

VERIZON WHITE PAPER ON BROADBAND REGULATION

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Verizon supports an open Internet, and we are proud to offer our customers services that allow them to reach the full scope of legal content and services they seek on the Internet. Verizon supports greater choice for consumers and believes innovation should be encouraged. Consumer choice includes encouraging more specialized services that some consumers may prefer.

Proposals to impose restrictions on offering such services and regulate broadband Internet services – to impose what proponents euphemistically label “net neutrality” – should be rejected. Such regulation poses a threat to the deployment of new broadband infrastructure that is needed to support the increasing variety of broadband services that consumers demand, and which provide enormous benefits to the U.S. economy as a whole. Such regulation cannot be justified under settled regulatory principles, which call for government intervention only in clear cases of market failure. Here, there is no history of problems that require regulatory intervention, much less a radical remedy like broadband regulation. Indeed, with competition in the provision of broadband services growing ever more intense, the prospect of problems demanding a regulatory cure grows more remote. Regulation of broadband Internet services is not only unnecessary, but would thwart the healthy development of the Internet. Such regulation would impede competition for broadband services and for Internet content and applications. Broadband regulation would also threaten competition for large enterprise customers who require customized service offerings and fast, reliable, and secure networks. In short, the prophylactic regulation of broadband Internet services is at best a cure for a non-existent disease, and in the end would do consumers and businesses far more harm than good.

Investment in Broadband Networks Benefits Consumers

The Internet has provided enormous benefits to consumers and the U.S. economy. Continuing these benefits depends on huge new investments. The deregulatory environment for broadband has enabled Verizon to invest at levels that make it the nation’s leader in broadband investment. Between 2004 and 2006 alone, Verizon’s capital expenditures totaled more than \$45 billion, much of which was devoted to broadband deployment. Verizon plans to spend \$18 billion to build its revolutionary new fiber-to-the-premises network known as FiOS. By the end of 2006, Verizon Wireless’s 3G technology was available to roughly two-thirds of the U.S. population. Verizon Business also operates a global IP network that offers comprehensive global solutions to enterprise customers in the U.S. and abroad.

If new and unwise regulation does not constrain their development, next-generation networks, like those Verizon is deploying, will enable consumers to receive myriad new services. Broadband not only makes the most common Internet applications like e-mail, instant messaging, and text-based Web surfing faster and better, but also makes it possible to provide new services that were impossible or technically impractical before. Broadband network operators have an economic interest in facilitating such innovation and competition among new Internet content and applications. After all, these cutting-edge functions and capabilities are what inspire consumers to switch to next-generation broadband networks. Thus, the central premise of broadband regulation – that broadband network operators have an interest in stifling such competition and innovation – is exactly backwards.

Broadband Regulation Would Impede Investment, Innovation, and Competition for Broadband Services

Broadband regulation would mark a radical departure from the flexible engineering and business practices that helped make the Internet successful. Such regulation would impede investment, innovation, and competition for broadband in several related ways.

First, it would restrict broadband providers from competing in important new respects, such as offering priority delivery services. Broadband providers have been developing or considering a wide range of priority delivery services in order to meet the varied needs of new broadband applications and content, many of which need more than best-efforts delivery in order to be of value to consumers. These new priority delivery services create an additional way for providers to differentiate themselves. Regulation that restricts these new services would thwart this emerging competition. Such restrictions would disproportionately harm new entrants, such as a new broadband provider that wants to compete by offering users faster access to particular types of content or applications.

Broadband regulation would also slow the growth of the Internet and impede the introduction of next-generation broadband technology by making it harder for broadband providers to recoup their network investments efficiently. Broadband is a classic “two-sided market”: both consumers and content/application providers derive value from the sale of broadband access. In such markets, providers need the flexibility to allocate charges based on each side’s willingness and ability to pay – just as newspapers share their costs between readers and advertisers. This flexibility will enable broadband providers to obtain the returns necessary to justify their investments. In addition, permitting broadband providers to spread the costs of network investment over a broader base – for example, by charging not only end users but also charging for differentiated services offered to content and application providers – will let providers keep prices for consumers lower than they would otherwise be. This will further stimulate demand for broadband services and, in turn, Internet content.

Broadband regulation would further impede broadband competition and investment by limiting the ability of network operators to provide Internet content and applications. Bundling of content and distribution has played a central role in the deployment of broadband networks thus far, and will be just as important going forward. With respect to Verizon’s FiOS network, for example, Verizon needs the ability to ensure that bandwidth for video programming is always available, and to determine the types of video programming consumers receive. Bundling distribution with content also is proving central in the deployment of alternative broadband technologies. Broadband regulation would ban such bundling by separating control over the use of the network from ownership of the wires. This would eliminate an efficient – and perhaps necessary – means of ensuring the rapid deployment of broadband.

Broadband regulation would also reduce competition between Internet content and application providers. By prohibiting broadband network operators from offering priority-delivery and other types of new network services, such regulation reduces competition for broadband applications that depend on faster access and other types of service differentiation, thereby raising the costs of such services and making them less attractive to consumers. Similarly, a regulatory regime that requires non-discrimination in prioritization offerings would

remove the incentive and ability for content and application providers to seek out arrangements that would improve their services vis-à-vis their rivals'. Although advocates of broadband regulation claim that providing better quality service to some necessarily entails inferior service for others, network operators have strong incentives to ensure that consumers and content/application providers can connect with each other at the speeds each side desires, because this makes broadband connections more valuable for everyone.

Broadband regulation also threatens competition for large enterprise customers. These customers require customized service offerings and fast, reliable, and secure networks. By restricting Verizon Business's ability to provide priority delivery capabilities and other differentiated offerings, such regulation could stifle or even bar Verizon Business's ability to offer the specialized and customized services that financial institutions and other sophisticated customers demand.

In sum, the new services and potential business models the proponents of broadband regulation seek to prohibit are presumptively both efficiency-enhancing and pro-competitive.

Competitive Conditions in the Broadband Market Make Broadband Regulation Unnecessary and Unwise

When proponents of broadband regulation issue their call to "Save the Internet," they beg the question: "From what?" There is no history of problems, and large and growing competition for broadband services gives no reason to assume such problems will develop in the future.

Advocates of broadband regulation have mustered just one concrete example of a network operator that supposedly did what such advocates fear. In early 2005, Madison River – a small rural telephone company – blocked the calls of a VoIP provider that had refused to pay Madison River for completing its calls. Madison River's blocking immediately gained public attention and the FCC quickly reached an agreement with Madison River to stop blocking the VoIP calls. In the meantime, all other telephone companies have continued to complete VoIP calls, even when the VoIP providers fail to pay the call completion charges. This isolated episode of a single rural company's action is a slim reed on which to base the monolith of broadband regulation.

Although the absence of problems is sufficient to reject broadband regulation, such regulation also cannot be justified in light of competitive forces in the broadband market. While advocates of broadband regulation claim there is a "broadband duopoly," they wrongly focus on the market for local connections provided to end users, rather than the global or national markets for the distribution of Internet content and applications. No single U.S. broadband provider controls more than a small fraction of connections in this global or national market, and therefore has no ability control access to such content, regardless of its share of broadband connections in any local market.

Proponents of broadband regulation also ignore the dynamic growth of the broadband market. As the FCC, courts, and state commissions have found, alternative platforms – such as WiMAX, WiFi, third generation ("3G") mobile wireless, satellite, competitive fiber, and broadband over power line ("BPL") – are emerging now. In addition to multiple competitors,

the broadband market is generally characterized by falling prices, increasing transmission speeds, large new investments, and vibrant innovation – all signs of a marketplace that is *not* in need of intervention by regulators.

In addition to actual and potential competition among broadband providers, other market forces also protect consumers. All broadband providers have strong incentives to allow consumers to access the content of their choice, because allowing access maximizes the value of the provider's network. In short, where, as here, vigorous market competition is already protecting consumers, regulatory intervention is unnecessary and unwise.

The Wireless Experience Confirms Broadband Regulation Is Misguided

Experience in the wireless industry demonstrates that broadband regulation would be a mistake both with respect to wireless services themselves, and also with respect to broadband services generally. The wireless industry has thrived under deregulation. Most consumers can choose among four to six facilities-based carriers, plus a wide range of wireless resellers. This competition has resulted in some of the lowest wireless prices in the world. It has also driven the major wireless carriers to make enormous investments to provide next-generation broadband services. Intense competition among wireless providers also has given rise to a highly competitive market for wireless handsets and devices.

Proponents of broadband regulation argue that, despite this competition, wireless carriers have failed to provide sufficiently “open” and “nondiscriminatory” access to their networks. But the reality is that consumers place a much higher value on other features, such as high-quality and low-priced service, which in many cases conflict with the priorities of regulation advocates. The disconnect between the preferences of regulation advocates and those of consumers highlights the perils of trying to out-guess the marketplace, and proves that service providers are far better than central planners in determining the needs of customers. Marketplace experience demonstrates that the practices regulation proponents label discriminatory and closed have overwhelmingly benefited consumers and have been instrumental in achieving the wireless industry's remarkable success.

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I. INVESTMENT IN BROADBAND NETWORKS BENEFITS CONSUMERS

The Internet has provided enormous benefits to consumers and the U.S. economy. Continuing these benefits depends on huge new investments in next-generation broadband networks. Each generation of network investment has fostered new services and products in cycles of dynamic competition that benefit consumers and the economy and, in turn, spur further network investment and competition. If new and unwise regulation does not constrain their development, next-generation wireline and wireless broadband technologies promise to continue this cycle of competition, innovation, and investment.¹

A. Verizon Is the National Leader in Deploying Next-Generation Broadband

The deregulatory environment for broadband has enabled Verizon to invest at levels that make it the nation's leader not only in broadband investment, but also in total capital expenditures. In the three years since federal regulators began dismantling network sharing and pricing regulation of broadband networks, Verizon's total capital expenditures were more than \$45 billion, including \$13.3 billion in 2004, \$15.0 billion in 2005, and \$17.1 billion in 2006.

Verizon is spending a total of \$18 billion to deploy a fiber-to-the-premises network (known as FiOS) to 18 million customer premises by the end of 2010.² The FiOS network provides greater capacity and capabilities than any network available to mass-market consumers today, including more video programming channels (particularly high-definition channels) than any cable provider, higher-speed Internet access (eventually up to 100 Mbps), best-of-class voice services, and other advanced features such as multi-room digital video recorders. In markets where it has been deployed, FiOS has already prompted cable operators to respond by lowering their prices (or increasing the quality of their service offerings) with respect to both high-speed Internet access and cable services.³

¹ See *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996*, Report, 14 FCC Rcd 2398, ¶ 95 (1999) (“We think of broadband facilities as an input product, like microprocessors or memory in the computer world. For such products, a so called ‘virtuous cycle’ can develop. Successive generations of input products provide more performance for the same amount of money. The greater performance enables current applications to perform better and fuels more demand for them, and demand for new applications that were not feasible before. We have seen such a virtuous cycle in bandwidth in the SONET market for optical networking, in the local area network market for desktop data communications, and in the modem market for consumers.”).

² The \$18 billion total represents net expenditures, after deducting the savings that Verizon expects to achieve from avoiding future maintenance of its legacy copper telephone network, which Verizon calculates as \$4.9 billion between 2004-2010. The \$18 billion does not include the cost to connect individual customers to FiOS, which Verizon estimates will be approximately \$5.1 billion, based on assumptions regarding the number of premises that are likely to subscribe to FiOS. Thus, Verizon's gross capital expenditures for deploying FiOS are \$22.9 billion, of which \$5.1 billion is the cost to connect.

³ See, e.g., D. Barden, *et al.*, Bank of America, *Battle for the Bundle: Consumer Wireline Services Pricing* at 9 (Jan. 23, 2006) (“The rollout of Verizon's FiOS service in select markets has elicited thinly advertised, yet highly competitive pricing responses for incumbent cable providers. . . . In each of these markets the respective cable provider . . . has responded with competitive pricing, well below their national average. . . . We discovered that incumbent cable customer sales reps were willing to offer more competitive pricing after mentioning FiOS, and significantly more competitive than Web pricing and out-of-region pricing.”).

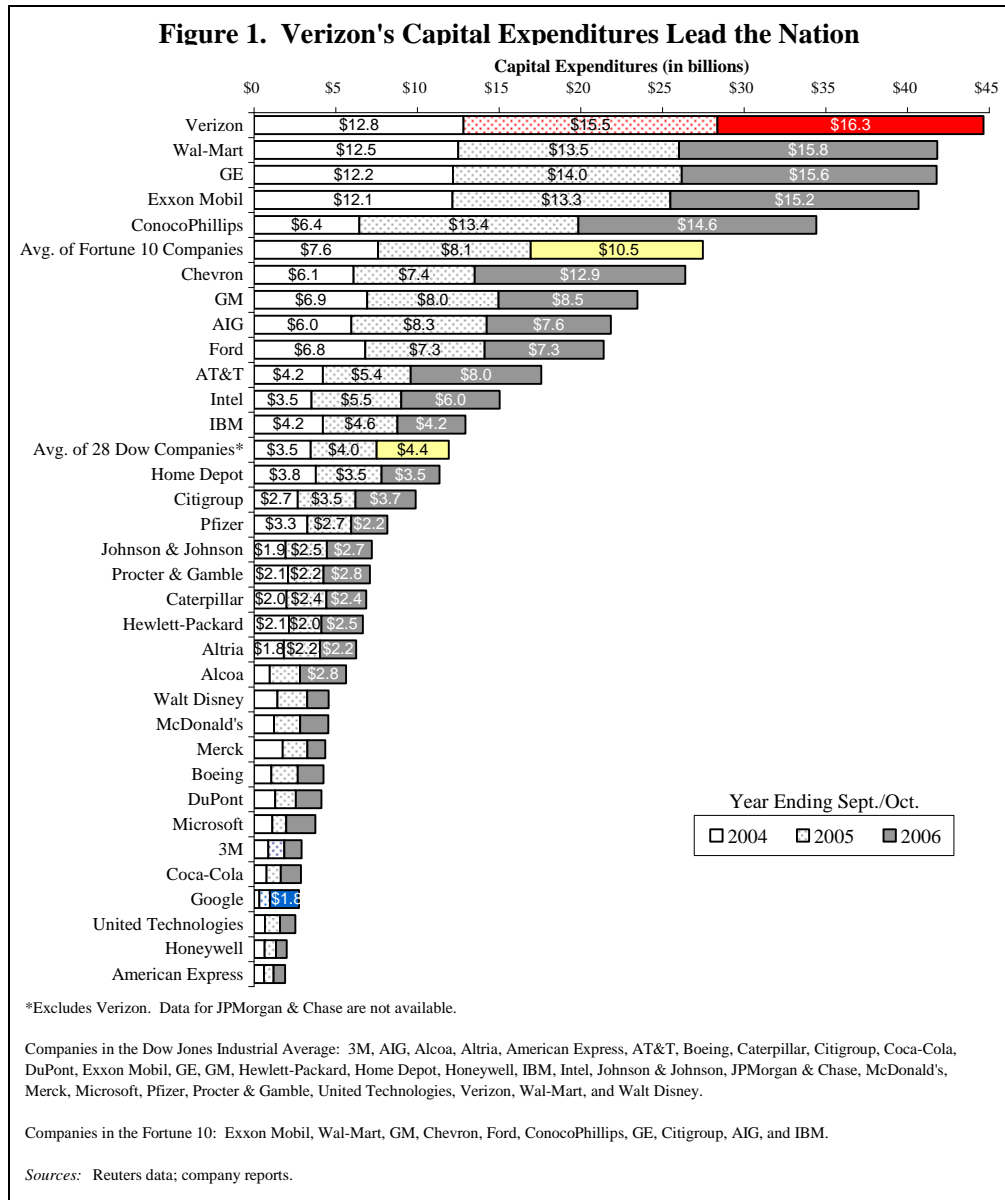
Verizon also is an industry leader in deploying 3G wireless broadband networks. Verizon Wireless's 3G technology enables users to obtain high-speed Internet access on their EV-DO-equipped laptops at average of 400-700 kbps, and top speeds of up to 2 Mbps. It also gives wireless phone users access to Verizon Wireless's next-generation content delivery network, known as V CAST, which provides multimedia content such as music downloads, video (including breaking news and weather, sports highlights, and music videos), and online games. Wireless networks have never been subject to network sharing or pricing regulations, and over the past six years alone Verizon Wireless has invested more than \$3 billion to upgrade its wireless networks to 3G, using EV-DO technology. This has led to one of the broadest 3G deployments in the country, reaching 242 major U.S. cities with a total population of more than 200 million people. Verizon Wireless also has begun deploying next-generation EV-DO Revision A technology, which is already available in more than 100 markets. Verizon Wireless is consistently rated as one of the highest-quality wireless networks by Consumer Reports and other consumer organizations.⁴

Verizon Business also operates a global IP network with more than 446,000 fiber route miles in 150 countries. Through that network, Verizon Business offers comprehensive global solutions to enterprise customers in the U.S. and abroad.

To put the scale of Verizon's network investments in perspective, Verizon's capital expenditures from 2004-2006 exceeded the capital spending of every one of the other 28 companies included in the Dow Jones Industrial Average, both in each individual year and collectively. *See* Figure 1. Verizon's average capital expenditures over this period were nearly four times the average capital expenditures of the other Dow Jones companies and nearly 70 percent greater than the average of the Fortune 10 companies. *See id.* In the year ending in September 2006 (the latest point for which data are available across companies), Verizon's capital expenditures were nearly three times as large as Intel's (\$6.0B); and nearly ten times as large as both Microsoft's and Google's (\$1.8B each).⁵

⁴ *See, e.g.*, Consumer Reports, *Ratings: Cell-Phone Service* (Jan. 2007) (Verizon Wireless earned the highest score in consumer satisfaction in 14 out of 20 markets); Consumer Reports, *Quick Picks: Cell-Phone Service* (Jan. 2007) ("If you live in one of the metro areas: Consider the top-rated carrier, in most cases . . . Verizon. . . . If you live in an area not covered by the Ratings: . . . Verizon [is] worth considering, based on [] generally better call connectivity and customer satisfaction in the metropolitan areas covered by our Ratings."); Verizon Wireless Press Release, *Verizon Wireless Ranks Highest in Call Quality in J.D. Power and Associates Call Quality Study Volume 2* (Sept. 7, 2006); J.D. Power & Associates Press Release, *A Dedicated Point of Contact is Critical in Delivering a Positive Service Experience to Business Wireless Customers* (May 17, 2006).

⁵ *See* Intel Corp., Form 10-K at 38 (SEC filed Feb. 27, 2006); Microsoft Corp., Form 10-K at 45 (SEC filed Aug. 25, 2006) (year ending June 30, 2006); Google Inc., Form 10-K at 46 (SEC filed Mar. 16, 2006).



Although Verizon is the leader in making broadband network investments, its investments are representative of the communications industry as a whole. Many other providers are also investing to build new broadband networks. AT&T has committed to spend \$4.6 billion over the next three years to deploy a fiber-to-the-node network to 19 million homes.⁶ Over the past decade, cable companies have invested over \$100 billion to upgrade their one-way, video-only networks to provide two-way services, including voice and high-speed Internet access.⁷ Each of the major wireless providers besides Verizon Wireless has also begun deploying 3G

⁶ See R. Klugman, *et al.*, Prudential Equity Group, *The Dust Has Settled: We Think It's O.K. To Own Telecom Stocks Again* at 43 (July 20, 2006).

⁷ See NCTA, *2006 Industry Overview* at 4 & Chart 1 (2006) (citing Kagan Research data).

networks (*e.g.*, Sprint Nextel and Cingular⁸) or has committed to do so (*e.g.*, T-Mobile⁹). Other providers are investing billions of dollars to deploy new wireless and wireline broadband networks using a range of technologies including WiMAX, WiFi, BPL, and satellite. *See* § III.B, *infra*.

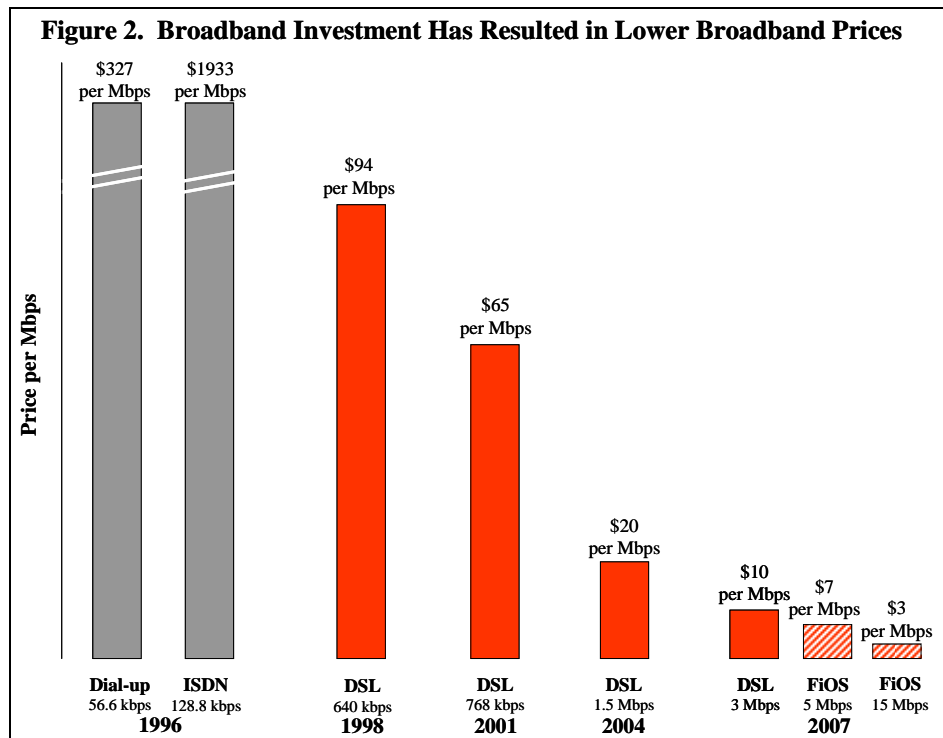
These investments by Verizon and other network operators are enabling consumers to obtain greater levels of bandwidth at lower prices than ever before. Just a decade ago, most consumers were still using 56 kbps dial-up connections to access the Internet; today, the vast majority of consumers can obtain access to either a DSL or cable modem connection, which provide at least 3 and 5 Mbps, respectively.¹⁰ With next-generation networks like FiOS, speeds of 50 Mbps are already available in some areas, and speeds up to 100 Mbps will be provided in the future. Wireless Internet access was non-existent a decade ago, whereas the latest technology – EV-DO Revision A, which Verizon has recently deployed – provides average download speeds of 450-800 kbps or higher, and average upload of speeds of 300-400 kbps or higher. The average price for wireline broadband Internet access has dropped from \$327 per Mbps in the dial-up era, to \$3-\$7 per Mbps in the FiOS era. *See* Figure 2. Wireless broadband cost \$150-\$1000 per Mbps three years ago, and is down to approximately \$52 to \$178 per Mbps today.¹¹

⁸ *See* Sprint, *The Largest Mobile Broadband Network*, <http://powervision.sprint.com/mobilebroadband/plans/coverage.html>; Sprint Press Release, *Sprint Accelerates EV-DO Revision-A Mobile Broadband Upgrade* (Aug. 3, 2006); Cingular News Release, *Cingular Launches 3G Network in Indianapolis* (Sept. 22, 2006).

⁹ *See* T. Watts, *et al.*, Cowen and Company, *Mobile Content Delivery – The Next Wave of Wireless Growth* at 6 (June 28, 2006) (“T-Mobile plans to begin its 3G roll out in 2007.”); R. Klugman, *et al.*, Prudential Equity Group, *FCC AWS Auction 66 Ends Raising \$13.7B, the Top Four Major U.S. Wireless Carriers Represented 78% of Total Bids and 71% of MHz-Pops Sold* at 2 (Sept. 18, 2006) (“T-Mobile, the most aggressive bidder in the auction, spent \$4.2 bil. on spectrum covering 100% of the U.S. population.”).

¹⁰ *See* S. Flannery, *et al.*, Morgan Stanley, *Telecom Services: Speed Is Key As Broadband Market Matures* at Exhibit 10 (Jan. 26, 2007) (availability); M. McCormack, *et al.*, Bear Stearns, *October Broadband Buzz: A Monthly Update on Critical Broadband Issues* at 5-6 (Oct. 31, 2006) (broadband offerings).

¹¹ *See* M. McCormack, *et al.*, Bear Stearns, *Wireless Broadband: The Impact of 802 Technology* at Exhibit 34 (June 2004) (AT&T Wireless offered GPRS/EDGE service at 100-130 kbps for \$19.99 per month for 8 MB; Verizon Wireless offered 1XRTT service at 40-60 kbps for \$39.99 per month for 20 MB); Verizon Wireless Press Release, *Verizon Wireless Rolls Out Faster EV-DO Revision A Wireless Broadband Network In Greater Chicago Area* (Feb. 02, 2007); Sprint Nextel, *Sprint Mobile Broadband Solutions*, <http://powervision.sprint.com/mobilebroadband/> (Sprint’s EV-DO Rev. A service offers download speeds of 490 kbps-1.155 Mbps; unlimited service is \$59.99 per month with a voice subscription and two-year contract); Verizon Wireless, *Broadband Access*, <http://www.verizonwireless.com/b2c/store/controller?item=planFirst&action=viewPlanDetail&sortOption=priceSort&catId=409> (Verizon Wireless’s EV-DO Rev. A service offers download speeds of 450-800 kbps; unlimited service is \$79.99 per month with a one-year contract).



B. Future Internet Competition and Innovation Depend on Continued Network Investments

The deployment of broadband Internet services has ushered in new waves of dynamic efficiency or Schumpeterian competition, providing new ways for enterprises to compete in traditional markets and creating entirely new markets. Over the past decade, the deployment of broadband has eroded once-clear boundaries among different content and application delivery technologies. “Old” media such as newspapers, broadcasters, cable operators, and video stores now compete directly with online news, blogs, and online video delivery. Online music downloading to PCs and devices such as iPods and wireless phones competes with radio, CDs, and record stores. Consumers can now access software and store information on remote servers, rather than on their desktop. Broadband not only makes the most common Internet applications like e-mail, instant messaging, and text-based Web surfing faster and better, but also makes it possible to provide new services that were impossible or technically impractical before – such as voice-over-IP, online video, online gaming, photo-sharing, podcasts, and e-books, to name just a few.

Like prior generations of communications networks, the new broadband networks will provide enormous economic benefits for consumers and the U.S. economy as whole. U.S. consumers have adopted broadband Internet access far more rapidly than they adopted narrowband Internet access, and more rapidly than they adopted many other pervasive consumer technologies, including personal computers, cellular phones, radio, color TVs, CD players,

VCRs, and pay cable.¹² Today, more than 40 percent of all U.S. households – and roughly two out of three households that purchase Internet access – subscribe to broadband.¹³ In the past five years, as broadband penetration has increased, the average time spent on the Internet has tripled, from approximately five hours per week to more than 14 hours.¹⁴ The majority of Americans spend as much or more time using broadband-enabled computers as they do watching television.¹⁵

Just as the deployment of broadband networks facilitates this new competition and innovation, it also depends on it. It is therefore in the interest of broadband network operators to ensure that there is rapid innovation and vibrant competition for Internet content and applications. Consumers will not switch to next-generation broadband networks unless they offer greater value than existing alternatives. This means not only greater speeds, but also new forms of content and application that take advantage of such speeds. The greater the variety of such content and applications, the more consumers are likely to find purchasing broadband connections worthwhile. The case for broadband regulation is thus founded on the false premise that broadband network operators have an economic interest in stifling competition and innovation for Internet content and applications.

It is also in the interest of the entire U.S. economy to promote investment in next-generation broadband networks. These networks will stimulate economic activity and improve national productivity, just like prior generations did. According to one economic study, widespread broadband deployment in the U.S. will generate between \$300-\$500 billion *per year* in consumer surplus, depending on the rate of consumer adoption.¹⁶ This same study estimates that broadband deployment will increase GDP by up to \$414 billion and create 1.2 million new

¹² See L. Vanston, Technology Futures, Inc., *Residential Broadband Forecasts* at Exhibit 7 (2002), http://www.tfi.com/pubs/w/ti_broadband.html; L. Vanston, Technology Futures, Inc., *Forecasts for Broadband Communications* at Figure 2 (2005); L. Topcuoglu, *et al.*, Goldman Sachs, *Distribution Fragmentation May Dwarf Cable's On-Demand Prospects* at Exhibit 6 (June 27, 2006); J. Horrigan, Pew Internet & American Life Project, *Broadband Adoption at Home in the United States: Growing But Slowing* at 7 (Sept. 24, 2005); U.S. Dep't of Commerce, *A Nation Online: Entering the Broadband Age* at 5 (Sept. 2004) (“[I]t is worth noting that broadband’s rate of diffusion is outpacing that of many popular technologies in the past, such as video cassette recorders (VCRs), the Internet, and personal computers (PCs).”).

¹³ See, *e.g.*, M. Nathanson, *et al.*, Bernstein Research, *Broadband Update: AOL's New Strategy Could Accelerate Transition to Broadband* at 3 (Sept. 1, 2006); D. Janazzo, *et al.*, Merrill Lynch, *US Wireline Matrix 2Q06* at 5 (Aug. 28, 2006); Nielsen//NetRatings Press Release, *U.S. Broadband Composition Reaches 72 Percent at Home, a 15 Point Year-over-Year Increase, According to Nielsen//NetRatings* (June 21, 2006).

¹⁴ See Jupiter Media Metrix Press Release, *Jupiter Media Metrix Announces U.S. Top 50 Web and Digital Media Properties for March 2001* (Apr. 13, 2001); JupiterResearch Press Release, *JupiterResearch Finds Online Consumers Spend as Much Time Online as in Front of the TV* (Jan. 30, 2006).

¹⁵ See JupiterResearch Press Release, *JupiterResearch Finds Online Consumers Spend As Much Time Online As in Front of the TV* (Jan. 30, 2006); C. Li, *et al.*, Forrester, *US Online Marketing Forecast: 2005 to 2010* at 6 (May 2, 2005) (“When at-work Internet use is taken into account, online consumers spend more than a third of their time online, comparable to the time they spend watching TV”).

¹⁶ Robert Crandall, Charles Jackson & Hal Singer, Criterion Economics, LLC, *The Effects of Ubiquitous Broadband Adoption on Investment, Jobs and the U.S. Economy* at 3 (Sept. 2003) (conducted for the New Millennium Research Council) (broadband deployment “could generate \$300 billion per year in consumer surplus,” and “accelerating the adoption rate of current generation broadband technologies could increase the present discounted value of consumer benefits by as much as \$500 billion.”).

jobs over the next decade.¹⁷ Economists broadly agree that the surge in U.S. productivity between 1995 and 2000 (the measure of economic output per hours worked) was due largely to the rise of information technology, including investment in network infrastructure.¹⁸ The Department of Commerce attributes more than 80 percent of the acceleration in U.S. productivity during the 1990s to information technologies.¹⁹ Although computers proliferated before the late 1990s, significant improvements in productivity were realized only when significant numbers of computers came to be interconnected via telecommunications networks, the Internet, and the World Wide Web. As economist Alan Binder of Princeton University concludes, “all these high-speed computers required greater interconnectivity before they could really boost productivity on a national scale – and the Net has now provided the missing link.”²⁰ Regardless of the exact quantification of these various benefits, broadband is clearly an enormous plus for the national economy.

II. BROADBAND REGULATION WOULD IMPEDE INVESTMENT, INNOVATION, AND COMPETITION FOR BROADBAND SERVICES

Today’s telecommunications infrastructure will not support the broadband services and applications planned for the future.²¹ New Internet content and applications require innovative

¹⁷ *Id.* at 20, 22; J. Rutledge, *Telecom Deregulation: It’s Time for That Call*, Investor’s Business Daily (Nov. 24, 2003) (citing New Millennium Research Council study). Other studies have concluded that broadband was responsible for increasing GDP by 1.25 to 2.5 percent – or roughly \$125-250 billion in additional output *per year* by 2005 (in 2000 prices). See Robert Litan, New Millennium Research Council, *Great Expectations: Potential Economic Benefits to the Nation from Accelerated Broadband Deployment to Older Americans and Americans with Disabilities* at 7 (Dec. 2005), http://www.newmillenniumresearch.org/archive/Litan_FINAL_120805.pdf. See also Robert Solow, *Technical Change and the Aggregate Production Function*, Review of Economics and Statistics at 39 (1957) (technological innovations account for nearly 90 percent of the growth in per capita income).

¹⁸ See Kevin J. Stiroh, *Information Technology and the U.S. Productivity Revival: What Do the Industry Data Say?*, 92 American Economic Review 1559-60 (Dec. 2002) (“both the production and the use of IT have contributed substantially to the U.S. aggregate productivity revival in the late 1990s. . . . The data show that IT-producing and IT-using industries accounted for all of the direct industry contributions to the U.S. productivity revival [between 1995-2000]”) (citing Jorgenson & Stiroh, Oliner & Sichel, Whelan, BLS, Council of Economic Advisors); U.S. Dep’t of Commerce, *Digital Economy 2002* at vi, 24-29 (Feb. 2002) (“*Digital Economy 2002*”) (During 1996-2000, when the economy grew by an average 4 percent annually, the IT-producing sector – which accounted for 7 percent of GDP (on average) – grew by 21 percent a year (on average, in real terms), and was responsible for 28 percent of overall real economic growth); Scott Wallsten & Seth Sacher, AEI-Brookings Joint Center for Policy Matters, *What U.S. Broadband Problem?*, Regulatory Analysis 06-18 (July 2006), <http://www.aei.brookings.org/policy/page.php?id=259> (“[I]nvestments in information infrastructure, including broadband, have brought huge economic benefits – possibly accounting for a third of our productivity growth over the past decade.”).

¹⁹ *Digital Economy 2002* at v, 31-40.

²⁰ Alan S. Blinder, *The Internet and the New Economy*, Brookings Institution Policy Brief No. 60 at 5 (June 2000).

²¹ See, e.g., Craig E. Moffett, Vice President and Senior Analyst, Sanford C. Bernstein and Co., LLC, testimony before the Subcommittee on Communications, U.S. Senate at 2 (Mar. 14, 2006) (“*Moffett March 14, 2006 Testimony*”) (“[O]ur telecommunications infrastructure is woefully unprepared for widespread delivery of advanced services, especially video, over the Internet. Downloading a single half hour TV show on the Web consumes more bandwidth than does receiving 200 emails a day for a full year. Downloading a single high definition movie consumes more bandwidth than does the downloading of 35,000 Web pages; it’s the equivalent of downloading 2,300 songs over Apple’s iTunes Web site. Today’s networks simply aren’t scaled for that.”).

new broadband delivery methods. The broadband future thus depends on large new network investments. Broadband regulation is one of the principal threats to this necessary investment.²²

Most proposals for new broadband regulation would regulate broadband networks in two general ways. First, they would restrict the ability of broadband providers to manage bandwidth and control traffic on their network – for example, to offer different levels of service for content and application providers to reach their customers. Specifically, the Internet content and application providers who advocate this regulation want either to mandate a “best-efforts”²³ level of delivery (which they wrongly assume has been an industry standard thus far), or, at a minimum, to prevent network providers from “discriminating” by letting certain content and application providers access new features or services, such as prioritized delivery, that meet their particular needs.²⁴ Second, some proposals for new broadband regulation would restrict the ability of broadband providers to provide their own content, applications, and devices. Supposed “non-discriminatory access” would be required here, too – that is, network providers would be required to treat unaffiliated Internet content, applications, and devices the same as their own content, applications, or devices, or those of an affiliate.

By compromising broadband providers’ management and utilization of their networks, broadband regulation would harm consumers in several related respects.²⁵ It would first limit competition for broadband services directly. Such regulation would restrict the ability of broadband providers to compete against each other across certain dimensions, such as providing priority delivery services. It would also deter investment in broadband networks by limiting the

²² See Christopher Yoo, *Beyond Network Neutrality*, 19 Harvard J. Law & Tech. 1, 10 (Fall 2005) (“Yoo, *Beyond Network Neutrality*”) (“Concerns about reducing investment incentives carry little weight when last-mile competition is infeasible, as was arguably the case when interconnection and standardization were mandated with respect to CPE, long distance, and enhanced services. They are paramount when entry by new last-mile providers is ongoing and other last-mile technologies are waiting in the wings. Under these circumstances, regulation imposed to curb market concentration can turn into the cause, rather than the consequence, of market failure.”).

²³ With “best efforts” service, there is no guarantee that transmitted packets will arrive to a specified destination by a particular time. See Lawrence Lessig, Professor, Stanford Law School, prepared testimony before the Senate Committee on Commerce, Science and Transportation, Hearing on “Network Neutrality” at 10 (Feb. 7, 2006) (“*Lessig February 7, 2006 Testimony*”) (“At a minimum, Congress could simply restrict access-tiering by network providers. That would leave network providers free to offer consumer-tiered service. But such tiering should not be allowed to turn upon the particular provider of network content.”).

²⁴ The “net neutrality” condition that AT&T/BellSouth agreed to in order to obtain FCC approval for their merger is an example of this latter requirement. AT&T/BellSouth agreed to “maintain a neutral network and neutral routing in its wireline broadband Internet access service,” which “shall be satisfied by AT&T/BellSouth’s agreement not to provide or to sell to Internet content, application, or service providers, including those affiliated with AT&T/BellSouth, any service that privileges, degrades or prioritizes any packet transmitted over AT&T/BellSouth’s wireline broadband Internet access service based on its source, ownership, or destination.” See Letter from R. Quinn, AT&T, to M. Dortch, FCC, WC Docket No. 06-74 (FCC filed Dec. 28, 2006).

²⁵ After Congress rejected broadband regulation legislation in 2006, some regulation advocates have sought to persuade state lawmakers and officials to take up the cause. See Charles Cooper & Brian Koukoutchos, *Federalism and the Telephone: The Case for Preemptive Deregulation in the New World of Intermodal Competition* 57, 58 n. 178 (2007), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=959720. This is a disturbing trend. The damage that broadband regulation would cause if implemented at the federal level would be further compounded if implemented at the state level. See *id.* (“[A] regulatory policy choice for a national – indeed, international – network industry should be made at the national rather than the state or local level. The information superhighway cannot be regulated as if it were fifty discontinuous sets of winding country roads.”).

ways in which broadband network operators can recoup that investment. Some proposals for broadband regulation would require broadband network operators to recover their costs exclusively from end users, and would prohibit charging upstream content and application providers. Second, broadband regulation would also limit competition for broadband Internet content and applications. Such regulation would reduce the ways in which Internet content and application providers can compete with each other. By reducing competition for Internet content and applications, broadband regulation would further reduce demand for the broadband services and networks over which those content and applications are provided, and therefore make it more difficult to justify investments in those networks.

Contrary to the claims of advocates of broadband regulation, “neutral” engineering and business practices were not what made the Internet successful.²⁶ To the contrary, providers at every level of the Internet have long been free to manage bandwidth and control traffic on their networks, even where that entails differentiation of service offerings. Broadband regulation would therefore mark a radical departure from the flexible engineering and business practices that helped make the Internet successful. Internet backbones, for instance, operate using a tiered system under which certain providers with relatively even traffic volumes, such as Tier 1 backbone, engage in settlement-free peering with each other, while other providers are required to pay transit fees to get their traffic on the Internet backbone.²⁷ More generally, having always had the freedom to design appropriate arrangements, backbone providers have been driven by competitive forces and their common interest to establish efficient arrangements that are not always “neutral.”²⁸ At the content and application layer, many providers pay for specialized Content Delivery Networks, which are networks of local caching servers that permit content to be accessed more quickly and efficiently than the public Internet permits.²⁹ Unlike e-mail providers, instant messaging providers have refused to establish industry-wide standards for interoperability, thereby forcing consumers to choose among competing standards.³⁰ At the

²⁶ Letter from Vinton G. Cerf, Google, to Rep. Joe Barton and Rep. John Dingell, Committee on Energy and Commerce, U.S. House of Representatives (Nov. 8, 2005) (The Internet is “based on a layered, end-to-end model that allows people at each level of the network to innovate free of any central control”; these “architectural characteristics” are central to “the remarkable social impact and economic success of the Internet.”); Google, *Google Help Center: A Guide to Net Neutrality for Google Users*, <http://www.google.com/help/netneutrality.html> (“The Internet has operated according to this neutrality principle since its earliest days. Indeed, it is this neutrality that has allowed many companies, including Google, to launch, grow, and innovate.”); *Lessig February 7, 2006 Testimony* (“the innovation and explosive growth of the Internet is directly linked to its particular architectural design.”); SavetheInternet.com, *F.A.Q.*, <http://www.savetheinternet.com/=faq> (“Net Neutrality is the reason why the Internet has driven economic innovation, democratic participation, and free speech online.”).

²⁷ See *Verizon Communications Inc. and MCI Inc., Applications for Approval of Transfer of Control*, Memorandum Opinion and Order, 20 FCC Rcd 18433, ¶¶ 111-112 (2005) (“*Verizon/MCI Order*”); *SBC Communications Inc. and AT&T Corp., Applications for Approval of Transfer of Control*, Memorandum Opinion and Order, 20 FCC Rcd 18290, ¶¶ 110-111 (2005).

²⁸ See *Verizon/MCI Order* ¶¶ 125, 133 (concluding that the backbone market “is both competitive and dynamic” and that “interconnection between Internet backbone providers has never been subject to government regulation, and settlement-free peering and degradation-free transit arrangements have thrived.”).

²⁹ See *Your Television Is Ringing: A Survey of Telecoms Convergence* at 14, *The Economist* (Oct. 14, 2006) (“As well as buying fast pipes and building huge ‘server farms’, big companies such as Google and eBay also pay extra for specialist ‘content delivery’ services, such as Akamai, to make their websites download even faster.”).

³⁰ See R. Pegoraro, *Finally, a Peek over the Barriers between IM Networks*, *Wash. Post* at F7 (July 30, 2006) (“Instant messaging. . . has remained stubbornly proprietary. The operators of the three major commercial networks

access layer, broadband providers have long had the freedom of deciding how much network capacity to deploy, and how to allocate that capacity among different applications (such as voice, video, and data) and customers. As demand for Internet access services have grown, for example, many network providers have increased the amount of capacity devoted to such services.³¹

A. Broadband Regulation Would Impede Competition and Investment in Broadband Services and Networks

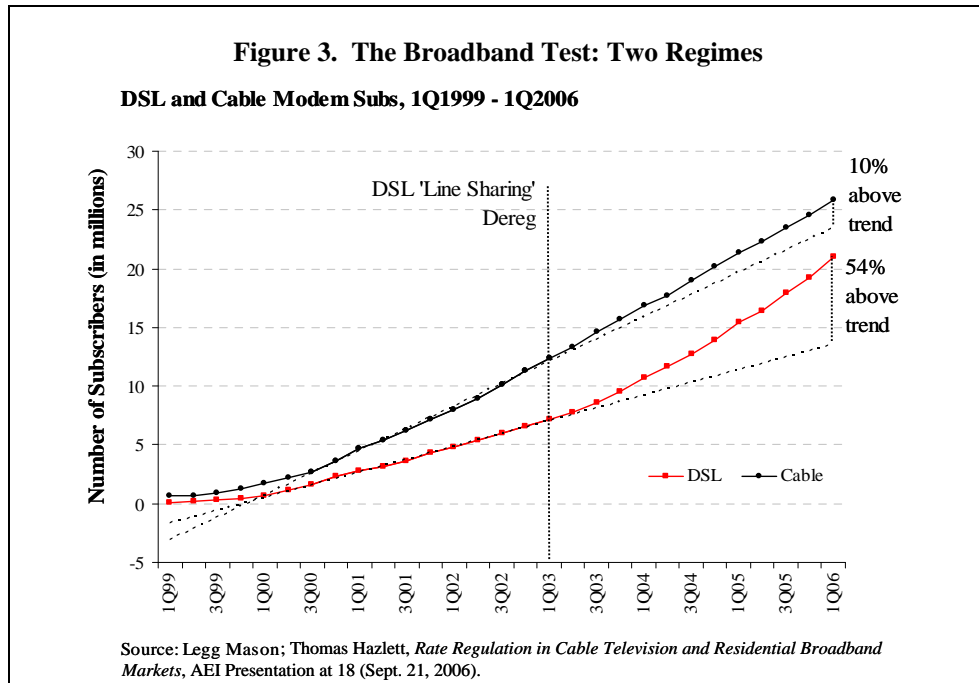
To the extent regulators have sought to regulate broadband in the past, their intervention has reduced investment, innovation, and competition. Since deregulation of those few parts of the Internet that were regulated – mostly telephone company broadband service – broadband has grown much more rapidly (*see* Figure 3),³² prices for broadband access have dropped significantly (*see* § III.C), and Verizon and other carriers have committed to massive investments.³³ Broadband regulation threatens to undermine these gains and deter broadband investment and competition in several important respects.

– AOL, Microsoft and Yahoo – have kept their systems closed off from each other. Earlier this month, however, Microsoft Corp. and Yahoo Inc. updated their software to allow people on one network to chat with people on another. . . [but] these companies aren’t using an open standard that any other network could tap into as well. . . [AOL] has only tiptoed toward interoperability, opening its network strictly to far smaller competitors”).

³¹ See C. Moffett, *et al.*, Bernstein Research, *The Dumb Pipe Paradox (Part II): Patchwork Pipes* at 3 (Feb. 28, 2006) (“*The Dumb Pipe Paradox, Part II*”).

³² Following deregulation, DSL services grew 54 percent faster, and cable modem services grew 10 percent faster, than historical trends would have predicted. During this time, DSL became much more competitive with cable modem, with the ratio of cable modem-to-DSL subscribers decreasing from more than 7:1 before deregulation (and more than 10:1 in 1999), to slightly more than 1:1 today. See Thomas Hazlett & Coleman Bazelon, *Regulated Unbundling of Telecommunications Networks A Stepping Stone to Facilities-Based Competition* at 19-20 (Sept. 2005); Thomas Hazlett, *Rate Regulation in Cable Television and Residential Broadband Markets*, AEI Presentation at 18, 20 (Sept. 21, 2006).

³³ *Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers*, Report and Order and Order on Remand and Further Notice of Proposed Rulemaking, 18 FCC Rcd 16978, ¶¶ 273-277 (2003) (“*Triennial Review Order*”). See SBC News Release, *SBC Communications To Rapidly Accelerate Fiber Network Deployment in Wake of Positive FCC Broadband Rulings* (Oct. 14, 2004) (“SBC will significantly accelerate its previously planned deployment pace”); BellSouth News Release, *BellSouth Boosts Fiber Deployment Following FCC Order* (June 30, 2005) (BellSouth planned to deploy fiber to almost 60 percent more locations in 2005 than it did in 2004); Jeffrey Eisenach, Chairman, CapAnalysis, LLC, *Telecoms in Turmoil: What We Know and (Mostly) Don’t Know about the Telecom Marketplace in 2006*, presentation to the National Regulatory Conference at 13 (May 11, 2006) (showing investment in telecommunications equipment rose by 40 percent in the two years following deregulation of broadband facilities by the FCC).



1. *Broadband Regulation Would Impede Broadband Competition and Investment by Restricting the Ability of Network Providers To Offer Innovative New Network Services*

Many types of Internet content and applications require enormous amounts of bandwidth, and many either need to be delivered to consumers on better-than-best-efforts terms – *i.e.*, with an assurance of no delay – or would greatly benefit from it. Narrowband, best-efforts delivery may be sufficient for applications such as e-mail, instant messaging, and the most basic Web-surfing, but broadband content and applications display enormous variation in the necessary speeds of delivery.³⁴ For instance, VoIP services do not require a great deal of bandwidth, but are intolerant of transmission delays, which cause choppy conversations.³⁵ Both online gaming and video-over-IP services likewise are intolerant of delays, and also require enormous bandwidth (particularly for higher-definition video that matches TV-quality).³⁶ Network software applications – like Google Earth and Google’s recently introduced Docs and

³⁴ See Broadband Working Group MIT Communications Futures Program, *The Broadband Incentive Problem* at 5 (Sept. 2005) (“*The Broadband Incentive Problem*”) (“Narrowband (dialup) access constrained user behaviors such that: (a) average usage levels were similar across users, and (b) for any individual user, the difference between average and peak usage rates was not large. . . . Customers continue to use applications and services . . . that were developed to work well under narrowband constraints; but they also have a widening array of broadband-enabled applications and services to choose from.”).

³⁵ See B. Levin, *et al.*, Stifel Nicolaus, *Net Neutrality: Value Chain Tug of War* at 21 (Mar. 2006) (“Voice is a low-bandwidth application, but it requires low latency.”).

³⁶ See *id.* at 2 (gaming requires “real-time delivery of large bit streams”); A. Bezoza, *et al.*, Friedman Billings Ramsey, *How the Internet Will Disrupt the Long-Term Video Value Chain* at 21 (Oct. 6, 2005) (“We [] believe that some sort of fee structure will need to be developed so that consumers taking advantage of higher-bandwidth applications such as gaming can be charged appropriately.”).

Spreadsheet programs – require broad connections with minimal delay in order to mirror the desktop experience.³⁷

To meet the varied needs of broadband applications and content and satisfy consumer demand for those services, broadband providers have begun developing or considering a wide range of new network services. One class of services – sometimes known as “bandwidth prioritization” – would provide priority delivery services to Internet content and application providers. Other possibilities include providing users (or content providers) a wider range of options for bandwidth – such as allowing them to pay to use only certain types of applications (such as e-mail); giving them the ability to obtain extra bandwidth on an as-needed basis for applications such as data back-up or online gaming; or allowing users to specify types of services or packets that they want delivered more quickly than others. Another option – one that Google is reportedly implementing in its San Francisco WiFi network – is to make broadband access available to users for free, supported by advertising.³⁸

New network services like these will be an important aspect of competition for broadband services – a way for providers to differentiate themselves. Cable and DSL providers already compete by offering customers different mixes of quality (*e.g.*, speed) and price. But the new generation of broadband services – which is being driven by the new generation of broadband content and applications – will allow these and other broadband providers to compete along many more dimensions. Some providers may choose to offer all-you-can-eat, best-efforts service, while others may seek to charge for every individual packet. Some may offer 10 Mbps that can be used only for online gaming, while others may offer a pipe with no limitations.

Regulation that either prevents such offerings, or requires that carriers make them available only on a non-discriminatory basis, would eviscerate these new forms of competition among broadband providers. This will harm competition not only among more established providers, but will impede competition from emerging platforms. For such emerging providers, being able to differentiate their services from larger providers is one of the key ways to help overcome the disadvantages such providers might face due to their size or other factors.³⁹

³⁷ See T. Watts, *et al.*, Cowen and Company, *AT&T, Inc: Could a New Video Strategy Be in the Works?* at 3 (May 25, 2006) (“[M]any of the web-centric applications developed over the past 2 years (i.e. Google Earth, streaming video, on-line gaming) would simply not run on a dial-up network today. We believe it is also widely understood that applications to be deployed over the next 5 years are likely to be more demanding of robust network architectures than we have today – we point to HD IPTV, interactive TV and VOD as early examples.”).

³⁸ See EarthLink Municipal Networks and Google, *San Francisco TechConnect Community Wireless Broadband Initiative* (Feb. 2006); D. Kawamoto, *EarthLink and Google Win San Francisco Wi-Fi Bid*, CNET News.com (Apr. 6, 2006), http://news.com.com/EarthLink+and+Google+win+San+Francisco+Wi-Fi+bid/2100-7351_3-6058432.html.

³⁹ See, *e.g.*, Christopher S. Yoo, *Promoting Broadband Through Network Diversity* at 4 (Feb. 6, 2006) (by restricting the ability of broadband providers to differentiate their service offerings, net neutrality regulation would “reinforce the sources of market failure in telecommunications markets by exacerbating the impact of up-front, fixed costs and by network economic effects. . . . [E]conomic theory shows how allowing network owners to differentiate the service they offer can allow smaller producers to survive despite having lower sales volumes and higher per-unit costs by differentiating their offerings to appeal to a subsegment of the larger market.”); Carl Shapiro & Hal R. Varian, *Information Rules: A Strategic Guide to the Network Economy* at 24-25 (Harvard Bus. School Press 1999) (“The high sunk cost, low marginal cost feature of information markets has significant implications for the market structure of information industries. In the final analysis, there are only two sustainable structures for an information

Moreover, given that many new technologies are only just emerging, now is an especially critical time to ensure that all market participants have the flexibility to respond to market forces.⁴⁰ Two of the country's pioneers in helping to create the Internet – engineers David Farber and Robert Kahn – have explained that “[t]he Internet needs a makeover” to support next-generation services, and that it would therefore be a mistake “to mandat[e] that nothing interesting can happen inside the net.”⁴¹

Preserving the freedom of broadband providers to utilize and manage their networks will also help them recoup their investments as efficiently as possible, which is critical to ensuring these investments get made in the first place, given the high risks involved. Broadband is a classic “two-sided market” – one in which the demand that one party (the consumer) has for the product (Internet access) is complementary to the demand the other party (the Internet content provider) has.⁴² In such markets, it may be economically optimal to charge both sides, depending on each side's willingness and ability to pay (*i.e.*, demand elasticities).⁴³ In some two-sided markets, it may be efficient to impose charges only on one side, while in others it may be efficient to charge the other side or both sides. The key is that providers should be permitted to make these determinations based on market forces, rather than regulation. Just as newspapers are not required to recover all their costs from readers, or radio and TV from viewers, broadband providers must retain the flexibility to develop business models that will best ensure the returns on investment needed to make such investments in the first place.⁴⁴

To the extent that broadband network operators are able to develop services for which Internet content and application providers are willing to pay, that would not only help recoup the

market. 1. The *dominant firm* model . . . 2. In a *differentiated product* market we have a number of firms producing the same “kind” of information, but with many different varieties. This is the most common market structure for information goods”) (emphasis in original); William Lehr & Lee McKnight, *A Broadband Access Market Framework: Towards Consumer Service Level Agreements* at 16 (Sept. 2000) (“multiple tiers of SLAs will provide a mechanism for both users and firms to segregate themselves into service quality groupings that better accounts for heterogeneous willingness-to-pay for service and the costs of supporting higher quality service. A number of analyses have shown how differentiated pricing can result in improved welfare for customers in all quality tiers relative to a ‘one size fits all’ approach.”).

⁴⁰ *The Broadband Incentive Problem* at 4 (“Stakeholders in these markets have the opportunity to establish sustainable user expectations regarding pricing and usage, at an earlier stage of market development. The incentive problem may be more easily dealt with in newer markets, if stakeholders do not follow the initial ‘all you can eat’ pricing policies employed in leading fixed broadband markets.”).

⁴¹ David Farber, Gerald Faulhaber, Michael Katz & Christopher Yoo, *Common Sense About Network Neutrality* (June 2006), available at <http://www.interesting-people.org/archives/interesting-people/200606/msg00014.html>; A. Orłowski, *Father of the Internet Warns Against New Neutrality*, Register (Jan. 18, 2007), http://www.theregister.co.uk/2007/01/18/kahn_net_neutrality_warning/ (quoting Robert Kahn).

⁴² See J. Gregory Sidak, *A Consumer-Welfare Approach to Network Neutrality Regulation of the Internet* at 13 (Sept. 2006) (“Sidak, *A Consumer-Welfare Approach to Network Neutrality Regulation*”).

⁴³ See *id.* at 14.

⁴⁴ See *The Broadband Incentive Problem* at 7 (if broadband providers are required to impose flat-rate consumer-only pricing, “they will be increasingly motivated to curtail rather than encourage many innovative uses of their networks.”).

costs of network investment, but also could help reduce costs for consumers.⁴⁵ By spreading the costs of network investment over a broader base, consumers will not have to foot the entire bill for broadband network deployment. Reducing costs to consumers will have the effect of stimulating demand for broadband services and, in turn, Internet content.

Another consumer benefit of new prioritization services is that they help manage network congestion. It is estimated that peer-to-peer file sharing services like BitTorrent already consume more than one-half of Internet bandwidth.⁴⁶ Unless some mechanism is created to prioritize certain types of traffic, such applications could continue to expand to fill the available space. And this “could mean the average consumer, who uses the least bandwidth, could be forced to subsidize the relatively few who consume the most bandwidth.”⁴⁷ Bandwidth prioritization is a way to ensure that these services don’t overrun the rest of the Internet.⁴⁸ Tiered pricing schemes are in fact frequently used to help solve resource allocation problems in many other contexts, including dining at restaurants (early-bird specials), commuting (higher rush-hour subway prices), and generating electricity (lower off-peak rates).

⁴⁵ See Robert Hahn & Scott Wallsten, AEI-Brookings Joint Center, *The Economics of Net Neutrality*, The Economists’ Voice at 3 (June 2006) (“Yet we know a demand for this general type of service [*i.e.*, bandwidth prioritization] exists. This is one reason people and businesses are willing to pay more for faster Internet connections now.”).

⁴⁶ See *The Dumb Pipe Paradox, Part II* at 3 (“By some accounts, video file sharing sites like *BitTorrent* account for as much as half of all web traffic.”); CacheLogic, *P2P in 2005*, http://www.cachelogic.com/home/pages/studies/2005_07.php (“P2P still Represented 60% of Internet Traffic as of year- end 2004.”).

⁴⁷ See Scott Cleland, NetCompetition.org, *Why Competition Obviates Net Neutrality*, presentation for the FTC Internet Access Task Force at 21 (Sept. 26, 2006) (“*Cleland September 26, 2006 Presentation*”) (“The highly unequal nature of net usage combined with the forced equalization of net neutrality, could mean the average consumer, who uses the least bandwidth, could be forced to subsidize the relatively few who consume the most bandwidth. Thus Net Neutrality could have the perverse unintended consequence of taking from the bandwidth poor and giving to the bandwidth rich.”); see also Alfred E. Kahn, AEI-Brookings Joint Center, *Telecommunications, the Transition from Regulation to Antitrust* at 19 (July 2006, rev. Aug. 14, 2006) (“Kahn, *Telecommunications, the Transition from Regulation to Antitrust*”) (“The opposition to ‘tiering’ . . . is economically ignorant. The costs – both short-run (the opportunity costs of giving priority to the higher-speed uses) and long-run (the costs of the investments to provide additional broadband capacity) – are, presumably, higher for the users requiring the ‘express lane’; and it is therefore not discriminatory for them to be levied on the services requiring their incurrence.”).

⁴⁸ See Jon M. Peha, Carnegie Mellon University, *The Benefits and Risks of Mandating Network Neutrality, and the Quest for a Balanced Policy*, 34th Telecommunications Policy Research Conference at 7 (Sept. 2006), http://www.ece.cmu.edu/~peha/balanced_net_neutrality_policy.pdf (“Peha, *Benefits and Risks of Mandating Network Neutrality*”) (“The ready availability of high-capacity always-on connections to the network has made it possible for a small number of users to generate the vast majority of network traffic on many commercial broadband networks, while filling some communications links to capacity. Today, peer-to-peer file transfers are the primary cause, but other applications may have a similar impact in the future. Moreover, some of these applications are not ‘TCP-friendly,’ which means when congestion occurs on these bottleneck links, these applications do not reduce their rate of transmission to allow the congestion to subside. An application like this will send out data as fast as it can, while the TCP-friendly applications deliberately send fewer and fewer packets. One Gb of traffic that is not TCP-friendly therefore degrades performance for its neighbors more than one that is TCP-friendly. Network operators may therefore wish to give traffic from these applications lower scheduling or dropping priorities, or limit the amount of traffic can send per day, or charge them more for consuming more network resources.”).

2. ***Broadband Regulation Would Impede Broadband Competition and Investment by Limiting the Ability of Carriers To Provide Internet Content and Applications***

By bundling distribution with content, network providers can compete with each other even more on price and quality – stimulating demand for broadband services and, in turn, Internet content.⁴⁹ Proposed new broadband regulation would ban such bundling. It would “separat[e] control over the use of the network from ownership of the wires that make-up the network,” in order to prevent broadband providers from controlling “what people see and do online.”⁵⁰ But allowing broadband providers to provide their own content and applications, and to dedicate bandwidth to those services as they see fit, is an efficient – and perhaps necessary – means of ensuring the rapid deployment of broadband.⁵¹

In distribution industries like broadband, it is common for distributors either to vertically integrate or to enter into customized arrangements with downstream suppliers, because “[c]onsumers do not generally have an independent demand for distribution; rather, consumers have a demand for the goods and services made accessible by distribution.”⁵² Thus, in order to sell an attractive product to consumers, it is often necessary to bundle distribution and content together – as is the case with radio, television, and cable TV. In those industries, vertical integration was in fact central to ensuring the development of quality content, which in turn boosted demand for the distribution network, thereby ensuring sufficient investment to support network deployment in the first place.⁵³ Similarly, in the satellite industry, much of DIRECTV’s success in competing with cable is attributable to its exclusive package of Sunday NFL football games.⁵⁴

⁴⁹ See Robert Hahn & Scott Wallsten, AEI-Brookings Joint Center, *The Economics of Net Neutrality*, The Economists’ Voice at 3 (June 2006).

⁵⁰ Google, *A Guide to Network Neutrality for Google Users*, <http://www.google.com/help/netneutrality.html> (quoting Vint Cerf, Google Chief Internet Evangelist); Lawrence Lessig, Professor, Stanford Law School, testimony before the U.S. Senate Committee on Commerce, Science, and Transportation, regarding the Government’s Role in Promoting the Future of Telecommunications Industry and Broadband Deployment at 2 (Oct. 1, 2002) (“Separating control over the use of the network from ownership of the wires that make-up the network is a necessary step to restoring the growth and innovation of the original Internet.”).

⁵¹ See, e.g., Thomas M. Lenard & David T. Scheffman, *Distribution, Vertical Integration and the Net Neutrality Debate*, in *Net Neutrality or Net Neutering: Should Broadband Internet Service Be Regulated* at 1 (The Progress & Freedom Foundation 2006) (“Lenard/Scheffman, *Distribution, Vertical Integration and the Net Neutrality Debate*”) (“Broadband is a distribution business and arrangements that are not neutral with respect to the products being distributed – in this case, content and applications – are typical of distribution businesses. In fact, ‘non neutral’ businesses models are likely to be necessary to provide sufficient incentives to invest, both in content and the distribution infrastructure itself.”).

⁵² Lenard/Scheffman, *Distribution, Vertical Integration and the Net Neutrality Debate* at 11.

⁵³ Kahn, *Telecommunications, the Transition from Regulation to Antitrust* at 22 (“[T]he positive competitive benefits of vertical integration – in this case the especial interest of broadcasters in ensuring the flow of ‘quality’ programming by directly investing in its development.”); Lenard/Scheffman, *Distribution, Vertical Integration and the Net Neutrality Debate* at 32 (“vertical integration into programming was a key element in the development of cable television.”).

⁵⁴ See Yoo, *Beyond Network Neutrality* at 32.

Bundling of content and distribution has played a central role in the deployment of broadband networks thus far. Indeed, it has been a critical component of Verizon's investment in both FiOS and 3G wireless networks. Verizon's ability to ensure that the bandwidth needed for video is always available, and its ability to sell its own video programming to consumers, are central components of the FiOS business model. Similarly, it is important that Verizon have the ability to allocate bandwidth among the various services on its network, to ensure that it can satisfy users' quality expectations. For instance, Verizon's FiOS network divides the fiber deployed to each premises into three different wavelengths – one devoted exclusively to video programming, and the other two to provide a shared upstream and downstream path for all the other services that Verizon provides, including voice, Internet access, and video on demand. It is critical that Verizon be able to determine how much bandwidth to devote to each wavelength, and how to allocate bandwidth within each wavelength. These decisions determine the quality of Verizon's services and, ultimately, consumers' willingness to buy FiOS services.

Bundling distribution with applications and content also is proving central in the deployment of alternative broadband technologies. For example, all major cable operators now provide VoIP services over proprietary IP infrastructure, which has helped such operators recoup the large investment that was required to upgrade their networks.⁵⁵ A number of municipal WiFi networks being deployed – including by Google and EarthLink in San Francisco – will rely on vertically integrated content (such as advertiser-supported search) in order to make service more affordable.⁵⁶ In San Francisco, Google will be the exclusive provider of such content on the advertiser-supported services that it and EarthLink plan to offer.⁵⁷

B. Broadband Regulation Would Thwart Competition for Internet Content and Applications, Which Would Reduce Demand for Broadband Services and Threaten Broadband Investment

As noted above, in order for many broadband content and applications to be commercially viable, they require more than best-efforts guarantees, which is why many VoIP, online video, and online gaming providers already contract for prioritization services of some sort.⁵⁸ Differentiated offerings, such as the bandwidth prioritization services that some network operators propose to offer, would provide a competitive alternative to other technologies and

⁵⁵ See, e.g., T. McElgunn, *et al.*, Stratecast Partners, *The VoIP Playbook for Cable MSO Executives* at 6 (Jan. 2005) (“the cable MSOs are under enormous pressure from Wall Street to . . . begin generating significant returns on the \$80 billion in capital invested in upgrading their networks for two-way services. Recently, these cable MSOs have turned their attention to adding the critical ingredient in creating a bundle of services that will help drive new subscriptions, increase ARPU, and reduce churn: consumer voice, delivered through Voice over IP (VoIP) technology.”).

⁵⁶ See EarthLink Municipal Networks and Google, *San Francisco TechConnect Community Wireless Broadband Initiative* (Feb. 2006).

⁵⁷ See *id.* at 56 (Google's advertising platform will be used for Basic Access Service).

⁵⁸ See, e.g., C. Marsan, *When Speed Rules*, *Network World* at 1 (Dec. 19, 2005) (“the latest crop of online games . . . are pushing top-tier carriers to meet even higher requirements for bandwidth and speedy response times. . . . AT&T has set up a special network operations center in Bridgeton, Mo., to focus on meeting the performance and bandwidth needs of its online gaming customers. . . . AT&T provides managed Web hosting services to several online gaming companies, including Blizzard (maker of World of Warcraft), Turbine (maker of Asheron's Call) and Konami (maker of Yu-Gi-Oh).”).

suppliers that currently provide such benefits. By prohibiting or restricting such services, broadband regulation would have the effect of limiting or raising the costs of broadband services that depend on faster access to consumers. This would reduce end-user demand for such services, which in turn would reduce the demand for broadband itself.⁵⁹

Proponents of new broadband regulation argue that, if broadband providers are permitted to offer “fast lanes” or other prioritization services to unaffiliated entities despite the objections of some of those proponents, at a minimum they should be required to do so on a non-discriminatory basis. As one such advocate puts it, this approach would ensure that “Amazon doesn’t have to outbid Barnes & Noble for the right to work more properly on your computer.”⁶⁰ But this is not a legitimate basis for concern.

First, providing better quality to some does not necessarily entail inferior service for others; next-generation broadband networks will have enough capacity and functionality to provide superior services across the board.⁶¹ Next-generation broadband networks, like those Verizon is deploying, will offer much greater capacity than existing networks as well as many more ways to manage that bandwidth efficiently. Verizon’s FiOS network, for example, offers Internet access up to 30 Mbps (and will eventually offer up to 100 Mbps), which is between 10-30 times higher than Verizon’s fastest DSL offering (3 Mbps). As a technical matter, therefore, these networks will ensure that all consumers and content/application providers will be able to obtain superior access than they can obtain on existing networks. Network operators have strong incentives to make this happen – that is, to ensure that consumers and content providers can connect with each other at the speeds each side desires. This will make broadband connections themselves more valuable to consumers and content providers alike. In any event, each of the major broadband providers has indicated that it has no intention of blocking the ability of users to access the sites of their choice,⁶² and Verizon has formally committed, during the course of the

⁵⁹ See, e.g., T. Horan, *et al.*, CIBC World Markets, *Upgrading Sector to Overweight on Relative Earnings and Valuation* at 5 (May 31, 2006) (“Fundamentally, communications/cable services companies are seeing a strong pickup in demand from new IP services (voice, data, video). This has driven an increase in demand for broadband capabilities across the board (local, long-haul, data centers).”).

⁶⁰ MoveOn.org Civic Action, *Save the Internet*, http://www.civic.moveon.org/save_the_Internet/. See also *Lessig February 7, 2006 Testimony* at 2, n.2 (“By effectively auctioning off lanes of broadband service, this form of tiering will restrict the opportunity of many to compete in providing new Internet service.”).

⁶¹ Peha, *Benefits and Risks of Mandating Network Neutrality* at 8 (“Note that the incentive to discriminate with respect to QoS and price is based on the assumption that there are limited resources”); D. Wilkerson, *FCC Chairman: Too Soon for Net Neutrality Rules*, MarketWatch (June 5, 2006) (quoting FCC Chairman Kevin Martin: “[I]f you offer different tiers of speeds, a consumer chooses the lowest tier, and he wants to access content that would require higher speeds than he has purchased, he’s not being blocked from access. He just hasn’t purchased the speed that’s necessary.”).

⁶² See J. Barthold, *Verizon’s Captain Charts Slow, Steady Course*, Telecommunications Online (Feb. 9, 2006), http://www.telecommagazine.com/archives/article.asp?HH_ID=AR_1713 (Verizon CEO Ivan Seidenberg: “We don’t block anything; never have, never will. It’s not part of what we do.”); J. Duffy, *Carrier CEOs: We Won’t Block ‘Net*, Network World (Mar. 27, 2006) (“‘AT&T will not block access to the public Internet or degrade service [of content providers], period,’ said AT&T Chairman Ed Whitacre.”); *id.* (“Let me be clear,” [BellSouth CEO Duane Ackerman] said during another keynote, “managing our networks is not about controlling where people go on the Internet.”); *Notebaert: Qwest Won’t Block Content, But It Will Charge*, Xchange Magazine (Mar. 16, 2006), <http://www.xchangemag.com/tdhotnews/63h1614143172779.html> (Qwest CEO Richard Notebaert stated that Qwest “will not block anything on the Internet.”).

Verizon/MCI merger, to conduct business in a manner that comports with the FCC's policy statement on net neutrality until January 2008.⁶³

Second, forbidding Internet content and application providers from voluntarily paying for the development of differentiated services can only slow such improvements. A regulatory regime that requires non-discrimination in prioritization offerings would also eliminate the ability of network operators and Internet content and application providers freely to contract for such services. It would therefore remove the incentive and ability for certain content and application providers to seek out arrangements that would improve their services vis-à-vis their rivals, thereby limiting competition among providers who seek to differentiate their services through arrangements with network providers. By impeding competition in this way, broadband regulation would not only harm consumers directly, but also would reduce demand for Internet content and applications that rely on priority delivery services and, therefore, for the broadband infrastructure over which they are provided.

Internet content and application providers already compete in providing fast delivery of their services to consumers using a variety of different alternatives. Very large providers such as Google have built their own data centers and servers that connect directly to the largest Internet backbones, thereby ensuring rapid access to Google's search database.⁶⁴ Many other large Internet content and application providers buy similar capabilities from companies like Akamai, which have deployed Content Delivery Networks consisting of local caching servers that store content closer to the customer so it can be accessed more quickly.⁶⁵ But many other Internet content and application providers may not be able to afford these existing options, or may for other reasons prefer to obtain alternative services that network operators would offer. Furthermore, even competing Internet content and application providers will place different values on such services, and therefore have a different willingness to pay. Amazon may be willing to pay a higher price for faster delivery than Barnes & Noble because it believes its customers place a higher premium on such service. Restricting the ways in which Amazon and Barnes & Noble can bid against each other for communications services makes no more sense than restricting their ability to bid against each other for a prime location in a shopping mall.

C. Broadband Regulation Would Harm Competition for Large Enterprise Customers

As noted above, Verizon Business operates an extensive global IP network used to serve large enterprise customers in the U.S. and abroad. Having invested in that network, Verizon has every incentive to maximize traffic on that network, and no incentive to degrade or block it. To

⁶³ See *Verizon/MCI Order* ¶ 143; *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities*, Policy Statement, 20 FCC Rcd 14986 (2005).

⁶⁴ See S. Arnold, *The Google Legacy* at 57 n.6, 75 (Infonortics 2005) (estimating that Google operates 60 data centers); R.S. Peck, *et al.*, Bear Stearns, *The Google Ecosystem* at 28 (Jan. 4, 2006) ("*The Google Ecosystem*") (according to a conference call with Google's Bob Cringley on December 19, 2005, Google has 150,000-165,000 servers and 24 data centers); J. Markoff, *et al.*, *Hiding in Plain Sight, Google Seeks More Power*, N.Y. Times (June 14, 2006) (Google is developing a new data center in The Dalles, Or. that is as big as two football fields).

⁶⁵ See Akamai, *Technology Overview, EdgePlatform*, <http://www.akamai.com/en/html/technology/edgeplatform.html>; Akamai, *About Akamai, Our Customers*, <http://www.akamai.com/en/html/about/customers.html>.

compete effectively, however, Verizon Business must be able to provide large enterprise customers with the customized products and services that these customers demand. For example, Verizon Business's customers in the financial services, health care, or other industries may require connections that are fast, reliable, and secure, and may seek customized products or services that provide varying levels of bandwidth or traffic prioritization. Verizon Business currently enjoys a significant degree of flexibility to tailor service offerings to particular customer requirements, including requirements for broadband connectivity to small office/residential locations and home office environments to support telecommuting or distributed work arrangements (such as virtual call centers).

Broadband regulation could impede or even prevent Verizon from providing the specialized and customized services that large enterprise customers may demand. Such regulation could also interfere with Verizon Business's ability to insert intelligence into its network, which may be necessary to provide specialized features such as dedicated bandwidth and security protections. Finally, there is no need for the protections touted by proponents of broadband regulation, because enterprise customers – like consumers – would punish any network that blocks, degrades, or otherwise hinders access to their services. Efforts to regulate Verizon's utilization or management of its network, however, could discourage continued broadband investment and inhibit consumers from taking advantage of the online services that enterprise customers are deploying.

III. COMPETITIVE CONDITIONS IN THE BROADBAND MARKET MAKE BROADBAND REGULATION UNNECESSARY AND UNWISE

Economic regulation – and especially blanket prohibitions on certain business practices – is warranted only in clear cases of market failure, and, even then, only when the benefits of government intervention outweigh the costs.⁶⁶ In other circumstances, directing markets is a job best left to competitive forces, which consistently prove themselves better than regulators at

⁶⁶ See, e.g., Deborah P. Majoras, Chairman, FTC, *Opening Remarks on Broadband Connectivity Competition Policy* at 2-3 (February 13, 2007) (“[F]rom the market’s perspective, government-imposed restrictions on competition or barriers to entry may be more harmful than private exclusion”); Deborah P. Majoras, Chairman, FTC, *The Federal Trade Commission in the Online World: Promoting Competition and Protecting Consumers*, address before the Progress & Freedom Foundation’s Aspen Summit at 15 (Aug. 21, 2006) (“*August 21, 2006 Majoras Speech*”) (“[A]bsent clear evidence of market failure or consumer harm, policymakers should not enact blanket prohibitions of particular forms of business conduct or business models or place requirements on how business is conducted.”); Thomas O. Barnett, Assistant Attorney General, Antitrust Division, U.S. Dep’t of Justice, *Interoperability between Antitrust and Intellectual Property*, presentation to the George Mason University School of Law Symposium, Managing Antitrust Issues in a Global Marketplace at 16 Washington, DC (Sept. 13, 2006) (“We should avoid involving the government in the detailed re-engineering of products produced by private firms, under the guise of antitrust policy; we should question any claim that government regulators are more competent than private firms and consumers to choose the ‘best’ design for a product, particularly when the ‘best’ design must evolve rapidly to meet changing consumer demands.”); Deborah Lathen, Cable Services Bureau, *Broadband Today: A Staff Report to William E. Kennard, Chairman, Federal Communications Commission, on Industry Monitoring Sessions Convened by Cable Services Bureau* at 41 (Oct. 1999) (“The Commission’s public interest mandate requires it to forbear from regulation and allow market forces to flourish, but to intervene in the event of market failure.”); Jerry Hausman, *Internet-Related Services: The Results of Asymmetric Regulation*, in Robert Crandall & James Alleman, eds., *Broadband: Should We Regulate High-Speed Internet Access?* at 139 (Dec. 2002) (“Regulation should be used only in the situation of market failure”).

maximizing consumer welfare.⁶⁷ In nascent industries that are undergoing rapid technological change, it is particularly difficult for even the most capable regulator to keep up with the market's evolution.⁶⁸

Under these settled regulatory principles, there is no basis for broadband regulation. When the lobbyists of new regulation issue their call to “Save the Internet,” they beg the obvious question: “From what?” There is no history of problems that require regulatory intervention, much less a radical remedy like broadband regulation. And because competition in the provision of broadband access services is growing ever more intense, it is even less likely that prophylactic regulation – and not the workings of the free market – will be needed to protect consumers in the future.

A. The Absence of Past Problems in Lightly Regulated Broadband Markets Establishes That Regulation Is Not Needed

A decade ago, Congress charted a deregulatory course for broadband services. In the Telecommunications Act of 1996, Congress directed the FCC and state public utility commissions to “encourage the deployment . . . of advanced telecommunications capability to all Americans” by, among other things, “methods that remove barriers to infrastructure investment.”⁶⁹ Congress also declared that it is the policy of the United States “to preserve the vibrant and competitive free market that presently exists for the Internet and other interactive computer services, unfettered by Federal or State regulation.”⁷⁰

Carrying out Congress's mandate, the FCC encourages a “minimal regulatory environment” with respect to broadband Internet services, in order “to benefit American consumers and promote innovative and efficient communications.”⁷¹ Since 2002, the FCC – consistently upheld by the courts – has implemented its policy of minimum regulation through a series of decisions that first protected cable modem providers against new regulatory burdens, and then freed telephone companies from legacy requirements that were drafted with embedded,

⁶⁷ See, e.g., *August 21, 2006 Majoras Speech* at 17 (“[C]ompetition generally produces the best results for consumers over time. Our free market breeds innovation, creativity, and entrepreneurship at rates unmatched around the world.”); Timothy J. Muris, Chairman, FTC, *Creating a Culture of Competition: The Essential Role of Competition Advocacy*, address before the International Competition Network (Sept. 28, 2002) (“Economists and legal scholars around the globe now recognize the benefits of competition to consumers and to the economy as a whole.”).

⁶⁸ See Yoo, *Beyond Network Neutrality* at 67 (“[S]cholars from across the political spectrum have warned of the dangers of regulatory lag in industries that are technologically dynamic”) (citing Stephen Breyer, *Regulation and Its Reform* 286-287 (1982)); Alfred E. Kahn, *The Economics of Regulation* 127 (1971); John C. Panzar & Robert D. Willig, *Free Entry and the Sustainability of Natural Monopoly*, 8 *Bell J. Econ.* 1, 21 (1977); Richard A. Posner, *Natural Monopoly and Its Regulation*, 21 *Stan. L. Rev.* 548, 636 (1969)).

⁶⁹ Telecommunications Act of 1996 § 706(a), 110 Stat. 153, reprinted at 47 U.S.C. § 157 note.

⁷⁰ 47 U.S.C. § 230(b)(2).

⁷¹ *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities*, Report and Order and Notice of Proposed Rulemaking, 20 FCC Rcd 14853, ¶ 1 (2005) (“*Wireline Broadband Order*”), petition for review pending, *Time Warner Telecom Inc. v. FCC*, No. 05-4769 (D.C. Cir.).

narrowband networks in mind.⁷² The FCC also refrained from taking steps that would subject any emerging broadband technologies – such as satellite, wireless, or BPL – to regulation.

For several years, therefore, cable operators, telephone companies, and other broadband providers have been providing their broadband services under FCC decisions that increasingly rely on competition, rather than regulatory non-discrimination and network-access mandates, to protect consumers. Thus, broadband providers – and cable modem and DSL providers in particular – have been free of laws imposing the requirements that proponents of broadband regulation say should be adopted.⁷³ If there were a genuine need for such regulation, actual events in the lightly regulated markets should provide evidence of that need. There is no such evidence.

Blocking. When given an opportunity to present their strongest case to the U.S. Senate, two of the most prominent advocates of broadband regulation could only express “concerns” about a “risk” that network operators might block or “tax” other providers’ online content and applications.⁷⁴ Together, they were able to muster just one concrete example of a network operator that supposedly did what the proponents of broadband regulation fear – a small local telephone company called Madison River Communications, nearly two years ago.⁷⁵

The inability to field a better poster child is telling. Madison River is a rural telephone company that serves approximately 190,000 lines in Illinois, North Carolina, Georgia, and Alabama.⁷⁶ In early 2005, the company blocked calls originating with Vonage, a VoIP provider, because Vonage refused to pay Madison River’s high charges for completing calls placed by Vonage customers.⁷⁷ Vonage complained to the FCC.⁷⁸ The FCC staff quickly reached an agreement with Madison River under which Madison River agreed to cease blocking and to pay

⁷² See *National Cable & Telecommunications Ass’n v. Brand X Internet Servs.*, 125 S. Ct. 2688 (2005) (upholding FCC’s classification, in 2002, of cable modem service as an information service under the Communications Act, rather than a telecommunications service subject to common-carriage requirements); *United States Telecom Ass’n v. FCC*, 359 F.3d 554, 578-85 (D.C. Cir.) (upholding FCC’s decision, in 2003, not to require incumbent telephone companies to provide competitors “unbundled access” to broadband facilities under 47 U.S.C. § 251), *cert. denied sub nom. National Ass’n of Regulatory Util. Comm’rs v. United States Telecom Ass’n*, 543 U.S. 925 (2004); *EarthLink, Inc. v. FCC*, 462 F.3d 1 (D.C. Cir. 2006) (upholding FCC’s decision, in 2005, to forbear from requiring the Bell companies to provide unbundled access to broadband facilities under 47 U.S.C. § 271); *Wireline Broadband Order*, 20 FCC Rcd 14853 (2005) (freeing providers of wireline broadband Internet access services from common-carrier and *Computer Inquiry* non-discrimination requirements).

⁷³ Cf. *supra* nn.62-63 and accompanying text (discussing voluntary commitments regarding blocking).

⁷⁴ Vinton G. Cerf, Vice President and Chief Internet Evangelist, Google Inc., prepared statement before the U.S. Senate Committee on Commerce, Science, and Transportation, Hearing on “Network Neutrality” (Feb. 7, 2006) (“*Cerf February 7, 2006 Testimony*”); *Lessig February 7, 2006 Testimony* at 6.

⁷⁵ *Cerf February 7, 2006 Testimony* at 5; *Lessig February 7, 2006 Testimony* at 7.

⁷⁶ See *Madison River Communications Corp.*, Form S-1 at 1 (SEC filed Oct. 17, 2006).

⁷⁷ See Sidak, *A Consumer-Welfare Approach to Network Neutrality Regulation* at 65.

⁷⁸ See B. Charny, *Vonage Says Broadband Provider Blocks Its Calls*, CNET News.com (Feb. 14, 2005), http://news.com.com/Vonage+says+broadband+provider+blocks+its+calls/2100-7352_3-5576234.html?tag=nl; D. McCullagh, *Telco Agrees To Stop Blocking VoIP Calls*, CNET News.com (Mar. 3, 2005), http://news.com.com/Telco+agrees+to+stop+blocking+VoIP+calls/2100-7352_3-5598633.html.

\$15,000 as part of a consent decree.⁷⁹ Emboldened by the Madison River episode, many VoIP providers have refused to pay telephone companies' charges for call completion, but telephone companies have nonetheless continued to complete the VoIP providers' calls.

The other examples of supposed blocking that proponents of broadband regulation sometimes invoke took place outside the U.S., where the relevant markets and market participants are different, and where broadband regulation would have no effect.⁸⁰

Restrictions on Use of Broadband Services. Some proponents of broadband regulation have emphasized that, years ago, some cable operators did not allow use of their cable modem services to support home networking or certain private network communications.⁸¹ Those examples actually prove that legislative intervention is *not* needed. In those instances, the cable operators eliminated their restrictions after consumers complained.⁸² Market forces protected consumers, and no regulatory intervention was necessary.

Proponents of broadband regulation have also invoked various rules that network operators establish to ensure that consumers, who receive service on different terms and conditions than businesses, do not use their consumer-rated services as business connections. Qwest, for instance, prohibits the use of its consumer DSL lines to provide a wireless hotspot or send spam.⁸³ Such restrictions help to ensure that services are correctly billed, and to avoid the network congestion that can result from passing commercial volumes of traffic through residential connections. Analogous restrictions are commonplace, and include agreements that prevent consumers from using their rental cars for commercial purposes, residential real estate leases that forbid commercial activities on-site or that limit the number of people living in the home, and consumer software licenses that prohibit commercial use.

B. Increasing Intermodal Competition Protects Consumers and Makes Regulation Unnecessary

Although the absence of *past* problems is alone sufficient grounds to reject broadband regulation, it is only half of the story. In order to justify regulatory rules that override market forces, the proponents of broadband regulation would have to show that competition will be

⁷⁹ *Madison River Communications, LLC and Affiliated Companies*, Consent Decree, 20 FCC Rcd 4295, ¶¶ 4, 19 (E.B. 2005).

⁸⁰ In any event, it is not clear that in every instance, the foreign network operator acted unreasonably. For instance, advocates of broadband regulation sometimes claim that a Canadian ISP, TELUS, blocked access to a website that TELUS believed contained illegal material that threatened or intimidated workers who broke a strike against TELUS. A Canadian court ultimately agreed with TELUS and enjoined the website from posting the content; the website ultimately removed the content in question. See TELUS News Release, *Alberta Court Grants Interim Injunction Against Posting TELUS Employee Photos* (July 28, 2005); Sidak, *A Consumer-Welfare Approach to Network Neutrality Regulation* at 81-82.

⁸¹ See Tim Wu, *Network Neutrality, Broadband Discrimination*, 2 J. on Telecomm. & High Tech. L. 162-163 (2003).

⁸² See, e.g., Comcast, *Help: FAQs: Connection: Troubleshooting*, <http://www.comcast.net/help/faq/index.jsp?faq=ConnectionTroubleshooting17796> (indicating that Comcast permits the use of VPN connections).

⁸³ Qwest, *Qwest High-Speed Internet Subscriber Agreement*, http://www.qwest.com/legal/highspeedinternetsubscriberagreement/files/HSI_Subscriber_Agreement_ENG_v6_091506.pdf.

inadequate to prevent problems in the *future*. Yet such proponents have not demonstrated, and could not demonstrate, that competitive forces are insufficient to protect broadband consumers. In fact, the FCC has repeatedly concluded that competition is robust, it has been twice upheld on this point by the U.S. Court of Appeals for the District of Columbia Circuit, and has been echoed by state regulators.⁸⁴

Advocates of broadband regulation argue, as they must, that “an effective duopoly” of cable modem and DSL providers currently “controls access to high speed Internet,” and there is no “near-term prospect for meaningful competition from alternative platforms.”⁸⁵ In the absence of competitive constraints, the theory goes, the major cable and telephone companies could “leverage[] [their] market power in broadband access to the content or applications markets.”⁸⁶

The advocates for broadband regulation err, first of all, in focusing on the wrong product and geographic market. The relevant market is not local broadband access; it is the global market for content and applications.⁸⁷ The theory of harm that broadband regulation advocates posit is that network providers will bar content and applications providers from reaching end

⁸⁴ See *EarthLink*, 462 F.3d at 11 (upholding as “reasonable” the FCC’s determination that “[t]he broadband market is still an emerging and changing market, where, as the [FCC] previously has concluded, the preconditions for monopoly are not present. In particular, actual and potential intermodal competition informs rational competitors’ decisions concerning next-generation broadband technologies.”); *U.S. Telecom Ass’n v. FCC*, 359 F.3d 580, 582 (D.C. Cir. 2004) (“agree[ing]” with FCC’s determination that “intermodal competition in broadband, particularly from cable companies,” ensures “vigorous competition” in the broadband market). See also California Public Utilities Commission, *Broadband Deployment in California*, Chapter 2 at 6 (May 5, 2005), http://www.cpuc.ca.gov/word_pdf/final_decision/46428_d0505013_bbreport_2of9.pdf (“All four broadband technologies surveyed . . . (Wireless, DSL, Cable and Satellite) are available in 26% of California zip codes, and 39% of California zip codes have DSL, Cable and Satellite broadband technologies available.”); New York Dep’t of Public Service Staff, *Telecommunications in New York: Competition and Consumer Protection*, Case 05-C-0616, App. E (Sept. 21, 2005), [http://www3.dps.state.ny.us/pscweb/WebFileRoom.nsf/Web/C76443168615205885257083006ADF64/\\$File/05c0616.coverltr.09.21.05.pdf?OpenElement](http://www3.dps.state.ny.us/pscweb/WebFileRoom.nsf/Web/C76443168615205885257083006ADF64/$File/05c0616.coverltr.09.21.05.pdf?OpenElement) (“[I]t is critical to point out that the ILECs will be constrained from raising the prices of discretionary packages given the percentage of customers having reasonable intermodal options. As noted above, 93% of Verizon NY’s customers have two alternative platforms available to them.”).

⁸⁵ *Lessig February 7, 2006 Testimony* at 5; *Cerf February 7, 2006 Testimony* at 2; see also Tim Wu, Professor, Columbia Law School, testimony before the House Committee on the Judiciary, Telecom & Antitrust Task Force, Hearing on “Network Neutrality: Competition, Innovation, and Nondiscriminatory Access,” at 1 (Apr. 24, 2006) (“Ninety-four percent of Americans have either zero, one, or two choices for broadband access.”); SavetheInternet.com, *F.A.Q.*, <http://www.savetheinternet.com/=faq> (“The cable and telephone companies already dominate 98 percent of the broadband access market. And when the network owners start abusing their control of the pipes, there will be nowhere else for consumers to turn.”).

⁸⁶ Nicholas Economides, *Net Neutrality*, presentation at ABA Brownbag on Antitrust at 8 (Sept. 15, 2006).

⁸⁷ The FCC has reached this conclusion with the roughly analogous market for video programming content. See *Implementation of Section 11 of the Cable Television Consumer Protection and Competition Act of 1992*, Further Notice of Proposed Rulemaking, 16 FCC Rcd 17312, ¶ 9 (2001) (“The relevant geographic market for general entertainment programming is at least national, and, to some extent, international. The geographic market for certain types of niche programming may also be national or international. An example would be programming that appeals to a narrowly defined interest group across a broad geographic area such as golf fans (e.g., the Golf Channel).”); see also Hal Singer, *Net Neutrality: A Radical Form of Non-Discrimination*, Speech Delivered at the William Pitt Debating Union, Univ. of Pittsburgh at 4-6 (Feb. 23, 2007).

users, injuring competition in the content-and-applications market.⁸⁸ Many content and applications providers have global audiences. Search engines, for example, aim to reach users around the world. Indeed, Google, MSN and Yahoo! only get about a fourth or a fifth of their traffic from users in the United States; the rest of their traffic comes from overseas.⁸⁹ This is true not only for search engines with universal appeal, but also for online buyers and sellers with geographically dispersed niche audiences that the Internet has aggregated in a new virtual marketplace.⁹⁰ If the concern is that content and applications providers will lose access to their audiences around the world (and hence lose the incentive to develop innovative content or services), then only a network provider with market power over that global market could (as broadband regulation advocates fear) deprive content and applications providers of access to their global audiences.

Yet no U.S. network provider serves more than a small fraction of users in the content and applications providers' global markets. No single broadband provider in the U.S. serves more than 22 percent of U.S. broadband subscribers or more than 3 percent of global subscribers.⁹¹ Verizon serves approximately 12 percent and 2 percent, respectively, of the national and global online markets.⁹² Thus, no single broadband provider has the ability to displace online content that consumers want. *See* Figure 4.

⁸⁸ *See, e.g., Lessig February 7, 2006 Testimony* at 4-6 (arguing that concentration in broadband access market threatens competition and innovation in the content-and-applications market).

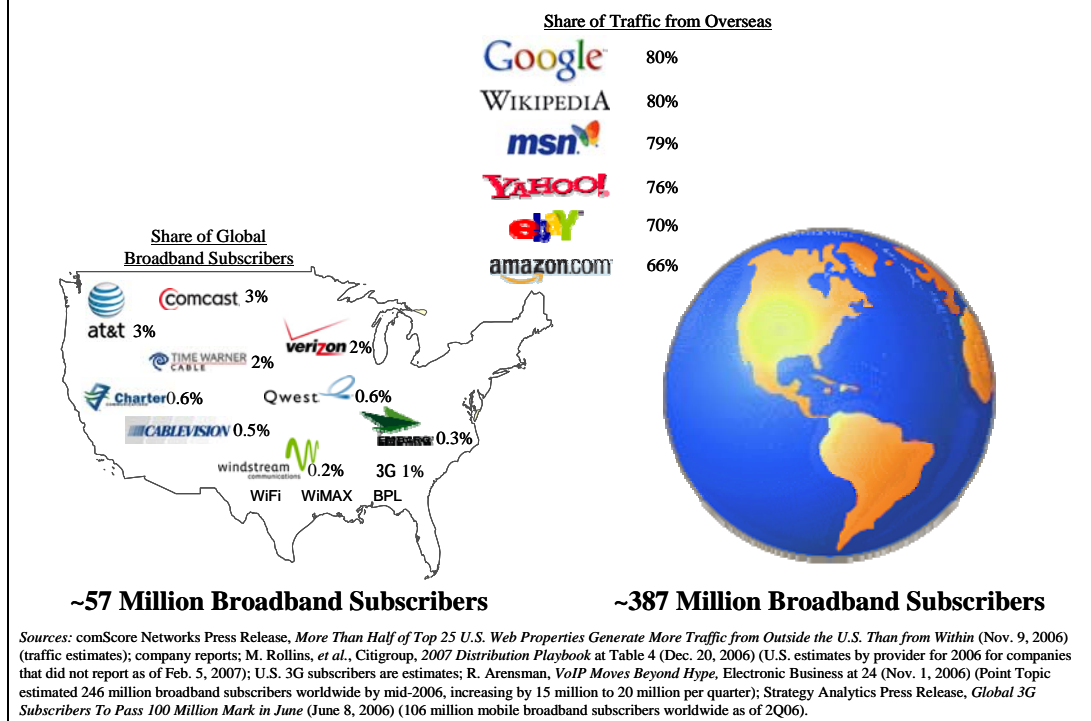
⁸⁹ *See* Figure 4. Google derives more than 40 percent of its revenues from outside the United States, where its share in the search engine market is even larger than it is in the U.S. *See* Google Press Center, *Google Announces Third Quarter 2006 Results* (Oct. 19, 2006) (44 percent of total 3Q06 revenues from outside the U.S.); T. Crampton, *European Search Engines Take on Google*, *International Herald Tribune* (Dec. 17, 2006), <http://www.iht.com/articles/2006/12/17/business/search.php?page=1> ("For Europe as a whole, as in much of the world, Google leads in Internet search. Of all those who visited search and navigation sites in Europe [in October 2006], 86 percent went to Google at least once, compared with 30 percent for Microsoft's search sites and 21 percent for Yahoo, according to comScore, an online market research firm."). *See also* comScore Networks Press Release, *More Than Half of Top 25 U.S. Web Properties Generate More Traffic from Outside the U.S. Than from Within* (Nov. 9, 2006) ("14 of the top 25 U.S. web properties attract more traffic from people outside the U.S. than from within. Among them are the Top 5 Web properties in the U.S. – Yahoo! Sites, Time Warner Network, Microsoft Sites, Google Sites and eBay.").

⁹⁰ B. Levin, *et al.*, Stifel Nicolas, *Quadruple Play from the Edge: The Long Tail of Voice and Video* at 5 (Oct. 6, 2006) ("In the recent business best-seller *The Long Tail*, author Chris Anderson makes the case that the big economic impact of the Internet is that it enables a 'long tail' of markets: the aggregation of many niche, geographically dispersed, small markets.").

⁹¹ *See* sources cited in Figure 4. AT&T is estimated to be the largest broadband provider following its acquisition of BellSouth, with approximately 12 million broadband subscribers at the end of 2006. *Id.*

⁹² *See* sources cited in Figure 4; R. Arensman, *VoIP Moves Beyond Hype*, *Electronic Business* at 24 (Nov. 1, 2006) ("Point Topic estimates there were 246 million broadband subscribers worldwide by mid-2006, a total that's increasing by 15 million to 20 million per quarter.").

Figure 4. Distribution of Internet Content and Applications Is a Global Market



By the same token, even if a broadband provider were to promote its own Internet content or applications at the expense of others', it could favor that content for only a small minority of the nation's subscribers – and other broadband providers in the same local market invariably would feature any desirable content disfavored by their rival. Thus, no broadband provider (regardless of its share of any regional or local market) is in a position meaningfully to influence the global or nationwide market for content or applications.

Second, even focusing incorrectly on the provision of broadband services in local geographic markets, the claim that broadband is a duopoly fails to consider the nascent characteristics of the broadband market in which providers are still competing for potential customers who do not yet use broadband.⁹³ The availability and use of broadband networks are still in their infancy, with companies racing to grow and develop the market by attracting new subscribers. Even with broadband providers' great success over the past few years, only about 40 percent of homes have a broadband connection. According to customer surveys, however, the majority of customers who do not have broadband are interested in subscribing.⁹⁴

⁹³ As the FCC has explained, "an emerging market, like the one for broadband Internet access, is more appropriately analyzed in view of larger trends in the marketplace, rather than exclusively through the snapshot data that may quickly and predictably be rendered obsolete as this market continues to evolve." *Wireline Broadband Order* ¶ 50. See also *supra* at 1 & n.2; 4 & Figure 3 (describing current competition between broadband providers).

⁹⁴ See, e.g., N. Klein, Yankee Group, *As Broadband Moves into the Mass Market BSPs Will Be Challenged by Late Adopters* at 3 (Jan. 2007) (According to a Yankee Group customer survey, "nearly 60% of those who do not have broadband are interested in subscribing to broadband.").

Thus, no provider or group of providers has a dominant share of the total market in any economically meaningful sense.⁹⁵ Most of the market has yet to be captured by *any* provider or technology.⁹⁶ Furthermore, as bandwidth-intensive applications – such as online video, multiplayer gaming, and media-rich websites – proliferate and attract new users to broadband, competitors will vie to provide greater bandwidth through continued investment and technological innovations. It is far too early to predict winners and losers in the upcoming races to provide faster speeds and new services.⁹⁷

Experience in the semiconductor industry, where there has long been only two significant suppliers, provides a case in point. First, Intel's monopoly was shattered by AMD.⁹⁸ AMD started by marketing low-cost alternatives to Intel's high-end chips.⁹⁹ Then, AMD later introduced chips (Athlon) that surpassed Intel in performance.¹⁰⁰ The market never settled into a cozy duopoly – rather, Intel started a price war, which continues to this day.¹⁰¹ Both companies continue to innovate vigorously by developing new chips with higher processing power.¹⁰²

⁹⁵ See *Wireline Broadband Order* ¶ 55 (“[W]hile cable modem and DSL clearly have exhibited significant growth over the last few years, market penetration for these two technologies is still far below the size of the potential market. . . . [B]roadband services stand[] in marked contrast to other, more mature markets the Commission has examined and regulated to varying degrees.”).

⁹⁶ See Christopher Yoo, *Vertical Integration and Media Regulation in the New Economy*, 19 *Yale J. on Reg.* 171, 280 (Winter 2002) (“As Stan Liebowitz and Stephen Margolis have observed, ‘If a market is growing rapidly, the number of users who have made commitments to any standard is small relative to the number of future users.’ In such cases, the fact that a particular firm may currently dominate a market is of little consequence. People concerned about lock-in will focus on the size of the network that will exist in the future, not the size of the one that exists today.”) (quoting S.J. Liebowitz & S. Margolis, *Should Technology Choice Be a Concern of Antitrust Policy*, 9 *Harv. J.L. & Tech.* 283, 310, 312 (1996)) (footnotes omitted); see also *id.* (“[E]xplosive growth of the kind that the broadband transport industry is currently undergoing can render the network externalities largely irrelevant,” and enable new entrants to make rapid gains in the market); Michael Katz & Carl Shapiro, *Product Introduction with Network Externalities*, 40 *J. Indus. Econ.* 55, 73 (Mar. 1992) (concluding that exponential market growth effectively prevents excess inertia).

⁹⁷ See *Wireline Broadband Order* ¶ 61 (“As the Internet and related applications mature and continue to evolve, the demand for broadband Internet access services will likely grow. The presence of more content available through the Internet and the enhanced means of presenting the content, together with growth in broadband-related applications, such as streaming video, will lead more subscribers to seek broadband Internet access service. As the number of subscribers grows, so does the opportunity for alternative technologies and their respective providers. As any provider increases its market share or upgrades its broadband Internet access service, other providers are likely to mount competitive challenges, which likely will lead to wider deployment of broadband Internet access service, more choices, and better terms.”).

⁹⁸ See *Intel: The Coming Clash of Logic*, *Economist* at 21 (July 3, 1993).

⁹⁹ See *Intel Inside; Antitrust*, *Economist* (Apr. 15, 2006).

¹⁰⁰ See L. Fisher, *Advanced Micro Introduces a Faster Chip*, *N.Y. Times* at C3 (Aug. 10, 1999) (“In a make-or-break move, Advanced Micro Devices Inc. introduced a microprocessor today with higher performance than the fastest chips made by the Intel Corporation.”).

¹⁰¹ See A. Hesseldahl, *et al.*, *Intel Starts To Push Back*, *BusinessWeek* (June 27, 2006), http://www.businessweek.com/technology/content/jun2006/tc20060627_227189.htm; C. Edwards, *Don't Count Intel Out*, *BusinessWeek* (July 20, 2006), http://www.businessweek.com/technology/content/jul2006/tc20060720_994270.htm.

¹⁰² See C. Edwards, *Don't Count Intel Out*, *BusinessWeek* (July 20, 2006), http://www.businessweek.com/technology/content/jul2006/tc20060720_994270.htm (“The world's two largest chipmakers are racing to outdo each other with powerful chips that can perform several processor-intensive tasks at the same time.”).

Given ever-increasing demand for processing power, either company stands to lose significant market share if it rests on its laurels for too long.

Moreover, even assuming *arguendo* that local broadband markets were meaningfully concentrated today, there is good reason to suspect that disruptive new technologies will shatter any such concentration soon. New technologies have repeatedly upset concentrated markets in the past. For example, the early wireless providers could not sustain a duopoly once new providers were allowed into the market in large part because these new providers were able to use new digital technology that offered significant benefits over the analog-based incumbents. This forced the incumbents to innovate as well.¹⁰³ As described above, the wireless market is transforming again with the race to deploy 3G broadband capabilities. Similarly, AT&T lost its monopoly in long distance when the advent of microwave, and then fiber, enabled competitors to overcome AT&T's scale advantages.¹⁰⁴ The AT&T/MCI/Sprint oligopoly was later broken by the emergence of IP technology that dramatically lowered costs even further.¹⁰⁵

As described in more detail below, alternative platforms are emerging on a timetable that makes them relevant suppliers under standard antitrust analysis.¹⁰⁶ Because many of these alternatives are less expensive to deploy than traditional alternatives, they are being deployed in rural and other high-cost areas.¹⁰⁷ Any informed consideration of broadband must take account of these developments. Moreover, although not all broadband services may be directly substitutable for all purposes, they collectively ensure that Internet content and application providers will have numerous alternative means of distributing their products and services to consumers.¹⁰⁸ If any broadband provider tried to block access to certain content, other providers

¹⁰³ See *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993*, Second Report, 12 FCC Rcd 11266, 11269-70 (1997) (“[T]he imminent availability of [digital] PCS in many markets appears to be accelerating the conversion of cellular systems from analog to digital technology, a change that will facilitate the offering of a broader array of wireless services by cellular licensees and that will help ensure the privacy of cellular calls.”).

¹⁰⁴ See H. Nelson, *The Telecommunications Act of 1996: How It Failed, and How It Succeeded (But Not As Expected)*, 31 S. Ill. U. L. J. 1, 6-7, 15 (Fall 2006); B. Stuck, *et al.*, *AT&T: The Path Not Taken*, Business Communications Review (Mar. 17, 2005).

¹⁰⁵ See, e.g., D. Rohde, *Carriers Raise a Challenge*, Network World (Jan. 4, 1999).

¹⁰⁶ See U.S. Dep't of Justice and FTC, *Horizontal Merger Guidelines* § 3.2 (rev. Apr. 8, 1997) (“The Agency generally will consider timely only those committed entry alternatives that can be achieved within two years from initial planning to significant market impact.”).

¹⁰⁷ See FTC Staff Report, *Municipal Provision of Wireless Internet* at 41 (Sept. 2006) (“Rural communities appear to be at a significant advantage to urban communities concerning available and affordable broadband access.”).

¹⁰⁸ See *Wireline Broadband Order* ¶ 60 (“We recognize that the attributes of the available broadband platforms vary, particularly as to price, speed, and ubiquity. We expect that customers will weigh these attributes for each platform and make service-related decisions based on their specific needs. For example, a customer may select a broadband Internet access service with a somewhat slower speed than that associated with other service platforms in return for the lower price of the selected service.”).

could step in and make such content available.¹⁰⁹ And the mere threat of this occurring would deter the provider from taking the step of denying access in the first place.¹¹⁰

Fixed Wireless/WiMAX. Fixed wireless service is a broadband alternative for many customers today, which is likely to reach many more customers over the next two years. Currently, there are thousands of wireless Internet service providers (“WISPs”) that use fixed wireless technology, often to serve rural areas that cable and DSL do not reach.¹¹¹ WISP services also are being deployed in major metropolitan areas. TowerStream, for example, offers high-speed Internet access in Boston, New York City, San Francisco, Los Angeles, Chicago, and Providence/Newport/Westerly, Rhode Island.¹¹² Clearwire’s service is available in Alaska, California, Florida, Hawaii, Idaho, Minnesota, Nevada, North Carolina, Oregon, Texas, Washington State, and Wisconsin.¹¹³ Virginia Broadband provides services in three rural service territories and is expanding its service territory to 16 counties through a partnership with the Rappahannock Electric Cooperative.¹¹⁴

A recently adopted industry standard for fixed wireless, known as WiMAX, will allow broadband Internet access at speeds up to 155 Mbps and a range of up to 30 miles. For non-line-of-sight service, speeds up to 75 Mbps are can be achieved within a radius of three miles or more.¹¹⁵ Early WiMAX deployments achieved speeds of approximately 1.5 Mbps.¹¹⁶

¹⁰⁹ See Phillip E. Areeda, *et al.*, *Antitrust Law* ¶ 535c at 221 (2002) (A provider cannot “reduce[] output when its rivals have a large volume of efficient excess capacity that can quickly generate additional and readily saleable output.”).

¹¹⁰ Some have questioned whether broadband providers are sufficiently savvy or prescient to spot the new content or applications that their users will like. They have suggested curing that failure with broadband regulation, compelling providers to carry all online content and applications. But as noted above, such regulation is not likely to gain consumers much. Broadband providers already have market incentives to identify new popular content and applications and – if necessary – to develop new expertise at doing so. Against such slim benefits must be weighed the significant costs of such broadband regulation, including the erosion of the competitiveness of the content-and-applications market that the regulation aims to save. See § II.B.

¹¹¹ See Wireless Broadband Access Task Force, FCC, *Connected & On the Go: Broadband Goes Wireless*, GN Docket No. 04-163 at 32 (Feb. 2005) (reporting estimates that there are between 4,000 and 8,000 WISPs). There is at least one fixed wireless broadband provider in all but three states (Connecticut, Delaware, and Rhode Island) and an average of more than 13 providers in the remaining 38 states for which data are available. Ind. Anal. & Tech. Div., Wireline Competition Bureau, FCC, *High-Speed Services for Internet Access: Status as of June 30, 2006* at Table 8 (Jan. 2007) (“*FCC June 2006 High-Speed Internet Access Report*”). WiMAX is being rapidly deployed, and more than 150 deployments were in use as of May 2006. See U.S. Gov’t Accountability Office, *Broadband Deployment Is Extensive Throughout the United States, But It Is Difficult To Assess the Extent of Deployment Gaps in Rural Areas*, GAO-06-426 at 60 (May 2006) (“*May 2006 GAO Report*”).

¹¹² TowerStream, *Service Areas*, <http://www.towerstream.com/content.asp?serviceareas>.

¹¹³ See Clearwire, *Interactive Coverage Map*, http://www.clearwire.com/store/service_areas.php. As of September 2006, Clearwire served 162,000 subscribers in 31 U.S. markets. Those markets included more than 250 municipalities. Clearwire, *Clearwire Facts*, <http://www.clearwire.com/company/facts.php>.

¹¹⁴ See Virginia Broadband, LLC, *What Is Our Coverage Area*, <http://www.vabb.com/coverage.htm> (as of 2005); M. Cotter, *REC Plans To Roll Out Broadband Service*, http://fredericksburg.com/News/FLS/2006/052006/05202006/192464/printer_friendly.

¹¹⁵ *May 2006 GAO Report* at 60.

¹¹⁶ See, e.g., Clearwire, *Which Plan Is Right for Me?*, <http://www.clearwire.com/wireless-broadband/getstarted.php>.

According to WiMAX providers, the technology is relatively quick and inexpensive to deploy. In August 2006, for instance, Sprint announced that by 2008 it will have constructed a nationwide WiMAX network to provide 2-4 Mbps service to an estimated 100 million customers, with an investment of \$3 billion.¹¹⁷ As the *Wall Street Journal* editorialized at the time, “[t]hose who want to regulate broadband providers are saying that the phone and cable networks are too valuable and too hard to replicate for anyone to break up the duopoly. We guess Sprint did not get the memo.”¹¹⁸

WiFi. Initial deployment of commercial WiFi service in the U.S. involved the placement of tens of thousands of hot spots in public gathering points such as airports, coffee shops, and parks.¹¹⁹ T-Mobile, for example, offers more than 8,000 WiFi hotspots spanning all 50 states.¹²⁰ Recently, cities throughout the country have begun deploying WiFi networks to provide high-speed Internet access (typically up to 1 Mbps) and other services to businesses and residents.¹²¹ WiFi has a significant cost advantage over those wireless services that require large payments for spectrum rights, because it uses unlicensed radio spectrum.¹²² Also, as Google’s WiFi Product Manager has explained, “[i]nstead of trenching fiber, wireless broadband requires a bucket truck, a lamppost, and 5 minutes of installation.”¹²³ For these reasons, as with WiMAX, the cost of deploying WiFi networks is relatively low. EarthLink, for example, expects to wire all of Philadelphia and San Francisco for about \$15 million per city.¹²⁴

3G Mobile Wireless. Current 3G wireless networks are capable of providing speeds for Internet access at average speeds of 400-700 kbps, and top speeds up to 2 Mbps, which is

¹¹⁷ A. Sharma, *et al.*, *Sprint To Spend Up to \$3 Billion To Build Network Using Wimax – New Wireless-System Plan Shows Belief in Demand for Mobile Internet Services*, Wall St. J. at B2 (Aug. 9, 2006); A. Mohammed, *Sprint Nextel To Build \$2.5 Billion Wireless Network*, Wash. Post at D04 (Aug. 9, 2006); J. Markoff, *et al.*, *Sprint Will Build an Intel Backed Network*, N.Y. Times at 7 (Aug. 8, 2006). Sprint has chosen Chicago and Washington, D.C. as initial WiMAX service areas; the company plans to launch service in initial markets by the end of 2007. Sprint News Release, *Sprint Nextel Cites WiMAX Network Progress for 2007* (Jan. 8, 2007).

¹¹⁸ *Wi-Fi to the Max*, Wall St. J. at A10 (Aug. 9, 2006).

¹¹⁹ See JiWire, *Wi-Fi Hotspot Directory*, <http://www.jiwire.com/search-hotspot-locations.htm> (50,340 hotspots in the U.S. as of March 5, 2007).

¹²⁰ T-Mobile, *T-Mobile HotSpot: US Locations*, <https://selfcare.hotspot.t-mobile.com/locations/viewLocationMap.do>.

¹²¹ According to one industry source, as of the end of 2006 there were approximately 79 municipal WiFi networks in the U.S. that were providing public access, plus 36 additional networks that were being used solely for municipal purposes such as public safety. See MuniWireless.com, *List of US Cities and Regions* at 1, 3 (Dec. 29, 2006), <http://munewireless.com/reports/docs/Dec-29-2006summary.pdf>.

¹²² WiFi systems typically use unlicensed spectrum in the 2.4 and 5 GHz bands. See 47 C.F.R. § 15.1(a); K. Werbach, New America Foundation & Public Knowledge, *Radio Revolution: The Coming Age of Unlicensed Wireless* at Table 1 (Dec. 15, 2003).

¹²³ See Minnie Ingersoll, Google WiFi Product Manager, *Wi-Fi in Mountain View*, Google Blog (Nov. 17, 2005), <http://googleblog.blogspot.com/2005/11/wi-fi-in-mountain-view.html>.

¹²⁴ See R. Kim, *Philadelphia Selects EarthLink for Its Wi-Fi*, S.F. Chron. (Oct. 5, 2005), <http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2005/10/05/BUG3AF2GJ41.DTL> (estimating \$10-\$15 million for Philadelphia); V. Kopytoff, *S.F. Picks Google Wi-Fi Team High-Tech Giant To Pair with Earthlink To Establish Free Wireless Internet Network for Everyone in the City, Maybe by Year’s End*, S.F. Chron. (Apr. 6, 2006), <http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2006/04/06/MNGCGI4CA71.DTL> (estimating \$12 million for San Francisco).

generally sufficient to support common Internet applications such as web surfing.¹²⁵ Verizon Wireless and Sprint have each deployed their 3G networks (using EV-DO technology) in over 242 major U.S. cities that cover more than 200 million people, while Cingular has deployed 3G networks in areas with 180 million potential customers.¹²⁶ T-Mobile recently spent \$4.2 billion in the FCC's Advanced Wireless Services ("AWS") auction to acquire licensed spectrum covering 100 percent of the U.S. population and will begin its 3G deployment in 2007.¹²⁷ Cable companies, which were also major license winners in the recent auction, plan to deploy next-generation wireless services to complement their current broadband offerings.¹²⁸

Prices for 3G services have dropped significantly in the past year, while subscribership has increased steadily.¹²⁹ Analysts expect that nearly a fifth of U.S. wireless subscribers will

¹²⁵ See, e.g., Telstra Media Release, *Telstra's Turbo-Charged, Nationwide Mobile Broadband Network Goes Live* (Oct. 6, 2006), http://www.telstra.com.au/abouttelstra/media/mediareleases_article.cfm?ObjectID=38377 (announcing that Telstra's network in Australia provides peak network speeds of up to 3.6 Mbps, increasing up to 14.4 Mbps early next year).

¹²⁶ Verizon Wireless News Release, *Verizon Wireless Launches Faster New Wireless Broadband Network* (Feb. 1, 2007); Sprint, *The Largest Mobile Broadband Network*, <http://powervision.sprint.com/mobilebroadband/plans/coverage.html>; Sprint News Release, *Sprint Powers Up Faster Mobile Broadband Network in 10 More Markets, Upgraded Coverage Reaches 60 Million People* (Dec. 12, 2006); Cingular News Release, *Cingular Launches 3G Network in Indianapolis* (Sept. 22, 2006). In January 2007, Cingular announced that its 3G network covers 165 cities, including 73 of the top 100 markets in the country. Cingular News Release, *Cingular Wireless Reports Fourth-Quarter 2006 Results* (Jan. 24, 2007). See also Verizon Wireless, *BroadbandAccess Coverage Area*, <http://www.verizonwireless.com/b2c/mobileoptions/broadband/coveragearea.jsp>; Cingular, *BroadbandConnect Coverage Map*, available at http://www.cingular.com/broadbandconnect_consumer; Sprint Nextel, *Search for Sprint Power Vision(SM) Network Coverage Areas*, <http://www.sprint.com/business/products/products/evdoEnterZip.jsp>.

¹²⁷ See T. Watts, et al., Cowen and Company, *Mobile Content Delivery – The Next Wave of Wireless Growth* at 6 (June 28, 2006) ("T-Mobile plans to begin its 3G roll out in 2007."); R. Klugman, Prudential Equity Research, *FCC AWS Auction 66 Ends Raising \$13.7B, the Top Four Major Wireless Carriers Represented 78% of Total Bids and 7% of MHz-Pops Sold* at 2 (Sept. 18, 2006) ("T-Mobile, the most aggressive bidder in the auction, spent \$4.2 bil. on spectrum covering 100% of the U.S. population.").

¹²⁸ See, e.g., Comcast Corporation at Goldman Sachs Communacopia XV Conference – Final, FD (Fair Disclosure) Wire, Transcript 092006an.775 (Sept. 20, 2006) (Comcast COO Steve Burke: "[E]ven though 10, 20, 30 years, we think people are still going to use a wire into the home for the majority of their video viewing or their high-speed data consumption that takes place at home. And maybe for their telephone usage inside the home, there will be a major portion of video, voice and data that is consumed wirelessly. We want to be in a position where we can offer that."). See also R. Klugman, Prudential Equity Research, *FCC AWS Auction 66 Ends Raising \$13.7B, the Top Four Major Wireless Carriers Represented 78% of Total Bids and 7% of MHz-Pops Sold* at 2-3 (Sept. 18, 2006) ("Sprint in partnership with major cable providers, (SpectrumCo consortium) spent \$2.4 bil for 93%" coverage of the U.S. population; "we believe the spectrum will be used by the cable companies to expand data capabilities and have a wireless adjunct to their cable modem services.").

¹²⁹ See, e.g., C. Fleming, et al., UBS, *Sprint Nextel Corporation: Where Is the Light at the End of the Tunnel?* at 4 (Apr. 27, 2006) (Sprint "saw its PowerVision subscriber base triple in 1Q06 to 750K from 250K at the end of 2005. . . . we calculate that the take-rate of EV-DO in the first quarter of 2006 was an impressive 8%-9%.").

purchase 3G services by year-end 2008.¹³⁰ Those predictions are consistent with penetration rates in countries where 3G services have been available for several years.¹³¹

Satellite. Satellite broadband service is available nationwide, and from multiple providers.¹³² HughesNet, StarBand, and WildBlue offer two-way broadband services at download speeds up to 1.5 Mbps and upload speeds up to 256 kbps,¹³³ which are comparable to the most widely purchased DSL offerings.¹³⁴ Satellite providers report that they served more than 495,000 broadband lines at the end of June 2006, and that their subscribership was growing rapidly.¹³⁵ Although satellite broadband was previously considered expensive for residential customers, satellite providers' pricing is comparable to what cable modem and DSL providers charged just a few years ago.¹³⁶ In any event, satellite providers continue to improve their technology and cost structure.¹³⁷

¹³⁰ See M. Shuper, *et al.*, Morgan Stanley, *Cross-Industry Insights: The North American 3G Wireless Report*, Appendix at Exhibit 32 (Feb. 28, 2006) (3G subscribers for Cingular, Verizon, Sprint, and T-Mobile); T. Horan, *et al.*, CIBC World Markets, *3Q06 Communications and Cable Services Preview* at Exhibit 6 (Oct. 6, 2006) (total wireless subscribers).

¹³¹ See, e.g., NTT DoCoMo Press Release, *3G FOMA Subscribers Top 20 Million Mark* (Jan. 6, 2006) (Japan's NTT DoCoMo launched the world's first commercial 3G service over a WCDMA network in October 2001, and by year-end 2005, served 20 million subscribers); T. Watts, *et al.*, Cowen and Company, *Mobile Content Delivery – The Next Wave of Wireless Growth* at 6 (June 28, 2006) (“Forrester Research estimates that European 3G penetration was 6% in 2005 and will increase to 14% in 2006. Longer-term Forrester projects Western Europe 3G penetration to reach over 60% by 2010. While we expect the United States to lag behind Europe in 3G penetration, we see similar long-term growth opportunities.”).

¹³² See, e.g., StarBand, *What is StarBand?*, <http://www.starband.com/about/> (service available throughout U.S.); WildBlue, *About WildBlue: Questions & Answers*, http://www.wildblue.com/about/Wildblue/qaa.jsp#1_1 (service available in contiguous U.S.); HughesNet, *For Your Home*, [http://go.gethughesnet.com/HUGHES/Rooms/DisplayPages/LayoutInitial?pageid=hughesnetc&Container=com.webridge.entity.Entity\[OID\[91908CBE85AD4C428CCD8D5CDB016B51\]\]](http://go.gethughesnet.com/HUGHES/Rooms/DisplayPages/LayoutInitial?pageid=hughesnetc&Container=com.webridge.entity.Entity[OID[91908CBE85AD4C428CCD8D5CDB016B51]]) (same).

¹³³ WildBlue, *Packages and Pricing*, <http://www.wildblue.com/forYourHome/index.jsp> (residential and small business service at \$49.95/mo. for 512 kbps/128 kbps, \$69.95/mo. for 1 Mbps/200 kbps, and \$79.95/mo. for 1.5 Mbps/256 kbps; HughesNet, *For Your Home: Pricing*, <http://go.gethughesnet.com/HUGHES/Rooms/DisplayPages/LayoutInitial?Container=com.webridge.entity.Entity%5B0ID%5B71A9F5B422ABCE4886D9492F66B5B589%5D%5D> (HughesNet residential services at \$59.99-\$99.99/mo. for 700 kbps/128 kbps, \$69.99-\$109.99/mo. for 1 Mbps/200 kbps, and \$79.99-\$119.99/mo. for 1.5 Mbps/200 kbps, depending on up-front installation and equipment cost incurred by subscriber); Spacenet Press Release, *Spacenet Reinvents Home and Small Office Satellite Services with All New StarBand Nova* (Sept. 19, 2006) (StarBand offers residential and small office service at speeds of 1 Mbps/128 kbps and 1 Mbps/256 kbps, respectively).

¹³⁴ See S. Nowlin, *Road Runner Picks Up Its Pace*, San Antonio Express-News at 1E (Feb. 9, 2006) (“AT&T said most customers are happy with its standard 1.5 Mbps service”).

¹³⁵ *FCC June 2006 High-Speed Internet Access Report* at Tables 1, 6.

¹³⁶ See, e.g., *EchoStar Launches High-Speed Service*, Multichannel Newswire (Oct. 20, 2006) (EchoStar began marketing high-speed Internet to rural customers starting at \$49.95/month).

¹³⁷ See, e.g., *DirecTV to Nail Down Wireless Strategy by Year-End, CEO Tells Investors*, Satellite Week (Sept. 26, 2006) (DirecTV told a Goldman Sachs investor conference that by year-end 2006, DirecTV will nail down a wireless broadband strategy that will involve making a “discrete, defined investment” in a separate wireless entity); *Spacenet Reinvents Home and Small Office Satellite Services with All New StarBand Nova Featuring Next-generation Technology and Dramatically Reduced Pricing*, Business Wire (Sept. 19, 2006) (Spacenet recently introduced a new, StarBand Nova satellite broadband Internet service for residential and small office users “looking

Competitive Fiber. Competitive local telephone companies are deploying fiber-optic broadband networks in competition with Verizon’s FiOS network, AT&T’s fiber-to-the-node architecture, and digital cable networks.¹³⁸ According to FCC data, competing local carriers were serving approximately 128,000 high-speed lines over fiber as of the end of June 2006.¹³⁹ In addition, a number of municipalities, particularly in rural areas, have begun deploying fiber networks to provide broadband services to their residents.

Broadband over Power Line. BPL uses the electric distribution network as “a ubiquitous third broadband pipe to the home.”¹⁴⁰ Because the wires needed for BPL are largely in place, BPL can be deployed rapidly and at relatively low cost in virtually any market.¹⁴¹ BPL also benefits electric utilities by permitting network monitoring and facilitating remote billing and other system improvements. The FCC has established technical parameters for BPL and commercial BPL equipment.¹⁴² States also are encouraging the technology.¹⁴³ In April 2006, for instance, the California PUC took steps to foster the deployment of BPL. Noting that “BPL technology is evolving quickly, with a handful of pilot projects being run in the state,”¹⁴⁴ the CPUC exempted certain BPL-related transactions from regulatory review.¹⁴⁵

BPL technology is being deployed commercially by Current Communications (a company backed by Google and other investors) in Ohio and Texas,¹⁴⁶ and by other providers in smaller deployments throughout the U.S.¹⁴⁷ In southwestern Virginia, for instance, a joint

for a more reliable, professional-grade broadband satellite Internet connection at an affordable price”); WildBlue Press Release, *WildBlue Continues Free Installation Offer for High Speed Internet Via Satellite* (May 22, 2006) (extending a promotion that waives the \$179.95 installation charge).

¹³⁸ See *Triennial Review Order* ¶ 279 (“competitive LECs have demonstrated that they can self-deploy FTTH loops and are doing so at this time.”); see *id.* ¶¶ 273-280.

¹³⁹ *FCC June 2006 High-Speed Internet Access Report* at Table 6.

¹⁴⁰ *Inquiry Regarding Carrier Current Systems, including Broadband over Power Line Systems*, Notice of Inquiry, 18 FCC Rcd 8498, Separate Statement of Chairman Michael K. Powell (2003); see also *Broadband*, National Journal’s Technology Daily (Dec. 16, 2003).

¹⁴¹ See *Cleland September 26, 2006 Presentation* at 6 (“99% of the cost to provide BPL is already paid for to supply electricity.”).

¹⁴² See *Amendment of Part 15 Regarding New Requirements and Measurement Guidelines for Access Broadband Over Power Line Systems*, Memorandum Opinion and Order, 21 FCC Rcd 9308 (2006).

¹⁴³ See, e.g., *N.Y. Eases Limits on Utility Role in BPL Transactions, Says Industry Source*, Comm. Daily at 3 (Oct. 19, 2006) (New York adopting rules to make it easier for utilities to provide BPL).

¹⁴⁴ California Public Utilities Commission Press Release, *PUC Approves New Broadband Over Power Lines Regulatory Framework, Broadband Over Power Lines To Bring Internet Access to Underserved Communities* (Apr. 27, 2006).

¹⁴⁵ *Id.*

¹⁴⁶ See Current Communications, *Overview*, <http://www.currentgroup.com/about/index.html>; Current Communications Press Release, *Current Communications Group Announces Strategic Investments To Catalyze Broadband over Power Line Deployments* (July 7, 2005); Current Communications Press Release, *Current Communications Announces \$130 Million in Investments in Broadband over Power Line Networks* (May 4, 2006).

¹⁴⁷ See, e.g., Q. Hasan, *et al.*, Buckingham Research, *Pipe Dreams: Analyzing the Viability of Disruptive Broadband Models* at 14 (Mar. 17, 2006) (showing other commercial BPL deployments in Indiana and Michigan, citing the United Power Line Council).

venture of the Central Virginia Electric Co-operative and International Broadband Electric Communications is deploying BPL service to rural customers.¹⁴⁸ BPL networks currently provide 3 Mbps of bandwidth.¹⁴⁹ Next-generation equipment will increase BPL's speed to as high as 100 Mbps.¹⁵⁰

C. Existing Competition Is More Than Sufficient To Protect Consumers

The advocates of broadband regulation cannot base their case on the past, because there is no history of harm to consumers. They cannot base their case on the future, because consumers clearly will be able to protect their own interests by choosing among multiple, intermodal broadband competitors. Nor can they even find any legitimate basis for regulatory intervention in the present state of broadband, which is generally characterized by multiple competitors, falling prices, increasing transmission speeds, large new investments, and vibrant innovation – all characteristics of a marketplace that is *not* in need of intervention by regulators.

Multiple Competitors. The theory of a stable broadband duopoly advanced by proponents of broadband regulation omits key market participants that are winning large numbers of customers *today*. The vast majority of consumers in the U.S. have access to *at least* three competitive platforms for broadband, and consumers' broadband options are quickly increasing.¹⁵¹ In the first half of 2006, wireless and satellite technologies captured more than half of new broadband subscribers without any reliance on cable or DSL technologies.¹⁵² Moreover, many consumers have an additional alternative for broadband access at their workplace.

Competitive activity in Virginia illustrates the point. Verizon's wireline broadband service is available to 1.73 million Virginia households. All of those households could subscribe to satellite broadband service instead. Ninety-four percent of them can choose cable modem service. Eighty percent have access to cellular broadband service, and 75 percent can use fixed wireless service. Half of these Virginia households have access to broadband from eight or more different providers. More than nine out of ten of the households have access to broadband from five or more competing providers. In surveying broadband availability, Verizon identified more than 63 intermodal broadband providers in Virginia, including three satellite companies, four cellular companies, three municipalities, and 37 fixed wireless providers.

Rapid Deployment. In the last decade, cable operators have invested more than \$100 billion to upgrade their video networks with two-way broadband capabilities.¹⁵³ More than 90

¹⁴⁸ BPL Co-op, *Broadband over Powerline*, <http://www.forcvec.com/bplcoop/index.html>.

¹⁴⁹ *May 2006 GAO Report* at 59.

¹⁵⁰ *Id.*

¹⁵¹ According to FCC data, as of June 2006, consumers in more than 87 percent of U.S. zip codes have 3 or more broadband choices, up from 58 percent in June 2003. Sixty-three percent of U.S. zip codes are served by 5 or more broadband providers, up from 33 percent in June 2003. In one in five zip codes, there are now *10 or more* broadband choices. *FCC June 2006 High-Speed Internet Access Report* at Table 15.

¹⁵² *See FCC June 2006 High-Speed Internet Access Report* at Table 1.

¹⁵³ *See NCTA, 2006 Industry Overview* at 4 & Chart 1 (2006) (citing Kagan Research data).

percent of U.S. households passed by a cable network are able to obtain a cable modem connection.¹⁵⁴ Similarly, more than 82 percent of homes served by the Bell telephone companies are able to obtain DSL service.¹⁵⁵ And neither cable modem nor DSL is the most widely deployed broadband technology – satellite broadband is.

Falling Prices. Overall, prices for cable modem and DSL services have declined, particularly as the FCC has relaxed regulatory restrictions on these services. In the case of phone company DSL services, average prices have fallen by nearly 30 percent over the last three years, and by nearly 50 percent for a given speed.¹⁵⁶ Entry-level DSL prices have fallen by nearly 70 percent during the same time.¹⁵⁷ Cable modem operators also have reduced their prices for bandwidth, most often by offering consumers more bandwidth for the same price. On a per Mbps basis, cable modem prices have decreased by 70 percent (in real terms) over the past three years,¹⁵⁸ not considering further discounts that are available to customers who buy their cable modem service as part of a bundle with voice and cable services.¹⁵⁹ Although there will inevitably be fluctuations in individual providers' prices, both up and down, the overall industry trend has been decreasing consumer prices.

Increased Quality. Cable modem and DSL providers continually improve the quality of their services. In the past three years, the downstream speeds of major cable operators' fastest offerings have increased from 2-4 Mbps to 4-15 Mbps, while the major DSL operators have

¹⁵⁴ See NCTA, *Broadband Availability*, <http://www.ncta.com/ContentView.aspx?contentId=60> (116.1 million homes passed by cable modem service as of 2005); NCTA, *2006 Industry Overview* at 11 & Chart 6 (cable modem service is available to approximately 93 percent of homes passed by cable as of year-end 2005) (citing Morgan Stanley); *FCC June 2006 High-Speed Internet Access Report* at Table 14. See also C. Moffett, et al., Bernstein Research, *Cable and Satellite: ~40% of Cable VoIP Customers "New" to Broadband* at 4 (July 6, 2006) ("In general, the availability of [high-speed data] offerings is nearly ubiquitous"). Most of the areas without cable modem service do not have cable service, which is not available to all homes. See also T. Horan, et al., CIBC World Markets, *WindStream Corp.: 2H06 Guidance Looks Reasonable; Merger Synergies Likely a 2007 Story* at 4 (Sept. 12, 2006) ("The low density of rural regions makes the building of cable infrastructures very costly and hence the offerings of cable services more scarce.").

¹⁵⁵ See J. Hodulik, et al., UBS, *Qwest Communications* at 4, Table 1 (Oct. 4, 2005) (weighted average). Because DSL works only on lines that are shorter than three-and-a-half miles long, it is not available in many sparsely populated areas where lines typically exceed that length. See Verizon, *Verizon DSL FAQ: Availability*, <http://www22.verizon.com/forhomedsl/channels/dsl/learnmore/faqs/availability.asp>. See also C. Franklin, *How DSL Works*, <http://electronics.howstuffworks.com/dsl.htm> ("The limit for ADSL service is 18,000 feet. . . though for speed and quality of service reasons many ADSL providers place a lower limit on the distances for the service.").

¹⁵⁶ C. Moffett, Bernstein Research, *Broadband Update: "Value Share" and "Subscriber Share" Have Diverged* at Exhibit 1 (Apr. 21, 2006) (Average revenue for DSL has fallen from \$45 per month in 2002 to \$31 per month in 2006).

¹⁵⁷ *Cleland September 26, 2006 Presentation* at 5 ("Real DSL prices have fallen ~50% as speeds have roughly doubled over the last 3 years. Introductory DSL prices have fallen ~70% in 3 years; average monthly DSL prices fell ~15% from 2004-1005.").

¹⁵⁸ See *Cleland September 26, 2006 Presentation* at 5 ("Real cable modem prices have fallen ~70% as speeds have increased from 1.5Mbps to 5+ Mbps over the last two years with no price increase."); see also, e.g., J. Hu, *Comcast To Raise Broadband Speed*, CNET News.com (Jan. 16, 2005), http://news.com.com/Comcast+raises+broadband+speed/2100-1034_3-5537306.html.

¹⁵⁹ See C. Moffett, et al., Bernstein Research, *Quarterly VoIP Monitor: Playing Follow the Leader (. . . Cablevision, That Is)* at 8-9 (Sept. 20, 2006).

increased their top downstream speeds from less than 1 Mbps to 2-3 Mbps.¹⁶⁰ Further, telephone companies' massive investments in fiber-to-the-premises and fiber-to-the-node technologies, as discussed above, promise quantum leaps in speed and service offerings, as well as improved reliability due to fiber-optic cable's resistance to moisture and decay.

D. Other Market Forces Further Obviate the Need for Regulation

Actual and potential competition among broadband providers fully deters any individual provider from blocking or compromising consumers' access to popular online content or applications. In addition, other market forces provide redundant checks.

First, if a broadband content provider wants faster delivery or the ability to stream content to more end users simultaneously, it does not have to obtain upgraded service from its broadband provider. It can instead use a service like Akamai, which caches content locally, on edge servers, to facilitate delivery to end users.¹⁶¹ Alternatively, service and application providers, as well as end users, can use techniques such as multi-homing, direct connections, or peer-to-peer data transmission to increase delivery speeds, without depending on a higher level of service from their broadband service provider. If a broadband provider failed to provide content and applications providers with the delivery services they need, companies like Akamai could step in and offer market alternatives, just as they already do.

Second, although no broadband provider has anything approaching market power, all broadband providers have strong incentives to allow consumers to access the content of their choice, because allowing access maximizes the value of the provider's network.¹⁶² The FTC staff has itself applied these principles in the context of the broadcast industry. In the early days of broadcasting, the so-called "scarcity rationale" – the notion that the radio spectrum was scarce, and its use required government oversight – led to limits on vertical integration between the broadcast television networks and producers of video programming.¹⁶³ In 1995, the FCC

¹⁶⁰ *The Dumb Pipe Paradox, Part II* at 3. See also J. Hodulik, et al., UBS, *Is the Broadband Duopoly under Threat?* at 3 (May 10, 2006) ("Wired downstream speeds of 1-3 Mbps two years ago have been upgrade to 3-6 Mbps today. . . . Meanwhile, prices have come down dramatically.").

¹⁶¹ See Akamai Press Release, *Akamai Helps Handle High-Volume Traffic During Recent Victoria's Secret Online Fashion Show* (June 1, 2000) (discussing Victoria's Secret's use of Akamai caching for distribution of its Cannes fashion show webcast in 2000).

¹⁶² See Lenard/Scheffman, *Distribution, Vertical Integration and the Net Neutrality Debate* at 16; see *id.* at 17 ("[U]nder any market structure, the platform provider has a strong incentive to maximize the value of the platform to consumers. . . . Broadband providers benefit from having applications and content markets that maximize value to their customers. Anything that detracts from user value will also reduce the demand (and hence the price that can be charged) for the platform."); Joseph Farrell & Phillip J. Weiser, *Modularity, Vertical Integration, and Open Access Policies: Toward a Convergence of Antitrust Regulation in the Internet Age*, 17 *Harv. J. of L. and Tech* 86, 104 (Fall 2003) ("the platform monopolist gains from an efficient applications market – whether that be unbridled competition, integration without independents, licensing of a limited set of independents, or some attempt to combine these other structures.").

¹⁶³ The Financial Interest and Syndication ("Fin-Syn") rules, originally adopted in 1970, prohibited television networks from obtaining a financial interest in independently-produced programming and from syndicating any program domestically. *Review of the Syndication and Financial Interest Rules*, Report and Order, 10 FCC Rcd 12165 (1995) (eliminating the fin-syn rules). The Prime Time Access Rule ("PTAR"), adopted in conjunction with the Fin-Syn rules, required ABC/CBS/NBC network affiliates to devote at least one of the four daily "prime time"

eliminated those rules, citing the “substantially greater number of broadcast outlets” for programming that had developed, as well as the fact that “[v]iewers can choose from program offerings on cable, so-called ‘wireless’ cable, satellite television systems, and VCRs.”¹⁶⁴ The FTC staff urged elimination of the rules, noting that many of their underlying rationales had proved incorrect.¹⁶⁵ The FTC staff explained that, while broadcasters might have incentives to feature their own television programming, they also have strong countervailing incentives “in televising programming that will be attractive to audiences,” regardless of who produced it.¹⁶⁶ Similarly, broadband service providers invariably have strong incentives to allow (and, indeed, improve) access to online content that is attractive to their subscribers.¹⁶⁷

Third, the market power of key content and applications providers is likely to obviate any need for broadband regulation.¹⁶⁸ Even in the multi-channel video programming distribution (“MVPD”) market, which is highly concentrated at the last mile, it is often the content providers – not the distributors – who dictate the terms of carriage. For example, cable operators must pay substantial per-subscriber fees to carry the most popular cable programs (such as Disney’s ESPN and Fox’s Sports Net), and also are often required to accept less-popular networks that the parent company seeks to promote (such as ESPN Classic and Fox Reality).¹⁶⁹ Broadband is more competitive than the MVPD market in the last mile, which makes it even more likely that popular Internet content and application providers will retain significant bargaining power that will ensure that consumers will be able to access their services. If companies’ financial returns are any indication, major content and applications providers may be in a better position to dictate terms to the network providers than the other way around.¹⁷⁰

hours to non-network programming. *Review of the Prime Time Access Rules, Section 73.658(K) of the Commission’s Rules*, Report and Order, 11 FCC Rcd 546 (1995) (repealing the Prime Time Access Rule).

¹⁶⁴ *Review of the Prime Time Access Rules, Section 73.658(K) of the Commission’s Rules*, Report and Order, 11 FCC Rcd 546, ¶ 3 (1995).

¹⁶⁵ Comments of the Staff of the Bureau of Economics of the Federal Trade Commission, *Review of the Prime Time Access Rule, Section 73.658(k) of the Commissions’ Rules*, MM Docket No. 94-123 (FCC filed Mar. 7, 1995), (stating that, while a principle rationale for the rules “was to increase opportunities for independent producers of television programs to sell programming . . . [i]t is not clear that the PTAR has affected the number of independent production entities.”).

¹⁶⁶ *Id.*

¹⁶⁷ See *Your Television Is Ringing: A Survey of Telecoms Convergence*, Economist at 14 (Oct. 14, 2006) (“‘What makes [AT&T and Verizon] think that they are going to charge Google, as opposed to Google charging them?’ Cable companies . . . have to pay for the television shows and films they deliver over their networks.”) (quoting Mr. Andrew Odlyzko, Univ. of Minnesota).

¹⁶⁸ See, e.g., Kahn, *Telecommunications, the Transition from Regulation to Antitrust* at 21 (noting that “[a] provider of broadband service needs Google and eBay as much as they need it.”)

¹⁶⁹ See, e.g., U.S. Dep’t of Labor, *Broadcasting*, <http://www.bls.gov/oco/cg/cgs017.htm> (“For popular cable networks and local television stations, distributors pay a fee per subscriber and/or agree to broadcast a less popular channel owned by the same network.”); J. McLain, *Time Warner Finishes Switch*, Ventura County Star (Jan. 23, 2007), http://www.venturacountystar.com/vcs/business/article/0,1375,VCS_128_5297948,00.html (“cable systems often must sign agreements to carry less popular channels operated by companies that also own channels that most viewers demand.”).

¹⁷⁰ According to a recent analysis by economist Larry Darby, a former Chief of the FCC’s Common Carrier Bureau, Google’s return on invested capital are above 50 percent – more than three times the returns of Microsoft and eBay,

Fourth, market forces create incentives for network providers to provide wholesale access to independent ISPs, to the extent those independent ISPs are able to offer consumers benefits that the network provider may not. For example, some ISPs may be more efficient or effective at selling retail service than the network provider's own retail operations. In this situation, the network provider would prefer to capture the wholesale revenues associated with a given customer, rather than lose those revenues entirely to a competitive provider.¹⁷¹ Moreover, these incentives are growing with the rapid proliferation of broadband applications that enable consumers to use their Internet connections to obtain access to myriad services (such as voice telephone, video, and computer software) that were previously obtained from distinct networks or devices. Some Wall Street analysts believe that carriers will inevitably have separate wholesale and retail arms in order to meet the market demand for these new broadband services and applications.¹⁷² Sprint Nextel already makes its EV-DO-based broadband wireless services available on a wholesale basis to MVNOs.¹⁷³

IV. EXPERIENCE IN THE WIRELESS INDUSTRY DEMONSTRATES THAT BROADBAND REGULATION WOULD IMPEDE COMPETITION AND INNOVATION FOR BOTH WIRELESS AND WIRELINE BROADBAND NETWORKS

The wireless industry is a case study in the benefits of deregulation. For more than a decade, wireless carriers have had flexibility to design their networks and service offerings. Consumers have rewarded the carriers that provide networks and services that best meet consumers' needs. Proponents of broadband regulation claim that wireless carriers fail to provide sufficiently "open" and "nondiscriminatory" access to their networks and should therefore be subject to regulation. But marketplace experience demonstrates that consumers place a much higher value on other features, such as high-quality and low-priced service. Moreover, the practices that regulation proponents label discriminatory and closed have overwhelmingly benefited consumers and have been instrumental in achieving the wireless industry's remarkable success. The disconnect between the preferences of regulation advocates and those of consumers highlights the perils of trying to out-guess the marketplace, and proves that service providers are far better than central planners in determining the needs of customers.

and twice as high as Yahoo and Amazon. See Larry Darby, *Facts About Financial Power in Web-Centric Companies*, American Consumer Institute at 1. Bear Stearns estimates Google's gross profit margin at 59.5 percent (up from 54.3 percent in 2004). See *The Google Ecosystem* at 34. Google's returns are more than five times higher than the major broadband network operators – Verizon, AT&T, Comcast, and Time Warner. Google's market capitalization (\$140B on March 6, 2007) is larger than the second (eBay, \$43B) and third (Yahoo, \$42B) largest Internet companies combined, more than seven times larger than the biggest online retailer (Amazon, \$16B) and larger than three of the four principal suppliers of Internet connections – Verizon (\$106B), Comcast (\$81B), and Time Warner (\$77B).

¹⁷¹ See *Wireline Broadband Order* ¶¶ 74-75 (noting incentives of broadband providers to make wholesale access available, and statements of providers indicating they would do so in an unregulated environment); *id.* ¶ 91 (carriers who offer broadband Internet access on a non-common carrier basis "will have business incentives to attract both end user and ISP customers to their networks in order to spread network costs over as much traffic and as many customers as possible.").

¹⁷² See T. Horan, *et al.*, CIBC World Markets, *The Golden Age of Network Centric Computing* at 5 (Dec. 4, 2006).

¹⁷³ See *Alltel Enters 'First Of Kind' 3G Roaming Agreement*, Techweb (May 11, 2006).

Deregulation has allowed wireless competition and innovation to thrive. Contrary to the claims of regulation advocates, there are no signs of market failure or that the wireless industry is an oligopoly. Today, most consumers can choose between four national wireless carriers, one or two regional carriers, various unlicensed options, and a wide variety of MVNOs who resell service together with their own unique content and devices. Wireless prices in the U.S. are among the lowest in the world, while wireless usage is among the highest. Each of the major wireless carriers is making enormous investments to provide next-generation broadband services, and here, too, U.S. carriers are well ahead of the international curve. Intense competition among wireless providers also has given rise to a highly competitive market for wireless handsets and devices. According to one estimate, wireless carriers have created \$900 billion in consumer welfare benefits.¹⁷⁴

A. The Wireless Experience Demonstrates That the Marketplace Is Superior to Regulation in Determining and Meeting the Needs of Consumers

Wireless carriers compete aggressively to win new subscribers and retain existing ones. Each year, an average of 85 million wireless subscribers are up for grabs.¹⁷⁵ Marketplace experience demonstrates that consumers strongly prefer carriers that invest to provide high-quality networks. There has been much less consumer demand for wireless networks that provide the type of open and non-discriminatory access that proponents of broadband regulation seek to impose.¹⁷⁶

To distinguish themselves in the marketplace, wireless carriers have taken different approaches to designing their networks and service offerings. For example, Verizon Wireless has led in providing the highest quality network and the most advanced broadband capabilities; AT&T (formerly Cingular) has sought to provide consumers access to the latest advanced handsets; T-Mobile has focused on attracting the most price-sensitive customers; Sprint has been the most aggressive in forming agreements with MVNOs that combine resold service with unique handsets, content, and applications.¹⁷⁷

¹⁷⁴ See Thomas W. Hazlett & Matthew L. Spitzer, *Advanced Wireless Services, Spectrum Sharing, and the Economics of an "Interference Temperature"* at 33, ET Docket No. 03-237 (FCC filed Apr. 5, 2004).

¹⁷⁵ An average of 25 million new subscribers purchase wireless service each year, and more than 60 million subscribers switch wireless carriers every year. See Ind. Anal. Div., WCB, FCC, *Local Telephone Competition: Status As of June 30, 2006* at Table 14 (Jan. 2007); M. Rollins, et al., Citigroup Equity Research, *Telecom 2007: Fourth Quarter and EMT Conference Preview* at Figure 5 (Jan. 5, 2007) (estimating 2.7 percent monthly churn). See also *Wireless Telephone Services Antitrust Litigation*, 385 F. Supp. 2d 403, 412 (S.D.N.Y. 2005) ("*Wireless Antitrust Opinion*") (noting that, "[s]ince 2000, wireless service providers have lost 1.5 to 3 percent of their customers each month, resulting in a loss, or 'churn,' of between 18 and 36 percent of customers each year.").

¹⁷⁶ See Tim Wu, *Wireless Net Neutrality: Cellular Carterfone on Mobile Networks*, New America Foundation Wireless Future Program Working Paper #17 at 1-2 (Feb. 2007), available at <http://ssrn.com/abstract=962027> ("Wu, *Wireless Net Neutrality*"); Skype's Petition To Confirm a Consumer's Right To Use Internet Communications Software and Attach Devices to Wireless Networks, RM-11361 (FCC filed Feb. 20, 2007) ("*Skype's Petition*").

¹⁷⁷ See, e.g., J. Hodulik, et al., UBS, *Is an Apple Wireless MVNO Coming? – Impact on US Carriers* at 4 (Dec. 12, 2006) ("[Sprint] tends to be the service provider for subscribers that use a lot of minutes, but are less concerned with the quality of the network. In contrast, Verizon Wireless attracts subscribers concerned most of all with the quality of the network. They are often less concerned with handset selection. Cingular has typically had the best handsets –

Thus far, Verizon Wireless's approach has succeeded most in satisfying consumers. More consumers choose Verizon Wireless than any other wireless carrier, and Verizon Wireless also has the lowest churn in the industry.¹⁷⁸ Verizon Wireless also is the top choice for wireless broadband services, and has sold these services to a higher percentage of its customer base than any other wireless carrier.¹⁷⁹ Annual consumer surveys consistently rate Verizon Wireless the top wireless provider in terms of customer satisfaction.¹⁸⁰ Verizon Wireless's V CAST, a mobile content network, also ranks as the best offering of its kind.¹⁸¹

Verizon Wireless's success is consistent with what consumers indicate they most value in a wireless service. According to recent consumer surveys, by far the most important consideration in choosing a new wireless carrier is network coverage and reliability. Approximately 78 percent of consumers cite this as a priority.¹⁸² The second highest priority is low prices, which 64 percent of customers cite.¹⁸³ The next highest priority is the availability of wireless devices that are "easier to use," which 38 percent of consumers consider important.¹⁸⁴ Only 20 percent of consumers express a preference for "devices with more functionality and

with the exclusive carrier of the RAZR at its launch setting the tone. Meanwhile, T-Mobile generally attracts the most price sensitive of the postpaid market.").

¹⁷⁸ See, e.g., R. Klugman, *et al.*, Prudential Equity Group, *VZ: 4Q Inline But FiOS Costs Remain High* at Figure 3 (Jan. 30, 2007) (Among four national wireless carriers, Verizon is first in terms of the number of its post-paid wireless subscribers and the number of post-paid gross adds and net adds in four of the last five quarters (4Q05-4Q06)).

¹⁷⁹ See, e.g., M. Shuper, *et al.*, Morgan Stanley, *Cross-Industry Insights: The North American 3G Wireless Report* at Exhibit 1 (Feb. 28, 2006) (estimating that 6 percent of Verizon's subscribers purchased 3G in 2006, compared to 4 percent for Sprint, and that these totals will rise to 14 percent and 11 percent, respectively, in 2007. Verizon also has a larger base of subscribers than Sprint).

¹⁸⁰ See, e.g., Consumer Reports, *Cell Phone Service: Providers in Profile* (Jan. 2007), http://www.consumerreports.org/cro/electronics-computers/cell-phones-service/cell-phone-service-1-07/providers/0107_serve_pro_1.htm (Verizon Wireless is "[c]onsistently a top performer in this year's survey and in our earlier ones. Also among the better national carriers in its responsiveness to customer questions and complaints.").

¹⁸¹ See, e.g., S. Segan, *Verizon V Cast*, PC Magazine (June 8, 2006) ("V Cast costs \$15 for unlimited use, the best deal of any service I tested. . . . Verizon's delivery is smoother than that of Amp'd or Sprint . . . The clips I tested loaded faster, at 10.2 seconds on average, and rebuffered less often than on either of the two other EV-DO-based services."); *Verizon Wireless BroadbandAccess EV-DO*, PC Magazine (Mar. 1, 2006) ("[T]he V Cast Music Store leads in the cell-phone industry, offering the best prices and the best integration with Windows Media Player"); W. Rothman, *TV to Go*, Money (Nov. 2005) ("BOTTOM LINE V Cast is the best of the three services [Cingular Wireless MobiTV, Sprint PCS Vision, and Verizon V Cast] so far.").

¹⁸² See J. Porus, Harris Interactive, *What Will Wireless Consumers Want Next?* Wireless Wave (Spring 2006) (78% of consumers express preference that wireless carriers "improve coverage and service quality, while 64% express preference that wireless carriers "provide good value.").

¹⁸³ See *id.*

¹⁸⁴ See *id.*

features.”¹⁸⁵ Surveys of consumers that have switched wireless carriers reveal similar preferences.¹⁸⁶

Ignoring the actual preferences of consumers, proponents of broadband regulation have graded wireless carriers based on vague notions of how open wireless networks are to competing content, applications, devices, and services.¹⁸⁷ Applying this self-made test, Professor Tim Wu concludes that “Verizon Wireless scores the most poorly across every category, while T-Mobile scores the best. AT&T and Sprint are in the middle.”¹⁸⁸ But as demonstrated above, these rankings – and the test itself – are out of touch with what consumers actually care about. Verizon Wireless ranks first among consumers, while T-Mobile – the poster child of broadband proponents – ranks last in number of subscribers.¹⁸⁹ T-Mobile also is last among the major carriers in deploying broadband capabilities.¹⁹⁰

The sharp disconnect between the verdict of regulation proponents and that of consumers illustrates the dangers of trying to out-guess the marketplace. In fact, while proponents of broadband regulation claim that more open networks are needed to pave the way for more advanced features and functionality, other regulation advocates demand just the opposite. In an industry-wide antitrust case, class-action plaintiffs criticized wireless carriers for introducing too *many* phones with advanced features such as Internet access, video, and music which they complained raised the price of phones and service to consumers as a whole.¹⁹¹ Marketplace experience demonstrates that consumers have varied and constantly changing preferences, and that wireless carriers are striving to meet these competing demands. The evidence shows that wireless carriers have consistently succeeded in this respect, while regulation has failed.

B. The Wireless Experience Demonstrates the Need To Deregulate Nascent Markets

In the decade after the first commercial wireless services were deployed, the wireless industry was heavily regulated at both the federal and state level. For the last decade, however,

¹⁸⁵ *Id.*

¹⁸⁶ See ComScore Networks Press Release, *More Than One-Quarter of Wireless Subscribers Switched to Their Current Carrier to Gain Better Network Coverage* (Jan. 16, 2007) (27% of consumers switch for better coverage, 14% for lower prices, 13% for friends’/family members’ carrier, 9% for better minute-level plans, 9% for plan features, 8% for a promotional offer, 4% for a specific phone, and 16% for some other reason).

¹⁸⁷ Wu, *Wireless Net Neutrality* at 29 (“[I]t is easy to rate the [wireless] carriers on the degree to which they respect *Carterfone*, network neutrality, and open platform development principles.”).

¹⁸⁸ *Id.*

¹⁸⁹ See, e.g., R. Klugman, *et al.*, Prudential Equity Group, *VZ: 4Q Inline But FiOS Costs Remain High* at Figure 3 (Jan. 30, 2007) (Among four national wireless carriers, T-Mobile ranks last in the number of its post-paid wireless subscribers and the number of post-paid gross adds in four of the last five quarters (4Q05-4Q06)).

¹⁹⁰ See § I.A, *supra*.

¹⁹¹ See *Wireless Antitrust Opinion*, 385 F. Supp. 2d at 429 (noting that, “[o]n one hand, plaintiffs argue that as the ‘gatekeepers’ of the handset market, defendants have impeded the development or incorporation of certain handset features, such as multi-carrier functionality, multiple SIM slots, and Bluetooth technology. On the other hand, they contend that the defendants have blocked efforts by manufacturers to offer consumers simpler handset models. The plaintiffs have offered no admissible evidence on the first point, and limited, insufficient evidence on the latter.”).

deregulation has given wireless carriers the freedom to design their networks, to determine whether and how to interconnect with each other, to structure and price their services, to contract with content and application providers, and to make various handsets and other devices available for use on their networks. Proponents of broadband regulation criticize some of the practices that wireless carriers have adopted under deregulation as contrary to principles of “openness” and “non-discrimination.” These proponents argue that wireless carriers should therefore be subject to the same types of regulation that has been proposed for broadband providers generally.¹⁹² But the practices about which regulation proponents complain overwhelmingly benefit consumers, and have been instrumental in achieving the wireless industry’s remarkable success. The wireless experience accordingly shows that broadband regulation would be counterproductive not only in the wireless context, but also in broader broadband market as well.

1. Deregulation of Wireless Network Deployment

In the early days of the wireless industry, the FCC mandated that all cellular carriers adopt the same analog standard,¹⁹³ and it sharply restricted the amount of spectrum that each wireless carrier could hold in a given market.¹⁹⁴ Other rules prohibited the Bell companies – which were awarded half of the initial cellular licenses – from providing long-distance services with their wireless services.¹⁹⁵ These policies forced carriers to deploy networks that did not take advantage of more advanced and efficient technologies.

Following enactment of the Omnibus Budget Reconciliation Act of 1993, the FCC licensed multiple new wireless carriers in each market, and declined to mandate a technological standard for these new networks.¹⁹⁶ The 1996 Act eliminated the restriction prohibiting the Bell companies from providing wireless long distance services,¹⁹⁷ and also expanded the FCC’s forbearance authority. Pursuant to that authority the FCC lifted its rule limiting the amount of

¹⁹² Wu, *Wireless Net Neutrality* at 32; *Skype’s Petition* at 27-28.

¹⁹³ See *Year 2000 Biennial Regulatory Review – Amendment of Part 22 of the Commission’s Rules To Modify or Eliminate Outdated Rules Affecting the Cellular Radiotelephone Service and Other Commercial Mobile Radio Services*, Report and Order, 17 FCC Rcd 18401, ¶ 5 (2002) (citing Office of Engineering and Technology Bulletin No. 53 (Apr. 1981)).

¹⁹⁴ *Inquiry into the Use of the Bands 825-845 MHz and 870-890 MHz for Cellular Communications Systems*, Report and Order, 86 FCC 2d 469, ¶ 22 (1981).

¹⁹⁵ See *United States v. Western Elec. Co.*, 578 F. Supp. 643, 645-46, 647 (1983).

¹⁹⁶ Thomas W. Hazlett, *Saved from Common Standards*, FT.com (Nov. 27, 2002) (“The FCC had previously set a mandatory analogue standard for cellular phones, for instance. This, one of the great technology mistakes of the twentieth century, was largely repealed in 1988 – after major market cellphone systems had been built with antiquated technology.”).

¹⁹⁷ See 47 U.S.C. § 271(b)(3), (g)(3) (permitting Bell operating companies to provide “incidental interLATA services” which includes “commercial mobile services”).

spectrum a single provider could own in each market,¹⁹⁸ and agreed to phase out its requirement that wireless carriers maintain the analog capabilities of their systems.¹⁹⁹

Following deregulation, wireless carriers chose competing digital standards for their new networks – CDMA, TDMA, and GSM –rather than a common standard. This added a dimension of competition that does not exist in many parts of the world. As the FCC has noted, standard-based competition facilitates “greater product variety and greater differentiation of services,” and enhances price competition by “mak[ing] it more difficult for carriers to coordinate their behavior.”²⁰⁰ This standards-based competition also is credited with placing the U.S. ahead of the world in wireless broadband deployment, as the CDMA standard that Verizon Wireless and Sprint adopted enables a more efficient transition to 3G than the GSM standard adopted by Europe and much of the world.²⁰¹

Deregulation also paved the way for the Bell companies’ wireless affiliates and other wireless carriers to build national networks. Once these nationwide networks were established, wireless carriers were able to offer any-distance calling plans that have increased wireless penetration and established more vigorous competition with wireline service.²⁰² The lifting of long-distance and spectrum restrictions also facilitated the deployment of wireless broadband services, which require considerable bandwidth and do not conform to the artificial geographic boundaries that earlier regulation imposed.

¹⁹⁸ 2000 Biennial Regulatory Review *Spectrum Aggregation Limits for Commercial Mobile Radio Services*, Report and Order, WT Docket No. 01-14, FCC 01-328 (rel. Dec. 18, 2001).

¹⁹⁹ See *Year 2000 Biennial Regulatory Review – Amendment of Part 22 of the Commission’s Rules to Modify or Eliminate Outdated Rules Affecting the Cellular Radiotelephone Service and other Commercial Mobile Radio Services*, Report and Order, 17 FCC Rcd 18401 (2002) (modifying §§ 22.901 and 22.933).

²⁰⁰ *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993*, Eleventh Report, 21 FCC Rcd 10947, ¶ 103 (2006) (“*Eleventh CMRS Report*”) (citing Neil Gandal, David Salant, and Leonard Waverman, *Standards in Wireless Telephone Networks*, 27 *Telecommunications Policy* (2003); Carl Shapiro and Hal R. Varian, *Information Rules*, Harvard Business School Press (1999)).

²⁰¹ Joseph Farrell & Michael D. Topper, *Economic White Paper on National Third Generation Wireless Standards* at 1-2 (Nov. 1998) (“Government should only mandate a standard when there is clear and convincing evidence that the market will fail to achieve economically efficient results and that this market failure will be worse than the likely inefficiencies of government-mandated standards. In the case of third generation wireless standards, on the contrary, there is much evidence that market competition among multiple third generation standards will better achieve the efficiency goals that a national standard might be thought to confer.”).

²⁰² See, e.g., *Wireless Antitrust Opinion*, 385 F. Supp. 2d at 411 (“Just as digital technology offers certain efficiencies, so too does having a nationwide network, which eliminates a provider’s need to pay roaming costs to other carriers. Whereas some carriers, such as AT & T Wireless, already had extensive geographic coverage by the late 1990s, other, more regionally-focused carriers began to join forces to achieve nationwide coverage.”); *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993*, Tenth Report, 20 FCC Rcd 15908, ¶ 97 (2005) (“Today all of the nationwide operators offer some version of a national rate pricing plan in which customers can purchase a bucket of minutes to use on a nationwide or nearly nationwide network without incurring roaming or long-distance charges.”).

2. *Deregulation of Wireless-to-Wireless Services*

Wireless carriers have never been required to interconnect directly with each other.²⁰³ Wireless carriers were initially required to resell their service to other licensed wireless carriers,²⁰⁴ but the FCC designed these rules to sunset (which they now have) to ensure that all licensees would build their own networks rather than rely exclusively on resale.²⁰⁵ The FCC refused to require carriers to provide a particular resale discount, and never extended resale obligations to entities without wireless licenses.²⁰⁶

Although not required to do so, wireless carriers have privately negotiated roaming arrangements in order to offer coverage beyond the area served by their own facilities.²⁰⁷ Particularly in the early days of wireless, these agreements enabled consumers to obtain nationwide coverage, even though most wireless carriers had only regional coverage.

Wireless carriers have also entered into agreements to resell their service to MVNOs. Today, MVNOs serve approximately 6-7 percent of wireless subscribers.²⁰⁸ Virgin Mobile, the largest MVNO, reports that it serves 4.6 million wireless subscribers.²⁰⁹ As described below, many MVNOs are not merely reselling service, but are packaging it with their own unique content and devices. *See* § IV.C.

3. *Deregulation of Wireless Prices and Service Offerings*

In 1984, the FCC declared cellular carriers to be “dominant” – a regulatory classification usually reserved for incumbents in mature markets – and required them to file tariffs.²¹⁰ Many states at the time likewise required cellular carriers to file tariffs, and some also sought to go

²⁰³ *See Interconnection and Resale Obligations Pertaining to Commercial Mobile Radio Services*, Fourth Report and Order, 15 FCC Rcd 13523, ¶¶ 28-29 (2000).

²⁰⁴ *See Inquiry into the Use of the Bands 825-845 MHz and 870-890 MHz for Cellular Communications Systems*, Report and Order, 86 FCC 2d 469, 511 (1981).

²⁰⁵ *See Petitions for Rule Making Concerning Proposed Changes to the Commission’s Cellular Resale Policies*, Report and Order, 7 FCC Rcd 4006, ¶ 20 (1992); *Interconnection and Resale Obligations Pertaining to Commercial Mobile Radio Services*, First Report and Order, 11 FCC Rcd 18455, ¶ 28 (1996) (“1996 CMRS Interconnection and Resale Order”).

²⁰⁶ *See 1996 CMRS Interconnection and Resale Order* ¶ 12.

²⁰⁷ *See* S. Rossmiller, Merrill Lynch Capital Markets, Investext Rpt No. 8057068, Telecommunications: Mid Year Review and Second Half Outlook – Industry Report at *5 (June 20, 2001) (Such agreements allow carriers to “offer wireless services to the remaining U.S. population.”); A. Okwu, Wachovia Securities, Investext Rpt No. 2488491, Sprint PCS Group: Initiating Coverage – Company Report at *8 (Feb. 22, 2001) (“The final leg in [Sprint PCS’s] build-out strategy is achieved through roaming agreements focusing primarily on rural markets, which are essentially markets that have not been built-out by either PCS Group or its affiliates.”).

²⁰⁸ J.D. Breen, Jr., *et al.*, Thomas Weisel Partners, *Revisiting the MVNO Space – Survival of the Fittest* at 1 (June 22, 2006); J. Hodulik, *et al.*, UBS, *US Wireless 411* at Chart 1 (Oct. 9, 2006).

²⁰⁹ Virgin Mobile USA Press Release, *Virgin Mobile USA Marks 4.6 Million Customers* (Jan. 4, 2007).

²¹⁰ *Policy and Rules Concerning Rates for Competitive Common Carrier Services and Facilities Authorization Therefor*, Fifth Report and Order, 98 FCC 2d 1191, ¶ 18, n. 41 (1984).

beyond the FCC and regulate cellular rates.²¹¹ The 1993 Omnibus Budget Act explicitly preempted state regulation of wireless rates.²¹² Although some states petitioned the FCC to continue such regulation, the FCC consistently denied them.²¹³ The Commission also eliminated its own tariffing and dominant carrier requirements.²¹⁴

Wireless rates have declined rapidly under deregulation, and are among the lowest in the world.²¹⁵ Just as important, giving wireless carriers flexibility to structure their pricing led to many innovative arrangements that benefit consumers. For example, U.S. wireless carriers have long imposed charges on both the calling and receiving ends of a mobile call, rather than adopt a calling-party-pays (“CPP”) system that is used in wireline and is common in wireless networks throughout the world. This decision was initially criticized for deterring usage of wireless phones.²¹⁶ But it also benefited consumers by avoiding the problem – found throughout countries with CPP regimes – of carriers charging each other high mobile termination fees, which deters mobile usage.²¹⁷ In addition, just as the FCC began considering whether to implement CPP in the late 1990s, the industry began offering any-distance calling plans with large number of minutes, which had the effect of boosting usage well above levels found in CPP countries.²¹⁸

²¹¹ Following passage of the 1993 Budget Act, the Commission denied the petitions of numerous states to continue regulating rates. See *Petition of the State of Ohio for Authority to Continue to Regulate Commercial Mobile Radio Service*, Order on Reconsideration, 10 FCC Rcd 12427 (1995) (denying request of Ohio to continue regulating cellular rates); *Petition of the People of the State of California and the Public Utilities Commission of the State of California To Retain Regulatory Authority over Intrastate Cellular Service Rates*, Order on Reconsideration, 11 FCC Rcd 796 (1995) (same for California); *Petition on Behalf of the Louisiana Public Service Commission for Authority To Retain Existing Jurisdiction over Commercial Mobile Radio Services Offered Within the State of Louisiana*, Report and Order, 10 FCC Rcd 7898 (1995) (same for Louisiana).

²¹² 47 U.S.C. § 332(c)(3)(A).

²¹³ See, e.g., *Petition of the Connecticut Department Public Utility Control to Retain Regulatory Control of the Rates of Wholesale Cellular Service Providers in the State of Connecticut*, Report and Order, 10 FCC Rcd 7025 (1995), *aff’d*, *Connecticut Dep’t of Public Utility Control v. FCC*, 78 F.3d 842 (2d Cir. 1996).

²¹⁴ *Implementation of Sections 3(n) and 332 of the Communications Act*, Second Report and Order, 9 FCC Rcd 1411, ¶¶ 173-182 (1994).

²¹⁵ See § IV.C; see also *Eleventh CMRS Report* ¶ 5 & Statement of Chairman Kevin J. Martin.

²¹⁶ *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 Radio Services*, Third Report, 13 FCC Rcd 19746, 19760-61 (1998) (According to an industry study, the international experience shows that “CPP billing spurs wireless usage, promotes acceptance of wireless service, allows greater cost control by consumers, and increases the proportion of traffic on wireless networks relative to wireline networks.”).

²¹⁷ *Eleventh CMRS Report* ¶ 194 (“One of the reasons revenue per minute is higher in Western Europe and Japan than in the United States is that the calling party pays system . . . tends to give mobile operators the ability and the incentive to set mobile termination charges that are high relative to those in the United States and other countries that use the mobile party pays system. In addition, because these higher mobile termination charges are absorbed by the calling party, the calling party pays system may also reduce usage relative to [the] mobile party pays system by increasing the cost of calls to mobile phones.”).

²¹⁸ L. Mutschler, *et al.*, Merrill Lynch, *The Next Generation VII: Comparing European and US Wireless* at 28 (Feb. 21, 2003) (“Unlike Europe, the US is not a calling party pays environment. This means that the wireless user pays for both outgoing and incoming calls. As a result, the carriers initially introduced bucket plans in order to stimulate usage. If you had a bucket of minutes for a set amount each month, you might be more willing to give out your

Regulatory flexibility also has enabled wireless carriers to provide attractive bundles of service and handsets.²¹⁹ Wireless carriers throughout the world heavily subsidize the cost of wireless phones, by selling the handset with a package of service.²²⁰ These bundles are widely credited with promoting the uptake of wireless services.²²¹ Subsidizing new phones also encourages consumers to replace old phones with new models that make more efficient use of the network and therefore reduce service costs for consumers as a whole.²²² In addition, newer phones often enable higher-quality service.²²³

Some wireless carriers have begun considering other pricing arrangements where the customer would accept advertising in exchange for lower priced (or even free) service. As noted above, EarthLink and Google plan to implement this strategy in their joint WiFi venture in San Francisco. *See* § II.A.2. Virgin Mobile's "Sugar Mama" service offers up to 75 minutes of free airtime in exchange for viewing and rating online videos, receiving two advertising text messages a week, or completing surveys about brands, products, and services.²²⁴

Deregulatory policies are proving just as critical in the roll-out of new wireless broadband services. Despite spending billions on spectrum and network infrastructure to offer broadband services, due to spectrum constraints as well as other considerations (such as zoning regulations and costs), wireless networks support only a finite number of simultaneous users in each cell site. When the number of users or amount of traffic exceeds that limit, the quality of service or accessibility of the network will be impaired. A small number of users consuming a

phone number to your friends and to your colleagues in an environment where you had to pay for both outgoing and incoming calls. With growing competition, however, the buckets started to get bigger and bigger, including not only virtually unlimited night and weekend minutes but also long distance as well."); V. Shvets, *et al.*, *Deutsch Bank, The Hotline: Prepaid Services . . . the Key Wireless Product?* at 3 (Sept. 20, 2005) (noting that "'Bucket-style' plan pricing in the US . . . partially developed due to the lack of a CPP system").

²¹⁹ *See Bundling of Cellular Customer Premises Equipment and Cellular Service*, Report and Order, 7 FCC Rcd 4028 (1992).

²²⁰ *See, e.g., Wireless Antitrust Opinion*, 385 F. Supp. 2d at 410 ("It is undisputed that since the inception of wireless service in the U.S., wireless service providers have sold their respective service and handsets as a package, and that in doing so, the carriers have subsidized the cost of handsets to make initial entry into the wireless services market 'more palatable.'").

²²¹ *See id.*

²²² *See id.* at 409.

²²³ *See, e.g., Understanding Sensitivity in Handset Design*, *Wireless Design & Development* at 34 (June 2006) ("Conceptually, a phone that can consistently receive a smaller signal than another will have better voice clarity and fewer call disruptions such as service availability issues and dropped calls. In practice, better sensitivity improves handset coverage within a given cell including along the boundaries and provides better immunity to fading conditions. . . . Network operators are being forced to address QoS while they attempt to simultaneously add to their subscriber base and profitability. . . . The result is a tightening of the sensitivity requirements set by North American operators upon handset manufacturers. While phones with static sensitivity performance (as measured at the PCB antenna port) of around 106 to 107 dBm for high-band operation may have once been considered acceptable, operators are now pushing for sensitivities of 108 to 109 dBm.").

²²⁴ Virgin Mobile, *Sugar Mama*, <https://www.virginmobileusa.com/stuff/sugarmama.do>; M. Richtel, *Earn Cellphone Minutes by Watching Ads*, *New York Times* (May 30, 2006). Xero Mobile offers a similar service, targeted at college students. Xero Mobile Press Release, *Xero Mobile Completes Phase Three of Technology Implementation Plan* (Oct. 18, 2006).

disproportionate amount of bandwidth degrades the quality of service for other users. If this were to occur, wireless carriers would not be able to provide users with the speeds and level of service to which its customers have become accustomed.

To ensure high-quality service for the maximum number of users, wireless broadband providers typically include terms in the service contract that limit the use of certain bandwidth-intensive applications. Verizon Wireless offers both flat-rate and pay-as-you-go wireless data plans for its EV-DO service, and imposes usage limitations on the former. These limitations bar the use of certain type of applications that are inherently bandwidth intensive, such as continuous uploading, downloading or streaming of audio or video programming or games, server devices or host computer applications, automated machine-to-machine connections or peer-to-peer (P2P) file sharing, and the use of a wireless connection as a substitute or backup for private lines or dedicated data connections.²²⁵ Verizon Wireless does not impose any usage limitations on its pay-as-you-go plans, which demonstrates that it is not seeking to block access to any particular type of content, but only to prevent high-bandwidth users from raising the costs for consumers generally. While advocates of broadband regulation have criticized Verizon Wireless's usage limitations as discriminatory, they focus only on its flat-rate plans, and fail to acknowledge the existence of usage-sensitive plans that contain no such limitations.²²⁶

4. *Deregulation of Wireless Carriers' Content and Applications*

Wireless broadband services are one of the fastest growing segments of the industry.²²⁷ Given the enormous investments being made to provide 3G broadband services, wireless carriers need to make these services as attractive to consumers as possible in order to spur demand.²²⁸

²²⁵ Verizon's flat-rate plans include NationalAccess, BroadbandAccess, and GlobalAccess. The Terms and Conditions for these plans specify that wireless devices may be used only for "(i) Internet browsing; (ii) e-mail; and (iii) intranet access" and may not be used for any other purpose, including "(i) continuous uploading, downloading or streaming of audio or video programming or games; (ii) server devices or host computer applications, including, but not limited to, Web camera posts or broadcasts, automatic data feeds, automated machine-to-machine connections or peer-to-peer (P2P) file sharing; or (iii) as a substitute or backup for private lines or dedicated data connections." In addition, the Terms and Conditions provide a benchmark for what Verizon Wireless considers excessive network use, stating that "[a] person engaged in prohibited uses, continuously for one hour, could typically use 100 to 200 MBs, or, if engaged in prohibited uses for 10 hours a day, 7 days a week, could use more than 5 GBs in a month." See Verizon Wireless, *BroadbandAccess*, http://www.verizonwireless.com/b2c/store/controller?item=planFirst&action=viewPlanDetail&sortOption=priceSort&catId=409&cm_re=Global_-_Plans_-_Wireless%20PC%20Card%20Plans%20BroadbandAccess.

²²⁶ See Wu, *Wireless Net Neutrality* at 18. Wu mistakenly claims that Verizon Wireless's usage restrictions apply to VoIP services, *see id.*, but that is not the case. An earlier version of Verizon Wireless's Terms and Conditions for EV-DO listed Voice-over-IP services as a prohibited service. Verizon Wireless initially imposed this restriction based on concerns that users would find the quality of VoIP services provided over EV-DO unsatisfactory, and would blame Verizon. Verizon removed this restriction in August 2006.

²²⁷ See, e.g., T. Horan, *et al.*, CIBC World Markets, *4Q06 Mid-Quarter Review* at 5 (Feb. 21, 2007) (noting that wireless data revenues have grown from 9% to 13% of total average revenue per user in the past year, and predicting that "wireless data services adoption will be well above current investor expectations over the next couple of years.").

²²⁸ See, e.g., T. Watts, *et al.*, Cowen and Company, *Mobile Content Delivery – The Next Wave of Wireless Growth* at 6 (June 28, 2006) ("We view the issue as . . . a chicken and egg problem with handset penetration driven by attractive programming. As more and more content becomes available, consumers will likely buy handsets to view it.").

Wireless carriers must accordingly offer access to broadband content and applications that consumers value enough to warrant the purchase of high-speed wireless service. A key challenge for wireless carriers has been ensuring that there is sufficient broadband content designed for mobile handsets, which are much more limited than PCs in terms of their screen size, processing power, and memory. Developing technology that readily adapts Web pages to mobile phones has been a challenge.²²⁹

Verizon Wireless and other wireless carriers have accordingly formed commercial relationships with application and content providers to develop content that is customized to the constraints of a handset's small screen and cramped buttons.²³⁰ Verizon Wireless provides this content through its V CAST network. V CAST consists of content such as news, weather, sports, games, and music, that Verizon believes will most appeal to users. For example, Verizon Wireless's recent agreement with ESPN will give Verizon Wireless customers access to exclusive ESPN mobile features and sports content, including real-time sports news, scores and information, personalization for favorite teams, scoring alerts, and on-demand video.²³¹

Verizon Wireless's decision to offer V CAST has only enhanced, not restricted, the options available to consumers. With the exception of services that consume enormous amounts of bandwidth and that are therefore likely to degrade service for other users, Verizon Wireless permits its EV-DO subscribers to access any type of legal content through the Internet. This is true with respect to both EV-DO-equipped lap-top cards and also EV-DO wireless phones and other handset devices such as personal digital assistants. With respect to wireless handsets, Verizon Wireless users are free to access any mobile web content of their choice.

5. *Deregulation of Wireless Handset Interconnection*

Wireless carriers have always had the freedom to determine which handsets and devices should be permitted to operate on their networks. Competition among wireless operators has

²²⁹ See, e.g., J. Rabin, et al., *Mobile Web Best Practices 1.0*, W3 (Nov. 2, 2006), <http://www.w3.org/TR/mobile-bp> ("The widely varying characteristics of mobile devices can make it difficult for a Web site to provide an acceptable user experience across a significant range of devices. For example different devices support different markup features and different screen sizes may demand different sized images. Consequently, it is very common when delivering content to mobile devices to vary the details of the markup, format of images, image sizes, color depths and so on to suit the characteristics of the device in question."); Frost & Sullivan Press Release, *Increasing Device Fragmentation Represents a Major Challenge for the Mobile Content Adaptation Markets* (Sept. 13, 2006) ("As mobile operators continue to introduce new devices at a rapid pace, mobile content providers are being increasingly challenged to ensure that different media pieces such as ringtones, graphics, games and videos are properly adapted for all these target devices. Delivering a satisfactory end-user experience is paramount for the growth of the industry and this is easier said than done as the seemingly simple process of mobile media adaptation actually involves several considerations and processes before delivery.")

²³⁰ See M. Wolk, et al., Susquehanna Financial Group, LLLP, *The Big Picture: Internet Advertising Growth Themes and Beneficiaries* at 13 (Jan. 9, 2007) ("Many websites today do not work well on the small 2-1/2 inch screen, intermittent access, and weaker dial-up-like bandwidth of cellphones."). Verizon's mobile TV service is provided using Qualcomm's MediaFLO technology, while Sprint and AT&T subscribers access a mix of live and stored media via MobiTV. M. McCormack, et al., Bear Stearns, *January Broadband Buzz: A Monthly Update on Critical Broadband Issues* at 4 (Feb. 1, 2007).

²³¹ Verizon Wireless Press Release, *ESPN and Verizon Wireless Announce Exclusive Multi-Year Licensing Agreement for Award-Winning ESPN Sports Content* (Feb. 8, 2007).

ensured intense competition for wireless handsets. While proponents of broadband regulation are demanding regulation that would require wireless carriers to permit any handset or device on their networks – what these proponents term a “*Carterfone*” rule for wireless – such regulation is unnecessary and would be affirmatively harmful to consumers.²³² Such regulation is incompatible with providing high-quality and reliable wireless service, which consumers consider the most important feature of a wireless network. *See* § IV.A.

Wireless carriers have powerful incentives to provide an attractive range of handsets. Some consumers choose a wireless carrier based primarily on the handset.²³³ Wireless carriers often form agreements with manufacturers to offer exclusive access to the latest devices.²³⁴ Wireless carriers offer everything from basic phones that do little more than enable voice calls, to advanced devices that offer Internet browsing, e-mail, video, music downloads, camera, geo-location, picture sharing, games, and other features. Across the U.S., there are currently more than 800 wireless phones and devices available to consumers, from nearly three dozen manufacturers.²³⁵ The four major wireless carriers currently offer a total of more than 100 phones,²³⁶ 95 percent of which are unique to a single provider. A number of innovative new devices, by new manufacturers, such as Apple’s iPhone,²³⁷ HP’s iPAQ Voice Messenger,²³⁸ and FIC’s Neo1973²³⁹ are entering the market.

Although some wireless carriers in the U.S., including Verizon Wireless, permit only approved phones on their network, this policy is designed to benefit consumers by reducing costs and improving security. As a technological matter, wireless handsets are an integral part of the network and require much more coordinated interaction with fixed network infrastructure than is

²³² Wu, *Wireless Net Neutrality* at 30-32; *Skype’s Petition* at 25-28.

²³³ *See, e.g.*, J. Halpern, Bernstein Research, *Sprint-Nextel Deep Dive (Part 2): While Maybe Not Pleasant, the Problems Appear To Be Solvable* at 4 (Sept. 29, 2006) (“We believe that consumers select their wireless carrier based on three criteria: (1) the desire not to regret their decision about network choice later (i.e., the quality of the network, perceived or real); (2) the availability of the desired handset and/or rate plan (i.e., family plan, unlimited in-network calling, etc); and (3) the convenience factor of switching or not if they are already a wireless user. With the significant innovation that has evolved around handset design and features, we believe point #2, above, has taken on an increasingly important role.”); J. Hodulik, *et al.*, UBS, *Is an Apple Wireless MVNO Coming? – Impact on US Carriers* at 4 (Dec. 12, 2006) (explaining that while “Verizon Wireless attracts subscribers concerned most of all with the quality of the network” and that “are often less concerned with handset selection. Cingular has typically had the best handsets.”).

²³⁴ *See, e.g.*, Cingular News Release, *Apple Chooses Cingular As Exclusive U.S. Carrier for Its Revolutionary iPhone* (Jan. 9, 2007); Verizon Wireless Press Release, *Music for All: The Next Evolution of V CAST Music from Verizon Wireless* (July 31, 2006).

²³⁵ *See* Phone Scoop, <http://www.phonescoop.com/Phones/>.

²³⁶ *See* D. Barden, *et al.*, Bank of America, *4Q06 Trends in Wireless Services & Handset Pricing* at 22-26 (Dec. 2006). Variations in color were not counted as unique devices.

²³⁷ S. Flannery, *et al.*, Morgan Stanley, *Will AT&T and Rogers Catch the iPhone Fever?* at 3 (Feb. 6, 2007) (Morgan Stanley estimates that the iPhone will account for 4.7 percent of the North American handset shipments in 2008: “This is significant for such a high priced phone but it is certainly achievable if the product is widely accepted.”).

²³⁸ Hewlett Packard Press Release, *HP Unveils Smartphone with Powerful Wireless Email Capabilities for Mobile Professionals* (Feb. 12, 2007).

²³⁹ OpenMoko Press Release, *OpenMoko Announces the World’s First Integrated Open Source Mobile Communications Platform at Open Source in Mobile Conference in Amsterdam* (Nov. 7, 2006).

the case with the wireline network.²⁴⁰ In order to deliver new features and functionality to consumers, it is often necessary to implement parallel engineering changes in *both* network infrastructure and in handsets. The introduction of innovations such as Short Messaging Service (“SMS”), EV-DO, network-supplied games, multimedia messaging, wireless Internet access, push-to-talk services, and geo-location all required changes to both network infrastructure and handsets.²⁴¹ So did the implementation of FCC rules requiring wireless carriers to deploy certain 911 capabilities, such as providing the location of wireless callers to the public safety agency receiving a wireless 911 call.²⁴²

Wireless carriers authorize the specific handsets that can operate on their networks to ensure that consumers receive the innovations that are implemented in the network. For example, many technological attributes of a wireless handset affect how efficiently that device uses spectrum.²⁴³ These include the handset’s power, its antenna, and its voice compression system (known as a voice coder or vocoder). If one handset requires twice as much power to perform acceptably, it eats up twice as much signal power from a wireless base station, and reduces the number of simultaneous conversations that that base station may host. Handsets that use spectrum efficiently enable wireless carriers to serve more customers with a given parcel of spectrum and associated infrastructure, thereby reducing costs for all consumers.

Specifying network-compatible phones also reduces marketing and support costs. Wireless carriers spend large sums on marketing and support of each of the handsets and devices they sell. As with any consumer electronics products, these marketing and support costs increase with the number of different devices that must be supported. Limiting these costs helps keep the cost of service down.

Despite vigorous competition for handsets, regulation advocates have accused wireless carriers of disabling certain features of their phones in order to protect certain revenue streams.

²⁴⁰ See Charles Jackson, *Wireless Handsets Are Part of the Network* at 3 (Feb. 2007) (“Jackson, *Wireless Handsets*”), originally presented at the ITS Biennial Conference, Beijing China, June 2006 (“Handsets are part of the wireless network, and the performance of handsets has substantial static and dynamic efficiency implications for the operation of the network as a whole.”).

²⁴¹ See *id.* at 4-5, 26-28; P. Gupta, *Short Message Service: What, How, and Where?*, Wireless Developer Network, <http://www.wirelessdevnet.com/channels/sms/features/sms.html> (as of Feb. 27, 2007) (“Enhanced Messaging Service (EMS) is a mechanism by which you can send a comparatively richer message that are combination of text, simple melodies, pictures (simple, black and white) and animations to an EMS compliant handset. . . . The handsets however need to be EMS compliant. The next step in the evolution of SMS, which requires substantial changes in the network infrastructure, is the Multimedia Messaging Service (MMS) that allows a combination of text, sounds, images and video. MMS will support pictures and interactive video.”).

²⁴² See Jackson, *Wireless Handsets* at 28-30.

²⁴³ See *Wireless Antitrust Opinion*, 385 F. Supp. 2d at 409 (“Because wireless service providers cannot implement more efficient service unless subscribers are using handsets that operate on their respective networks, handsets sold for use in the U.S. wireless services market are developed by manufacturers in collaboration with the wireless service providers. The quality of handsets available to subscribers is particularly important to the service providers because the use of ‘outmoded’ handsets not only affects the quality of that subscriber’s service, but also diminishes the quality of service to other subscribers. As a result, at least two of the defendants, Verizon Wireless and AT & T Wireless, subject or have subjected handset models to an approval process involving testing and maintain a list of models approved for use with their respective services.”); Jackson, *Wireless Handsets* at 12-20.

For example, these advocates have claimed that wireless carriers have disabled Bluetooth capabilities to prevent consumers from transferring files from their cameras to their PCs so that consumers will use the wireless carrier's network to share those files, and that wireless carriers have disabled WiFi capabilities to protect their voice services.²⁴⁴ These claims are misguided.

As an initial matter, wireless carriers have taken different approaches to restricting the Bluetooth and WiFi capabilities of their phones.²⁴⁵ This proves that competition is working, and that if consumers value these services they can obtain them. Other wireless carriers, including Verizon Wireless, have taken a different view as to consumers' priorities. For example, Verizon has not enabled Bluetooth file transfer capabilities due to concerns that it could facilitate illegal access to personal information that customers store on their phones, and to prevent the illegal exchange of copyrighted material such as games, music, and ringtones.²⁴⁶

Carriers that do not approve phones with WiFi capabilities do not foreclose competition from WiFi technology. Consumers interested in making WiFi-based voice calls do not need to purchase service from a wireless carrier. They can obtain a WiFi handset. For example, a variety of equipment manufacturers (including LinkSys and NetGear) have begun producing handsets to be used on WiFi networks using Skype's VoIP service.²⁴⁷ The decision of some licensed wireless carriers not to allow their handsets to be used for competing unlicensed services is not anticompetitive, but pro-competitive, and is no different from the decision not to allow a handset to be used to access a competing licensed wireless carrier's service, or the decision of McDonalds not to sell Burger King's fries alongside its own.²⁴⁸ These policies ensure that companies can maintain the integrity of their products and brand and recoup their investments, all of which is necessary to promote innovation and competition. These concerns are particularly acute with respect to WiFi, which may offer lower quality service than licensed networks, and, therefore, lead to consumer confusion if both licensed and unlicensed services are accessed over the same device.

²⁴⁴ Wu, *Wireless Net Neutrality* at 16-17.

²⁴⁵ See, e.g., Verizon Wireless, *Bluetooth Functionality Chart*, http://support.vzw.com/pdf/BT_Chart_Handsets.pdf; see also Wu, *Wireless Net Neutrality* at 29-30.

²⁴⁶ See, e.g., M. Repo, et al., *Going Around with Bluetooth in Full Safety*, F-Secure, http://www.securenetwork.it/ricerca/whitepaper/download/bluebag_brochure.pdf (May 2006); A. Laurie, et al., *Bluetooth: Serious Flaws in Bluetooth Security Lead to Disclosure of Personal Data*, The Bunker, <http://www.thebunker.net/resources/bluetooth> (updated Oct. 14, 2004).

²⁴⁷ *Google and Skype Fund FON as Cisco Joins*, Computer Business Review Online (Feb. 7, 2006), http://www.cbronline.com/article_feature.asp?guid=2A93B2D6-BE8B-4EB8-99CD-EDF7DFB80C65 ("Skype has partnerships in place with hotspot aggregators such as Boingo and The Cloud, and already offers WiFi-enabled Skype handsets made by, among others, Linksys. A visit to any internet cafe in a big city will reveal countless individuals calling home over the P2P VoIP service, so if those connections can be wireless-enabled, it should only stand to gain more users.").

²⁴⁸ Cf. *Verizon Communications Inc. v. Law Offices of Curtis V. Trinko, L.L.P.*, 540 U.S. 398, 410 (2004) ("[I]nsufficient assistance in the provision of service to rivals is not a recognized antitrust claim.").

C. Wireless Competition Is Thriving

The deregulatory environment for wireless services has allowed competition and innovation to thrive. Contrary to the claims of regulation advocates, there are no signs of market failure or that the wireless industry is an oligopoly.²⁴⁹ There is accordingly no basis to impose regulations on wireless carriers. To the contrary, the wireless experience demonstrates that competition and innovation thrive to a greater extent in the absence of regulation.

There were 11 million wireless subscribers in 1992, the year before wireless deregulation, compared to more than 219 million as of mid-2006.²⁵⁰ See Figure 5. Total cumulative investment in the wireless industry stood at approximately \$9 billion in the year before wireless deregulation, compared to approximately \$209 billion as of June 2006.²⁵¹ Prior to wireless deregulation there were at most two facilities-based competitors in each market, the largest of which were at most regional in scope. Today, there are four national wireless carriers (Verizon Wireless, AT&T, Sprint Nextel, and T-Mobile) in virtually every geographic area, plus at least one (and in some cases more) additional regional or local carriers, such as Alltel, U.S. Cellular, and Dobson.²⁵² According to the FCC's most recent data, approximately 94 percent of the U.S. population lives in a county with four or more competing wireless providers; more than 50 percent live in a county with five or more.²⁵³ Regulators,²⁵⁴ courts,²⁵⁵ and independent

²⁴⁹ Wu, *Wireless Net Neutrality* at 34; *Skype's Petition* at 21.

²⁵⁰ CTIA, *CTIA's Semi-Annual Wireless Industry Survey Results*, <http://files.ctia.org/pdf/CTIAMidYear2006Survey.pdf>.

²⁵¹ CTIA, *CTIA – The Wireless Association's Annualized Wireless Industry Survey Results, December 1985-December 2004* (2005); CTIA, *Wireless Quick Facts* (Sept. 2006), http://www.ctia.org/media/industry_info/index.cfm/AID/10323.

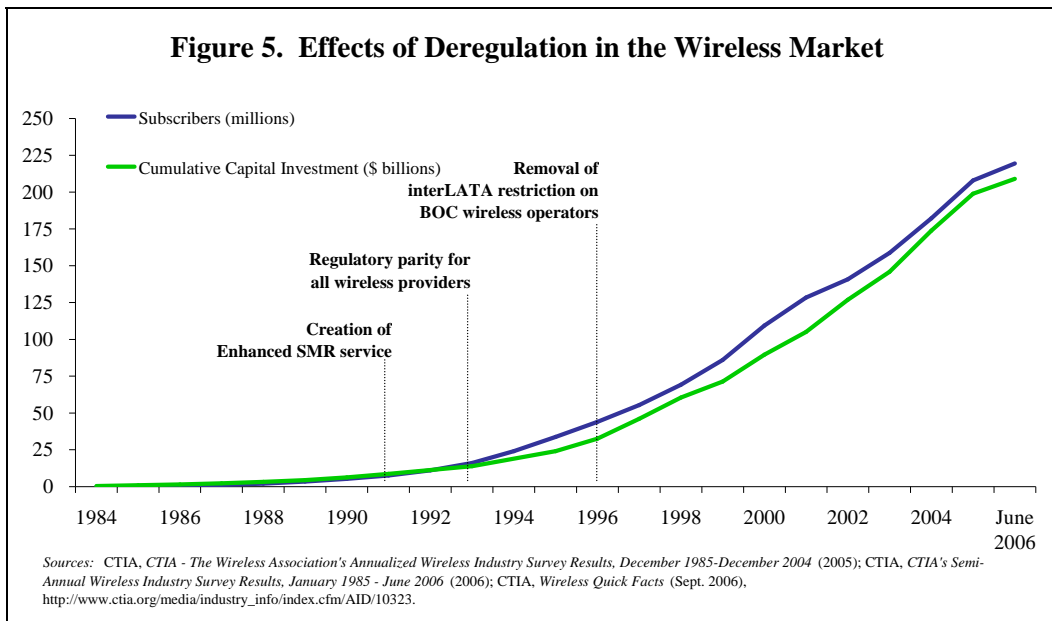
²⁵² See, e.g., P. Cusick, et al., *Bear Stearns, 4Q06 Big-4 and Wireless Industry Preview; Early Look at 2007* at 12-13 (Jan. 19, 2007) (estimating shares of regional and national carriers); M. Rollins, et al., *Citigroup, Teleconomy 2007* at Table 5 (Jan. 5, 2007) (covered pops).

²⁵³ *Eleventh CMRS Report*, App. A at Table 6.

²⁵⁴ See, e.g., *Proceeding on Motion of the Commission To Examine Issues Related to the Transition to Intermodal Competition in the Provision of Telecommunications Services*, Opinion, Case No. 05-C-0616 at 11-12 (N.Y. P.U.C. June 29, 2005) (“Wireless services are almost ubiquitously available in New York and exhibit very high subscription rates. . . . Because of existing competition within the wireless sector, we have witnessed ongoing efforts by the wireless industry to respond to consumer demands for improved quality of wireless service.”); *Saeid Shafizadeh v. Cingular Wireless*, Opinion and Order, Case No. 2003-00400 at 5 (Ky. P.S.C. Mar. 23, 2005) (“[T]he wireless telecommunications industry is highly competitive. If Complainant is dissatisfied with areas of Cingular's business practice over which the Commission has no jurisdiction, he may select another wireless carrier.”);

²⁵⁵ See, e.g., *Wireless Antitrust Opinion*, 385 F. Supp.2d at 417 (“None of the defendants [including Verizon Wireless, Cingular, T-Mobile, and Sprint] enjoys a market share that would, standing alone, permit an inference of market power to be drawn. . . . The defendants compete against each other in terms of service and price, and the high churn rate is striking evidence of their respective lack of control over the market and the impediments each of them faces to any effort to control price.”); *Jacqueline Orloff v. FCC*, 352 F.3d 415, 421 (D.C. Cir. 2003) (“[N]either Verizon nor any other CMRS provider is dominant. Customers dissatisfied with Verizon's charges or service may simply switch to another provider. . . . Haggling is a normal feature of many competitive markets. It allows consumers to get the full benefit of competition by playing competitors against each other. Here Verizon has adopted the practice as a competitive marketing strategy.”).

analysts²⁵⁶ have all found that the wireless industry is competitive.



All of this competition, investment, and growth has occurred on roughly 190 MHz of the electromagnetic spectrum – a small fraction of the prime bandwidth located below 3 GHz.²⁵⁷ Newly available spectrum will make the market even more competitive. The FCC has recently auctioned off a considerable amount of additional spectrum in the Advanced Wireless Services auction, both to existing providers and new entrants. One of the largest winning bidders is a joint venture between Sprint and four of the nation’s largest cable operators (Time Warner, Comcast, Cox, and Advance/Newhouse), who spent \$2.4 billion for 137 wireless licenses that they claim “will create a true national footprint.”²⁵⁸ Other auction winners include NextWave, Leap Wireless, and MetroPCS, which will be able to expand their regional footprints.²⁵⁹ The

²⁵⁶ See, e.g., S. Flannery, et al., Morgan Stanley, *Telecom Services: 4Q06 Preview / 2007 Outlook: Is Telecom Back for Good?* at 28 (Jan. 24, 2007) (“The wireless industry is intensely competitive, with heavy advertising, substantial handset subsidies and declining per-minute yields.”); M. Rollins, et al., Citigroup, *Sprint Nextel (S): Marketing Hurdles Remain As Integration and 4G Activities Progress* at 9 (Dec. 4, 2006) (“Sprint’s wireless business faces general industry risks such as the high level of competition with as many as six carriers per market, the capital intensity of network buildouts, and the high level of financial leverage in the industry.”).

²⁵⁷ See Thomas Hazlett & Matthew Spitzer, *Advanced Wireless Technologies and Public Policy*, 79 S. Cal. L. Rev. 595, 640 (Mar. 2006).

²⁵⁸ See Time Warner Cable Press Release, *Cable Consortium Acquires Spectrum Licenses Covering National Footprint* (Oct. 5, 2006).

²⁵⁹ See NextWave Press Release, *FCC Grants 154 AWS Licenses to NextWave* (Dec. 20, 2006) (NextWave president and CEO Allen Salmasi: “We . . . look forward to working with service provider partners to use this valuable spectrum to deliver next-generation wireless broadband services to the market.” “Combined with the Company’s existing 2.3 GHz and 2.5 GHz spectrum assets, the newly granted AWS licenses provide NextWave with a national spectrum footprint that covers approximately 247 million people in the U.S.”); M. Jay, *Rare Air*, *Wireless Wave* at 17 (Winter 2007), http://files.ctia.org/pdf/AfterAWSWhatsNext_WW_Winter07.pdf (“Leap had two goals in the auction, says Tim Ostrowski, the company’s vice president, business development. ‘One was expanding into new clusters. We added a significant number of new markets in this auction. The other was to increase the amount of

FCC also is planning additional spectrum auctions in the future. The largest of these is for 60 MHz in the 700 MHz band – prime spectrum for wireless broadband services²⁶⁰ – which Congress has ordered the FCC to complete by January 28, 2008.²⁶¹

Licensed wireless carriers face additional competition from unlicensed wireless technologies such as WiFi. In bands below 6 GHz, approximately 685 MHz of spectrum is now allocated to unlicensed use.²⁶² By comparison, Verizon Wireless and AT&T each typically make do with about 40 to 60 MHz of spectrum in each geographic market. As noted above, WiFi hotspots have been deployed throughout the country, and dozens of cities have begun deploying WiFi networks to provide high-speed Internet access and other services. *See* § III.B.

MVNOs provide an additional layer of competition. MVNOs rebrand the service of facilities-based carriers and often repackage it with the MVNO's own exclusive content or devices. For example, AMP'd Mobile resells Verizon Wireless's service with unique video and gaming content; its investors include Viacom's MTV unit and Universal Music Group.²⁶³ EarthLink resells Sprint service under the Helio name²⁶⁴ and offers three exclusive mobile devices and a variety of unique content and applications, such as Helio On Top (H.O.T.) (live content feeds sent directly to the Helio device idle screen) and Gifting & Begging (allowing Helio users to purchase content such as a music video or game, and have it delivered to another Helio user's device).²⁶⁵ Jitterbug offers simplified handsets targeted for baby boomers and the elderly.²⁶⁶ Virgin Mobile offers specialized handsets and music-oriented content.²⁶⁷ Disney

spectrum that we had in both our new and existing markets so that we had at least 20 MHz or more. That allows us to offer a full range of products to our customers, including both voice and data that is going to be so critical as we go forward in the marketplace.”).

²⁶⁰ *See* Catherine W. Seidel, Acting Bureau Chief, Wireless Telecommunications Bureau, FCC, Written Statement on Wireless Issues/Spectrum Reform before the Senate Committee on Commerce, Science and Transportation (Mar. 14, 2006) (“This spectrum is particularly well-suited for wireless broadband uses, and promises to yield significant benefits and innovative services for consumers.”).

²⁶¹ Other scheduled auctions include 1.4 GHz bands (Auction 69 for 8 MHz began February 7, 2007); broadband PCS (Auction 71 of unsold/returned PCS spectrum begins May 16, 2007); and 220 MHz (Auction 72 for 250 kHz begins June 20, 2007). *See* FCC Wireless Telecommunications Bureau, *Auctions*, http://wireless.fcc.gov/auctions/default.htm?job=auctions_home.

²⁶² *See* 3G Americas, *Technical Analysis and Position Paper on the Regulatory Issues Between Licensed and Unlicensed Spectrum* at 2 (June 2004), http://www.3gamericas.org/PDFs/licensed_unlicensed_spectrum.pdf.

²⁶³ T. Watts, *et al.*, Cowen and Company, *Mobile Content Delivery – The Next Wave of Wireless Growth* at 6 (June 28, 2006).

²⁶⁴ R. Klugman, *et al.*, Prudential Equity Group, *The Dust Has Settled: We Think It's O.K. To Own Telecom Stocks Again* at 103 (July 20, 2006); *see also* J. Breen, Jr., *et al.*, Thomas Weisel Partners, *Revisiting the MVNO Space – Survival of the Fittest* at 6 (June 22, 2006) (“Helio does point out that 63% of recent gross additions switched networks while 37% were new to wireless.”).

²⁶⁵ Helio Press Release, *Helio Is Here* (May 2, 2006); Helio Press Release, *Helio Drift Has Arrived* (Nov. 9, 2006).

²⁶⁶ Jitterbug Press Release, *GreatCall™ Announces National Availability of Jitterbug™ Cellular Phones and Service* (Oct. 11, 2006).

²⁶⁷ *See* V. Shvets, *et al.*, Deutsche Bank, *MVNO Growth – Watch Out for the Sharp Teeth* at 5 (Apr. 5, 2004).

Mobile offers phones with child location services, parental control features, and the ability to download unique Disney content.²⁶⁸

This highly competitive industry structure has put the U.S. ahead of the rest of world in delivering high-quality and low-priced wireless services to consumers. As described above, all major wireless carriers are now in the process of deploying next-generation (or 3G) wireless networks to consumers. Verizon Wireless and Sprint each already makes 3G services available to more than 200 million people, and AT&T to more than 35 million.²⁶⁹ Verizon Wireless and Sprint both recently deployed EV-DO Revision A technology, enabling faster average download speeds of 450-800 kbps or higher, and average upload speeds of 300-400 kbps or higher.²⁷⁰ As the FCC and others have found, the U.S. has leapfrogged Europe in making broadband services available, despite getting a later start due to early 3G licensing in Europe.²⁷¹ Wireless broadband services are now more widely available in the U.S. than in Europe, and also offer higher speeds.²⁷²

Overall wireless usage also is greater in the U.S. than internationally. According to FCC data, average minutes of use among U.S. wireless subscribers were 798 per month in the fourth quarter of 2005, compared with an average across Western Europe of 142.6 MOUs, 147 in Japan, 321.6 in South Korea, and 395 in Hong Kong.²⁷³ This greater U.S. usage reflects the fact that wireless rates in the U.S. are among the lowest in the world.²⁷⁴ An industry analyst estimated that the average U.S. wireless consumer spends \$54 per month on wireless services but

²⁶⁸ R. Klugman, *et al.*, Prudential Equity Group, *The Dust Has Settled : We Think It's O.K. To Own Telecom Stocks Again* at 103 (July 20, 2006); T. Watts, *et al.*, Cowen and Company, *Mobile Content Delivery – The Next Wave of Wireless Growth* at 5-6 (June 28, 2006).

²⁶⁹ Verizon Wireless News Release, *Verizon Wireless Launches Faster New Wireless Broadband Network* (Feb. 1, 2007); Sprint, *The Largest Mobile Broadband Network*, <http://powervision.sprint.com/mobilebroadband/plans/coverage.html>; Sprint News Release, *Sprint Powers Up Faster Mobile Broadband Network in 10 More Markets, Upgraded Coverage Reaches 60 Million People* (Dec. 12, 2006); Cingular News Release, *Cingular Launches 3G Network in Indianapolis* (Sept. 22, 2006). In January 2007, Cingular announced that its 3G network covers 165 cities, including 73 of the top 100 markets in the country. Cingular News Release, *Cingular Wireless Reports Fourth-Quarter 2006 Results* (Jan. 24, 2007). See also Verizon Wireless, *BroadbandAccess Coverage Area*, <http://www.verizonwireless.com/b2c/mobileoptions/broadband/coveragearea.jsp>; Cingular, *BroadbandConnect Coverage Map*, available at http://www.cingular.com/broadbandconnect_consumer; Sprint Nextel, *Search for Sprint Power Vision(SM) Network Coverage Areas*, <http://www.sprint.com/business/products/products/evdoEnterZip.jsp>.

²⁷⁰ See Verizon Wireless News Release, *Verizon Wireless Launches Faster New Wireless Broadband Network* (Feb. 1, 2007); Sprint News Release, *Sprint 'Powers Up' Largest Mobile Broadband Network with More Upgraded Markets, Faster Speeds, New Device and Integrated GPS Capabilities* (Jan. 30, 2007).

²⁷¹ *Eleventh CMRS Report* ¶ 202 (“Although early 3G licensing gave European operators a head start in the deployment of WCDMA networks, *Wall Street Journal* personal technology columnist Walt Mossberg argues that the superior next-generation technologies deployed by U.S. wireless carriers have given the United States an edge over Europe in wireless data networks for the first time in years.”) (citing Walter S. Mossberg, *Cingular Joins Rivals with Fast, Reliable Wireless Broadband*, *Wall St. J.* at A9 (Jan. 19, 2006)).

²⁷² *Id.*

²⁷³ *Id.* ¶ 192 (“[T]he United States continues to lead the world in average minutes of use per subscriber.”).

²⁷⁴ *Id.* ¶ 189 (“[M]obile calls continue to be significantly less expensive on a per minute basis in the United States than in Western Europe and Japan.”).

would pay about \$125 for the same services in the European Union.²⁷⁵ Average revenue per minute, a standard proxy for mobile pricing, is \$0.07 in the U.S. compared to an average of \$0.22 in Western Europe, \$0.27 in Japan, and \$0.10 in South Korea.²⁷⁶

V. CONCLUSION

Broadband provides a case study for how deregulation promotes competition and investment. The case for broadband regulation is based solely on hypothetical concerns about abuse of market power and discrimination. There is no proof of actual or likely market failure or other demonstrated problems that require regulatory intervention at this time. To the contrary, the technological innovations and innovative business practices that broadband regulation seeks to ban are both efficiency-enhancing and pro-competitive. By contrast, there are immediate concerns that regulation will thwart future broadband innovation and competition, as it did in the past. The case for broadband regulation therefore fails the standard tests for government intervention and regulation. For these reasons, the FTC should oppose broadband regulation. In addition, the FTC should take an active role in ensuring that other federal and state regulators and policymakers do not impose such regulation.

²⁷⁵ See CTIA Press Release, *Wireless Becomes Vital Economic Engine: Study Shows Industry To Be Major Economic Player in U.S.* (Oct. 6, 2005) (citing Ovum).

²⁷⁶ *Eleventh CMRS Report* ¶ 193.