMAs, including New York, Philadelphia, Boston, Tampa-St. Petersburg, Seattle, Cleveland-Akron, Orlando, Pittsburgh, Baltimore, San Diego, Hartford-New Haven, Columbus, Milwaukee, Harrisburg-Lancaster, Pennsylvania, Norfolk-Portsmouth-Newport News, Virginia, and Las Vegas. *Id.*

⁴⁴ Report and Order and Further Notice of Proposed Rulemaking, *In the Matter of Exclusive Service Contracts for Provision of Video Services in Multiple Dwelling Units and Other Real Estate Developments*, FCC MB No. 07-51, 22 FCC Rcd 20,235, 20,251 (rel. Nov. 13, 2007) (“*FCC MDU Exclusivity Report & Order*”).

Graph 1
Shares of MVPD Households Served by Competing Technologies
(June 1997 - June 2006)



	Jun 1997	Jun 1998	Jun 1999	Jun 2000	Jun 2001	Jun 2002	Jun 2003	Jun 2004	Jun 2005	Jun 2006
◆ Cable Subscribers	87.1%	85.3%	82.5%	79.8%	77.5%	75.9%	73.6%	71.6%	69.4%	68.2%
■ DBS Subscribers	6.9%	9.4%	12.5%	15.7%	18.7%	20.8%	22.7%	25.1%	27.7%	29.0%
▲ Other Subscribers	6.0%	5.3%	5.0%	4.5%	3.8%	3.3%	3.7%	3.3%	2.9%	2.6%

* Other Subscribers consist of BSP, MMDS, SMATV, Home Satellite Dishes, telephone companies and other video subscribers.

Eighth Report, In the Matter of Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming, FCC CS Docket No. 01-129, 17 FCC Rcd 1244 (released Jan. 14, 2002); *Id.*, MB Docket No. 02-145, 17 FCC Rcd 26901, Ninth Annual Report (rel. 2002); *Id.*, MB Docket No. 03-172, 19 FCC Rcd 1606, Tenth Annual Report (rel. 2004); Eleventh Report, In the Matter of Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming, FCC MB Docket No. 04-227, 20 FCC Rcd 2755 (released Feb. 4, 2005); *Id.*, MB Docket No. 05-255, 21 FCC Rcd 2503, Twelfth Annual Report (rel. 2006); *see* Press Release, MB Docket No. 06-189, FCC Press Release on Thirteenth Annual MVPD Report (Nov. 27, 2007).

The most significant development in residential local telephone service competition has been entry by cable operators and other facilities-based landline providers, through the offering of either stand-alone cable telephony or bundles of telephony, video, and broadband Internet access. At this time, most of this competition is provided by the cable companies, whose entry is generally limited to the video franchise areas where they own networks.

The FCC collects information from both ILECs and competitive local exchange carriers (“CLECs”) on the number of lines they serve, and also collects data on the number of wireless subscribers. This information helps to identify broad market trends and track nationwide share shifts from the incumbent providers to competition.⁴⁵

FCC data show that, as of March 2008, 95.2 percent of U.S. households (or 112.2 million households) purchased some type of telephone service.⁴⁶ More than 80 percent of those households had telephone service provided over a landline connection as of December 2007;⁴⁷ the remainder depended solely on wireless phones. The following table shows the distribution of residential landlines in the United States between the ILECs and CLECs.

Table 2: Residential Telephone Landlines as of December 2007⁴⁸

Type of Provider	Numbers of Lines	Share of Lines
ILECs	81.8 million	87.2%
CLECs	12.1 million	12.8%

Source: *FCC Local Telephone Competition Report*, at Table 2.

CLEC figures include all non-ILEC companies that are certified by regulators to provide local telephone services, including cable companies. CLECs’ shares vary significantly from one local area to another; however, figures for localities are not publicly available. The FCC’s statewide figures show wide variation in CLECs’ shares by state for both business and

⁴⁵ In its public reports, the FCC must aggregate data to preserve the confidential information of the reporting firms, so FCC data cannot be used to evaluate the market position of individual competitors, but only broader categories of providers.

⁴⁶ Industry Analysis and Tech. Division, Wireline Competition Bureau, F.C.C., *Telephone Subscribership in the United States*, at Table 1 (August 2008) (“*FCC Telephone Subscribership Report*”).

⁴⁷ Industry Analysis & Tech. Division, Wireline Competition Bureau, F.C.C., *Local Telephone Competition: Status as of December 31, 2007*, at Table 2 (Sept. 2008) (“*FCC Local Telephone Competition Report*”). It is not possible to provide a precise number or percentage of wireless-only households as of 2007 because the FCC data on the total of residential landlines in use in 2007 include both primary and secondary lines and do not provide a separate figure for non-primary lines in use, as is available for years up to 2006. Because of these second lines, the wireless-only households in 2007 were likely slightly larger than the difference of 18.3 million, or 16 percent, between the total of landlines and the total of telephone households. See *infra* Chapter II.E for more current estimates of the percentage of wireless-only households.

⁴⁸ These totals include both primary lines and the smaller number of second lines still in use.

residential customers, ranging from a high of 48 percent in Rhode Island to a low of eight percent in New Mexico.⁴⁹

There have been three very significant trends in landline residential telephone service over the past several years. The first is the decline in the number of residential landlines from the peak of 127.3 million in 2001 to 93.9 million by the end of 2007.⁵⁰ See Graph 2 – Number of Residential Switched Access Lines (ILECs and CLECs). Most of this decline reported in FCC data is attributable to consumers discontinuing second lines for various reasons.⁵¹ For example, broadband services like DSL that can run over a consumer’s primary telephone line without precluding its simultaneous use for voice telephony are increasingly being used for Internet access instead of narrowband telephone connections. A smaller part of the decline is attributable to consumers relying on only wireless telephones (“cutting the cord”).⁵²

The second trend has been the overall decline in the share of residential landlines served by the CLECs, down from a peak of 15.4 percent in June 2004 to 12.8 percent in December 2007.⁵³ See Graph 3 – Percent of End-User Residential Switched Access Lines Served by ILECs and CLECs. This decline is largely attributable to FCC regulatory changes that removed the right of CLECs to obtain switch ports as unbundled network elements (“UNEs”) at Total Element

⁴⁹ *FCC Local Telephone Competition Report*, at Table 8.

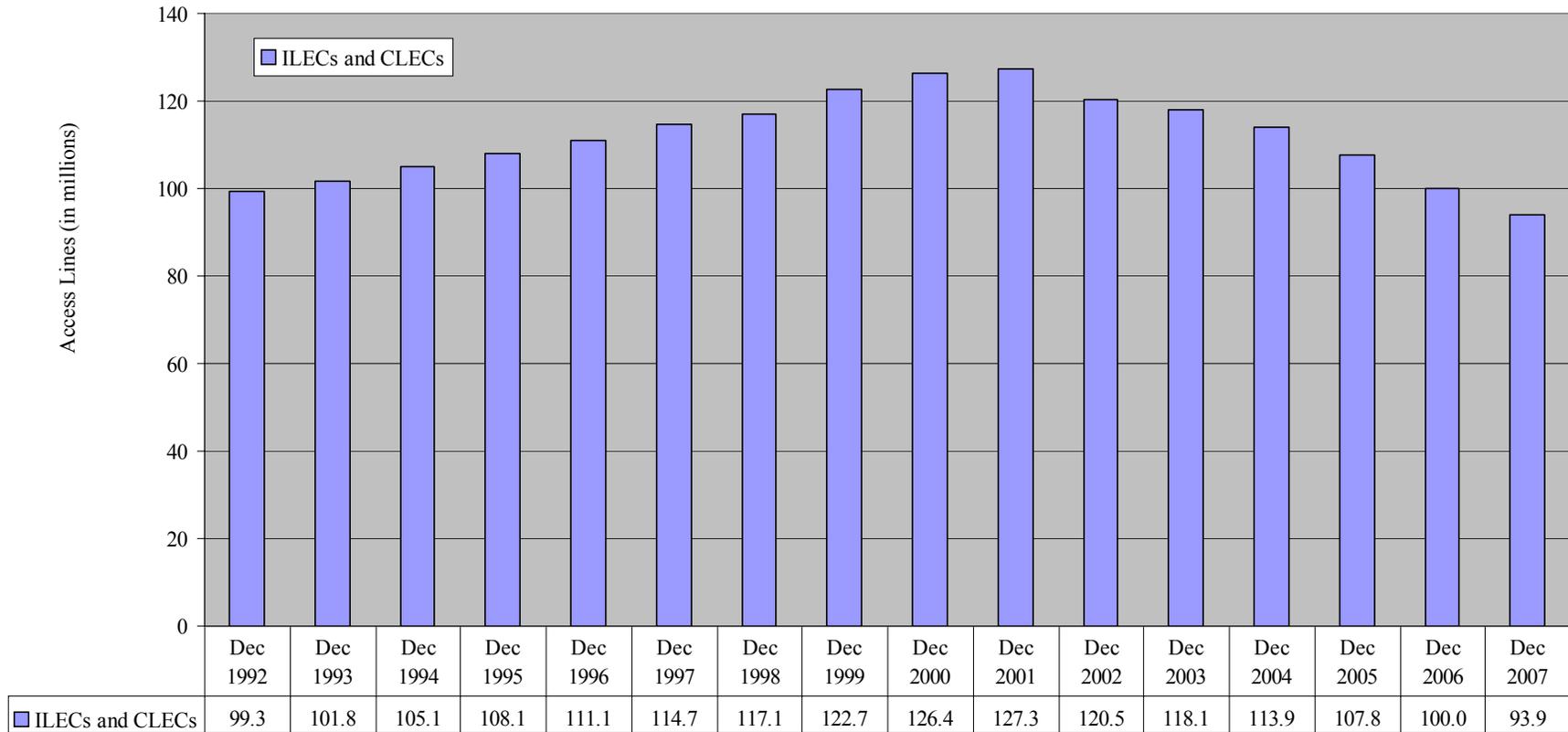
⁵⁰ The total for residential landlines in 2001 is based on Industry Analysis and Tech. Division, Wireline Competition Bureau, FCC, *Trends in Telephone Service*, at Table 7.4 (Aug. 2008) (“*Telephone Trends*”), and the total for residential landlines in December 2007 is based on *FCC Local Telephone Competition Report*, at Table 2. It is necessary to use two different sources to analyze the decline in residential landlines because, before 2005, the *FCC Local Telephone Competition Report* classified small business lines as residential, but from 2005 onward categorized them as business lines and excluded them from the residential totals. In contrast, Table 7.4 in *Telephone Trends* consistently included only actual residential lines in its total. As of 2005, the data in both sources became consistent, but the *FCC Local Telephone Competition Report* provides more up-to-date data than *Telephone Trends*.

⁵¹ The number of non-primary residential lines peaked in 2001 at 26.3 million. By 2006, it had fallen by more than half, to 10.5 million. *Telephone Trends*, at Table 7.4. This loss of 15.8 million non-primary lines from 2001 through 2006 accounts for most of the loss of 27.3 million residential landlines during the same period of time, from the peak of 127.3 million. *Id.* The *FCC Local Telephone Competition Report*, at Table 2, shows a larger decline in residential landlines over the same period, from 142.8 million to 101.4 million. The difference between the figures is mainly attributable to the reclassification of small business lines from residential to business lines after 2004.

⁵² See *infra* Chapter II.E for a discussion of substitution between wireless and wireline services.

⁵³ *FCC Local Telephone Competition Report*, at Table 2. Part of this reported decline – over three million lines – is due to the shift of CLEC small business lines from the residential to the business category in the FCC’s data, but most of it – over five million lines – represents actual losses of customers. From June 2005 to December 2007, after the shift of the small business lines had already been made, the CLECs lost 4.2 million residential lines, from 16.3 million down to 12.1 million. They lost another 1.1 million before the small business lines shift occurred, from 20.9 million in June 2004 down to 19.8 million in December 2004. *Id.*

Graph 2
Number of Residential Switched Access Lines
(ILECs and CLECs)
(December 1992 - December 2007)

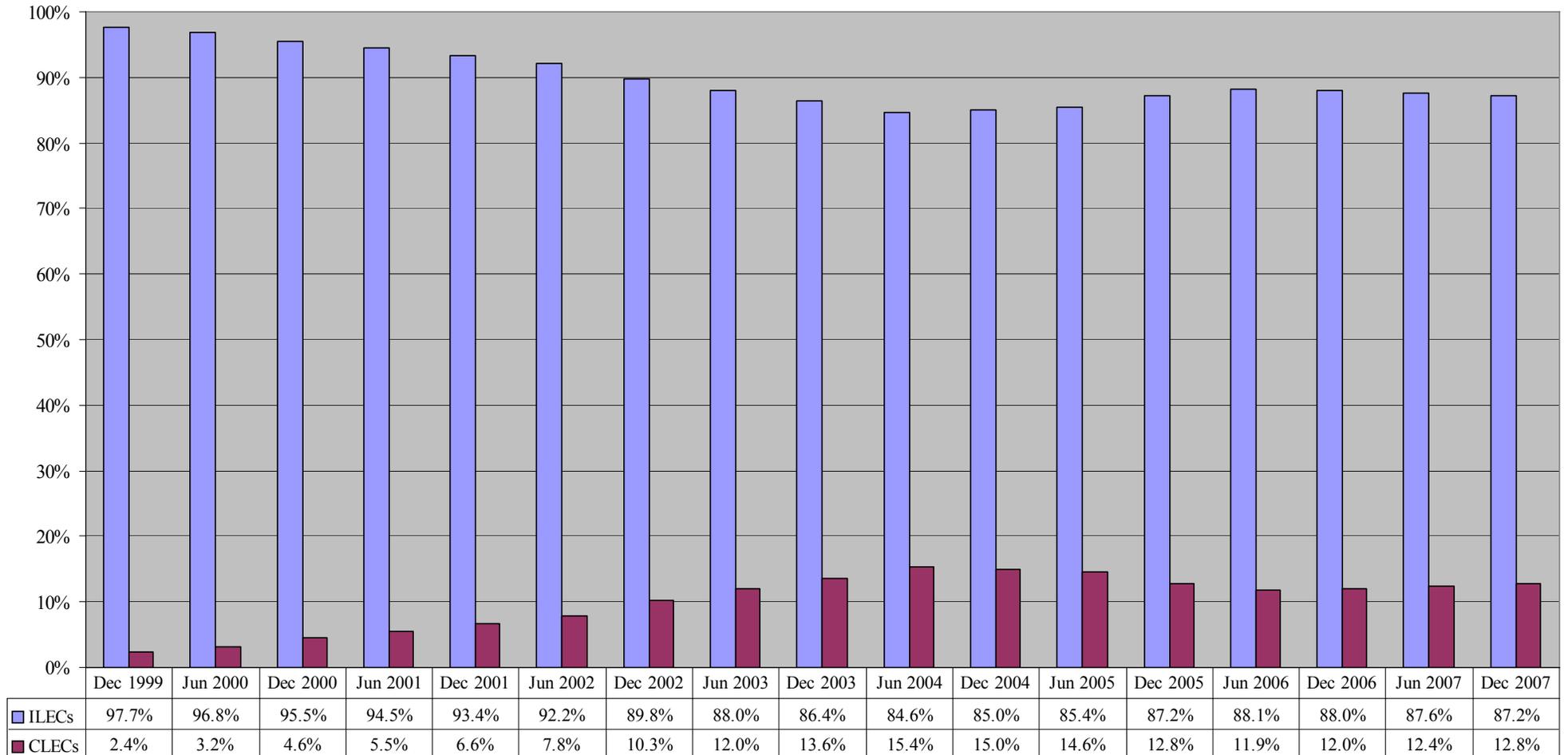


* Access Lines are represented in millions.

* Data through December 2006 is taken from Industry Analysis and Technology Division, Wireline Competition Bureau, Federal Communications Commission, *Trends in Telephone Service*, at Table 7.4 (August 2008).

* Data for December 2007 is taken from Industry Analysis and Technology Division, Wireline Competition Bureau, Federal Communications Commission, *Local Telephone Competition: Status as of December 31, 2007*, at Table 2 (September 2008).

Graph 3
Percent of End-User Residential Switched Access Lines
Served by ILECs and CLECs
(December 1999 - December 2007)



* Small business lines were included in residential access line calculations through December 2004.

Long Run Incremental Cost (“TELRIC”) prices.⁵⁴ However, the trend appears to be reversing with the growth of cable companies providing voice telephone service as CLECs.⁵⁵

The third trend has been a gradual shift in the mix of CLEC residential lines, from UNE-based lines to facilities-based service, reflecting the considerable success of cable entry into residential telephony. In December 2007, 40.8 percent of all CLEC lines, including residential and business lines, were facilities-based, up sharply from the lowest reported facilities share of 23.4 percent in June 2004. At the same time, 36.8 percent of CLEC service still depended upon ILEC unbundled network loops, down sharply from the peak of 61.3 percent in June 2004.⁵⁶ See Graph 4 – Modes of Entry Used by Competitive Local Exchange Carriers (CLECs). As of December 2007, most of the 12.1 million CLEC residential lines (up to 8.4 million) were provided over coaxial cable (that is, by cable companies).⁵⁷ An increasingly large share of the remaining UNE-based lines is provided through partly facilities-based arrangements, using a CLEC switch combined with an unbundled loop obtained from an incumbent carrier 46(“UNE-L”), rather than by use of a UNE-Platform combination.⁵⁸

The cable operators appear to be well positioned to offer facilities-based competition to the ILECs in the local

Due to expansion by cable companies, most consumers a choice of at least two providers for local voice services.

⁵⁴ Order on Remand, *In the Matter of Unbundled Access to Network Elements; Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers*, FCC WC Docket No. 04-313 & CC Docket No. 01-338, 20 FCC Rcd 2533 (rel. Feb. 4, 2005) (“TRRO”), *petition for review denied, Covad Communications Co. v. FCC*, 450 F.3d 528 (D.C. Cir. 2006). Switch port elements were mainly used for providing residential service as part of a combination of unbundled loop and switch port elements, also known as UNE-Platform (“UNE-P”).

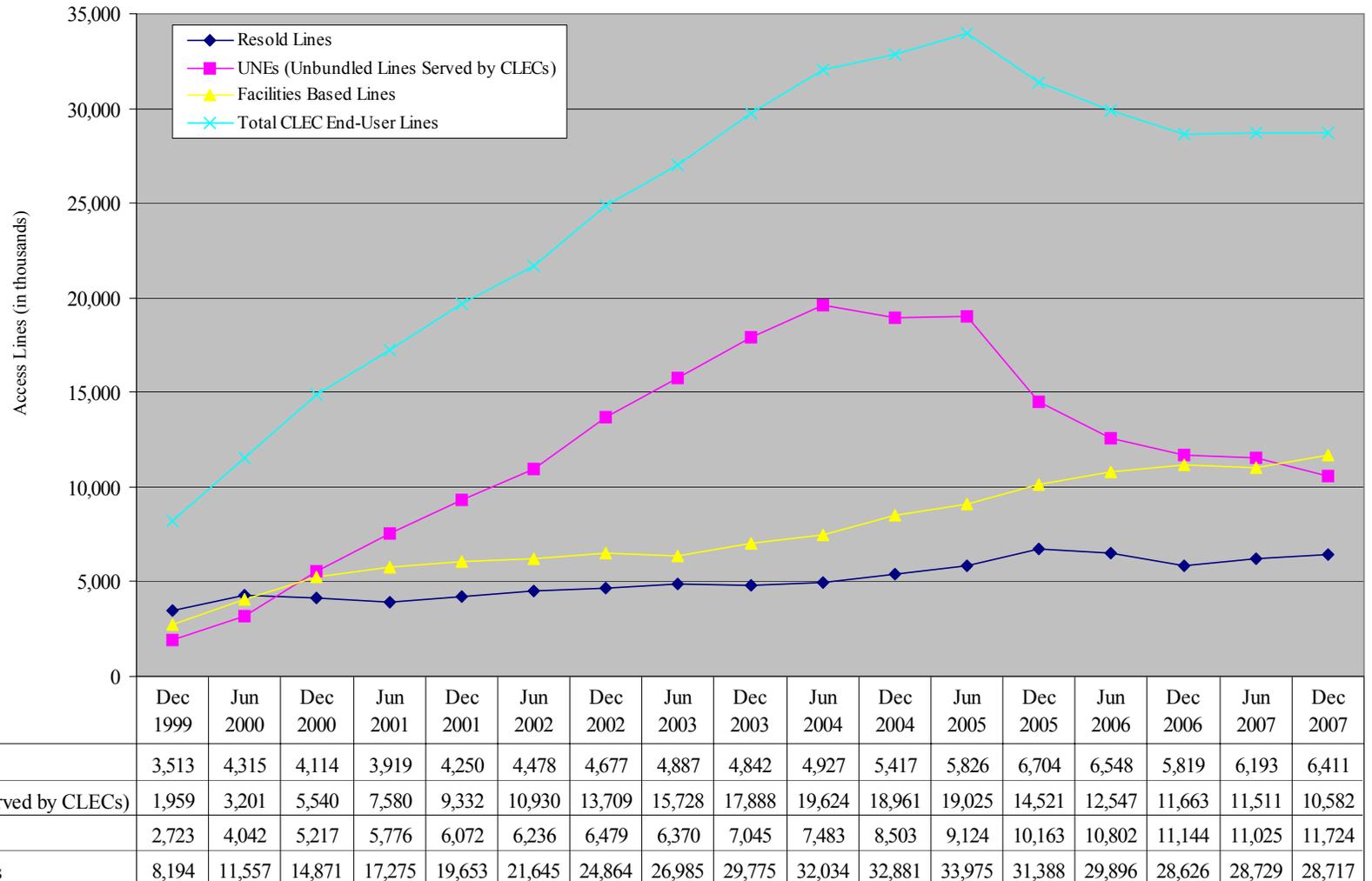
⁵⁵ Although the increase in the CLECs’ share of residential lines as shown in Graph 3 is relatively small, more recent cable telephony data, as discussed *infra*, show that the number of subscribers to cable telephony services is rising. The earlier declines in CLEC residential customers have not been paralleled in the CLECs’ business line totals. CLEC business lines declined by only one million in the two years following the shift of small business lines from the residential to the business category in the *FCC Local Telephone Competition Report* data, from a peak of 17.6 million in June 2005 to 16.7 million in December 2007. *FCC Local Telephone Competition Report*, at Table 2.

⁵⁶ *FCC Local Telephone Competition Report*, at Table 3. The remaining 22.3 percent of CLEC lines in December 2007 involved resold services obtained from the ILECs, an increase from the lowest reported share of 15.4 percent for resold lines in June 2004. *Id.*

⁵⁷ *Id.* at Table 5.

⁵⁸ *Id.* at Table 4. In December 2007, the ILECs reported providing a total of 9.6 million UNE loops to the CLECs. Of these loops, 4.1 million were provided without switching, down only slightly from the peak total of about 4.5 million in December 2005, while 5.5 million loops were provided with switching, reduced by over two-thirds from the peak total of 17.1 million in June 2004. *Id.*

Graph 4
Modes of Entry Used by Competitive Local Exchange Carriers (CLECs)
(December 1999 - December 2007)



* Access Lines are represented in thousands.

exchange markets.⁵⁹ Alexandra Wilson, of Cox Enterprises, Inc., reported that, according to the National Cable & Telecommunications Association (“NCTA”), cable telephony is available to around 100 million households (approximately 85 percent of the 118 million households nationwide) and accounts for more than 12 million subscribers (approximately 11 percent of the 112 million households with telephone service).⁶⁰ The cable companies are rapidly increasing their telephony business. More recent reports give the cable companies as many as 13 to 15 million telephony customers.⁶¹ As of late 2007, Cox, the third-largest cable company nationally, had nearly six million residential subscribers, including about 5.5 million video customers, 3.6 million broadband customers, and 2.3 million residential telephone customers, making Cox the tenth-largest provider of telephone services in the United States.⁶² Cox has committed to offering telephony and broadband services throughout its footprint. It added about 370,000 telephone subscribers in the twelve-month period ending November 2007.⁶³ Currently, more than 25 percent of Cox’s customers offered telephone service subscribe to its telephone service. The Cox customers who also take telephone services are much less likely to switch providers (“churn”) than those taking only video.⁶⁴

⁵⁹ In considering petitions by the ILECs for relief from regulatory obligations, the FCC and state agencies have relied on the existence of cable competition to justify partially granting the ILECs’ requests in some geographic areas. See, e.g., Memorandum Opinion and Order, *In the Matter of Petition of Qwest Corporation for Forbearance Pursuant to 47 U.S.C. § 160(c) in the Omaha Metropolitan Statistical Area*, FCC WC Docket No. 04-223, 20 FCC Rcd 19,415, 19,430-31 (rel. Dec. 2, 2005) (“*Omaha Order*”), order modified, 23 FCC Rcd 1716 (Feb. 8, 2008); Memorandum Opinion and Order, *In the Matter of Petition of ACS of Anchorage, Inc. Pursuant to Section 10 of the Communications Act of 1934, as Amended (47 U.S.C. s 160(c)), for Forbearance from Certain Dominant Carrier Regulation of Its Interstate Access Services, and for Forbearance from Title II Regulation of Its Broadband Services, in the Anchorage, Alaska, Incumbent Local Exchange Carrier Study Area*, FCC WC Docket No. 06-109, 22 FCC Rcd 16,304, 16,321-23 (rel. Aug. 20, 2007), order modified, 23 FCC Rcd 1716 (Feb. 8, 2008); *Application of Verizon Virginia Inc. and Verizon South Inc. For a Determination that Retail Services are Competitive and Deregulating and Detariffing of the Same*, Case No. PUC-2007-00008, Va. St. Corp. Comm’n, Order on Application (Dec. 14, 2007) (“*Virginia Order*”); *Application of Verizon Virginia Inc. and Verizon South Inc. For a Determination that Retail Services are Competitive and Deregulating and Detariffing of the Same*, Case No. PUC-2007-00008, Va. St. Corp. Comm’n, Order on Reconsideration (Feb. 1, 2008) (“*Virginia Reconsideration Order*”). However, the existence of cable competition has not always been sufficient to grant relief. See Memorandum Opinion and Order, *In the Matter of Petitions of the Verizon Telephone Companies for Forbearance Pursuant to 47 U.S.C. § 160(c) in the Boston, New York, Philadelphia, Pittsburgh, Providence and Virginia Beach Metropolitan Statistical Areas*, FCC WC Docket No. 06-172, 22 FCC Rcd 21,293, 21,304-05 (rel. Dec. 5, 2007) (“*Six MSA Order*”).

⁶⁰ Wilson, Tr. at 90; see *FCC Telephone Subscriber Report* at Table 1 for household totals.

⁶¹ *Cable Telephony Tops the 13-Million Mark*, IP DEMOCRACY, Mar. 5, 2008, available at http://www.ipdemocracy.com/archives/002899cable_telephony_tops_the_13million_mark.php (13.3 million as of 4th Quarter 2007, citing company reports and Emerging Media Analysis estimates); Cecelia Kang & Kim Hart, *Clearwire, Sprint Nextel Set Course for WiMax*, WASH. POST, May 8, 2008, at D1-D2 (15 million).

⁶² Wilson, Tr. at 85-86.

⁶³ *Id.* at 87-89.

⁶⁴ *Id.*

Stephen Perkins, of Cavalier Telephone LLC, presented information on the success that his company has had in competing with incumbent telephone companies.⁶⁵ Cavalier is a CLEC that provides a bundle of voice, video, and broadband Internet access services to residential customers using advanced DSL technology over copper loops leased as UNEs from the ILECs. This business model – employing DSL technology to provide services using the ILEC copper loop together with the CLEC’s own facilities – may be one of the few possibilities for residential wireline competition in places where cable companies or overbuilders have not built out networks. According to Cavalier’s submission, it is the “[l]argest competitive local carrier (non-incumbent, non-independent telco, non-CATV) in Virginia, Pennsylvania, and Michigan,” with approximately 750,000 retail business and residential lines throughout its service area, the large majority of which are residential.⁶⁶

ILEC speakers argued that they faced competition from not only the cable companies and CLECs but also wireless and nomadic Voice over Internet Protocol (“VoIP”) providers.⁶⁷ Sean Lindsay, of Qwest Communications International Inc., pointed to the significant decline in ILEC access lines as evidence of extensive competition.⁶⁸ Lindsay also contended that the availability of a broadband Internet connection enables the customer to purchase nomadic VoIP telephony from a wide range of providers in lieu of ILEC landline service.⁶⁹ Given the difficulty of determining which customers use VoIP services, Lindsay recommended focusing on “the number of broadband lines in service, because as soon as you have a broadband connection, you have the ability to receive VoIP telephony services.”⁷⁰

Jill Canfield, of the NTCA, similarly asserted that cable voice telephony is the biggest competitive threat to rural ILECs.⁷¹ The NTCA sees the competitive pressures for rural ILECs as “very similar to any ILEC out there today,” with declining minutes of landline use and more use of cell phones, together with increased emphasis on residential broadband connections.⁷²

⁶⁵ Cavalier was cited in the FCC’s *TRRO* as an example of a CLEC successfully using the UNE-L strategy. *TRRO*, 20 FCC Rcd at 2646.

⁶⁶ Stephen Perkins, Cavalier Telephone LLC, “Outline of Remarks,” 2007 DOJ Telecommunications Symposium, Nov. 29, 2007, at 3 (“*Perkins Presentation*”).

⁶⁷ Nomadic VoIP services are telephone services that use broadband but are offered by a provider that is not providing the underlying broadband connection.

⁶⁸ Lindsay, Tr. at 76-79.

⁶⁹ Sean C. Lindsay, Qwest Communications International Inc., “Facilities-Based Competition in Mass Market Telecom: A Period of Rapid Change,” 2007 DOJ Telecommunications Symposium, Nov. 29, 2007, at 7 (“*Lindsay Presentation*”).

⁷⁰ Lindsey, Tr. at 79.

⁷¹ Canfield, Tr. at 116.

⁷² *Id.* at 115.

Other speakers, however, raised concerns about whether wireless services, and nomadic VoIP services that depend on landline broadband access for delivery to the customer, should be considered to be competitive with landline access.⁷³ As to VoIP, economist Dr. Simon Wilkie pointed out that there is a “difference between telecom services [themselves] and access to those services via a wire line or a cable loop. . . . In many cases, they are actually different products.”⁷⁴ In other words, even where there is competition at the service level, there still may be no, or limited, competition for the access needed to reach consumers. The delivery of nomadic VoIP services requires the customer to have a broadband connection. Many consumers do not subscribe to broadband. In addition, a large number of broadband subscribers continue to buy a local telephone connection because either they need it to support another service (such as a security system) or they are unable to purchase a DSL connection without also paying for a local line. Dr. Wilkie’s analysis suggests that it would be inappropriate to treat all broadband Internet access services as part of the telephony market. He expressed doubt about the competitive constraint provided by entry of nomadic VoIP providers,⁷⁵ stating, “VOIP can't provide access substitution because you need the access line still.”⁷⁶

C. Broadband Services

The principal competitors in providing residential broadband services continue to be: (1) the incumbent telephone companies, using either DSL over copper or more advanced fiber networks (such as

The principal competitors providing residential broadband services are the incumbent telephone and cable companies.

Verizon’s FiOS); and (2) the incumbent cable companies, providing cable modem service over hybrid fiber-coaxial cable. Broadband service was the first area in which the incumbent telephone and cable companies competed substantially with one another. The aggregate nationwide shares of residential broadband connections in the U.S. are nearly 51 percent for cable modem services and more than 39 percent for DSL and fiber connections, the great majority provided by the incumbent telephone companies. *See* Graph 5 – Residential High Speed Lines (by type). These

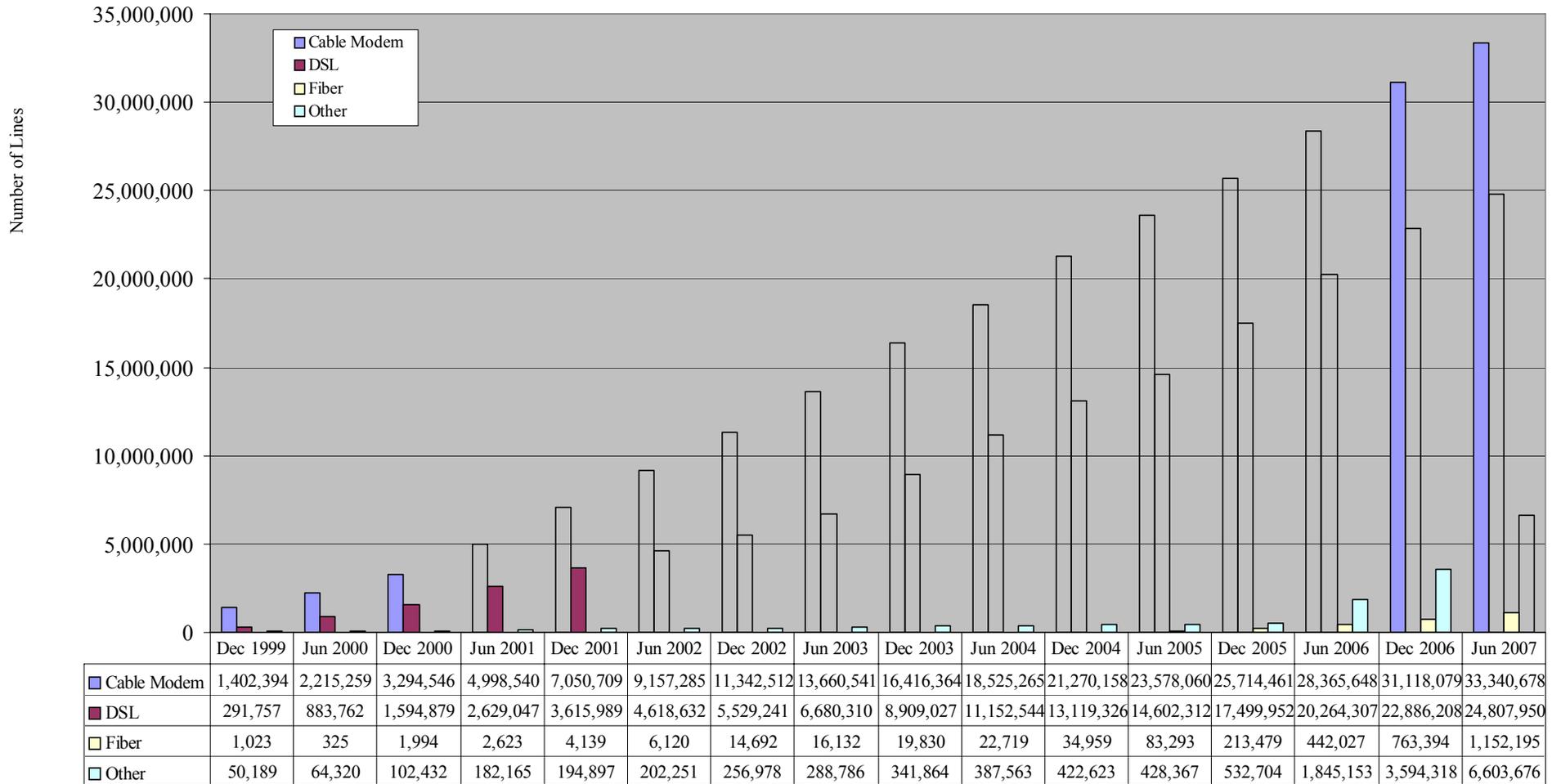
⁷³ *See infra* Chapter II.E for a discussion of substitution between wireless and wireline services.

⁷⁴ Wilkie, Tr. at 127; *see also* Simon J. Wilkie, Center for Communications Law and Policy, USC Gould School of Law, “Economics of Entry and Telecommunications Regulation,” 2007 DOJ Telecommunications Symposium, Nov. 29, 2007, at 3 (“*Wilkie Presentation*”).

⁷⁵ Wilkie, Tr. at 129. Federal and state regulatory agencies have taken different views on the significance of nomadic VoIP services when evaluating requests by ILECs to eliminate regulatory requirements. In a 2007 proceeding, the FCC declined to include in its analysis nomadic VoIP services that required the customer to purchase a separate broadband connection because the record did not contain data sufficient to find these services were close substitutes. *Six MSA Order*, 22 FCC Rcd at 21,305. Virginia’s regulator did take into account nomadic VoIP services that offer telephone service connected to the public switched network where those services were available and 75 percent of customers had subscribed to a broadband service. *See Virginia Reconsideration Order* at 8-14. However, Virginia’s regulator also found that the nomadic VoIP providers’ market shares were too small to be considered serious statewide competitors. *See Virginia Order* at 23-24.

⁷⁶ Wilkie, Tr. at 129.

Graph 5
Residential High Speed Lines (by type)
(December 1999 - June 2007)



* Other consists of Wireless, Satellite, Power Line and Other Lines.

shares in broadband are considerably closer than the shares of cable and telephone companies today for the provision of telephone and video services.⁷⁷

Broadband services are also provided by the alternative landline networks of the BSPs,⁷⁸ and by some partly facilities-based CLECs using unbundled copper loops obtained from the ILECs. Fixed wireless broadband services and satellite services play a very limited role nationwide, while the nationwide share of broadband over power line is insignificant. The following table shows the nationwide residential broadband subscriber totals and shares by different technologies, based on FCC data from June 2007.⁷⁹

Table 3: U.S. Broadband Residential Line Totals and Nationwide Shares by Technology

Broadband Technology	Total Residential Lines	Share of Total Broadband
Cable Modem	33.3 million	50.6%
Services using copper loop (mainly ADSL, others including SDSL and traditional wireline)	24.8 million (of which 24.7 million use ADSL)	37.7%
Mobile Wireless	5.5 million	8.4%
Fiber	1.2 million	1.7%
Satellite	530,357	0.8%
Fixed Wireless	522,752	0.8%
Other (including broadband over power line (“BPL”))	5,347	0.008%

Source: *FCC Broadband Report*, Table 3

Mobile wireless services are the fastest growing broadband segment.⁸⁰ However, it is not clear how closely such services compete with landline services on price, quality, and delivery speeds. According to FCC data for all broadband connections, including residential and

⁷⁷ Cable companies continue to account for over 65 percent of MVPD service subscribers nationwide, while ILECs account for over 80 percent of residential telephone landlines and likely around 70 percent of all households with telephone service. *See supra* Chapters I.A and I.B, and *infra* Chapter II.E.

⁷⁸ BSPs are similar to the incumbent telephone companies and cable companies in their network technology, as they provide video, voice, and broadband services over the same landline facilities by deploying fiber and coaxial cable. *See supra* Chapters I.A and I.B, and *infra* Chapter II.

⁷⁹ Industry Analysis and Tech. Division, Wireline Competition Bureau, F.C.C., *High-Speed Services for Internet Access: Status as of June 30, 2007*, at Table 3 (Mar. 19, 2008) (“*FCC Broadband Report*”).

⁸⁰ The FCC reports data on broadband in terms of “high speed lines,” but this term is used broadly to include not only actual wirelines but also wireless connections. *Id.* at 1-2 & n.1. The FCC’s data are based on the number of total line connections rather than on the number of subscribers or households, which might have both a wireline and a mobile wireless connection.

business, as of June 30, 2007, at least 73 percent of mobile wireless customers received high-speed services at the low end of the speed range.⁸¹ Fixed wireless customers mostly received somewhat faster speeds than mobile wireless, and most customers of wireline services, primarily cable modems and fiber, were already receiving services at speeds of 2.5 Mbps or more in at least one direction.⁸²

There has been dramatic growth in residential broadband usage over the past several years, from only 3.1 million residential lines in June 2000 to 65.9 million in June 2007,⁸³ and services are now available to the great majority of U.S. consumers.⁸⁴

There has been dramatic growth in the number of broadband lines in use since 2000 – increasing from 3.1 million in 2000 to 65.9 million in 2007.

However, broadband penetration was estimated at only 50.8 percent of U.S. households nationwide as of October 2007.⁸⁵

The competitive landscape is different in many rural areas, as the rural telephone carriers are the predominant providers of broadband, and cable plays a much smaller role. The NTCA reported that nearly all of its members provide broadband Internet to at least part of their service territories.⁸⁶ Based on a NTCA survey, half of rural youths with an Internet connection in their homes had DSL service, while only eight percent had a cable modem.⁸⁷ This is presumably attributable to the absence of cable in many rural areas.⁸⁸ Although 87 percent of NTCA members have reported facing broadband competition from at least one other provider, even in the most sparsely populated areas,⁸⁹ in many cases this competition probably is satellite-based or

⁸¹ Most mobile wireless services provided speeds exceeding 200 kbps in only one direction. Fixed wireless service speeds mostly exceeded 200 kbps in both directions, though they were slower than 2.5 Mbps in the faster direction. *Id.* at Tables 1 (for total mobile wireless) and 5 (for speeds by technology).

⁸² *Id.* at Table 5. Broadband services operate in two directions, an uplink to the network and a downlink from the network, and the speeds of a broadband service for the two directions are often not symmetrical.

⁸³ *Id.* at Table 3 & Chart 5.

⁸⁴ The FCC estimated that DSL was available to 82 percent of all households served by ILECs, and high-speed cable service was available to 96 percent of all households served by cable companies at the end of 2007. *Id.* at 3 & Table 14.

⁸⁵ *NTIA Broadband Report*, at ii.

⁸⁶ Canfield, Tr. at 114.

⁸⁷ *Id.* at 111; *see also* Jill Canfield, Nat'l Telecomm. Coop. Ass'n, "Entry into Telecommunications: Rural ILEC Perspective," 2007 DOJ Telecommunications Symposium, Nov. 29, 2007, at 3 ("*Canfield Presentation*"); Nat'l Telecomm. Coop. Ass'n, Foundation for Rural Service, *2007 Rural Youth Telecommunications Survey*, at 14.

⁸⁸ Only 20 percent of the rural youth households reported receiving video services from a cable company, while 45 percent of these households get service via DBS and 14 percent from a telephone provider. Canfield, Tr. at 111-12.

⁸⁹ *Id.* at 115; *see also Canfield Presentation* at 7.

wireless, rather than cable. Canfield, of the NTCA, recognized that the competition faced by rural ILECs is not evenly distributed geographically across their service areas. Most face competition only in the cities and towns they serve, although 47 percent report having competition for broadband throughout their entire service territories.⁹⁰

It is unclear how much wireless and developing technologies will affect broadband competition. Some providers are at an early stage of rollout geographically; others are evolving technologically. The key issue is whether any of these technologies have advantages that will enable them to compete effectively and profitably with the more established technologies. In the past, some wireless and BPL technologies were unable to meet customers' expectations as to speeds and latency, or the technology required large capital investment that was difficult to recoup. One question the Symposium sought to address is whether any of these technologies are "ready for prime time."

1. Wireless Providers

Some market observers believe that wireless technology, in particular mobile applications, holds the most promise of becoming the third connection to consumers' homes, giving consumers an alternative to the current fixed wireline services. The

Wireless broadband services are experiencing substantial growth, but these services may not yet be effective competitors to landline services because of price and speed differences.

advantage of mobile wireless services is that they can in theory be accessed anywhere that coverage is offered. Mobile wireless services constitute the fastest growing segment of high-speed services for Internet access and accounts for the most new broadband connections.⁹¹ As of June 2007, more than 62 percent of the residential and business high-speed lines identified by the FCC in service were provided using landline DSL or cable modems; of the remaining 37 percent of high-speed lines that used other technologies, about 90 percent were using mobile wireless technologies.⁹² The number of mobile wireless high-speed connections reported in service as of June 2007 was more than triple the number reported a year earlier.⁹³

⁹⁰ Canfield, Tr. at 115-16.

⁹¹ *FCC Broadband Report*, at Table 1. For this report, the FCC defined high-speed lines as connections to end-user locations that deliver services at speeds exceeding 200 kbps in at least one direction. *Id.* at 1, n.1. The *FCC Broadband Report's* purpose is to review the deployment of advanced telecommunications capabilities in the United States and therefore does not evaluate whether the technologies reported are actually competing with each other for consumers. It does not include information about the prices charged for such services nor the specific locations in which each service is offered. Nor does it provide information about whether mobile wireless services, which were offered at speeds that generally were lower than those provided by cable modem and DSL as of June 2007, were effective competitors to DSL or cable modem services. *Id.* at Table 5.

⁹² *Id.* at Table 1. The FCC also reported that there were almost 70 million advanced service lines for residential and business customers that delivered services at speeds exceeding 200 kbps in both directions. Of these lines, 58 million were DSL or cable modem lines and about 9 million used mobile wireless technology. *Id.* at Table 2.

⁹³ *Id.* at Table 1.

The Department invited a number of wireless providers to speak at the Symposium about their plans to provide broadband services and their views about the current state of competition between wireless technologies and DSL or cable modem services.

AT&T has the largest number of mobile wireless subscribers in the United States, deploying technologies based on Global System for Mobile Communications (“GSM”).⁹⁴ The company has invested more than \$18 billion over the last three years to increase the scope and capabilities of its wireless networks.⁹⁵ AT&T currently offers an advanced version of its GSM technology known as High Speed Packet Access (“HSPA”) service in 265 geographic areas and plans to extend coverage to nearly 350 areas by the end of 2008.⁹⁶ AT&T expressed the view that the downlink version of this service, High Speed Downlink Packet Access (“HSDPA”), which is advertised to provide download speeds of 600 kbps to 1.4 Mbps, competes directly with landline services.⁹⁷

AT&T also has the largest national Wireless Fidelity (“Wi-Fi”) network. The company provides or enables Wi-Fi access at more than 57,000 locations in more than 85 countries.⁹⁸ AT&T has also partnered with municipalities to deploy wide-area public broadband Internet access (“Municipal Wi-Fi”) networks that provide services for government and public safety functions as well as the general public.⁹⁹ AT&T’s first Municipal Wi-Fi deployment was in Riverside, California. Wi-Fi networks are also planned for St. Louis, Missouri, and San Antonio, Texas.¹⁰⁰ AT&T’s W-Fi business models rely on advertising revenues for free basic service, subscriptions for higher levels of service, and revenues from services offered to enterprise customers.¹⁰¹

⁹⁴ See Appendix D for a complete description of the various wireless technologies.

⁹⁵ Written Comments of Henry “Hank” Kafka on Behalf of AT&T Inc., for inclusion in the 2007 DOJ Telecommunications Symposium, Nov. 29, 2007, at 1-2 (“*AT&T Submission*”).

⁹⁶ See AT&T website, <http://www.att.com/gen/general?pid=7493>. Verizon has deployed an advanced version of its Code Division Multiple Access (“CDMA”) technology known as Evolution Data Only (“EV-DO”) Rev. A, which advertises typical download speeds of 600 kbps to 1.4 Mbps and typical upload speeds of 500-800 kbps, in 242 cities. See Verizon website, <http://b2b.vzw.com/broadband/RevA.html>.

⁹⁷ Kafka, Tr. at 193-96; see AT&T website, <http://www.att.com/gen/general?pid=7493> (for speeds offered of 600 kbps to 1.4 Mbps).

⁹⁸ *AT&T Submission*, at 7.

⁹⁹ *Id.* The Telecommunications Industry Association (“TIA”) estimates that there are over 250 municipal Wi-Fi networks being operated or developed in the United States. *NTIA Broadband Report*, at 21 (citing TIA, 2007 *Telecomm. Market Review & Forecast*, at 167 & Table IV-2.2 (“*TIA Market Review*”).

¹⁰⁰ *AT&T Submission*, at 7.

¹⁰¹ *Id.*

AT&T has been exploring the use of Worldwide Interoperability for Microwave Access (“WiMAX”) technology through trials in Riverside, California, St. Louis, and San Antonio.¹⁰² AT&T has deployed WiMAX technologies in areas where it does not provide DSL or other broadband services, in Pahrump, Nevada, and several cities in Alaska. Many customers have signed up for the service, and AT&T reported that the technology is working well.¹⁰³ However, the deployments are costly to build in areas with low population density.¹⁰⁴

Sprint Nextel and Clearwire made separate presentations at the Symposium, although they later announced that they will jointly develop a WiMAX network.¹⁰⁵ Both companies expressed the view that WiMAX offers a great opportunity and that there is sufficient demand for a mobile wireless service to ensure success. Wireless broadband services will allow people to expand their Internet experience from using a browser on a desktop PC or laptop to allowing connections to kiosks and obtaining broadband Internet access via backseat entertainment systems and portable multimedia players.¹⁰⁶ At the time of the Symposium, Sprint Nextel had started field testing service in its first two markets (Chicago and Baltimore/Washington).¹⁰⁷ In September 2008, Sprint Nextel launched commercial WiMAX service in Baltimore.¹⁰⁸

At the time of the Symposium, Clearwire had wireless broadband networks operating in more than 420 municipalities around the globe, covering more than 14.8 million people, with 350,000 customers, and more than ten percent penetration in each of its first 15 markets.¹⁰⁹ Clearwire had completed trials of mobile WiMAX and had planned a commercial launch in the

¹⁰² *Id.* at 8.

¹⁰³ *Id.* at 8-9.

¹⁰⁴ Kafka, Tr. at 189-91; *AT&T Submission*, at 9.

¹⁰⁵ Press Release, Clearwire Corporation, Sprint and Clearwire to combine WiMAX businesses, creating a new mobile broadband company, May 7, 2008, available at <http://newsroom.clearwire.com/phoenix.zhtml?c=214419&p=irol-newsArticle&ID=1141157&highlight=> (“*Clearwire Press Release*”). The new venture is expected to be valued at about \$12 billion, including assets committed by both Sprint and Clearwire, and a total of \$3.2 billion in investments by others, including cable providers Comcast, Time Warner, and BrightHouse, as well as Google and Intel. Sprint will own 51 percent of the new company, which will be called Clearwire and headed by Clearwire’s CEO. See Sprint Nextel Corp. & Clearwire Corp., *FCC Form 603 Application for Assignments of Authorization and Transfers of Control*, Ex. 1, at 1-12 (filed June 6, 2008) (“*Sprint/Clearwire Transfer Application*”). The venture will have a large amount of 2.5 GHz spectrum contributed by Sprint and Clearwire, with an average of 151 MHz of spectrum in each of the top 100 U.S. markets, and at least 100 MHz on average in the next 100 markets. *New Wireless Venture See Drawing Scant Regulatory Scrutiny*, COMM. DAILY, May 8, 2008, at 2-5.

¹⁰⁶ Shen, Tr. at 201-04.

¹⁰⁷ *Id.* at 210; Bin Shen, Sprint Nextel Corporation, “Introduction to Xohm,” 2007 DOJ Telecommunications Symposium, Nov. 29, 2007, at 5 (“*Shen Presentation*”).

¹⁰⁸ COMM. DAILY, Sept. 30, 2008, at 9.

¹⁰⁹ Salemme, Tr. at 220-21; R. Gerard Salemme, Clearwire Corporation, “Delivering Personal Broadband and the Mobile Internet,” 2007 DOJ Telecommunications Symposium, Nov. 29, 2007, at 6 (“*Salemme Presentation*”); see also *id.* at 7 (map depicting Clearwire’s U.S. markets), *id.* at 9 (detailing Clearwire’s international subscribers, covered POPs, and spectrum holdings).

first quarter of 2008.¹¹⁰ Prospects for the new Clearwire joint venture are discussed below, but the joint venture expects its network to cover 120 to 140 million people by the end of 2010.¹¹¹

William Wallace, of DigitalBridge Communications Corp., explained how his company seeks to provide WiMAX services to underserved communities, typically with populations of between 10,000 and 100,000, including some “vacation spots.”¹¹² DigitalBridge has started with fixed wireless broadband services, but envisions that PC cards, embedded chipsets, and roaming agreements will allow it to offer mobile services.¹¹³ DigitalBridge offers services in 13 communities in five states.¹¹⁴ Because the company takes a regional approach, and because Sprint Nextel and Clearwire have already been “seeding the market,” DigitalBridge was able to secure the relatively modest \$40 million in financing it needed to launch in 15 communities. DigitalBridge was able to outsource its back office systems (customer care, billing, and data centers), creating a low-fixed-cost and scalable approach.¹¹⁵ DigitalBridge has already achieved more than nine percent penetration in its first market (Rexburg, Idaho, with 21,000 POPs), after only about six months and an investment of less than \$260,000.¹¹⁶

2. Satellite Providers

Satellite broadband is one of the most widely available of the broadband technologies.¹¹⁷ There are currently at least three companies offering service using geostationary satellites – WildBlue Communications, Hughes Network Services LLC, and Skyway, USA LLC.¹¹⁸ Satellite broadband use grew from less than 50,000 subscribers in 2004 to an estimated 700,000

¹¹⁰ Salemme, Tr. at 220.

¹¹¹ *Sprint/Clearwire Transfer Application*, Exhibit 1, at 1, 19; see also *Clearwire Press Release*.

¹¹² William F. Wallace, DigitalBridge Communications Corporation, “DigitalBridge Presentation,” 2007 DOJ Telecommunications Symposium, Nov. 29, 2007, at 2 (“*Wallace Presentation*”); Wallace, Tr. at 226-27.

¹¹³ Wallace, Tr. at 227-28; *Wallace Presentation*, at 2-3.

¹¹⁴ DigitalBridge website, <http://www.digitalbridgecommunications.com/OurTowns/tabid/69/Default.aspx>.

¹¹⁵ Wallace, Tr. at 231; *Wallace Presentation*, at 5.

¹¹⁶ Wallace, Tr. at 232; *Wallace Presentation*, at 6.

¹¹⁷ See *FCC Broadband Report*, at 4 (showing that satellite broadband serves at least one customer in 92 percent of U.S. zip codes at the end of June 2007).

¹¹⁸ WildBlue website, <http://www.wildblue.com>; Hughes Network Service website, <http://www.hughes.com>; Skyway website, <http://www.skywayusa.com>. A representative of WildBlue spoke at the Symposium. Inmarsat, through its Broadband Global Area Network, delivers satellite broadband access as a mobile service. *NTIA Broadband Report*, at 22. Its service is substantially slower than the services offered by the other providers. See *id.* at Table 5. Other satellite firms are planning to offer more robust satellite broadband services by combining satellite with an ancillary terrestrial component. None of these companies currently offer service but plan to do so in the next few years. See *id.* at 23.

by 2006.¹¹⁹ Despite this growth, however, less than one percent of all broadband users subscribe to satellite service.¹²⁰

Satellite broadband services are generally more expensive, especially considering equipment costs, and offer lower speeds than cable modem and DSL services.¹²¹ Because of its disadvantages, satellite broadband services are mainly

attractive in low population density areas where alternative broadband suppliers are not available.¹²² It is estimated that these areas comprise 10 to 15 percent of the country.¹²³

Satellite broadband services have been attractive primarily to consumers who cannot purchase DSL or cable modem services, particularly rural residents.

WildBlue indicated that its target market is approximately eight million consumers living principally in rural areas.¹²⁴ Seventy percent of WildBlue's customers live in an area where there are 30 homes or fewer per square kilometer.¹²⁵ David Brown, of WildBlue Communications, Inc., believes that satellite services will continue to have a competitive advantage over other broadband offerings in rural areas in the long term.¹²⁶ WildBlue has experienced significant growth in its first two years, signing up more than 275,000 customers.¹²⁷

Brown stated that one factor that has led to the company's success is that WildBlue was able to substantially lower the cost of customer-premises equipment to well below \$1,000 by using a system that is based on the DOCSIS cable modem standard.¹²⁸ Because the technology is based on the same chip, WildBlue is able to take advantage of the economies of scale driven by

¹¹⁹ *Id.* at 23 (citing *TIA Market Review* at 71 & Table II-2.36). The FCC figures for satellite broadband access show about 669,000 subscribers as of June 2007. *FCC Broadband Report*, at Table 1.

¹²⁰ *FCC Broadband Report*, at Table 1.

¹²¹ Monthly charges for services generally start at \$50 to \$70 per month for download speeds ranging from 500 kbps to 1 Mbps and increase for higher speed offerings. *See generally NTIA Broadband Report*, at Table 5, citing Satellite Industry Association. Some providers offer lower speed plans at lower prices. *See, e.g.*, Skyway website, www.skywayusa.com/order.php (offering 256 kbps at \$29.95/month, compared with 512 kbps at \$49.95/month).

¹²² Grayer, Tr. at 276-77; Brown, Tr. at 287-88, 291.

¹²³ Grayer, Tr. at 277.

¹²⁴ Brown, Tr. at 286.

¹²⁵ *Id.* at 287.

¹²⁶ *Id.* at 326.

¹²⁷ *Id.* at 284.

¹²⁸ *Id.* at 286-87. WildBlue equipment can be purchased for \$299 with a one year commitment or \$249 with promotional discounts. *See* <http://www.wildblue.com/getWildblue/availability.jsp>.

the tens of millions of cable modems deployed.¹²⁹ WildBlue also has been able to reduce the size of its customer-premises equipment.¹³⁰

A second factor in WildBlue's success has been its use of distribution partners. The company sells through 1,500 dealers around the country and has wholesale distribution agreements with AT&T, DirecTV, DISH Network, and the National Rural Telecommunications Cooperative.¹³¹ AT&T offers WildBlue in areas where its DSL service is not available.¹³²

WildBlue's biggest impediment to further growth is the lack of available capacity in certain areas.¹³³ The company continues to work on designs to improve the efficiency of its satellites and reduce latency issues,¹³⁴ while attempting to reduce the cost of its equipment and service.¹³⁵

3. Broadband over Power Line

BPL is a hybrid network that uses fiber or wireless facilities to connect to the electric distribution grid and then rides on the medium and low voltage portions of the electrical grid to provide broadband Internet access to homes.¹³⁶ Although deployments of the technology have been around for some time, BPL has not achieved much success.¹³⁷ According to the United Power Line Council, there are 35 BPL deployments in the United States ranging from pilot projects to commercial deployments.¹³⁸ The FCC estimates that as of the end of June 2007, there were over 5,300 BPL customers.¹³⁹ Other estimates are substantially higher.¹⁴⁰

¹²⁹ Brown, Tr. at 286-87.

¹³⁰ *Id.* at 291-92.

¹³¹ *Id.* at 290.

¹³² *Id.* at 320.

¹³³ Brown, Tr. at 288-89; Grayer, Tr. at 278. According to a trade journal report, WildBlue has made additional capacity available since the Symposium. COMM. DAILY, Aug. 29, 2008, at 5-6.

¹³⁴ Brown, Tr. at 292; Grayer, Tr. at 277-78 (satellite has latency disadvantage as to other broadband services).

¹³⁵ Brown, Tr. at 292.

¹³⁶ Herron, Tr. at 293.

¹³⁷ Grayer, Tr. at 279.

¹³⁸ *NTIA Broadband Report*, at 26.

¹³⁹ *FCC Broadband Report*, at Table 3.

¹⁴⁰ One source estimated that by the end of 2006, there were 75,000 U.S. subscribers to BPL services. Brendan Herron, CURRENT Group, LLC, "Broadband Overview," 2007 DOJ Telecommunications Symposium, Nov. 29, 2007, at 5 ("*Herron Presentation*"). TIA estimated 200,000 BPL subscribers in 2007, increasing to 700,000 by 2010. *NTIA Broadband Report* at 26 (citing *TIA Market Review* at 69). Another source predicted

Several reasons have been advanced for the failure of BPL to make more of an impact. First, BPL was not able to offer a service that was competitive in terms of technical capabilities or price previously.¹⁴¹ However, newer BPL offerings support speeds as high as 10 Mbps, which are comparable with most wireline broadband speeds. Second, utilities were not convinced that BPL was a good investment given the cost to roll out a network and the need to compete for subscribers against established broadband providers. The expected revenue from broadband services alone was not enough to justify the cost of building a network.¹⁴² However, today utilities that are upgrading to take advantage of Smart Grid technologies to manage the electric grid may find it efficient to provide BPL service over their upgraded networks.¹⁴³

According to Current Group, LLC, BPL has several advantages over other broadband services. First, it uses the existing electrical wires that are connected to every home, eliminating the need to construct “last-mile” facilities (the wireline connection to an individual customer’s premises).¹⁴⁴ Second, installation involves only plugging the modem directly into an electrical outlet in the home. Neither additional wiring nor a technician visit is required.¹⁴⁵ Subscribers can move their Internet access to another room by unplugging the modem and connecting it to a different outlet.¹⁴⁶ Third, the service is near-symmetrical (upload speed is similar to the download rate) which gives it an advantage for certain types of applications (such as file sharing).¹⁴⁷

400,000 customers by the end of 2007, growing to 2.5 million by the end of 2011. *NTIA Broadband Report*, at 26 (citing C. Roden, *FTTx and BPL: Analysis and Outlook, First Quarter 2007*, Parks Associates, available at http://www.parksassociates.com/research/reports/tocs/2007/bpl_fttx.htm (link to purchase report)).

¹⁴¹ See Grayer, Tr. at 280.

¹⁴² *Id.*; see also *NTIA Broadband Report*, at 26.

¹⁴³ *New Technologies*, COMM. DAILY, Jan. 25, 2008, at 15. “A Smart Grid combines advanced sensing technology, two-way high-speed communications, 24/7 monitoring and enterprise analysis software and related services to provide location-specific, real-time actionable data to all departments in a utility.” Current Communication website, <http://www.currentgroup.com>. This offers several advantages to utilities and the general public even without broadband. Smart Grid systems can make electricity use more efficient by allowing better load management, which can both preserve resources and cut pollution. The Electric Power Research Institute estimates that distributing Smart Grid technologies throughout the United States could save five to ten percent of electric usage and cut carbon dioxide emissions caused by electricity generation up to 25 percent. Herron, Tr. at 296. This translates to ten percent overall reduction in carbon dioxide emissions nationwide. *Id.* at 297. Smart Grid also allows a utility to improve the efficiency and reliability of its network by providing information about what is happening on the grid, through such capabilities as advanced metering and detection of outages. Grayer, Tr. at 280-81; Herron, Tr. at 297. In addition, the technology allows for the use of distributed grids that take advantage of other sources of energy (such as solar power). Herron, Tr. at 298.

¹⁴⁴ Herron, Tr. at 293.

¹⁴⁵ *Herron Presentation*, at 4.

¹⁴⁶ Herron, Tr. at 294.

¹⁴⁷ *Id.* at 295.

Current has operated a BPL service for several years in Cincinnati in conjunction with Duke Energy Corp. using an older technology.¹⁴⁸ Approximately 20 percent of the households passed buy the service even though it offers lower speeds than competitors and cannot provide video or voice services that competitors offer. Current thinks that this is because customers like the ease of use, symmetrical speeds, and the ability easily to move the service from room to room.¹⁴⁹

At the time of the Symposium, Current was deploying a network in the Dallas-Fort Worth area for local utility Oncor. It expected to reach approximately 1.8 million homes in four years.¹⁵⁰ The service offered speeds up to 8 Mbps and was to be competitively priced.¹⁵¹ The service was being offered on a retail basis and wholesale through DirecTV. However, Current subsequently was reported to have abandoned its plans for providing BPL services in Dallas, and sold its Smart Grid networking equipment to Oncor.¹⁵²

¹⁴⁸ *Id.* at 299.

¹⁴⁹ *Id.* at 299-300. While this discussion focuses on Symposium participant Current Communications, other companies – such as Ambient Corp., Communications Technologies Inc. (COMtek), International Broadband Electric Communications, Inc. (IBEC), and MainNet Communications – also provide BPL services.

¹⁵⁰ Herron, Tr. at 298-99.

¹⁵¹ Grayer, Tr. at 279.

¹⁵² *DirecTV Weighs Impact of Clearwire-Sprint Alliance*, COMM. DAILY, May 8, 2008, at 9.

II. THE EFFECTS OF COMPETITIVE ENTRY

A. Economic Principles Affecting Facilities-Based Telecommunications Competition

Economic theory provides a framework for better understanding the cost and demand conditions under which competition can develop in telecommunications markets.¹⁵³

1. The Classic Model of High Sunk-Cost Industries

Dr. Wilkie provided the Symposium with an overview of certain economic principles affecting telecommunications, including how the need to make high sunk cost investments and the difficulties of recouping these costs have deterred entry. A large part of the cost of facilities-based entry is the cost of building the network, which is a sunk cost (the assets cannot be redeployed for an alternative purpose if the business fails). In general, entry is unlikely to occur where the sunk cost of entry cannot be defrayed by the revenue likely to be earned. It would therefore be very difficult for a new facilities-based telecommunications company to enter and compete successfully against incumbent providers if its product is identical to existing offerings and it does not have significantly lower costs than the incumbent.¹⁵⁴ This is because competition tends to drive price down to the cost of producing the next unit of the product (marginal or incremental cost), providing no opportunity to recoup large sunk costs.¹⁵⁵ Competition between the entrant and the incumbent could thus prevent the entrant from recouping the sunk cost of building its network.

In addition, a very large part of the cost of deploying a wireline telecommunications network to serve residential customers has been that of the “last-mile” connections (such as the local copper loops and coaxial cable drops) that

Telecommunications is a high-sunk cost industry. A large portion of the cost of deploying a wireline network is providing last-mile connections, which are dedicated to a specific household.

¹⁵³ Although this chapter provides some explanation of how the characteristics of an industry affect entry, it does not address all factors that may influence competition. As Dr. Wilkie noted, further study would advance the analysis of the complex telecommunications sector. Wilkie, Tr. at 125-26, 134-39 (effects of bundling and effects of incomplete information are among the areas where economic theory needs further development).

¹⁵⁴ See Wilkie, Tr. at 131-33. Dr. Wilkie refers to this scenario – entry being discouraged by the prospect of intense post-entry competition – as the “dumb pipe paradox.”

¹⁵⁵ See Jean Tirole, *THE THEORY OF INDUSTRIAL ORGANIZATION*, 209-11 (MIT Press, Cambridge 1988) (“*Tirole*”) (section discussing the Bertrand paradox); see also Dennis W. Carlton & Jeffrey M. Perloff, *MODERN INDUSTRIAL ORGANIZATION*, 244-46 (HarperCollins College Publishers, New York, 2d ed. 1994) (“*Carlton & Perloff*”). Competition here means that the firms in the market do not maintain prices above competitive levels through coordinated behavior, in the form of either explicit agreements or tacit coordination. Coordination could allow firms to recover much or all of their sunk costs, but at the expense of greater total costs. There may be significant opportunities for such conduct in a duopolistic or oligopolistic market with high cost of entry. The likelihood of successful coordination depends on a variety of factors, including product homogeneity, the stability of market shares over time, and the ability to monitor prices charged by other firms in the market and punish deviations from the coordinated level. See *Horizontal Merger Guidelines* § 2.1.

allow each customer to access the network. These last-mile connections were dedicated to providing service to a specific customer location, making it difficult, if not impossible, for a firm to recoup its sunk costs if that customer canceled service.¹⁵⁶ In addition, last-mile connections were used to provide only a single service because of the state of technology and regulatory policy. The traditional copper loop provided only telephone service, and the coaxial cable provided only multichannel video service, with neither network serving as a substitute for the other. Regulatory policy historically viewed each incumbent provider as a “natural monopoly” subject to price regulation and protection from entry.¹⁵⁷

2. Sources of Competition: Deviations from the Sunk-Cost Model

Facilities-based competition is emerging today in telephony, video, and broadband services. Legal prohibitions on entry in telephone and cable markets have been removed, and telephone networks have been required to interconnect with competitors to facilitate the necessary exchange of traffic between subscribers of

Today facilities-based competition is emerging in part because of changes in technology that allow companies to provide multiple services over a single connection and reduce the cost of constructing last mile facilities.

different companies. Competition is more feasible because new technologies have both reduced the sunk cost of installing last-mile facilities and allowed for the provision of multiple services over the facilities, including new services (such as broadband Internet access).¹⁵⁸

Development in technology has enabled providers to challenge other incumbents in traditional markets.¹⁵⁹ Cable companies have made significant investments to upgrade their facilities to provide more advanced video, offer broadband with cable modems, and provide telephony over what were historically one-way distribution networks. Although a few cable

¹⁵⁶ Construction of new loop facilities by an entrant raises the question whether the benefit the customer receives from facilities-based competition is sufficient to justify the sunk cost of building duplicate facilities, only one of which will be used to provide service. Duplicative facilities would not be an issue if the customer owned its own connection infrastructure (that is, the “last mile” referred to above) and could make it available to the provider it chose. Although this is the case in many industries with high sunk costs, it is not how the infrastructure has evolved for most telephony and video networks.

¹⁵⁷ See Wilkie, Tr. at 131 (discussing “natural monopoly” characteristics of telecommunications and potential effects of “premature deregulation”).

¹⁵⁸ See *id.* at 132.

¹⁵⁹ From an economic standpoint, convergence can be seen as a very substantial reduction in the costs that must be sunk in order to compete in another market. When these costs are low and entry reasonably can be expected to increase the entrant’s profits, classic “Prisoner’s Dilemma” analysis indicates that firms will be drawn into new competition with one another unless they agree – tacitly or expressly – not to compete by declining to enter each other’s markets, or dividing customers, or jointly setting prices. See *Carlton & Perloff* at 254-56 (discussion and example of the Prisoner’s Dilemma); *Tirole* § 6.5.1 at 258 (conditions in which cooperation may develop). Although both firms might find it beneficial to mutually stay out of each other’s markets, such an agreement would be difficult to enforce without regulatory restrictions on entry, and also likely would be per se illegal and subject to criminal prosecution.

companies offered telephone services using circuit-switched technology in limited areas,¹⁶⁰ cable telephony was limited until the advent of VoIP technology. Building on their preexisting connections into customer premises and the cost savings enabled by VoIP technology, the cable companies have made their telephone services available to a large number of U.S. households – 100 million – in the past few years.¹⁶¹ As a result, cable telephony has become the main facilities-based alternative to the ILECs for residential consumers.¹⁶² The telephone companies similarly have been able to use their last-mile copper loops to provide DSL broadband services in competition with the cable companies. Limitations on the ability to use copper plant for video and higher-speed broadband have resulted in some companies constructing fiber networks to compete more effectively in providing these services.¹⁶³

A second factor facilitating increased competition has been the overall reduction in costs that must be sunk to construct customer-specific facilities. Dr. Wilkie observed that the level of investment needed for a wireline connection to the home has fallen sharply, from approximately \$2,900 per household to as little as \$700 per household now with passive optical networks,¹⁶⁴ reducing the revenues needed for recoupment.¹⁶⁵ This development has strengthened the economic case for fiber-to-the-home.

In addition, wireless technologies are often more efficient to deploy than wireline networks because wireless requires little or no investment in facilities dedicated to a specific customer.¹⁶⁶ A customer needs only a telephone or other device to be connected, and wireless companies do not need to invest in the telephone until the customer signs up for service. The ability of wireless services to compete with wireline services, however, may be significantly affected by speed, quality, and the availability of spectrum.¹⁶⁷

¹⁶⁰ Cox, for example, installed more expensive circuit switching in parts of its network to provide telephone service even before VoIP technology became available, and still has those switches in its networks. *See* Wilson, Tr. at 87-88.

¹⁶¹ Wilson, Tr. at 90.

¹⁶² *See supra* Chapter I.B (discussing the role of cable telephony).

¹⁶³ To sustain facilities-based competition over the long run, however, providers must be able to earn a margin of prices over average variable costs that is large enough to cover depreciation, so as to allow for the replacement of infrastructure facilities of both networks.

¹⁶⁴ “Passive optical networks” are fiber optical networks without active electronics (such as repeaters) relying on passive optical splitters to deliver signals to multiple terminal devices. Use of this technology allows a network to be built without incurring the substantial costs for active electronics found in other types of telecommunications networks.

¹⁶⁵ Wilkie, Tr. at 132.

¹⁶⁶ Although wireless carriers do not invest in customer-specific facilities, they do invest substantial amounts to build, maintain, and upgrade their networks. As of 2006 wireless carriers’ total annual capital investment in the United States was nearly \$28 billion. *Telephone Trends* at Table 17.6.

¹⁶⁷ *See infra* Chapters II.C, II.E, and III.C.

As noted above, the tendency toward monopoly in industries with high sunk costs rests in significant part on the assumption that competing firms would each produce the same product or very close substitutes, so that competition would drive prices below the level needed by an entrant to recoup its sunk costs. Entry is more likely, however, when providers can differentiate their products, thus reducing the extent to which consumers view them as exactly the same, allowing each firm greater ability to recoup its sunk costs.¹⁶⁸ At the same time, competition between differentiated products can still bring prices closer to marginal cost than with a monopoly provider, if enough consumers find the products sufficiently substitutable.

Technological change has also created new services and improved the quality of existing services, increasing value to consumers and potentially allowing new firms to enter. For example, mobile wireless companies provide consumers with the advantage of being able to communicate while away from home. Broadband Internet access services greatly increase the value of both wireline and wireless networks as higher speeds permit new applications (such as high quality streaming video and downloads of feature films). The ability to earn greater revenue from a given investment makes it easier to recoup sunk costs.

3. Regulation and Other Factors that Can Lead to Imperfect Competition

There are other factors, in addition to consumer demand and the cost of deploying networks, that can affect if and when firms enter and whether entry is economically efficient. One factor is the existence of regulation, which can affect both the ability of firms to enter and the prices they can charge.

Local telephone services traditionally have been subject to regulation to achieve public policy goals (such as ensuring that service is universally available at reasonable prices). To provide affordable services to customers in high-cost (typically rural) areas, regulators have helped the incumbent defray some of the costs of serving those areas. Subsidies of this sort have not usually been funded out of traditional tax revenues. Instead, the subsidies have been funded by an implicit tax on customers in other areas where the regulator allows the incumbent to charge more than is needed to cover the relatively low cost of service.¹⁶⁹ This kind of regulation is still prevalent in many jurisdictions and it creates an opportunity for new entrants to target areas where the incumbents are earning excessive profits (lower-cost areas) even though the new entrant may not be as efficient as the incumbent.¹⁷⁰ It may also deter entry in high-cost areas by firms that may be able to serve those customers at a lower cost than the incumbents, because

¹⁶⁸ Differentiation can be in the quality of service (such as broadband speeds), pricing (such as flat fee plans) or additional services (such as video-on-demand (“VOD”) or high definition (“HD”)).

¹⁶⁹ These types of subsidies requiring a company to charge the same prices to customers located in different geographic areas, even where a company might well choose for reasons of differing costs or other efficiencies to charge different prices to these sets of customers, are known as “price averaging.” Subsidies can take many forms, including explicit payments to fund telecommunications services to institutions (such as schools and libraries), and the implied subsidies between high and low cost customers where price averaging requirements are imposed.

¹⁷⁰ Hank Intven, Jeremy Oliver & Edgardo Sepulveda, *TELECOMMUNICATIONS REGULATION HANDBOOK, Module 6, Universal Service* 6-14 (Hank Intven ed., World Bank 2000), available at <http://cbdd.wsu.edu/e/dev/edp/intven-2000b-universality.pdf>.

regulation has kept prices artificially low. For example, wireless technology may be the most efficient way to provide service in rural areas, but wireline service is subsidized.

Regulatory policies may distort entry decisions in other ways. For example, requiring an entrant to construct facilities to all of a particular geographic area may require it to serve areas where there is insufficient demand or the cost of serving the area is too high to support two firms. When faced with these types of demands, an entrant can either build out and incur higher overall costs or forego providing services in a geographic area altogether, including those areas where competitive entry would have been efficient.¹⁷¹

Telecommunications markets are also characterized by imperfect access to information. In the classic high sunk cost model, a firm that could only offer a product identical to an incumbent's would not choose to enter because its best price would be undercut or equaled by the incumbent, and demand by informed customers would be insufficient to allow the entrant to recoup its sunk costs. However, consumers sometimes are unaware of the terms offered by all competitors, and offers are often complex and hard to compare.¹⁷² This may weaken incentives for firms in the market to compete on price and distort incentives to enter or leave the market.

B. Consumer Benefits from Competition in Video and Local Telephony

The evidence indicates that there has been substantial entry in video and local telephony. Cable companies are able to offer telephone services to more than 80 percent of households. In addition, cable companies face competition in the provision of MVPD services from DBS providers, BSPs, and now telephone companies building fiber-based networks. Although the degree and type of entry have varied from place to place, entry generally has resulted in increased quality and wider choices for consumers. Consumers in many areas are offered faster and better Internet broadband access and improvements in the quality and variety of video programming. Companies are offering more HD and other channels, new equipment, and other features designed to improve customer experience.

There was some dispute among Symposium participants over how and to what extent prices for video services are being affected by competition. Studies of earlier entry by BSPs indicate that BSP competition has provided a greater constraint on an incumbent cable

¹⁷¹ The Department filed comments with the FCC discussing the effect of build-out requirements imposed as part of the video franchising process, focusing on the economic effect of these requirements rather than whether those requirements served some other social interest. *DOJ Cable Ex Parte Submission*, at 12-16 (encouraging the FCC to address what would constitute an “unreasonable refusal” by a local franchising authority to award a competitive video franchise and expressing concern about certain demands made by these authorities).

¹⁷² The prices of telecommunications services can be difficult for customers to compare and it is common for different customers purchasing at the same time to be paying different prices for the same services (or for services that seem very similar). This pattern of behavior would follow from consumers minimizing their own search costs by only infrequently attempting to find a better price for telecommunications services. The economic model of “viscous demand” (where most customers respond slowly to price changes) is developed in Roy Radner & Thomas J. Richardson, *Monopolists and Viscous Demand*, 45 *GAMES & ECON. BEHAV.* 442-64 (2003). The implications of “viscous demand” for competition can be significant. In such a model, the lag in customer response to prices can lead to a firm retaining customers even if it would be more efficient for another firm to serve them – diluting the incentives to compete on price, to fund entry, and even to make investments.

company's video pricing than has satellite-based competition alone.¹⁷³ Consequently, there is an expectation that price competition will increase where facilities have been expanded or upgraded to allow telephone companies to provide video. Verizon claimed this has been the case for its FiOS service and offered comparisons showing that its price is lower than the incumbent cable company's in most, but not all, areas where it provided data.¹⁷⁴ Other speakers pointed to rising video prices and expressed doubt that entry by the ILECs is effectively constraining cable companies. Related concerns have been raised by FCC Chairman Kevin J. Martin, who has stated that "[t]he cost of basic cable services ha[s] gone up at a disproportionate rate – 38% between 2000 and 2005 – when compared against other communications sectors."¹⁷⁵

Disagreement about the effect on prices of entry by new video providers is due in part to the difficulty of making such assessments in light of pricing and quality variations. Competing video service providers frequently offer different packages of regular and HD channels and varying features (such as the ability to obtain movies on demand). Some customers may also benefit from temporary price promotions.¹⁷⁶ In addition, existing subscribers may pay higher prices than new subscribers or subscribers who threaten to change providers. Customers also typically can get discounts by agreeing to purchase bundles that include video, telephone or broadband services or signing long-term contracts.¹⁷⁷ Finally, any assessment of the effects of entry needs to look not only at the magnitude of price changes, but also at how prices compare to what consumers would have paid absent the new entry. Determining "but for" prices is inevitably difficult and complicated by the fact that video price increases may be necessitated by the increased cost associated with providing higher quality services.

¹⁷³ See Gov't Accountability Off., *Telecommunications: Direct Broadcast Satellite Subscribership Has Grown Rapidly, but Varies across Different Types of Markets*, GAO-05-257, at 33 (Apr. 2005) ("GAO 2005 Study") and Gov't Accountability Off., *Telecommunications: Wire-Based Competition Benefited Consumers in Selected Markets*, GAO-04-241 (Feb. 2004) ("GAO 2004 Study").

¹⁷⁴ Verizon also compared service offerings to illustrate that customers get a wider array of channels from Verizon for the prices being compared.

¹⁷⁵ Written Statement of The Honorable Kevin J. Martin, Chairman, Federal Communications Commission, Before the Committee on Commerce, Science and Transportation, U.S. Senate (February 1, 2007), at 6.

¹⁷⁶ Providers may raise prices after a promotional period upon entry. See Lawton, Tr. at 59-60; see also Raclin, Tr. at 51 (referring to Verizon raising prices after entry).

¹⁷⁷ Bundles of services are often priced at a substantial discount relative to the same services sold separately from the same provider, but not necessarily lower than the best combination a customer might be able to put together from different providers.

Even with this uncertainty about the effect entry has had on prices, consumers appear to be benefitting today from the increase in the number of providers. The extent and nature of these benefits may depend on how competition evolves over time. Facilities-based competition among providers offering bundles of voice, video,

Consumers in many areas now have additional choices for the provision of telecommunications services, and providers are competing by offering subscribers more video channels and features and higher quality services.

and broadband services is just beginning to develop, so predictions about its future impact can be very sensitive to assumptions used in an economic model. One economist pointed out that some of the assumptions typically used in modeling would not fit telecommunications.

Telecommunications customers often stay with rates or plans that are not as advantageous, given that customer's usage pattern, as a more recent offer from its provider or others. In addition, carriers acknowledge that customers who purchase bundles of services have lower churn rates than other customers. To Dr. Wilkie, these observations suggest that consumer switching costs may be an important factor in evaluating competition and that changes in providers' offerings can impact consumers' switching costs.¹⁷⁸ If these considerations are significant, then early competition (arguably what can be observed today) may just be the carriers' way of establishing their relative positions so that, in the future, they may be able to take advantage of customers' resistance to changing providers and limited competition. Such possibilities pose a problem for regulators evaluating requests by industry participants to limit or remove existing regulations based on an expectation that future competition will look much like it does today. Dr. Wilkie proposed additional study to develop better models of competition that reflect the particular characteristics of telecommunications consumers and the impact of bundling voice, video, and broadband services.¹⁷⁹

Because WiMAX systems and other new technologies are only beginning to be deployed, it is not yet possible to evaluate how effective these services will be. The prospects of WiMAX benefitting a substantial percentage of the population will depend on such factors as the ability to keep costs low, the value that consumers place on mobility and the response of existing providers. Satellite broadband is attractive primarily in rural areas, and providers do not position their services to compete directly against cable and telephone companies.

1. Price Effects of Competition

a. Video

There was substantial disagreement among panel participants as to whether consumers were seeing lower prices as a result of the telephone companies' entry into video services. John Thorne, of Verizon, John Goodman, of the BSPA, and Dr. Singer asserted that consumers were

¹⁷⁸ See Wilkie, Tr. at 133-37.

¹⁷⁹ See *id.* at 125, 134-35, 137, 139-40.

paying lower prices as a result of wireline competition in video services, citing various government and industry studies.¹⁸⁰

Dr. Singer presented several economic studies estimating annual benefits from telephone company entry into video markets ranging between \$6 and \$14 billion based on evidence from past entry by overbuilders.¹⁸¹ He also observed that cable price inflation appeared to be slowing.¹⁸² Dr. Singer cited a 2006 FCC finding that cable rates were 17 percent lower in the relatively few areas where a multisystem cable operator (“MSO”) faced competition from a wireline overbuilder than elsewhere, and a 2005 Government Accountability Office (“GAO”) study similarly finding that cable rates were 16 percent lower where an MSO faced wireline overbuilder competition.¹⁸³ Another 2006 study cited by Dr. Singer predicted a 14 percent decrease in price from telephone company entry into video.¹⁸⁴ In addition, Dr. Singer pointed to a January 23, 2006, Bank of America report that found in areas where Verizon has been rolling out its FiOS FTTH network, the cable MSOs responded with targeted price cuts of 28 to 42 percent.¹⁸⁵

¹⁸⁰ *Verizon Submission*, at 4-5; Goodman, Tr. at 31-32; *BSPA Submission*, at 5-6; Hal J. Singer, Criterion Economics, “The Consumer Benefits of Telco Entry in Video Markets,” 2007 DOJ Telecommunications Symposium, Nov. 29, 2007, at 5-8 (“*Singer Presentation*”); *Singer Supp. Submission*, at 3 & n.11.

¹⁸¹ *Singer Presentation*, at 2. The studies cited included: Robert Crandall et al., *Does Video Delivered over a Telephone Network Require a Cable Franchise?* 59 FED. COMM. L.J. 251 (Mar. 2007) (\$6 billion annual benefit); Robert Crandall & Robert Litan, *The Benefits of New Wireline Video Competition for Consumers and Local Government Finances*, Criterion Working Paper (May 2006) (\$7.5 to \$14 billion annual benefit); Thomas W. Hazlett, *George Mason Law & Economics Research Paper* (2006) (\$9 billion annual benefit); Jerry Brito & Jerry Ellig, *George Mason Working Paper* (2006) (\$8 billion annual benefit); and George S. Ford & Thomas M. Koutsky, *Phoenix Center Policy Bulletin* (2006) (\$8 billion annual benefit). Dr. Singer noted that these estimates are likely to be conservative because they are based on evidence from BSP competition and the telephone companies are likely to be stronger competitors than the BSPs. *Singer Presentation*, at 2.

¹⁸² *Singer Presentation*, at 4.

¹⁸³ *Singer Presentation*, at 7 (citing Report on Cable Industry Prices, *In the Matter of Implementation of Section 3 of the Cable Television Consumer Protection and Competition Act of 1992*, 21 FCC Rcd 15,087, ¶ 2 (2006), and *GAO 2005 Study*, at 33).

¹⁸⁴ *Singer Presentation*, at 10 (citing T. Hazlett, *George Mason Law & Economics Research Paper* (2006)).

¹⁸⁵ *Id.* at 8. The Bank of America study identified targeted price cuts of 43 percent by Cox, 29 percent by Charter, and 38 percent by BrightHouse. Bank of America Equity Research, *Battle for the Bundle: Consumer Wireline Services Pricing*, at 10 (Jan. 23, 2006) (surveying prices in Herndon, Va., Keller, Tx., and Temple Terrace, Fl.). As Fairfax County pointed out, however, the Bank of America report is based on unadvertised promotional discounts. Reply Comments of Fairfax County, Virginia, *In the Matter of Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming, Implementation of Section 621(a)(1) of the Cable Communications Policy Act of 1984 as amended by the Cable Television Consumer Protection and Competition Act of 1992*, FCC MB Docket Nos. 06-189, 05-311, at 16 & n.39 (filed Jan. 16, 2007) (“*Fairfax County Reply Comments*”). Fairfax County argues, therefore, that the report is not a good prognosticator of the long-term effects of competitive entry on cable prices and/or future equilibrium pricing, a point Bank of America subsequently conceded. *Id.* (citing Bank of America Equity Research, *Battle for the Bundle: Consumer Wireline Services Pricing*, at 18 (Apr. 18, 2006)) (“As we wrote last quarter, we note that these are in many cases un-advertised offers and we believe that they do not necessarily represent the equilibrium pricing that will prevail longer term in these markets.”).

Goodman, of the BSPA, also cited evidence of the benefits of competitive wireline entry, both in video and other services. Specifically, he pointed to a February 2004 study by the GAO, which found that, in markets with wireline competition from second cable companies, rates for video were between 15 and 41 percent lower than elsewhere and on average 23 percent lower. For broadband and telephony services, rates were on the order of five to 15 percent lower. According to this study, wireline competition led to increased penetration of both broadband Internet service and enhanced digital television and improved customer satisfaction.¹⁸⁶

Verizon provided examples of the consumer price and quality benefits of video entry based on its experience.¹⁸⁷ Verizon provided data showing that in five areas where the company is operating, the 2008 price for its FiOS TV Premier digital package (including the set top box) is two to nine percent lower than the cable companies' prices for packages with fewer channels.¹⁸⁸

Evidence was presented to support the view that the entry into video services by the ILECs has resulted in lower prices for consumers, including pricing data suggesting that Verizon offers packages with more channels at lower prices than the cable companies.

Although Verizon raised the price of its FiOS TV Premier service to \$47.99 (not including the set top box) for new customers beginning in January 2008, Verizon explained that the increase reflected increased costs to Verizon and that nearly one million existing customers under contract are not affected by the increase.¹⁸⁹ Verizon also observed that its 2008 rate packages are still priced below those of the cable companies, which have raised prices over the past three years.¹⁹⁰

Dr. Singer predicted positive welfare effects from Verizon's entry even assuming that Verizon increased the price of FiOS nationwide after the initial introductory period for new and existing customers. He based this conclusion on evidence that Charter Communications Inc. offered targeted rate cuts in anticipation of Verizon's entry and Verizon's prices for stand-alone

¹⁸⁶ John Goodman, Broadband Service Providers Association (BSPA), "Overview Presentation," 2007 DOJ Telecommunications Symposium, Nov. 29, 2007, at 6 ("*Goodman Presentation*") (citing *GAO 2004 Study*). These benefits from competition by broadband wireless providers are limited geographically, however, as less than 5 to 7 percent of local markets have such wireline competition. See *Goodman Presentation*, at 7; *BSPA Submission*, at 7.

¹⁸⁷ Thorne also cited a variety of studies, including some of the studies cited by Dr. Singer and Goodman to demonstrate the benefits of wireline competition on cable rates. See *Verizon Submission*, at 4-5. According to a 2005 FCC finding cited by Verizon, there were 27 percent rate reductions on a per-channel basis where wireline competition was present compared with only 2.6 percent reductions from DBS competition. *Id.* at 5.

¹⁸⁸ *Verizon Supp. Submission*, at Table 2 (comparing markets in Massapequa Park, NY (Cablevision), Bethesda, MD (Comcast), Beaumont, CA (Time Warner), Virginia Beach, VA (Cox), Keller, TX (Charter), and Tampa, FL (Bright House Networks). In Beaumont, Verizon's price without HD reception is higher than Time Warner's price, but Verizon offers more channels.

¹⁸⁹ *Id.*, at 4-5,8; see also *Singer Supp. Submission*, at 1-2. Verizon explained that it plans on increasing the number of HD channels it offers from 20 to 150 by the end of 2008. It also plans to expand its VOD offerings and introduce a new interactive media guide.

¹⁹⁰ *Verizon Supp. Submission*, at 5, 8.

video service were below Charter's at the outset.¹⁹¹ Dr. Singer suggested that Verizon's introductory price in Keller, Texas may have been set below Verizon's profit-maximizing price.¹⁹²

Contrary views disputing the benefits of facilities-based video competition were offered by some, including incumbent cable companies and two local franchising authorities ("LFAs").¹⁹³ Grier Raclin, of Charter, contended that because Charter faces competition from a variety of sources in addition to telephone companies, it does not react to new telephone company entry into video by immediately dropping prices. Charter's primary response to competitive entry has been to offer bundles.¹⁹⁴ Contrary to Dr. Singer's assertion, Raclin explained that Charter did not drop its MVPD prices in Keller, Texas, in anticipation of Verizon's entry, but executed a previously planned price increase.¹⁹⁵

Others disputed whether consumers are receiving price benefits, pointing to the large price increases that both Verizon and the cable companies have imposed in recent years.

Fairfax County, Virginia, and the Honorable Jane Lawton, on behalf of Montgomery County, Maryland, disputed whether competitive entry in video programming has yielded substantial consumer benefits. Lawton described a competitive environment in Montgomery County with four wireline video alternatives, including the incumbent Comcast, RCN (in the market since 2000), Verizon (in the market since 2007), and Cavalier (in the process of entry).¹⁹⁶ Lawton did not believe that wireline competition had constrained prices charged by incumbent cable operators. According to Lawton, since Montgomery County granted competitive cable franchises, stand-alone video programming prices have continued to rise, service complaints have increased, customer safeguards have declined,¹⁹⁷ and programming choices have not

¹⁹¹ *Singer Supp. Submission*, at 1-2.

¹⁹² *Id.*

¹⁹³ Raclin, Tr. at 50-51; Lawton, Tr. at 58-59; *Fairfax County Reply Comments*, at 10-11.

¹⁹⁴ Raclin, Tr. at 50-51.

¹⁹⁵ *Id.*

¹⁹⁶ Lawton, Tr. at 54; Jane Lawton, Cable Communications Administrator, Montgomery County, Maryland, "Local Franchising Supports Competition," 2007 DOJ Telecommunications Symposium, Nov. 29, 2007, at 3-4 (*"Lawton Presentation"*); Statement of the Hon. Jane Lawton, Cable Communications Administrator, Montgomery County, Maryland, "Local Franchising Supports Competition," 2007 DOJ Telecommunications Symposium, Nov. 29, 2007, at 6 (*"Montgomery County Submission"*). This does not mean that all consumers in Montgomery County have access to three competing wireline networks now, or will have access to four with Cavalier's entry.

¹⁹⁷ Customer safeguards at issue include protection from unreasonable contract terms and undisclosed fees (such as charges to terminate service and forced arbitration to resolve disputes), loss of privacy, and lack of guaranteed quality.

changed significantly.¹⁹⁸ In addition, new fees continue to be added to customers' bills.¹⁹⁹ Citing FCC data, Lawton observed that cable prices overall rose six percent in 2006, twice the rate of inflation. According to Lawton, since the first competitive MVPD provider entered Montgomery County in 2000, the incumbent's rates have risen 63.8 percent.²⁰⁰ Lawton also noted that Verizon recently raised its rates by 11.6 percent over its introductory rate. She reported that RCN increased rates by 5.6 percent in 2007.²⁰¹ These reported rate increases appear to relate to stand-alone video service prices, although Lawton also observed that consumers have faced price increases as much as 40 percent at the end of their introductory bundled discount period.²⁰²

Fairfax County has three wireline cable providers: two incumbents, Cox and Comcast, which serve non-overlapping franchise areas, and Verizon, which is licensed to compete throughout the county. Although Verizon's FiOS service now reaches about one-third of all households in the county, most households still do not have a competitive wireline choice.²⁰³ Verizon is offering consumers a stand-alone MVPD package with a larger number of channels than the incumbents at a similar price. Fairfax County reported that Cox and Comcast have increased their stand-alone video rates since January 2006 and that their rates have risen at a faster rate than before competitive entry. However, Fairfax County was unable to determine whether cable rates grew more slowly in areas where there was wireline cable competition.²⁰⁴ Fairfax County recognized that competition could bring consumers greater video choice and improved customer service, with entrants choosing to compete on such features as more channels and services, while matching the incumbent's prices.²⁰⁵

¹⁹⁸ Lawton, Tr. at 58-59; *Lawton Presentation*, at 7; *Montgomery County Submission*, at 6.

¹⁹⁹ Lawton, Tr. at 60. According to Lawton, Verizon has a truck trip fee of \$79.95, and RCN has a truck trip fee of \$49.95 to pick up the customer's set-top box when service is cancelled. Alternatively, RCN allows the customer to mail in the set-top box for \$22 or deliver it out of state to one of their offices. *Id.* at 60.

²⁰⁰ Lawton, Tr. at 59.

²⁰¹ *Id.*; *Lawton Presentation*, at 8; *Montgomery County Submission*, at 6 (citing price increase by Comcast for preferred basic service tier from \$36.85 to \$60.35 between 2000 and 2007).

²⁰² Lawton, Tr. at 59-60 (citing own experience of increase in bundled package price from \$119 to \$170); *Montgomery County Submission*, at 6.

²⁰³ *Fairfax County Reply Comments*, at i, 2-4, 17-18, 21.

²⁰⁴ *Fairfax County Reply Comments*, at iii, 5, 10, 18-24 (finding that during the initial period of head-to-head competition in parts of Fairfax County from January 1, 2006 to January 22, 2007, Cox's monthly cable rates rose more than 5 percent, while Comcast's monthly cable rates rose almost 4 percent, and Verizon's video service rates rose more than 9 percent, while as of January 22, 2007 Verizon's monthly rates were expected to rise to match exactly the \$47.98 rate of Verizon's principal competitor Cox).

²⁰⁵ *Id.* at 25-26.

b. Telephony

Several speakers presented evidence of consumer benefits from facilities-based telephony competition at the Symposium. Wilson, of Cox, cited a 2007 NCTA study finding that residential telephone consumers could save an average of \$135 or more per year, and small business customers could save \$500 or more per year, as a result of cable competition. In combination, on a nationwide basis, these two groups could save more than \$100 billion over the next five years.²⁰⁶ Perkins, of Cavalier, also discussed the consumer price benefits that could result from “third-wire” CLEC competition.²⁰⁷ Cavalier’s price for a residential local telephone service package is \$24.95, which is competitive with the ILEC price.²⁰⁸ Cavalier has been able to use the ILECs’ copper loops to provide IPTV to residential customers at attractive prices. Cavalier’s price for its triple-play bundle of \$79.95 per month was lower than any of the prices cited by incumbent telephone or cable companies for their triple-play bundles.²⁰⁹

On the other hand, Lindsay, of Qwest, expressed concern about new entrants taking advantage of regulatory arbitrage and subsidy structures, and focusing on the high-value customers.²¹⁰ According to Lindsay, most of the new residential entrants in Qwest’s territory price slightly below or even above Qwest’s regulated price for basic flat-rate, residential local service.²¹¹

c. Bundled Services Pricing

According to Verizon, cable companies facing competition from FiOS have responded by lowering their prices for the bundle of services that include telephony, broadband Internet access, and cable services.²¹² For example, in Richmond, Virginia, Comcast reportedly cut the price for its

²⁰⁶ Wilson, Tr. at 90-91 (citing Michael D. Pelcovits & Daniel E. Haar, Microeconomic Consulting & Res. Assocs. Inc., *Consumer Benefits from Cable-Telco Competition* (updated Nov. 2007) (“*Consumer Benefits from Cable-Telco Competition*”). This report also found that consumers have already received benefits of \$23.5 billion from cable competition in voice telephony over the past four years and from the competitive response of the ILECs over the past two years. *Consumer Benefits from Cable-Telco Competition*, at i.

²⁰⁷ Perkins, Tr. at 99-100; *Perkins Presentation*, at 3. Cavalier also competes with the ILECs by offering unlimited long distance service for an additional monthly flat rate. See <http://www.cavaliersalesagent.com>.

²⁰⁸ *Perkins Presentation*, at 3.

²⁰⁹ Perkins, Tr. at 97-99; see *Perkins Presentation*, at 3.

²¹⁰ Lindsay, Tr. at 75-77. “Regulatory arbitrage” refers to competitors taking advantage of regulatory pricing requirements imposed on the incumbent (such as price averaging). Competitors may seek to serve only customers that are less costly to serve or that generate larger volumes of service by offering them favorable rates, while leaving the higher-cost or lower-volume customers to the incumbent. Subsidy structures can exist, for example, if the incumbent’s rates are required to be lower for one class of customers and higher for another class than would be justified by costs. Although the incumbent would still earn an overall profit from these rates in the absence of competition, the subsidy inherent in the rates leads competitive entrants to target the group being charged higher rates and ignore the lower-rate group.

²¹¹ Lindsay, Tr. at 82-83.

²¹² *Verizon Submission*, at 3-7.

own triple-play bundle by \$31 just a few months before Verizon rolled out its FiOS service there; in other areas where FiOS entered, Comcast refrained from raising prices as it had historically done.²¹³ In addition, Verizon reported that Comcast cut its prices in the Philadelphia area in response to Verizon's entry, reducing the price of its triple-play bundle by \$25 per month in August 2006 as Verizon prepared to enter, and then by another \$27 in November 2006 after Verizon's launch.²¹⁴

Verizon's contract price for a triple-play of premium video, broadband Internet service with downstream speeds ranging from 5 to 20 Mbps, and telephone service with calling features was set initially at between \$99 and \$109 per month.²¹⁵ Verizon reported that its triple-play bundle typically is still priced lower than comparable packages offered by the cable company incumbents.²¹⁶ In Keller, Texas, the first place Verizon began offering FiOS, the initial price of its "Everything" bundled package was 13 percent below that of the cable incumbent, Charter.²¹⁷

Customers who are willing to purchase bundles and commit to long-term discounts can take advantage of substantial discounts off providers' stand-alone prices.

Verizon offers two types of pricing discounts for its FiOS services, giving relatively small discounts off stand-alone prices to consumers who purchase bundles on a month-to-month basis, from zero to eight percent, and greater discounts for term contracts, ranging from 11 to 38 percent.²¹⁸ Verizon explained that these discounts reflect the fact that the cost of installing fiber to a residence is the same whether a customer purchases one service or three. In addition, many of the costs Verizon incurs to provide its services are essentially fixed and do not vary as Verizon adds additional customers onto the network.²¹⁹

There was considerable dispute, however, about how the telephone and cable company bundles compare on price. Based on data for a limited number of markets shown in the following table, the prices for telephone company and cable company bundled offers appear to be close, though there is substantial geographic pricing variation. The price ranges reflect in part variations in the number of channels and features offered.

²¹³ *Id.* at 7.

²¹⁴ *Id.* at 6.

²¹⁵ *See Verizon Supp. Submission*, at 7.

²¹⁶ *Id.* at 6.

²¹⁷ *Verizon Submission*, at 5 & n.20. The Charter triple-play bundle is offered at a uniform price of \$99.97 per month for a twelve-month contract. Written Comments of Grier Raclin on Behalf of of Charter Communications Inc., for inclusion in the 2007 DOJ Telecommunications Symposium, Nov. 29, 2007, at 3-4 ("*Charter Submission*"). Dr. Singer observed that consumers in Keller appeared to be selecting Verizon's triple-play bundle over Charter's for non-price reasons, based on consumer surveys. *Singer Supp. Submission*, at 5.

²¹⁸ *Verizon Supp. Submission*, at 7-8.

²¹⁹ *Id.* at 12-13.

Table 4: Price Comparisons of Telephone Company and Cable Company Bundles

Source and Type of Prices	Telephone Company Offers	Cable Company Offers
Low End Overall (as reported by Verizon for six markets) ²²⁰	\$99-108.98 (Verizon FiOS triple-play, 24-month contract)	\$89.85-\$103.96 (promotional triple-play)
High End Overall (as reported by Verizon for six markets) ²²¹	\$125.97-\$137.97 (Verizon FiOS triple-play, no term contract)	\$114.95-\$153.97 (regular triple-play)
Dallas, TX (as reported by Dr. Singer) ²²²	\$59 (AT&T, video and broadband Internet access only)	\$74.50 (Time Warner, video and broadband Internet access only)
Fairfax County, VA (as reported by Dr. Singer) ²²³	\$120 (Verizon FiOS triple-play)	\$156 (Cox triple-play)
Fairfax County, VA (as reported by Fairfax County) ²²⁴	\$100.85-\$133.80 (Verizon FiOS triple-play, including digital programming, before January 22, 2007) \$104.93-\$137.88 (Verizon FiOS triple-play following price increases)	\$96.98-\$133.98 (Cox triple-play, + \$10.95 for digital programming) \$140.52-\$165.47 (Comcast triple-play, but including additional premium channels)

Fairfax County, Virginia, found that Verizon, Cox, and Comcast all offered discounted prices for their bundles of video, broadband, and telephone services, compared to stand-alone prices. The three Verizon FiOS bundled packages provide a \$5 savings over stand-alone prices of the services in the bundle, while the three Cox bundles offer a savings of between \$5.89 and \$20.94 or about five to 13 percent off stand-alone service prices.²²⁵ Comcast packages offered a savings of \$33 off stand-alone service prices, a reduction of 16 to 19 percent.²²⁶ Fairfax County found that incumbent cable providers were responding to competition by offering lower-priced bundled

²²⁰ *Verizon Supp. Submission*, at 7, Table 3. Markets compared include Massapequa Park, NY (Cablevision), Bethesda, MD (Comcast), Beaumont, CA (Time Warner), Virginia Beach, VA (Cox), Keller, TX (Charter), and Tampa, FL (Bright House Networks). Verizon's data for these markets do not state the period of time in which the prices were offered in each market. In November 2008, Verizon announced it was changing the prices of its service bundles with the new triple-play prices set between \$79.99 to \$119.99 per month. *Verizon Heats up Price War with Cheaper Bundles*, COMM. DAILY, Nov. 4, 2008, at 8. Comparable information is not available on the current prices of cable competitors.

²²¹ *Id.*

²²² *Singer Presentation*, at 5. Dr. Singer also found AT&T to have advantages over Time Warner in cable channels and upstream Internet speeds. His data, like Verizon's, do not indicate the period of time in which the prices were offered in each market.

²²³ *Singer Presentation*, at 6.

²²⁴ *Fairfax County Reply Comments*, at 11-16. Fairfax County looked at Cox prices effective as of January 2007, and Comcast prices effective as of October 2006, comparing them to Verizon prices both before and after the price increase announced for January 22, 2007.

²²⁵ *Id.*

²²⁶ *See id.* at 13.

packages with more limited features, as well as promotional discounts to new subscribers, to match the competitor's bundled rate.²²⁷

2. Non-Price Effects of Competition

Extensive investment in facilities-based telecommunications networks has been one aspect of the more competitive new environment. This investment has yielded positive benefits for service quality and consumer choice. Telecommunications equipment spending has trended upward, with total annual spending increasing from \$15.2 billion in 2003 to \$24.4 billion by 2007.²²⁸ Annual investment in equipment is projected to rise further to \$28.9 billion by 2010. Similarly, spending on services to support broadband network infrastructure is projected to increase from \$15.2 billion to \$23 billion between 2007 and 2010.²²⁹ Annual deployment of fiber in the United States has grown sharply from a low of 4.8 million miles in 2003 to 13.1 million miles in 2007, and is projected to increase to 15.8 million miles by 2010.²³⁰

Competition has made this investment and the resulting non-price benefits not merely an option but a matter of long-term survival. Indeed, some of the most substantial investments in more advanced networks and entry into new lines of service have been made by the incumbent telephone and cable companies because they faced competitive challenges as well as new competitive opportunities.

At least one Symposium participant attributed the new facilities-based investments made by telephone carriers partly to regulatory changes limiting these carriers' obligations to share their facilities with competitors. Economist Dr. Thomas Hazlett explained that these regulatory changes provided a natural experiment demonstrating that regulation requiring the sharing of facilities limits investment. According to Dr. Hazlett, revised FCC rules relieving ILECs of their obligations to make unbundled facilities available to competitors for DSL "line sharing" encouraged the ILECs to make network investments and compete more aggressively against the cable companies.²³¹ This, Dr. Hazlett stated, substantially narrowed the gap between the

²²⁷ *Id.* at 10.

²²⁸ *NTIA Broadband Report*, at Table 7 (citing *TIA Market Study*).

²²⁹ *Id.* at Table 8.

²³⁰ *Id.* at 24 & Table 6.

²³¹ Hazlett, *Tr.* at 174-76. After the passage of the 1996 Act, the FCC required telephone companies to make the high-speed portions of their copper loops available on an unbundled wholesale basis at regulated prices to independent third-party DSL providers. This regulation was referred to as a "line sharing" obligation. It allowed third-party DSL providers to offer broadband service to customers without having to purchase the entire unbundled loop and provide telephony service as well. However, the FCC did not require cable operators similarly to open their facilities to third-party broadband providers, creating a regulatory asymmetry between the obligations of the ILECs and cable companies, which were already competing on a facilities basis to offer broadband service. In February 2003, the FCC adopted an order rescinding the broadband line-sharing obligations for ILECs. Report and Order and Order on Remand and Further Notice of Proposed Rulemaking, *In the Matter of Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers, Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, Deployment of Wireline Services Offering Advanced Telecommunications Capability*, FCC CC Docket Nos. 01-338, 96-98, 98-147, 18 FCC Rcd 16,978, 17,132-36 (rel.

broadband shares of the cable and telephone companies, which had been at a two to one ratio from 1999 through 2002. After the FCC rescinded the line-sharing requirement, cable modem service continued to attract customers at about the same rate, but DSL began to add subscribers at an increased rate.²³² By the end of 2006, there were ten million more DSL households than Dr. Hazlett believed would have existed had the line-sharing regulation remained in place.²³³ Dr. Hazlett attributed the two to one advantage in U.S. broadband subscribership that the cable companies enjoyed from 1999 to 2002 to the greater willingness of cable companies to invest aggressively in their networks, which in turn was due to the difference in regulatory treatment.²³⁴

The largest ILECs have responded to facilities-based entry by cable operators into telephony through substantial investments in fiber to provide video distribution services and increase broadband speeds. This investment has been paralleled to a lesser extent by many smaller ILECs.²³⁵ The largest single ILEC investment is the \$23 billion Verizon is spending on its new FiOS fiber-based network, which enables Verizon to provide multichannel video services competitive with the cable incumbents and, as of November 2007, to provide broadband at speeds of up to 20 Mbps in both directions (eventually as much as 100 Mbps downstream). These speeds are equal to or greater than what most cable modem service offers and far surpass the telephone companies' normal DSL speeds of 768 kbps over the copper wire network.²³⁶ The next largest is AT&T's plan to upgrade its landline network with 40,000 miles of FTTN, at a cost ranging between \$4.5 and \$6.5 billion, to provide IPTV digital television services, broadband Internet access (at speeds ranging from 1.5 to 6 Mbps downstream and 1 Mbps upstream), and VoIP services under the "U-Verse" brand.²³⁷ Qwest, though it has not announced video service deployments in its landline network comparable to Verizon or AT&T, has said that

Aug. 21, 2003), *vacated and remanded in part, aff'd in part, United States Telecom Ass'n v. FCC*, 359 F.3d 554 (D.C. Cir. 2004), *cert. denied*, 543 U.S. 925 (2004).

²³² Thomas W. Hazlett, George Mason University School of Law, "Emerging U.S. Wireless Broadband Markets," 2007 DOJ Telecommunications Symposium, Nov. 29, 2007, at 4 ("*Hazlett Presentation*") (graph shows that the rate of additions of new DSL subscribers following the FCC's high-speed line-sharing deregulation increased, while the rate of additions of new cable modem subscribers remained the same).

²³³ Hazlett, Tr. at 174-176; *Hazlett Presentation*, at 4.

²³⁴ *Hazlett Presentation*, at 3 (graph shows number of residential subscribers to cable modem exceeded subscribers to DSL from 1999 to 2002).

²³⁵ See *NTIA Broadband Report*, at 24 & Table 6 (showing that telephone companies have increased annual fiber deployment from 2.4 to 9.7 million miles from 2003 to 2006, and the total is expected to increase to 12.9 million miles by 2010).

²³⁶ See *Verizon Submission*, at ii, 1. The \$23 billion includes about \$18 billion in net expenditures to deploy the network, and \$5 billion to connect individual subscribers, but does not include savings Verizon hopes to achieve from avoiding future maintenance of its legacy copper telephone network between 2004 and 2010. *Id.* at 1 n.1.

²³⁷ *NTIA Broadband Report*, at 25, 34; *AT&T Says Costs Rise for TV System's Launch*, WALL ST. J., May 8, 2007, at B4.

the company plans to spend \$300 million to deploy fiber upgrades to provide speeds of 20 Mbps to 1.5 million more homes.²³⁸

Cable companies like Cox have also made very substantial new investments. The increased use of VoIP rather than circuit-switched telephony has made entry much less expensive for cable companies, leading most to enter telephone services within the past several years. From 1996 through 2006, cable companies in the United States made more than \$117 billion in capital expenditures to develop their broadband networks. During 2007 they were expected to spend another \$13.7 billion on infrastructure, up ten percent over 2006.²³⁹ Cable companies' new investment in fiber has been considerably less than the telephone companies in recent years. Following a period of heavy activity from 2000 through 2002, fiber investment by cable companies declined, but investment began to rise again after 2006. Cable operators are expected to deploy almost 4.6 million miles of fiber between 2007 and 2010.²⁴⁰ Since the 1996 Act, Cox, one of the first cable companies to offer telephony, has spent about \$16 billion on private capital investments to build a state-of-the-art network.²⁴¹

In addition to these major investments by telephone and cable incumbents, significant investments have been made in telecommunications facilities by a number of smaller companies seeking to serve residential customers. Facilities-based overbuilders like RCN and other members of the BSPA in the aggregate have constructed more than 40,000 miles of networks, passing 4.1 million homes, to provide multichannel video, voice telephone, and broadband services.²⁴²

Several companies are making significant investments to provide new wireless broadband services, including AT&T, Sprint Nextel, Clearwire, and DigitalBridge. The joint venture between Sprint Nextel and Clearwire has raised \$3.2 billion in capital and its executives are predicting that it will need another \$2 to 2.3 billion to complete the roll out of its network.²⁴³ This network will use WiMAX technology, which according to Symposium speakers is substantially less expensive than older technology.

Several Symposium participants discussed the non-price benefits from competitive entry and new investment. For

Evidence presented suggested that incumbent providers are reacting to new entry by increasing the quality of their offerings, providing consumers with higher broadband speeds, more HD channels, and other features.

²³⁸ *NTIA Broadband Report*, at 34.

²³⁹ *Id.* at 32-33 & Chart 10 (citing various sources including NCTA data).

²⁴⁰ *Id.* at 24 & Table 6.

²⁴¹ Wilson, Tr. at 87.

²⁴² Goodman, Tr. at 27-28; *Goodman Presentation*, at 2-4; *BSPA Submission*, at 9.

²⁴³ See *New Wireless Venture Seen Drawing Scant Regulatory Scrutiny*, COMM. DAILY, May 8, 2005, at 2-5; *Does the New Ultra-Mega Clearwire Have Enough Dough?*, May 13, 2008, available at <http://www.dsreports.com/shownews/Does-the-New-Ultra-Mega-Clearwire-Have-Enough-Dough-94371>.

example, Dr. Singer predicted that incumbent cable operators are likely to react to telephone company entry by increasing the quality of their offerings (such as by offering more HD and VOD programming).²⁴⁴ Dr. Singer's predictions are supported by observation of actual cable company competitive responses. According to Verizon, several cable companies have improved their cable modem service in response to FiOS in their territories, increasing modem service speeds to as high as 10 to 30 Mbps. Cable operators also have made investments in new cable modem technologies that could increase broadband speeds to as high as 150 Mbps.²⁴⁵ In addition to rolling out its bundled service offering, Charter stated that it has responded to new entry by improving customer service, increasing bandwidth speeds to try to "get up to the level of bandwidth that FiOS offers," adding more programming channels and services, and rolling out enhanced products (such as HD).²⁴⁶ In addition, cable companies have made competitive investment responses to video entry by AT&T, including offering more HD channels, more VOD, more digital telephony features, and wireless telephony.²⁴⁷ According to the NCTA, "the telephone companies have adopted strategies that focus on quantity and quality of programming, rather than focusing solely on price."²⁴⁸

Verizon continues to improve its service, claiming that by the end of 2008, the company will offer 150 HD channels and more than 10,000 VOD titles in HD.²⁴⁹ Verizon also offers different downstream Internet speeds in response to the offering of the local cable company. For example, in Massapequa Park, New York, both Verizon and the incumbent cable operator offer 20 Mbps downstream speed. In contrast, in Bethesda, Maryland, Verizon offers 5 Mbps downstream versus Comcast's 6 Mbps.²⁵⁰

²⁴⁴ *Singer Supp. Submission*, at 4.

²⁴⁵ *Verizon Submission*, at 9-10. Verizon observed that in northeast Indiana, Comcast doubled the speed of its fastest cable modem service when Verizon rolled out FiOS there, while Cox and Adelphia increased modem speeds in Northern Virginia when FiOS was deployed, and Time Warner and Cablevision increased speeds in the New York area as well.

²⁴⁶ Raclin, Tr. at 51-52; see *Raclin Presentation*, at 9, and *Charter Submission*, at 11-12.

²⁴⁷ *Singer Presentation*, at 12-16.

²⁴⁸ *NCTA Program Access Comments*, at 5.

²⁴⁹ *Verizon Submission*, at 10.

²⁵⁰ *Verizon Supp. Submission*, at 7.

C. Challenges Faced by New Broadband Providers

Dr. Hazlett and Hank Kafka, of AT&T Inc., claimed that there was already substantial competition for broadband services.²⁵¹ Dr. Hazlett described as additional competitors several categories of wireless data players. First, wireless voice carriers are upgrading their mobile voice networks to provide broadband services. These include the national wireless carriers, AT&T, Verizon, Sprint, and T-Mobile, as well as regional carriers such as Alltel,²⁵² Leap, and MetroPCS, who have not as yet been significant entrants into the data markets. Second, companies have entered the provision of broadband service by purchasing access to spectrum and networks from existing wireless carriers. These broadband service providers include Research in Motion/Blackberry, OnStar, iPhone, Virgin Mobile, and Twitter. Third, there are broadband service providers with their own networks, such as Clearwire and DigitalBridge.²⁵³ Additionally, on the margin, there are potential entrants such as SpectrumCo, a consortium of cable operators that acquired spectrum in the Advanced Wireless Services (“AWS”) auction, and applications providers such as Google, Microsoft, and Apple. Some of these applications providers have contracted with existing wireless providers or have made efforts to organize consortia in order to enter the wireless broadband market.²⁵⁴ Industry analyst Blair Levin, of Stifel Nicolaus, disagreed with Dr. Hazlett, contending that broadband competition is limited at present to wireline providers and that in most areas of the country there are only two providers – incumbent cable companies providing cable modem services and incumbent telephone companies offering DSL services or in some areas fiber-based networks.²⁵⁵

One speaker acknowledged that his company’s broadband services are aimed at specific “niche” markets (meaning they appeal only to a select group of users limited by geography or some other characteristic). WildBlue’s target market is primarily rural areas where consumers are not served by either DSL or cable.²⁵⁶ Another speaker said that his company’s initial focus was on smaller communities in underserved areas, or where broadband services are not offered. DigitalBridge is able to compete in smaller communities because WiMAX is highly capital efficient: it costs only \$40 to \$60 to pass a household, compared to \$800 to \$1200 for DSL or

²⁵¹ Hazlett, Tr. at 177; Kafka, Tr. at 196-97.

²⁵² In June 2008, Verizon announced that it will acquire Alltel. *Alltel Deal Strengthens Hand of Verizon Wireless*, WALL ST. J., June 6, 2008, at B9.

²⁵³ Another broadband service provider of this type mentioned by Dr. Hazlett was Frontline. Hazlett, Tr. at 180. Frontline filed an application to bid in the 700 MHz auction, but it has since ceased to operate. Frontline Wireless News, Frontline Wireless statement, Jan. 12, 2008, and Frontline Wireless News, Frontline Confirms Auction Participation, Dec. 3, 2007, *available at* <http://www.frontlinewireless.com/news.php>.

²⁵⁴ Hazlett, Tr. at 180-81.

²⁵⁵ *See, e.g.*, Levin, Tr. at 303-12. Levin’s analysis is discussed in more detail *infra*.

²⁵⁶ Brown, Tr. at 287-89.

cable companies.²⁵⁷ DigitalBridge believes that about half of its customers did not previously subscribe to broadband services.²⁵⁸

On the other hand, Sprint Nextel, Clearwire, and Current presented very positive assessments of the likely impact of their WiMAX and BPL broadband services, claiming they would challenge the incumbent cable and telephony providers.²⁵⁹ Clearwire said a little more than 40 percent of its current customers switched from DSL or cable modem services.²⁶⁰ Sprint Nextel at the time of the Symposium was not yet providing its WiMAX broadband service, but opined that wireless broadband will follow a trend similar to wireless voice. Initial purchasers will be new broadband subscribers, but eventually people will think of it as a replacement for landline services.²⁶¹ Current believes that 50 percent of its customers in Cincinnati came from the telephone company or cable company.²⁶²

Providers of wireless and BPL broadband services are optimistic about their prospects, believing they can compete directly with existing landline providers.

Sprint Nextel and Clearwire discussed the advantages resulting from their use of WiMAX technology, including the ability to build their networks at a lower cost than existing wireless technologies and make them affordable for residential consumers.²⁶³ They also said that they intended to cut costs by convincing consumer electronic manufacturers to include WiMAX chips in laptops, game systems, PDAs, and other portable devices. This would eliminate the need to support a range of handsets.²⁶⁴

Sprint Nextel and Clearwire stated that their systems also would have other advantages, including offering an “open” network allowing any device to be connected to, and any

²⁵⁷ Wallace, Tr. at 228-29; *Wallace Presentation*, at 4.

²⁵⁸ Wallace, Tr. at 259.

²⁵⁹ Shen, Tr. at 202, 208, 211; Salemme, Tr. at 222-23; Herron, Tr. at 295, 299-300.

²⁶⁰ Salemme, Tr. at 260.

²⁶¹ Shen, Tr. at 260.

²⁶² Herron, Tr. at 321.

²⁶³ Shen, Tr. at 208 (“We think the WiMAX technology will achieve one-tenth of the current 3G cost, and that will give us a lot of flexibility driving adoption by the mass consumer market.”). Salemme, of Clearwire, similarly said that his company will be able to deliver a bit over wireless networks at one-tenth of the cost of previous networks. *Id.* at 219. Articles published after the Clearwire joint venture was announced have reported that some analysts doubt whether its WiMAX strategy will have competitive advantages over other mobile wireless broadband technologies (such as long term evolution (“LTE”)). See Matt Hamblen, *WiMAX vs. Long Term Evolution: Let the Battle Begin*, COMPUTER WORLD, May 14, 2008, available at <http://www.computerworld.com/action/article.do?command=viewArticleBasic&taxonomyName=voip&articleId=9085202&taxonomyId=81>.

²⁶⁴ Shen, Tr. at 205-07; *Sprint/Clearwire Transfer Application*, Ex. 1, at 24-26.

application to run on, the network.²⁶⁵ Openness invites a broader community to produce innovative devices and applications, driving more traffic onto the network.²⁶⁶ In addition, the companies said they planned to offer some content that is exclusive to their networks.²⁶⁷ Finally, their intent was to make their services more affordable than existing wireless services. Although the majority of Sprint Nextel's existing wireless broadband customers are businesses,²⁶⁸ Sprint Nextel believes that service pricing can be made more attractive to a broader range of customers because of the lower cost of WiMAX.²⁶⁹ Sprint Nextel also planned to offer more flexible plans (such as single day subscriptions) that would lower barriers for consumers with WiMAX embedded in their laptops.²⁷⁰

Clearwire indicated that when it sets prices, the company compares its features to other broadband options. It prices a little above DSL service because Clearwire's portability offers more value, but a little less than cable modem service which can provide higher speeds.²⁷¹

Sprint Nextel and Clearwire also expressed the view that they would be able to challenge existing providers by offering consumers the ability to take broadband services outside the home. Evan Grayer, of DirecTV Group, also acknowledged that this would be attractive to consumers. He said that although speeds available from mobile wireless broadband services were slower than landline alternatives, customers would buy them anyway because they offer mobility and the advantage of having a single provider.²⁷²

Although Municipal Wi-Fi networks were not specifically represented at the Symposium, several speakers expressed the view that they would provide additional competition. Kafka, of AT&T, stated that Municipal Wi-Fi networks are fully capable of providing broadband services as a technical matter. In Kafka's opinion, technical and business challenges for Municipal Wi-Fi

²⁶⁵ Shen, Tr. at 207; *Sprint/Clearwire Transfer Application*, Ex. 1, at 24-27. Other providers have announced plans to allow unaffiliated applications and devices to be used on their networks. See Press Release, Verizon Wireless, Verizon Wireless To Introduce 'Any Apps, Any Device' Option For Customers In 2008, November 27, 2007, available at <http://news.vzw.com/news/2007/11/pr2007-11-27.html>.

²⁶⁶ Shen, Tr. at 207.

²⁶⁷ Shen, Tr. at 235-36; Salemm, Tr. at 236-37.

²⁶⁸ Shen, Tr. at 208.

²⁶⁹ *Id.*

²⁷⁰ *Id.* at 209.

²⁷¹ Salemm, Tr. at 239. The new Clearwire also has suggested that it will benefit from its willingness to offer its services on a wholesale basis. Its cable company partners will offer new Clearwire services in combination with their wireline video, voice, and broadband services. *Sprint/Clearwire Transfer Application*, Ex. 1, at 20, 37-38.

²⁷² Grayer, Tr. at 282.

are surmountable.²⁷³ However, some reports indicate that Municipal Wi-Fi systems have been losing momentum, with some providers abandoning their networks or refusing to expand.²⁷⁴

Industry analyst Levin provided a Wall Street perspective on the likely impact of alternative broadband technologies (such as WiMAX, BPL, and satellite). Levin was pessimistic about their ability to move beyond niche markets to more broadly challenge the cable companies and telephone companies.²⁷⁵ Levin cited a few of the reasons for his pessimism. First, he focused on the failures of other technologies (such as LMDS, Municipal Wi-Fi, and Vonage's nomadic VoIP), observing that promising technologies do not always succeed as business concepts. Vonage was the subject of a high technology Initial Public Offering selling for \$17, but as of November 2007 was selling for only about \$2. None of those technologies, Levin stated, is going to have a significant competitive impact.²⁷⁶

Doubts were expressed about the potential impact wireless broadband providers and BPL will have on broadband competition because existing providers have first-mover, scale, and scope advantages.

Second, new technologies will be entering a maturing broadband product market, where most potential customers have already signed up with one of the incumbents.²⁷⁷ Levin observed that it is well understood in marketing that it is difficult to take away a customer who is already subscribing to someone else's service.²⁷⁸ Though Clearwire reported that it obtains a little more than 40 percent of its customers from cable and DSL, Levin noted that the combined share of cable company and telephone company broadband has remained very consistent over the last five years. He believes that it is going to get more difficult to take their customers away, because new technologies are competing against competitors with significant advantages in terms of brands, bundles, and economies of scale.²⁷⁹

Levin noted that incumbents also have other advantages. For example, many of them require term commitments.²⁸⁰ That means there is only a small window when a customer is able to move. The incumbent knows when that window is, but the new entrant does not. The new entrant must spend resources marketing to customers during periods when they cannot switch or

²⁷³ Kafka, Tr. at 190-91.

²⁷⁴ Ian Urbina, *Hopes for Wireless Cities Fade as Internet Providers Pull Out*, N.Y. TIMES, Mar. 22, 2008, available at http://www.nytimes.com/2008/03/22/us/22wireless.html?_r=1&pagewanted.

²⁷⁵ Levin, Tr. at 303. This pessimism does not extend to the niche broadband services, such as WildBlue's satellite service, which are important in terms of universal service and digital divide issues. *Id.*

²⁷⁶ *Id.* at 304.

²⁷⁷ *Id.* at 304-05.

²⁷⁸ *Id.* at 305.

²⁷⁹ *Id.* at 305-06.

²⁸⁰ *Id.* at 306-07.

will have disincentives to doing so.²⁸¹ In contrast, an incumbent can target discounts and other incentives to subscribers immediately prior to the expiration of their contracts.²⁸²

Third, Levin cited the inability of the new entrants to offer any functional advantage over the incumbents, apart from the one obvious advantage of wireless – mobility.²⁸³ Levin questioned the ability of a new entrant to offer a significant price advantage, particularly when selling against a bundle.²⁸⁴

Levin predicted that mobile and wireline broadband would probably be complementary, rather than directly competing services.²⁸⁵ In the past, mobile voice has not been a competitor to landline voice service; Levin also disagreed with AT&T's view that wireless mobile broadband is competitive with wireline.²⁸⁶ He opined that Verizon is building FiOS, and cable is increasing speeds, to drive higher demand for newer applications, particularly high-definition video, for which mobile delivery will never be competitive.²⁸⁷ However, if those applications do not emerge, then mobile will be competitive and will have significant advantages based on its mobility.²⁸⁸

Finally, Levin stated that entrants may have difficulty obtaining a number of key inputs that they will need to succeed (such as sufficient spectrum).²⁸⁹ The 700 MHz auction provided the best opportunity for a new entrant, in Levin's view. But he did not think that a new competitor was going to emerge because the incumbents have an incentive to block entry of others.²⁹⁰ Another key input is intellectual property. Because of the recent lawsuits over

²⁸¹ *Id.* at 307.

²⁸² *Id.*

²⁸³ *Id.* at 307-08.

²⁸⁴ *Id.* at 308.

²⁸⁵ *Id.* at 311.

²⁸⁶ *Id.* at 309.

²⁸⁷ *Id.* at 310.

²⁸⁸ *Id.*

²⁸⁹ *Id.* at 311.

²⁹⁰ Levin, Tr. at 311. This concern about the failure of spectrum auctions to result in much entry was shared by Dr. Wilkie. In the FCC's AWS spectrum auction, the last major one before the FCC's 700 MHz auction pending at the time of the Symposium, Dr. Wilkie observed that no significant new entrant was able to get into the market. Wilkie, Tr. at 143. He characterized the 700 MHz auction as the "last best opportunity" to get a new broadband entrant. *Id.* The results of the 700 MHz auction were announced in March 2008. AT&T and Verizon won an estimated 80 percent of the spectrum sold. *Verizon, AT&T Account for Most 700 MHz Bids*, COMM. DAILY, Mar. 21, 2008, at 1; *FCC Names Winners of Wireless Auction*, WASH. POST, Mar. 21, 2008, at D1.

intellectual property, Levin said that capital markets now have to consider whether there is a potential lawsuit waiting to happen before making any big investment in this space.²⁹¹

Generally, Levin was skeptical that there is going to be extensive broadband competition from new entrants other than in discrete geographic markets. He noted the impact this lack of competition will have on innovation.²⁹² Levin said that 87.5 percent of Gross National Product growth in the United States was due to technology changes that create new efficiency by developing new ways of doing business.²⁹³ But he observed that the last 25 years have taught that this kind of innovation does not start with incumbents. None of the most significant innovations – e-mail, VoIP, instant messaging, search, video on the net, social networking, and others – were invented or brought to the market by the incumbent providers.²⁹⁴

D. The Competitive Importance of Service Bundles

The Symposium discussions and submissions highlighted the growing importance of bundling telephony, broadband Internet access, and video programming services. Many providers, including telephone companies, cable companies, and CLECs, made clear the significant role that bundles play in their competitive strategies, both in attracting customers and reducing churn, as well as taking advantage of network economies. In addition, evidence presented showed that a growing number of consumers are choosing bundled plans. It was less clear, however, whether consumers purchase bundles solely to take advantage of the discounted prices or also view these offerings as providing additional benefits (such as having a single bill or provider).

A growing number of consumers are choosing to purchase bundled plans, and some providers report that more than 30 percent of their subscribers purchase a triple-play bundle.

As of 2006, one study found that 46 percent of U.S. households subscribed to bundles of two or more services and 11 percent to three or more.²⁹⁵ A 2007 study found that 64 percent of U.S. households receive two or more services (excluding long distance, which is already widely bundled with local telephone service) from the same provider.²⁹⁶ Another study found that 54 percent of consumers were already purchasing multiple services from a single provider in 2006 and forecast 76 percent would purchase multiple services from the same provider by the end of

²⁹¹ Levin, Tr. at 312.

²⁹² *Id.* at 312-13.

²⁹³ *Id.* at 313.

²⁹⁴ *Id.* at 313-14.

²⁹⁵ *Verizon Supp. Submission*, at 11 (citing Frost & Sullivan, *Move Toward Full Convergence - Communication Services for U.S. Residential Markets*, No. 20-62 (2007)).

²⁹⁶ *Verizon Supp. Submission*, at 11 (citing TNS Telecoms, *2Q07 National Market Tracking Report*, at 9 (Sept. 2007)).

2007.²⁹⁷ These bundles typically consisted of broadband Internet service, in which the cable and telephone incumbents have already been competing for several years, paired with either the cable incumbent’s video service or the telephone incumbent’s voice service. Now that cable companies have widely entered telephone service markets with VoIP and telephone incumbents are beginning to enter video on a wireline basis, triple-play bundles are on the rise. Although only a minority of customers is taking the triple-play bundle from a single provider today, that share is rapidly growing, with some companies now reporting 30 percent or more of their customers taking all three services, as discussed below.

The following table provides information reported by various providers on the willingness of consumers to purchase bundled services, expressed as a percentage of overall subscribers.

Table 5: Use of Bundled Services by Consumers Where Available

Provider	Consumers buying Triple-Play	Consumers Using only a Stand-Alone Service	Consumers Using Two or More Bundled Services	Penetration of Newer Services in Homes Passed
Verizon (FiOS only) ²⁹⁸	N/A	11%	88%, including 38% voice and data and 50% video plus at least one other service	17% (Jan. 2008) (FiOS TV); 20% (FiOS Internet)
Charter ²⁹⁹	N/A	57% (video)	43%	Under 10% (voice)
Cox ³⁰⁰	More than 30%	38% (video)	62%	Nearly 40% (voice)
BSPA Members ³⁰¹	32%	31%, including 22% video and 9% voice or data	70%, including 38% taking two services only	N/A

²⁹⁷ *Verizon Supp. Submission*, at 11 (citing Patrick Monaghan, Yankee Group, *Driving Value in the Quad Play and the Future of the Communications Bundle*, at 3 (Oct. 2007)).

²⁹⁸ *Verizon Supp. Submission*, at 9-11 (as of 3rd quarter 2007 unless otherwise stated); *Verizon Submission*, at 1 n.2 (for FiOS Internet percentage as of 3rd quarter 2007).

²⁹⁹ *Charter Submission*, at 3.

³⁰⁰ Press Release, Cox Communications, Greater than 62% of Cox Customers Now Bundling Services, Feb. 13, 2008, available at <http://phx.corporate-ir.net/phoenix.zhtml?c=76341&p=irol-newsArticle&t=Regular&id=1107954> (“Cox Press Release”).

³⁰¹ *Goodman Presentation*, at 4.

According to Verizon, “a large and increasing number of consumers” prefer to purchase voice, video, and broadband Internet services on a bundled basis from a single provider for the convenience of a single bill and one-stop shopping, and for the discounts.³⁰² Verizon views bundles as a form of quantity discount that increases sales revenue earned from a customer and enables a firm to reduce its costs in various ways, including scale, scope and marketing economies, while reducing transaction costs for consumers.³⁰³ Verizon has also found that 56 percent of the customers who switched to it from another provider did so to get a bundle of three services; 82 percent of those customers received a discount on the bundled service.³⁰⁴

The cable companies offered similar perspectives on the importance of bundling. Nationwide, they are better positioned to offer a wireline triple-play bundle than are the incumbent telephone carriers, because cable telephony is available to more homes than are Verizon’s or AT&T’s video services.³⁰⁵ Cox has made telephone and broadband available to nearly 100 percent of its customer base. At the end of 2007, 62 percent of its customers, a total of 3.7 million, were purchasing bundled services.³⁰⁶ As of November 2007, Charter had 2.5 million customers (out of its 5.7 million video customers) purchasing bundles of two or more services.³⁰⁷

BSPA members offer their own facilities-based digital video, broadband Internet, and voice telephony services on a “bundled triple-play” basis as a central part of their business model.³⁰⁸ BSPA members have the highest take rate of triple-play bundles among providers who supplied data for the Symposium – on average 32 percent, with some members selling more than 50 percent of their customers triple-plays.³⁰⁹ According to Goodman, of the BSPA, members of his organization have found the bundle to be “essential” to wireline competition. They have also found that sales are driven by video, which has the highest penetration and best economics, although broadband and VoIP telephone services are growing in penetration. A video-only strategy, as early overbuilders found, fails without the added revenues of voice and data.³¹⁰ The advantage of the triple-play model is that it has not been necessary to get a dominant share in any of the three services to survive.³¹¹

³⁰² *Verizon Submission*, at 11; *see also Verizon Supp. Submission*, at 10-11.

³⁰³ *Verizon Submission*, at 11.

³⁰⁴ *Verizon Supp. Submission*, at 11.

³⁰⁵ *See Wilson*, Tr. at 90 (referring to 100 million homes where cable telephony is available).

³⁰⁶ *Cox Press Release*.

³⁰⁷ *Charter Submission*, at 2-3.

³⁰⁸ *Goodman*, Tr. at 29-30; *Goodman Presentation*, at 2; *BSPA Submission*, at 3.

³⁰⁹ *Goodman*, Tr. at 29-30; *Goodman Presentation*, at 4.

³¹⁰ *Goodman*, Tr. at 29-31; *Goodman Presentation*, at 8; *BSPA Submission*, at 10.

³¹¹ *Goodman*, Tr. at 30-31.

Bundling is not limited to CLECs with their own end-to-end facilities. Perkins, of Cavalier, described the triple-play product that his company offers to residential customers using unbundled loops, combining IPTV service, a 15 Mbps Ethernet broadband service, and voice telephony.³¹² Perkins explained, “We are in triple-play because we have to be. That is where the competitors are going, the big competitors in the marketplace.”³¹³

Even the smaller rural telephone incumbents have begun to bundle their services. According to membership surveys, 59 percent of NTCA carriers are now offering bundled services; that number is expected to increase as more cable companies enter the voice telephone market. Though it is not seen as a large source of revenue, video is one of the key drivers for broadband deployment in rural areas, as carriers need it to retain their customers by offering them the triple play.³¹⁴

The available evidence from the Symposium and other public sources indicates that bundled offerings are now widely available. Some providers can offer these services over their own networks. Others, including the telephone companies in many areas and satellite providers, rely on partnerships with other service providers to offer a full bundle of services. At present, there are only a small number of areas where two or more providers offer triple-play bundles with all three services carried over their own networks. This is because the incumbent telephone companies are in the process of rolling out their video-capable fiber networks and BSPs are available in limited geographic areas.

As noted above, providers benefit from bundles by gaining the ability to use an existing connection to earn more revenue from a customer. In addition, customers who purchase bundles tend to churn less frequently, reducing providers’ marketing costs as they spend less to recruit and retain customers.³¹⁵

Although bundled service customers gain the benefits of dealing with a single provider and obtaining a single bill, Symposium participants debated whether this was a major factor motivating customers’ decisions.³¹⁶ A more substantial reason why customers buy bundles may be that bundles are sold at lower prices compared to purchasing the services separately from the same provider. The information provided in the Symposium indicates that triple-play bundles

³¹² Perkins, Tr. at 97-99; *see Perkins Presentation*, at 3. “Ethernet” refers to a local area network standard, known officially as IEEE 802.3, which operates over wire and over coaxial cable.

³¹³ Perkins, Tr. at 99; *see Perkins Presentation*, at 3.

³¹⁴ Canfield, Tr. at 116-17; *NTCA Broadband Survey*, at 16. Sixty-three percent of NTCA members are offering or planning to offer video services. Canfield, Tr. at 117-18.

³¹⁵ *See Wilkie*, Tr. at 135-36 (discussing effect of bundles on reducing churn).

³¹⁶ Verizon said consumers liked receiving a single bill and one stop shopping. *Verizon Submission*, at 11. Grayer of DirecTV said the main advantage of bundling was the convenience of ordering service from a single company, but he did not think that a single bill was particularly important to customers. Grayer, Tr. at 319-20. Industry analyst Levin said that the work has not been done to determine the impact of bundling and that bundling will become more significant to consumers when firms are able to integrate the functions of the various services. Levin, Tr. at 323-24.

can be discounted by as much as one third over stand-alone service offered by the same provider, particularly if the customer is willing to commit to a contract with a term of a year or more.³¹⁷ Providers may be offering these discounts because bundling leads to efficiencies in the use of their networks and/or because it will reduce churn.

Dr. Wilkie noted that, although customers can save money from bundles compared with the cost of buying the three services individually from the same provider, they may be able to obtain lower-priced and more appealing services by purchasing from three separate providers.³¹⁸ He suggested that bundling may reduce churn because customers now have to switch two or more services and find a provider that meets all of their requirements.³¹⁹ It is therefore difficult to predict the impact of bundling on customers.³²⁰ If customers stay with providers because they are happy with their services, the net benefit will be positive. However, if they stay with their existing provider because it is time consuming and difficult to change, it is less clear whether there will be a net benefit to consumers.

Some broadband providers are not able to offer triple-play bundles over their own facilities. For example, Clearwire and DigitalBridge offer VoIP telephony along with their wireless broadband data services,³²¹ the telephony service being provided by a third-party provider and resold by Clearwire and DigitalBridge.³²² Clearwire and DigitalBridge also do not offer their own multichannel video programming delivery services now, although Clearwire expects to offer some video programming in the future.³²³ R. Gerard Salemme, of Clearwire, stated that his company's plan is to expand from home data services in 2007 to offer a mobile triple-play, with mobile data in 2008, mobile voice in 2009, and mobile video (such as in automobiles) in 2010.³²⁴

Satellite television cannot be easily offered as a bundle with broadband and voice services over the same satellite system.³²⁵ Grayer, of DirecTV, maintained that his company is doing well due to a superior video product despite the lack of a complete bundle of services

³¹⁷ See generally Chapter II.B *supra*.

³¹⁸ See Wilkie, Tr. at 135.

³¹⁹ See *id.* at 137.

³²⁰ See *id.* at 135-36.

³²¹ Salemme, Tr. at 252-53 (stating that Clearwire sells facilities-based VoIP in all of the markets it serves, but this is only marketed to broadband customers); Wallace, Tr. at 253 (observing that DigitalBridge has approach similar to Clearwire).

³²² Wallace, Tr. at 253 (stating that hosted VoIP providers can provide a turnkey solution so that the broadband provider does not need to become a voice provider but can resell this service).

³²³ See Raclin, Tr. at 47 (discussing mobile video).

³²⁴ Salemme Presentation, at 5.

³²⁵ Verizon Submission, at 3 n.12.

offered over its own facilities, with one million subscribers added in the third quarter of 2007.³²⁶ Grayer contended that consumers benefit more by purchasing video from DirecTV rather than by purchasing a triple-play bundle from a cable provider that has fewer HD channels.³²⁷ Industry analyst Levin agreed that DirecTV's success even without a bundle was attributable to a superior video product as the result of the decision to invest in HD.³²⁸ However, Goodman, of the BSPA, discussed a 2005 GAO study indicating that DBS penetration is much lower where cable competitors offer the triple-play bundle.³²⁹ In this study, DBS penetration rates were found to be highest, at 36 percent, where DBS competed against only a traditional cable system offering no advanced services (such as digital cable, cable modem, and telephone services). But where a cable provider offers one or more, but not all, advanced services (for example, digital video plus broadband, but not telephony), DBS penetration fell to 16 percent. When competing against a cable provider offering all three advanced services, DBS penetration dropped most dramatically, to 14 percent.³³⁰

To the extent bundling is preferred by consumers, providers that cannot offer a full bundle over their own facilities may be able to mitigate the impact through service partnerships. DirecTV offers broadband and voice packages that it provides through arrangements with other carriers, primarily telephone companies. The telephone companies gain the ability to sell video bundled with their DSL and voice services where they cannot provide video over their own networks.³³¹ However, DirecTV is aware that these types of arrangements have limits going forward. DSL services are not available everywhere, the telephone companies are increasingly becoming video competitors of DirecTV in major markets, and wholesale arrangements generally can be difficult to implement for business and technical reasons.³³² Therefore, DirecTV is cultivating multiple types of wholesale arrangements with different providers, including relationships with WildBlue and Current for broadband services.³³³

Broadband over power line providers also have limited ability to respond to bundling. Current offers only broadband Internet access, along with the potential for customers to use VoIP telephone services over broadband, but it does not provide a full multichannel video

³²⁶ Grayer, Tr. at 273-74. As of the first quarter of 2008, DIRECTV had added another 964,000 gross/275,000 net subscribers in the U.S. See *DIRECTV 1st Q Press Release*.

³²⁷ Grayer, Tr. at 274-75.

³²⁸ Levin, Tr. at 322. Independent consumer analysis similarly supports the advantage that DBS currently has over cable in HD offerings. *High-def TV service*, CONSUMER REP., Mar. 2008, at 28. This article reports that consumer were generally more satisfied with the HD offerings of satellite than cable, though satellite offered more limited VOD offerings.

³²⁹ Goodman, Tr. at 32-33; *Goodman Presentation*, at 7.

³³⁰ *GAO 2005 Study*, at 11.

³³¹ Grayer, Tr. at 274.

³³² *Id.* at 275-76.

³³³ *Id.*

service comparable to the cable or telephone companies.³³⁴ Therefore, Brandon Herron, of Current Group LLC, said that his company was also partnering with DirecTV on the video side to provide a triple-play bundle.³³⁵ Herron contended that Current's inability to offer a triple play was not a detriment as some customers rely solely on wireless phones and watch video off the Internet and, therefore, are not interested in purchasing a bundle.³³⁶

The experiences of the satellite and BPL providers demonstrate that companies unable to offer a full bundle on their own either: (1) price below competitors so as to offer consumers the opportunity to assemble their own service bundles; or (2) differentiate their products based on quality, offering features attractive to particular customers or a wider range of offerings to make their services attractive on a stand-alone basis. In addition, these providers will partner with other companies to enable them to offer a bundle. These partnerships will become increasingly less attractive, however, if the providers offering a triple play over their own networks succeed in integrating their services in ways that non-integrated providers cannot. Bundling has the potential to become an even more significant competitive strategy to the extent firms can integrate services³³⁷ and thereby further differentiate themselves from rivals.

There was no consensus whether bundled products constitute a separate product market from stand-alone services or will do so in the future. Markets are defined in the *Horizontal Merger Guidelines* based on the "SSNIP" test: absent price discrimination, a product or group of products can be defined as a market if "a hypothetical profit-maximizing firm that was the only present and future seller of those products ('monopolist') likely would impose at least a 'small but significant and nontransitory' increase in price."³³⁸ Applied in this context, if a small but significant nontransitory price increase applied to bundled offerings by all of the firms capable of offering a bundle would not be constrained by substitution to alternative stand-alone services, the bundled product would be considered to be in a distinct product market from the stand-alone products.³³⁹

Although no Symposium participant offered the results of such a complete market analysis, participants reached varying conclusions about the appropriate markets based on the limited data available. Raclin, of Charter, argued for a broad market definition of "integrated communications services" including voice, broadband or high-speed data, and video sold to

³³⁴ *Herron Presentation*, at 4 (listing services as broadband data with a 10+ Mbps rate, VoIP voice services, but only video on demand or video instant messaging).

³³⁵ Herron, Tr. at 321.

³³⁶ *Id.*

³³⁷ See Levin, Tr. at 323-24 (explaining that the bundle becomes a much more powerful product when it provides integrated services rather than just discounts – for example, allowing users who are watching video programming to have information on incoming telephone calls appear on their TV screens).

³³⁸ *Horizontal Merger Guidelines* §1.11.

³³⁹ Dr. Wilkie noted that bundling can affect market definition, making it more difficult to apply the antitrust "SSNIP" test when competitors sell bundles with different elements in them. Wilkie, Tr. at 126-27.

residential customers, taking into account the increasing sale of these products in a bundle.³⁴⁰ Lindsay, of Qwest, contended that competition should be evaluated in terms of competing broadband access suppliers, rather than individual services offered over the networks.³⁴¹ In contrast, Dr. Singer suggested that the triple-play bundle might be too broad a product market, as an antitrust product market represents the smallest set of services for which a hypothetical monopoly provider could profitably impose a SSNIP. If the provider of any component of the triple-play bundle could profitably impose a SSNIP, then the bundle would not be in the market. He also noted that some providers, like DBS firms, can still profitably offer a component of the bundle on a stand-alone basis.³⁴²

E. Wireless Substitution for Wireline Telecommunications Services

The issue of substitution of wireless mobile telephone services for landline telephony has attracted considerable attention in recent years, and was a significant topic of discussion at the Symposium. The ILECs have frequently expressed concern about wireless substitution eroding their subscriber bases and revenues, and have also relied on the existence of wireless competition to support their requests for deregulation and forbearance at the federal and state levels.³⁴³ Substantial information was presented at the Symposium, and is available from public sources, to demonstrate that substitution from landline to mobile telecommunications services is having a noticeable effect on the number and usage of residential lines served by incumbent landline carriers. However, no evidence was presented at the Symposium that this substitution to date has effectively constrained the prices consumers pay for access to landline telephone service.³⁴⁴ In addition, although the number is growing, publicly available sources report that less than 20 percent of consumers have “cut the cord.”

The increased popularity of mobile phones has affected telephone usage patterns. First, there has been a marked increase in wireless subscribers and usage, so much so that the number of wireless subscribers is greater than the number of landlines. FCC data indicate that, as of December 2007, there were 249.2 million mobile phone subscribers in the United States, an increase of 19.6 million (or more than eight percent) over the previous year.³⁴⁵ The number of

³⁴⁰ *Charter Submission*, at 28-29.

³⁴¹ Lindsay, Tr. at 77-79.

³⁴² *Singer Supp. Submission*, at 5-6.

³⁴³ For example, in the *Six MSA Order*, Verizon’s request for forbearance from various federal regulatory requirements in six major metropolitan areas was based in part on claims of substantial wireless competition for residential and small business customers. However, the FCC found that “[w]ith respect to retail competition for mass market customers, Verizon’s MSA-wide mass market market shares, even including wireless ‘cut the cord’ competition . . . are not sufficient to warrant forbearance from dominant carrier regulation.” *Six MSA Order*, at 21,313-14.

³⁴⁴ “Access” as used here refers to the monthly fixed rates consumers pay to have a telephone line, rather than any usage-sensitive per-minute charges they may incur for calls.

³⁴⁵ *FCC Local Telephone Competition Report*, at Table 14.

mobile subscribers considerably exceeded the 158 million total residential and business landlines in use.³⁴⁶

Second, the number of residential landlines in service has decreased substantially. FCC data demonstrate the decline in absolute numbers of residential landlines.³⁴⁷ See Graph 2. All of the major ILECs appear to have experienced similar residential line loss patterns. According to Qwest, the company lost 3.7 million residential access lines between 2000 and 2006, or 32 percent of its lines. Other major ILECs suffered losses nearly as large in percentage terms, with Verizon losing 10.8 million residential lines (or 28 percent), and AT&T losing 16.2 million residential lines (or 30 percent) over the same period.³⁴⁸ Some of the ILEC losses are attributable to competition from cable companies or other landline CLECs.³⁴⁹ Even more of the losses are probably due to consumers discontinuing second telephone lines as they move from narrowband Internet service to broadband service requiring only a single telephone line.³⁵⁰ Lindsay, of Qwest, concluded that, because the overall number of voice connections in use is not decreasing, the incumbents' losses are attributable to users switching from the incumbents' landline technology to wireless carriers as well as VoIP services.³⁵¹

Third, consumers are shifting some usage from landline telephones to their wireless phones when they own both. This shift is quite extensive in the case of landline long-distance services traditionally paid for on a per-minute basis. The effective cost to the consumer of long-distance minutes on a mobile telephone has fallen, through the introduction of large "buckets" of mobile minutes at a low average cost per minute, as well as through nationwide long distance mobile services offered without the roaming charges that had earlier been a large part of the cost of many wireless long distance calls. This has made it more attractive for many consumers to make a larger share of their long distance calls on their mobile phones. The proportion of wireless mobile traffic that is interstate has been steadily growing.³⁵² The average wireless price

³⁴⁶ *Id.* at Table 1.

³⁴⁷ As of December 2007, there were 93.9 million residential switched access lines in service, including 81.8 million ILEC lines. *FCC Local Telephone Competition Report*, at Table 2. This total was down more than 33 million from the peak of 127.3 million residential wireline loops in 2001. *Telephone Trends*, at Table 7.4.

³⁴⁸ *Lindsay Presentation*, at 6.

³⁴⁹ Total CLEC residential landlines in use as of December 2007 were 12.1 million. *FCC Local Telephone Competition Report*, at Table 2.

³⁵⁰ As of 2006, non-primary residential lines in use were 10.5 million, down from a peak of 26.3 million in 2001, a loss of 15.8 million. *Telephone Trends*, at Table 7.4. This decline has likely continued with the expanded use of broadband lines since 2006.

³⁵¹ *Lindsay Presentation*, at 8; Lindsay, Tr. at 79-82.

³⁵² Between 2000 and 2007, the mix of residential traffic carried by the wireless mobile carriers shifted more toward long distance from local calls. In 2000, 87 percent of residential wireless calls and 82 percent of residential wireless minutes were intrastate (including local and intrastate toll, which are both charged for by mobile carriers though local calls are generally not billed to residential customers on a usage basis by landline carriers), compared with only nine percent interstate calls and 16 percent interstate minutes. By 2005, the share of residential wireless calls that were interstate had increased to 15 percent, and 28 percent of residential wireless minutes were

per minute, which as of 2000 was still well in excess of average landline interstate per-minute rates, fell by 2005 to a nearly comparable level.³⁵³ The FCC reported that customers in nearly one-third of U.S. households make at least half of their long-distance calls at home from their cell phones rather than their landlines. Forty-two percent of cell phone users that also have landline telephones reported using their cell phones more often.³⁵⁴ Per-minute substitution has been less relevant to local telephone service for residential customers, because most residential customers still obtain local telephone service from their landline provider on a flat-fee basis without per-minute usage charges.

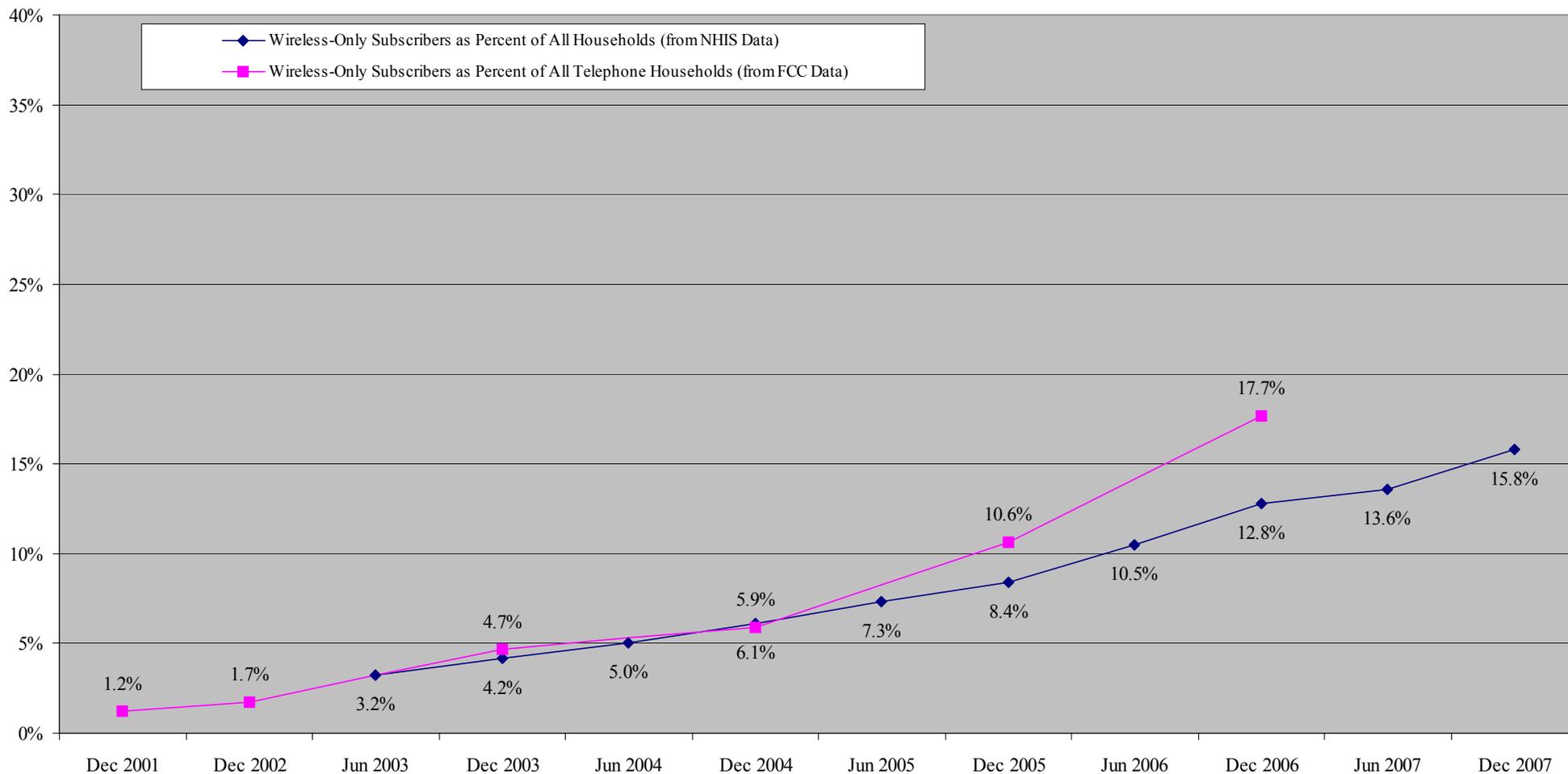
To date, only a small percentage of customers forgo landlines entirely and rely solely on a mobile wireless device, although data compiled by the FCC suggest that the percentage is growing. See Graph 6 – Percent of U.S. Wireless-Only Telephone Households. A large majority of residential consumers still choose to keep both a landline and a mobile telephone. This may be due to the greater security afforded by redundancy on alternative networks, superior landline voice quality, lower reliability, and coverage of the mobile networks in various geographic areas, the ability to use the independently-powered landline telephone in an emergency or when mobile networks lose power, or other factors. Moreover, for the growing number of consumers who want a DSL broadband landline connection for Internet access, the additional cost of adding landline network access for voice telephone service may be seen as relatively small, or even unavoidable if “naked DSL” (DSL provided separately without the requirement to also buy voice telephone service) is not offered by the landline telephone provider.

interstate, compared with 81 percent intrastate calls and 71 percent intrastate minutes. *Telephone Trends*, at Table 11.4.

³⁵³ Compare *Telephone Trends*, at Table 11.3 (average monthly wireless bill rose from \$45.27 to \$50.56 between December 2000 and December 2006, but average number of minutes used per month increased during the same time from 255 to 714, bringing the average monthly rate per minute used down from 17.7 to 7.0 cents per minute) with *id.*, at Table 13.4 (average revenue per minute for interstate calls between 2000 and 2006 fell from nine cents per minute to six cents per minute). In 2006, the sharp declines in mobile telephone service prices appeared to have leveled off and prices became relatively stable. By some measures prices increased though other measures continued to show declines. Though the average monthly wireless bill was \$50.56, up slightly from 2005, average revenue per minute was unchanged from 2005, at seven cents for all minutes or six cents for voice minutes. Twelfth Report, *In the Matter of Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993 Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services*, FCC WT Docket No. 07-71, 23 FCC Rcd 2241, 2321-24 & Table 14 (rel. Feb. 4, 2008) (“*FCC Twelfth CMRS Report*”).

³⁵⁴ Eleventh Report, *In the Matter of Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993 Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services*, FCC WT Docket No. 06-17, 21 FCC Rcd 10,947, 11,027 (rel. Sept. 29, 2006), (“*FCC Eleventh CMRS Report*”).

Graph 6
Percent of U.S. Wireless-Only Telephone Households
(As Reported by FCC Sources)
(December 2001 - December 2007)



* All Households data is taken from Twelfth Report, In the Matter of Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993 Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services, at ¶ 248, FCC WT Docket No. 07-71, 23 FCC Rcd 2241 (released Feb. 4, 2008), and Stephen J. Blumberg, Ph.D., and Julian V. Luke, Wireless Substitution: Early Release of Estimates Based on Data from the National Health Interview Survey, July - December 2007, National Center for Health Statistics, Centers for Disease Control, at Table 1 (released May 13, 2008), available at <http://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless200805.pdf>. Data source of report is National Health Interview Survey, July to December 2007.

* Telephone Households data is taken from Industry Analysis and Technology Division, Wireline Competition Bureau, Federal Communications Commission, Trends in Telephone Service, at Table 7.4 (August 2008).

Qwest submitted data illustrating that the percentage of U.S. households with only wireless telephone service increased between January 2003 and December 2006 from 2.9 percent to 11.8 percent, with significantly higher substitution in certain population segments, including younger and poorer households.³⁵⁵ Lindsay, of Qwest, thought that by the end of 2007, 16 to 17 percent of U.S. homes probably no longer had wireline access.³⁵⁶ His estimates are close to survey data indicating that 15.8 percent of all households had only wireless telephone service as of December 2007.³⁵⁷ Lindsay also observed that the rate of this substitution has been increasing, from 1.5 percent from June 2003 to June 2004, to 2 percent the next year, and to about 3 percent from June 2005 to June 2006.³⁵⁸

The existence of some consumers who choose to substitute wireless service for access to the landline network does not demonstrate that wireless service is an effective constraint on prices for access to landline services. That determination turns in part on the number of customers who would choose to substitute to wireless services

Although wireless substitution has decreased the number and usage of ILEC residential lines, it is not clear whether wireless substitution constrains the prices consumers pay for access to landline phone service.

entirely in response to a specified price increase for landline telephone service, compared with the number of customers who would choose to stay with landline and pay the additional price.³⁵⁹ The size of that wireless substitution effect is not known. However, there are reasons (discussed below) to think that wireless is not by itself an effective competitive constraint today.³⁶⁰

³⁵⁵ *Lindsay Presentation*, at 8. The *FCC Twelfth CMRS Report* issued in 2008 included data from a National Health Interview Survey showing that 11.8 percent of adults lived in households having only wireless phones in 2006, up from 7.8 percent in 2005 and 3.5 percent in 2003, as well as data showing that 12.8 percent of households had given up wireline telephones by 2006, up from 8.4 percent in 2005 and 4.2 percent in 2003. *Twelfth CMRS Report*, at 2340-41. Other FCC data indicated that the total of wireless-only households was already 19.3 million in 2006, out of the total of 108.8 million U.S. households with telephone service at that time. *Telephone Trends*, at Table 7.4.

³⁵⁶ Lindsay, Tr. at 157.

³⁵⁷ Stephen J. Blumberg & Julian V. Luke, *Wireless Substitution: Early Release of Estimates Based on Data from the National Health Interview Survey, July - December 2007*, National Center for Health Statistics, Centers for Disease Control, at Table 1 (released May 13, 2008), available at <http://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless200805.pdf>.

³⁵⁸ *Id.* at 80-81.

³⁵⁹ See *Horizontal Merger Guidelines*, § 1.1.

³⁶⁰ For some ILECs, the loss of landline subscribers to mobile wireless services does not mean that they will lose all of the associated revenues. Some significant share of consumers who “cut the cord” entirely in the regions served by AT&T and Verizon likely will remain with those companies’ wireless networks, given that AT&T and Verizon have the nation’s two largest wireless businesses in terms of subscribers. Although wireless revenues would not replace lost landline access revenues, assuming the customer was already a mobile service user, there would be a revenue offset to the extent substitution to mobile leads to increased demand for mobile minutes paid on a usage-sensitive basis, or the customer adds a new mobile telephone to substitute for the landline telephone.

Data indicate that more than 80 percent of residential consumers do not consider mobile wireless to be a substitute for a landline telephone at current access prices, since they continue to pay for and use both.³⁶¹ In addition, there is little evidence that landline telephone companies consider the threat of wireless substitution sufficient to change their access prices. In response to customers “cutting the cord,” a telephone company can either lower its prices to all customers to keep subscribers from switching, or leave prices where they are.³⁶² A company would choose the first option if the loss of revenue from cord-cutting is expected to be greater than the loss of revenue from reducing the fees paid by customers who would not switch. If, however, the extent of wireless substitution in response to price changes is small, the company would choose not to lower prices. In fact, stand-alone landline access prices have remained relatively stable and do not appear to have declined substantially below the levels at which they are capped by regulation.³⁶³

Most significantly, Dr. Wilkie observed that econometric analyses of the issue have not shown that wireless and landline telephone services are in the same product market, though they may be getting close.³⁶⁴ He concluded that “even though we have the vast migration of minutes, we don’t see any ability to constrain access pricing.”³⁶⁵ Dr. Wilkie suggested that this issue could be further studied using number portability data, on the assumption that when customers are actually substituting a new service for their traditional landline they would want to associate their old number with the new service.³⁶⁶

Dr. Wilkie concluded that deregulation of the monthly prices consumers pay for landline telephone service based on the number of wireless providers or number of traditional access lines

³⁶¹ Although these customers may substitute some usage from their landline to their cell phone, they continue to pay the monthly nonusage-sensitive access fee to keep a landline telephone.

³⁶² This assumes that the telephone company cannot identify which customers are likely to switch from landline to wireless and only decrease access prices as to those users.

³⁶³ See *Telephone Trends*, at Tables 13.1 & 13.3 (showing a decrease in monthly prices for residential access lines from 2000 to 2007 from \$25.02 to \$24.80 measured in 2006 dollars, as well as in total urban residential rates including connection and other charges, from \$44.10 to \$40.67). It does not appear from available evidence that landline local telephone prices have declined significantly since that time.

³⁶⁴ Wilkie, Tr. at 128-29 (“[W]hen economists do careful econometric studies of the degree of substitution and when we look at the access line, is there any evidence that the wireless substitution is sufficient such that it is in the same relevant product market, formally in the DOJ sense. They all say no.”); see also *Wilkie Presentation*, at 4 (“No economic evidence of access substitution”). Studies referenced by Dr. Wilkie include: Michael R. Ward & Glenn A. Woroch, *Usage Substitution between Mobile Telephone and Fixed line in the U.S.*, Center for Research on Telecomm. Policy Working Paper (May 2004); Mark Rodini et al., *Going Mobile: Substitutability between Fixed and Mobile Access*, 27 TELECOMM. POLICY 457 (2003) (finding evidence of moderate and growing usage substitution, and second access line substitution, from wireline to wireless, but stating that it would be premature to infer that mobile service currently constrains landline local telephone market power to any economically significant degree).

³⁶⁵ Wilkie, Tr. at 129; see also *id.* at 142-43, 157-59 (describing wireless as a complement rather than substitute for wireline based on cost, and explaining that the key issue is enough substitutability to affect price).

³⁶⁶ *Id.* at 129-30.

lost may result in higher prices because it has not been shown that these alternative services are sufficiently competitive to effectively constrain pricing by the incumbents.³⁶⁷ Although he could not predict the overall welfare consequences of deregulation given mandated price averaging and other factors, Dr. Wilkie asserted that current economic evidence does not provide sufficient assurance that prices would be controlled by the market.

Wireless mobile and landline residential service may become closer substitutes for more customers in the future. Several Symposium speakers recognized this possibility as advanced wireless broadband networks are deployed.³⁶⁸

³⁶⁷ *Id.* Other Symposium participants also expressed doubts that wireless was a substitute for wireline. *See, e.g.,* Canfield, Tr. at 149; Perkins, Tr. at 149-51.

³⁶⁸ *See, e.g.,* Levin, Tr. at 308-10; Kafka, Tr. at 186-87.

III. OBSTACLES TO COMPETITIVE ENTRY

One purpose of the Symposium was to gather information about the various barriers that may be slowing or deterring entry. Participants identified a variety of regulatory and other potential barriers to entry and explained their impact. The concerns discussed in this chapter relate primarily to regulatory issues as well as to conduct by incumbents. Other inherent economic or technical impediments that make entry less likely – such as the high cost of building networks in rural areas – are not discussed here. Government action is unlikely to lessen these obstacles, though their effect on the extent of competition can be significant.

A. MVPD Services

1. Local Franchising Requirements

Companies that want to provide multichannel video services need to obtain a franchise from either a state or local agency. Entrants have expressed concerns about the local process, including that incumbent cable providers use it to delay entry and increase entrants' costs. They also raised issues with the process itself, alleging, among other things, that it takes too long and that local franchising authorities demand expensive and inappropriate conditions.³⁶⁹ They have sought reform of the local franchising process from both the FCC and state legislatures.

On March 5, 2007, the FCC released a Report and Order relating to video franchising.³⁷⁰ In this decision, the FCC adopted rules and guidance to prevent local franchising authorities (“LFAs”) from unreasonably refusing to grant franchises to new entrants.³⁷¹ Among other things, the FCC adopted time limits within which a LFA has to act.³⁷²

³⁶⁹ *Verizon Submission*, at 12-27; *Verizon Supp. Submission*, at 1-4.

³⁷⁰ Report and Order and Further Notice of Proposed Rulemaking, *In the Matter of Implementation of Section 621(a)(1) of the Cable Communications Policy Act of 1984 as Amended by the Cable Television Consumer Protection and Competition Act of 1992*, FCC MB Docket No. 05-311, 22 FCC Rcd 5101 (rel. Mar. 5, 2007) (“*FCC VF Report and Order*”), *petitions for review denied, Alliance for Community Media v. FCC*, 529 F.3d 763 (6th Cir. 2008). Section 621(a)(1) provides that a franchising authority may not unreasonably refuse to award a franchise to an entrant.

³⁷¹ The *FCC VF Report and Order* addresses only the actions and rules of LFAs and does not address statewide franchising activities. *Id.* at 22 FCC Rcd 5101, 5102 n.2.

³⁷² If an LFA does not act on an application within 90 to 180 days of an application being filed, the applicant automatically receives an interim franchise. *FCC VF Report and Order*, 22 FCC Rcd at 5134. The interim license continues until the LFA approves the franchise or formally denies the application. The FCC also provides a list of information that must be included in the application to start the clock and allows the LFA to “stop the clock” if it issues a request for information. *Id.* at 5138.

The FCC's video franchising order also provides guidance on other issues. The FCC found that imposing "unreasonable" build-out conditions³⁷³ on new entrants would constitute an improper refusal to award a competitive franchise.³⁷⁴ Similarly, the FCC determined that requiring a new entrant to provide products or services unrelated to the provision of cable services is unreasonable unless the value of these demands is counted toward franchising fees, which are capped by law at five percent of cable revenues.³⁷⁵ Finally, the FCC's order preempts local franchising rules and regulations, including level-playing-field laws,³⁷⁶ to the extent that they are inconsistent with the order, unless those rules and regulations are specifically authorized by state law.³⁷⁷ On November 6, 2007, the FCC adopted a Second Report and Order in this proceeding, where it extended a number of its rules to franchises issued to incumbents.³⁷⁸

In addition to FCC action, a number of states have passed laws reforming the local franchising process. These state franchising laws aim to make video entry easier, either by transferring authority over video franchising from multiple local authorities to a single statewide agency such as the state public utility commission, or by imposing uniform statewide conditions – such as timetables for decisions on how local authorities conduct the franchising process. Texas was the first state to enact a state franchising law in 2005.³⁷⁹ The Texas law moved cable franchising authority from the municipalities to the Public Utility Commission of Texas ("TPUC") and requires the TPUC to act on a completed franchise application within 17 business days of receipt.³⁸⁰ Texas has no build-out requirements, although franchisees are prohibited from denying service based on the income level of an area.³⁸¹ At this time, 21 states have enacted reforms to the local franchising process. The vast majority of these states have transferred franchising authority to a state entity. State franchising legislation is pending in an additional

³⁷³ Build-out conditions require the entrant to deploy cable services to parts or all of the franchise area within a specific period of time.

³⁷⁴ *FCC VF Report and Order*, 22 FCC Rcd at 5140-44.

³⁷⁵ *Id.* at 5144-51.

³⁷⁶ Level-playing-field requirements impose on the new entrant the terms and conditions that are in the incumbent cable company's franchise.

³⁷⁷ *FCC VF Report and Order*, 22 FCC Rcd at 5156-64.

³⁷⁸ Second Report & Order, *In the Matter of Implementation of Section 621(a)(1) of the Cable Communications Policy Act of 1984 as Amended by the Cable Television Consumer Protection and Competition Act of 1992*, FCC MB Docket No. 05-311, 22 FCC Rcd 19,633 (rel. Nov. 6, 2007).

³⁷⁹ Tex. Util. Code Ann. §§ 66.001 et seq. (Vernon 2005).

³⁸⁰ *Id.* at § 66.003.

³⁸¹ *Id.* at §§ 66.007 (no build-out requirement), 66.014 (no discrimination based on income).

five states.³⁸² These laws have varying terms and no comprehensive studies of their effects on the process of video franchising are available as yet.

Several commenters and Symposium participants raised questions about the appropriateness and efficacy of the FCC's video franchising order and statewide franchising laws.³⁸³ Lawton, on behalf of Montgomery County, Maryland, noted that without state franchising legislation and before the intervention of the FCC, Montgomery County already had three wireline cable franchisees competing head-to-head.³⁸⁴ She argued that there is no evidence that state franchising laws have resulted in a significant increase in competitive deployment,³⁸⁵ a point echoed by Fairfax County.³⁸⁶ Although Virginia enacted a law creating an alternative franchising process, Fairfax County noted that competitive entry occurred in the county *before* that law was enacted.³⁸⁷

Fairfax County argued that reasonable build-out requirements not only ensure that every resident has a choice of at least two competitive wireline providers within a specific period of time, but also advance a policy of ensuring that every American home has access to advanced services (such as broadband Internet access).³⁸⁸ Dr. Singer, on the other hand, argued that entrants should not be burdened with the same build-out requirements imposed on incumbents because the incumbents' build out was subsidized by monopoly profits.³⁸⁹

Lawton opined that local regulators are better-equipped to deal with local consumer complaints and manage local rights-of-way in order to protect the community and prevent disruption caused by construction.³⁹⁰ She suggested that local, state, and federal governments need to work together in order to ensure that consumers have access to reliable, equitably-priced MVPD services.³⁹¹

³⁸² State franchising laws have been enacted in California, Connecticut, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Louisiana, Maine, Michigan, Missouri, Nevada, New Jersey, North Carolina, Ohio, South Carolina, Tennessee, Texas, Virginia, and Wisconsin. State franchising legislation currently is pending in Idaho, Massachusetts, New York, Pennsylvania, and Washington.

³⁸³ See, e.g., Lawton, Tr. at 56; *Lawton Presentation*, at 4.

³⁸⁴ Lawton, Tr. at 54; *Lawton Presentation*, at 4.

³⁸⁵ Lawton, Tr. at 62; *Lawton Presentation*, at 11.

³⁸⁶ *Fairfax County Reply Comments*, at 26-30.

³⁸⁷ *Id.* at 4.

³⁸⁸ *Id.* at 7.

³⁸⁹ *Singer Presentation*, at 22.

³⁹⁰ Lawton, Tr. at 57-58, 63; *Lawton Presentation*, at 6.

³⁹¹ Lawton, Tr. at 64 ("The public and the competitive providers alike will benefit when local government is supported at the federal level."); *Lawton Presentation*, at 12.

Verizon countered that despite improvements over the past year, the local franchising process continues to pose barriers to competitive entry in terms of both additional costs and delays.³⁹² Verizon estimated that the average time to obtain a franchise is six to twelve months in New York and Massachusetts and five to nine months in Pennsylvania.³⁹³ None of these states have statewide franchising laws, although legislation is pending in all of them. Verizon further noted that almost half of its franchises are located in states that have statewide franchising laws, even though such states account for less than 25 percent of its residential access lines.³⁹⁴ Cavalier also commented about the difficulties of obtaining franchises in some localities, although its experience was not uniformly negative.³⁹⁵

Charter disputed assertions that the local franchising process poses a barrier to new MVPD entry. Raclin, of Charter, stated that his company secured more than 2,000 cable franchises in an eighteen-month period in the late 1990s.³⁹⁶ However, Charter's experience is based on its rapid growth by acquisition of existing cable franchises.³⁹⁷ Such franchise transfers are not directly comparable to efforts by Verizon or other new entrants to obtain competing franchises.

The Department has stated in an *ex parte* letter to the FCC that entry by the telephone companies into the MVPD market may induce not only additional competition in video distribution, but also quicker deployment of broadband services to consumers.³⁹⁸ These potential gains in consumer welfare are more likely to be realized if the local franchising process does not impose restrictions or conditions on entry beyond those necessary to protect important public policy goals (such as preserving the integrity of public rights of way).³⁹⁹ The Department recommended that the FCC adopt rules or other guidance that would: (1) establish standard and enforceable time frames for acting on franchise applications; (2) establish objective criteria for determining what, if any, "concessions" localities may appropriately demand; and (3) clarify that service areas proposed by the new entrants

The potential gains in consumer welfare from entry are less likely to be realized if the local franchising process imposes restrictions or conditions on entry beyond those necessary to protect important public policy goals.

³⁹² Thorne, Tr. at 22-23; *Verizon Supp. Submission*, at 1-4.

³⁹³ *Verizon Supp. Submission*, at 2.

³⁹⁴ *Id.*

³⁹⁵ Perkins, Tr. at 100-01.

³⁹⁶ Raclin, Tr. at 47; *Raclin Presentation*, at 8.

³⁹⁷ *See Charter Submission*, at 4.

³⁹⁸ *DOJ Cable Ex Parte Submission*, at 3-4.

³⁹⁹ *Id.* at 4.

should be approved unless there is credible evidence that the proposed service areas are intended to discriminate against low-income residents.⁴⁰⁰

In addition to filing its *ex parte* letter in the FCC proceeding, the Department also sent letters to nine states considering statewide franchising legislation.⁴⁰¹ The letters cited evidence that the local franchising process can and has posed in some situations unreasonable barriers to competitive entry.⁴⁰² Continuing reduction of regulatory entry barriers in the video franchising process and elsewhere is supported by the identifiable consumer benefits that can be realized from entry, though reduction of entry barriers does not foreclose a role for local authorities in legitimate consumer protection efforts. Local governments have traditionally had responsibilities to ensure their citizens' safety and to preserve the integrity of their public rights of way, and the Department is not suggesting that local governments should have no role in regulating MVPD providers within their jurisdictions related to those legitimate functions. However, regulatory restrictions that make it difficult for companies to enter markets tend to shield incumbents from competition and lead to higher costs, reduced innovation, and diminished choices for consumers.

2. Access to Multiple Dwelling Units

Verizon asserted that not being able to obtain access to multiple dwelling units ("MDUs") is one of the largest barriers to MVPD entry.⁴⁰³ On November 13, 2007, the FCC released an order prohibiting the enforcement of existing exclusivity contracts as well as the execution of new exclusive agreements between certain MVPD providers and MDU owners.⁴⁰⁴ The FCC has not required landlords to allow multiple carriers to serve a building, but only addressed the legality of agreements precluding such entry. In its order, the FCC cited statistics showing that approximately 30 percent of the U.S. population now live in MDUs and that the number is growing.⁴⁰⁵ The FCC found that exclusivity clauses were widespread and that incumbent cable operators have increased their use of exclusivity clauses.⁴⁰⁶ Although the FCC

⁴⁰⁰ *Id.*

⁴⁰¹ *See, e.g.*, Letter from Thomas O. Barnett, Asst. Atty. Gen., Antitrust Div., U.S. Dep't of Justice, to Rep. Cameron C. Staples & Sen. Eileen M. Daily, Co-Chairs, Jt. Comm. On Fin., Rev. & Bonding, State of Connecticut (Apr. 30, 2007) available at <http://www.usdoj.gov/atr/public/comments/223435.htm> ("*Barnett Letter*"). In addition to Connecticut, similar letters were sent to Florida, Illinois, Massachusetts, Minnesota, Nevada, Ohio, Tennessee, and Wisconsin and can be found at <http://www.usdoj.gov/atr/public/comments>.

⁴⁰² *See, e.g., Barnett Letter*, and similar letters to other states.

⁴⁰³ Thorne, Tr. at 25. *See also* Goodman, Tr. at 34-35 (discussing MDUs).

⁴⁰⁴ *FCC MDU Exclusivity Report & Order*. In its Further Notice of Public Rulemaking in this proceeding, the FCC sought comment on whether this prohibition should be extended to DBS and private cable operators. *Id.*, 22 FCC Rcd at 20,236.

⁴⁰⁵ *Id.* at 20,329. MDUs are defined in the order to include apartment, cooperative and condominium buildings as well as gated communities, mobile home parks, garden apartments, and other centrally managed real estate developments. *Id.* at 20,238-39.

⁴⁰⁶ *Id.* at 20,237.

acknowledged that exclusivity clauses “may in certain cases be beneficial, at least in the short term, to consumers,” it nonetheless concluded that “harms of exclusivity clauses outweigh their benefits.”⁴⁰⁷ The FCC’s order has been challenged by several MDU associations as well as the NCTA.⁴⁰⁸

Apart from such regulatory action, agreements entered into by an incumbent in a market to block entry of a competitor can also, depending on the facts, violate antitrust law. However, exclusive dealing arrangements can also benefit consumers. For example, such an agreement may provide incentive for the provider to upgrade facilities in a building by ensuring that the costs can be recouped. Antitrust analysis needs to take into account the potential for both the positive and negative impacts from an exclusive agreement.⁴⁰⁹ The Department has in the past and will continue to investigate allegations that such conduct is anticompetitive and take appropriate enforcement action where appropriate.

3. Access to “Must-Have” Programming

The BSPA argued that video competition would be seriously impaired without guaranteed access to certain content even “[i]f every other issue that historically has been identified as a potential barrier to competitive video entry . . . were fully resolved.”⁴¹⁰ According to the BSPA, “[e]xclusivity and discrimination in access to programming are the most powerful tactics that incumbent operators use in an effort to block or otherwise constrain wireline competition.”⁴¹¹

⁴⁰⁷ *Id.* at 20,248.

⁴⁰⁸ On January 16, 2008, the National Multi Housing Council (“NMHC”) and the National Apartment Association (“NAA”) filed a petition in the United States Court of Appeals for the District of Columbia Circuit seeking to vacate the *FCC MDU Exclusivity Report and Order* on the grounds, *inter alia*, that it exceeds the FCC’s statutory authority and constitutes a “taking” in violation of the Fifth Amendment. That same day, the NCTA also filed a petition and the two cases have now been consolidated. On January 22, 2008, the NCTA filed an emergency motion for a stay of the *FCC MDU Exclusivity Report & Order* pending judicial review, which was denied by the Court on February 28, 2008 in a *per curiam* opinion. See Docket, *Nat’l Cable Telecomm. Ass’n v. FCC*, Nos. 08-1016 & 08-1017 (D.C. Cir. current through Aug. 11, 2008).

⁴⁰⁹ For a more complete discussion of the Department’s views on exclusive agreements see U.S. DEP’T OF JUSTICE, COMPETITION AND MONOPOLY: SINGLE-FIRM CONDUCT UNDER SECTION 2 OF THE SHERMAN ACT (2008), Chapter 8.

⁴¹⁰ *BSPA Submission*, at 13-14. This position was echoed by the Coalition for Competitive Access to Content (“CA2C”) in its comments filed with the FCC. Comments of the CA2C, *In the Matter of Review of the Commission’s Program Access Rules and Examination of Programming Tying Arrangements*, FCC MB No. 07-198, at 2 (filed Jan. 4, 2008) (“*Comments of CA2C in the FCC’s NPRM on Program Access & Tying Arrangement*”). CA2C members include AT&T, BSPA, DIRECTV, Embarq, Hiawatha Broadband, Independent Telephone and Telecommunications Alliance (“ITTA”), Knology/PrairieWave, Media Access Project (“MAP”), Organization for the Promotion and Advancement of Small Telecommunications Companies (“OPASTCO”), RCN, SureWest, USTelecom, and WOW! Internet, Cable and Phone.

⁴¹¹ Comments of the Broadband Service Providers Association, *In the Matter of Review of the Commission’s Program Access Rules and Examination of Programming Tying Arrangements*, FCC MB No. 07-198, at 3 (filed Jan. 4, 2008); see also *Verizon Submission*, at 27-29.

On October 1, 2007, the FCC extended for five years its existing prohibition on exclusive arrangements related to cable programming that is delivered via satellite and owned by companies that are also MVPDs.⁴¹² In so doing, the FCC specifically found that such vertically-integrated cable programmers have increased incentives and ability to foreclose access to certain “must-have” programming to their MVPD rivals.⁴¹³ The FCC based its holding in part on “specific factual evidence that, where the exclusive contract prohibition does not apply, such as in the case of terrestrially delivered programming, vertically integrated programmers have withheld and continue to withhold programming from competitive MVPDs.”⁴¹⁴ The FCC found this to be especially true of regional sports networks (“RSNs”), which are highly valued by MVPD subscribers and for which there are no adequate substitutes.⁴¹⁵ The FCC concluded that continued access to this programming is necessary for competition in the MVPD market to remain viable.⁴¹⁶ While the FCC recognized “the benefits of exclusive contracts and vertical integration cited by some cable MSOs, such as encouraging innovation and investment in programming and allowing for ‘product differentiation’ among distributors,” the FCC nonetheless held that the anticompetitive effect of lifting the exclusivity ban outweighed these purported benefits.⁴¹⁷ In so holding, the FCC noted that the 1992 Cable Act grants vertically-integrated cable programmers the right to petition for a waiver of the ban.⁴¹⁸

In its *FCC Exclusivity Sunset Report and Order*, the FCC sought comments on a number of programming issues, including the need to extend its prohibition on exclusive arrangements to terrestrially-delivered programming,⁴¹⁹ as well as forced bundling and tiering requirements.⁴²⁰ The BSPA argued that the FCC should close the terrestrial loophole because a MVPD provider

⁴¹² *FCC Exclusivity Sunset Report & Order*, 22 FCC Rcd at 17,792.

⁴¹³ *Id.* at 17,810.

⁴¹⁴ *Id.*

⁴¹⁵ *Id.* at 17,819 (“We remain convinced . . . that, with regard to RSNs and programming with similar characteristics (such as popularity and similar monthly per subscriber affiliate fee and network advertising revenue), withholding programming from rivals can be a profitable strategy for a vertically integrated cable programmer and that such withholding can have a significant impact on a subscribership to the rival MVPDs. Such practices, in turn, predictably harm competition and diversity in the distribution of video programming, to the detriment of consumers.”).

⁴¹⁶ *Id.* at 17,817-18.

⁴¹⁷ *Id.* at 17,835.

⁴¹⁸ *Id.* (citing § 628(c)(2)(D)&(4), *codified at* 47 U.S.C. § 548(c)(2)(D)&(4)).

⁴¹⁹ The FCC reaffirmed its previous ruling that § 628(c)’s prohibition on exclusive arrangements involving vertically-integrated cable programming is limited to programming that is delivered via satellite to the MVPD provider for distribution to that providers’ end-user customers. *Id.* at 17,844-45. This limitation created a “terrestrial loophole” from the exclusivity prohibition for programming, typically of a local or regional nature, that is delivered by terrestrial fiber. *See* Goodman, Tr. at 35. Programming subject to § 628(c) does not include programming that is distributed to end users via direct broadcast satellite by one of the two DBS providers.

⁴²⁰ *FCC Exclusivity Sunset Report & Order*, 22 FCC Rcd at 17,859-67.

must have access to certain programming (such as RSNs) in order to be a viable competitor.⁴²¹ Verizon echoed these concerns, stating that the company has been denied access to such programming. According to Verizon, Rainbow Media Holdings, LLC (“Rainbow”), initially refused to provide Verizon access to Rainbow’s RSNs in the New York City metropolitan area and New England.⁴²² Rainbow is owned by the incumbent cable operator, Cablevision Systems, Inc. Verizon eventually obtained the standard definition version of this sports programming after filing a program access complaint with the FCC.⁴²³ However, Verizon claims that Rainbow has declined to sell Verizon HD feeds of its terrestrially delivered RSNs in the New York City metropolitan area. In addition to RSNs, Verizon also advocates extending the ban on exclusive contracts to terrestrial HD feeds of programming that is otherwise subject to the program access rules.⁴²⁴ However, the NCTA disagreed with the BSPs and ILECs, saying such regulation is unnecessary as the MVPD market is more competitive now than in 1992, when the program access rules were promulgated.⁴²⁵

In several investigations the Department has examined whether allowing an MVPD provider to own alleged “must-have” programming would adversely impact consumers and whether vertically integrated providers’ refusal to license such programming violates antitrust law. The analysis included examining the incentive and ability of the provider to disadvantage a competitor given the attractiveness of the programming and the cost to the provider of withholding the programming. The Department also considered whether there were efficiencies associated with vertical integration or procompetitive reasons for refusals to license. The Department will continue to investigate allegations that such conduct is anticompetitive and take enforcement action where appropriate.

⁴²¹ *Goodman Presentation*, at 10-11; *see also Comments of CA2C in the FCC’s NPRM on Program Access & Tying Arrangements*, at 14.

⁴²² *Comments of Verizon Communications Corp., In the Matter of Review of the Commission’s Program Access Rules and Examination of Programming Tying Arrangements*, FCC MB No. 07-198, at 6 (filed Jan. 4, 2008) (“*Comments of Verizon in the FCC’s NPRM on Program Access & Tying Arrangements*”).

⁴²³ *Id.* at 6 (citations to Program Access Complaint omitted). The FCC identified other instances where incumbent cable operators have denied competitors access to vertically-integrated RSNs, including in Philadelphia, San Diego, and elsewhere. *See FCC Sunset Exclusivity Report and Order*, 22 FCC Rcd at 17,823-26.

⁴²⁴ *Comments of Verizon in the FCC’s NPRM on Program Access & Tying Arrangements* at 7. In support of its position, Verizon notes, “More than one-third of American households already have an HD television (“HDTV”) set, and HDTV sales are growing at an astonishing 50% per year. By 2011, according to estimates by the Consumer Electronics Association, the number of HDTVs sold in the United States will reach 170 million, which is roughly one set for every two Americans.” *Id.*

⁴²⁵ “Given this vibrant competition,” the NCTA argues, “it is time for a less regulatory, more market-driven approach[.]” *NCTA Program Access Comments*, at 2. Consequently, the NCTA opposes extension of the program access rules to terrestrially delivered programming. *Id.* at 10. Cablevision echoes the points made by the NCTA. *Comments of Cablevision Systems Corp., In the Matter of Implementation of the Cable Television Consumer Protection and Competition Act of 1992: Development of Competition and Diversity in Video Programming Distribution: Section 628(c)(5) of the Communications Act: Sunset of Exclusive Contract Prohibition*, FCC MB Docket No. 07-29, at 3-4 (filed Jan. 4, 2008). Cablevision also questions the FCC’s legal authority to extend the exclusivity ban to terrestrially delivered program offerings, including HD offerings. *Id.* at 13-19.

B. Local Telephone Services

Unlike the telephone companies that have begun providing video over their own facilities in the last three years, cable operators and wireless providers have benefitted in the last decade from the 1996 Act and the rules and procedures adopted by the FCC and states to open local telephone markets to competition. While many states require certificates for providing local exchange service, the difficulties encountered in obtaining state certification usually are not comparable to the local franchise requirements faced by video entrants. Therefore, in telephony there appear to be fewer regulatory barriers to facilities-based entry than in video programming, with the exception of rural areas where some states have more difficult certification requirements.⁴²⁶ Companies seeking to provide telephone services did raise concerns related to current proceedings at the FCC and state public service commissions evaluating whether certain types of regulatory requirements should be eliminated, as well as problems in obtaining cooperation from incumbents, and access to multi-tenant buildings and master-planned communities, as discussed below.

1. Forbearance Proceedings and Requests to Deregulate Local Services

Many Symposium participants commented on proceedings pending before the FCC and state regulatory bodies in response to ILEC petitions to be relieved of obligations imposed by the 1996 Act or price regulations mandated by the states.⁴²⁷ The outcome of these proceedings depends in large part on the regulatory agency's analysis of whether existing competition is sufficient to make the regulation unnecessary. Comments addressed mainly two topics: (1) the competitive analysis used in deciding that the existing regulations were not needed to protect consumers; and (2) the effect of regulatory uncertainty on decisions by companies to provide telephone services.

Covad Communications, NuVox Communications, and XO Communications, LLC ("CLEC Commenters")⁴²⁸ submitted a compendium of materials expressing their concerns about a number of issues, including requests by several ILECs for forbearance from regulations regarding UNEs and other regulatory obligations. The CLEC Commenters stated that facilities-based CLECs rely on UNEs obtained from incumbent telephone companies to compete in telecommunications markets. They cited a study by QSI Consulting purporting to show that granting forbearance requests with respect to UNEs would greatly increase consumers' telecommunications expenses.⁴²⁹ The CLEC Commenters also contended that the FCC is given

⁴²⁶ See *DOJ Pennsylvania PUC Comments* (recommending reform of Pennsylvania's procedures for certification of competitors to provide facilities-based telephony services in rural areas to promote more rapid entry).

⁴²⁷ See, e.g., *Six MSA Order*, 22 FCC Rcd at 21,302-03; *Virginia Order*.

⁴²⁸ Comments of Covad Communications, NuVox Communications, and XO Communications, LLC, for inclusion in the 2007 DOJ Telecommunications Symposium, Nov. 13, 2007 ("*Covad Submission*").

⁴²⁹ *Id.* at 2. A copy of the QSI study is appended to the October 29, 2007 Ex Parte Letter contained in the Attachments to the CLEC Commenters letter (Tab 17 under "Forbearance").

insufficient information to make the required competitive determinations.⁴³⁰ Among other things, the CLEC Commenters cited the lack of reliable data sufficiently disaggregated to evaluate the state of facilities-based competition at individual wire centers or local switching points.⁴³¹ Cavalier also raised concerns about the effects of regulatory forbearance.⁴³²

ILECs seeking forbearance strongly disagree. They contend that they face extensive competition and that regulation may deter investment.⁴³³ They also contend that changes are necessary to ensure regulatory parity because cable companies and other entrants are not subject to the same requirements.

Regulators should evaluate the need for future regulation and continually reassess whether existing rules discourage efficient investment in new facilities or have other negative impacts.

During the Symposium, other speakers commented on whether the benefits of imposing UNE obligations outweigh the negative impacts. As described in more detail in Chapter II.B.2, Dr. Hazlett contended that regulations requiring incumbent telephone companies to make their facilities available to entrants diminish the incumbents' incentives to invest in new facilities and technology. To support his view, he compared the telephone companies' share of broadband subscribers while they were subject to "line sharing" regulation and after the regulations were lifted to the share of the cable companies that were never subject to sharing requirements. He credited repeal of the regulations with spurring the telephone companies to make the investment necessary to attract more subscribers.

Cavalier, a CLEC that combines UNE loops with its own facilities, said that being able to access the incumbents' last-mile facilities allows it to innovate by offering higher Internet speeds and video using IPTV over copper wires.⁴³⁴ In addition, the company is able to offer a triple-play bundle for a lower price than the cable or telephone companies. Finally, Cavalier contended that without UNEs, consumers in many areas would be faced with a duopoly, thus defeating the goals of the 1996 Act.⁴³⁵

In addition, some entrants suggested that the uncertainty created by state and federal proceedings relating to unbundling, retail rate deregulation, intercarrier compensation, the

⁴³⁰ *Covad Submission*, at 3.

⁴³¹ *Id.*

⁴³² *See Perkins, Tr.* at 106-07.

⁴³³ *See, e.g., Reply Comments of Verizon, Petitions of the Verizon Telephone Companies for Forbearance Pursuant to 47 U.S.C. § 160(c) in the Boston, New York, Philadelphia, Pittsburgh, Providence, and Virginia Beach Metropolitan Statistical Areas, FCC WC Docket No. 06-172, at 6-7 (filed Apr. 18, 2007).*

⁴³⁴ *Perkins, Tr.* at 106.

⁴³⁵ *Id.* at 107.

universal service fund, and other issues may deter competitive entry.⁴³⁶ All of these issues could have an impact on either the cost of an entrant's service or the price charged by the incumbent against which the entrant must compete. Cavalier said that constant regulatory battles drive up costs and act as a barrier to investment.⁴³⁷

Dr. Wilkie cautioned against a "rush" to regulate or deregulate.⁴³⁸ He provided several examples to illustrate why defining the appropriate product market may not be straightforward, including determining whether the market is a bundled product or separate products of voice, video, and broadband. He also cautioned that it matters what geographic market definition is used. Using national averages is misleading as the number of competitors may be very different in rural markets than in some urban areas.⁴³⁹ Finally, Dr. Wilkie pointed out that users of telecommunications services appear to be "sticky" in that they do not switch services frequently and that product differentiations and bundling may make consumers even stickier. He recommended further study to analyze how the unwillingness of customers to switch providers and the efforts of providers to differentiate their offerings impact competition.⁴⁴⁰

2. Access to Customers in Multiple Dwelling Situations

Perkins, of Cavalier, also noted problems accessing customers in multi-tenant buildings.⁴⁴¹ Subsequent to the Symposium, the FCC addressed this problem by issuing rules prohibiting telephone carriers from entering into contracts with owners of residential multiple tenant environments that restrict consumers' access to other telecommunications providers.⁴⁴² The FCC found that such agreements perpetuate barriers to entry.⁴⁴³

Accipiter Communications, Inc., dba Zona Communications, filed comments identifying problems obtaining access to compete in newly-built communities.⁴⁴⁴ The company noted that in areas where Accipiter is the certified ILEC, builders constructing new developments have

⁴³⁶ See generally Wilson, Tr. at 93-96.

⁴³⁷ Perkins, Tr. at 104.

⁴³⁸ Wilkie, Tr. at 125-26.

⁴³⁹ *Id.* at 127-28.

⁴⁴⁰ *Id.* at 134-40.

⁴⁴¹ Perkins, Tr. at 105.

⁴⁴² Report and Order, *In the Matter of Promotion of Competitive Networks in Local Telecommunications Markets*, FCC WT Docket No. 99-217, 23 FCC Rcd 5385 (rel. Mar. 21, 2008). The FCC had previously prohibited such contracts in commercial settings. *Id.* at 5385.

⁴⁴³ *Id.* at 5385-86.

⁴⁴⁴ Electronic Submission by Phillip K. Sotel, General Counsel, on Behalf of Accipiter Communications Inc. (dba Zona Communications), for inclusion in the 2007 DOJ Telecommunications Symposium, Nov. 27, 2007 ("*Accipiter Submission*"), at 1. Accipiter's operations are "conducted entirely as an ILEC in a rural service area of about 1000 square miles in the Arizona counties of Maricopa and Yavapai." *Id.*

allegedly entered into preferred provider agreements (“PPAs”) with another telecommunications provider allowing it to construct its network as the development is being built. According to Accipiter, this agreement provides valuable advantages to the preferred provider who in return agrees to share revenue from the telecommunications services with the developer. By discriminating against the certified ILEC in terms of making trenches available only to the preferred provider, the developer gives an important competitive advantage to its partner and therefore increases the revenue that it receives from the sale of telephone and video services.

Accipiter recognized that PPAs offer legitimate advantages to developers. In particular, providers may be unwilling to make the large capital investment required to serve a new development without some way to recoup their investment. By agreeing to a PPA, developers are assured that voice,

Preferred provider arrangements can exclude competitors from serving new developments, but they also can be beneficial by ensuring that residents receive services in a timely manner.

video, and broadband services will be available when the first resident moves in before the development’s population is sufficient to justify the provider’s investment. However, Accipiter regarded regulation of such agreements as necessary to prevent anticompetitive abuses that harm consumers. Hence the company concluded that “when these PPAs are used to exclude competitors or as a methodology to bar entry into new markets by unnecessarily increasing the costs and/or uncertainties to other entrants whether through fees, delays in build out or marketing/sales [advantages] . . . they should be prohibited.”⁴⁴⁵

As noted above in the discussion of exclusive agreements between cable companies and MDU owners, agreements entered into by one provider in a market to block the entry of another competitor can also, depending on the facts, violate antitrust law.⁴⁴⁶

C. Broadband Providers

Broadband providers and others raised a number of concerns regarding the availability of spectrum, regulations about how spectrum can be used, and other regulatory issues.

⁴⁴⁵ *Id.* at 3. Dr. Wilkie also noted problems with master plan communities. Wilkie, Tr. at 140-41.

⁴⁴⁶ Concerns were also raised about Verizon’s practice of removing copper wires when it installs its FiOS service. CLECs said that the removal of these wires prevent them from providing broadband and other services in competition with the ILECs. See Perkins, Tr. at 97-100: *Perkins Presentation*, at 6; *Covad Submission* at 4-5. Verizon contends that savings from not maintaining copper plant helps to offset the cost of installing the fiber-based facilities used to offer FiOS. Thorne, Tr. at 17; see also *Verizon Submission*, at 1, n.1 and *Verizon Supp. Submission* at 13 (estimating annual cost savings of \$110 per home served over fiber rather than copper).

1. Spectrum Policies

Spectrum is critical for providers to enter or expand the provision of wireless services. Several Symposium participants mentioned the need for more spectrum to be made available. Dr. Hazlett said that the government needs to review how spectrum is being used and make underutilized spectrum available to new users faster. He said the United States lagged behind Europe by several years in issuing both 2G and 3G spectrum licenses. Because spectrum was not available through FCC auctions, Dr. Hazlett said wireless carriers merged in order to obtain sufficient bandwidth to upgrade their networks to mobile broadband. He indicated this is what motivated Cingular to acquire AT&T Wireless and Sprint to acquire Nextel.⁴⁴⁷

Dr. Hazlett maintained that there is no shortage of spectrum that could be made available for broadband services. For example, after the digital television transition, the television band will have 294 MHz of almost entirely unused spectrum. All over-the-air broadcasting could be provided digitally on a small fraction of the available spectrum. The broadcast spectrum could be better utilized by grandfathering existing broadcasters and issuing overlay rights that would allow the efficient reallocation of shared spectrum between the broadcasters and new entrants. This policy would make additional spectrum available to wireless service providers to provide broadband services.⁴⁴⁸ The unused portions of these spectrum bands are often referred to as “white spaces.” Other speakers also suggested that the FCC should take action on this issue.⁴⁴⁹

In Dr. Hazlett’s view, the FCC’s failure to make more spectrum available to wireless carriers and new entrants more quickly is balanced in part by the FCC’s decision not to place extensive restrictions on how the wireless carriers can use the spectrum they license. In the United States, the FCC did not choose one wireless technology, but allowed each wireless carrier to choose its technology. In contrast, European regulators restricted carriers to using GSM technologies. Subsequently, Europe liberalized its carriers’ ability to utilize CDMA because it has worked better with 3G technology. The utilization of two technologies by U.S. wireless carriers has fostered competition between EV-DO and Wideband CDMA (“WCDMA”) advanced broadband technologies.⁴⁵⁰

According to Dr. Hazlett, regulators that adopt the “property rights model” provide flexibility for wireless carriers to determine how best to use their spectrum licenses. Investment in broadband services is stimulated by letting the market work out business models, technologies, and services provided. Dr. Hazlett argued that this model has resulted in U.S. cellular markets being successful in

Innovation is more likely to occur if providers have flexibility to decide how spectrum can be used.

⁴⁴⁷ Hazlett, Tr. at 177-78.

⁴⁴⁸ *Id.* at 257-58, 264-65.

⁴⁴⁹ Salemme, Tr. at 256; Wallace, Tr. at 261. On November 4, 2008, the FCC approved an order opening television white spaces for use on an unlicensed basis by certain portable devices. *FCC Dedicates TV White Spaces to New Generation of Unlicensed Mobile Devices*, COMM. DAILY, Nov. 5, 2008, at 1.

⁴⁵⁰ Hazlett, Tr. at 179.

keeping broadband prices relatively low, even though the regulators have not made much spectrum available.⁴⁵¹ He disagreed with the current move to re-regulate in some of the 700 MHz proceedings,⁴⁵² advocating retention of the property rights model given its effectiveness.

Salemme, of Clearwire, agreed that it is important to increase the amount of spectrum available for two-way communications because more spectrum brings more competition, higher speeds, and additional services.⁴⁵³ Additional spectrum could be provided by converting the currently unlicensed 3.65 MHz band to licensed spectrum (white spaces), and making AWS-3 spectrum available. New technology has made wireless services possible on spectrum that had previously been considered unusable.⁴⁵⁴ Clearwire also wants spectrum to be efficiently allocated without the FCC placing limits on how much spectrum a company can own, allowing companies to have the spectrum they need to provide broadband services.⁴⁵⁵

Wallace, of DigitalBridge, agreed that making more spectrum available is important and said he supports competitive bids in auctions granting rights to use white spaces.⁴⁵⁶ He cautioned against conditioning licenses by specifying what services the winner can offer.⁴⁵⁷ Bin Shen, of Sprint Nextel, also noted that the speed at which his company can offer WiMAX service in currently unlicensed areas will be affected by whether clear rules and dates are established for the auction of white space spectrum.⁴⁵⁸

Overall, AT&T does not perceive any major barriers to entry in the wireless broadband market. AT&T maintained that spectrum rules have to allow for the use of different technologies and business models.⁴⁵⁹

2. Other Regulatory Issues Affecting Broadband Deployment

Though broadband is less regulated than either voice telephony services of the telephone incumbents, or video services of the cable companies, there are still some regulatory issues that may affect broadband deployment.

⁴⁵¹ *Id.* at 181-83.

⁴⁵² The FCC imposed open access conditions on the C-block of the 700 MHz auction.

⁴⁵³ Salemme, Tr. at 256.

⁴⁵⁴ *Id.* at 256.

⁴⁵⁵ *Id.* at 261-62.

⁴⁵⁶ Wallace, Tr. at 233.

⁴⁵⁷ *Id.* at 261.

⁴⁵⁸ Shen, Tr. at 212; *Shen Presentation*, at 7.

⁴⁵⁹ Kafka, Tr. at 263-64.

Herron, of Current, pointed to regulations that in his view slow the adoption of BPL and Smart Grid. He said that the traditional forms of utility rate regulation provide no incentives for utilities to reduce energy consumption. Utilities are compensated based on how much volume goes through their grid, so that if utilities invest in efficient delivery systems, they lose revenue.⁴⁶⁰ This provides a disincentive to use Smart Grid, which in turn is important for the adoption of BPL.

Congress and some states have taken steps to encourage the adoption of more energy saving and reliable networks.⁴⁶¹ In addition, the Energy Independence and Security Act of 2007 sets as a national policy the implementation of Smart Grid systems to modernize the electric grid and requires both federal and state governments to support the use of Smart Grid. It provides for loans and federal contributions to establish Smart Grid demonstration projects.⁴⁶²

Current also indicated that it has had problems obtaining the rights to access utility and telephone poles, which it needs to deploy its network and attach to the utilities' medium and low voltage lines.⁴⁶³ As the last company to attach its wires to the poles, Current has experienced difficulties getting a clear space and has had to fix others' violations.⁴⁶⁴ In addition, both times Current deployed BPL, incumbent telephone carriers have sued it over pole attachment issues, causing delays for Current's entry.⁴⁶⁵

Wallace, of DigitalBridge, commented on the need for timely tower access, which is more difficult to obtain when the only towers available are cellular towers not owned by independent companies.⁴⁶⁶

Finally, Salemme, of Clearwire, expressed the view that, in order for alternative broadband platforms to succeed, companies need regulatory stability and certainty, because these efforts require considerable up-front capital and the financial markets want certainty about how the companies will be treated.⁴⁶⁷ He also noted that, as services converge, legacy regulations and requirements such as CALEA and E911 have to be adapted to the new underlying technologies.⁴⁶⁸

⁴⁶⁰ Herron, Tr. at 300.

⁴⁶¹ *New Technologies*, COMM. DAILY, Jan. 25, 2008, at 15.

⁴⁶² Pub. L. No. 110-140, 121 Stat. 1492 (2007).

⁴⁶³ Herron, Tr. at 301-02.

⁴⁶⁴ *Id.* at 301-02.

⁴⁶⁵ *Id.* at 302.

⁴⁶⁶ Wallace, Tr. at 233.

⁴⁶⁷ Salemme, Tr. at 223; *Salemme Presentation*, at 13.

⁴⁶⁸ Salemme, Tr. at 225; *Salemme Presentation*, at 13.

3. Prices for Local Private Lines

Several speakers and one company that submitted written comments raised issues related to obtaining local private line services (local leased circuits dedicated to the use of a particular customer) from the ILECs to support their network operations.⁴⁶⁹ A wireless carrier that does not have a terrestrial network of its own needs to obtain local private line services to carry its traffic between its switches and cell towers, or to provide interoffice transport through the ILEC's network beyond the initial switching center to other end offices, an activity known as "backhaul." In most areas wireless carriers obtain these connections by buying "special access" circuits (local private lines provided under tariffs) from the ILEC.

Shen, of Sprint Nextel, stated that in order for his company to provide its broadband alternative, it must purchase these local private line services for backhaul from its major wireline and wireless broadband competitors.⁴⁷⁰ According to Shen, AT&T and Verizon combined account for 82 percent of nationwide special access revenues.⁴⁷¹ In January 2007, Sprint Nextel found through a survey of alternative access providers that competitive alternatives for the ILECs' special access services were available at less than two percent of its cell sites.⁴⁷² The fees charged by incumbents to connect cell sites to switches are in Sprint Nextel's view excessively high and affect its ability to offer its broadband wireless services at a competitive rate.⁴⁷³ Sprint Nextel said that AT&T and Verizon have the incentive and ability to raise their competitors' costs in the provision of broadband Internet access services.⁴⁷⁴ Sprint Nextel is also concerned that certain special access contract provisions hinder the development of alternative providers.⁴⁷⁵

Wallace, of DigitalBridge, said his company is able to enter in communities only where it can obtain low-cost and high-capacity backhaul.⁴⁷⁶ DigitalBridge is more likely to find the low-

⁴⁶⁹ Shen, Tr. at 211-12; *see also Shen Presentation*, at 7. Sprint Nextel detailed these concerns in a separate letter prepared for the Symposium. Written Comments by Robert S. Foosaner, Senior Vice President - Government Affairs and Chief Regulatory Officer, on behalf of Sprint Nextel Corp., for inclusion in the 2007 DOJ Telecommunications Symposium, Nov. 13, 2007 ("*Sprint Submission*"). Sprint Nextel also submitted comments that it filed on this subject with the FCC. Comments of Sprint Nextel Corporation, *In the Matter of Special Access Rates for Price Cap Local Exchange Carriers*, FCC WC Docket No. 05-25 (filed Aug. 8, 2007); *see also* Comments of T-Mobile Corp., *In the Matter of Special Access Rates for Price Cap Local Exchange Carriers*, FCC WC Docket No. 05-25 (filed Aug. 8, 2007); Reply Comments of T-Mobile Corp., *In the Matter of Special Access Rates for Price Cap Local Exchange Carriers*, FCC WC Docket No. 05-25 (filed Aug. 15, 2007).

⁴⁷⁰ Shen, Tr. at 211.

⁴⁷¹ *Id.* at 212.

⁴⁷² *Sprint Submission*, at 2.

⁴⁷³ Shen, Tr. at 211-12.

⁴⁷⁴ *Sprint Submission*, at 6.

⁴⁷⁵ *Id.* at 7-8.

⁴⁷⁶ Wallace, Tr. at 233; *Wallace Presentation*, at 5.

cost local private lines it needs in areas where there are three or four competitors.⁴⁷⁷ Issues relating to special access pricing are currently the subject of an FCC proceeding.⁴⁷⁸ The ILECs have filed comments in this proceeding disputing the assertions discussed above. They allege that special access markets are competitive, rates have been falling, and no action by the FCC is required.⁴⁷⁹

Sound decision making about the need to regulate or reinstate safeguards depends on a careful assessment of competitive conditions based on clear data and following generally accepted principles of competition analysis. Regulators also need to consider the cost of imposing regulations, including the impact of regulation on the incentives of providers to invest.

⁴⁷⁷ Wallace, Tr. at 233.

⁴⁷⁸ Public Notice, *In the Matter of Special Access Rates for Price Cap Local Exchange Carriers*, FCC WC Docket No. 05-25, 22 FCC Rcd 13,352 (released July 9, 2007).

⁴⁷⁹ See Supplemental Comments of AT&T Inc., *In the Matter of Special Access Rates for Price Cap Local Exchange Carriers*, FCC WC Docket No. 05-25, at 1-2 (filed Aug. 8, 2007).

IV. OBSERVATIONS AND CONCLUSIONS FOR COMPETITION POLICY

A. General Competitive Trends

Overall, the competitive trends in telecommunications services are positive. Companies continue to invest significant sums to build new facilities or upgrade existing ones, providing customers with better services and more choices. Landline facilities-based competition is available for most U.S. consumers in broadband and telephony and is beginning to spread in video as well. However, the extent and nature of competition varies substantially from one geographic area to another. While the available data make it possible to evaluate broad nationwide trends, it is considerably more difficult to evaluate the state of competition in any specific area. In addition, public data that would allow meaningful analyses of the effect of developments (such as bundled services), differences in the quality and quantity of service offerings, and substitution between formerly distinct categories of services (such as wireline and wireless) are often limited or unavailable.

Multichannel Video Programming Distribution. The principal competitive alternative to the incumbent cable television companies remains satellite-based DBS services. In an increasing number of areas, wireline MVPD competition is also available from telephone companies or overbuilders, though this option so far is available to only a small minority of U.S. residential consumers.

Consumers today are able to purchase video services that offer higher quality pictures, more channels, and other features. These improvements are in part a direct result of the entry of MVPD providers to challenge the cable companies. It is more difficult to draw definitive conclusions from the available information regarding the price benefits of competitive entry that has occurred in video services. Whether price benefits have been realized by consumers, and to what extent, may depend on various factors, including how to assess the value of quality improvements that have accompanied price increases and whether consumers value bundled services. There is evidence that competitive entry has resulted in lower prices for some consumers, particularly bundled service users, even as other stand-alone prices have remained the same or continued to increase. Variations in offerings, the availability of special promotions, and other factors make such assessments complex.

Voice Telephone. Competition for residential consumers occurs primarily between the ILECs and cable companies. In some areas, however, competition is supplemented by facilities-based overbuilders or companies that obtain last-mile connections from the incumbent telephone companies. Local telephone subscribers in many areas continue to experience increased choices, notwithstanding the loss of UNE-P as a mode of entry. The success of cable operators is the best evidence that facilities-based competition is economically feasible for residential telephone service, at least for operators that have made the investment in wireline connections to the home that can be used to provide multiple services.

One major question is whether mobile or fixed wireless services are effective competitors to the incumbents' wireline telephone services. Although traditional mobile wireless services have taken considerable amounts of traffic from landline telephony and some customers, the available evidence does not establish that mobile services currently represent an effective competitive constraint on landline access pricing. Consistent with that observation, wireline telephone prices have remained relatively stable except where telephony is offered in a bundle with video and broadband.

Broadband. Competition for residential customers so far occurs primarily between two major providers, the cable company and the telephone company. In some areas, facilities-based overbuilders or companies obtaining last-mile connections from the telephone incumbents are also offering broadband, and fixed wireless broadband services are beginning to develop in limited geographic areas.

There are still rural areas where residential customers do not have access to terrestrial broadband services. In these areas, satellites are used to deliver broadband. However, satellite service providers are not effective competitors to landline broadband providers where both offer service because the price of satellite service is substantially higher. Satellite broadband service providers do not offer voice telephony or MVPD services over their own facilities.

Companies such as the new Clearwire joint venture are investing in wireless broadband service, and some believe that this technology is a promising way to provide a "third wire" to consumers' homes. However, it is unclear whether wireless broadband providers will have a substantial impact on the marketplace. New entrants may have a limited impact due to restraints on available spectrum, limitations of the technology, and the difficulty of competing against better-positioned incumbents that have first-mover and scale and scope advantages. Recent FCC spectrum auctions have not resulted in the emergence of a new nationwide wireless provider.

Bundling. A potentially important competitive development in the marketing and pricing of telephony, broadband, video, and wireless has been the offering of "triple-play" or "quadruple-play" bundled services. These bundles, at least initially, have been priced attractively for many consumers compared with stand-alone services of the same provider, and they have reduced customer churn. Increasing numbers of consumers have been subscribing to triple-play bundles of video, voice telephony, and broadband. Some providers reported that more than 30 percent of their subscribers buy triple-play bundles. It is not yet clear how bundling of services will impact competition and consumer welfare.

B. Barriers to Entry

Symposium participants discussed a variety of possible barriers to entry in video, telephony, and broadband services. They differed in their views about whether significant barriers continue to exist. Given the continuing high cost of constructing networks, especially in rural areas, competition may continue to be limited in some areas. While inherent "natural" entry barriers of this kind can significantly affect markets, the barriers to entry highlighted in this report are those that result from regulatory policy or conduct of incumbent providers.

Some panelists contended that regulatory barriers remain in video franchising and have adversely affected consumers, including unreasonable demands by local franchising authorities and conduct by incumbents seeking to block or delay entry. Others, including cable companies and local franchising authorities, defended the role of franchising in consumer protection. FCC and state legislative action have reduced these barriers to some extent, but the Department believes that more can be done to ensure that video competition is not unreasonably precluded or delayed because of local franchising requirements.

A number of other concerns were raised about alleged actions by incumbent providers to preclude or limit new entry, such as exclusive contracts between cable companies and multi-tenant building owners and denial of access to “must-have” programming that is owned by incumbents. Depending on the facts, such conduct can violate antitrust law. However, exclusive dealing arrangements can also benefit consumers. For example, such an agreement may provide incentive for the provider to upgrade facilities in a building by ensuring that the costs can be recouped. Antitrust analysis needs to take into account the potential for both the positive and negative impacts from an exclusive agreement.

New video entrants have also sought action by the FCC to address these concerns. The FCC issued orders restricting the use of exclusive contracts between both cable operators and telephone carriers and building owners and extended the prohibition on exclusive contracts for programming owned by cable companies. These orders are currently being challenged in appellate courts. The FCC is also considering whether to eliminate the “terrestrial loophole” in the program access rules. Whether such regulatory action is warranted depends upon the extent to which competition exists and whether such conduct is unreasonably and substantially precluding entry. Regulators also need to consider whether there are procompetitive reasons for incumbents to engage in such conduct and whether regulation would discourage beneficial behavior. The Department has in the past and will continue to investigate allegations that such conduct is anticompetitive and take enforcement action where appropriate.

Concerns were raised relating to whether incumbent telephone providers should be required to make portions of their networks, particularly last-mile connections, available to competitors to facilitate additional entry. Wireline providers that combine unbundled local loops with their own facilities to provide service questioned whether the FCC had failed to evaluate appropriately the current state of competition in proceedings evaluating the need for making these facilities available at cost-based prices. These providers argue that requiring these facilities to be made available encourages entry that would otherwise not occur due to the high cost of building last-mile facilities. Incumbent providers oppose the continuation of these regulations because they contend that in many areas there is already robust competition. In addition, these regulations require incumbent providers to incur expenses and discourage investment in new facilities. Dr. Hazlett discussed evidence that he contended showed that these types of regulations caused telephone companies to invest less in their networks than the cable companies, which did not face such requirements.

Wireless broadband providers consider spectrum critical to their ability to compete. Accordingly, during the Symposium various wireless operators and Dr. Hazlett reiterated the need to make more spectrum available. Some speakers also expressed concern about the

perceived failure of the FCC AWS and 700 MHz spectrum auctions to yield much new entry, as the bulk of spectrum auctioned went to incumbent providers.

C. Proposals for Further Action

- The Department remains committed to enforcing the antitrust laws against conduct that harms competition in the telecommunications industry. When reviewing conduct raising competitive concern, the Department will continue to give particular attention to the effects of convergence and increasing substitution among services. Assessing the legality of conduct under the antitrust laws requires both an understanding of how customers view and use services and the impact of consumer behavior on pricing decisions. The Department recognizes that those assessments can be particularly complex in the telecommunications industry in view of technology and other changes and will continue to take them into account in its enforcement decisions.
- To aid its ability to enforce the antitrust laws in the telecommunications industry efficiently and effectively, the Department will continue to monitor industry trends and developments. But effective review requires reliable data. Traditionally, regulators have obtained and reported data about telecommunications providers along the lines of distinct industry sectors. Consideration should be given to whether this is still an appropriate framework given the dynamic changes in the industry.
- Increased efforts to obtain relevant data and further refine economic analysis would advance the Department's ability to evaluate competitive conditions. Potential subjects of future study include review of the competitive implications of bundled pricing, substitution patterns, and quality-adjusted pricing trends.
- In its role as advocate for sound competition policy, the Department will continue to seek the removal of regulatory barriers that unreasonably impede competition. This advocacy remains of critical importance given the important role of regulation in shaping competitive conditions in the telecommunications industry.

APPENDIX A: GLOSSARY OF TERMS USED IN THE REPORT

- 1G:** First Generation mobile network; the original analog mobile wireless technology.
- 2G:** Second Generation mobile network; the second generation of mobile wireless technology, introducing digital transmission to carry both voice and data communications. Standards include GSM, CDMA, TDMA, GPRS, and EDGE.
- 3G:** Third Generation mobile network; the latest generation of mobile wireless technology in use; extends the capabilities of 2G networks, providing better quality voice and high-speed data communications, support for packet applications, and access to the Internet. Standards include UMTS/WCDMA, CDMA2000, EV-DO, HSPA, and WiMAX.
- 4G:** Fourth Generation mobile network; the next generation of mobile wireless technology; expected to support IP end-to-end, and to enable personalized, high-definition multimedia and video services.
- ADSL:** Asymmetric Digital Subscriber Line; the most commonly used form of DSL services. A group of DSL technologies that reserves more bandwidth in one direction than the other, normally providing higher bandwidth for download than for upload.
- AWS:** Advanced Wireless Services. Collectively, various new fixed and mobile wireless service applications for which the FCC has been working to allocate, auction, and license additional spectrum on a flexible use basis allowing licensees to offer a variety of wireless services.
- Backhaul:** An aggregation of telecommunications traffic to take it beyond, or bring it to, a point where it is further processed (such as when wireless carriers use landline network facilities to transmit traffic from their cell towers to their switches.)
- BPL:** Broadband over Power Line; the provision of broadband telecommunications services using electric utility networks to reach consumers' premises.
- Broadband:** Any high-speed circuit that can deliver data significantly faster than a dial-up telephone line. The FCC has defined high-speed services based on several speed tiers. The lowest tier includes any services having speeds of at least 200 kilobits per second (Kbps), which the FCC now characterizes as "first generation," but broadband speeds are often much higher, frequently several megabits per second (Mbps) and in many cases in excess of 10 Mbps. The FCC has established seven higher-speed broadband classifications: 768 kbps to 1.5 Mbps; 1.5 Mbps to 3.0 Mbps; 3.0 Mbps to 6 Mbps; 6 Mbps to 10 Mbps; 10 Mbps to 25 Mbps; 25 Mbps to 100 Mbps; and 100 Mbps and higher. Broadband can be supplied by cable TV providers offering cable modem service, or BSPs offering similar services over their fiber-based or hybrid fiber/coaxial cable networks; ILECs or CLECs offering DSL or fiber-based service; or a variety of other ways including wireless operators offering mobile 3G or fixed Wi-Fi and WiMAX services, satellites, or BPL.
- BSP:** Broadband Service Provider; commonly refers to facilities-based alternatives to the incumbent telephone and cable companies. These competitors, also often known as "overbuilders," commonly provide service over hybrid fiber/coaxial cable or fiber-based terrestrial networks.
- BSPA:** Broadband Service Providers Association; a trade association of BSPs.
- BSS:** Broadcast Satellite Service (or System). BSS satellites are used to provide DBS multichannel video programming service to customers.
- Bundling:** A term used by telephone companies, cable companies, BSPs, and other telecommunications service providers to describe offering several services, such as local and long distance voice telephony, multichannel video, and broadband, as one package.
- C-band:** A portion of the electromagnetic spectrum used for both terrestrial and satellite-based telecommunications, in the range of 4-6 GHz. Among other things, the C-band is used for transmission of signals by MVPD satellite providers, and requires large home "backyard" satellite dishes, typically six to ten feet in diameter, to receive signals.
- CA2C:** Coalition for Competitive Access to Content.
- CALEA:** Communications Assistance to Law Enforcement Act, a federal law enacted in 1994 that provides law enforcement agencies with the ability to wiretap digital networks, and requires wireline and wireless carriers to enable such wiretapping equipment.
- CATV:** Cable Television; a widely used form of MVPD service operating over local distribution

networks composed of coaxial cable or hybrid fiber/coaxial cable. Originally, “community antenna television,” reflecting the fact that the original cable systems carried only broadcast stations received over the air. The term evolved to its present meaning as cable systems began to originate their own programming.

CDMA: Code Division Multiple Access; a digital, spread spectrum, packet-based access technique widely used in radio frequency systems; a 2G standard used in certain mobile wireless systems and some wireless local area networks.

CDMA2000: A 3G evolution of the CDMA standard.

Churn: The level of disconnects from service relative to total subscriber base of the system over a period of time, such as a month or year; a metric used as an indication of how successful service companies are at retaining customers.

CLEC: Competitive Local Exchange Carrier; a non-incumbent carrier that provides local telephone services in competition with ILECs in a service area; includes cable television systems offering local telephone services.

Circuit Switched: A network that establishes a circuit on demand and keeps that circuit reserved for the user until it receives a disconnect signal.

Coaxial Cable: A cable composed of an insulated central conducting wire surrounded by a dielectric layer, a radio frequency shield and an outer layer usually of polyurethane; usually further wrapped in another insulating layer and an outer protective layer. A coaxial cable has capacity to carry great quantities of information, and is typically used by CATV networks to carry video, high-speed data, and (in the case of cable telephony) voice services.

DBS: Direct Broadcast Satellite; a satellite that sends relatively powerful signals to small (typically 18-inch diameter) dishes installed at homes to provide MVPD services.

DMA: Designated Market Area; the 210 geographic areas established by Nielsen Media Research for the purpose of rating the viewership of commercial television stations, and used by the FCC for identifying television markets.

DOCSIS: Data Over Cable Service Interface Specification; refers to several versions of specifications for the relationship between cable modem customer premises equipment and the cable modem termination system at the headend of the cable network, and the specifics by which two-way data transmission channels operate over the coaxial cable distribution systems. More recent levels of specifications such as DOCSIS 2.0 provide for new upstream-intensive broadband transmissions such as VoIP, peer-to-

peer networking, video conferencing, web hosting, video-on-demand, on-line gaming, and application services. A 3.0 specification is being developed.

DSL: Digital Subscriber Line; a family of technologies that provides broadband digital data transmission over the copper wire loops of a local telephone network. Download speeds of consumer DSL services typically range from 256 kbps to 8 Mbps, depending on DSL technology, line conditions, and service level implemented, with commonly offered speeds of about 768 kbps; upstream speeds are somewhat lower. *See* ADSL.

E911: Enhanced 911 service, a 911 emergency reporting service with certain advanced features, including automatic number identification and automatic location information.

EDGE: Enhanced Data for GSM Evolution; an upgrade of GPRS, touted as the final stage in the evolution of wireless data communications with the existing GSM standards; intended to support data transmission rates of up to 384 kbps, though typical speeds are 75 to 135 kbps.

End User: Any individual, association, corporation, government agency or entity that subscribes to telecommunications services of a provider and does not resell them to others.

Ethernet: A local area network standard, known officially as IEEE 802.3, which operates over wire and over coaxial cable.

EV-DO: Evolution Data Only (or Data Optimized); a CDMA2000-based 3G wireless technology that provides wireless data connections at speeds of 300 to 600 kbps. More advanced versions may provide speeds of up to 1 Mbps with considerably higher bursts.

Facilities-Based: A telecommunications carrier that owns its own facilities (such as switching equipment and transmission lines) rather than leasing from others. A carrier can be partially facilities-based, providing its own switches but leasing local loops from the incumbent telephone carrier.

FCC: Federal Communications Commission; the federal regulatory agency responsible for telecommunications in the United States.

FDD: Frequency Division Duplexing; a method used to achieve full duplex communications in wireless systems, in which the forward and reverse directions (transmitter and receiver) each use a different and equally large frequency band to be able to send and receive transmissions at the same time, with the sub-bands separated by a frequency offset. FDD is appropriate for symmetrical services such as voice and

bidirectional data transfers and is considered more efficient for such services than TDD.

- FiOS:** Verizon's FTTH network, over which it provides video, high-speed data, and voice services.
- FSS:** Fixed Satellite Service (or System); refers to telecommunications satellites providing service between fixed points on the Earth's surface; does not include mobile satellite service or BSS. FSS satellites are typically in GEO orbits.
- FTTH:** Fiber-to-the-Home; a fiber deployment architecture in which optical fiber is installed all the way to the customer's home (or premises) as a replacement for the traditional copper telephone network, which allows delivery of broadband services at higher speeds than copper lines or partial fiber networks, making it possible to provide services requiring high bandwidth such as movies on demand and online multimedia presentations without noticeable delay.
- FTTN:** Fiber-to-the-Node (or Neighborhood); a hybrid network architecture involving optical fiber that terminates in a neighborhood cabinet, where the signal is converted from optical to electrical and transmission is completed over a copper loop.
- GAO:** Government Accountability Office, a federal oversight agency in the United States.
- GEO:** Geostationary (or Geosynchronous) Satellite; a satellite with a period of revolution of one sidereal day. A satellite placed in a geosynchronous orbit (22,300 miles directly over the equator) will appear to be stationary in the sky, orbiting synchronously with the earth's rotation, which allows for positioning a satellite receiving/transmitting antenna at a fixed point on the ground, and pointing it at that satellite's fixed location in the sky relative to the earth in order to receive signals from and transmit signals to the satellite.
- GPRS:** General Packet Radio Service; operates by connecting a GPRS-equipped cell phone into a laptop with a cable, or inserting a small GPRS-equipped PCMCIA card into the laptop. The always-on packet data service for GSM is a primary feature of what has become known as 2.5G mobile wireless services.
- GSM:** Global System for Mobile Communication; the standard digital cellular telephone service technology found in Europe, Japan, and Australia. Some years ago most countries selected a single, standard wireless phone technology for 2G services, settling on GSM. Some U.S. mobile wireless networks also use the

GSM standard, though on a different frequency than is used internationally.

- HD:** High Definition; a new television standard producing a better quality picture and better quality sound.
- HDTV:** High Definition Television; its hallmark is high resolution of display and wide rectangular screen.
- HSD:** Home Satellite Dish; the larger "backyard" satellite dishes, typically three meters in diameter, used to receive C-band MVPD service.
- HSPA:** High Speed Packet Access; a packet-based wireless data service with data transmission, which includes both HSDPA and HSUPA, representing an extension of UMTS technology.
- HSDPA:** High Speed Downlink Packet Access; the downlink version of HSPA, which is advertised to provide download speeds from 600 kbps to 1.4 Mbps and can offer peak speeds of 3.6 Mbps for download. Theoretical downlink performance is up to 14.4 Mbps.
- HSUPA:** High Speed Uplink Packet Access; the uplink version of HSPA, which is advertised to provide upload speeds from 500-800 kbps and can offer peak speeds of 1.5 Mbps for upload. HSUPA provides theoretical uplink performance of up to 5.76 Mbps.
- IEEE:** Institute of Electrical and Electronics Engineers; a technical professional society and standards-setting body.
- ILEC:** Incumbent Local Exchange Carrier; the established carrier that provides local telephone services in a service area; defined by Section 251 of the Telecommunications Act of 1996. In most service areas, the ILEC is one of the RBOCs.
- IP:** Internet Protocol; part of a family of protocols describing software that tracks the Internet address of nodes, routes outgoing messages, and recognizes incoming messages.
- IPTV:** Internet Protocol-based Television; a technique for sending digital TV programs over a broadband network using IP; requires that programming be digitized and compressed before being fragmented into IP packets for transmission over a broadband network.
- IMT-Advanced:** International Communications Advanced; a 4G mobile wireless technology offering high speeds of up to 100 Mbps.
- ITTA:** Independent Telephone and Telecommunications Alliance; an organization that represents mid-sized local exchange carriers.
- ITU:** International Telecommunications Union; an international organization (and United Nations agency) responsible for, among other things, worldwide telecommunications standards.

- Last Mile:** The portion of a network comprising the link between an end-user and the serving telephone company's central office.
- LFA:** Local Franchising Authority; a state or local government body that grants franchises to companies, allowing them to provide MVPD services over landline networks within a certain area defined by the franchise.
- LMDS:** Local Multipoint Distribution System; a system for microwave transmission of point-to-multipoint television signals. *See* MMDS.
- LTE:** Long-term Evolution Technology; an advanced wireless technology currently being standardized, in order to improve the UMTS/WCDMA mobile phone standard to cope with future technology evolutions.
- MAP:** Media Access Project.
- MSA:** Metropolitan Statistical Area; geographic areas defined by the U.S. Census Bureau that contain cities with populations of 50,000 or more, and which also include the surrounding counties.
- MSO:** Multiple System Operator; a company that operates more than one cable TV system, either in different places or clustered in the same area.
- MMDS:** Multichannel Multipoint Distribution System; a way of distributing cable television signals via microwave from a single transmission point to multiple receiving points. The MMDS band uses microwave frequencies from 2 to 3 GHz in range. Reception of MMDS-delivered television signals requires a special rooftop microwave antenna and a set-top box for the television receiving the signals.
- MVPD:** Multichannel Video Programming Distribution. A MVPD provider delivers multiple channels of video programming services, usually for a subscription fee. These operators include CATV systems, DBS providers, and wireline video providers such as telephone companies and BSPs.
- MDU:** Multiple Dwelling Units; any housing structure divided into multiple living areas to accommodate multiple "family" units (such as apartment buildings, condominiums, and duplexes).
- MTU:** Multiple Tenant Units; a building (or group of buildings) that houses many tenants, including businesses and residences (such as an office building, office park or corporate campus, medical facility, hotel, or college dormitory).
- NAA:** National Apartment Association.
- Naked DSL:** DSL service that is offered without any obligation to have another service from the same or an affiliated provider (such a voice telephone service). This allows the customer to use a nomadic VoIP service.
- Narrowband:** Refers to Internet access services operating at lower speeds of up to 56/64 kbps, typically on a dial-up basis over telephone lines. The FCC considers services to be below high-speed (narrowband) if their transmission speeds are less than 200 kbps in both directions.
- NCTA:** National Cable and Telecommunications Association; a trade association of CATV providers.
- NMHC:** National Multi-Housing Council.
- Nomadic VoIP:** VoIP service offered by a provider independently of a broadband network, requiring the customer to have access to another provider's broadband service; also known as "over-the-top" VoIP.
- NPRM:** Notice of Proposed Rule Making; a FCC term referring to an announcement of proposed regulatory actions made available for public comment.
- NTCA:** National Telecommunications Cooperative Association; a non-profit association representing small and rural telephone cooperatives and commercial companies.
- OPASTCO:** Organization for the Promotion and Advancement of Small Telecommunications Companies.
- Passive Optical Network:** A fiber optical network without active electronics (such as repeaters) relying on passive optical splitters to deliver signals to multiple terminal devices. Use of this technology allows a network to be built without incurring the substantial costs for active electronics found in other types of telecommunications networks.
- PEG Channels:** Public, Education, and Government; denotes local public access TV channels.
- Price Averaging:** A form of implicit subsidy in which a company, often pursuant to regulatory requirements, charges the same prices to customers located in different geographic areas, even though differing costs or other efficiencies would support charging different prices to these sets of customers.
- RBOC:** Regional Bell Operating Company; the largest ILECs. Seven RBOCs were created pursuant to the Modified Final Judgement in *U.S. v. AT&T*, though currently only three remain (AT&T, Verizon, and Qwest).
- PPA:** Preferred Provider Agreement; an agreement governing access by a specific provider to a development, often excluding or disadvantaging other providers.
- RSN:** Regional Sports Network; a network that presents sports programming to a local market via cable television, consisting primarily of live

- broadcasts of local professional and college sporting events.
- SAE:** System Architecture Evolution; the core network architecture of the future LTE wireless communications standard and the evolution of the GPRS core network (with some differences). The main component of SAE is the evolved packet core which will serve as the equivalent of GPRS networks.
- SDSL:** Symmetrical Digital Subscriber Line; a type of DSL technology that, in contrast to the more commonly used ADSL, provides the same amount of bandwidth in both directions for download and upload.
- STB:** Set Top Box; the electronic box which sits on top of or adjacent to a TV, decoding incoming signals for cable or DBS channels so that they can be watched by subscribers.
- SMATV:** Satellite Master Antenna Television (also known as “private cable”); a MVPD distribution system that receives video programming via a rooftop satellite dish and distributes satellite TV signals by wires through one or a limited number of buildings (such as hotels and apartments).
- Smart Grid Technology:** A technology that allows two-way communications and control of equipment on the electrical grid; can support BPL services.
- Special Access:** The provision of non-switched local leased circuits dedicated to the use of a particular customer. These local services are commonly provided by the ILECs to wireless carriers, long distance carriers, CLECs, broadband providers, and others.
- TDD:** Time Division Duplexing; a method used in cellular and PCS networks employing TDMA, as well as certain modes or interfaces for other standards and some other types of networks. Each radio channel is divided into multiple time slots through TDMA, thereby supporting multiple conversations.
- TDMA:** Time Division Multiple Access; a technology used to separate multiple wireless conversation transmissions over a finite frequency allocation of bandwidth, with each caller assigned a specific timeslot for transmission.
- Telco:** A local telephone company.
- TELRIC:** Total Element Long Run Incremental Cost; a cost measure adopted by the FCC to implement the requirement of the Telecommunications Act of 1996 that ILECs make UNEs available to CLECs at cost-based rates.
- TPUC:** The Public Utility Commission of Texas; a state telecommunications regulatory agency.
- Third Pipe:** A network providing residential users an alternative to incumbent telephone and cable networks for obtaining telecommunications services. Potential providers may include BSPs, wireless, satellite, or BPL.
- TIA:** Telecommunications Industry Association; a trade association that represents telecommunications equipment companies and is involved in standards development.
- Triple Play:** Refers to the delivery of voice, broadband Internet access, and video as a bundled package, usually over a single broadband network. With wireless mobile services added, this becomes a “quadruple play.”
- UMTS:** Universal Mobile Telecommunications System; one of the 3G wireless standards, based on GSM. Once fully implemented, UMTS will allow mobile voice and data users to maintain constant connectivity to the Internet, regardless of where they travel. *See* WCDMA.
- UNE:** Unbundled Network Element; physical and functional elements of the network (such as local loops, switch ports, and dedicated and common transport facilities). The Telecommunications Act of 1996 requires ILECs, to the extent determined by the FCC, to unbundle their network elements (such as loops, switches, and transport) for provision on a wholesale basis to CLECs. Use of UNEs allows a CLEC to provide service without having to duplicate that portion of the ILEC’s network.
- UNE-L:** Unbundled Network Element-Loop. The provision of an unbundled local loop on a stand-alone basis by the ILEC, commonly used by partially facilities-based CLECs that own their own local switches.
- UNE-P:** Unbundled Network Element-Platform; a combination of UNEs that enables a CLEC to provide an end-to-end local circuit without some part of the facilities being supplied by the CLEC. In 2005 the FCC stopped requiring ILECs to provide the full UNE-P combination.
- USIIA:** US Internet Industry Association; an Internet-related trade association.
- USF:** Universal Service Fund; a cost allocation mechanism designed to keep local exchange rates at reasonable levels, especially in “high cost” (usually rural) areas. Originally intended to provide a basic telephone service access line to every U.S. household at a reasonable cost.
- U-Verse:** AT&T’s FTTN network, used to provide video, high-speed broadband service, and voice telephony.

- U-Verse TV:** AT&T's video service provided over the U-Verse network.
- VDSL:** Very-high-data-rate Digital Subscriber Line; a high-speed form of ADSL that delivers 13 to 52 Mbps downstream bandwidth and 1.5 to 2.3 Mbps upstream.
- VOD:** Video-on-Demand; a service that allows the subscriber to choose from among a variety of video programs at any time, with the ability to control play functions such as pause, resume, and forward, similar to a VCR or DVD player.
- VoIP:** Voice over Internet Protocol; a means of providing voice telephony over a broadband network (such as the Internet, a corporate Intranet, or a managed network) using "Internet Protocol," a catchall term for the protocol and technology of encoding a voice call so it can be slotted as data packets on a data network. VoIP makes it unnecessary to employ more expensive circuit switching to provide telephony.
- WCDMA:** Wideband CDMA; a high-speed 3G mobile wireless technology officially known as UMTS, which digitizes and transmits the input signals in a coded, spread spectrum mode over a range of frequencies; supports images, mobile/portable voice, data, and video communications up to 2 Mbps for local area access or 384 kbps for wide area access.
- Wi-Fi:** Wireless Fidelity (also known as IEEE 802.11 standard); a wireless technology that runs in the 2.4 GHz range at speeds of up to 11 Mbps and provides service over a limited geographic radius, typically in the range of 150 to 220 feet. Known as "Municipal Wi-Fi" when offered by municipalities.
- WiMAX:** Worldwide Interoperability for Microwave Access (also known as IEEE 802.16 standard); a non-line-of-sight wireless technology that for fixed applications can carry data at a potential speed of up to 70 Mbps in a radius of up to 31 miles, greatly extending the range of normal Wi-Fi. Mobile applications are currently being deployed up to 15 Mbps of capacity within a typical cell radius deployment of two miles.

APPENDIX B: SYMPOSIUM PARTICIPANTS

Panel I: *Entry into Multichannel Video Services*

Moderator: Yvette Tarlov, Attorney, Antitrust Division, U.S. Department of Justice

John Thorne, Deputy General Counsel and Senior Vice President, Verizon Communications Inc.

John Goodman, Executive Director, Broadband Service Providers Association

Grier Raclin, Executive Vice President and General Counsel, Charter Communications, Inc.

Jane Lawton, Administrator, Office of Cable and Communications Service, Montgomery County, Maryland, and Delegate, Maryland General Assembly

Hal J. Singer, President, Criterion Economics

Panel II: *Entry into Telephone Services*

Moderators: Carl Willner, Attorney, Antitrust Division, U.S. Department of Justice

Luin Fitch, Attorney, Antitrust Division, U.S. Department of Justice

Sean C. Lindsay, Associate General Counsel, Qwest Communications International Inc.

Alexandra "Sandy" Wilson, Vice President, Public Policy and Regulatory Affairs, Cox Enterprises, Inc.

Stephen Perkins, General Counsel, Cavalier Telephone LLC

Jill Canfield, Senior Regulatory Counsel, National Telecommunications Cooperative Association

Simon J. Wilkie, Executive Director, Center for Communications Law and Policy, University of Southern California, Gould School of Law

Panel III: *Wireless Broadband Technologies*

Moderator: Hillary Burchuk, Attorney, U.S. Department of Justice

Thomas W. Hazlett, Professor of Law and Economics, George Mason University School of Law

Hank Kafka, Vice President, Network Architecture, AT&T Inc.

Bin Shen, Vice President, Broadband Product Management, Sprint Nextel Corporation

R. Gerard Salemme, Executive Vice President of Strategy, Policy and External Affairs, Clearwire Corporation

William F. Wallace, Chairman, DigitalBridge Communications Corporation

Panel IV: *Other Alternative Broadband Technologies Including Satellite and Broadband over Power Line*

Moderator: Nancy Goodman, Chief, Telecommunications and Media Section, Antitrust Division, U.S. Department of Justice

Evan R. Grayer, Vice President Broadband, DirecTV Group

David Brown, Vice President and General Counsel, WildBlue Communications, Inc.

Brendan Herron, Vice President, Corporate Development and Strategy, Current Group, LLC

Blair Levin, Managing Director, Stifel Nicolaus

APPENDIX C: WRITTEN SUBMISSIONS

In addition to the written materials provided by Symposium participants, the following entities submitted comments or other documents to the Department in connection with the Symposium:

- Accipiter Communications, Inc., dba Zona Communications
- The Brookings Institution
- Covad Communications, NuVox Communications, and XO Communications (collectively)
- The Department of Cable Communications and Consumer Protection of Fairfax County, Virginia
- Frontline Wireless, LLC
- T-Mobile USA, Inc.
- US Internet Industry Association

APPENDIX D: THE EVOLUTION OF WIRELESS TECHNOLOGY

Wireless broadband services have been characterized by “[s]wift technological evolution and persistent innovation.”¹ Consumers have benefitted in terms of improved quality and the addition of new features and options. Today most wireless broadband services are delivered via cellular technologies adopted by companies that initially built analog voice systems and have migrated to digital and upgraded their networks to provide a variety of data services. A much smaller but growing segment uses fixed wireless technologies, including Wireless Fidelity (“Wi-Fi”) and Worldwide Interoperability for Microwave Access (“WiMAX”) technology. WiMAX is being extended to provide fully mobile broadband communications.

A. Cellular Families: CDMA and GSM

Two cellular technology families, Code Division Multiple Access (“CDMA”) and Global System for Mobile Communication (“GSM”),² are now in widespread use in the United States. Both initially offered only voice services. Over time standards and equipment were developed for each technology enabling providers to offer data services, initially at or below the speeds offered by dial-up Internet access services and evolving to speeds similar to some wireline broadband offerings.³ In GSM, Wideband CDMA (“WCDMA”), also known as Universal Mobile Telecommunications System (“UMTS”), evolved to High Speed Packet Access (“HSPA”) capability, while in CDMA, CDMA 2000 evolved to Evolution Data Only (“EV-DO”). These third-generation (“3G”) technologies are continuing to evolve and offer significantly greater speeds.⁴

To illustrate how evolving technology has increased wireless data speeds, Hank Kafka, of AT&T, provided a review of the history of downlink and uplink speeds in the GSM technology family.⁵ In the early phase of Second Generation (“2G”), General Packet Radio Service (“GPRS”) technology provided speeds comparable to a dial-up modem. The next iteration was Enhanced Data for GSM Evolution (“EDGE”) technology which was introduced to GSM networks beginning in 2003. EDGE, with typical speeds of 75 to 135 kbps, made

¹ Henry J. Kafka, AT&T, “Voice, Video and Broadband: The Changing Competitive Landscape and Its Impact on Consumers,” 2007 DOJ Telecommunications Symposium, Nov. 29, 2007, at 1 (“*AT&T Submission*”).

² For a more detailed description of the evolution of GSM and follow-on standards, the technologies used by AT&T, see *AT&T Submission*, at 2-5.

³ See, e.g., *AT&T Submission*, at 3-5 (GPRS offering about 35 kbps and HSPA offering peak rates of 5 to 14 Mbps).

⁴ Kafka, Tr. at 186-87; *AT&T Submission*, at 4; see also Hank Kafka, AT&T Inc., “Wireless Broadband,” 2007 DOJ Telecommunications Symposium, Nov. 29, 2007, at 2 (“*Kafka Presentation*”) (chart shows evolution of wireless echnologies from 1G to enhanced 3G (“E3G”).

⁵ *Kafka Presentation*, at 3 (chart shows increasing download and upload throughput for GPRS, EDGE, WCDMA/UMTS, and HSDPA).

advanced mobile services such as low resolution video, higher-speed color Internet access, and e-mail possible.⁶ EDGE evolved to WCDMA/UMTS, which provided download and upload throughput at about 220 to 320 kbps. UMTS was then extended to HSPA and its two facets – High-Speed Downlink Packet Access (“HSDPA”) with typical download speeds of 600 kbps to 1.4 Mbps and High Speed Uplink Packet Access (“HSUPA”) with typical upload speeds of 500 to 800 kbps.⁷ In Kafka’s view devices that are being deployed now at these speeds have true broadband capability.⁸ In the future, according to Kafka, there will be multiple new HSPA releases that will extend peak speeds; however, these releases are not yet operable and typical field speeds cannot be measured. Typical user speeds will be lower than peak speeds because of the real world constraining effects of distance from the cell site, interference, and noise. At the time of the Symposium peak speeds were 3.6 Mbps downstream and 1.5 Mbps upstream for HSPA. In the next few years, this will expand to 14 Mbps downstream, using existing standards. With new standards extensions, peak speeds will reach 41 Mbps downstream.⁹

Moving beyond HSPA, Kafka said there is intensive work ongoing in standards organizations to define Long-Term Evolution (“LTE”) technology. The LTE standard should be completed by the end of 2008, and manufacturers will be introducing LTE equipment in late 2009 or early 2010.¹⁰ Both a new radio interfaces and a related network architecture called System Architecture Evolution (“SAE”) are being developed. The LTE development goals include: (1) evolution towards a pure packet-only system; (2) higher data rates (target peak rates of 100 Mbps downlink and 50 Mbps uplink); (3) higher spectral efficiencies and flexible channel bandwidths; (4) higher quality-of-service, always-on experience, and lower latency; and (5) a simpler and more efficient network architecture.¹¹ Verizon has also announced that the company will use LTE for its advanced mobile wireless network.

B. Wi-Fi and WiMAX

Wi-Fi operates pursuant to FCC rules permitting unlicensed use of certain spectrum and is based on Institute of Electrical and Electronics Engineers (“IEEE”) 802.11 standards. It is deployed in residences, in businesses, and in large and small venue “hotspots.” It allows users

⁶ *AT&T Submission*, at 3.

⁷ Kafka, Tr. at 193; *see also Kafka Presentation*, at 3 (showing even higher speeds for HSDPA and HSUPA). At present, AT&T has deployed HSDPA in over 270 markets and plans to extend coverage to nearly 350 leading U.S. markets by the end of 2008. *See* AT&T Web site, www.att.com/gen/general?pid=7493. Verizon has deployed EV-DO Rev. A in over 240 metropolitan areas and advertises typical download speeds of 600 kbps to 1.4 Mbps and typical upload speeds of 500 to 800 kbps. *See* Verizon web site, <http://b2b.vzw.com/broadband/RevA.html>.

⁸ Kafka, Tr. at 193-94.

⁹ Kafka, Tr. at 195-96; *Kafka Presentation*, at 4 (chart shows HSPA/LTE peak throughput evolution).

¹⁰ Kafka, Tr. at 187. Extensive LTE deployment is not not expected until 2012. *Ericsson Expects Mass LTE Deployment in 2012*, Feb. 19, 2008, available at <http://www.gigaom.com/2008/02/19/ericsson-expects-mass-lte-deployment-in-2012>.

¹¹ *AT&T Submission*, at 5.

who are located short distances (150-250 feet) from an access point to obtain high-speed wireless Internet connections.¹² The number of hot spots in the United States has grown substantially. According to one report, there were 66,000 hot spots in the United States as of December 21, 2007.¹³ Municipalities are also using Wi-Fi technologies to deliver broadband Internet access to their citizens.

Fixed Wireless evolved to a mobile technology with the IEEE's adoption of the 802.16(e) standard, referred to as "WiMAX." WiMAX is being deployed on licensed spectrum. The WiMAX Forum, a consortium of wireless industry participants formed to promote 802.16(e), designed interoperability protocols so that the technology could be deployed on a significant scale. WiMAX is suitable for a wide range of applications including providing high-speed data service, Internet connectivity, and mobile connectivity.¹⁴ Typical mobile deployments are expected to have capacities of up to 15 Mbps per cell within a radius of up to three kilometers, while typical systems for fixed/portable access are expected to have capacities of up to 40 Mbps per channel.¹⁵

WiMAX was recently accepted as a 3G technology by the International Telecommunications Union ("ITU") although additional work must be done to establish a fully interoperable multivendor WiMAX ecosystem.¹⁶ As with other 3G technologies, WiMAX is continuing to evolve. New releases are planned and there are active standards meetings to further define and increase its capabilities. Work has also begun on setting standards for the next version of WiMAX: 802.16m, which is going to significantly increase the speeds and capabilities of WiMAX. Similar to LTE, WiMAX has its own time line for technological developments and improvements.¹⁷

C. Beyond WiMAX-LTE

The ITU is defining 4G technologies called IMT-Advanced. IMT-Advanced systems, which could be commercially available by 2011, are expected to deliver speeds of 100 Mbps for high mobility applications.¹⁸ Kafka of AT&T believes the development of 4G technologies will continue the swift evolution and progress of wireless broadband services.¹⁹

¹² *FCC Eleventh CMRS Report*, 21 FCC Rcd at 11028-29.

¹³ *NTIA Broadband Report*, at 20 (citing JiWire Wi-Fi HotStats).

¹⁴ *AT&T Submission*, at 6-7.

¹⁵ WiMAX Forum website, <http://www.wimaxforum.org/technology>.

¹⁶ *AT&T Submission*, at 6-7.

¹⁷ Kafka, Tr. at 189-90. Clearwire and Sprint Nextel have announced plans to deploy Wi-MAX to 120-140 million people by 2010. See *supra* Chapters II.C and III.C.

¹⁸ ITU web site, <http://www.itu.int/newsroom/media-kit/ITU-R/story3.html>.

¹⁹ Kafka, Tr. at 192-93.

