

**Before the
Federal Communications Commission
Washington, DC 20554**

In the Matter of)	
)	
A National Broadband Plan for Our Future)	GN Docket No. 09-51
)	
)	

**COMMENTS OF VERIZON AND VERIZON WIRELESS ON A NATIONAL
BROADBAND PLAN**

Michael Glover
Of Counsel

Edward Shakin
William H. Johnson
VERIZON
1320 North Court House Road
9th Floor
Arlington, Virginia 22201
(703) 351-3060

John T. Scott, III
William D. Wallace
VERIZON WIRELESS
1300 I Street N.W.
Suite 400 West
Washington, DC 20005

June 8, 2009

TABLE OF CONTENTS

I.	SUMMARY	1
II.	WHERE WE ARE NOW AND THE GOALS WE ARE WORKING TOWARDS: UBIQUITOUS AVAILABILITY, WIDESPREAD ADOPTION, AND CONSUMER EMPOWERMENT	11
A.	Most Americans Have the Benefit of Real Broadband Competition	12
B.	The Goals As We Move Forward	24
1.	Ubiquitous Availability.....	24
2.	Widespread Adoption.....	25
3.	Consumer Empowerment	26
III.	A PLAN FOR UBIQUITOUS BROADBAND DEPLOYMENT, WIDESPREAD BROADBAND ADOPTION, AND CONSUMER EMPOWERMENT	29
1.	A Focused Effort to Encourage Broadband Demand.....	31
2.	A Consumer Choice Framework.....	36
3.	Encouraging Continued Innovation to Improve Cybersecurity Both For Consumers and the Nation.....	45
4.	Pursuing A Consumer-Focused Approach to Privacy that Encourages Broadband Adoption and Continued Innovation and Investment	54
5.	Facilitating Wireless Broadband Services	63
a.	Expediting Tower Siting Would Further Broadband Deployment.....	63
b.	Identify Additional Spectrum for Wireless Broadband	68
c.	The Flexible Use Licensing Policy Promotes Wireless Broadband	70
6.	Pursuing a Pro-Growth Regulatory Approach that Encourages Broadband Investment and Innovation	76
a.	A Flexible, Pro-Growth Approach Furthers Broadband Goals.....	77
b.	The Flexible, Pro-Growth Approach Also Promotes Openness	85
c.	Intrusive Broadband Regulation Would Harm Consumer Choice.....	87

d.	Flexibility in Network Management Also Benefits Consumers	92
e.	Wireless Broadband Networks Should Not Be Subject to the Wireline Broadband Principles or Other Intrusive Regulation	96
7.	Reforming the Universal Service Fund for the Broadband Era.....	112
8.	Encourage Broadband by Encouraging IP-Based Services	118
9.	Effective Implementation of Stimulus Programs	125
10.	Encouraging Broadband Adoption and Deployment Through Tax Reform.....	127
IV.	CONCLUSION	133

I. SUMMARY

As the Commission prepares its recommendations for Congress, the aims of the national broadband plan should be clear:

- Broadband availability for *all* Americans;
- Widespread adoption and use of broadband services; and
- Consumer empowerment, with continued growth in the choice of services, applications and devices, enabled by even more robust, useful and secure broadband services.

Verizon¹ fully shares these broadband goals and will work with the Commission, the Administration, Congress, and other policymakers and stakeholders to achieve them in order to enable consumers and the nation to receive the full benefit of both broadband technology and the Internet.

Broadband holds extraordinary promise for consumers and the nation. Consumers will continue to benefit from both broadband technology and the Internet, and put both to an ever-expanding number of uses throughout all parts of their lives. Broadband will also be an increasingly important part of efforts to address the many challenges that we face – ranging from accessibility, to health care, to energy efficiency, to education and work force development, to economic recovery and competitiveness. To be successful, however, broadband must be available; it must be widely adopted and utilized; and it must be sufficiently robust, secure and advanced to accommodate and serve the near-infinite number of uses – from the frivolous to the life-or-death – that broadband will support. And broadband must continue to provide consumers and others with an expanding range of choices – in terms of speeds, levels of security and reliability, mobility, or other capabilities – to meet their many and varied demands.

¹In addition to Verizon Wireless, the Verizon companies participating in this filing (“Verizon”) are the regulated, wholly owned subsidiaries of Verizon Communications Inc.

Much progress towards this broadband vision has already occurred. A lively and open ecosystem of innovation and investment has helped to make broadband an integral part of the lives of millions of Americans, providing an ever-expanding array of services, applications and devices to address nearly any conceivable purpose. Network providers – with their millions of jobs and billions in annual investments in networks and innovation – have been a vital part of that dynamic and are delivering concrete benefits to Americans during these troubled economic times while building the platforms essential to innovation. Most consumers have choices among ever-more-robust broadband networks that meet their needs at home, at work, and on the go.

But much work remains to be done for broadband to achieve its full potential in the United States. First, policymakers – together with industry and other stakeholders – need to find ways of ensuring that *all* Americans have access to broadband. Today, well over 90 percent of Americans have such access, and most consumers can choose from at least two wireline broadband providers, three or more wireless broadband providers, and two satellite broadband providers for broadband Internet access services. But given the cost and/or difficulty of serving certain areas, some consumers remain unserved by broadband (other than satellite). Any national broadband plan should have as a top priority filling those gaps. Doing so will mean good jobs and economic stimulus both for those building the networks to unserved areas and for the communities served by broadband, as well as increased opportunity for those Americans who will be able to come online for the first time. Ubiquitous availability will also be essential in enabling the full range of public benefits that can flow from broadband technology.

Second, in many more areas, work remains to be done to address the other factors that prevent too many consumers from adopting broadband services. Roughly 40 percent of Americans do not adopt broadband when it is available to them. Reports indicate that

approximately 80 percent of households with computers currently subscribe to broadband, thus suggesting that computer ownership is one significant factor affecting broadband adoption.

More broadly, a recent survey conducted by the Pew Internet & American Life Project indicated that for more than two-thirds of Americans that do not have broadband, issues such as lack of computer literacy, or failure to appreciate the potential relevance of broadband to their lives, are primarily accountable for consumers' decision not to get broadband – not lack of availability or price. We also know that concerns related to privacy or online safety may prevent some from adopting broadband or accessing the public Internet.

Third, consumers should be empowered with choices in services, applications and devices that meet their many and evolving uses of broadband. Consumer empowerment and expanded choice will depend on broadband providers and other providers of Internet services, applications and devices continuing to innovate and invest to spread the reach and capabilities of broadband and to continue the evolution of broadband networks and the services, applications, and devices that use broadband or the public Internet. Policies that encourage innovation and investment will also help to ensure that jobs of tomorrow are available to Americans, that businesses in this country are competitive globally, and that broadband is capable of doing all that it can to benefit consumers and to address other urgent national priorities.

A Consumer-Focused, Pro-Innovation, Pro-Growth National Broadband Plan. The key to addressing these challenges and realizing the vision of ubiquitous broadband availability, widespread adoption, and empowered consumers will be a policy framework that increases consumer choices and that reinforces the powerful cycle of innovation and investment in broadband. This continued innovation and investment is necessary, not only to create expanded

choices for consumers, but also to maximize the many societal benefits of broadband in areas such as health care, energy efficiency, and education.

Any policy framework should build on the successes of the pro-growth, stimulative policies that have unleashed enormous private investment in broadband networks, widespread availability of services providing access to the public Internet, and tremendous innovation in the services, devices, applications, and networks available to most consumers. In reliance on these policies, broadband providers have invested more in broadband infrastructure over recent years than the federal government has spent on highways, bridges or airports, and American consumers and workers are directly benefitting from this steady flow of investment.

In order to maintain this healthy dynamic – while furthering the core goals of ubiquitous availability, widespread adoption, and consumer empowerment – the Commission’s recommendations to Congress should include the following elements:

1. A Focused Effort to Encourage Broadband Demand. For broadband to achieve its potential, creative approaches to – and a sustained focus on – demand-side issues affecting broadband adoption are required. Too many consumers lack computers; lack the knowledge, skills, or comfort level to go online; or fail to recognize the relevance of broadband to their lives. Such issues – and not availability or price – are the predominant obstacles to more widespread adoption. Policymakers should consider a variety of approaches to increase computer ownership and computer literacy, and to address other demand-side factors that keep people offline and prevent more Americans from understanding how broadband can improve their lives.

2. A Consumer-Choice Framework. As consumers’ and the public’s uses of broadband technology continue to evolve and become more varied, expanding consumer choice is central to fulfilling broadband’s potential. Policymakers should pursue a flexible approach

that encourages continued innovation and investment to increase the choices in networks, services, devices and applications from which they may choose, rather than adopting new limitations freezing in place a one-size-fits-all approach. The Commission should recommend to Congress a consumer-focused national policy that relies on informed consumer choice to drive the evolution of the broadband and Internet marketplace. To further this policy, Congress should encourage and promote the development of industry best practices to promote transparency by ensuring that providers of broadband services, devices, or applications give consumers the types of meaningful information that allow informed decisions. Policymakers should permit and encourage providers to innovate and to experiment with different types of offerings – whether in terms of pricing or network management techniques or other differentiating factors – and let consumer preference, informed by transparency that comes from meaningful information about available choices, determine the direction in which the broadband technology and the Internet marketplace continue to evolve.

3. Encouraging Continued Innovation to Improve Cybersecurity Both for Consumers and the Nation. In order to effectively address the evolving and significant threats that exist online – and to foster the level of comfort and security needed to encourage consumers to go online – policymakers should encourage providers to develop and employ a variety of innovative tools and approaches that improve cybersecurity. As President Obama recently recognized, cybersecurity “is one of the most serious economic and national security challenges we face as a nation,” and effectively addressing this challenge will require public entities to “collaborate with industry to find technology solutions that ensure our security and promote prosperity” and to “continue to invest in the cutting-edge research and development necessary

for the innovation and discovery we need to meet the digital challenges of our time.”² Especially as broadband is put to increasingly sensitive uses – ranging from a consumer handling his or her finances online to a medical service that monitors a patient’s cardiac activity to emergency communications and national security uses – the need for more robust and effective cybersecurity measures likewise increases. An increased level of coordination and cooperation among public and private stakeholders will be essential in order to tackle the complex and daunting challenge of cybersecurity. At the same time, encouraging continued innovation in broadband networks and services – such as by encouraging the deployment of technology that makes networks smarter and more capable of fending off and responding to attacks – will be required.

4. Pursuing a Consumer-Focused Approach to Privacy that Encourages Broadband Adoption and Continued Innovation and Investment. Likewise, protecting consumers’ privacy is an essential part of encouraging consumers to adopt and use broadband. In order to help foster the level of trust and comfort that consumers need in order to engage online, policymakers should take a comprehensive approach to consumer privacy that is consumer focused and that encourages all providers of services on the Internet to provide consumers with meaningful information and choices concerning the use of their private information. The approach taken to protect consumer privacy should apply throughout the broadband and Internet ecosystem, and should be technologically and competitively neutral, rather than targeting particular technologies or classes of providers. In particular, policymakers should promote the creation of effective industry best practices to ensure that consumers’ data are adequately protected and to ensure that consumers have an informed, meaningful choice before receiving

² http://www.whitehouse.gov/the_press_office/Remarks-by-the-President-on-Securing-Our-Nations-Cyber-Infrastructure (May 29, 2009).

online behavioral advertising based on Internet viewing behaviors over time and across unaffiliated web sites.

5. Facilitating Wireless Broadband. Wireless broadband platforms will be central to meeting national broadband goals, and could prove especially important in reaching unserved areas. There are several steps policymakers should take to encourage wireless broadband and to remove current obstacles to more widespread deployment and adoption. First, the Commission should recommend reforms that expedite the approval process for tower- and antenna-siting, thus limiting delays in wireless broadband deployment caused by the local approval process. Second, federal policymakers should identify spectrum bands that can be reallocated for future broadband use. Third, the Commission should re-commit to its market-based spectrum management policies that rely on geographic-based, exclusive use licenses that give licensees the flexibility to meet consumers' evolving demands.

6. Pursuing a Pro-Growth Regulatory Approach that Encourages Broadband Innovation and Investment. Policymakers should ensure that any new policies maintain the healthy dynamics of the broadband marketplace that are currently creating or preserving jobs and leading to additional choices for consumers. The decision to apply a flexible, pro-growth regulatory approach to broadband and the Internet – initiated during the Clinton Administration – has directly resulted in tremendous levels of investment by broadband providers and the rapid spread of facilities-based competition and deployment of next-generation broadband networks. Imposing intrusive new regulations – such as a broad nondiscrimination requirement, cost-based rate justifications, or other common carriage-like regulations – in this competitive marketplace is unnecessary and would undermine these successes and stifle the sustained innovation and investment needed to meet consumers' and society's demands going forward. Similarly,

permitting wide flexibility in reasonable network management practices will help to ensure that providers are able to meet consumers' evolving demands for reliable and safe broadband and will further consumer choice.

All of these concerns are particularly acute in the context of wireless broadband services. Given the technical challenges in delivering high quality services in a mobile environment and over finite and shared spectrum resources – and given the robust competition among providers of wireless broadband services and the existing, customer-driven momentum towards greater openness – any additional regulation of wireless broadband services would be counterproductive.

As noted above, transparency – with providers of all types disclosing to consumers meaningful information enabling informed consumer choice – will protect and empower consumers while encouraging the continued innovation and investment fostered by the current pro-growth policy approach to broadband and the Internet.

7. Reforming the Universal Service Fund to Encourage Broadband. Policymakers need to update the existing universal service fund (“USF”) to enhance broadband. Two measures are necessary to create a sustainable fund that can help support broadband. First, policymakers must set a budget, or a reasonable cap, for the high cost portion of the USF. Once we define the limits of what consumers – who ultimately pay for universal service through charges on their bills – should be asked to fund, focus can shift to retargeting support to the most pressing broadband priorities. For example, policymakers could provide targeted universal service support for “middle mile” facilities needed to transport Internet traffic to and from rural areas. Likewise, policymakers should transition to a competitive bidding system for wireless USF support in order to target support more efficiently and more effectively and encourage wider deployment of wireless broadband services. Second, to fix the broken universal service

funding mechanism without double-taxing broadband, policymakers should replace the current revenue-based USF contribution system with a flat-rate charge on phone numbers.

8. Encourage Broadband by Encouraging IP-Based Services. The increased use of Internet Protocol (IP)-based services encourages broadband availability and adoption, and vice versa. To encourage deployment of broadband infrastructure and the IP-based services it makes possible, policymakers should reaffirm once and for all that all IP-enabled services are interstate services subject to the Commission's exclusive jurisdiction. These services are being deployed nationally and internationally, using common systems and platforms. Widespread deployment simply cannot be done on a disparate state-by-state basis under more than 50 different sets of rules. As President Obama noted in announcing new national fuel efficiency standards, multiple sets of overlapping requirements result in "an inefficient and ineffective system of regulations."³ Providers of IP-enabled services similarly need commonality. The Commission should also classify voice-over-IP ("VoIP") services as information services. The industry has grappled with (and fought over) this issue for years, and clarifying it will further national broadband goals by finally resolving a question that has diverted attention and resources better spent providing these advanced services to consumers.

9. Effective Implementation of Stimulus Programs. The more than \$7 billion in funding that the American Recovery and Reinvestment Act of 2009 ("Recovery Act") provided to the National Telecommunications and Information Administration (NTIA) and the Rural Utilities Service (RUS) for broadband-related projects provides an unprecedented opportunity to address the obstacles that stand in the way of achieving the nation's broadband goals. Consistent with the broader goals discussed above, the finite resources provided by the Recovery Act should

³ http://www.whitehouse.gov/the_press_office/Remarks-by-the-President-on-national-fuel-efficiency-standards/ (May 19, 2009).

be targeted to the country's most pressing broadband needs. First and foremost, that means awarding grants to projects that would extend broadband service to unserved areas. If funds remain after funding projects targeted at the unserved, then NTIA should focus remaining funds on projects that address demand-side issues – such as computer ownership, computer literacy, and lack of understanding of the benefits of broadband – that limit broadband adoption. NTIA and RUS also should encourage broad participation and a wide pool of potential projects by avoiding unnecessary regulatory strings, such as intrusive broadband regulation.

10. Encouraging Broadband Adoption and Deployment through Tax Reform.

Targeted federal tax policies and reforms – such as reform to the rules concerning depreciation or the creation of refundable tax credits and investment tax credits – also could effectively address both demand- and supply-side issues affecting broadband adoption and deployment. Such policies could contribute significantly and directly to the goals of extending broadband to unserved areas, encouraging widespread adoption (including by lower income individuals), and encouraging investment that would create jobs and stimulate the economy. Tax reforms also are needed at the state and local level to ensure that discriminatory and regressive tax provisions do not discourage broadband investment and, instead, increase affordability, thus encouraging wider adoption of communications services, including broadband.

By following this consumer-focused, pro-growth and pro-innovation framework and taking these steps to encourage broadband deployment and adoption, policymakers would encourage broadband deployment and adoption, and would empower consumers with an increasing array of choices.

II. WHERE WE ARE NOW AND THE GOALS WE ARE WORKING TOWARDS: UBIQUITOUS AVAILABILITY, WIDESPREAD ADOPTION, AND CONSUMER EMPOWERMENT

In order for any national broadband plan to be useful and successful, it must reflect a clear understanding of the dynamics and facts of today's broadband marketplace and establish clear goals for moving forward. In most areas, intensive private investment in broadband is creating or preserving high quality jobs, spreading ever-more-robust wireline and wireless broadband networks, and fostering robust, intermodal competition that is increasing the choices for consumers. The Internet is open – allowing consumers to go where they want and do what they want online – and wireline and wireless broadband networks provide powerful platforms for innovation. The national broadband plan should recognize and build on these successes.

At the same time, the broadband marketplace is a work in progress, and more needs to be done for broadband to reach its full potential in this country. The Commission's recommendations should establish clear goals to get us there. While broadband has the potential to create jobs and provide innumerable consumer and public benefits, the primary focus of any broadband plan should be three issues that are prerequisites for broadband to realize its potential:

- **Ubiquitous Broadband Availability.** Broadband technology should be available to *all* Americans, regardless of where they live or work.
- **Widespread Adoption.** Broadband adoption should be widespread. All Americans should have the devices and the ability to go online and take advantage of the many benefits of broadband services and the public Internet. They should also understand the ways broadband can improve their lives.
- **Consumer Empowerment.** As broadband and the Internet continue to evolve, they must truly empower consumers with more choices – enabled by continued innovation and investment – that allow broadband technology to meet consumers' and the public's evolving demands.

By focusing on these three, core objectives, the national broadband plan would set the stage for all of the many benefits that will flow to consumers and society from broadband.

A. Most Americans Have the Benefit of Real Broadband Competition

As an initial matter, the Commission and other policymakers should take into account what has worked, and continues to work, in the broadband marketplace and obtain a clear view of where we are today. Private-sector investment in broadband is a fundamental driver of economic growth and innovation and is already leading to concrete benefits to millions of Americans, including the rapid spread of broadband services in most areas and the creation or preservation of millions of jobs. As a result of the hundreds of billions of dollars spent building broadband networks, the availability and reach of competing broadband platforms has rapidly increased over the last several years. The most recent Commission report confirms this trend, revealing that the number of zip codes with four or more broadband providers reporting connections in service grew from 51.5 percent at the end of 2004 to 87.9 percent at the end of 2007.⁴ In fact, more than 90 percent of U.S. households already have access to broadband networks for Internet access, and most consumers have access to at least two wireline broadband platforms, the mobile wireless broadband networks of at least three national providers, and two satellite broadband providers – a level of intermodal competition present in few if any other places in the world. This growth in broadband availability and intermodal competition was prompted by flexible, pro-growth policies aimed at stimulating investment and innovation.

Those same policies are also benefitting American consumers by promoting the rapid growth in availability of next-generation broadband networks. For example, when the Commission confirmed its pro-growth approach to next-generation fiber networks in 2003, fewer than 200,000 American households nationwide had access to fiber-to-the-premises networks.

⁴ FCC Wireline Competition Bureau, *High-Speed Services for Internet Access: Status as of December 31, 2007*, http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-287962A1.pdf, at Table 15 and Chart 12 (Jan. 2009) (“*Broadband Status Report*”).

Now, Verizon alone passes more than 13.2 million households with its all-fiber, FiOS network. Advanced wireless broadband services also continue to spread. Verizon Wireless' current broadband Internet access service is available to more than 280 million people, and its next-generation service will be available to approximately 100 million people by the end of next year.⁵

Consumer adoption of broadband – particularly among households owning computers – has also been rapid, far outpacing the rate of adoption for such popular services as cable television or mobile telephone services.⁶ As of 2007, sixty-two percent of U.S. households accessed the Internet from home – up from only 18 percent a decade earlier – and 82 percent of these households connected to the Internet using broadband.⁷ The Commission's data indicate that in December 2000, there were fewer than 7 million broadband connections nationwide. By the end of 2007, the number of wireline broadband connections had grown to nearly 70 million, not including an additional 52 million satellite and wireless connections.⁸ One analyst recently predicted that notwithstanding the difficult economic times, five million additional consumers will subscribe to broadband this year, and that the nationwide broadband penetration rate would exceed 80 percent within the next five years.⁹ The rate of adoption by households owning

⁵ Verizon at JPMorgan Global Technology, Media and Telecom Conference Transcript, Thompson StreetEvents, http://investor.verizon.com/news/20090519/20090519_transcript.pdf, at 7 (May 19, 2009).

⁶ “Battle for the Bundle: Something in the “Over-the-Air,” Bank of America Merrill Lynch, at 7 (May 19, 2009) (“Battle for the Bundle”).

⁷ Lesley Cauley, “Internet Use Triples in a Decade; Broadband Soars,” USA Today (June 4, 2009).

⁸ *Broadband Status Report* at Table 1.

⁹ “Strategy Analytics: US To Add 5 Million New Broadband Subscribers in 2009, Despite Recession,” <http://www.pr-inside.com/print1293686.htm> (June 2, 2009).

computers has been particularly impressive, thus suggesting that computer ownership is one of the significant issues affecting broadband adoption. Analyst reports indicate that broadband penetration among those households with computers currently is around 80 percent.¹⁰

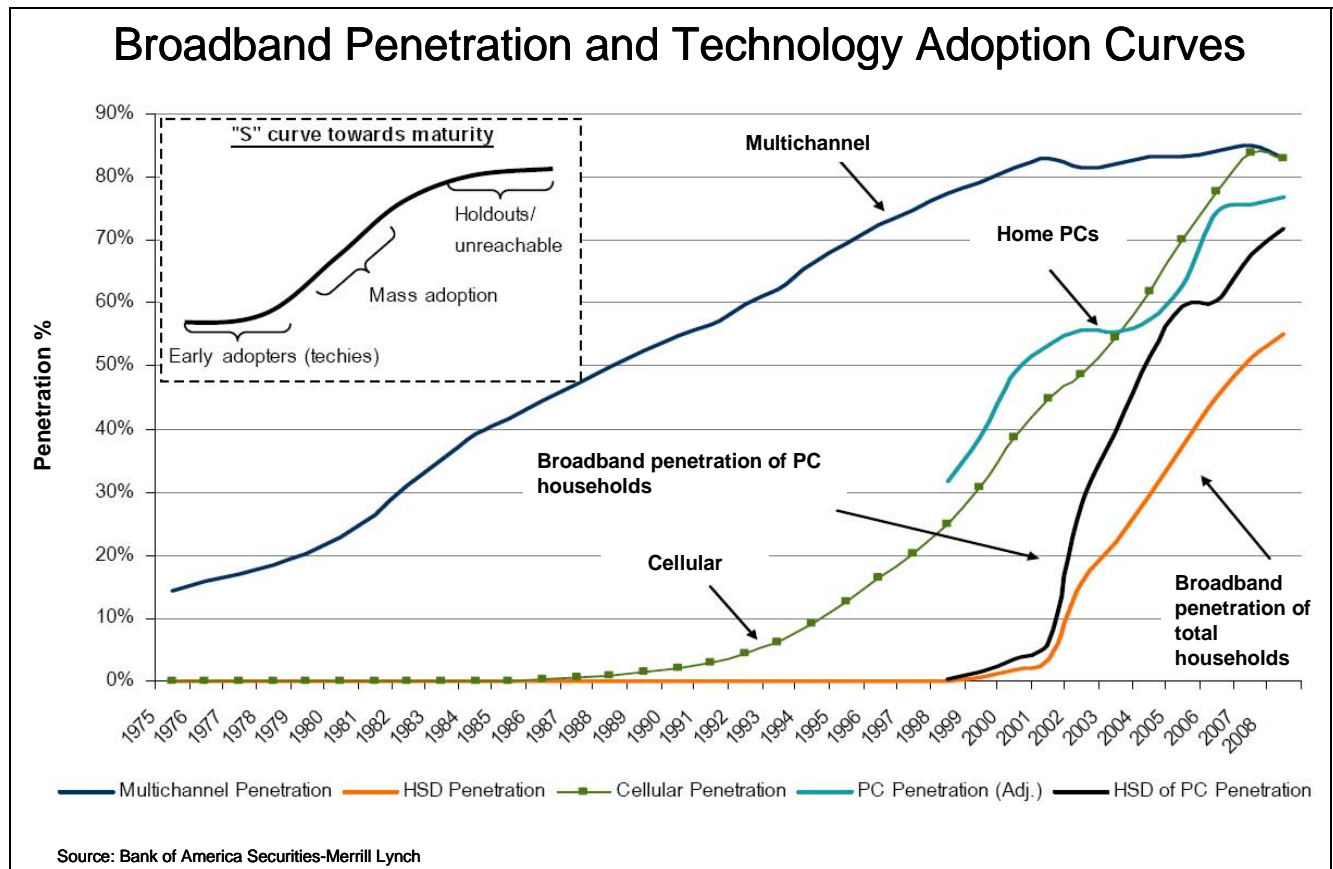


Chart 1

As Chairman Copps recently acknowledged in his report to Congress concerning a rural broadband strategy, “we are not starting from scratch,” but instead Americans are already receiving the benefits of broadband delivered using many different technologies and over many

¹⁰ “Downgrading Telecom Services to Market Weight,” Credit Suisse, at 3 (Feb. 19, 2008) (“Downgrading Telecom Services”); Battle for the Bundle at 7. While not distinguishing between broadband and other forms of Internet access, U.S. Census figures also show that nearly 90 percent of homes with computers subscribed to some form of Internet access as of 2003. See <http://www.census.gov/population/socdemo/computer/2007/Appendix-TableA.xls>.

different types of platforms that, “with American ingenuity, will become faster and more powerful in the years to come”:

High-capacity fiber networks—once found only in dense urban cores—have been redesigned for residential use, and their performance continues to increase. Cable networks are being upgraded to a platform that will support data rates of up to 160 megabits per second (Mbps). While issues remain, broadband over power lines (BPL) continues to emerge as a viable technology option. Wireless technologies are extending broadband into areas unreachable by cables and wires, and enabling consumers to be connected while on the move. Many wireless Internet service providers (ISPs) have used the IEEE 802.11 wireless local area network technologies (commonly known as Wi-Fi) to offer fixed wireless broadband services in areas not reached by wireline technologies. Wireless providers have been launching new broadband technologies that allow subscribers to access the Internet, while mobile, at speeds that are beginning to rival those on landline networks. We expect to see further advancements on the wireless broadband front as wireless service providers begin to build out networks using advanced technologies—such as Long Term Evolution (LTE) or Worldwide Interoperability for Microwave Access (WiMAX)—that support data rates that may exceed 100 Mbps. Finally, satellite broadband, with its near ubiquitous coverage and downstream data rates between 512 kbps and 5 Mbps, can provide a much-needed connection in rural areas, especially where other broadband solutions are not viable for technical or other reasons.¹¹

Tremendous Levels of Investment Are Bringing Consumers Next-Generation

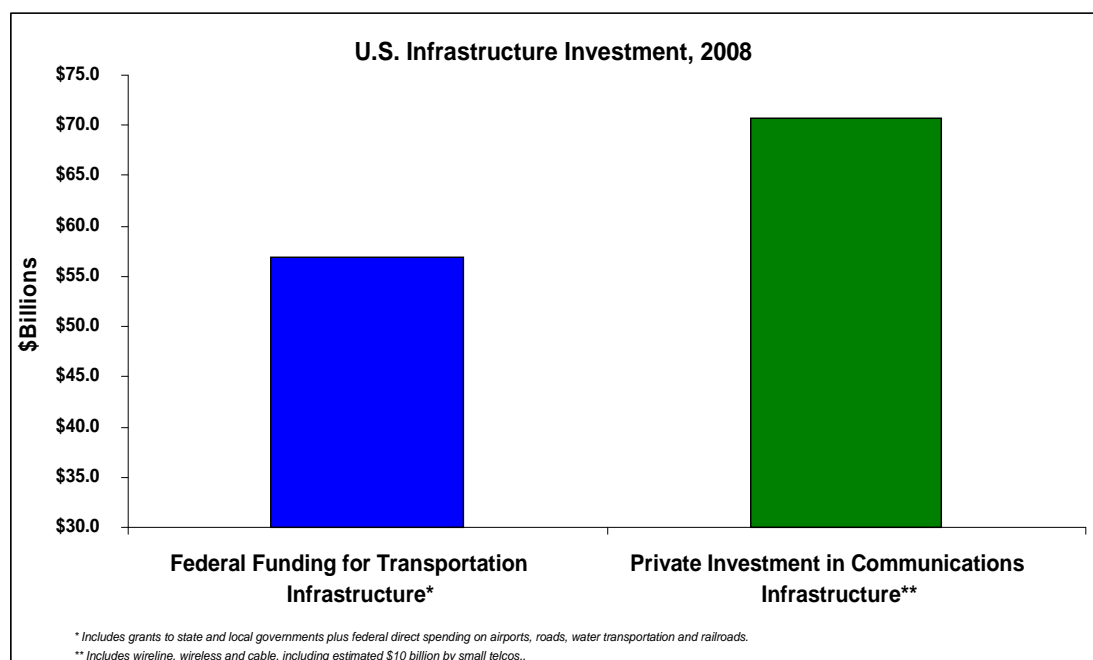
Broadband Networks and Widespread, Facilities-Based Competition. The benefits that are flowing to American consumers and workers from the growing number of competing wireline and wireless broadband networks are the direct result of a tremendous amount of private investment. In fact, in recent years, the private sector has invested more in broadband

¹¹ *Bringing Broadband to Rural America: Report on a Rural Broadband Strategy*, http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-291012A1.pdf, ¶ 10 (May 22, 2009) (internal citations omitted).

infrastructure – nearly \$70 billion annually and hundreds of billion over the last ten years – than the federal government has invested in all forms of transportation.¹²

Communications is a Growth Industry

- In recent years, the private sector has invested more in the telecommunications infrastructure than the Federal government has invested in all forms of transportation infrastructure.
- The economy is seeing the payoff from this investment in productivity, job creation, prices, and GDP growth.



Source: **The Telecom Sector and the Economy: How U.S. Broadband Policies Are Working for America**, Jeffrey A. Eisenach, Ph.D. (Rev. May 2009).

Chart 2

While private investment throughout the economy dropped by 6 percent between mid-2006 and mid-2008, investment in communications equipment grew by nearly 10 percent over that same time period. *Id.* The Chair of the President’s Council of Economic Advisers,

¹² Jeffrey Eisenach, Empiris LLC, “The Telecom Sector and the Economy: How U.S. Broadband Policies Are Working for America,” <http://www.empiris.com/index.php> (follow “Current Events” to “October 17, 2008”) (2008).

Christina D. Romer, recently reiterated the centrality of private “[n]onhousing business investment,” both to help pull the economy out of recession in the short term and to provide a stable basis for economic growth going forward.¹³ The robust private investments being made in the nation’s broadband infrastructure do exactly that.

The heavy investment in broadband also creates high quality jobs. The information and communications technology (ICT) sector accounted for more than half of all jobs created in the United States between April 2007 and April 2008. *Id.* While overall employment shrank by 3.8 percent from February 2008 through February 2009, employment in the ICT sector grew by 2.5 percent over that same period. These jobs are among the highest paying jobs in the economy, with jobs in the ICT industry paying 51 percent higher than the national average, and other ICT-centric jobs paying 37 percent higher than the national average. *Id.* Moreover, broadband has a ripple effect on the local communities where it is offered, resulting in additional jobs even outside of the telecommunications sector and increasing the competitiveness of the businesses with access to broadband.¹⁴ In fact, one study indicates that each \$10 billion increase in broadband infrastructure investment produces nearly 500,000 new jobs (including over 260,000 jobs in small businesses), and that for every one-percentage point increase in broadband

¹³ “Growth Without Bubbles, A Conversation with Christina Romer,” Council on Foreign Relations, <http://www.cfr.org/> (follow “Publication Types,” then follow “Transcripts”), at 7-12 (May 12, 2009).

¹⁴ See Robert Crandall, William Lehr and Robert Litan, Brookings Institution Issues in Economic Policy No. 6, *The Effects of Broadband Deployment on Output and Employment: A Cross-sectional Analysis of U.S. Data*, http://www.brookings.edu/papers/2007/06labor_crandall.aspx (2007); Robert D. Atkinson, Daniel Castro and Stephen J. Ezell, Information Technology & Innovation Foundation Policy Issues Report, *The Digital Road to Recovery: A Stimulus Plan to Create Jobs, Boost Productivity and Revitalize America*, <http://www.itif.org/index.php?id=212> (Jan. 7, 2009); Stephen B. Pociask, TeleNomic Research, LLC, *Building a Nationwide Broadband Network: Speeding Job Growth*, <http://www.newmillenniumresearch.org/archive/jobspaper.pdf> (2002).

penetration in a state, employment increases by 0.2 to 0.3 of a percentage point per year (or about 293,000 jobs nationally).¹⁵

Verizon is leading the charge in investing in America's broadband future, and America is receiving a significant return on this investment in terms of jobs, expanded broadband availability and adoption, and other public benefits from broadband. Indeed, Verizon has invested more in capital expenditures over the last several years – more than \$80 billion from 2004 through 2008 – than *any* other company in the United States in *any* industry.

¹⁵ Atkinson, *supra*. at 5, 8.

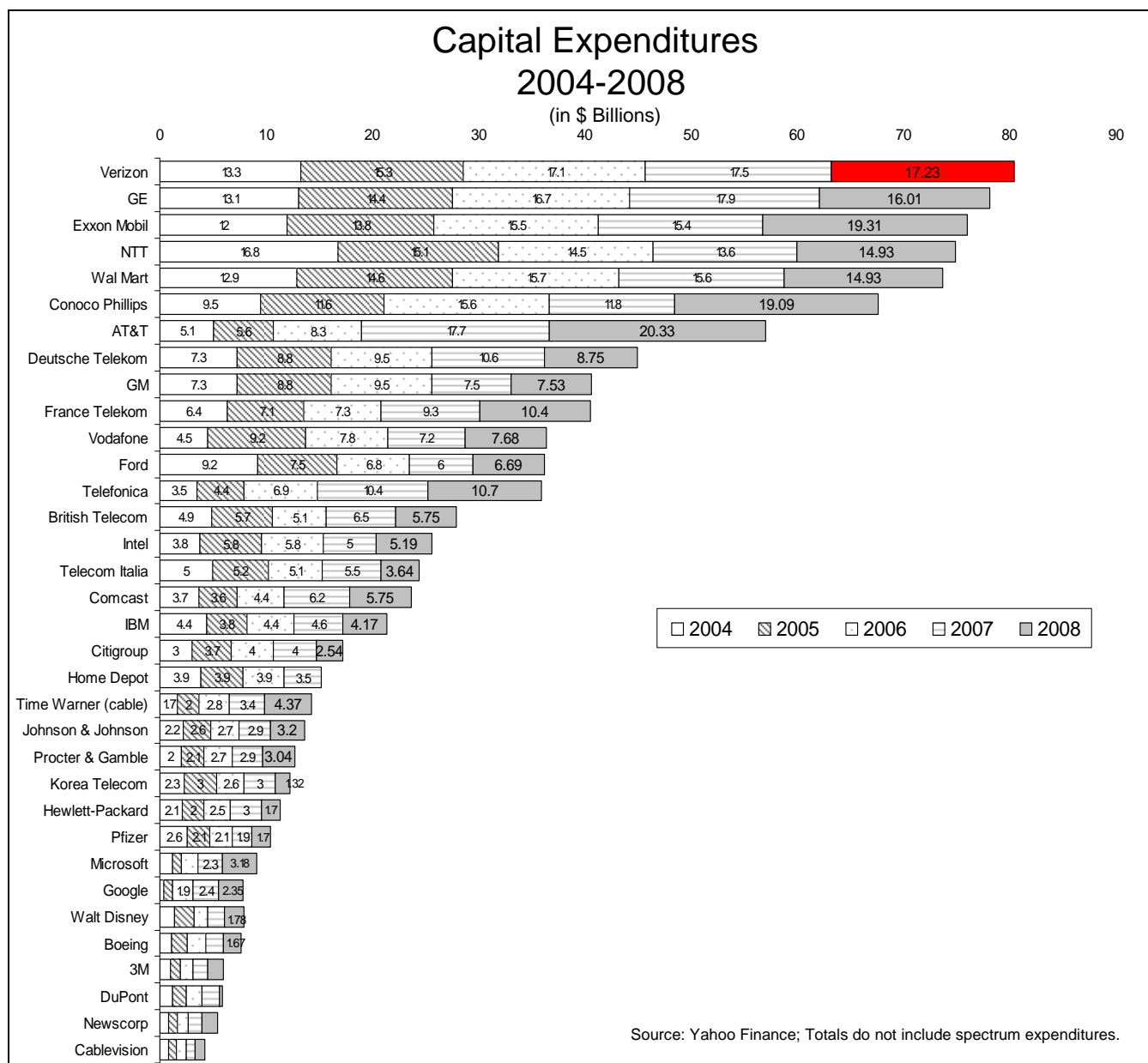


Chart 3

In reliance on and in response to decisions by policymakers – beginning under the Clinton Administration and with Chairman Kennard’s leadership – to follow a flexible, pro-growth regulatory approach, Verizon and other broadband providers are rapidly expanding the reach of next-generation broadband networks. For example, in response to the Commission’s confirmation in 2003 that unbundling obligations would not apply to the broadband capabilities

of next-generation fiber networks, Verizon and other broadband providers responded with dramatic increases in investments to build networks capable of supporting a wide range of innovative services. *See* Declaration of Professor Michael L. Katz, attached hereto as Attachment 1, ¶¶ 26-30 (explaining negative effects of network sharing obligations on network investment by incumbents and those sharing the incumbents' network) ("*Katz Decl.*"). And these investments are directed in ways that directly benefit consumers and create or preserve jobs.

Verizon – with more than 200,000 tax-paying, domestic employees – is investing over \$23 billion and employing tens of thousands of employees to pass 18 million homes with its next-generation, all-fiber FiOS network by the end of next year.¹⁶ We have already passed more than 13.2 million of those homes in 16 states – approximately 40 percent of households in our current landline footprint. More recently, Verizon has begun its deployment of FiOS in larger cities, having obtained franchises in New York City, Philadelphia and Washington, D.C., and it will build out each of these cities over coming years. The FiOS network currently offers Internet access services of up to 50 Mbps upstream and 20 Mbps downstream, and Verizon will increase the available speeds over time. Verizon also continues to spread the reach and capabilities of DSL in other areas – recently expanding the reach of its 7.1 Mbps DSL offering to more areas.

¹⁶ On May 13, 2009, Verizon announced an agreement to sell certain exchanges within its territory to Frontier. Included within those properties are certain FiOS territories where approximately 600,000 premises have been passed with fiber. After the completion of this transaction, Verizon still plans to have passed over 17 million homes and businesses with FiOS by the end of 2010 (not including those areas sold to Frontier), and ultimately would pass 18 million homes with FiOS throughout its remaining footprint – almost 70 percent of households. *See* "Verizon to Discuss Plans to Divest Wireline Businesses in 14 States," Analyst Conference Call Transcript, Thompson StreetEvents, http://investor.verizon.com/news/20090513/20090513_transcript.pdf, at 3 (May 13, 2009).

Similarly, Verizon Wireless has been investing heavily to deploy wireless broadband services. Its third generation (3G) mobile wireless broadband capability using EV-DO Rev. A technology is available to more than 280 million Americans. In 2008, Verizon Wireless invested over \$9 billion for C Block spectrum in last year's 700 MHz auction – thus obtaining a license for 22 MHz of contiguous spectrum throughout the continental United States – and has announced plans to use this spectrum in deploying its fourth generation (4G) wireless network based on Long Term Evolution (LTE) technology. The rollout of that next-generation wireless broadband service, allowing much more robust broadband speeds and capabilities, will begin later this year and be offered to approximately 100 million people by the end of next year.

While Verizon is the clear leader in broadband investment, its investments are driving its competitors to respond in-kind – whether it is cable operators deploying DOCSIS 3.0 technology to add capacity and speed, Clearwire deploying its 4G WiMAX network, wireless Internet service providers (WISPs) deploying fixed wireless, or other intermodal competitors investing in their own innovative platforms to offer broadband. One recent analyst report noted a “trend that began in 2006 and has since expanded [of] . . . the introduction of higher speeds for both standard and premium tiers in markets where cable operators face competition from telco FTTx networks, particularly Verizon's all-fiber FiOS Network.”¹⁷ The presence of FiOS requires cable to “once again dip[] into its technology toolkit to remain competitive,” and “as Verizon has rolled out FiOS Internet and TV services in more and more communities, the market has seen an increasing variety of prices and data rates, as cable operators respond to FiOS launches.” *Id.*

Consumers Are Seeing the Benefits of Broadband Innovation and Investment.

Consumers are the beneficiaries of this robust, intermodal competition in broadband services,

¹⁷ Pike & Fisher, “High-Speed Internet Packaging and Pricing Strategies: 5th Edition,” at 9 (Dec. 2008).

which is driving prices down and spurring companies to create faster and faster networks. As Dr. Everett Ehrlich, the Under Secretary of Commerce for Economic Affairs under President Clinton, recently noted, “[t]he data . . . indicate that the broadband market has grown rapidly while innovating – from speed and capacities, to new services and products enabled because of the new speeds and capacities – and maintaining price moderation.”¹⁸ The additional capabilities resulting from this intermodal competition have allowed consumers to use broadband in new and different ways, while creating platforms for additional innovation in devices, applications and services that increase the choices available to consumers.

The U.S. Compares Favorably With the Rest of the World. The state of the U.S. broadband marketplace is healthy not only in absolute terms, but also compared to broadband marketplaces throughout the world. The United States is one of only a handful of countries in the world – and, with Canada, one of only two G-8 countries – where *two* wireline broadband platforms (cable and DSL) are available to the vast majority of households.¹⁹ The U.S. also is one of only a handful of countries – and the only large country – where private companies are investing to deploy next-generation fiber broadband networks on a large scale. *Id.* In fact, Verizon has deployed more next-generation fiber-to-the-premises lines than all providers in Europe combined.²⁰

¹⁸ Everett Ehrlich, “The Reality of Competition in the Broadband Marketplace,” at 4 (Nov. 2008)

¹⁹ See OECD, *OECD Broadband Statistics: 1d. OECD Broadband Subscribers per 100 Inhabitants, by Technology, December 2008*, <http://www.oecd.org/dataoecd/21/35/39574709.xls>.

²⁰ *Compare Verizon FiOS – Fact Sheet*, <http://newscenter.verizon.com/kit/fios-symmetrical-internet-service/all-about-fios.html> (at the end of March 2009, Verizon’s FiOS network passed 13.2 million homes and businesses), with Roland Montagne, IDATE, *FTTH European Panorama*, http://www.ftthcouncil.eu/documents/studies/Market_Data-December_2008.pdf, at 8, 10 (Dec. 2008) (11.2 million homes passed by FTTH/B in 31 European countries).

The U.S. excels even further with respect to mobile wireless broadband, which is more widely deployed in the United States than most other countries. Indeed, the U.S. ranks highest in wireless Internet penetration,²¹ and all major U.S. wireless carriers are now deploying next-generation wireless networks to consumers, including 4G technologies such as LTE and WiMAX. Finally, not only do the vast majority of Americans have access to at least two wireline broadband platforms and at least three wireless broadband networks, but the U.S. is among a select few developed countries where a fourth platform – satellite – is both ubiquitously available and economical enough to drive consumer adoption.²² Thus, the U.S. compares favorably to other countries, most of which have limited intermodal, wireline competition, less robust wireless broadband capabilities, and no satellite availability, and thus only a single broadband network.

²¹ See OECD, *Broadband Growth and Policies in OECD Countries*, www.oecd.org/sti/ict (follow “Ministerial meeting on the Future of the Internet Economy,” then “Recommendations, Guidances and Background Reports”) at 36 (June 2008) (“*Broadband Growth and Policies in OECD Countries*”); *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services*, Thirteenth Report ¶ 227, WT Docket No. 08-27, DA 09-54 (rel. Jan. 16, 2009) (“*Thirteenth CMRS Competition Report*”).

²² See, e.g., *Broadband Growth and Policies in OECD Countries*, at 8 and 36-37.

B. The Goals As We Move Forward

Notwithstanding the many successes of the broadband marketplace in the United States, it is still a work in progress and much remains to be done for broadband to achieve its full potential. For purposes of the Commission's recommendations to Congress concerning a national broadband plan, it makes sense to focus on three primary goals that are the essential prerequisites to America's broadband future: (1) ubiquitous availability, (2) widespread adoption, and (3) consumer empowerment. Focusing on these three issues will create jobs, increase consumer choice, and facilitate the many consumer and societal benefits of broadband.

1. Ubiquitous Availability

The most basic requirement for consumers to receive the benefits of broadband is access. As noted above, for the vast majority of Americans, access to broadband networks is no longer an obstacle to coming online. Indeed, more than 90 percent of Americans have access to broadband at their homes (not counting satellite), and most of these have access to several competing wireline, wireless, and satellite broadband platforms.

Notwithstanding the widespread competition in most parts of the country, certain high-cost, hard-to-serve areas currently remain completely unserved by any forms of Internet access other than dial-up or satellite. These are the areas where the business case for private investment is most difficult to make. Such areas – which are now being identified with precision by state-level mapping initiatives such as those conducted by Connected Nation – should be at the top of policymakers' list of concerns regarding the broadband marketplace.

The reasons that unserved areas have not yet been reached with broadband vary, and policymakers must consider various approaches that address the full range of obstacles faced by these areas. In some areas that are sparsely populated or that have difficult terrain, the primary

issue may be the cost of deploying the “last mile” facilities to reach end-users. In other rural communities that are distant from the long haul facilities that can carry traffic to the Internet backbone, the problem may be the lack of availability or high costs of “middle mile” facilities. These are the facilities that connect a rural broadband provider to a long haul carrier that can carry the traffic to and from the Internet backbone. Without adequate middle mile capacity, a rural broadband provider may not be able to provide service that will meet the needs of its end-users, or may not be able to provide service at all, even if the “last mile” facilities are in place. And in still other areas, a combination of “last mile” and “middle mile” challenges may be present. Therefore, as it considers its policy recommendations to Congress, the Commission should consider both types of issues, and should look for approaches that address each of these potential problems that may account for an area being unserved.

2. Widespread Adoption

In order to be effective, the Commission’s recommendations to Congress should also address the various demand-side factors that prevent many Americans from adopting broadband services that are available to them. Well over 90 percent of homes have access to wireline broadband networks, but a much smaller percentage subscribe. For example, lack of computer ownership may keep many Americans from going online. In fact, analyst reports suggest that broadband penetration among those owning computers is already around 80 percent.²³ Similarly, a variety of other demand-side factors have kept many consumers from adopting broadband. A recent survey by the Pew Internet & American Life Project indicated that most people who do not subscribe to broadband cite “relevance” or “usability” – not availability or price – as their

²³ Downgrading Telecom Services at 3.

reasons for not doing so.²⁴ In fact, 68 percent of respondents pointed to either “relevance” – such as “not interested” or “too busy” – or to “usability” – such as difficulty, waste of time, or physical inability – as the reasons for not subscribing. Pew Study at 2-3. As these statistics show, policies that increase computer ownership, teach people how to use those computers and navigate the Internet, and demonstrate the relevance and benefits of broadband to their lives could go far in increasing broadband adoption. That increased demand would, in turn, further increase the incentives for private investment in broadband deployment.

Ultimately, for consumers to benefit from the many potential benefits of broadband, they must understand the relevance of broadband to their lives and have the ability to use it. As the Pew survey shows, addressing those issues is perhaps the largest broadband challenge going forward, and a concerted effort to address the many and varied obstacles to adoption is required.

3. Consumer Empowerment

A third, essential goal for any national broadband plan must be to empower consumers by expanding their range of choices with respect to their broadband and Internet services, devices, and applications and by promoting the development of smarter networks and devices better able to meet consumers’ demands in a reliable and secure manner. Broadband will continue to be put to many and varied uses, and consumers will need more choices in order to meet their different needs. One consumer may place a premium on security, another on reliability, another on mobility, and another on ease of use. One consumer may prefer a service optimized for a particular use – such as a medical monitoring service or online gaming – while another may prefer a less managed environment. Because no two users are the same and the potential uses of

²⁴ See John B. Horrigan, Pew Internet & American Life Project, “Obama’s Online Opportunities II,” http://www.pewinternet.org/~media/Files/Reports/2009/PIP_Broadband%20Barriers.pdf (2009) (“Pew Study”).

broadband technology continue to expand, it will be essential to allow sufficient flexibility to allow the broadband ecosystem to develop in ways that best meet consumers' needs and to maintain a fertile environment for continued investment and innovation by providers of all types.

For the same reason, the Commission and other policymakers should avoid arbitrary definitions or conceptions about the definition of "broadband," given the many differences in the way that consumers use or think about broadband – beyond speed thresholds – as they integrate broadband into more and more parts of their lives.²⁵ *See Katz Decl.* ¶¶ 58-61 (discussing "multi-dimensional" nature of consumer preferences for broadband).

For broadband to empower consumers and produce the other public benefits that are possible, innovation and investment is needed to make broadband networks – and all of the services, applications, devices that rely on broadband – smarter, more reliable and safer. Rather than taking a one-size-fits-all approach or putting the brakes on the continued evolution of broadband and related technologies, policymakers should embrace and encourage additional innovation and experimentation throughout the broadband ecosystem, and should allow network operators flexibility to employ a variety of reasonable network management techniques to better serve consumer and public interests.

Similarly, as the Obama Administration recently highlighted in bringing public attention to cybersecurity issues, innovation and investment in all parts of the broadband and Internet ecosystem also are necessary to make broadband networks safer and more reliable for consumers

²⁵ As policymakers collect and review data to assess the broadband marketplace, they should follow the Commission's sensible approach of tracking services based on a range of speed tiers. This approach – while focusing on only one of many factors that may be of interest to consumers – still provides policymakers with a granular view of the services available to consumers and a view into the advances that are benefitting consumers. While encouraging higher speed services is a worthy goal, arbitrary, new definitions that set artificial thresholds for broadband would be counterproductive, by ignoring relevant data about the services available to consumers.

and the public in the face of a growing number of threats. As the online threats continue to grow at the same time that broadband becomes more integral in Americans' lives, smarter networks and more choices for consumers about the nature of their broadband services will be necessary in order to make the Internet a place that consumers are willing to venture and to make sure that broadband can provide the public benefits of which it is capable.

III. A PLAN FOR UBIQUITOUS BROADBAND DEPLOYMENT, WIDESPREAD BROADBAND ADOPTION, AND CONSUMER EMPOWERMENT

As the Commission develops its recommendations to Congress in the national broadband plan, it should comprehensively and objectively assess the broadband marketplace, including both the successes of pro-growth policies as well the challenges that have not been adequately addressed by existing approaches. The Commission should consider the effects of its proposals on the investment and innovation needed to increase consumer choice and to make broadband more available, more robust, more useful, and safer for consumers and the public. The Commission should consider whether existing communications policies are appropriate to the broadband and IP era, or whether reforms to or elimination of some aspects of the existing regulatory scheme are needed. And the Commission should consider both the costs and benefits of any policy proposals, and look for proposals that strike an appropriate balance and continue to have the development of the broadband marketplace primarily driven by consumer choice.

As outlined below, this approach should lead the Commission to recommend a consumer-centric approach that will empower consumers, increase consumer choice and increase the availability and capabilities of broadband networks and services. The Commission should continue the flexible, pro-growth approach that was initiated under President Clinton's administration and that has yielded tremendous consumer benefits and left the management and operation of the Internet in the hands of engineers – and responsive to the demands of consumers – not lawyers or regulators. The Commission's recommendations should include fundamental reforms of certain elements of existing regulatory scheme that were designed for a one-wire, voice world and need to be modified to move into the broadband and Internet era. And the Commission's recommendations should seek out practical, common sense proposals that target remaining challenges – such as reaching the unserved and increasing consumers' understanding

of, and ability to use, broadband – without sacrificing the healthy dynamics of the broadband marketplace that are benefitting consumers.

1. **A Focused Effort to Encourage Broadband Demand**

As noted above, in order for the United States to achieve its broadband potential, a central focus of policymakers must be on the various issues that keep far too many Americans offline, even after broadband is available to them. While it may be easier to focus on “supply-side” issues – such as areas lacking broadband service – such an approach ignores the most significant issues that prevent more Americans from receiving the benefits of broadband. As discussed above, while over 90 percent of homes have access to broadband and approximately 80 percent of households that own computers already subscribe, a variety of factors still keep many other Americans from adopting broadband. The predominant reason for the lagging adoption is not availability or price, but instead issues such as “usability,” “relevance,” and computer ownership. Pew Study at 2-3. Given these realities, policymakers must develop approaches that improve computer literacy, encourage computer ownership, and develop Americans’ recognition of the relevance of broadband to their lives.

In order to overcome larger barriers to adoption, the Commission should recommend that Congress focus its attention on programs that help Americans have the ability and interest in going online. Some groups – such as Connected Nation – have made an intensive effort to identify the particular demand-side factors in an area that limit broadband adoption and to craft creative approaches to address such issues. As noted above, NTIA should encourage initiatives to do likewise as it considers which broadband projects to fund with stimulus money. Given the range of reasons for lack of demand, a variety of creative approaches will be required.

Computer Literacy. One of the commonly cited factors in the decision not to go online relates to “usability” – accounting for 17 percent of non-adopters in the Pew survey. Pew Study at 2. Many American simply feel that they do not have the know-how or physical ability that

they would need in order to take advantage of broadband services. In order to address that concern, policymakers must make a concerted effort to ensure that the computer skills needed to function in a broadband world are a core part of this country's education system. In today's economy, computer literacy must go hand-in-hand with literacy writ large, and no children should be denied computer literacy skills that they will need in order to succeed.

Providing core computer literacy skills to adults could prove even more of a challenge, but is just as important. Policymakers should encourage a wide range of creative programs that provide opportunities for adults to learn computer literacy skills. Likewise, programs should seek to demonstrate to adults ways of taking advantage of the online environment that do not require substantial computer skills, such as connecting to broadband using smartphones or other similar devices.

Demand-side programs also could include the funding of community outreach programs targeted to older populations. Such programs could be handled through community colleges, community centers, libraries, or any other available settings. The development and operation of such programs should be included as potential projects for young volunteers – such as those signing on for the AmeriCorps program or high school students seeking service opportunities. Many of these young volunteers would be well-positioned to help older Americans gain the skills that they need in order to come online.

Computers and Devices. In addition to helping develop computer skills, the national broadband policy should also consider ways of helping more Americans have the computers or other devices that they need in order to go online. Some private programs – such as the “No Child Left Offline” and the “Computers 4 Kids” programs administered in several states by Connected Nation – have been effective at improving computer ownership and making

equipment available to those who may not be able to afford to purchase computers.

Policymakers should encourage such initiatives, and develop additional ones, such as a refundable tax credit program (discussed in more detail below) to help lower income individuals purchase the computers or other devices that they need to access the Internet.

Along the same lines, policymakers should encourage projects that make going online less intimidating for consumers not adept with technology. For example, some individuals may find smartphones, netbooks or other simple devices more user-friendly as they are first becoming familiar with the Internet. Demand-side initiatives should seek to experiment with such approaches in order to find ways of overcoming the technology hurdle and drawing new populations online.

Here too, AmeriCorps volunteers and others could help bring the benefits of broadband to more people by helping to install and set-up computers or other devices, or provide instruction on computer applications, for those who are not comfortable doing so on their own. The process of setting up a computer is intimidating to many people who may otherwise be willing to go online, if someone could just help them overcome this obstacle.

Affordability. For some consumers, the price of broadband services may prove an obstacle to coming online. Policymakers should consider targeted policies – such as refundable tax credits for the price of broadband services and devices – for those most in need. Creative consumer outreach efforts also could help lower income individuals, by helping them identify the available lower-cost broadband services offered by many providers.

Demonstrating the Relevance of Broadband. Policymakers must also look for opportunities to develop in more Americans an understanding of the relevance of broadband to their lives, and the benefits from subscribing. In fact, “relevance” was cited as the reason by

over half of those who do not yet subscribe. *Id.* Given this fact, all of the programs aimed at teaching computer literacy skills must also seek to impart the many ways in which broadband can improve the lives of subscribers. For example, these programs should demonstrate, in concrete terms, the practical benefits of going online. For example, they could show people separated by distance from friends or family the ease with which one can keep in touch using e-mail or social networking. Or they could show the time one can save by handling banking and bill payment over the Internet. Or these programs could demonstrate to grandparents how easy it is to access photographs or video of their grandkids over a broadband connection. Or they could show the jobless how to search for new employment opportunities online or where to receive online training to help prepare them for those opportunities. By demonstrating such day-to-day benefits and conveniences of going online, more Americans could discover the relevance of broadband to their lives.

Improved Use of the Internet by Government. Likewise, policymakers could further these efforts to demonstrate the relevance of broadband – and provide additional benefits to all citizens – by ensuring that all levels of government do a better job of using broadband technology. The Obama administration has already made progress in expanding on the efforts of prior administrations to make information available to the public over the Internet, expanding useful sites such as www.fedstats.gov. Such efforts should continue to be expanded. Americans will understand how broadband benefits them the first time they are able to go online, rather than stand in line at the DMV, to renew their car registration, thus saving themselves time, money and frustration. And even aside from such day-to-day conveniences, individuals will have a better understanding and appreciation of their representatives in government to the extent they have ready, online access to governmental activities. Such e-gov programs could also help to counter

cynicism and promote democratic participation by promoting transparency and accountability and making it easier for ordinary citizens to become involved in the workings of their government.

While there is unlikely to be any one cure-all solution to addressing the many socio-economic and other demand-side factors that keep many Americans offline today, given the predominance of these issues in lack of broadband adoption, it is essential that policymakers address such factors effectively in order for broadband to live up to its potential. By doing so, policymakers will help to bridge the digital divide and bring the benefits of broadband to more people. Approaches that increase the demand for broadband services will help to address “supply-side” issues as well by increasing the incentives for investment and deployment of broadband networks capable of meeting this heightened demand.

2. A Consumer Choice Framework

Consumer empowerment and expanded consumer choice should be central to the national broadband policy framework. Focusing on these interests will ensure that broadband technology and the Internet are truly serving the interests of consumers and the public, particularly as the uses of broadband technology continue to expand and evolve. A one-size-fits-all approach to broadband or the Internet would prevent each from meeting the evolving needs of consumers and the public.

Given the existing and growing number of competitive broadband options available for consumers, relying on consumer choice to guide the development of the broadband and Internet ecosystem is appropriate. Under a consumer-choice framework, all providers of broadband and Internet services, applications and devices should promote transparency by providing consumers with meaningful information of the type that will allow informed choices. Policymakers should promote this level of transparency by supporting efforts by providers of all types to develop best practices that provide consumers with the appropriate level of meaningful information. Armed with this information, consumers will be empowered to select those services, applications or devices that best meet their needs. These consumer choices will direct how providers of all types innovate and invest, which will in turn ensure that the continued evolution of broadband technology and the Internet are responsive to and support consumers' interests.

Let Consumers Decide. Verizon and other broadband providers have committed to openness on the Internet, and consumers will continue to benefit from the openness that they are accustomed to, with the ability to go where they want and do what they want on the Internet. Nonetheless, it would be a mistake to limit consumer choice by mandating a one-size-fits-all, “dumb pipe” model for broadband networks. Notwithstanding the successes of the traditional

model for Internet access services, there is no reason to assume that a single approach – one based on 1970s-era technological capabilities where smarter, networks were not an option and getting packets from point A to Point B was challenge enough – will best serve consumers going forward. Nor is there any reason to conclude that more managed platforms cannot provide a strong platform for innovation – the opposite is true. *See, e.g., Katz Decl ¶¶ 37-44.* As Professor Michael L. Katz explains in the attached declaration, “[o]ne-size does not fit all.” *id.* ¶ 25. Instead, consumers could receive a wide range of benefit – including increased availability and adoption of broadband and the choice of innovative services and devices – by encouraging broadband providers to experiment and innovate with different business models, network management strategies, and differentiated offerings. *Id., passim.* “Absent innovation, Americans will not have access to the most advanced possible services.” *Id.* ¶ 35. Therefore, policymakers should encourage experimentation and innovation throughout the broadband marketplace that leads to smarter networks and innovative services, applications and devices providing additional choices for consumers.

Some consumers, for example, may benefit from a usage-based pricing model, as is common in many other parts of the world. Or perhaps some consumers would be more likely to go online if they had the option of advertiser-supported Internet access services, in exchange for lower monthly costs. Some customers may prefer more highly managed Internet access services that provide additional layers of security to shield themselves or their children from certain sites or from online security threats, while some tech-savvy users may prefer a less-managed service without those protections. Some consumers may see benefits in optimizing their services for certain uses – such as prioritizing online gaming or streaming HD video services or a health monitoring service. Other consumers may show a preference for services that follow the

traditional best-efforts, all-you-can-eat model that they have grown accustomed to. *Id.* ¶ 21 (“At this point, neither business nor public policy makers know what is the best [pricing] approach.”). Fundamentally, however, there is no reason to foreclose any of those choices and freeze in place a single one-size-fits-all model for broadband and Internet services and chill continued innovation in the capabilities of broadband. As Professor Katz concludes:

[I]t would be a mistake for public policy to impose a particular model of network management or network architecture in the name of promoting innovation. There is no one best degree of modularity, best extent of vertical integration, best set of network management practices or best set of pricing policies to promote innovation. . . . Public policies that force a single approach to openness on the industry are thus very likely to harm innovation and limit experimentation. . . . [I]t is much more desirable for public policy to allow for a portfolio of approaches rather than force a one-size-fits-all approach on broadband service providers.²⁶

Encouraging differentiation and innovation becomes all the more important as consumers’ and the public’s uses of the Internet continue to evolve and as more and different services, with varying requirements and limitations, must coexist in the networked environment. Some services – such as backing up data online – may require lots of capacity, but be less time sensitive or less affected by latency or jitter. Other services – such as VoIP – may not require much bandwidth, but may suffer if network conditions result in latency. Still other services – such as video conferencing, gaming, or health monitoring services – may require both substantial amounts of capacity and a heightened quality-of-service in order to meet consumers’ needs. And as broadband networks become increasingly integral to more sensitive uses – such as providing access to health care records in a reliable and secure manner or managing the smart electrical grids in real-time – the needs for smarter broadband networks capable of meeting the varying demands of different uses becomes all the more crucial.

²⁶ *Id.* ¶ 45.

At the same time, the growing and constantly-evolving threats that exist on the Internet make the broadband and Internet experience more challenging for consumers and providers, and increase the need for and benefits of smarter or more tightly-managed broadband networks in some contexts. *Id.* ¶¶ 8, 57 (noting need for innovation to improve cybersecurity). As discussed below, the Internet is already rife with threats to the security and integrity of broadband networks and to the safety of end-users and their devices and data. The source and nature of those threats are constantly evolving, and the answers to them must keep pace. As the Obama Administration has clearly acknowledged, increased cybersecurity is a national priority.

Under these circumstances, rather than locking in place a single model for Internet access – with best efforts, all-you-can-eat service and minimal network management – policymakers should instead encourage innovation and experimentation, and allow consumers to have additional choices in the types of services that they can select.

Managed Networks Can Foster Innovation. While the Internet has proven a fertile ground for innovation – and will remain so – there is no reason to assume that alternative platforms and environments that are more managed cannot also foster innovation. *Id.* ¶¶ 37-44. As Professor Katz notes in discussing more open and “modular” environments, like traditional wireline Internet access services, “the benefits of modularity do not come without costs,” and “rigid interface standards can limit innovation.” *Id.* ¶ 39. Depending on the circumstances, “it may be preferable to have innovation in a more managed environment and/or to have a single entity that is responsible for the overall health of the system.” *Id.* ¶ 41.

In fact, the popularity of the devices and services offered by providers like Blackberry or Apple – companies that rely on more tightly managed platforms – illustrates that wide open platforms are not the only source of innovation. Indeed, the proliferation of independent

applications now available through the Blackberry “App World” or the Apple “App Store” show that managed platforms are not an impediment to innovation. Verizon Wireless is pursuing a similar approach, even as it introduces additional openness into its wireless networks in response to consumer demand. Verizon Wireless’ Open Development Initiative, for example, encourages third parties to develop new devices and applications that will run on Verizon Wireless’ network, thus increasing consumer choice and providing a new platform for third-party innovation. Similarly, Verizon Wireless recently announced that, together with China Mobile, SOFTBANK and Vodafone, it would join the Joint Innovation Lab, which will “focus on creating a single global platform for developers to encourage the creation of a wide range of innovative and useful mobile widgets . . . capable of enhancing the mobile Internet experience on a variety of smartphones as well as mid- and low-cost handsets on multiple operating systems.”²⁷ Verizon Wireless announced the creation of its LTE Innovation Center – an “incubator” to assist third-party device and application developers to create innovative new products and services for Verizon Wireless’ upcoming fourth-generation wireless network.²⁸ Such developments illustrate that innovation and managed network environments can work together and increase the choices available to consumers, all without compromising the openness of the Internet.

In fact, restrictions that deny consumers the option of more managed broadband platforms would discriminate against, if not foreclose, potential services, applications, or devices that are incompatible with a best-efforts approach, and could undermine innovation that would

²⁷ “Verizon Wireless to Join China Mobile, SOFTBANK and Vodafone in Creating the Largest Global Platform for Mobile Developers,” <http://www.fiercewireless.com/press-releases> (April 1, 2009) (“Joint Innovation Lab Press Release”).

²⁸ “Verizon Wireless LTE Innovation Center to Drive 4G Next Generation Wireless Product Development,” <http://www.redorbit.com/news/archive> (follow “Technology” to “2009”) (April 1, 2009) (“LTE Innovation Center Press Release”).

benefit consumers. *Katz Decl.* ¶¶ 46-47. For example, services that require heightened reliability with low levels of latency or jitter and substantial amounts of bandwidth in order to work well – such as a 3-D telepresence service or telemedicine services supporting remote operating rooms – may not be feasible in a less-managed network environment. In addition, given their sensitivity to latency, VoIP services provided over the Internet could benefit from prioritization during times of peak usage.

Flexibility and consumer choice also will help to guide network management practices in ways that make broadband services safer and more useful for consumers. The significant technical and operational challenges to providing reliable and safe broadband services weighs heavily in favor of a flexible approach that provides more choices for consumers. The management of broadband networks to meet consumers' needs is a job best left for network engineers – with consumers as the ultimate judges of the practices that they value – not politicians or regulators. Prescriptive regulations could never keep pace with the ever-changing challenges on the Internet.

As with other practices, informed consumer choice among the existing and growing competitive broadband options will be the most effective check on providers' network management practices. *Id.* ¶ 18. As long as providers give meaningful information to consumers about network management practices that could materially affect their experience, consumers will help to drive providers' approaches to network management. Any provider that engages in network management practices that are disfavored by consumers will soon learn as much by losing customers, while those that employ practices that benefit subscribers' broadband experience will be rewarded. Armed with meaningful information, consumers are able to choose the broadband services that best meet their needs.

An approach that relies on consumer choice to drive innovation and business models will be the most likely to promote consumer welfare and encourage the evolution of broadband and Internet technology in ways that are useful to consumers and the public. *Id.* ¶ 75. This flexible approach – which is consistent with the approach to the Internet taken by policymakers since its inception – is particularly appropriate given the complex and evolving nature of the broadband and Internet marketplace. *Id.* ¶ 74. The broadband marketplace is still emerging, and consumers’ preferences for their services continue to evolve. Thus, it would be inappropriate – and against consumers’ long-term interests – to freeze in place one particular type of broadband service before consumer preferences have been given the opportunity to develop.

Moreover, as a general matter, regulatory restrictions on business practices are warranted only in clear cases of demonstrated market failure, and, even then, only when the benefits of government intervention outweigh the costs.²⁹ When those conditions are absent, directing markets is a job best left to consumers in order to maximize long term consumer welfare. In nascent industries that are undergoing rapid technological change – like today’s broadband and Internet marketplace – it is particularly difficult for even the most capable regulator to keep up with the market’s evolution or to set policies that avoid unintended negative consequences.³⁰ *See Katz Decl.* ¶ 74 (noting risk of prescriptive regulations given the “complexity of the issues”).

²⁹ *See, e.g.,* 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*, <http://www.fcc.gov/Bureaus/Cable/Reports/broadbandtoday.pdf> 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 *Broadband: Should We Regulate High-Speed Internet Access?* 139 (Robert Crandall & James Alleman, eds., Dec. 2002) (“Regulation should only be used in the situation of market failure”).

³⁰ *See* Stephen Breyer, *Regulation and Its Reform* 286-87 (1982) (“[B]ecause regulation, once in place, is hard to dismantle, one would like to know whether future technological change is likely to transform an industry that is now a natural monopoly, making it structurally suited to

Transparency To Inform Consumer Choice. Of course, in order to be sure that this consumer choice approach will truly benefit consumers, it is important to also ensure that consumers are able to make truly informed choices. *Id.* ¶ 76 (“public policies should promote meaningful disclosures”). To further this policy, Congress should support the development of industry principles or best practices to promote transparency by ensuring that broadband providers and other providers of devices, services, or applications that use the Internet provide consumers with the types of meaningful information that allow informed decisions. Broadband providers and other providers of applications and services over the Internet should be expected to make reasonable and meaningful disclosures that tell consumers what they need to know to select the services, applications, and providers that best meet their needs.

For example, to promote transparency, broadband Internet access providers should provide information that allows consumers to understand the speeds that they may reasonably expect from their services, as well as the factors that could affect the speeds that consumers actually experience. It may also be to consumers’ benefit for providers to furnish or direct subscribers to tools – like Verizon’s “Speed Optimizer” feature or various independent, online speed tests – that help consumers to assess the speeds that they are experiencing and to address potential issues that could affect their service. Broadband providers should also disclose any other significant features of or limitations on available services, including general descriptions of network management practices that could affect the ways in which a consumer may use a service. The development of industry best practices or principles that promote transparency could help in identifying the types of information and disclosures that would be most useful for

competition.”); Alfred E. Kahn, *The Economics of Regulation* 127 (1971) (“In the presence of such rapid change, the natural monopoly of yesterday may be transformed into a natural arena of competition today; and vice versa.”).

consumers, and perhaps in helping to standardize the general nature of information provided to consumers in order to permit more apples-to-apples comparisons for consumers.

Policymakers should also encourage online application and service providers – and the manufacturers of devices that rely on the Internet – to develop appropriate best practices or industry principles that likewise increase transparency in order for consumers to better understand and appreciate the effect of their choices on the user’s services and security. For example, consumers should be informed about the potential effect of certain peer-to-peer (P2P) applications on the performance of their broadband services, as well as the security threats that have been associated with such applications in some cases. Increased transparency and more meaningful and useful disclosures by providers throughout the Internet ecosystem can help to protect consumers and facilitate informed consumer choices.

Increased transparency – coupled with existing broadband competition – will enable consumers to make choices about the types of broadband and Internet services, applications and devices that best meet their demands and preferences. Among other things, this consumer-centric approach lets consumers decide the extent to which they prefer differentiated service options or the types of broadband pricing that best serves them. And by necessity, providers will have to respond to consumer choice in the way that they structure and offer their services.

This consumer-choice framework will promote the development of broadband technology and the Internet marketplace in ways that benefit consumers and the public and encourage the continued innovation and investment that will create jobs and spread the reach, adoption, usefulness, and capabilities of broadband.

3. Encouraging Continued Innovation to Improve Cybersecurity Both For Consumers and the Nation

As the Obama Administration recently made clear – improving cybersecurity is a vital issue for consumers and for our nation. Broadband technology and the Internet continue to become more integral to the lives of consumers and to the operation of our government, economy, and society. At the same time, the variety and sophistication of online threats constantly grows. Robust efforts to improve cybersecurity and stay ahead of these threats are essential if broadband is to fulfill its promise.

In order to create the level of comfort and security that will encourage consumers to use broadband technology to access the Internet, broadband providers and their public and private partners must take steps to improve cybersecurity. Many consumers already use broadband technology and the Internet to engage in a variety of sensitive tasks, from maintaining finances online to accessing private health records, and consumers' dependence on technology will only increase over time. As a result, improving the level of cybersecurity is an important consumer issue – particularly in attracting new users to broadband and the Internet who may otherwise be scared off by the threats that exist online.

Similarly, broadband networks and the Internet are each being used by government, businesses, or other entities for a wide and increasing range of critical uses, ranging from the electricity grid, to air traffic control, to our national security, to health care, to our banking system. Ensuring an adequate level of cybersecurity is essential in order to prevent massive disruptions by those seeking to cause harm.

In order to effectively address the evolving online threats, policymakers should support efforts by broadband providers to develop and employ a variety of innovative tools and approaches that keep pace. In order to achieve the level of security that is required, public and

private partners will need to cooperate and coordinate responses and approaches to cybersecurity. At the same time, encouraging continued innovation by broadband providers – such as smarter broadband networks – and a diversity of approaches, will strengthen our defenses against online threats and attacks. As the recent report to President Obama recognized: “Without major advances in the security of these systems or significant change in how they are constructed and operated, it is doubtful that the United States can protect itself from the growing threat of cybercrime and state-sponsored intrusions and operations.”³¹

Improved Cybersecurity Is Critical. Cybersecurity issues are real and important. Broadband providers’ networks and services face numerous and evolving threats over the Internet. Among other things, broadband providers must take steps “to protect their users from viruses and spam” by “block[ing] such antisocial applications,” and must enforce “acceptable use policies to prevent spammers and other ‘bad guys’ from using their networks to launch attacks on others.”³² For example, providers attempt to identify and address the threats posed by zombie computers – computers compromised by hackers, viruses, or Trojan horses – that are used to spread spam, viruses, worms, or other malware or mischief.³³ The Conficker worm is but

³¹ *Cyberspace Policy Review: Assuring a Trusted and Resilient Information and Communications Infrastructure*, http://www.whitehouse.gov/assets/documents/Cyberspace_Policy_Review_final.pdf, at i (2009) (“*Cyberspace Policy Review*”).

³² Rachelle B. Chong, New York Law School Advanced Communications Law & Policy Institute, *31 Flavors of the Net Neutrality Debate*, <http://www.nyls.edu/pdfs/Rachelle%20Chong%20-%20Net%20Neutrality%20Essay%20-%20December%202007.pdf>, at 7 (Dec. 2007).

³³ See, e.g., Daniel Tynan, “Zombie PCs: A Silent, Growing Threat,” PC World, <http://www.pcworld.com/article/id,116841-page,1/article.html> (July 9, 2004).

one recent example which, as a result of its advanced malware techniques, has resulted in the largest computer worm infection on the Internet since 2003.³⁴

Similarly, “[b]otnets, which can include as many as 100,000 individual ‘zombie’ computers, can distribute spam e-mail, spread viruses, attack other computers and servers, and commit other kinds of crime and fraud.”³⁵ Broadband providers also guard against Internet denial of service (DOS) attacks – many spread by zombie computers and botnets – that flood a network or particular site with traffic in order to deny access by legitimate users. Unfortunately, many consumers are already all too familiar with these potential harms, and many consumers have had their data compromised or devices damaged as a result of targeted Internet attacks or other abusive behavior.

The stakes will grow even higher, however, as consumers, the government and businesses make broadband networks and the Internet ever-more integral to critical or sensitive uses. For example, given the increasing reliance on Internet services by government agencies, including emergency first responders, guarding the security and integrity of these networks also serves a significant national security role.³⁶ And even government agencies like the Defense Information Systems Agency (DISA) – the “combat support agency responsible for planning, engineering, acquiring, fielding, and supporting global net-centric solutions to serve the needs of

³⁴ John Markoff, “Worm Infects Millions of Computers Worldwide,” New York Times (Jan. 22, 2009).

³⁵ Microsoft, “Zombies and Botnets: Help Keep Your Computer Under Control,” <http://www.microsoft.com/protect/computer/viruses/zombies.msp> (Jan. 3, 2007, updated Jan. 2, 2009).

³⁶ See Joint Advisory Committee on Communications Capabilities of Emergency Medical and Public Health Care Facilities, *Report to Congress*, http://energycommerce.house.gov/Press_110/JAC.Report_FINAL%20Jan.3.2008.pdf, at 53-54 (Feb. 4, 2008).

the President, Vice President, the Secretary of Defense, and other [Department of Defense] Components, under all conditions of peace and war”³⁷ – relies on commercial networks for 95 percent of the infrastructure for strategic communications.³⁸

The stakes in the case of critical, private data networks that traditionally are not connected to the public Internet but share the same broadband physical infrastructure are also significant, as a recent front page story in the Wall Street Journal reveals – “Electricity Grid in U.S. Penetrated by Spies.”³⁹ That story suggested that “[c]yberspies have penetrated the U.S. electrical grid and left behind software programs that could be used to disrupt the system,” and noted that “water, sewage and other infrastructure systems also were at risk.” *Id.*

Verizon recently published a report on the work our forensic investigators have done in analyzing 90 confirmed Internet-based data breaches that occurred in 2008, which involved 285 million compromised records. This report provides a roadmap for avoiding and defending against such breaches in order to protect critical data.⁴⁰ Among the key findings of this report were:

- **Most data breaches investigated were caused by external sources.** Seventy-four percent of breaches resulted from external sources, while 32 percent were linked to business partners. Only 20 percent were caused by insiders, a finding that may be contrary to certain widely held beliefs.
- **Most breaches resulted from a combination of events rather than a single action.** Sixty-four percent of breaches were attributed to hackers who used a

³⁷ “Mission,” <http://www.disa.mil/about/ourwork.html>.

³⁸ Ivan Seidenberg, Verizon Communications, “Keynote Speech, DISA Customer Partnership Conference,” <http://newscenter.verizon.com/leadership/speeches/defense-information-systems.html> (April 21, 2009) (“DISA Speech”).

³⁹ Siobhan Gorman, “Electricity Grid in U.S. Penetrated by Spies,” Wall Street Journal (April 9, 2009).

⁴⁰ http://www.verizonbusiness.com/resources/security/reports/2009_databreach_rp.pdf.

combination of methods. In most successful breaches, the attacker exploited some mistake committed by the victim, hacked into the network, and installed malware on a system to collect data.

- **In 69 percent of cases, the breach was discovered by third parties.** The ability to detect a data breach when it occurs remains a huge stumbling block for most organizations. Whether the deficiency lies in technology or process, the result is the same. During the last five years, relatively few victims have discovered their own breaches.
- **Nearly all records compromised in 2008 were from online assets.** Despite widespread concern over desktops, mobile devices, portable media and the like, 99 percent of all breached records were compromised from servers and applications.
- **Roughly 20 percent of 2008 cases involved more than one breach.** Multiple distinct entities or locations were individually compromised as part of a single case, and remarkably, half of the breaches consisted of interrelated incidents often caused by the same individuals.

The report also found that while “[o]nly 17 percent of attacks were designated as highly difficult, . . . they accounted for 95 percent of the total records breached.” *Id.* at 3.

Verizon Finds Significant Rise in Targeted Cyber Attacks

(from the network cloud, through the network, and all the way to the end user)

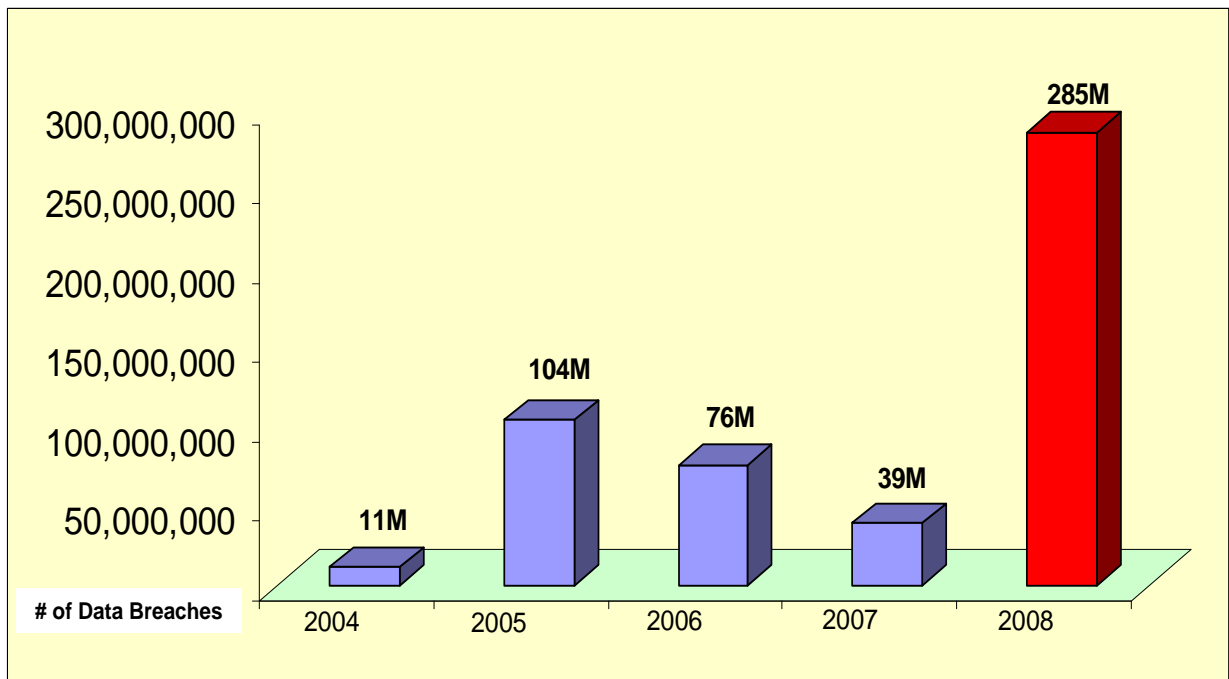


Chart 4

Verizon Is Working to Improve Cybersecurity. Verizon is on the forefront of fighting back against online threats and protecting the security and integrity of its networks, its customers, and their data. Verizon's security teams monitor more than 5 billion security events per day on the global Internet, and, because of the design of its networks, is able to resolve the vast majority of those breaches before they can do harm to its networks or customers.⁴¹ We also make our security expertise available to customers through our managed security services. We can provide end-to-end security analysis, threat detection and warning – from the network cloud,

⁴¹ See DISA Speech.

through the network, and all the way to the end user. Indeed, Verizon was recently placed in the “Leaders” quadrant in analyst firm Gartner’s report about managed security service providers.⁴²

Innovation and Flexibility Are Needed to Respond Effectively. While Verizon and other providers are already actively engaged in the development of innovative solutions to increase cybersecurity and make broadband networks secure and useful, a sustained effort involving a wide range of public and private partners will help to develop more effective and creative approaches to further vital cybersecurity interests. In order to foster the needed solutions and approaches, policymakers must do two important things – (1) encourage the innovation that will produce robust and creative protections for broadband networks and throughout the broadband and Internet ecosystem and (2) provide network managers with flexibility to respond to threats in a real-time manner.

First, policymakers must encourage robust innovation that is able to stay two steps ahead of those seeking to make mischief. As the recent Administration report noted, policymakers should “incentivize the market to make more secure products and services available to the public.”⁴³ In order to be most effective, this innovation should occur both by broadband providers and by the developers of devices, applications and services that use broadband networks or the public Internet. This innovation should improve protections both inside networks and on the ends. While firewalls and other similar protections play an important role in protecting the devices and data of individual users, cybersecurity is too important of an issue to place solely on the ends of networks. Among other things, it is not reasonable to expect all end-users to have the diligence required to ensure that protections are sufficiently robust and up-to-

⁴² Gartner, Inc., “Magic Quadrant for MSSPs, North America,” at 2 (April 16, 2009).

⁴³ *Cyberspace Policy Review*, at v.

date. For this reason, while continued innovation in end-user tools will remain important, policymakers must also encourage innovation in smarter networks that can deploy network-based defenses to cyber-threats.⁴⁴

Indeed, “experts agree that an updated Internet could offer a wide range of new and improved services, including better security against viruses, worms, denial-of-service attacks and zombie computers.”⁴⁵ For example, providers may engage in a “broader examination of traffic patterns [that] may reveal that a given source is participating in a denial of service attack on another user.” *Id.* Or providers may “prevent customers from using equipment that will operate in ‘promiscuous mode’ to observe their neighbors’ traffic.” *Id.*

Policymakers also should recognize that consumers may benefit from the choice of broadband services that include heightened, network-based protections – protections that may go beyond the “dumb pipe” model that some parties seek to lock in place – and should recognize the benefits of offering such choices to consumers. *Katz Decl.* ¶ 8 (“Innovative solutions to security problems can come from both the edges of the network and the core, and it is very likely that both types of innovation will be needed to address these formidable problems.”).

Second, given the complexity and ever-evolving-nature of threats on the Internet, policymakers must allow considerable flexibility to the managers of networks or to other Internet providers that permits real-time responses to real-time threats. In this environment, regulatory restrictions that tie the hands of such providers or require compliance with inflexible standards would create enormous potential risks to consumers and others who rely on the reliability and

⁴⁴ Tom Tovar, “Network Based Security Is Our Future,” [http://voip-phone-systems.tmcnet.com/follow “View All” under “Featured Articles”](http://voip-phone-systems.tmcnet.com/follow+View+All+under+Featured+Articles)) (May 11, 2009).

⁴⁵ David Farber and Michael Katz, “Hold Off on Net Neutrality,” *The Washington Post* (Jan. 19, 2007).

security of broadband networks. As the Commission’s Chief Technologist Jon Peha has observed, “[p]erhaps the greatest danger from . . . overly broad” net regulation “is that it could undermine security.”⁴⁶

Continuing to allow providers and other stakeholders the flexibility to develop innovative approaches to addressing threats – such as smarter networks or more sophisticated network management practices – will most effectively protect the security and integrity of their networks, services, subscribers, and the public. Restrictions on this flexibility or one-size-fits-all approaches, on the other hand, would make broadband networks less secure and less useful for consumers, and thus would harm consumers and the public interest.

⁴⁶ Jon M. Peha, *Benefits and Risks of Mandating Network Neutrality, and the Quest for a Balanced Policy*, http://web.si.umich.edu/tprc/papers/2006/574/Peha_balanced_net_neutrality_policy.pdf, at 18 (Sept. 2006).

4. Pursuing A Consumer-Focused Approach to Privacy that Encourages Broadband Adoption and Continued Innovation and Investment

Protecting our customers' privacy has long been, and will continue to be, a priority for Verizon. We understand that in order to encourage more Americans to go online and to gain the benefits of broadband and the Internet, it is essential (1) that consumers understand who has access to their private information and how it will be used, (2) that they are comfortable that their information will be adequately protected, and (3) that they are empowered to make meaningful choices about the collection and use of their private information. In order to help foster the level of trust and comfort that consumers need in order to go online, policymakers should take a comprehensive approach to consumer privacy that is consumer focused. Moreover, consistent with consumers' interests, policymakers should approach privacy in a manner that is technologically and competitively neutral, rather than targeting particular technologies or classes of providers. In particular, policymakers should support the creation of effective industry best practices to ensure that consumers' data are adequately protected and to ensure that consumers have an informed, meaningful choice before any provider uses their information for purposes of "online behavioral advertising,"⁴⁷ *i.e.*, the use of consumers' web-surfing data over time and across unaffiliated or third-party web sites to foster advertising. Verizon is actively participating in the development of such a framework that protects consumers' data and provides transparency and meaningful choices to consumers, while allowing the use of appropriate online advertising practices to help fund the reach of the Internet.

⁴⁷ "Online behavioral advertising" means the collection and use of data from a particular computer or device regarding web viewing behaviors over time and across non-affiliated web sites in order to predict user preferences, interests and to deliver advertising online to that computer or device using such predictions. Online behavioral advertising does not include the activities of providers or their agents on their own web sites, Ad Delivery or Ad Reporting, or contextual advertising, (*i.e.* advertising based on the content of the web page being visited, a consumer's current visit to a web site, or a search query).

Online Advertising Is a Driver for the Growth of Broadband and the Internet, and Maintaining Consumer Trust Is Essential In Order to Maintain that Growth. Today, more than 60 million American homes are connected to the Internet via broadband, and the wide range of content, services, and applications online – most offered for free – draws more people online every day. It is also in the context of online advertising that many privacy concerns arise, as various types of providers gain access to consumer information that can be used for advertising purposes. In particular, the potential use of consumers' web-surfing data for purposes of online behavioral advertising raises complex and important issues surrounding online privacy. Consumers and policymakers want to understand what personal information is being collected and used for advertising purposes. They want to know what privacy and consumer protections are in place, and what choices are available to participate – or not – in online behavioral advertising models.

In a rapidly changing and innovative environment like the Internet, maintaining consumer trust is essential. It is critical that consumers understand what forms of online behavioral advertising, if any, their service providers and favorite websites employ. If certain practices cause consumers to believe that their privacy will not be protected, or their preferences will not be respected, they will be less likely to trust their online services, and the tremendous power of the Internet to benefit consumers will be diminished. So, maintaining consumer trust in the online experience is critical to the future success of the Internet.

Existing Laws Already Provide Substantial Protections to Consumers. As an initial matter, a variety of existing laws and rules already provide substantial protections in many contexts to consumers' private information. For example, both federal and state wiretap statutes protect consumers' information, and limit other parties' ability to access or use that information.

See, e.g., [18 U.S.C. § 2510](#) *et seq.* In addition, the FTC has recognized its role in protecting consumers' privacy as they go online. Along those lines, the FTC staff recently published a report on "Self-Regulatory Principles for Online Behavioral Advertising," which provide detailed guidance concerning the protection of consumers' information, including discussion of the circumstances in which disclosures to consumers and consent from consumers is appropriate.⁴⁸ While noting that work remains to be done in order to develop a more robust, stakeholder-led framework that keeps pace with technological change and serves consumers' interests, the FTC expressed its intent to "continue to examine this marketplace and take actions to protect consumers as appropriate." *Id.* at iv. Therefore, existing law and regulation already provides consumers with a baseline of protections when they go online.

While many protections already exist, Verizon believes that more work remains to be done in developing a comprehensive approach to consumer privacy that better serves consumers' interests, that is flexible enough to keep pace in an area of rapid technological change, and that applies in a technologically and competitively neutral manner across the Internet space.

Verizon is committed to protecting our customers' privacy and providing consumers with meaningful choice concerning the use of their information. We also are committed to maintaining strong and meaningful privacy protections for consumers in this era of rapidly changing technological advances. We are strong proponents of transparency and believe that consumers are entitled to know what kinds of information we collect and use, and should have

⁴⁸ *FTC Staff Report: Self-Regulatory Principles for Online Behavioral Advertising*, <http://www2.ftc.gov/os/2009/02/P085400behavadreport.pdf>, at 45-47 (Feb. 2009).

ready access to effective tools that allow them to control the use of that information. In 2008, Verizon was named among the top twenty U.S. companies most trusted to protect privacy.⁴⁹

At Verizon, we have worked to craft – and communicate to our customers – responsible policies aimed at protecting online privacy. In particular, we can commit – and believe that all Internet and broadband companies should commit – to a set of best practices in the area of online behavioral advertising, and we are actively engaged in efforts with other members of the Internet industry and other stakeholders to develop such a framework. These principles and best practices should be consumer-focused and should be developed by and applied to *all* types of online companies, regardless of their technology or the platform used. From the consumers’ perspective, the type of provider collecting and using data and the technological approach to doing so is not relevant. A sound set of industry best practices for online behavioral advertising should include:

First, before using a consumer’s Internet-usage information to engage in online behavioral advertising, a company should obtain meaningful consent from the consumer. Meaningful consent includes three elements: 1) transparency, 2) affirmative choice, and 3) consumer control.

Transparency involves conspicuous and meaningful information to consumers as to (1) what types of data are collected and for what purpose those data are being used, (2) how the data are retained and for how long, and (3) who is permitted access to the data. Consumers would then be able to use these clear explanations to make an *affirmative choice* that their information can be collected and used for online behavioral advertising. Importantly, a consumer’s failure to consent should mean that there is no collection and use of that consumer’s information for online

⁴⁹ See “Ponemon Institute and Truste Announce Results of Annual Most Trusted Companies for Privacy Survey,” http://www.truste.org/about/press_release/12_15_08.php (Dec. 15, 2008).

behavioral advertising. Finally, *consumer control* means that consumers have an ongoing opportunity to make a different choice about behavioral advertising. In other words, should consumers at some later time choose not to participate in the behavioral advertising, there are equally clear and easy-to-use instructions to make that change. That preference should remain in effect until the consumer changes it.

Second, companies engaged in online behavioral advertising must take particular care – and use appropriate safeguards – to protect consumers’ sensitive information. Consumers rightly expect that special attention be given to the protection of information of a sensitive nature (e.g., accessing medical web sites or consumers’ financial information). This information should not be collected and used for online behavioral advertising unless specific, affirmative consent, and customer controls are in place to limit such use. Specific policies may be necessary to deal with this type of information. Consistent with our long-standing policies and practices, Verizon also believes that the content of communications, such as e-mail, instant messages, or VoIP calls, should not be used, analyzed, or disclosed for purposes of online behavioral advertising.

Finally, in order to provide additional comfort to consumers in this sensitive area, all companies engaged in online behavioral advertising should agree to participate in a credible, third-party certification process to demonstrate to consumers that they are doing what they say with regard to the collection and use of information for online behavioral advertising. This process would confirm that companies are complying with and respecting consumers’ expressed choices regarding such data collection.

We believe a framework such as this is a rational approach that protects consumer privacy, while allowing the market for Internet advertising and its related products and services to grow. Should a company fail to comply with these principles, the FTC has authority over

abuses in the privacy area and has already indicated that it will take appropriate measures against companies that intentionally violate applicable consumer protection laws.

The Same Framework Should Apply to All Businesses and All Technologies. In order to be successful and to serve consumers' interests, it is critical that any approach to online privacy and advertising apply comprehensively to all participants in the Internet space. In particular, all parties that engage in online behavioral advertising – ad networks, publishers, search engines, Internet service providers, browser developers and other application providers – should commit to these common sense principles and best practices through a broad-based, third party coalition. And the framework should apply in a technological and competitively neutral manner.

The focus of this coalition and the principles should be the protection of consumers, not the technology or applications that happen to enable the data collection. Widespread and uniform adoption of principles will greatly enhance the public trust – a piecemeal approach would undermine that trust.

In particular, policymakers should recognize – in this context and others – that there is no such thing as a “bad technology,” and instead should apply the same principles to different technologies that are used to achieve the same or similar result. And no technology, or category of provider, should be prohibited, categorically shunned, or held to a higher standard than other technologies used to achieve the same result.

For example, online behavioral advertising currently could be accomplished using either a cookie-based approach or using packet inspection technologies that can create an advertising dossier based on a consumer's Internet activities. The cookie-based approach builds on methods that have been used by online advertisers for many years. For advertisers with relationships

across a wide range of unaffiliated web sites, this approach can result in a comprehensive view of consumers' online activities. Some providers not only have that broad view across a wide variety of web sites, but also have the capability to combine the information collected in this way with other consumer data gleaned from separate interactions with consumers – such as search or e-mail services.

Other providers have considered the use of newer “packet inspection” approaches for accomplishing the same task. Few, if any, providers in this country have gone beyond the “trial” stage with respect to using packet inspection for advertising purposes.⁵⁰ And scrutiny by policymakers and other stakeholders has led providers to proceed cautiously in considering the use of this technology for advertising purposes. But from the perspective of the consumer, the end result of using this approach would be very similar to the cookie-based approach.

While the particular technological approach may be of interest to some people, there is little practical difference for consumers which approach is used in the targeting of a particular advertisement. In either case, consumers have a strong privacy interest in providing meaningful consent to either kind of behavioral advertising, regardless of the technology used.

Likewise, policymakers should ensure that consumers have the same level of protections in both contexts, and should not dictate particular technological approaches that are favored or disfavored. Doing otherwise would not only distort the marketplace for online advertising – thus entrenching providers who rely on one, particular technology – but also could get in the way of the development of technologies that serve other useful functions. Packet inspection technology, for example, can be a helpful engineering tool to manage network traffic – for example, by facilitating “dynamic quotas” during times of network congestion to ensure that all

⁵⁰ To be clear, Verizon has not used packet inspection technology to target advertising to customers.

consumers receive a fair allocation of available capacity – and enable online services and applications consumers may wish to use – such as three-dimensional telepresence services or latency-sensitive online gaming. It could also be used to implement network-based cybersecurity capabilities that make broadband networks safer for end-users and more useful as broadband networks are put to additional sensitive uses. Packet inspection may also be useful in identifying and fighting child pornography. But if policymakers condemn the technology itself – or even discourage innovation with respect to the technology by condemning it for purposes of advertising – these beneficial uses may never materialize.

The problem that some stakeholders have perceived with “packet inspection” is not the technology itself. Many useful technologies can be used for nefarious purposes. A problem arises only if packet inspection is used to inappropriately track customers’ online activity without their knowledge and consent and invade their personal privacy. The framework suggested above could fully respond to those legitimate concerns.

For similar reasons, policymakers should not address privacy issues in a way that picks competitive winners and losers. Many providers of online services and applications offer overlapping and competing functionalities that can impact consumer trust in the privacy context – whether they are an ad network, publisher, search engine, Internet service provider, browser developer or other application provider. Accordingly, a competitively neutral policy does not focus on one type of Internet service or application provider, but rather serves the consumers’ strong privacy interest in providing meaningful consent to online behavioral advertising. Nor does a competitively neutral policy become bogged down in jurisdictional issues – such as subjecting different providers to oversight or jurisdiction of different agencies for purposes of privacy or advertising issues – that may result in substantively treatment different or

enforcement. Instead, consumers should receive the same levels of protection, regardless of who is collecting or using their information or how they are doing so.

By taking this consumer-focused approach to online privacy issues, policymakers can do much to make consumers feel safe and comfortable as they go online. A comprehensive, yet flexible, approach to these issues will strike the right balance and ensure that consumers are protected, while at the same time facilitating continued innovation and investment that will help to increase broadband availability and make services more secure and useful for consumers.

5. Facilitating Wireless Broadband Services

In addition to the above policy proposals aimed at furthering consumers' access to broadband in all of its forms, there are a number of specific actions that the policymakers should take that specifically address *wireless* broadband services. Wireless broadband services – and in particular the 4G wireless services that are now emerging – hold much promise for reaching areas that currently remain unserved by broadband, and bringing more individuals online. While the deployment of wireless broadband is proceeding rapidly, there are concrete steps that could be taken that would maximize the growth of wireless, particularly in rural markets.

a. Expediting Tower Siting Would Further Broadband Deployment

One of the biggest barriers that carriers face in deploying wireless broadband services to unserved and underserved areas are the laborious and costly delays associated with tower siting. Carriers and tower companies are experiencing long and unreasonable time periods for new sites, and even for minor changes to towers already in the ground, to gain state or local zoning approval. In addition, carriers are facing the threat of increased environmental review requirements, and therefore delays. In both of these areas, there are steps that policymakers should take to streamline and expedite siting. This will hasten the deployment of wireless broadband coverage by multiple competitors, and reap benefits to the economy, competition, and consumer access to broadband.

Although companies invest huge sums in expanding and improving their networks, capital expenditure dollars are a finite resource, particularly in the present economy. As the costs associated with obtaining the necessary zoning and environmental approvals continue to increase, the number of new sites bringing broadband services to America necessarily decreases. Policymakers can and should take the following steps to minimize tower siting costs and delays.

Congress Should Amend the Communications Act to Exclude Certain Collocations and Modifications from the Zoning Process. Carriers are often required to seek zoning approval merely to add new antennas to an existing building or structure or to replace existing antennas with new antennas. These zoning requirements impact wireless broadband buildout because implementing broadband technologies in new areas often involves collocation on existing towers or structures, and implementing broadband in existing service areas typically requires wireless carriers to replace existing antennas with different antennas.

In order to reduce costs and eliminate unnecessary delays in the siting process, Congress should amend Section 332(c)(7) of the Communications Act to limit state and local authorities' authority to require zoning approval for collocations on towers that were previously approved, that do not result in a "substantial increase" in the tower, and that do not materially change the appearance of the tower.⁵¹ Similarly, antenna modifications that do not constitute a "substantial increase" should be excluded from the zoning process.

Policymakers Should Impose Reasonable Time Constraints on the State and Local Zoning Process. Delays in the state and local zoning process constitute another significant barrier to wireless implementation of broadband technologies. These delays make it difficult for wireless carriers to meet the Commission's build-out requirements and slow carrier efforts to implement broadband technology in new and existing markets.

In July of 2008, CTIA filed a petition for declaratory ruling asking the Commission, *inter alia*, to define when a state or local zoning authority has "failed to act" on a zoning application.⁵²

⁵¹ The term "substantial increase" has been defined by the Commission in the context of historic preservation reviews on existing towers. *Nationwide Programmatic Agreement for the Collocation of Wireless Antennas*, 16 FCC Rcd 5574, Appendix A at I.C (2001).

⁵² CTIA, *Petition for Declaratory Ruling to Clarify Provisions of Section 332(c)(7)(B) to Ensure Timely Siting Review and to Preempt under Section 253 State and Local Ordinances that*

In the CTIA Petition and in comments and reply comments submitted on the record in that proceeding, CTIA, Verizon Wireless and others provided myriad examples of unreasonable zoning delays experienced by wireless carriers.⁵³ CTIA and Verizon Wireless also discussed the negative impacts such delays have on wireless broadband deployment.⁵⁴

To curb these delays and give effect to Section 332(c)(7) of the Act, CTIA asked the Commission to declare that a “failure to act” under this Section has occurred if a zoning authority fails to render a final decision within 45 days on a wireless facilities siting application proposing to collocate on an existing structure or within 75 days for all other wireless facilities siting applications.⁵⁵

To facilitate wireless carrier efforts to implement broadband technology, reasonable time limits should be placed on state and local authority zoning decisions. These time limits can be imposed either through an amendment to Section 332(c)(7)(B) that both defines when a zoning authority has failed to act and that either automatically grants the zoning application or creates a presumption in favor of the applicant in any court action brought by the applicant under Section 332(c)(7)(B)(v) alleging a failure to act. Alternatively, the Commission could impose these measures as requested in the CTIA Petition by issuing an order interpreting Section

Classify All Wireless Siting Proposals as Requiring a Variance, WT Docket No. 08-165 (July 11, 2008) (“CTIA Petition”).

⁵³ CTIA Petition at 13-16; Comments of Verizon Wireless, *CTIA Petition*, WT Docket No. 08-165, at 6-7 (Sept. 29, 2008) (“Verizon Wireless CTIA Comments”); Reply Comments of Verizon Wireless, *CTIA Petition*, WT Docket No. 08-165, at 4-6 (Oct. 14, 2008) (“Verizon Wireless CTIA Reply Comments”) (citing examples from other party comments).

⁵⁴ CTIA Petition at 8-13; Verizon Wireless CTIA Reply Comments at 2-3.

⁵⁵ CTIA Petition at 24-26.

332(c)(7)(B)(ii). We urge the Commission to act promptly on that Petition, which has been pending for nearly a year.

Policymakers Should Clarify that Zoning Ordinances that May Have the Effect of Prohibiting Wireless Service Violate Section 253(a) of the Act. Another cause of significant delays in expanding broadband networks is the proliferation of zoning ordinances that, by imposing arbitrary tower height, parcel size or review requirements, are designed to make wireless facilities siting more difficult and/or to extract unreasonable fees from wireless carriers. The effect of many of these ordinances is to prohibit wireless facilities siting in a particular area.⁵⁶ Wireless carriers should be able to overturn restrictive zoning ordinances by showing that the ordinances violate Section 253(a) of the Act by erecting requirements that “*may* prohibit or have of the effect of prohibiting the ability of any entity to provide any interstate or intrastate telecommunications service.”⁵⁷ Last year, however, the United States Court of Appeals for the 9th Circuit reversed its own interpretation of Section 253(a) and held that “a plaintiff suing a municipality under Section 253(a) must show actual or effective prohibition, rather than the mere possibility of prohibition.”⁵⁸ This decision may encourage enactment of new ordinances that frustrate wireless broadband deployment and new wireless competition. In order to stem the tide of zoning ordinances that unreasonably target wireless facilities siting and to limit the barriers to broadband deployment, Congress should revise Section 253(a), or the Commission should make clear through action on CTIA’s Petition, that ordinances that may prohibit or may have the effect of prohibiting the provision of wireless telecommunications services are unlawful.

⁵⁶ Verizon Wireless CTIA Comments, at 12-15.

⁵⁷ 47 U.S.C. § 253(a).

⁵⁸ *Sprint Telephony PCS v. County of San Diego*, 527 F.3d. 791 (2008).

Any New Tower Siting Rules Should Avoid New Mandates that Impede Wireless Broadband Deployment. The Commission currently has a number of pending proceedings considering the impact of wireless communications towers on migratory bird populations.⁵⁹ These proceedings have not produced factual evidence that associates towers typically constructed for wireless carriers' towers with bird deaths. Nonetheless, if the Commission adopts some of the proposals for new siting restrictions, siting will become considerably more difficult and costly for wireless carriers to deploy broadband networks.

These rules could particularly frustrate broadband investment in *rural* areas. The *Migratory Bird NPRM* sought comment on whether to adopt regulations restricting the use of guy wires and the height of communications towers.⁶⁰ As Verizon Wireless noted in its comments, tall towers are typically deployed in rural areas and along highways to increase and improve coverage in such areas. Tall towers also provide more opportunities for other carriers to collocate antennas on the tower – thus reducing the need for additional towers. Many tall towers require the use of guy wires to support the tower. Guy wires are often favored over other means of supporting towers for engineering reasons, cost considerations (guy wires are often cheaper than self-supporting towers), and due to zoning board preferences (guyed towers have a smaller profile and are considered more aesthetically pleasing to local communities). Restricting the height of towers or the use of guy wires will necessarily result in the need for more towers to produce the same coverage characteristics, and will increase carrier costs.⁶¹ Any such

⁵⁹ *Effects of Communications Towers on Migratory Birds*, Notice of Proposed Rulemaking, 21 FCC Rcd 13241 (2006) (*Migratory Bird NPRM*).

⁶⁰ *See id.* ¶¶ 48-58.

⁶¹ Comments of Verizon Wireless, *Effects of Communications Towers on Migratory Birds*, WT Docket No. 03-187, at 13-16 (April 23, 2007) (“Verizon Wireless Migratory Bird Comments”).

requirements will likewise result in higher costs and more delays in carrier efforts to deploy broadband technologies – particularly in rural areas where taller towers are most often deployed.

As the Commission considers these proceedings, it should adopt categorical exclusions for towers that do not present a significant threat to migratory birds. To the extent any additional rules are found to be necessary, the Commission should carefully balance any need to protect migratory birds with the desire to facilitate wireless broadband deployment.

b. Identify Additional Spectrum for Wireless Broadband

Verizon Wireless believes it is vitally important for the federal government to identify spectrum bands that can be reallocated for future broadband use. Any policy or strategy to promote broadband access should acknowledge the need for more spectrum in order to meet the growing demand for wireless broadband. One recent report demonstrates that “the capacity of mobile networks based on currently allocated and available licensed spectrum is finite and exhaustible based on current and expected broadband and Internet usage and innovation trends.”⁶² CTIA also has made a strong case that the Government must identify and allocate additional licensed spectrum to meet the future needs of U.S. wireless broadband consumers.⁶³ CTIA notes that, unlike many other countries around the world that have identified between 72 and 400 MHz for licensed mobile broadband, the United States has identified only 40 MHz of additional spectrum to fuel the next generation of wireless growth.⁶⁴

⁶² Rysavy Research, LLC. *Mobile Broadband Spectrum Demand*, http://www.rysavy.com/Articles/2008_12_Rysavy_Spectrum_Demand_.pdf, at 24 (Dec. 2008).

⁶³ See Comments of CTIA, *Rural Telecommunications Group, Inc.; Petition for Rulemaking to Impose a Spectrum Aggregation Limit On All Commercial Terrestrial Wireless Spectrum Below 2.3 GHz*, RM-11498, at 6-9 (Dec. 2, 2008).

⁶⁴ *Id.* at 5.

While the Commission has recently sold at auction more than 200 MHz of spectrum suitable for broadband, it took more than a decade to allocate and auction those bands. The government has the responsibility to identify and license spectrum to serve the public interest. Therefore, given the likely timeframe for identifying, allocating and licensing new spectrum, NTIA and the Commission must begin now to guarantee a richer wireless broadband future for consumers. It is important to note the important role that NTIA plays in this process. Past actions to repurpose spectrum managed by NTIA from federal to commercial use have required many years. The sooner Congress directs NTIA to identify candidate bands, the sooner Congress can move toward making more spectrum available for consumers.

With respect to the reallocation of non-federal bands, the Commission's *NOI* asks whether the Commission should conduct a "spectrum census" or "spectrum inventory" in order to identify spectrum bands that may be "suitable for broadband services."⁶⁵ Some theorists believe that the first step "to facilitat[ing] an optimal and efficient use" of spectrum is to "measur[e] how spectrum is being used, identifying blocks of unused spectrum and encouraging greater leasing arrangements to gain access to otherwise unused or underused blocks of spectrum."⁶⁶ The view is that an inventory would help the Commission gain a greater understanding of how (and whether) spectrum licenses are being used and thus facilitate the secondary market. Verizon Wireless believes that a more important goal of any spectrum inventory should be to identify any underused spectrum that can be repurposed to auction for broadband use.

⁶⁵ *A National Broadband Plan for Our Future*, Notice of Inquiry, 24 FCC Rcd 4342, ¶ 44 (2009) ("NOI").

⁶⁶ Philip J. Weiser, The Brookings Institution, *The Untapped Promise of Wireless Spectrum*, http://www.brookings.edu/~media/Files/rc/papers/2008/07_wireless_weiser/07_wireless_weiser.pdf, at 2 (July 2008).

The Commission already has access to much of the information it needs to create a spectrum inventory. Its first effort should be to revise and reform the universal licensing system (ULS) so that it can inventory what spectrum is licensed, but also so it can provide more useful information to the public. Once the Commission has established what it already has, it can determine what is missing from its databases and seek additional data where necessary.

If, as the Commission says, the purpose of this inventory is to identify and allocate spectrum “suitable for broadband,” then there is no reason to include in the accounting any spectrum bands the Commission has already identified for broadband use, such as the cellular, PCS, AWS, 700 MHz and BRS bands. Not only has the Commission identified these bands as suitable for broadband services and adopted flexible rules that permit such services, but licensees already are using these bands to provide broadband. The issue is what *other* bands, not currently identified for broadband use, can be identified.

c. The Flexible Use Licensing Policy Promotes Wireless Broadband

To promote efficient and effective access to broadband, the Commission should re-commit to its decades long effort to put in place market-driven procedures for spectrum management and avoid what its own experts call the “shortages and waste” that the administrative allocation of spectrum entails.⁶⁷

Beginning with PCS, cellular and ESMR, the Commission promoted efficient use of spectrum by providing wireless carriers exclusive, flexible use rights. Over the years, the Commission has taken similar action in other bands, increasing licensee flexibility and espousing

⁶⁷ See Evan Kwerel and John Williams, FCC Office of Plans and Policy Working Paper Series, *A Proposal for a Rapid Transition to Market Allocation of Spectrum*, at iv (Nov. 2002). Indeed, one very limited departure from that consistent policy in the ultra-wideband proceeding has yet to generate much, if any, economic activity. See *Revision of Part 15 of the Commission’s Rules Regarding Ultra-Wideband Transmission Systems*, First Report and Order, 17 FCC Rcd 7435 (2002), *reconsid. granted in part and denied in part*, 18 FCC Rcd 3857 (2003).

market forces as the best means to ensure efficient use of spectrum. The foundation of these policies has been granting exclusive use licenses on a geographic basis with the “flexibility to determine the types of services and the technologies and technical implementation designs used to provide those services.”⁶⁸

The economic literature has consistently endorsed Commission policies that provide strong and flexible spectrum rights in the form of geographic licenses that can be purchased at auction and traded on an active secondary market.⁶⁹ According to economic theory, it is through such policies that the Commission can ensure that spectrum is put to its highest and best use. These policies produce large efficiency gains, because they (a) give spectrum users incentives to internalize most of the costs and benefits of their actions, and (b) minimize coordination and other transaction costs.⁷⁰

⁶⁸ *Establishment of an Interference Temperature Metric to Quantify and Manage Interference and to Expand Available Unlicensed Operation in Certain Fixed, Mobile and Satellite Frequency Bands*, Notice of Inquiry and Notice of Proposed Rulemaking, 18 FCC Rcd 25309, ¶ 6 (2003).

⁶⁹ See, e.g., Ronald Coase, *The Federal Communications Commission*, 2 J.L. & Econ. 1 (1959); Arthur S. De Vany et al., *A Property System for Market Allocation of the Electromagnetic Spectrum*, 21 Stan. L. Rev. 1499 (1969); Douglas Webbink, *Radio Licenses and Frequency Spectrum Use Property Rights*, Comm. & The Law 4 (1987); Gregory Rosston and Jeffrey Steinberg, *Using Market-Based Spectrum Policy to Promote the Public Interest*, 50 Fed. Comm. L.J. 87 (1997); Thomas Hazlett, *The Wireless Craze, the Unlimited Bandwidth Myth, the Spectrum Auction Faux Pas, and the Punchline to Ronald Coase’s ‘Big Joke’: An Essay on Airwave Allocation Policy*, 14 Harv. J.L. & Tech. 335 (2001); Comments of Thomas Hazlett and Matthew Spitzer, *Establishment of an Interference Temperature Metric to Quantify and Manage Interference and to Expand Available Unlicensed Operation in Certain Fixed, Mobile and Satellite Frequency Bands*, ET Docket No. 03-237 (Apr. 5, 2004) (“Hazlett and Spitzer Comments”); William Baumol and Dorothy Robyn, *Toward an Evolutionary Regime for Spectrum Governance: Licensing or Unrestricted Entry?* (2006); Gerald Faulhaber, *The Future of Wireless Communications: Spectrum as a Critical Resource*, 18 Info. And Econ. Policy 256 (2006).

⁷⁰ See, e.g., Kwerel, *supra*. at 5; see also Hazlett and Spitzer Comments at 18-21.

To that end, the Commission should continue to embrace the geographic-based, exclusive use licensing model that grants the licensee sole use of its assigned spectrum and the flexibility to “mine” the spectrum to the maximum extent feasible, subject to interference restrictions. The exclusive use licensing model increases the value of spectrum, fosters the development of innovative equipment and services, provides certainty to the capital markets, and facilitates the creation of secondary markets – all to the benefit of U.S. consumers of wireless services.

The Commission does not need to rely solely on theory, but it can see the direct, positive, results of implementing a market-based system of spectrum management. Due in part to these policies, commercial mobile radio service (CMRS) licensees have made multi-billion dollar investments in spectrum, R&D, and networks that have spurred innovation and created a robust market for wireless services. In particular, the wireless industry has invested billions of dollars in new capital equipment every year to make increasingly efficient use of its licenses and spectrum. For example, in 1995, when the Commission granted the first auctioned broadband PCS licenses, the industry provided primarily analog voice service to only 33 million wireless customers in the U.S. on a handful of devices. Now the industry provides robust digital voice and data services to 270 million customers in the U.S. on hundreds of devices. Not only has the customer base expanded, but the average minutes of use (MOU) for each customer has increased by a factor of more than six – from an industry average of 119 MOU per month to now nearly 800 MOU per month.⁷¹ – thus increasing exponentially the total volume of wireless traffic. This incredible increase in efficiency and consumer value occurred against a backdrop of a declining cellular consumer price index (Cellular CPI) and a declining price per MOU.⁷²

⁷¹ *Thirteenth CMRS Competition Report* ¶ 193, Table 12.

⁷² *Id.*; During the period 1995-2007, the average cost per MOU declined from \$.43 to \$.06. The Bureau of Labor Statistics only began tracking the Cellular CPI in 1997 – in the decade between

The bottom line is that spectrum, geographically licensed on a flexible, exclusive use, basis has generated enormous value for the U.S. economy. Indeed by 2004, Professors Thomas Hazlett and Matthew Spitzer calculated that the wireless service market as a whole already had created consumer benefits worth some \$900 billion.⁷³ That number would far exceed one trillion dollars if it were to include the last five years of economic activity.

Moreover, the FCC's own analysis has shown that market-based spectrum principles are working to bring wireless service to rural America. Beginning with its Twelfth Annual CMRS Competition Report, the FCC has looked at wireless competition in each census block, of which there are over 8 million in the United States. This has allowed for a more granular, and thus significantly more accurate, assessment of the state of wireless coverage. In its most recent CMRS Competition Report, not only did the FCC find that the vast majority of the population had access to four or more competitors, it found that nearly 100 percent of the nation's population has one or more different operators (cellular, PCS, and/or SMR) offering mobile service in the census blocks in which they live, and that approximately 98.5 percent of the U.S. population living in rural census blocks, or about 60 million people, have one or more different operators offering mobile service in the census blocks within the rural counties in which they live.⁷⁴

There is every reason to believe that the same will be true for delivery of wireless broadband services. Even prior to deploying its fourth generation broadband networks on its

1997 and 2007, the Cellular CPI dropped from an index value of 100 to 64.4. During that same period the CPI increased from 100 to 129.2.

⁷³ See Hazlett and Spitzer Comments at 33.

⁷⁴ *Thirteenth CMRS Competition Report* ¶ 2.

newly acquired spectrum, Verizon Wireless has already achieved significant broadband coverage in rural America. It now reaches more than 75 percent of the population living in rural areas.

Despite these findings and the fact that the Commission has held more than 70 auctions to date, only a small percentage of the spectrum below 5 GHz has been auctioned and operates under flexible rules. Most spectrum continues to be managed under the so-called “command and control” regime, in which licensees must request permission from the Commission to change technology or use. Moreover, in the past decade, the Commission has continued to allocate a significant portion of repurposed spectrum for unlicensed use.

Some parties will argue that the allocation of more spectrum for *unlicensed* use is a preferred way to promote broadband. Verizon disagrees. Unlicensed spectrum can play a role in providing broadband. However, while the Commission has allocated substantial amounts of spectrum for unlicensed use, it has not evaluated the effectiveness of these decisions or the amount of unlicensed use that is in fact occurring. For example, Wi-Fi is clearly one of the most significant current uses of unlicensed spectrum; its success is often used as evidence of the need to allocate vast amounts of additional spectrum for unlicensed use. Yet some observers believe that licensed mobile Internet access has surpassed that available through Wi-Fi. On the other hand, there is ample evidence that licensing spectrum on a flexible, exclusive use, basis has significant benefits for the economy.

Separate from the economic arguments against allocating too much unlicensed spectrum to the detriment of licensed services, the Commission has to use caution in doing so given the very difficult task it faces in “unwinding” an unlicensed allocation. It is much more difficult to repurpose unlicensed spectrum for more efficient uses than it is to repurpose licensed spectrum, where there is a long history of such processes. If the standard for repurposing unlicensed

spectrum is that there are no devices certified for use in the band, rather than some measure of efficient use or economic value,⁷⁵ the Commission would be highly unlikely ever to repurpose unlicensed spectrum, no matter how inefficiently used. Before the Commission allocates more spectrum to unlicensed use, it should determine the value to the economy of the current allocations, including an analysis of the intensity of use of the unlicensed bands. Only once that evidence is developed should it consider allocating additional spectrum for unlicensed devices.

⁷⁵ In the 1910-1920 MHz unlicensed PCS band, one of the few cases where the Commission was able to repurpose a portion of that unlicensed spectrum for licensed use, it was only after it determined that there were *no* devices certified for use in the band. *Improving Public Safety Communications in the 800 MHz Band; Consolidating the 800 and 900 MHz Industrial/Land Transportation and Business Pool Channels*, Report and Order, Fifth Report and Order, Fourth Memorandum Opinion and Order, and Order, 19 FCC Rcd 14969, ¶¶ 50-52 (2004).

6. Pursuing a Pro-Growth Regulatory Approach that Encourages Broadband Investment and Innovation

The Commission should encourage Congress to maintain a flexible, pro-growth regulatory approach for broadband, and should counsel against intrusive new broadband regulations that would undermine the current successes, stunt the continued evolution of broadband technology and the Internet, or lock in place a one-size-fits-all approach. The history of the broadband marketplace shows that the more flexible, pro-growth approach – which began under the leadership of Chairman Kennard during the Clinton Administration – leads to more robust broadband deployment, more job creation and economic stimulus, and a higher level of facilities-based, intermodal competition.

Moreover, the existing pro-growth framework – coupled with consumer demand, competitive necessity, active public scrutiny, and industry commitments to openness – have safeguarded and increased consumer choice and kept the Internet open, without hampering broadband innovation and investment. Verizon and the rest of the broadband industry have committed to openness and providing consumers access to the full benefits of public Internet, and consumer demand has created ever-stronger momentum in the direction of increasing openness. In addition, the Commission's wireline broadband principles have helped to guide providers' practices in a way that protects the public Internet. In short, consumers have access to the public Internet with services that let them go where they want and do what they want online, and they will continue to do so.

Moreover, if policymakers follow the consumer-choice framework suggested above – with its reliance on more meaningful disclosures to consumers and more choices for consumers concerning the nature of their services – consumers will continue to drive broadband and the Internet in ways that best serve them and that lead to more widespread, more robust, and more

secure broadband networks. Some consumers are likely to prefer a plain-vanilla Internet access service, while others may prefer more managed services that afford additional security, reliability or other features or capabilities. In either case, consumers should make those decisions, and network engineers should have the flexibility that they need to satisfy consumers and provide them with an expanded range of choices.

While some parties raise concerns – mostly hypothetical – in an effort to prompt new, more intrusive, broadband regulation, most of those concerns would best be addressed through this type of consumer-choice framework. On the other hand, any retreat from the flexible, pro-growth regulatory policy to address concerns that may never come to pass – and particularly any policies that would impose outdated, common-carrier-like obligations on the competitive broadband marketplace – would threaten the healthy dynamics of the current broadband marketplace, including the high levels of investment and deployment that are putting people to work and building the next-generation wireline and wireless networks that will help America to achieve its broadband potential. Such regulation would also chill the innovation needed to make sure that broadband technology is capable of satisfying the many and varied uses that consumers and the public will demand going forward.

a. A Flexible, Pro-Growth Approach Furthers Broadband Goals

As an initial matter, as the administration’s new regulatory czar has explained, “the use of rigid, highly bureaucratized ‘command-and-control’ regulation” is a “pervasive source of regulatory inefficiency.”⁷⁶ Such regulation often ignores the “enormous differences among” regulated parties and pays “inadequate attention to the problem of incentives.” *Id.* at 97-98.

Therefore, “[f]or the most part, the policy instruments of choice should not involve rigid dictates

⁷⁶ Richard H. Pildes & Cass R. Sunstein, *Reinventing the Regulatory State*, 62 U. Chi. L. Rev. 1, 96 (1995).

or commands, which are expensive and potentially counterproductive, and in any case ill-suited to an era of rapidly changing technology.”⁷⁷

These observations have proven true in the case of the competitive and emerging broadband marketplace. As broadband technology for the mass market first started to emerge in the 1990s, policymakers in the Clinton administration recognized the risk of extending outdated regulatory policies in the context of the emerging and innovative Internet marketplace, as well as the significance of private investment and innovation in the development of broadband technology and the public Internet. As President Clinton stated when signing the “Framework for Global Economic Commerce”:

Though government played a role in financing the initial development of the Internet, its expansion has been driven primarily by the private sector. For electronic commerce to flourish, the private sector must continue to lead. Innovation, expanded services, broader participation, and lower prices will arise in a market-driven arena, not in an environment that operates as a regulated industry.

Accordingly, governments should encourage industry self-regulation wherever appropriate and support the efforts of private sector organizations to develop mechanisms to facilitate the successful operation of the Internet. Even where collective agreements or standards are necessary, private entities should, where possible, take the lead in organizing them.⁷⁸

In fact, in a technology plan released shortly after he was elected, President Clinton recognized that “[c]ivilian industry . . . is the driving force behind advanced technology today,” and pledged to strengthen[] our civilian technology base” in order to “solve the twin problems of national

⁷⁷ Cass R. Sunstein, *Television and the Public Interest*, 88 Calif. L. Rev. 499, 563 (2000).

⁷⁸ White House Office of the Press Secretary, “Memorandum for the Heads of Executive Departments and Agencies,” <http://govinfo.library.unt.edu/npr/library/direct/memos/eleccom.html> (July 1, 1997).

security and economic competitiveness.”⁷⁹ At that point, he tasked Vice President Al Gore with “creat[ing] a forum for systematic private sector input into U.S. government deliberations about technology policy and competitiveness.” *Id.* Later, Vice President Gore confirmed the central role of private industry in the development and deployment of broadband, noting that “[t]he idea of the federal government constructing, owning, and operating a nationwide fiber-optic network to the home is a strawman.”⁸⁰ Rather than building or operating broadband networks, the Vice President noted that government instead would focus on the coordination of standards and the funding of research and development.

When the Clinton Administration later developed its “National Information Infrastructure Agenda for Action,” it recognized again that the private sector should remain in the leadership role. The first guiding principle listed in that agenda was to “[p]romote private sector investment, through tax and regulatory policies that encourage innovation and promote long-term investment, as well as wise procurement of services.”⁸¹

Consistent with the Clinton Administration’s approach, FCC Chairman Kennard recognized (a decade ago now) that outdated regulatory frameworks would stifle the innovation and investment needed to fuel the continuing evolution of the Internet and harm consumers’ interests:

I believe that two things are most responsible for the explosion of the Internet . . . First, this tradition of openness. Second, the fact that the Internet is unregulated.

⁷⁹ William J. Broad, “Clinton to Promote High Technology, With Gore in Charge,” *New York Times* (Nov. 10, 1992).

⁸⁰ Mitchell Kapor, *Wired Magazine* “Where Is the Digital Highway Really Heading?,” http://www.wired.com/wired/archive/1.03/kapor.on.nii.html?pg=1&topic=&topic_set= (1993).

⁸¹ <http://www.ifla.org.sg/documents/infopol/us/nii.txt>.

Let me say this as clearly as I can: as long as I am chairman of the FCC, we will not regulate the Internet. . . . Unfortunately, there are those who, for whatever reasons, try to rile up Internet users saying that the FCC is going to take those old phone regulations and dump them on the Internet. . . . [A]nyone who knows anything about me knows that I am committed to creating a telecom marketplace that is free from unnecessary regulation and full of robust competition. . . .

Because if you know that companies are making decisions based on marketplace incentives, rather than regulatory edicts, then you can better predict what companies will do. And more predictability and more stability means: more investment, more innovation, more growth, more jobs, and more opportunity.⁸²

Later that same year, after noting that the Internet had “flourish[ed]” following the Commission’s creation of a “deregulatory environment,” Chairman Kennard noted: “So how do we get Americans broadband pipes? The answer lies in the history that I just laid out for you: by letting a competitive marketplace thrive.”⁸³

This visionary approach to broadband and the Internet in fact unleashed the “chain reaction of investment and growth” that Chairman Kennard predicted.⁸⁴ Following these early decisions by the Commission and other policymakers to refrain from applying old-school common carriage regulation to cable operators’ broadband services – and to prevent state or local regulation that could balkanize the Internet or slow its growth⁸⁵ – cable operators invested

⁸² Chairman William E. Kennard, “A Stable Market, A Dynamic Internet,” <http://www.fcc.gov/Speeches/Kennard/spwek910.html> (March 11, 1999) (“A Stable Market, A Dynamic Internet”).

⁸³ Chairman William E. Kennard, “The Unregulation of the Internet: Laying a Competitive Course for the Future,” <http://www.fcc.gov/Speeches/Kennard/spwek924.html> (July 20, 1999).

⁸⁴ See A Stable Market, A Dynamic Internet.

⁸⁵ Jim Davis and Corey Grice, CNET News, “FCC’s Kennard Slams Open Access Ruling,” http://news.cnet.com/FCCs-Kennard-slams-open-access-ruling/2100-1033_3-227121.html (June 15, 1999) (in explaining the need for national standards, Chairman Kennard stated: “There are 30,000 local franchises in the United States. If each one decided to develop standards for two-way communications on the cable infrastructure, there would be chaos.”)

heavily to upgrade their networks and rapidly spread the availability of cable modem services. Capitalizing on the less intrusive regulatory approach to these services – as compared to traditional telephone providers, whose broadband services were reflexively subjected to traditional common carriage regulation initially – the cable operators opened a commanding lead in the broadband marketplace, initially taking approximately two-thirds of broadband subscribers.⁸⁶

Only several years later did the Commission extend this same regulatory approach to the broadband services offered by traditional telephone providers, when it removed outdated common carriage regulation from wireline broadband services and limited unbundling obligations on next-generation broadband networks. This leveling of the competitive playing field yielded results that dramatically illustrate the consumer benefits of the flexible, pro-growth approach.

Professor Thomas Hazlett recently examined the effects of the various episodes of moving away from intrusive regulation of DSL services on broadband investment and deployment. *See id.* As Professor Hazlett notes, the history of broadband regulation in the U.S. created a natural experiment, given that cable modem service has been largely deregulated from the beginning while the treatment of DSL service has shifted over time from intrusive regulation to a more deregulated regime. *Id.* at 460-65. While cable modem services “held a nearly two-to-one market share advantage when DSL” was subject to intrusive regulations that were not applied to cable modem, “[o]nce the FCC eliminated a key provision of the access regime, ending line sharing in a February 2003 ruling, DSL subscribership increased dramatically.” *Id.* at 477. Indeed, “[b]y year-end 2006, DSL subscribership was 65% higher – more than 9 million

⁸⁶ Thomas W. Hazlett and Anil Caliskan, *Natural Experiments in U.S. Broadband Regulation*, 7 *Review of Network Economics* 460, 477 (Dec. 2008).

households – than it would have been under the linear trend established under” the previous, more intrusive, regulatory framework. *Id.* And the growth in DSL adoption continued with a subsequent decision in August 2005 to classify wireline Internet access services as information services, not subject to common carriage regulation. *Id.* As Professor Hazlett notes, “[t]his robust deployment response is inconsistent with the view that broadband regulation promotes innovation that spurs infrastructure investment or deployment . . . [and] presents a strong case for protecting such growth dynamics in public policy.” *Id.*

While this study focused largely on the effects of regulation on DSL deployment and adoption, the results of decisions to forego intensive regulation of next-generation fiber networks is perhaps even more dramatic. At the time in 2003 that the Commission made clear that next-generation fiber networks would not be subject to unbundling, fewer than 200,000 homes nationwide were passed by fiber. In reliance on that decision, Verizon and other broadband providers increased investment in next-generation, fiber networks. As of the end of March 2009, Verizon alone had passed 13.2 million homes with its all-fiber network, and will have passed 18 million homes with this network by the end of next year, at a cost of \$23 billion. This is a level of private investment in fiber networks not found anywhere else in the world.

As Professor Katz explains in the attached declaration, this increased infrastructure investment in the absence of intrusive, network-sharing obligations makes perfect economic sense. From the perspective of an incumbent provider, “[i]f an operator is forced to share portions of its network with rival network providers, then it will have diminished incentives because that investment will not be a source of competitive advantage.” *Katz Decl.* ¶ 27. Providers forced to bear all of the risks of heavy network investment, but share any rewards with competing providers, “have lower incentives to invest in facilities.” *Id.* ¶¶ 26-28. “These

concerns are particularly acute in the context of investment in new, next-generation broadband networks that require substantial investment, yet face both competitive and technological risks.”

Id. ¶ 28. Moreover, policies that mandate network sharing can also deter investment in facilities by other, competing providers. This is because “mandatory access at relatively low prices undermines the incentives of the service providers gaining access to invest in networks of their own. In colloquial terms, why should a service provider make costly investments in its own facilities when regulation guarantees low-cost access to another company’s facilities?” *Id.* ¶ 29.

By creating incentives for facilities-based providers of all types to invest in their broadband networks in reliance on pro-growth, pro-investment policies, the virtuous cycle of increased investment and deployment continues. In response to Verizon’s substantial investment in its FiOS network, cable operators are again upgrading their broadband networks in order to keep up and to meet consumers’ growing demands for speed and capacity. At this time, all of the major cable operators “are beginning to deploy DOCSIS 3.0 technology that allows them much greater flexibility in terms of matching FiOS data rates.”⁸⁷

⁸⁷ Pike & Fisher, *supra*. at 39.

Changed Regulation Increased Investment

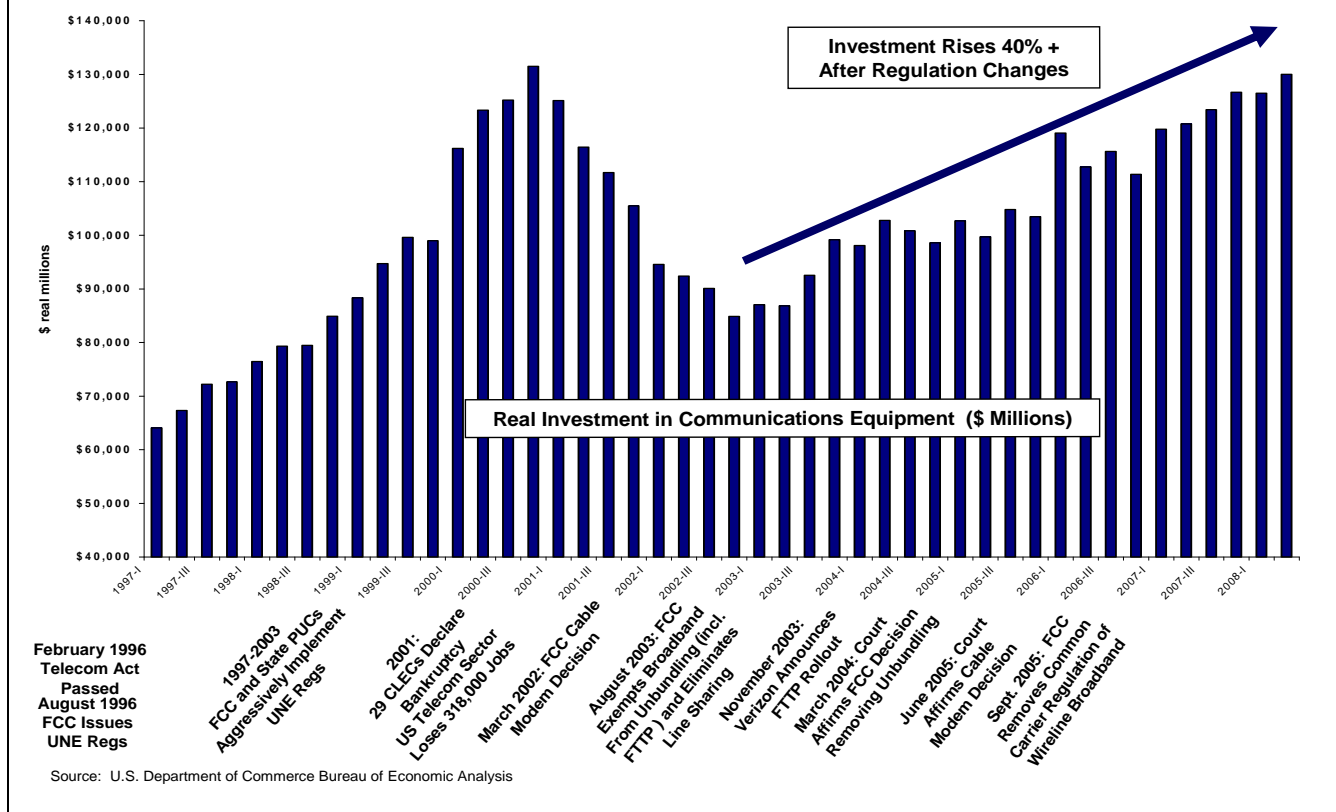


Chart 5

The broadband arms race for more widely available and robust services is also playing out across other competing platforms, such as wireless. As discussed above, all of the national wireless providers already offer 3G wireless broadband services, and 4G services are now becoming available. Verizon Wireless' will offer its 4G LTE wireless broadband service to approximately 100 million people by the end of next year, and Clearwire plans to offer its competing 4G WiMAX service widely by that time.⁸⁸

⁸⁸ See Verizon at JPMorgan Global Technology, Media and Telecom Conference Transcript, Thompson StreetEvents, http://investor.verizon.com/news/20090519/20090519_transcript.pdf, at 7 (May 19, 2009).

The benefits of a less intrusive regulatory approach on broadband infrastructure investment have likewise been documented in other parts of the world. An analysis comparing various European regulatory regimes found that more intrusive access obligations have a demonstrated effect of deterring investment in competing broadband infrastructure and undermining facilities-based competition.⁸⁹ Based on econometric analysis, that study concluded that “the intensity of access regulation . . . negatively affects investment in alternative and new access infrastructures.” *Id.* at 5. This study is consistent with the experience in this country – the removal of intrusive regulation and network sharing obligations encourages investment in competing platforms and prompts intermodal competition.

As all of this evidence shows, the flexible, pro-growth regulatory approach employed over most of the last 15 years is working well for consumers and furthering the nation’s broadband goals, including widespread facilities-based, intermodal competition, investment in next-generation broadband networks, and expanding consumer choice.

b. The Flexible, Pro-Growth Approach Also Promotes Openness

Experience also confirms that a flexible, pro-growth regulatory approach is consistent with the openness of the public Internet. Verizon is committed to openness, and we and other broadband providers have committed to providing public Internet access services that enable consumers to go where they want and do what they want online. Indeed, consumers expect and demand as much and would quickly abandon any broadband provider that failed to satisfy their demands for openness. A vigilant online community also keeps a close watch on broadband

⁸⁹ See Leonard Waverman, et al., LECG, *Access Regulation and Infrastructure Investment in the Telecommunications Sector: An Empirical Investigation*, http://www.etno.be/Portals/34/ETNO%20Documents/LECG_Final%20Report.pdf (Sept. 2007).

providers' practices, and likewise would pounce on any provider that tried to undermine the openness of the public Internet.

Moreover, in the context of wireline broadband Internet access services, the commitment to openness is further bolstered by the Commission's *Broadband Policy Statement*, which sets out four openness principles that apply in this context. Those principles recognize that, subject to "reasonable network management," users of wireline broadband services used to access the public Internet are entitled to: (1) "access the lawful content of their choice"; (2) "run applications and use services of their choice, subject to the needs of law enforcement"; (3) "connect their choice of legal devices that do not harm the network"; and (4) "competition among network providers, application and service providers, and content providers."⁹⁰ These principles have helped to guide wireline providers' practices and to ensure that consumers' expectations for their public Internet access services are met.

Not surprisingly in light of all of these forces pushing towards openness, Verizon and other broadband providers have lived up to these consumer expectations and continued to provide broadband services that enable customers to access the public Internet in an open manner. And in the rare instances in which concerns were raised – namely, in the case of Madison River's blocking of a port associated with VoIP traffic and Comcast's network management practices aimed at reducing congestion by targeting P2P traffic – the combination of competitive pressure, public attention, and Commission action have addressed the concerns.

⁹⁰ *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities; Review of Regulatory Requirements for Incumbent LEC Broadband Telecommunications Services; Computer III Further Remand Proceedings: Bell Operating Company Provision of Enhanced Services; 1998 Biennial Regulatory Review – Review of Computer III and ONA Safeguards and Requirements; Inquiry Concerning High-Speed Access to the Internet Over Cable and Other Facilities; Internet Over Cable Declaratory Ruling; Appropriate Regulatory Treatment for Broadband Access to the Internet Over Cable Facilities*, Policy Statement, 20 FCC Rcd 14986, ¶ 4 (2005) ("Broadband Policy Statement").

In short, the existing flexible, pro-growth approach has worked at maintaining openness and addressing any concerns that arise, but without intrusive regulation that would limit the choices available to consumers or deter investment in broadband networks.

In fact, if anything, consumer demand has created increasing momentum towards increased openness. For example, as discussed in more detail below, in response to consumer demand Verizon Wireless has embraced openness with respect to its wireless broadband networks and is currently engaged in several initiatives that create opportunities for increased innovation by third-parties in new devices and applications that will run on its wireless networks. As this shows, there is no “openness” problem that needs to be fixed – consumers have, and will continue to have, access to the full range of content and services that the Internet has to offer, and both wireline and wireless networks will continue to provide platforms for continued innovation.

c. Intrusive Broadband Regulation Would Harm Consumer Choice

Given the successes that have resulted from a pro-growth regulatory approach, the Commission’s recommendations concerning a national broadband policy should not move backward by supporting – as some advocates of more intrusive net regulation have proposed – a broad non-discrimination principle that would effectively impose common carrier obligations, or impose the other ill-fitting common carrier or Title II regulation. That type of backward-looking, heavy-handed regulation – even if couched in terms of “net neutrality” – would undermine consumer choice and inhibit innovation and investment in broadband, and the jobs created and sustained by that innovation and investment. Such regulation would also undermine other important broadband goals by, for example, making it less likely that new investment extends

broadband networks to areas that are unserved today or by denying consumers additional choices in available services, devices, or applications.

No Basis for Intrusive Regulations Mandating One-Size-Fits-All Approach.

Common carriage requirements, including broad nondiscrimination requirements, were designed to address a one-wire world where non-differentiated services (*i.e.*, telephone service over twisted-pair copper) were offered by a monopoly provider. There is no policy or legal basis for imposing such requirements in the competitive and emerging broadband marketplace, and doing so would only get in the way of innovation and additional consumer choice and undermine the important interests in spreading broadband and creating or maintaining jobs. “There is no one business model or technological architecture that is the best way to achieve the goals of broadband investment, innovation, competition and adoption.” *Katz Decl.* ¶ 78.

Imposing a broad “non-discrimination” obligation or other common-carrier-like requirements on broadband providers would be inappropriate and would harm consumers limiting consumer choice and chilling innovation and investment by broadband providers. *Id.* ¶¶ 46-47. In the context of commercial agreements, “non-discrimination” obligations – *i.e.*, obligations foreclosing differentiation and customization – are the exception, rather than the rule.⁹¹ That is because most commercial contracts provide for some form of differentiation or

⁹¹ See *Verizon Communications Inc. v. Law Offices of Curtis V. Trinko, LLP*, 540 U.S. 398, 408 (2004) (“[A]s a general matter, the Sherman Act ‘does not restrict the long recognized right of [a] trader or manufacturer engaged in an entirely private business, freely to exercise his own independent discretion as to parties with whom he will deal.’”) [quoting *United States v. Colgate & Co.*, 250 U.S. 300, 307 (1919)]; Restatement (First) of Torts § 762 (1939) (“One who causes intended or unintended harm to another merely by refusing to enter into a business relation with the other or to continue a business relation terminable at his will is not liable for that harm if the refusal is not (a) a breach of the actor’s duty to the other arising from the nature of the actor’s business or from a legislative enactment, or (b) a means of accomplishing an illegal effect on competition, or (c) part of a concerted refusal by a combination of persons of which he is a member.”).

customization,⁹² and they generally lead to procompetitive benefits by doing so. *Id. passim* (noting the potential consumer benefits from differentiated business models, pricing strategies, and network management practices). Indeed, today’s Internet marketplace offers numerous examples of procompetitive differentiation, such as settlement-free peering between backbone providers that receive an equal exchange of value from the traffic they exchange with each other.

The Commission ordinarily cannot compel a provider to “serve the public indifferently,”⁹³ unless “the public interest requires common carriage operation of the proposed facility.”⁹⁴ In assessing whether the public interest demands that a provider assume common-carrier obligations, the Commission has “focused its inquiry on whether the provider has sufficient market power to warrant regulatory treatment as a common carrier.”⁹⁵ No such finding could be made here, considering the vigorous intermodal competition that exists in the market for broadband access services.⁹⁶ As the Commission has recognized, “the public interest is best

⁹² Cf. *Barry Wright Corp. v. ITT Grinnell Corp.*, 724 F.2d 227, 236 (1st Cir. 1983) (Breyer, J.) (“Virtually every contract to buy ‘forecloses’ or ‘excludes’ alternative sellers from some portion of the market, namely the portion consisting of what was bought.”).

⁹³ *Appropriate Framework for Broadband Access to the Internet Over Wireline Facilities*, Report and Order and Notice of Proposed Rulemaking, 20 FCC Rcd 14853, ¶ 103 n.317 (2005) (“*Wireline Broadband Order*”).

⁹⁴ *Virgin Islands Tel. Corp. v. FCC*, 198 F.3d 921, 924 (D.C. Cir. 1999) (internal quotation marks omitted).

⁹⁵ *Id.* at 925 (internal quotation marks omitted).

⁹⁶ See also *Wireline Broadband Order* ¶ 3 (“[T]he broadband Internet access market today is characterized by several emerging platforms and providers, both intermodal and intramodal, in most areas of the country.”); Robert J. Litan and Hal J. Singer, *Unintended Consequences of Net Neutrality Regulation*, 5. J. on Telecom. & High Tech. L. 533 (2007), available at SSRN: <http://ssrn.com/abstract=942043> (“access providers lack *significant* power over prices” or “the ability to exclude rivals”).

served if [the Commission] permit[s] competitive marketplace conditions to guide the evolution of broadband Internet access service.”⁹⁷

Moreover, adopting broad “non-discrimination” obligations brings with it a host of administrative burdens – inevitably leading to intrusive, common carrier-like regulation, with regulatory oversight of the physical and economic terms of arrangements including regulatory determinations of rates and costs.⁹⁸ For example, courts have held that, to find a violation of the nondiscrimination obligation in § 202(a) of the Communications Act, 47 U.S.C. § 202(a), the Commission must find (1) that “the services are ‘like’”; (2) if they are, that “there is a . . . difference between them”; and (3) “if there is, . . . that [the] difference is [un]reasonable.”⁹⁹ Thus, regulators would be required to determine, among other things, which upstream providers are similarly situated and account for all variations between different types of content and application providers or different types of deals. For example, a regulator would have to decide whether a provider could offer higher priority to medical monitoring or online video-streaming than to music downloads or P2P file sharing. Ultimately, a nondiscrimination obligation could dissolve into a regime of regulated rates and offerings – a regime that would impose significant restrictions on innovation and consumer choice.

In addition to restricting innovation, a common-carriage-type regime would also undermine important broadband goals by forcing providers to build inefficiencies into their

⁹⁷ *Wireline Broadband Order* ¶ 85.

⁹⁸ *Cf. Trinko*, 540 U.S. at 408 (“Enforced sharing [of network facilities] requires antitrust courts to act as central planners, identifying the proper price, quantity, and other terms of dealing – a role for which they are ill suited.”)

⁹⁹ *Competitive Telecomms. Ass’n v. FCC*, 998 F.2d 1058, 1061 (D.C. Cir. 1993).

networks and systems in order to accommodate regulatory requirements.¹⁰⁰ Broadband networks have not been designed to accommodate the requirements imposed on traditional common carriers. As the history following the Telecommunications Act of 1996 clearly showed, requiring such things as regulatory arbitrations concerning the terms of interconnection would be an invitation to litigation and inefficiency – not increased broadband deployment or the creation and preservation of jobs. In order to comply with such regulatory requirements, providers would also have to incur massive added costs and inefficiencies in the way they structure their networks and configure their systems, thus adding complexity and costs for providers in those areas that are already most difficult to serve. Indeed, the cost of the wholesale systems and processes for narrowband services that were required in the wake of the 1996 Act ran into the multiple billions of dollars, and extending those requirements to broadband services would require massive additional expenditures and inhibit additional broadband investment. Such a regime would discriminate against those consumers who would miss out on the benefits of increased broadband deployment or additional competitive choice and innovative services as a result of intrusive new regulatory mandates.

As discussed above, rather than locking in a regulated, one-size-fits-all approach to broadband – as broad nondiscrimination or common carrier requirements would do – policymakers should encourage experimentation, innovation and investment that create new choices for consumers and lead to more widely available, useful and secure services, applications and devices. *See Katz Decl., passim.* Among other things, this approach is more suited to a

¹⁰⁰ *Wireline Broadband Order* ¶ 80 (concluding that, on balance, consumers would benefit from removal of *Computer Inquiry* requirements and from use of “latest technologically advanced integrated equipment”).

world in which broadband technology will be put to work to address many and varied uses by consumers and by the public.

d. Flexibility in Network Management Also Benefits Consumers

Similarly, policymakers should continue to recognize the importance of effective network management practices, and should encourage providers to develop and employ network management practices that make broadband networks more useful and secure for consumers. Broad, common-carriage-like obligations on network management practices – as some parties have advocated – would be grossly overbroad in this context.

The supposed concerns that some have raised concerning network management practices have focused on practices that are employed at times of network congestion, such as Comcast’s former practice of blocking certain P2P flows during times of network congestion. As a general matter, however, all parties agree that some form of network management is necessary in order provide consumers with high-quality, safe broadband and Internet services. All also agree that network management should be reasonable, and not unreasonably discriminatory. Therefore, policymakers’ approach to network management should reflect those areas of consensus, rather than imposing new restrictions – such as limitations on particular technological approaches – that that could make broadband services less safe and useful to consumers.

This approach – requiring that network management practices be reasonable, and not unreasonably discriminatory, but not otherwise tying the hands of the network managers – is particularly appropriate in the complex and evolving area of network management and the many important functions served by network management.

The Network Management Practices Required to Provide Consumers with Safe, Reliable, and High Quality Broadband Services Are Complex and Evolving, and These

Practices Are Best Developed by Network Engineers Who Must Respond to Real World

Concerns. The arguments asking policymakers to prospectively restrict providers' network management practices – such as by restricting certain technological approaches – fail to account for the complexity and importance of these practices, the evolving threats to networks and services, and delivering what customers choose from their providers. Arguments in favor of sweeping approaches that would tie the hands of network operators – such as broad nondiscrimination or common carrier restrictions – ignore the real world need for broadband providers to manage their networks in a wide range of contexts and using a variety of methods in order to deliver high quality and safe broadband services to their consumers. In fact, there appears to be a broad consensus that network management is both appropriate and necessary.

“Network management” is a simple term, but it implicates a broad range of practices aimed at myriad legitimate goals. Network management practices have long been used, with little controversy, to protect subscribers and the network from the relentless and evolving threats that exist on the Internet. As noted earlier, in order to ensure security and protect the performance of their networks, providers actively seek to identify threats – such as viruses, spam, Trojan horses, botnets, zombie computers, denial-of-service attacks or all manner of malware and spyware – and stop them *before* they harm subscribers or the provider's network. Innovation in network management practices could enhance these capabilities – such as the use of smarter networks capable of additional network-based security measures – and could help to improve cybersecurity, consistent with the Obama Administration's goals.

Likewise, in response to ever-increasing demands on network capacity and the proliferation of bandwidth-intensive applications, some broadband providers use network management practices to ensure that all subscribers get a fair shot at the network's available

bandwidth. Without such practices, the services of the vast majority of customers could be degraded by a handful of heavy users. Along the same lines, network management could be used to improve the functioning of the Internet and provide additional choices for consumers, such as by providing prioritization to latency-sensitive applications like telemedicine, voice, or streaming video, over other less sensitive traffic.

Although all providers engage in some forms of network management, the magnitude of particular concerns facing a provider, and the alternatives available to address those concerns, vary considerably. For example, broadband providers with shared network resources closer to the end user – such as wireless networks and cable modem networks – may face bigger challenges in ensuring that the activities of some users do not unreasonably degrade the services of other users competing for the same capacity. Likewise, differing technological and practical constraints mean that not all broadband providers have the same menu of options for addressing particular concerns. And innovation in network management practices continue to develop new solutions to more effectively meet the various challenges that threaten the quality and safety of broadband networks and services – particularly as broadband networks are put to more and varied uses by consumers, government agencies, businesses, and others.

Informed Consumer Choice Will Drive Network Management Practices. As with other broadband provider practices, informed consumer choice among the existing and growing competitive broadband options is the most effective check on providers’ network management practices. Broadband providers are engaged in competition across a number of dimensions, including speed, price, service quality, and features. Given this dynamic and working marketplace, any provider that engages in network management practices that harm consumers will be identified and punished, while those that employ practices that benefit subscribers’

broadband experience will be rewarded. The efficiency of this approach could be furthered by the consumer-choice framework described above, including the development of industry best practices aimed at ensuring that consumers receive meaningful disclosures concerning network management practices.

Regulation of Network Management Practices Would Inhibit Innovation and Would Lower the Quality and Safety of Broadband Services Used by Consumers. Given the central role of network management in providing consumers with reliable, safe, and high quality broadband Internet access services, and the complex variety of concerns addressed by these practices, regulation in this area would be particularly harmful to consumers. In order to effectively manage their networks and meet consumers' demands, broadband providers require flexibility to address the ever-changing challenges that arise. These practices may also be essential to furthering national interests, as broadband networks become more integral to such sensitive areas as health care, emergency communications, and smart electrical grids.

Restrictive new regulation in this dynamic area would constrain broadband providers' ability to address those challenges effectively and would remove alternatives that could prove effective – or even essential – in providing high quality services. Regulation limiting available network management practices or inhibiting the development of new technological approaches also would undermine the quality and security of consumers' services and the important national interest in more effective cybersecurity. Instead, the Commission should recommend a policy that – while recognizing that network management practices be reasonable and not unreasonably discriminatory – leaves it to engineers and network managers – not lawyers or regulators – to determine the practices that best serve consumers' interests.

e. Wireless Broadband Networks Should Not Be Subject to the Wireline Broadband Principles or Other Intrusive Regulation

The Commission also seeks comment on whether its existing “open network policies” should be applied to wireless networks, and asks, “What are the costs and benefits, technical considerations, bandwidth constraints, or constraints associated with the capacity of mobile wireless devices or networks that should be given consideration?”¹⁰¹ The NOI correctly acknowledges the importance of the very different paradigm that has evolved for wireless broadband services – a paradigm built on (1) competition, (2) the unique technical challenges involved in wireless communications, and (3) the close interdependence of wireless devices, applications and networks. These factors strongly counsel against extending the Commission’s wireline broadband principles to wireless or otherwise imposing new regulation on wireless broadband services.

As an initial matter, the wireless marketplace is already moving rapidly toward increased openness, but in a way that meshes with the unique constraints of wireless networks. Moreover, in the four years since adoption of the wireline broadband principles, there has been no demonstrated need to transfer them to the wireless broadband industry.¹⁰²

In any event, policymakers can effectively and efficiently promote the buildout of wireless broadband networks by adhering to the flexible, pro-growth regulatory approach

¹⁰¹ NOI ¶ 48.

¹⁰² In its extensive study of the broadband marketplace, the FTC noted that the lack of “significant market failure or demonstrated consumer harm from conduct by broadband providers” heightened the concerns about imposing blanket regulation. *FTC Staff Report: Broadband Connectivity Competition Policy*, <http://www2.ftc.gov/reports/broadband/v070000report.pdf>, at 11 (June 2007).

implemented by Congress and the Commission for CMRS.¹⁰³ This approach to the wireless industry has resulted in a fiercely competitive market for consumers in which over 95 percent of U.S. consumers have access to three or more wireless providers, and the majority of Americans – 60 percent – have access to five or more CMRS networks.¹⁰⁴ The value of this approach is reflected in the fact that the wireless industry in the first half of 2009 is characterized by continuing investment and innovation in the voice, consumer equipment, information services and broadband sectors, despite the nationwide recession.

To replicate this success for wireless broadband, policymakers should continue to promote deployment of wireless services through competitive market forces, and not impose the *wireline* broadband regulatory framework on wireless broadband networks. Congress and the Commission consciously did not attempt to replicate the wireline telephone regulatory model for CMRS, and the result is a robust and competitive CMRS industry. For the same reasons, the wireless broadband market should be allowed to develop without regulation imported from the wireline sector. Imposing the wireline broadband principles on wireless services is thus entirely unnecessary, and would be flatly inconsistent with the successful, pro-growth regulatory approach that has long applied to wireless services as well as with the significant differences between wireless and wireline networks.¹⁰⁵

¹⁰³ See generally Letter from William H. Johnson, Verizon, to Marlene Dortch, FCC, *The Commission's Consultative Role in the Broadband Provisions of the Recovery Act* and attached Comments, "Verizon's Recommendations for Effective Implementation of the American Recovery and Reinvestment Act of 2009's Broadband Stimulus Programs," GN Docket No. 09-40 (Apr. 13, 2009) ("Verizon's Recovery Act Recommendations") (discussing how investment in broadband networks is promoted by Commission's continuing a flexible, pro-growth regulatory approach).

¹⁰⁴ *Thirteenth CMRS Competition Report* ¶ 2.

¹⁰⁵ See Verizon's Recovery Act Recommendations, at 17-19; Comments of Verizon Wireless, *Skype Communications S.A.R.L.; Petition to Confirm A Consumer's Right to Use Internet*

Competition Is Also Driving Openness for Wireless Services. The wireless industry already is moving toward increased openness to respond to customer demands.¹⁰⁶ As Verizon's CEO recently noted, "the market is pressing the wireless industry towards openness and compatibility," and the "new business model [that] is emerging" will lead to "growth and innovation" that will be "hugely beneficial to the U.S. economy."¹⁰⁷

Verizon Wireless' Open Development Initiative (ODI), initiated in November 2007, is paving the way for third-party devices and services to access Verizon Wireless' networks.¹⁰⁸ For its initial ODI project on its CDMA network, Verizon Wireless announced that it would provide customers the option to use any device that meets the company's published technical standards and to use any application the customer chooses on such devices. Verizon Wireless subsequently published standards, held a developer's conference, established a certification procedure for third-party devices, and began certifying third-party devices for use on its network. Verizon Wireless has recently launched an open development project for its soon-to-be-built

Communications Software and Attach Devices to Wireless Networks, RM-11361, at 4-29 (Apr. 30, 2007) ("Verizon Wireless Skype Comments"); "Regulations always must be considered carefully to ensure that they carefully target a specific market failure and that the benefits of the regulation are expected to exceed its costs. In the case of the wireless industry, there is no evidence of market failure, and regulations – especially sweeping ones of the type [Professor Tim] Wu would like us to consider [i.e., wireless net neutrality] – are likely to impose significant costs on society and ultimately harm consumers." *Wireless Net Neutrality?*, Posting of Scott Wallsten, Progress & Freedom Foundation Blogs, http://blog.pff.org/archives/2007/02/wireless_net_ne.html (Feb. 11, 2007, 3:29 PM).

¹⁰⁶ See Thomas W. Hazlett, "Wireless *Carterfone*: An Economic Analysis," Verizon Wireless Skype Comments, Exhibit A at 14-15 ("competitive forces organize markets in innovative ways, discovering and satisfying consumer demands") ("Wireless *Carterfone*").

¹⁰⁷ "Verizon's Seidenberg: Wireless Industry Innovation Can Help Put Economy Back on Path to Growth and Prosperity," <http://newscenter.verizon.com/press-releases/verizon/2009/verizons-seidenberg.html> (April 1, 2009).

¹⁰⁸ See www.verizonwireless-opendevdevelopment.com.

LTE network using the 700 MHz C-Block spectrum.¹⁰⁹ Hundreds of third-party developers recently participated in the first conference held as part of that initiative.

Through ODI, device manufacturers and applications developers can create and market wireless products on their own using the Verizon Wireless network. This initiative gives consumers an opportunity to use third-party devices, onto which they can load the applications of their choice. This consumer-driven initiative “has spurred a flurry of research and development, from handsets to software and applications.”¹¹⁰

In addition to ODI, Verizon Wireless is now engaged in several additional initiatives to allow for third-party innovation on its networks. In April, Verizon Wireless announced that, together with China Mobile, SOFTBANK and Vodafone, it would join the Joint Innovation Lab, which will “focus on creating a single global platform for developers to encourage the creation of a wide range of innovative and useful mobile widgets . . . capable of enhancing the mobile Internet experience on a variety of smartphones as well as mid- and low-cost handsets on multiple operating systems.”¹¹¹ It also announced the creation of the Verizon Wireless LTE Innovation Center – an “incubator” to assist third-party device and application developers to create innovative new products and services for Verizon Wireless’ upcoming fourth-generation wireless network.¹¹²

¹⁰⁹ See “Verizon Wireless Drives 4G LTE Innovation with Open Device Development Specifications,” <http://news.vzw.com/news/2009/04/pr2009-04-16c.html> (Apr. 17, 2009).

¹¹⁰ A. Berg, “2009 Leadership Awards: Lewis Opens Up About Open Networks,” *Wireless Week* (Apr. 1, 2009).

¹¹¹ See Joint Innovation Lab Press Release.

¹¹² See LTE Innovation Center Press Release.

More recently, Verizon Wireless announced that it would encourage developers that use Java technology to develop new applications that will run on Verizon Wireless' broadband networks. As the Verizon Wireless CEO, Lowell McAdam, explained while announcing this decision at the JavaOne conference: "What we've decided to do is open up our network elements."¹¹³ This step increases the openness of Verizon Wireless' networks, and encourages innovation over the platforms.

Other wireless carriers also are responding to consumer demand for increased openness. Sprint Nextel Corporation and Clearwire have committed that their joint venture "New Clearwire" featuring Wi-MAX broadband technology "will permit consumers to use any lawful device so long as it is compatible with and not harmful to the network, and to download any applications or content subject only to reasonable network management practices and law enforcement and public safety considerations."¹¹⁴ Similarly, AT&T claims that its wireless network is open for both consumers and developers. On its website, AT&T commits to customers that they can bring any GSM phone for connection to the network, and it explains how customers can access and download applications.¹¹⁵

Notwithstanding the momentum towards openness, the wireless marketplace also shows that many consumers prefer a more highly-managed network environment for their wireless

¹¹³ <http://www.fiercemobilecontent.com/story/verizon-wireless-embraces-java/2009-06-02>.

¹¹⁴ Sprint Nextel Corp. and Clearwire Corp., Joint Opposition to Petitions to Deny and Reply to Comments, *Applications of Sprint Nextel Corporation and Clearwire Corporation for Consent to Transfer Control of Licenses and Authorizations*, WT Dkt. No. 08-94, at 36 (Aug. 4, 2008).

¹¹⁵ See <http://choice.att.com/flash/customersdevices.aspx>.

devices, such as the one generally available using popular Blackberry devices.¹¹⁶ *See also Katz Decl.* ¶¶ 59-60. Wireless providers should be permitted to continue to respond to those consumer choices as well. In short, imposing intrusive new regulatory requirements would have the effect of limiting consumer choice and impairing the efficiency of wireless broadband networks, while the competitive market for wireless broadband is achieving openness that is consistent with the technical and regulatory constraints on such networks.

Competition Is Promoting Wireless Broadband Deployment. Congress' and the Commission's pro-growth regulatory approach for wireless started with the Omnibus Budget Reconciliation Act of 1993 (OBRA), which amended the Communications Act to limit wireless regulation. The Commission declared that the "overarching congressional goal" in OBRA was "promoting opportunities for economic forces – not regulation – to shape the development of the CMRS market."¹¹⁷ As a result, the Commission has generally refrained from imposing new regulatory mandates for wireless.

This flexible approach preserves the incentives for wireless providers to invest in their networks, knowing that their own competitive decisions will result in a return on their investment.¹¹⁸ As the Commission noted when it implemented OBRA:

The continued success of the mobile telecommunications industry is significantly linked to the ongoing flow of investment capital into the

¹¹⁶ *See* Mark Lowenstein, "Implications of the Skype Petition for Wireless Carriers and Consumers," Verizon Wireless Skype Comments, Exhibit B at 6-9 ("Lowenstein Skype Analysis").

¹¹⁷ *Implementation of Sections 3(n) and 332 of the Communications Act*, Third Report and Order, 9 FCC Rcd 7988, ¶ 29 (1994). Congress amended the Act to implement its "general preference in favor of reliance on market forces rather than regulation." *Petition of New York State Public Service Comm'n to Extend Rate Regulation*, Report and Order, 10 FCC Rcd 8187, ¶ 18 (1995).

¹¹⁸ *See* Wireless *Carterfone* at 10-11.

industry. It thus is essential that our policies promote robust investment in mobile services.¹¹⁹

Nothing would be more destructive to investment in wireless broadband networks than changing this approach, such as by applying the wireline broadband principles. Forcing wireless providers to allow any device and any application to use their networks,¹²⁰ without regard to the source or operational characteristics and impact, would undermine the operators' incentives to design broadband networks to optimize the user experience and open up Internet access.

The wireless operator's goal is to ensure the user has the best opportunity to make his or her own choices about Internet access and content, within the constraints imposed by wireless technology. If consumers determine that they are not getting the choices they want, they can and will move to competitors. As the Commission has found, vigorous competition in the wireless industry has brought consumers extraordinary benefits, including the providers' massive pro-consumers investments in broadband 3G and 4G networks, EV-DO, HSPA, Wi-MAX and LTE, and adding new devices and applications at a rapid clip.¹²¹ There is simply no evidence either that this effort to improve wireless users' Internet choices is abating or that regulatory intervention might somehow be needed.

¹¹⁹ *Implementation of Sections 3(n) and 332 of the Communications Act Regulatory Treatment of Mobile Services*, Second Report and Order, 9 FCC Rcd 1411, ¶ 22 (1993).

¹²⁰ See *Broadband Policy Statement*, ¶ 4.

¹²¹ As recently as January 2009, the Commission provided more than 150 pages of data to support its central findings that there is "effective competition" in the industry, and that "U.S. consumers continue to reap substantial benefits – including low prices, new technologies, improved service quality, and choice among providers" from that competition. *Thirteenth CMRS Competition Report* ¶ 1.

Moreover, the Commission has heard from rural WISPs for whom intrusive new regulatory obligations would be severely costly and burdensome.¹²² Such providers are exactly the kind of broadband investors that the Commission wants to promote rather than discourage because their business model is bringing broadband to unserved or underserved areas. Being forced to changing their business model to address hypothetical concerns about wireless Internet access would hurt the very consumers who need and want the service and are the alleged beneficiaries of advocates for greater regulation.¹²³

The Wireline Model Does Not Fit Wireless Broadband Networks. The Commission's existing broadband principles were designed for wireline networks, not for wireless networks.¹²⁴ Good reasons exist not to apply those principles to wireless providers because wireless networks present unique technical challenges and concerns that distinguish them from wireline broadband networks.

Shared User Access. The core networks for wireless and wireline networks are not substantially different. But, the "last mile" distribution/access system is. Mobile systems are shared bandwidth systems, the "last mile" for wireless being the shared radio link.¹²⁵ All customers on a wireless network in the same area share that same capacity, meaning that the

¹²² See "Prepared Remarks of Brett Glass, Owner and Founder of LARIAT, an ISP serving Laramie and Albany County, Wyoming," *Broadband Network Management Practices En Banc Public Hearing*, http://www.fcc.gov/broadband_network_management/041708/glass-stmt.pdf (Apr. 17, 2008).

¹²³ See *Wireless Carterfone* at 2 (rural WISP "in competing for subscribers, has evidently determined that the losses associated with proscribed options [lack of device choice, usage limits] are exceeded by the value of improved opportunities for network users overall").

¹²⁴ See Verizon's Recovery Act Recommendations at 17.

¹²⁵ See George Ou, Information Technology & Innovation Foundation, *Managing Broadband Networks: A Policymaker's Guide*, http://www.itif.org/files/Network_Management.pdf, at 36 (Dec. 2008) ("*Policymaker's Guide*").

more one customer uses, the less that is available for all others attempting to use or access the network.¹²⁶ The bandwidth that can be delivered is spread across all the active customers on the same base station antenna and is constrained by the RF signal strength and quality which vary with geography, weather, traffic, speed, and the position of the people and objects near the device. Resource-intensive use by one wireless broadband customer can and will impact the speeds at which others can communicate and their ability to access the network. This is unlike the dedicated user access technology used in many wireline broadband systems, where sharing of capacity occurs only at more central points in the network.

Mobility. Mobile wireless networks, unlike fixed networks, enable customers to change locations and still gain access, or even to communicate while traveling. The wireless network has to be built to accommodate mobile subscribers, rather than subscribers sitting in one place.

Moreover, a wireless network includes cell sites that serve a variety of geographic areas ranging from areas as small as a few city blocks or as large as many square miles. These cell sites see a constantly changing mix and volume of voice and data uses, which put varying strains on the available spectrum resources. The wireless network has to respond to these variations with real-time, dynamic management of the RF “last mile” connections to users.

Another feature unique to wireless networks arises from supporting portability. A mobile service network has to be able to hand off a customer’s call or data session seamlessly from one cell site to another as the customer travels and to “find” the customer when he or she accesses the network from a new location. Managing mobility puts a type of bandwidth tax or overhead on the system. There must always be a small reserve of capacity at each cell site in order to prepare for either the next user to originate a session or for a current session to make the next handoff.

¹²⁶ See Brian Higgins, “Verizon Wireless Technical Statement in Response to Skype Petition,” Verizon Wireless Skype Comments, Exhibit C at 22-23 (“Higgins Technical Statement”).

This limits the spectrum resource that can be allocated to any one user and to all users within the area served by a certain cell. The need to accommodate portability and mobility thus puts unique network management demands on wireless networks because of the dynamic, constantly changing mix and location of traffic.

Bandwidth Availability. Wireless networks also face management challenges because they operate with very limited capacity, particularly when compared to a broadband system such as fiber. The more bandwidth available, the greater the throughput speeds that can be achieved.¹²⁷ To start, fiber has much greater capacity than wireless. Moreover, since the radio link to the user must compensate for interference from other users and noise, which are not present in a fiber optic line, the attainable throughput for wireless broadband is significantly less than fiber even on comparable bandwidths. As a result, the throughput capabilities of wireless services are much more constrained than in the wireline environment. As compared to the 50 Mbps services available over fiber, Verizon Wireless' 3G wireless broadband service, using EV-DO Rev. A technology, offers downloads at typical speeds of 600 kbps to 1.4 Mbps, and uploads at 500-800 kbps. Although 4G wireless technologies, such as LTE and Wi-MAX, will substantially improve those speeds, they will still lag behind the speeds available using next-generation wireline networks.

The discrepancy in bandwidth cannot simply be solved by adding more wireless capacity. A fiber-based network is limited only by existing technology and financial resources. Spectrum, in contrast, must be obtained from the federal government. Over the past two decades, the federal government has sold spectrum for mobile wireless networks, but in small pieces. For the first decade of the wireless industry (1984-1994), there was only 50 MHz of spectrum in total for

¹²⁷ See *Policymaker's Guide* at 36-37.

wireless networks, and it was split so that no carrier could have more than 25. In 1995, the Commission added PCS spectrum and other small blocks that it said provided 180 MHz total in each market. But it put a 45 MHz “spectrum cap” on what any one company could hold.

In the past three years, the Commission has allocated considerably more spectrum, but today, the government and broadcasting still occupy a significant amount of spectrum. Moreover, although the Commission repealed the 45 MHz spectrum cap, it still subjects spectrum purchases to a “screen” that requires further scrutiny, in all cases, of any spectrum aggregation of more than 145 MHz, and, depending on the availability of certain bands of spectrum in the local market, of spectrum aggregations of as little as 95 MHz. Even the highest screen is well below the bandwidth available to some landline networks. Wireline networks simply do not have similar constraints on accessing “last mile” resources.

Regulatory Oversight. The Commission’s wireline broadband principles also envision an environment where the network and the computers that attach to it are essentially independent. But, Congress and the Commission developed different regulatory regimes for wireline and wireless networks in part because of the technical differences between the two services, and those differences remain. While a DSL “network” is viewed as essentially the operator’s facilities up to the connection to the subscriber’s premises, the wireless broadband network includes the network and all the subscriber devices. A wireless device, or “mobile station,” operates as an integral part of the provider’s network, as the Commission’s rules require.¹²⁸

These architecture differences carry through to the regulatory framework for wireless service, which is built on the basic concept that wireless licensees are responsible for equipment

¹²⁸ See, e.g., 47 U.S.C. § 153(27)-(28); 47 C.F.R. § 22.923. Similarly, Section 22.927 of the Commission’s rules notes that “[c]ellular system licensees are responsible for exercising effective operational control over mobile stations receiving service through their cellular systems.”

and operations that use radio spectrum. In order to comply with a variety of Commission rules – including both technical rules and public interest obligations, such as E911 and CALEA requirements – wireless carriers must ensure that all aspects of their network, including the devices attached to the network, are coordinated and compliant with relevant regulatory obligations.¹²⁹

The Differences between Wireless and Wireline Networks Preclude a “One Size Fits All” Approach to Network Management. These major differences between wireless and wireline broadband networks translate to differences in the way the operators manage their networks that necessarily preclude extension of wireline-based net neutrality concepts to wireless.¹³⁰ For example:

Resource Management. To address the limited and shared spectrum resource, wireless operators, and their customers, have a strong interest in the effective management of this resource. Among other things, management strategies are employed in optimizing applications for use on the network. For example, network operators care about an application’s behavior with respect to the frequency and duration of “keep alive” and retry functions because, left unchecked, these features can overwhelm a cell site without achieving any benefit to the user.¹³¹

¹²⁹ Indeed, the Commission’s rules are clear that CMRS providers are accountable for devices on their networks. Section 22.3 of the Commission’s rules states that “[a]uthority for subscribers to operate mobile or fixed stations in the Public Mobile Services ... is included in the authorization held by the licensee providing service to them.” 47 C.F.R. § 22.3(b). Section 22.305 in turn states that “[s]tation licensees are responsible for the proper operation and maintenance of their stations, and for compliance with FCC rules.” 47 C.F.R. § 22.305.

¹³⁰ See generally Comments of Verizon and Verizon Wireless, *Petition for Rulemaking to Establish Rules Governing Network Management Practices by Broadband Network Operators; Petition for Declaratory Ruling Regarding Internet Management Policies; Broadband Industry Practices*, WT Dkt. No. 07-52 (Feb. 13, 2008) (discussing benefits to consumers of broadband network management practices).

¹³¹ See Higgins Technical Statement at 8-9.

Accordingly, an operator may restrict applications that keep an access connection alive more than is needed for typical usage.

The goals of wireless network management practices are to maintain equitable access to the network resource for the most users and to ensure that the most users have access to the bandwidth expected at any given time.¹³² The customer experience improves when the wireless network operator optimizes performance and efficiency by managing the shared air interface between users and the base station. For example, the air interface signal-to-noise conditions vary by user by time. When signal-to-noise conditions are good, more packets can be sent to the user. When signal-to-noise conditions are bad, fewer packets can be sent. The wireless industry uses sophisticated queuing and scheduling algorithms at each base station to optimize throughput by sending packets to users during times of good signal-to-noise conditions. This increases the throughput per cell and increases the average throughput per user. Also, the bandwidth required by various applications varies. Some applications consume as much bandwidth as possible, whether needed for an optimal user experience or not. Some video applications adjust dynamically to consume all available bandwidth. Latency requirements vary by application as well. VoIP is very sensitive to latency; email is not. Wireless network management provides as many customers as possible with the best user experience available, given the conditions in the cell site and mix of applications in use.

However, placed under a “neutrality” mandate with a standard based on wireline networks, such techniques may fail in one or more ways to provide “neutral” access to users and Internet sites and applications. But, the access configuration, the throughput, the choices of usage tiers or price points for consumers on wireline networks may be totally different from

¹³² See *Wireless Carterfone* at 15 (net neutrality rules would disrupt efficiencies achieved by rural WISPS with limited network resources through subscriber usage restrictions).

those on the wireless network. Competition will drive wireless networks to structure their offerings in ways that attract consumers, and consumers can vote with their feet if they do not like particular usage restrictions.

Regulatory Management. Pursuant to its Title III authority over spectrum licensees, the Commission has encouraged wireless carriers to design their networks to provide priority service to federal, state and local governments. Carriers must comply with detailed Commission rules for this service, which are designed to ensure that emergency responders get priority on a wireless network in emergencies. Verizon Wireless, for example, has contracts with a number of agencies to provide that priority service. To ensure it meets those agencies' needs, it must carefully manage the limited capacity on its networks, again particularly in times of emergency when the greatest usage volumes can be expected. As wireless services migrate to broadband networks, the same concerns will arise for access to the network and basic communications such as VoIP. Just as with CMRS, there are various techniques for meeting regulatory mandates. If an operator chooses one that is overly restrictive, consumers are likely to find a network with less intrusive restrictions.

Device and Application Management. To a much greater degree than with wireline networks, each wireless network is engineered differently, built to different interfaces, different frequencies, and contains varying network elements and platforms used to offer content and meet regulatory requirements. As noted above, the devices that attached to a wireless network are part of the network and operate under the control of the network operator. Therefore, there is no "legal device" concept in the wireless world other than a device that has been approved or certified for use on the network in accordance with the Commission's and operator's technical

requirements, regulatory obligations and available frequency choices.¹³³ The Commission made this clear in the open platform rules for the 700 MHz C-Block, by limiting access to devices and applications that are in compliance with the licensee’s published technical standards, including those standards necessary for reasonable network management and protection and compliance with regulatory obligations.¹³⁴

Even among devices and applications that may be certified for use on a network, there will be performance differences. Branded devices and applications are generally the result of an extensive development and testing process, which results in optimization for use on a specific network.¹³⁵ There are many considerations that go into the development of a wireless device that are irrelevant to desktop computers. For example, battery life, mobility, dropped call and blocked call performance all have to be taken into account for wireless services, and require the operator’s attention to the device and how it performs. Devices built simply to network access specifications will not necessarily perform in the same way as those that are optimized for use on the network. Consumers may not realize such differences exist in the wireless ecosystem. A “bring your own device” mandate places consumers at the risk of purchasing devices and applications that operate, but not well.¹³⁶ Given that the network operator will be blamed for any

¹³³ Cf. *Broadband Policy Statement* ¶ 4 (“consumers are entitled to connect their choice of legal devices that do not harm the network”).

¹³⁴ 47 C.F.R. § 27.16(b) (the technical standards must be “reasonably necessary for the management or protection of the licensee’s network,” or “as required to comply with statute or applicable government regulation”).

¹³⁵ See Higgins Technical Statement at 3-10.

¹³⁶ See <http://choice.att.com/customers/faq.aspx> (explaining that there is no guarantee that applications downloaded from the Internet will work properly, unlike those that are designed by AT&T for use on its wireless network). Cf. *Wireless Carterfone* at 4-7 (explaining why it makes little economic sense to require customers to choose all the technology and service options on wireless devices; wireless operators can ensure network efficiencies: “Firms earn profits by

performance problems, no matter what the source of the device or application, competition will drive operators to build networks that can accommodate the devices and applications that are popular with consumers, and there is no need to mandate standards that will be quickly dated.

Management of Harm. Of course, Internet users prefer their on-line experiences to be free of the harms or nuisances caused by spam, virus, malware, or bots. But, harmful applications and network attacks can come in many forms, and the sources and methods of attacks are constantly changing, particularly in the context of “open” wireless platforms.¹³⁷ New regulatory obligations aimed at “neutrality” would complicate wireless providers’ efforts to draw the line between blocking harmful applications or sources and allowing “openness.” In a competitive market, if the wireless operator errs too far one way or the other, it will experience complaints from those who did not or did want whatever was or was not blocked. Relying on the expertise and experience of the network operator is a more effective path than attempting to create an abstract and unforgiving regulatory standard.

All of these network and spectrum management realities make it not only inadvisable but impractical and ill-advised to attempt to graft wireline requirements onto wireless networks. Instead, the most effective policy for the Commission to follow to promote wireless broadband is to rely on the well-settled pro-growth regulatory paradigm for wireless and the innovative and competitive industry that this paradigm has fostered.

themselves re-arranging inputs in productive ways”); Lowenstein Skype Analysis, at 5 (current wireless industry model for devices has produced significant innovation and benefits for consumers).

¹³⁷ See Higgins Technical Statement at 10-16.

7. Reforming the Universal Service Fund for the Broadband Era

Absent an overhaul, the antiquated federal universal service program will weigh down many of the exciting opportunities promised by innovations in the broadband space. It is past time to update the USF to enhance the reach and capabilities of broadband.

Two measures are necessary to create a sustainable fund that can help support broadband. First, policymakers must set a budget, or a reasonable cap, for the high cost portion of the USF. Regardless of the services and technologies that policymakers may subsidize with high cost funding in the future, unrestrained growth in the fund imperils both the affordability and sustainability of all universal service programs – programs that consumers pay for through charges on their bills.¹³⁸ Indeed, consumers are taxed heavily to meet the fund’s existing demands. The federal universal service “contribution factor” (state universal service assessments are additional) is poised to increase to an all-time high – nearly 13 percent – in the third quarter of 2009¹³⁹ in large part to pay for more than \$4 billion in annual high cost support.¹⁴⁰ Allowing even larger USF charges would discourage broadband adoption. An overall high cost fund cap of \$5 billion would preserve the viability of the fund and provide sufficient support to address pressing needs in the broadband era.

Second, to fix the broken universal service funding mechanism without double-taxing broadband, policymakers should replace the current revenue-based USF contribution system with a

¹³⁸ 47 U.S.C. § 254(b)(5).

¹³⁹ See Universal Service Administrative Company (USAC), *Federal Universal Service Support Mechanisms Fund Size Projections for the Third Quarter 2009*, <http://www.usac.org/about/governance/fcc-filings/2009> (May 1, 2009).

¹⁴⁰ See USAC, *Federal Universal Service Support Mechanisms Quarterly Contribution Base for the Third Quarter 2009*, <http://www.usac.org/about/governance/fcc-filings/2009> (June 1, 2009).

flat-rate charge on phone numbers.¹⁴¹ The current USF contribution system is not viable in the broadband era. It was designed for a world where telephone companies offered customers simple phone service with separate local and long distance services. That world no longer exists. Today, consumers buy from a variety of providers “all distance” bundled offerings, which often include video, voice, and data for one price. To report revenues for purposes of USF contributions, providers must make increasingly difficult – and almost always arbitrary – distinctions between what portion of their revenues is “interstate” or “intrastate” and “telecommunications” or “information” services. These complexities are only exacerbated as companies roll out more and more converged services that rely on broadband connections and the Internet backbone. Companies that compete with each other for the same customers thus pay into the fund in different ways, skewing the competitive landscape – a result at odds with the desire to encourage all providers, using all technologies, to invest in and deploy broadband facilities.

A contribution system based on telephone numbers is more equitable for everyone and much easier to understand. Numbers-based contributions would stabilize the contribution base because the “number of numbers” is growing. Such a system is also better for consumers because it puts more of the contribution obligation on business services and because the amount of the USF charge that appears on consumers’ bills will not vary from month to month. And a numbers-based system fairly spreads the contribution burden among all competing providers and would be easier for the Commission and the Universal Service Administrative Company to administer and audit.

¹⁴¹ See Comments of Verizon and Verizon Wireless, *High Cost Universal Service Support*, WC Docket Nos. 05-337, 03-109, 06-122 and 04-36; CC Docket Nos. 96-45, 99-200, 96-98, 01-92 and 99-68, at 32-41 (Nov. 26, 2008) (“Verizon High Cost Comments”); Comments of Verizon, *Universal Service Contribution Methodology*, WC Docket No. 06-122, at 4 (Aug. 9, 2006).

At the end of last year, AT&T and Verizon jointly proposed a workable numbers-based methodology to replace the current USF contribution system.¹⁴² The AT&T and Verizon proposal is broadly supported across the industry and should be adopted. A “pure numbers” system with a flat-rate, per-number charge and limited, narrowly tailored exclusions (and appropriate adjustments for wireless family-share and pre-pay plans) as AT&T and Verizon proposed is the best approach.

With a numbers-based system, all customers, including broadband customers, would contribute to the fund based on the numbers they used. It would be harmful to broadband to double tax high-speed services by imposing an additional charge directly on the broadband connection. Such an assessment would put government’s thumb on the scale to discourage broadband deployment and adoption – which is exactly the opposite of what government policies should do.

Once we define the limits of what consumers should be asked to fund and how it is to be funded, focus can shift to retargeting support to meet important priorities – including broadband priorities. For example, policymakers could provide targeted universal service support for “middle mile” facilities needed to transport Internet traffic to and from rural areas. A broadband provider serving a rural part of a state must transport its customers’ Internet traffic to and from the nearest connection point to long-haul networks. Some have referred to those transport services as the “middle mile” to distinguish them from the “last mile” connections to end-users. In many cases, rural broadband providers must transport their Internet traffic over a greater distance than a broadband provider serving an urban area. Rural providers in several states have

¹⁴² See Letter from AT&T and Verizon to Marlene Dortch, FCC, WC Docket No. 06-122, CC Docket No. 96-45 (Sept. 11, 2008); *see also* Letter from AT&T and Verizon to Marlene Dortch, FCC, WC Docket No. 06-122, CC Docket No. 96-45 (Oct. 20, 2008).

met the demand for middle-mile transport services by constructing their own fiber-optic transport networks, often through a consortium. In some rural high cost areas, however, the cost of the additional transport mileage is high enough to impinge on a rural broadband provider's ability to offer services in those areas.

Any new middle-mile support program should fall within the overall cap on the high cost fund and should itself be capped at a set amount. Support also should be available for a fixed duration sufficient to provide recipients an opportunity to build a customer base, add new services, form a consortium or otherwise cover the costs of the transport. The program also should be technology neutral so that the most efficient technology is funded and should work in concert with the broadband stimulus programs administered by the RUS and the NTIA

The Commission could better encourage wireless broadband and other wireless build-out through a transition to a competitive bidding system for wireless USF support. The current system subsidizes wireless providers with USF support for every handset they sell under the so-called "identical support rule."¹⁴³ This results in excessive support to multiple carriers in the same study area – and does not encourage wireless providers to expand their networks and the reach of their wireless broadband platforms.

Competitive bidding would solve these problems. Rather than encouraging multiple wireless carriers to offer service and sell more handsets in the same areas where wireline high cost support is available, a competitive bidding system would provide a flat amount of subsidy to one wireless provider for the service term. This would encourage efficiency by the subsidized provider in order to maximize profit. Competitive bidding for wireless universal service support also has the benefit of increasing wireless broadband coverage. To win the bid, a wireless carrier

¹⁴³ 47 C.F.R. § 54.307.

must agree to serve an entire area, not just the smaller, more densely populated locale for which the provider often receives support today. The service area could be a wire center, or it could be an area that corresponds to the spectrum license that a wireless carrier holds. In either case, competitive bidding for wireless high cost support will require that the winning wireless bidder expand its service area in ways that today's system does not.

Competitive bidding is not a new concept. A recently released paper examining reverse auctions for universal service support in several countries reveals that competitive bidding programs “have proven themselves both feasible and effective mechanisms for reducing expenditures on universal service and for revealing information about the true costs of supplying service in rural areas.”¹⁴⁴ And competitive bidding is the standard means by which virtually all government agencies and businesses procure goods and services.

A new competitive bidding process for wireless support would clear the way for new broadband investments by wireless providers in other ways. The current system includes a patchwork of rules and commitments that create competitive disparities in the wireless market, such as merger conditions imposed on Verizon Wireless and Sprint that reduce support to these providers by 20 percent per year over five years.¹⁴⁵ As the Commission did with the interim cap on wireless support last year, a new competitive bidding system should supersede these

¹⁴⁴ Scott Wallsten, Technology Policy Institute, *Reverse Auctions and Universal Telecommunications Service: Lessons from Global Experience*, http://www.techpolicyinstitute.org/files/wallsten_global_reverse_auctions-1.pdf, at 17 (April 2008).

¹⁴⁵ *Applications of Cellco Partnership d/b/a Verizon Wireless and Atlantis Holdings LLC For Consent to Transfer Control of Licenses, Authorizations, and Spectrum Manager and De Facto Transfer Leasing Arrangements and Petition for Declaratory Ruling that the Transaction is Consistent with Section 310(b)(4) of the Communications Act*, Memorandum Opinion and Order and Declaratory Ruling, 23 FCC Rcd 17444, ¶¶ 192-197 (2008); *Sprint Nextel Corporation and Clearwire Corporation Applications for Consent to Transfer of Control of Licenses, Leases, and Authorizations*, Memorandum Opinion and Order, 23 FCC Rcd 17570, ¶ 108 (2008).

conditions and again level the playing field for all wireless providers.¹⁴⁶ In the Verizon-Alltel and Sprint-Clearwire merger orders, the Commission adopted the companies' commitments to accept the reductions as conditions of approval. Those commitments expressly provide that any action to reform wireless high cost support more broadly supersedes the merger conditions.¹⁴⁷

¹⁴⁶ *High-Cost Universal Service Support*, Order, 23 FCC Rcd 8834, ¶ 5 n.21 (2008) (providing that the new interim cap replaces similar merger condition caps on high cost support to AT&T and Alltel).

¹⁴⁷ *See* Letter from John Scott, Verizon Wireless, to Marlene Dortch, FCC, WT Docket No. 08-95 (Nov. 3, 2008) ("In the event that the Commission adopts a different transition mechanism or a successor mechanism to the currently capped equal support rule in a rulemaking of general applicability, however, then that rule of general applicability would apply instead."); *see also* Letter from Lawrence Krevor, Sprint, to Marlene Dortch, FCC, WT Docket No. 08-94 (Nov. 3, 2008) (same).

8. Encourage Broadband by Encouraging IP-Based Services

Policies that encourage the development and use of IP-based services have the effect of encouraging broadband deployment and adoption. The reverse is also true – wider availability and adoption of broadband also increases consumers’ ability to take advantage of innovative, IP-based services. To further this healthy dynamic and advance both broadband and IP-based services, the Commission should recommend that Congress reaffirm once and for all that all IP-enabled services are interstate services¹⁴⁸ subject to the Commission’s exclusive jurisdiction. Investors in and providers of these services need this certainty to continue offering the kinds of VoIP and IP services consumers want.

The time has also come for the Commission to decide the appropriate regulatory classification of VoIP services. This is an issue that the industry has grappled with for years.

The Commission Should Recommend that Congress Confirm Exclusive Federal Jurisdiction over Internet Protocol-Enabled Services. The Commission should recommend that Congress provide explicitly that all IP-enabled services,¹⁴⁹ including VoIP, and regardless of provider or technology, are interstate services subject to the Commission’s exclusive jurisdiction – *not* to more than 50 different sets of economic regulation. IP-enabled services are multi-

¹⁴⁸ In the *Vonage Order*, the Commission found that Vonage’s Digital Voice service is jurisdictionally mixed but practically inseverable, and therefore subject to the Commission’s exclusive jurisdiction. *Vonage Holdings Corp. Petition for Declaratory Ruling Concerning an Order of the Minnesota Public Utilities Commission*, Memorandum Opinion and Order, 19 FCC Rcd 22404, ¶¶ 18, 31-32 (2004) (“*Vonage Order*”), *petitions for review denied*, *Minnesota Pub. Utils. Comm’n v. FCC*, 483 F.3d 570 (8th Cir. 2007). For ease of writing, we refer to such services as “interstate.”

¹⁴⁹ To provide clarity to the industry, IP-enabled service should be explicitly defined as follows: “Internet protocol-enabled service” or “IP-enabled service” means any service, capability, functionality, or application provided over an Internet protocol (IP) platform (or any successor technologies), that enables an end user to send or receive a communication in IP format (or any successor format), regardless of whether the communication is voice, data or video.

faceted, any-distance services that cannot practicably be separated into intrastate and interstate parts. These services are deployed nationally, using national systems and platforms. As President Obama noted in announcing new national fuel efficiency standards, multiple sets of overlapping requirements result in “an inefficient and ineffective system of regulations.”¹⁵⁰ The same is true in the case of IP-based services – a single federal regime will produce efficiencies that would be lost if these services were subjected to more than 50 different sets of rules.

The Commission has already recognized the interstate nature of broadband networks and services. For example, in the *Cable Modem Order*, the Commission classified cable modem service as jurisdictionally interstate because cable modem service communications often travel between points located in different states and countries.¹⁵¹ The Commission also has classified DSL service used to provide Internet access as interstate for the same reason.¹⁵² In the *Pulver* case, the Commission declared that IP to IP services are information services and are interstate, subject to the Commission’s exclusive jurisdiction.¹⁵³ Similarly, the Commission has found that

¹⁵⁰ http://www.whitehouse.gov/the_press_office/Remarks-by-the-President-on-national-fuel-efficiency-standards (May 19, 2009).

¹⁵¹ See *Inquiry Concerning High-Speed Access to the Internet Over Cable and Other Facilities; Internet Over Cable Declaratory Ruling; Appropriate Regulatory Treatment for Broadband Access to the Internet Over Cable Facilities*, Declaratory Ruling and Notice of Proposed Rulemaking, 17 FCC Rcd 4798, ¶ 59 (2002) (“*Cable Modem Order*”).

¹⁵² See *GTE Telephone Operating Cos.; GTOC Tariff No. 1; GTOC Transmittal No. 1148*, Memorandum Opinion and Order, 13 FCC Rcd 22466, ¶ 1 (1998) (concluding that DSL service, “which permits Internet Service Providers (ISPs) to provide their end user customers with high-speed access to the Internet, is an interstate service and is properly tariffed at the federal level”) (“*GTE Order*”).

¹⁵³ *Petition for Declaratory Ruling that pulver.com’s Free World Dialup Is Neither Telecommunications Nor a Telecommunications Service*, Memorandum Opinion and Order, 19 FCC Rcd 3307, ¶¶ 5, 8, 11-14, 19-22 (2004) (“*Pulver Order*”).

VoIP services are subject to its exclusive federal jurisdiction.¹⁵⁴ It is time for policymakers to confirm that the same is true for all IP-based services.

These services are inextricably integrated services and inherently interstate in nature. As the Commission has observed, IP packets are “routed across a global network with multiple access points [that] defy jurisdictional boundaries.”¹⁵⁵ IP-enabled services provide the capability to interact with many different sources of information in various jurisdictions during a single communication.¹⁵⁶ By their very nature, IP-enabled services ignore state boundaries, and the efficient routing of IP traffic depends on the free flow of packets irrespective of the kind of point-to-point routing characteristic of circuit-switched networks. The web servers and soft-switches that allow for the provision of IP-enabled services will, in many cases, be located outside the particular state in which a user of those services is located. When end users employ IP-enabled services to communicate with each other, the packets travel with complete disregard for state and national boundaries.

Moreover, IP-enabled services up-end traditional concepts of location-based and device-based services. VoIP customers, for example, can have a single number that reaches them, no matter where they are and what device (phone or computer) they are using. Subscribers to IP-enabled services can also utilize multiple service features that access different websites or IP

¹⁵⁴ *Vonage Order* ¶¶ 15-37.

¹⁵⁵ *IP-Enabled Services*, Notice of Proposed Rulemaking, 19 FCC Rcd 4863, ¶ 4 (2004).

¹⁵⁶ The Internet is “an international network of interconnected computers enabling millions of people to communicate with one another and to access vast amounts of information from around the world.” *GTE Order* ¶ 5; see also *Cable Modem Order* ¶ 1 n.1 (defining “the Internet” as a “global information system”); *Amendment of Section 64.702 of the Commission’s Rules and Regulations (Second Computer Inquiry)*, Final Decision, 77 F.C.C.2d 384, ¶ 125 (1980) (enhanced services generally consist of the transmission of signals “over the interstate telecommunications network and, as such, fall within the subject matter jurisdiction of this Commission”).

addresses during the same communication session and perform different types of communications simultaneously. In addition, such services can route calls seamlessly to and from a wide variety of devices, some of which may be mobile, some of which may be nomadic and some of which may be fixed, and changeable at the user's discretion. It is precisely these features, which resist traditional legacy telephone regulatory classification and which are characteristics of IP-enabled services, including both facilities-based and over-the-top VoIP service, that make possible vast new opportunities for consumers and businesses in urban and rural areas alike across the country.

The ability to deploy IP-based services nationally, using national systems and platforms provides efficiencies that will make deployment more cost effective, enabling wider availability and greater benefit to consumers. Conversely, subjecting these services to disparate state regulatory regimes would eliminate the efficiencies of operating common systems and platforms, and would directly undermine Congress's and the Commission's policies of encouraging the development of such services free from the "burden[s] of rules, regulations and licensing requirements."¹⁵⁷

The Commission Should Determine The Classification Of VoIP. As Verizon has explained, policymakers can and should reaffirm exclusive federal jurisdiction over all IP-based services, regardless of technology or provider. In addition, clarifying the appropriate regulatory classification for VoIP will further national broadband goals by finally resolving a question that has long been the source of numerous disputes within the industry and that has diverted attention and resources from providing these advanced services to consumers. Consistent with the

¹⁵⁷ *Vonage Order* ¶ 21.

Commission's approach to such services in the past, VoIP services should be classified as information services.

IP-enabled services meet the statutory definition of an information service for a number of reasons. First, the voice calling capabilities of these services are inherently tightly integrated with a host of other features that themselves are information services. *Vonage Order* ¶ 32. VoIP services include a variety of integrated IP-enhanced features such as call- and contact-management features, the ability to access online applications during a call, instant messaging, and sophisticated “talking” e-mail in place of traditional voice mail.¹⁵⁸ For example, IP-enabled services allow end users to connect to the Internet (a functionality that the Commission has long deemed an information service), and provide users with the ability to access stored files (such as voicemail or directory information), engage in customized call management and screening, and route communications in a manner customized to the end user's preferences.¹⁵⁹

Similarly, VoIP services include “[m]essaging functions [that] can be integrated across platforms – so that voice mail can be accessed via computer, text messages can be accessed as if they were voice messages, and video messages can be viewed on a television set or personal computer.”¹⁶⁰ This integration of platforms provides users with the capability for “generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available

¹⁵⁸ Comments of AT&T, *High Cost Universal Service Support*, WC Docket Nos. 05-337, 03-109, 06-122 and 04-36; CC Docket Nos. 96-45, 99-200, 96-98, 01-92 and 99-68, at 24 (Nov. 26, 2008).

¹⁵⁹ Comments of SBC Communications Inc., *IP-Enabled Services*, WC Docket No. 04-36, at 34 (May 28, 2004).

¹⁶⁰ Comments of Comcast Corp., *IP-Enabled Services*, WC Docket No. 04-36, at 12-13 (May 28, 2004).

information.”¹⁶¹ As the Commission has previously found, these types of capabilities and features clearly bring VoIP services within the Act’s definition of information services, because they offer the “capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information via telecommunications.”¹⁶²

In addition, VoIP services that connect to the PSTN involve a net protocol conversion between end users, and thus constitute an “enhanced” or “information” services.¹⁶³ Such conversion is traditionally a hallmark of information services under the Commission's precedent.¹⁶⁴

Determining the appropriate regulatory classification for VoIP will not impair the Commission’s ability to address public interest issues as they relate to VoIP services. Indeed, the Commission has already addressed universal service, E911, Customer Proprietary Network Information (CPNI), the Communications Assistance to Law Enforcement Act (CALEA), disability access, local number portability (LNP), and discontinuance notice requirements as they apply to VoIP services. The Commission has determined that these requirements apply whether VoIP is classified as an information service or a telecommunications service.¹⁶⁵

¹⁶¹ *Id.* (citing 47 U.S.C. § 153(20)).

¹⁶² *Pulver Order* ¶ 11-12; 47 U.S.C. § 153(20). *See also*, 47 C.F.R. § 64.702(a) (“enhanced” services include any service that “provide[s] the subscriber additional, different, or restructured information; or involve[s] subscriber interaction with stored information.”)

¹⁶³ *See, e.g., Implementation of the Non-Accounting Safeguards of Section 271 and 272 of the Communications Act, as Amended*, First Report and Order and Further Notice of Proposed Rulemaking, 11 FCC Rcd 21905, ¶ 101 n.229 (1996) (“‘protocol conversion’ is the specific form of protocol processing that is necessary to permit communications between disparate . . . networks”).

¹⁶⁴ *See id.*

¹⁶⁵ *See, e.g., IP-Enabled Services; E911 Requirements for IP-Enabled Service Providers*, First Report and Order and Notice of Proposed Rulemaking, 20 FCC Rcd 10245, ¶ 26 (2005);

The Commission also should clarify that classification of VoIP services as information services will not interfere with the existing rights of competitive carriers to interconnect and to use the state arbitration process as provided in the Act. The Commission should state that VoIP providers that operate as a carrier and connect directly with an ILEC as well as to those who use the services of an affiliated or unaffiliated wholesale telecommunications carrier may continue to obtain interconnection as provided in the Act. Carriers will continue to have the ability to interconnect to an incumbent carrier's network at "any technically feasible point" as provided in the Act, nor is it altering carriers' ability to use the state arbitration process to resolve interconnection disputes under the Act. 47 U.S.C. §§ 251(c)(2), 252(b)(1).

Universal Service Contribution Methodology, Report and Order and Notice of Proposed Rulemaking, 21 FCC Rcd 7518, ¶ 35 (2006); *IP-Enabled Services; Implementation of Sections 255 and 251(a)(2) of The Communications Act of 1934, as Enacted by The Telecommunications Act of 1996: Access to Telecommunications Service, Telecommunications Equipment and Customer Premises Equipment by Persons with Disabilities; et al.*, Report and Order, 22 FCC Rcd 11275, ¶ 24 n.99 (2007); *Communications Assistance for Law Enforcement Act and Broadband Access and Services*, First Report and Order and Further Notice of Proposed Rulemaking, 20 FCC Rcd 14989, ¶ 8 (2005), *aff'd*, *Am. Council on Educ. v. FCC*, 451 F.3d 226 (D.C. Cir. 2006); *Telephone Number Requirements for IP-Enabled Services Providers, et al.*, Report and Order, Declaratory Ruling, Order on Remand, and Notice of Proposed Rulemaking, 22 FCC Rcd 19531, ¶¶ 30-38 (2007); *Implementation of the Telecommunications Act of 1996: Telecommunications Carriers' Use of Customer Proprietary Network Information and Other Customer Information, et al.*, Report and Order and Further Notice of Proposed Rulemaking, 22 FCC Rcd 6927, ¶¶ 54-59 (2007); *IP-Enabled Services*, Report and Order, WC Docket No. 04-36, FCC 09-40, ¶ 8 and n.21 (May 13, 2009).

9. Effective Implementation of Stimulus Programs

Another important aspect of the national broadband plan should include effective implementation of the Recovery Act's broadband grant programs. The more than \$7 billion in funding provided by the Recovery Act to the NTIA and the RUS for broadband-related projects provides an unprecedented opportunity to address the various obstacles that stand in the way of achieving the nation's broadband goals.

Given the scope of the work to be done, it is essential that stimulus funds be effectively targeted and efficiently administered by NTIA and RUS in order to make the most of this important opportunity and to ensure the best use of taxpayer dollars and the most progress towards national broadband goals. As explained in more detail in Verizon's comments concerning the implementation of the Recovery Act's broadband programs,¹⁶⁶ NTIA and RUS, first and foremost, should fund projects that would extend broadband service to unserved areas. In order to effectively locate and target unserved areas, NTIA and RUS should make use of the state-level broadband maps being created by public-private partnerships in many states around the country. States including Kentucky, North Carolina, Ohio, Tennessee, and West Virginia have public-private partnerships up and running,¹⁶⁷ and Congress' embrace of this approach in the Broadband Data Improvement Act – and funding of these initiatives through the Recovery Act – means that they will continue to spread. These initiatives – many following the successful approach used Connected Nation in several states – provide a granular and accurate view of broadband availability (in addition to generating useful information about the resources in

¹⁶⁶ See Verizon's Recovery Act Recommendations.

¹⁶⁷ Alliance for Public Technology and the Communications Workers of America, *State Broadband Initiatives: A Summary of State Programs Designed to Stimulate Broadband Deployment and Adoption*, http://www.appt.org/publications/reports-studies/state_broadband_initiatives.pdf, at 3 (Nov. 2008).

particular areas that can be put to use in expanding broadband as well as the demand-side issues affecting adoption). The output of these mapping projects and other state initiatives provide a good starting point for identifying the unserved areas.

If funds remain after funding projects targeted at the unserved, then NTIA should focus remaining funds on projects that address demand-side issues – such as computer ownership, computer literacy, and lack of appreciation of the benefits of broadband – that limit more widespread broadband adoption.

In order to best further national broadband goals, NTIA and RUS should take an inclusive and flexible approach that encourages broad participation and casts a wide net for meritorious projects focused on the country's most pressing broadband needs. At the same time, in order to ensure that the Recovery Act's broadband programs do not get bogged down in regulatory wrangling that would undermine quick job creation and economic stimulus, NTIA and RUS also should avoid imposing regulatory "strings" or eligibility criteria – such as intrusive new restrictions on broadband providers' practices – that will deter participation or otherwise inhibit sustainable broadband investment and job creation.

10. Encouraging Broadband Adoption and Deployment Through Tax Reform

In order to encourage additional broadband adoption and deployment, policymakers also should ensure that tax policies at all levels of government encourage, rather than discourage, broadband adoption, investment and deployment – particularly in unserved areas. Doing so would help to make broadband availability ubiquitous and affordable, and also could help spur investment in new broadband infrastructure that creates jobs and stimulates economic activity.

Depreciation/Expensing Rules That Encourage Network Investment. The Commission should recommend that Congress take steps to ensure that current rules concerning the depreciation and expensing of network infrastructure investment encourage broadband investment and deployment by *all* providers.

Any steps that Congress could take to allow for expensing or accelerated depreciation of broadband network investment would effectively lower the cost of deploying these networks, helping to expand their reach to more areas. Much like investment tax incentives, these rules can be structured to encourage deployment and to create incentives for continued capital investment in these facilities.

Congress also should ensure that its depreciation and expensing rules apply in a way that is competitively neutral and encourages *all* broadband providers to invest. Currently, the tax code permits cable operators to depreciate their investments as they add fiber to their network over the course of seven years as provided by Rev. Proc. 87-56 under guideline class 48.42. For providers that were traditionally telecommunications carriers, the applicable rules extend the period for depreciating investment in fiber to 15 years. IRC § 168(e)(3)(E)(ii). A failure to update the tax code with respect to new innovative technologies that have evolved over the last two decades also has resulted in a disparity in the depreciation period assigned by the IRS to

wireless electronics located at the cell site. These disparities tilt the competitive playing field and effectively make it cheaper and more efficient for some of providers to invest than others. The failure to update depreciation rules for innovative new technologies results in a failure of the current classifications to reflect the hi-tech nature of the network assets used to provide today's broadband services. Congress should rectify this disparate treatment in a manner that increases the incentives for broadband investment for all types of providers.

Investment Tax Credits. Another effective approach to encourage increased or accelerated broadband investment would be the adoption of investment tax credits. Such credits would improve the return on investment in broadband infrastructure and provide an incentive for broadband providers to maintain or increase capital spending during this time of economic uncertainty. Moreover, depending on the structure of the investment tax credit, such policies could be structured to create particular incentives for deployment in currently unserved areas or to encourage the deployment of next-generation wireline or wireless networks, thus resulting in significant public benefits. The Senate passed a proposal along these lines as part of the Recovery Act, and Representative Meek has offered a similar proposal in the House of Representatives.¹⁶⁸ By adopting such a proposal, Congress could effectively encourage broadband investment and deployment – including in unserved areas or of next-generation networks – and spur the creation or preservation of jobs by following this approach. Unlike grant programs, an investment tax credit is administered in the normal course of business under the existing income tax structure, which significantly reduces the cost to administer such a program and encourages a wider range of providers to participate.

¹⁶⁸ HR 1, Section 1271, Senate Version, 2009; H.R. 69.

Tax Policies That Encourage Widespread Broadband Adoption. Tax policy and reform could also prove highly effective at addressing various “demand-side” concerns – such as affordability – that limit more widespread broadband adoption. Specifically, broadband policy considerations should include consideration of the broad array of state and local taxes that currently apply to communication services and providers. Many of these taxes were adopted at a time when the industry operated as a rate-regulated utility and the level of taxation did not impact the demand for telephone service. The highly competitive operating environment that exists today for the broadband/communications industry is vastly different than the monopoly phone system of a few decades ago. Unfortunately, the taxes applicable to communications providers and the services sold to communications consumers that were imposed on the legacy phone and cable industries still remain intact in most states today.

Refundable Tax Credits. An efficient and effective way to address broadband affordability concerns faced by some consumers would be for Congress to establish a refundable tax credit for low-income Americans to help them afford online access. For example, Congress should consider a 100% refundable tax credit for Americans that qualify for the earned income tax credit, to help these individuals pay for broadband service. The tax credit could be phased out as income increases. Congress might also consider refundable tax credits to help low-income families purchase computers or other devices that they could use to go online. This approach would directly address one obstacle to greater broadband adoption in a sensible and competitively neutral way. Moreover, the resulting increase in demand for broadband service would also increase broadband providers’ incentives to deploy and upgrade their broadband networks.

Address Regressive Taxes That Make Consumers Pay More for Communications

Services. The price of communications services to consumers is significantly increased each month by the regressive and discriminatory taxes that too often apply to these services.

Communications services – including voice and video services – typically are taxed at exceedingly high rates. One study found that, on average, consumers of wireline telephone service pay \$8.50 per month in taxes and fees, or 17.23 percent.¹⁶⁹ Cable video subscribers pay, on average, \$6.12 per month in taxes and fees, or 11.69 percent. *Id.* Finally, wireless telephone customers pay, on average, \$5.89 per month in taxes and fees, or 11.78 percent. *Id.* So, taken together, a customer purchasing a bundle of voice, video, wireless and broadband services may pay more than \$20 per month in taxes for use of these services. This average rate of 13.52 percent in taxes for the use of communications services is more than double the national average rate of tax – 6.61. percent – for retail sales. *Id.* at 2. In fact, in some places the taxes on communications service exceed the “sin taxes” levied on alcohol or tobacco. *Id.* at 3. Taxation at sin-tax levels is typically implemented to discourage use or consumption of the relevant service or product. These excessive levels of tax burden consumers with tens of billions of dollars annually in taxes on communications services, artificially inflating the costs of these services and depressing demand. *Id.*

Broadband Internet access services are generally not subject to state and local taxation because Congress recognized that it would need to take action to encourage innovation and expansion of the Internet through the imposition of a moratorium on the taxation of Internet access (except in eight states where state taxes on such services are grandfathered). Nonetheless, the fact that most other communications services that are transmitted over these broadband

¹⁶⁹ David Tuerck, et al., “Taxes and Fees on Communications Services,” The Heartland Institute, Policy Study #113, www.heartland.org, at 1 (May 2007).

networks are taxed at such high levels has a collateral effect on broadband deployment and adoption. Not only do these discriminatory taxes take money out of consumers' pockets that could be spent to subscribe to broadband services, but the excessive level of tax also decreases overall demand for services delivered over broadband networks, thus undermining the incentives for network investment.

Moreover, roughly half of the states have considered imposing new taxes on digital goods and services over the last two years – unfortunately, a number of states have gone ahead and started to tax these new broadband services. With efforts being taken to accelerate innovation in the broadband sector through stimulus funds focused on health IT and smart grid solutions provided over broadband networks, now is the time to implement a national framework to ensure that new digital broadband services do not come under the vestiges of the excessive level of state and local taxation that still exists under the legacy telephone tax system applicable to legacy services.

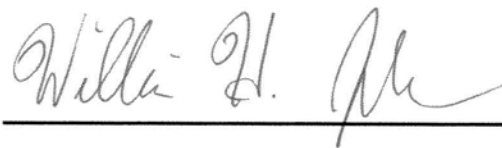
As discussed above, capping the universal service fund also would be a good starting point for limiting the taxes and fees on consumers' bills. The Commission also should recommend that Congress take steps to prevent other taxes (whether federal, state, or local) that discriminate against communications services. For example, Congress should act on legislation that places a moratorium on any new, discriminatory taxes on wireless services. Allowing the already excessive burden on wireless services to increase at a time when policymakers should be addressing and reducing the current level of taxation is counterproductive. A national framework focused on federal, state and local reform of these regressive tax burdens would help to ensure that tax impositions on broadband investment and consumer services are not

undermining broader, national objectives, such as the deployment of broadband networks and widespread adoption of broadband services.

IV. CONCLUSION

By taking the pragmatic, consumer-focused steps described above, policymakers could take enormous strides towards achieving key national broadband goals: (1) ubiquitous availability, (2) widespread adoption, and (3) empowered consumers with the benefit an expanded range of choices.

Michael Glover
Of Counsel

A handwritten signature in cursive script, appearing to read "William H. Johnson", written over a horizontal line.

Edward Shakin
William H. Johnson
Verizon
1320 North Court House Road
9th Floor
Arlington, Virginia 22201
(703) 351-3060

John T. Scott, III
William D. Wallace
VERIZON WIRELESS
1300 I Street N.W.
Suite 400 West
Washington, DC 20005

June 8, 2009

Attachment 1

**INVESTMENT, INNOVATION, AND COMPETITION IN THE
PROVISION OF BROADBAND INFRASTRUCTURE**

Declaration of Michael L. Katz

June 8, 2009

CONTENTS

I.	INTRODUCTION AND OVERVIEW	1
II.	BROADBAND NETWORKS HAVE THE POTENTIAL TO PROVIDE SUBSTANTIAL PUBLIC BENEFITS	4
III.	BROADBAND POLICY SHOULD PROMOTE EFFICIENT INVESTMENT BY ALLOWING NETWORK MANAGEMENT, VERTICAL CONTRACTING, AND SOPHISTICATED PRICING	6
A.	INVESTMENT BENEFITS OF NETWORK MANAGEMENT, VERTICAL CONTRACTING, AND SOPHISTICATED PRICING	7
B.	PUBLIC POLICIES AND PRIVATE INVESTMENT	11
IV.	BROADBAND POLICY SHOULD PROMOTE EFFICIENT INNOVATION BY ALLOWING NETWORK MANAGEMENT, VERTICAL CONTRACTING, AND SOPHISTICATED PRICING	19
A.	THERE IS NO “BEST” DEGREE OF OPENNESS TO PROMOTE INNOVATION	20
B.	PUBLIC POLICY AND INNOVATION	23
V.	BROADBAND POLICY SHOULD PROMOTE COMPETITION BY ALLOWING NETWORK MANAGEMENT, VERTICAL CONTRACTING, AND SOPHISTICATED PRICING	26
VI.	BROADBAND POLICY SHOULD PROMOTE EFFICIENT ADOPTION BY ALLOWING NETWORK MANAGEMENT, VERTICAL CONTRACTING, AND SOPHISTICATED PRICING	29
A.	NETWORK MANAGEMENT CAN PROMOTE BROADBAND ADOPTION	30
B.	SOPHISTICATED PRICING CAN PROMOTE BROADBAND ADOPTION	33
C.	VERTICAL CONTRACTING CAN PROMOTE BROADBAND ADOPTION	36
VII.	THE APPROPRIATE PUBLIC POLICY APPROACH.....	37

VIII. CONCLUSION	40
APPENDIX: QUALIFICATIONS	42
APPENDIX: FOOD LABELING AND UNINTENDED CONSEQUENCES	44

I. INTRODUCTION AND OVERVIEW

1. The American Recovery and Reinvestment Act of 2009 directs the Federal Communications Commission (Commission) to initiate a proceeding to develop a national broadband plan.¹ In response, the Commission has issued the National Broadband Plan Notice of Inquiry.² The *Broadband Plan NOI* poses an extremely wide ranging and extensive list of questions.

2. I have been asked by counsel for Verizon to conduct an economic analysis of certain issues raised in the *Broadband Plan NOI*. Specifically, I have been asked to analyze whether imposing various regulations that would broadly restrict broadband providers' network management practices, pricing policies, service offerings, or business models in the name of promoting "open networks" would promote consumer welfare and economic efficiency. I conclude that they would not. Instead, such requirements could very well stifle innovation and investment, and distort competition, all to the detriment of consumer welfare and economic efficiency.

3. Briefly, my findings are the following:

- *Broadband networks provide a fundamental platform on which many different entities can build to offer valuable goods and services that will benefit Americans as consumers, workers, and citizens.* As recognized by Congress and the Commission, broadband networks are a vital component of the 21st century national infrastructure.

¹ American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, 123 Stat. 115 (2009).

² Federal Communications Commission, Notice of Inquiry, *In the Matter of A National Broadband Plan for our Future*, GN Docket No. 09-51, adopted April 8, 2009, rel. April 8, 2009 (hereinafter, *Broadband Plan NOI*).

- *The potential benefits of a broadband infrastructure will be most fully realized only if there is investment, innovation, and competition in the provision of broadband networks and services, and only if end users widely adopt broadband services.* Absent investment, the infrastructure will not exist. Absent innovation, Americans will not have access to the most advanced services potentially available. Competition can play an important role both in promoting investment and innovation, and in ensuring that the benefits of that investment and innovation accrue to consumers. By creating attractively priced, advanced services, the combination of investment, innovation, and competition will also promote broadband adoption by businesses and consumers.
- *Network management, vertical contracting, and sophisticated pricing can all play important roles in promoting investment in broadband infrastructure.* Each of these business practices can increase the returns to investment in network infrastructure and, thus, promote investment.³ Vertical contracting can also promote investment in complementary products and services (e.g., broadband access devices or software applications).
- *The effects of mandatory infrastructure sharing are difficult to predict, and mandatory sharing runs a significant risk of reducing investment.* In theory, mandatory sharing can promote complementary investment. But mandatory facilities sharing can also discourage investment in substitute facilities (thus discouraging facilities-based competition) and is very likely to discourage investment by the providers subject to the mandatory sharing requirements. Empirical research supports the finding that, in several instances, mandatory sharing regulations have reduced investment and thus harmed competition.
- *Network management, vertical contracting, and sophisticated pricing can all play important roles in promoting innovation.* There is no one “right” business model for promoting innovation. There are modular, unintegrated systems that are highly innovative (e.g., some aspects of the Internet) and managed, integrated systems (e.g., BlackBerry smartphones or the Apple iPhone) that are highly innovative. Innovation may require the use of sophisticated pricing strategies to achieve profitability. And innovation may be profitable only if new services can be rolled out on a selective or integrated basis, rather than immediately made available to everyone. Hence, the use of both sophisticated pricing strategies and selective roll-outs can promote innovation. Lastly, it is important that policy makers

³ By vertical contracting, I mean vertical integration and various forms of contracting between providers at different stages in the value chain, including exclusive contracts. By sophisticated pricing, I mean the use of strategies such as third-degree price discrimination, two-sided pricing, and the offering of menus of products or services that vary in terms of speed, reliability, or other characteristics. Arguably, offering product menus goes beyond pricing alone, but I will use this shorthand where it is not a potential source of confusion.

recognize that beneficial innovation is not limited to products and services but can also include innovation in terms of new business models.

- *Network management, vertical contracting, and sophisticated pricing can all play important roles in promoting the competitive provision of broadband infrastructure.* Each of these practices can increase investment by entrants, as well as incumbents. Moreover, public policies that mandate undifferentiated networks comprising “dumb pipes” will create conditions under which the achievement of scale and density are critical to competitive advantage and commercial success. By so doing, these policies will create natural monopoly conditions that tend to promote increased concentration.
- *Network management, vertical contracting, and sophisticated pricing can all play important roles in promoting consumer adoption of broadband services.* Each of these policies can improve the value propositions service providers offer to end users. For example, network operators can use price discrimination to encourage adoption by those consumers who are most reluctant to purchase broadband access. Network operators can potentially use two-sided pricing strategies under which charges to application providers make it economical for network operators to offer consumers access at very low prices. Lastly, various forms of network management can be used to offer services that have highly controlled user experiences, which appeal to some consumers, even if not to others.
- *Blanket restrictions on network management, vertical contracting, and sophisticated pricing pose substantial risks of stifling investment and innovation, distorting and weakening competition, and harming consumers and economic efficiency.* Public policies that block network management, vertical contracting, and sophisticated pricing in the name of forcing network openness will thwart the realization of the benefits summarized in the bullet points above. In addition, business and public policy makers face tremendous uncertainty regarding which are the most beneficial business models and technological architectures, and there are good reasons to conclude that there is no one choice that is the best one for all situations. Hence, it is in the public interest to have regulations and antitrust policies that are themselves open to a variety of approaches. Public policies that force a single approach to openness on the industry are likely to harm innovation and limit experimentation. If policy makers mandate a single approach and get it wrong, there is no safety valve to fix the problem, as there would be under unfettered competition.
- *A case-by-case approach applying existing antitrust and consumer protection laws to broadband providers’ business practices, including the appropriate level of network openness, is more appropriate than are blanket legislation or broad regulatory rules.* Although network management, vertical contracting, and sophisticated pricing can all play important roles in promoting investment, innovation, competition, and adoption, there are certain circumstances in which some of these practices can be harmful to competition and consumer welfare. Given the highly fact-intensive nature of an inquiry into the question of whether

these potential harms outweigh the benefits in a particular instance, the most appropriate public policy treatment of these practices is the application of existing antitrust and consumer-protection laws on a case-by-case basis.

- *It is important for policy makers to recognize that competition generally creates incentives for network operators to adopt open network policies where doing so is efficient.* A competitive network provider faces pressures to adopt practices that allow the greatest possible benefits to be derived from its network. Two fundamental implications follow from this fact. First, public policy makers should aim to protect competition. This should be done both through the application of antitrust policy and by avoiding policies that themselves harm competition (*e.g.*, open network policies that discourage investment by new entrants). Second, policy makers should be particularly wary of imposing open network requirements or other intrusive regulatory restrictions that mandate a one-size-fits-all approach on network operators that face competition. Thus, for example, claims of widespread market failure and the need for a “wireless Caterfone” policy are particularly suspect—competitive forces can be expected to induce wireless service providers to allow the use of a wide variety of devices *where efficient*. Today, wireless network operators are taking a variety of approaches to network openness. It is my understanding, for example, that Verizon Wireless has concluded that allowing additional devices to connect to its network through its Open Development Initiative will promote network growth.

4. The remainder of this declaration explains these findings in greater depth and provides details of the facts and analysis that led me to reach them.

II. BROADBAND NETWORKS HAVE THE POTENTIAL TO PROVIDE SUBSTANTIAL PUBLIC BENEFITS

5. Broadband networks can serve as a fundamental platform on which many other activities can build to provide valuable goods and services. As recognized by Congress and the Commission, broadband networks are a vital component of the 21st century national infrastructure. That said, the potential benefits of a broadband infrastructure will be most fully realized only if there is investment, innovation, and competition in the provision of broadband networks and services, and only if end users widely adopt broadband services.

6. Absent investment, the infrastructure will not exist. Wireline, cable, and wireless telecommunications companies are estimated to spend tens of billions of dollars annually on broadband infrastructure.⁴ But many tens of billions of dollars of additional investment will be needed in order to reach the point where broadband services are ubiquitously available to Americans by a means other than satellite.

7. Absent innovation, Americans will not have access to the most advanced services possible. Wireless telecommunications provide an excellent example of continual network innovation. With each new generation of network, data throughput rates have increased and the range of services, applications, and devices available to consumers has expanded. Innovation in wireless networks is far from over. Currently, major wireless service providers are in the middle of yet another wave of network innovation (and investment) as they migrate to “fourth generation” LTE and WiMAX technologies. And—absent public policies that stifle innovation—there is no reason to believe that network evolution will not continue into the foreseeable future.

8. In addition to innovation in terms of new services and applications, there is a need for ongoing innovation to protect network and end-user security. There are many threats to network and end-user security, including worms, viruses, Trojan Horse programs, denial of service attacks, and various means of exploiting operating system vulnerabilities. Security is

⁴ See, for example, Jeffrey A. Eisenach, “The Telecom Sector and the Economy: How U.S. Broadband Policies are Working for America,” rev. May 2009, *available at* <http://www.empiris.com/docs/Telecom%20and%20the%20Economy%20Presentation%20Rev%20May%202009.pdf> at 7, and National Telecommunications and Information Administration, “Networked Nation: Broadband in America 2007,” January 2008, *available at* <http://www.ntia.doc.gov/reports/2008/NetworkedNationBroadbandinAmerica2007.pdf>, at 32-34.

becoming an increasingly important issue as broadband networks are used for more and more applications, some of which are critically important (*e.g.*, public safety applications) or could suffer from serious privacy breaches (*e.g.*, various forms of on-line medical record keeping or online banking).⁵ Innovative solutions to security problems can come from both the edges of the network and the core, and is it very likely that both types of innovation will be needed to address these formidable problems.

9. Competition policy (including antitrust enforcement and modern telecommunications regulation) is designed to protect competition because of the benefits that competition brings to consumers. These benefits typically come in the form of lower prices, greater innovation and variety, or higher product and service quality. Competition can play an important role both in promoting investment and innovation, and in ensuring that the benefits of that investment and innovation accrue to consumers.

10. By creating a variety of attractively priced, advanced services, the combination of investment, innovation, and competition will also promote broadband adoption by businesses and consumers.

III. BROADBAND POLICY SHOULD PROMOTE EFFICIENT INVESTMENT BY ALLOWING NETWORK MANAGEMENT, VERTICAL CONTRACTING, AND SOPHISTICATED PRICING

11. The potential of broadband networks to create public and consumer benefits will be realized only if companies have incentives to invest in these networks. Thus, as the

⁵ The increasing importance of security concerns is highlighted by President Obama's recent announcement that he will be appointing a national cybersecurity coordinator.

Commission recognizes, a central goal of any national broadband plan should be to create a policy environment that promotes efficient investment in broadband networks.

12. The *Broadband Plan NOI* asks

[H]ow can Congress or the Commission encourage private sector investment in broadband technology and services and the services and economic activity that they support? Likewise, how can Congress or the Commission encourage uses of broadband infrastructure and services that stimulate private sector investment in a variety of contexts (*e.g.*, seed programs, technology hubs, unlicensed services)?⁶

As I will now discuss, an important first step is to avoid imposing various restrictions in the name of open networks that would—if implemented—have the unintended effect of harming investment in both broadband networks and complementary products and services.

A. INVESTMENT BENEFITS OF NETWORK MANAGEMENT, VERTICAL CONTRACTING, AND SOPHISTICATED PRICING

13. Network management, vertical contracting, and sophisticated pricing can all promote investment in network infrastructure as well as in complementary equipment and applications.

14. Consider, for example, the use of sophisticated pricing strategies, such as price discrimination (*i.e.*, charging different prices to different buyers where the price differences are not driven by differences in the underlying costs of serving those consumers, such as when an airline charges a business traveler much more for a ticket without a Saturday night stay than it charges a leisure traveler for a ticket with a Saturday night stay), two-sided pricing (*i.e.*, an intermediary's charging prices to all sides of a transaction that it brings together, such as a broadband service provider that collects revenues from both an application

⁶ *Broadband Plan NOI*, ¶ 95.

provider and an end user when the end user accesses the application through the service provider's network), and the offering of menus of services that vary in quality or other characteristics. It is well known that all of these strategies can, in some circumstances, increase the economic returns enjoyed by a network operator. Hence, giving network operators the flexibility to utilize these strategies can increase network operators' investment incentives, thus increasing the availability of broadband services to consumers.

15. Various forms of vertical contracting, including vertical integration and various forms of exclusivity arrangements can promote investment in both network infrastructure and complementary equipment and applications. For example, although there are some circumstances in which exclusive arrangements raise concerns, it is widely accepted in legal, public policy, and economic analysis that exclusive contracts frequently promote competition and consumer welfare. Exclusivity arrangements can promote competition and increase incentives for suppliers to engage in facilities investment and innovation. These effects arise because exclusive contracts provide a means for parties to commit to dealing with one another and, thus, such contracts can increase the incentives for the parties to invest in their economic relationship. For this reason, exclusivity arrangements are common in many competitive markets (*e.g.*, a department store may have a contract with a clothing manufacturer to be the exclusive distributor of a certain line of clothes). Similarly, vertical integration (including integration into the supply of complementary inputs) can stimulate investment by internalizing what might otherwise be uncompensated spillovers from the investing stage to another stage in the vertical chain.

16. The iPhone illustrates the positive investment effects of exclusive vertical arrangements. AT&T was willing to invest in network infrastructure to support the Apple iPhone because AT&T had an agreement with Apple that the iPhone would be available in the United States exclusively on the AT&T network. This arrangement created an economic environment in which AT&T was willing to invest in modifications to its network hardware and software to support the iPhone’s “visual voicemail” feature and to make use of enhanced callback features.⁷ AT&T’s incentives to make these investments would have been significantly lower absent an exclusive arrangement with Apple.

17. Various forms of vertical relationships also support investments in goods and services that are complementary to broadband networks. Both network operators and device manufacturers provide support to independent providers of complementary goods and services (*e.g.*, Verizon’s Open Development Initiative and Apple’s developer kit). Consumers benefit from the resulting increase in the availability of a variety of access devices and applications.

18. Network management can also contribute to network investment. Network management allows a network operator to offer the greatest overall value to its customers from a given set of facilities, whether by efficiently allocating capacity among users, providing higher quality of service, or protecting network and end-user security. Network management thus makes investment in broadband networks more attractive: when a network

⁷ Visual voicemail provides a visual index of the voicemail messages that a user has received, and it allows him or her to access those messages in any order.

operator can offer greater value to its customers, the operator can expect to derive greater revenues from its network investments and, thus, has greater investment incentives.

19. Because there has been some confusion about the issue, it is useful to consider further the role of various network management practices in efficiently allocating capacity among end-users. There are those who claim capacity is, or eventually will be, essentially costless. Whatever the merits of this statement as a claim about the distant future, capacity certainly is not costless today. Network operators invest billions of dollars in capacity expansion every year. Simply put, high-volume users impose greater costs on network operators and on other end users than do low-volume users. These costs are clearly evident on wireless access networks, where high usage by a subset of end-users can result in a degraded ability of other end-users to utilize a network. Congestion and service degradation also arise in fixed-line, shared local access architectures, such as those used by cable system operators. Although less apparent, end users even cause congestion at higher levels of traffic aggregation, such as backbone networks. This congestion is why network operators have to continue to invest large amounts of money in expanding backbone network capacity.

20. There is no practical solution that will achieve the ideal outcome of allocating each unit of capacity to the use with the highest social value. In part, the problem is that policies that come close to achieving such an outcome would require large amounts of information and computation by network operators and consumers alike. These transaction costs should be taken into account. For example, to achieve such fine tuning through pricing, the pricing scheme would have to be so precise and detailed that consumers would very likely have to incur large costs simply to understand the pricing policies to which they were subject.

21. In the light of the costs associated with very finely tuned prices, alternative approaches, such as relatively simple forms of metered billing or usage caps, are likely to be reasonable second-best solutions. That said, it is also possible that some providers will continue to offer “all-you-can-eat” services. One plausible outcome is that—absent regulatory prohibitions of the practice—network operators will provide menus of options that include all-you-can-eat offers, which appeal to certain types of end users, as well as several other pricing options. At this point, neither business nor public policy makers know what is the best approach. Indeed, there very likely is not one best approach. For the foreseeable future, both pricing policies and more direct network management practices have potentially important roles to play in promoting the efficient use of broadband networks.

B. PUBLIC POLICIES AND PRIVATE INVESTMENT

22. Many different public policies can affect private sector investment in broadband networks. For instance, taxes and subsidies clearly have direct effects on investment incentives. It is important to recognize that public policies regarding business practices in the areas of network management, vertical contractual relations, and sophisticated pricing can also have significant effects on network investment incentives. This is so because, as discussed above, network management, vertical contracting, and sophisticated pricing can all promote investment in both network infrastructure and complementary equipment and applications. It follows that public policies that restrict these business practices can have significant adverse effects on network investment incentives.⁸

⁸ Some parties would like to see price levels for broadband service regulated. (See, for example, Letter from Ben Scott, Policy Director, Free Press to Chairman Henry A. Waxman,

23. Consider the public policy implications of this fact. If open network practices create economic value for network operators, then operators can be expected to adopt such practices voluntarily, and there is no need for regulation. Verizon Wireless' Open Development Initiative provides one example of a network operator encouraging third-party device and application developers to create complementary products and services that use its network. On the other hand, if open network practices destroy economic value for network operators, then a regulatory policy that imposes those open network practices on network operators will very likely reduce network investment and, consequently, harm consumers. In either case, there is a not a positive investment effect of open network regulation.

24. Open Video Systems (OVS) provide a cautionary tale in this regard. Open Video Systems are subject to regulations that are much like common carriage and, as the name implies, are intended to be open networks.⁹ The OVS model has provided little benefit for consumers; operators never made large investments in these networks and, consequently, few consumers benefited from them. Although many forces are at work, it is plausible that the common-carriage-like requirements played a central role in rendering this a business model that was unable to attract significant investment.

25. The dangers of adverse unintended consequences from public policy restrictions are particularly great in the presence of significant uncertainty and the high degree of heterogeneity across technologies. One-size does not fit all. Although policy makers can try

et al., April 22, 2009, available at http://www.freepress.net/files/FP_metering_letter.pdf, site visited May 27, 2009.) It should almost go without saying that regulating price levels would very likely distort investment, innovation, and network usage.

⁹ 47 CFR §76.1500.

to tailor rules to specific technologies, it is extremely difficult—if not impossible—to tailor rules exactly to each different technology and network operator. Consequently, there is a strong likelihood that such rules would not be competitively neutral.

26. The investment effects of a particular type of open network policy merit additional discussion. Specifically, consider the investment effects of public policies that mandate various forms of infrastructure sharing, such as mandatory roaming or forced unbundling of access to certain network components. In theory, mandatory sharing can promote complementary investment. However, mandatory sharing can also discourage both substitute investment and investment by the network providers subject to the mandatory sharing requirements. For these reasons, among others, U.S. competition policy typically (and appropriately) does not impose upon a supplier any general duty to deal with its competitors.

27. There are at least two broad mechanisms through which various forms of mandatory facility sharing can affect investment. First, requirements that lower the economic returns earned by a network operator will tend to reduce that operator's incentives to invest in its network. If an operator is forced to share portions of its network with rival network providers, then it will have diminished investment incentives because that investment will not be a source of competitive advantage. Rival operators' use of the shared facilities may lead them to increase the intensity of their other competitive activities, which harms the investing network operator. Absent mandatory facilities sharing, a network operator would not have to worry that other operators will use the facilities funded by its investments to compete against it. Consequently, the network operator will have lower incentives to invest in facilities when it is subject to mandatory facilities sharing.

28. It is worth noting that these adverse consequences of mandatory facility sharing can be particularly acute when there is a high degree of marketplace uncertainty and facilities investments are risky. Consider a potential investment in a new local access network that has a 50-percent chance of commercial success. If the new access service introduction fails, the investing carrier will lose its investment. The carrier may be willing to undertake this risk of loss because there is also a 50-percent chance of gain. But if the access service launch is successful and the operator is subject to mandatory sharing provisions, other service providers will be able to use the access to offer competing services, which diminishes the investing carrier's returns. The initial carrier's willingness to undertake the risky investment will thus be weakened. For this reason, a regulatory policy that forced carriers to bear all of the risks of their facilities investments but socialized the benefits associated with those investments that ultimately proved to be successful would have especially pernicious effects. These concerns are particularly acute in the context of investment in new, next-generation broadband networks that require substantial investment, yet face both competitive and technological risks.

29. Now, consider the second broad mechanism through which various forms of mandatory facility sharing can affect investment: effects on the investment incentives of parties that can take advantage of mandatory-sharing regulations to gain access to other network operators' facilities. This type of regulation is intended to stimulate complementary investment, and in some instances it can do so. But this type of regulation can also have the unintended effect of stifling substitute investment. Specifically, mandatory access at relatively low prices undermines the incentives of the service providers gaining access to the

facilities of other providers to invest in networks of their own. In colloquial terms, why should a service provider make costly investments in its own facilities when regulation guarantees low-cost access to another company's facilities?

30. These concerns are not merely theoretical. Several empirical studies have concluded that mandatory infrastructure sharing fails to stimulate investment in competitive facilities and, in some circumstances, even reduces it. One study looked at the local loop unbundling and facilities investment across different U.S. states over time. The authors found that “the best argument for maintaining the current unbundling regime—namely, that low UNE rates encourage CLECs to rent at first, and then build facilities once they have some market experience—is not supported by the data.”¹⁰ Another study examined the experiences of several nations to determine whether mandatory unbundling of local telephone networks promoted facilities-based competition. The authors concluded that there was no evidence that it did.¹¹ Similarly, the authors of a study examining the effects of local loop unbundling

¹⁰ Robert W. Crandall, Allan T. Ingraham, and Hal J. Singer, “Do Unbundling Policies Discourage CLEC Facilities-Based Investment?” at 4. Crandall, *et al.* found that the ratio of CLEC facilities-based loops to UNE loops was higher in states where the price of UNEs was high relative to the cost of building facilities. This finding suggests that CLEC facilities investment would be higher in the absence of unbundling, at least in the short term. This analysis does not directly test whether unbundling facilitates entry of CLECs who later migrate to facilities-based lines. However, Crandall, *et al.* report on a second regression analysis, which finds that the growth of CLEC facilities-based loops relative to the growth in UNE loops was greater in states where the price of UNEs was high relative to the cost of building facilities. This finding provides some evidence against the hypothesis that CLECs will transition over time to facilities-based loops after the availability of UNEs facilitates entry.

¹¹ Jerry A. Hausman and J. Gregory Sidak, “Did Mandatory Unbundling Achieve its Purpose? Empirical Evidence from Five Countries,” *Journal of Competition Law and Economics* **1**(1), 173–245. The countries were the United States, Canada, the United Kingdom, Germany, and New Zealand. In the U.S. and Canada, CLEC-owned lines decreased as a share of all lines after mandatory unbundling, which is the opposite of what would be expected if mandatory unbundling encouraged facilities-based entry. In the U.K., CLECs were already investing in

(LLU) on demand for alternative Internet access platforms in 12 European countries concluded that “The key *finding* from our study is that the intensity of access regulation (measured through LLU prices) negatively affects investment in alternative and new access infrastructures.”¹²

31. It is useful to close this section by addressing the false—but in some ways intuitively appealing—argument that restricting network management practices would encourage investment because it would force a network operator to invest in huge amounts of capacity in order to satisfy consumer demands. There are at least two fundamental flaws in such an argument.

32. First, a policy that triggered capacity investment in lieu of capacity management would be inefficient. Because a managed network can provide greater levels of service for a given amount of investment in physical infrastructure than can an unmanaged network, a managed network provides services at a lower unit cost. It is more efficient and a better use of society’s resources to expand effective network capacity through a combination of physical infrastructure investment and intelligent network management practices than to pour more

facilities prior to unbundling and the authors saw no evidence of conversion of UNEs to CLEC-owned lines. In Germany, CLECs used both UNEs and owned loops, and the authors saw no evidence of a transition from the former to the latter. Lastly, New Zealand did not implement mandatory unbundling of local loops.

¹² Leonard Waverman, Meloria Meschi, Benoit Reillier, and Kalyan Dasgupta, “Access Regulation and Infrastructure Investment in the Telecommunications Sector: An Empirical Investigation,” September 2007, *available at* http://www.etno.be/Portals/34/ETNO%20Documents/LECG_Final%20Report.pdf, site visited May 27, 2009, at 5 [emphasis in original]. Waverman, *et al.* estimated a regression showing that lower LLU prices are associated with lower demand for broadband services provided over alternative, facilities-based platforms. This demand reduction was then used in a calibrated simulation model, which makes the reasonable assumption that lower demand leads to lower facilities investment, to project the investment effects of lower LLU prices.

money into physical infrastructure alone. Network operators invest billions of dollars in capacity expansion annually, and the potential social costs of inefficiently blocking network management could run in the billions of dollars annually as well.

33. Attempts to meet demand through infrastructure investment without sound network management practices will be especially costly and inefficient given the high degree of uncertainty regarding future demand for broadband services and the amount of capacity needed to meet that demand, particularly as the consumer and public uses of broadband networks become more varied. It would be economically irrational (and socially inefficient) for network operators to invest in sufficient amounts of capacity to meet the highest levels of demand that might conceivably be realized. If network operators were to do so, they would run a very substantial risk of having large amounts of excess capacity, which would be wasteful from both private and public perspectives. Instead, rational network operators will balance the cost of additional capacity against the likelihood that there will be demand for that capacity. Given the uncertainty of demand, this means that efficient network operators will sometimes have insufficient capacity to meet realized demand. Consequently, it is important that network operators retain the ability to manage their networks to deal with the possibility that realized demand exceeds capacity.¹³

34. A second fundamental flaw with the argument that a policy that blocks network management can promote investment is that such a policy might actually reduce the overall amount of capacity investment, in addition to leading to the inefficient use of the existing

capacity. Restrictions on an operator's management of its network will prevent the operator from producing as much output as possible from any given amount of physical plant and equipment. Because the physical plant cannot be used efficiently, the cost of capacity per unit of output is higher. These higher costs reduce the operator's net return on investment and, consequently, the operator may invest less in physical capacity.¹⁴ In summary, any intuitive appeal of this argument is deceiving; a public policy that restricted network management practices would have the opposite of its intended effect. The ultimate result would be to increase the costs of a given amount of effective capacity and to reduce the availability of broadband services to consumers.

¹³ For additional discussion of this point, see Christopher Yoo, Written Testimony for the Federal Communications Commission, Public *En Banc* Hearing on Broadband Network Management Practices, February 25, 2008.

¹⁴ A simple algebraic model illustrates the harms of limitations on network management practices. Suppose that the total output, x , that can be derived from network capacity investment, k , is $x = mk$, where m is a measure of network management practices. Let $P(\cdot)$ denote the inverse demand curve faced by the network provider. The provider will choose its capacity investment and network management practices to $\max P(mk)mk - rk$, where r is the cost of a unit of capacity investment. This maximization problem can be rewritten as $\max P(x)x - \frac{r}{m}x$. From this formulation, it is obvious that higher values of m correspond to higher equilibrium values of x . In words, allowing the firm to manage its network to maximize m will result in greater output and lower prices for consumers.

Now, suppose that $P(x) = \alpha - x$, where α is a positive constant. Then, as is well known and easily derived, the network operator maximizes its profits by choosing the highest feasible value of m and setting $k = \frac{1}{2m} \left[\alpha - \frac{r}{m} \right]$. Differentiation of this expression with respect to m yields $\frac{dk}{dm} = \left[\frac{1}{m} \right]^2 \left[\frac{r}{m} - \frac{\alpha}{2} \right]$. Hence, when $\frac{r}{\alpha} < m < 2\frac{r}{\alpha}$, an increase in m leads to an increase in k . In words, public policies that restrict the network operator's choice of m will reduce total output, raise the costs per unit of output, and lead to less investment in capacity.

IV. BROADBAND POLICY SHOULD PROMOTE EFFICIENT INNOVATION BY ALLOWING NETWORK MANAGEMENT, VERTICAL CONTRACTING, AND SOPHISTICATED PRICING

35. Absent innovation, Americans will not have access to the most advanced possible services. As the *Broadband Plan NOI* observes, “[c]oupling the dynamic innovations and flexibility of the private sector with the farseeing policy goals of the public sector can help our nation achieve its broadband goals more efficiently and effectively than either could achieve alone.”¹⁵ It is vital to consumer welfare that broadband policy promote—rather than stifle—efficient innovation.

36. In the *Broadband Plan NOI*, the Commission “ask[s] commenters to address the value of open networks, and specifically, the impact on investment, *innovation* and entrepreneurship, content, competition and affordability of broadband, among other things.”¹⁶ In an important respect, this is the wrong question to ask for policy analysis. The question is not simply whether open networks are good or bad for innovation, but whether there are public policies that could reasonably be expected to promote efficient investment by mandating various forms of openness. Even if—counterfactually—open networks were always the best means of promoting innovation, it would *not* follow that open network regulations would promote innovation, in particular, or consumer welfare, in general. This is so because the full range of likely intended *and unintended* consequences of the regulation would have to be taken into account to make a reasonable prediction of the policy’s overall

¹⁵ *Broadband Plan NOI*, ¶ 7.

¹⁶ *Broadband Plan NOI*, ¶ 48 [emphasis added].

effects on innovation and consumer welfare.¹⁷ Features of the policy itself might stifle innovation even if it were true that openness tended to promote innovation.

A. THERE IS NO “BEST” DEGREE OF OPENNESS TO PROMOTE INNOVATION

37. In examining the effects of open networks on innovation, it is important to recognize that there are different dimensions to the openness of a network or system. One dimension is technological and concerns how different components of the network or system interact. Consider, for example, traditional wireline Internet access networks. There are well-defined interface standards, and any device complying with those standards has the technological ability to connect to the network. This form of openness of the network has been lauded as promoting innovation, but it is far from evident that this openness led to more innovation than would have resulted from alternative architectures or that this is the optimal approach for the future.

38. Modularity is a central concept in thinking about technological openness and innovation. The degree of modularity of a system refers to how tightly coupled its different components are and the extent to which different components can be mixed and matched. A system is highly modular if it contains separate components that communicate or interoperate with each other via well-defined, standardized interfaces or linkages. The degree of modularity can affect the process of innovation. Consider a system comprising two components, *A* and *B*. For example, *A* might be a communications network and *B* an access device. If the system is modular and components *A* and *B* have a standardized interface, then

¹⁷ This task is made difficult, in part, by the fact that significant unintended consequences may be difficult to predict.

innovation in *A* and innovation in *B* can proceed independently. This independence can reduce the costs of innovation by avoiding the need for coordinated innovation across components. The Internet, for example, is often praised for its modular structure, which allows for innovation at the application layer independent of the underlying layers.

39. It is critically important to realize that the benefits of modularity do not come without costs. It has long been recognized that rigid interface standards can straightjacket innovation. That is, the need to conform to the standardized interface can limit innovation in *A* or *B* or both. This is one reason why the market has frequently abandoned standards for audio playback devices over time (*e.g.*, from vinyl records, to CDs, to MP3 files). The Internet also illustrates the costs of modularity. There has been little innovation in terms of the underlying protocols. For instance, these protocols support best-effort service and still do not allow for the effective provision of various levels of guaranteed quality of service. Moreover, the latency and jitter inherent in the current approach also provide obstacles to offering many applications.

40. The Internet's design principle of "intelligence at the edges" is closely related to its modularity and is often similarly praised as stimulating innovation. There is, however, no general theorem or principle stating that a network with the intelligence at the edges is more innovative than a network with intelligence in the core. Modularity and related architectural choices have both costs and benefits. Depending on the specifics of the situation, the costs may be smaller or larger than the benefits.

41. Another dimension to openness is legal: to what extent does a particular party control access to the network? The lack of centralized control of the Internet is also often cited as

promoting innovation. The slogan “innovation without permission” is catchy. It is also potentially misleading. For a system, it may be preferable to have innovation in a more managed environment and/or to have a single entity that is responsible for the overall health of the system and acts to coordinate the various entities involved in creating innovative new services.¹⁸ Arguably, there has been much greater innovation over the last two decades in wireless handsets connected to managed networks than there has been in personal computers attached to the Internet through more open networks.

42. It is also important to recognize that the fact that a network operator manages the set of devices or applications that can be attached to or run over its network does *not* imply that the network manager will pursue the full-integration model of pre-divestiture AT&T. The Apple iPhone provides a good example. It is a centrally managed system, but there are thousands of applications providers working within the development and sales environment created and managed by Apple. More generally, managed networks can have incentives to create innovation eco-systems with large numbers of independent innovators. Verizon Wireless is doing just that through its Open Development Initiative and through other efforts aimed at encouraging third-party applications and devices that would use its networks. Managed cellular and PCS networks generally rely on many different firms to innovate, including handset manufacturers, applications developers, and others.

43. The history of video games illustrates many of the points just discussed. Atari had an open system, which led to many pornographic and/or low quality games. Consumers (and/or

¹⁸ Moreover, as discussed in Section III.A above, that single entity also will have incentives to invest in system infrastructure.

their parents) reacted negatively, and the whole system failed as a consequence. In contrast, Nintendo maintained strict quality control over the games that were allowed to be used with its consoles. Consumers benefited from the quality control, as did the makers of high-quality games.¹⁹ Nintendo and later console manufacturers (who adopted similar strategies) did not limit game innovation (except to the extent that pornographic or low-quality games could be considered “innovative”), nor did console manufacturers preserve “monopoly” positions for themselves as developers of games for their consoles. Instead, console manufacturers allowed many different independent developers to license the rights to sell games on those systems.

44. The existence of operators with control over the systems also has played a role in video game innovation. As part of managing access to its system, a video game console manufacturer typically charges license fees to game developers. The console manufacturer’s profits are thus tied, in part, to the success of various games developed by others. Because its profits depend on both console and game sales, and because it can set common standards for the games that run over its system, a console manufacturer has the ability and incentives to coordinate the transitions to innovative new game systems that are expected to generate significant consumer benefits and resulting game sales. Nintendo’s launch of the Wii, with games that make heavy use of its motion sensitive controllers, is a recent example.

B. PUBLIC POLICY AND INNOVATION

45. The discussion above makes clear that it would be a mistake for public policy to impose a particular model of network management or network architecture in the name of

¹⁹ In this respect, video games offer another parallel with broadband networks; there are many consumers who are willing to pay a premium to be on a system that offers a high-quality user

promoting innovation. There is no one best degree of modularity, best extent of vertical integration, best set of network management practices, or best set of pricing policies to promote innovation. Moreover, even if there were a set of universal best practices in each of these areas, there is today no agreement on what those best practices are (the claims made by Internet advocates notwithstanding).²⁰ Public policies that force a single approach to openness on the industry are thus very likely to harm innovation and limit experimentation. If policy makers mandate a single approach and get it wrong, then there is no safety valve to fix the problem. In contrast, if public policy allows for a variety of different approaches to be pursued, then private and public sector decision makers alike can learn from comparative experiences. For all of these reasons, it is much more desirable for public policy to allow for a portfolio of approaches rather than force a one-size-fits-all approach on broadband service providers.

46. In addition to recognizing the dangers of sweeping regulations, it is also useful to examine the effects of specific public policies, particularly broad non-discrimination obligations or other common-carriage-like rules. One way in which common-carriage requirements could harm innovation is the following. There might be a new or experimental service that a network operator has the ability to offer but only if done so on a limited basis. For example, there could be a telemedicine application that requires a higher quality-of-service (QOS) guarantee than is available for standard Internet services. A broadband service

experience that is protected from objectionable content.

²⁰ Although the Internet clearly has supported a high degree of innovation, that fact does not establish that there would not have been even greater innovation under different institutional

provider might not have the capacity to offer such QOS guarantees generally, but still have enough capacity to offer the service if allowed to “discriminate” and offer it on a select basis. A policy that banned selective offerings would have the effect of denying consumers access to this beneficial telemedicine application.

47. Similarly, some advocates of broadband regulation have supported broad nondiscrimination requirements that could foreclose the offering of private network services that do not rely on the public Internet but are provided over broadband networks that are also used to deliver Internet access services. One example of such a service would be a video service delivered by a broadband provider over the same network as its Internet access services. The broadband provider might violate this type of nondiscrimination requirement if it were to allocate network capacity to ensure the quality of its video service. But the video service might not be viable without that quality assurance. In addition to denying consumers the benefits of such private network services, public policy restrictions of this type could harm network investment. To the extent public policies deny network operators the benefits of the net revenues that would otherwise be derived from private network offerings, these regulations also undermine the providers’ incentives to make the investments in their networks.

arrangements or that the optimal institutional arrangements for innovation are not changing over time.

V. BROADBAND POLICY SHOULD PROMOTE COMPETITION BY ALLOWING NETWORK MANAGEMENT, VERTICAL CONTRACTING, AND SOPHISTICATED PRICING

48. Competition policy (including antitrust enforcement and modern telecommunications regulation) is designed to protect competition because of the benefits that competition brings to consumers. These benefits typically come in the form of lower prices, greater innovation and variety, or higher product and service quality. Competition can play an important role both in promoting investment and innovation, and in ensuring that the benefits of that investment and innovation accrue to consumers. By creating attractively priced, advanced services, the combination of investment, innovation, and competition will also promote broadband adoption by businesses and consumers.

49. In thinking about the effects of public policy on competition, it is essential to recognize a fundamental distinction between protecting the competitive process and protecting individual competitors from the rigors of the marketplace. Or, as is commonly stated, competition policy is concerned with harm to competition, not harm to competitors.

50. The following hypothetical example makes clear why this distinction is so important. Suppose that a supplier invests in an innovative, new, proprietary product that is extremely attractive to consumers. The introduction of that innovative product harms competitors because they will lose sales and profits to the innovative supplier or will have to spend resources to respond with competitive offerings of their own. But the innovation benefits consumers and is, indeed, an example of the competitive process in action. Competition policy properly favors innovation and seeks to protect competition. A policy that sought to protect competitors might block the introduction of innovative products. Alternatively, a pro-

competitor policy might require that any such innovation be shared with rivals, thus greatly weakening or even destroying innovation incentives. In either case, a policy that sought to protect competitors would harm competition and consumer welfare.

51. Network management, vertical contracting, and sophisticated pricing can be key components of both an established provider's ability to attract and retain customers and an entrant's strategy for achieving commercial viability. As discussed above, public policy restrictions on these practices can diminish the investment incentives of established providers and make entry by new providers less attractive and, hence, less likely. Consequently, instead of promoting competition, open network requirements can—by reducing investment, innovation, and entry—harm competition.

52. Some might argue that the problems of stifling entry and investment by entrants could be addressed by making entrants exempt from open network regulations. However, the result of such an approach would be to distort competition, which would potentially harm both consumer welfare and economic efficiency. Setting date-certain limits on such exemptions would reduce the extent of such distortions. However, even an exemption of finite, pre-determined length would still give rise to market distortions and would also impose costs that reduced the likelihood of entry. Problems would also arise under an approach that would exempt an entrant from various openness requirements until it was deemed to have become sufficiently successful or well established. Such performance-based application of open network rules could have especially perverse effects on competition because the rules would act as a tax on success and encourage entrants not to compete too vigorously, lest they become sufficiently successful to trigger application of the open-network requirements.

53. There is another way in which certain types of open network policies can limit competition and lead to highly concentrated markets. Public policies that have the intended or unintended effect of forcing network operators to provide “dumb,” undifferentiated networks may undermine investment and/or promote highly concentrated markets. These adverse effects can arise because the lack of differentiation coupled with large economies of scale would create a situation in which network provision was a purely scale-driven business. In this scenario, small-scale providers would not be economically viable, and the market would not support having several large-scale providers.²¹

²¹ Consider a standard Hotelling model in which consumers are uniformly distributed along a unit line with endpoints 0 and 1, and each consumer values a single unit of the service at $v - t\lambda$, where v equals an end user’s willingness to pay for his or her ideal service minus its marginal cost of production, λ is the distance between the end user’s ideal service and the actual service measured in “product space,” and t is the transportation cost or disutility suffered per unit of distance between the end user’s ideal service and the actual service. Assume that any given end user demands at most one unit of service and that each service provider incurs a fixed cost of $F > 0$, which becomes sunk upon entry. To avoid corner solutions under monopoly, assume that $v < 2t$. Lastly, suppose that potential service providers make their entry decisions sequentially.

Suppose public policy requires that any service provider locate at endpoint 0. Then once one supplier has entered the market, no further entry will occur—if there were two or more suppliers located at the same point, they would drive price down to 0 and fail to cover their fixed costs. This result obtains no matter how small F is as long as it is positive.

Suppose that absent public policy restrictions on product differentiation, service providers would be free to enter at either endpoint. In this case, one provider will choose location 0 and the other supplier will choose location 1 when F is sufficiently small (although still positive). As is well known, the two providers’ market areas will not overlap for some parameter values. In this case, each provider will act as a local monopolist. Consumer surplus will be double what it would have been under regulation—end users will face the same prices as under regulation, but will have greater choice, which reduces transportation costs. For other parameter values, the two providers’ market areas will overlap. In this case, consumer surplus will be more than double what it would have been under regulation—in addition to having greater choice, consumers will face lower prices.

[Footnote continues on next page.]

54. There is no one right choice of network architecture, modularity, business model, and network management to which all firms should adhere. Public policies should be aimed at protecting competition, not protecting competitors or particular business models, such as those of certain applications providers. To update an old phrase, it would be a mistake for public policy makers to conclude that “what is good for Google (or any other specific company or business model) is good for America.”

55. The consumer and efficiency benefits of open public policies that encourage competition in products and services as well as technology choice and business model are particularly great for an evolving service such as broadband, where alternative providers are using several different technologies to compete and there is extensive, ongoing investment and innovation.

VI. BROADBAND POLICY SHOULD PROMOTE EFFICIENT ADOPTION BY ALLOWING NETWORK MANAGEMENT, VERTICAL CONTRACTING, AND SOPHISTICATED PRICING

56. The widespread adoption of broadband services is a central objective of the Obama Administration, the U.S. Congress, and the Commission. Network management, sophisticated pricing, and vertical contracting can all play important roles in promoting broadband adoption.

In summary, regulations that limit product differentiation can increase concentration and lower consumer welfare. Further analysis of the model above shows that such regulation can lower efficiency (as measured by total surplus) as well.

The point that commoditization of networks can lead to increased concentration has been made by George Ford in Testimony of George S. Ford, Ph.D., Chief Economist, Phoenix Center for Advanced Legal & Economic Public Policy Studies, Before the Federal

A. NETWORK MANAGEMENT CAN PROMOTE BROADBAND ADOPTION

57. Managed broadband networks can promote broadband adoption in several ways.

First, as discussed in Section III.A above, network management can lower networks costs. A broadband service provider with lower costs will rationally undertake greater efforts to attract customers, whether through lower prices or improved levels of service quality or customer care. Second, network management practices can themselves be an important element of service quality. For instance, as discussed above, network and end-user security are very serious concerns. Network management practices and network intelligence can make important contributions to maintaining security. For example, network operators might block some transmissions in order to prevent e-mail spam or operate what might be thought of as network-based firewalls to limit the dissemination of malware.

58. In any analysis of the effect of public policy on service quality, it is critical to recognize that quality is a multi-dimensional concept, that there are costs and tradeoffs involved in offering services that vary along these different dimensions, and that different end-users can have very different valuations of the different dimensions of quality. Indeed, what might constitute higher quality to one user may constitute lower quality to another.

59. For example, some consumers highly value being shielded from the complexities of the Internet as well as various forms of harmful content. By managing the network to offer protected or simplified environments that appeal to some consumers, network operators can tailor services to the tastes of such consumers. Managed networks and networks with

intelligence in the core can also allow for less costly, easier to use, and easier to maintain consumer access devices. These virtues of managed, intelligent networks are important because the lack of adoption of access devices has repeatedly been identified as a leading barrier to the adoption and use of broadband services.

60. Of course, while some consumers prefer a controlled environment featuring greater protections from spam or pornographic content, others users may disfavor such protections. Perhaps some end users even enjoy maintaining their personal computer operating systems and defending themselves against viruses and other malware. In other words, there are a variety of consumer experiences that appeal to different consumers.

61. Given the heterogeneity of consumer tastes and the impossibility of designing (let alone providing) a single offering that all end users agree is the best possible service, it is efficient to provide a range of service offerings and let end users choose among them. A public policy of promoting consumer choice that leaves consumers free to choose the type and capabilities of the broadband service they desire can be expected to lead to more widespread broadband adoption

62. Cellular and PCS networks provide excellent examples of the benefits of managed networks. Wireless telecommunications networks offer services that have proved to be tremendously attractive to consumers and have led to widespread consumer adoption. Network operators have made huge investments in infrastructure and, in many cases, subsidize handsets, which also promotes consumer adoption. In addition, leading network operators work with handset manufacturers to optimize the consumer experience, further enhancing adoption.

63. Cellular and PCS networks also provide excellent examples of the benefits of variety. Smartphones offer many consumer benefits (*e.g.*, mobility). One benefit due in part to the more managed network environment is that—in contrast to PC users—smart phone users typically have not faced either constant threats from malware or automatic operating system upgrades that can disable existing applications and create problems that take hours to resolve. However, consumers who use smartphones that allow end users to download any applications they want are more vulnerable to malware threats than are users of “feature phones,” which provide selected sets of applications that have been vetted by network operators.

64. Consumers thus have a choice of the degree of openness. If a consumer desires an open environment and is willing to take on responsibility for security, then a PC with wireless capabilities is the preferred option. If the consumer wants a more secure device that still allows him or her the opportunity to download applications from any source (and assume responsibility for the associated risks to reliability and security), then a smartphone makes sense. If the consumer highly values reliability and security, and he or she is content to use the applications and features selected and thoroughly tested by the service provider, then a feature phone can be the best option.

65. Although having the intelligence at the edge of the network often works well for people who are comfortable with personal computers, it may be an unattractive approach for consumers who seek ease of use and who are uncomfortable with technology. This is a very important point because the lack of access devices has been identified as a significant barrier to broadband use. For many users, a smartphone or a feature phone offers a more convenient and safe means of accessing many of the benefits that the Internet can offer than does going

online using a personal computer. Public policy makers should recognize that smartphones and feature phones connected to managed networks can play a valuable role in raising broadband adoption rates to the levels public policy makers seek.

B. SOPHISTICATED PRICING CAN PROMOTE BROADBAND ADOPTION

66. There are several means through which sophisticated pricing can promote consumer adoption of broadband services. First, as discussed in the previous subsection, offering a variety of services generates consumer and efficiency benefits. One means of achieving variety is to have each provider offer a single service but allow differentiation across providers. Another means is to have a given provider offer multiple services. In many instances the most efficient outcome will be to have multiple providers, each offering a menu of service options.

67. Some parties seek public policies that would limit the ability of network operators to offer multiple grades of service on the theory that such limits would protect small end users or application providers. In reality, such product-line restrictions can drive out of the market end users or application providers that would otherwise have purchased a low-speed option.²² Hence, menus of service options can be important means of giving consumers more choice, thus increasing the chances that consumers will find broadband adoption desirable.

68. The discussion of service offerings with different bandwidths highlights another important point. Speed is only one dimension of service. There are many others, including

²² A model exhibiting these characteristics is presented in Benjamin E. Hermalin and Michael L. Katz, “The Economics of Product-Line Restrictions with an Application to the Network Neutrality Debate,” *Information Economics and Policy*, Vol. 19, No. 2 (June 2007).

reliability and the degree of mobility. Policy makers should not fixate on speed. For instance, communications services have important contributions to make in improving the quality of health care while lowering its cost. For some health applications, speed, capacity, or quality-of-service may be essential. But not all healthcare applications require the highest possible speeds in order to bring tremendous benefits to consumers. Chronic disease management programs, for example, have the ability to improve health outcomes while dramatically reducing costs. Patient empowerment and frequent interaction of patients with healthcare professionals are key components of these programs.²³ Hence, for these programs, access device mobility may well be much more important than bandwidth. Similarly, computer engineers at Washington University in St. Louis have developed a USB-based ultrasound probe that can plug into a Microsoft Windows based smartphone and be used to provide a wide range of medical imaging.²⁴ This form of telemedicine has tremendous potential for use in ambulances, emergency rooms, and on military battlefields.

69. Returning to the examination of how sophisticated pricing can affect consumer adoption, consider price discrimination. As in many other markets, price discrimination can encourage consumer adoption. The reason that price discrimination is attractive to suppliers is that it allows them to charge relatively high prices to customers who have relatively high willingness to pay, while at the same time charging relatively low prices to customers who have relatively low willingness to pay. This latter group of consumers might be priced out of

²³ For a brief overview of disease management programs, see DMAA: The Care Continuum Alliance, “Advancing the Population Health Improvement Model,” *available at* http://www.dmaa.org/phi_definition.asp.

the market in the absence of a targeted offer. Stated slightly differently, an economically rational service provider will charge lower prices to those consumers who would otherwise not adopt broadband. In this way, price discrimination is a means of encouraging adoption. It follows that restrictions on price discrimination can discourage adoption.

70. Some critics argue that usage-based pricing or ceilings on usage are discriminatory and should be prohibited. This argument is fundamentally flawed in two respects. First, price discrimination can benefit consumers and promote broadband adoption. Hence, blanket condemnation is inappropriate. Second, usage-based pricing or ceilings on usage are not inherently discriminatory. For example, users who continually share video files impose much greater costs on the system (accounting for congestion and the need for incremental capacity) than do users who exchange only text-based email messages. It is not discrimination to require those users to pay for the greater costs that they impose. If it were, one could just as well argue that charging for gasoline by the gallon discriminates against SUV drivers. In fact, if policy makers were to adopt a prohibition of price discrimination based on an economically rigorous definition, it could force carriers to institute usage-based pricing because, under the economic definition of price discrimination, charging users the same price for services that have different underlying costs is discrimination.

71. Various forms of targeted options and pricing are not the only sophisticated pricing strategies that can promote widespread adoption of broadband services. Public policy makers should also recognize the important role that two-sided pricing could have to play.

²⁴ Tony Fitzpatrick, "Ultrasound imaging on smartphone may change global medicine," *Washington University in St. Louis Record*, May 7, 2009, at 1.

Specifically, network operators might use revenue from arrangements with online service or application providers to subsidize the costs of consumer access, which would increase adoption.²⁵ A network operator could even adopt a business model similar to advertiser-supported over-the-air television broadcasting whereby consumers would receive access for free. Or, a network operator could use the revenues from differentiated arrangements with online service or application providers to offer discounted rates to consumers. Given the widespread recognition that cost can be an obstacle to consumer adoption of broadband, an application-provider-supported broadband service model could be an important component of an overall approach to increasing broadband penetration. Two-sided pricing could be a particularly valuable means of promoting broadband adoption if access providers are able to develop a targeted offering that is particularly attractive to underserved groups.

C. VERTICAL CONTRACTING CAN PROMOTE BROADBAND ADOPTION

72. Lastly, consumers can adopt broadband only if it is available. This fact highlights the importance of public policies that promote efficient investment in network deployment, rather than discourage it. As discussed above, vertical contracting—including vertical integration and exclusive contracts—can, in important circumstances, promote investment. Public policies that impose broad prohibitions on vertical contracting may thus harm consumers and

²⁵ This benefit of two-sided pricing does not rely on altruism by the network provider. The ability to collect fees from application providers would lower the marginal cost of serving consumers, possibly to the point where effective marginal costs would be negative. The forces at work are similar to those that lead Google to offer consumers search services without charge.

reduce broadband adoption. Policies that discourage network investment will be particularly harmful in rural areas, where investment incentives already are relatively low.²⁶

VII. THE APPROPRIATE PUBLIC POLICY APPROACH

73. Network management, vertical relationships, and sophisticated pricing are all business practices that have been attacked by parties advocating public policies that mandate so-called open networks. However, all of these practices have potentially important roles to play in promoting the central public-interest goals of broadband investment, innovation, competition, and adoption. It would thus be a serious policy mistake to ban these practices. At the same time, certain forms of network management, sophisticated pricing, and vertical contracting can harm competition and consumers in some circumstances.²⁷ How should public policymakers address the fact that these practices often promote competition and consumer welfare but in some cases harm them?

74. The approach to policy should reflect the state of the marketplace. The current state of the marketplace is the following:

²⁶ This point applies with equal force to public policies that discourage investment by limiting network management or the use of sophisticated pricing.

²⁷ For a discussion of the potential benefits and harms of many of these practices, see, for example, Joseph Farrell and Phil Weiser, “Modularity, Vertical Integration, and Open Access Policies: Towards a Convergence of Antitrust and Regulation in the Internet Age,” *Harvard Journal of Law and Technology*, Vol. 17, No. 1, Fall 2003.

It should also be recognized that, by limiting contracting and network management, open network regulations can themselves create exclusion incentives. It has long been understood that certain types of price regulation can have this effect (Farrell and Weiser (2003, §IV.A) provide a useful summary discussion.) A similar logic implies that other forms of regulation that limit a service provider’s ability to negotiate its terms of trade with end users and/or complementary service and application providers can also create exclusionary incentives.

- Policy makers lack experience with respect to how various regulatory policies would affect broadband service providers and consumers.
- Future technological developments, business models, and consumer demand are highly uncertain.
- Consumers, access providers, and applications providers are heterogeneous.
- Business practices have both costs and benefits.

An important and central implication of these facts is that it is a mistake to implement broad prohibitions of network management, vertical contracting, and sophisticated pricing or to lock in place a one-size-fits-all approach without knowing which business models and network architectures best serve consumer interests. The Commission lacks the information and experience necessary to craft such prohibitions in a way that would not be expected to harm consumers and competition. This is not a failing of the Commission but rather a statement about the complexity of the issues and the fact that we are all sailing in uncharted waters. The Commission has no basis for forming the subjective probabilities that would be necessary for the proper application of decision theory.

75. Overall, policies should be aimed at promoting competition and encouraging efficient investment, innovation, and experimentation that provide consumers with additional choices. Case-by-case application of antitrust laws is the best way to deal with concerns that, in some circumstances, network management, vertical contracting, and sophisticated pricing can be used to harm competition. A case-by-case approach is the only way to block the use of these practices when they harm competition and consumers while at the same time ensuring that service providers can engage in these practices in the many instances where they benefit

consumers and promote competition and the achievement of other public-interest goals. In addition to the application of antitrust laws, which seek to protect competition, there are areas in which public policy should promote competition by removing obstacles to it. Public policy makers should look for means to increase the availability of spectrum to be used by private entities to offer broadband services, for example. Policy makers should also seek to remove regulatory or public policy obstacles to network investment and operation.

76. Lastly, with respect to network management practices, it would appear to be clear that public policies should promote meaningful disclosures. However, considerable experience demonstrates that it can be extremely difficult to legislate or regulate disclosure policies. Public policy makers should be cautious when considering whether to subject broadband service providers' disclosure practices to additional regulatory requirements. Even well-intentioned regulations can harm consumers. This is so for four reasons:

- First, the potential incremental benefits of additional broadband-specific billing and disclosure regulations can be small where competition already promotes consumer welfare, and new rules may inefficiently distort competition.
- Second, the potential incremental benefits of additional broadband-specific regulations are smaller to the extent that existing state and federal laws and public policies of general applicability already provide fundamental consumer protections. Additional rules may be redundant or may conflict with existing rules.
- Third, it is well established in economic theory and practice that higher provider costs are passed on to consumers in the form of higher prices or lower quality service.

Additional regulation of disclosure practices can potentially raise service providers' costs and, therefore, the prices consumers pay.

- Fourth, additional regulation will almost inevitably have other adverse, unintended consequences for consumer welfare.²⁸

VIII. CONCLUSION

77. The Commission seeks “comment on the value of open networks as an effective and efficient mechanism for ensuring broadband access for all Americans”.²⁹ The discussion above reveals two fundamental points. First, although open networks can play a valuable role in ensuring broadband access for all Americans, so, too, can more managed networks. This observation leads to the second point: public policies that restrict network management, vertical contracting, and sophisticated pricing in order to force open networks can have the unintended effects of reducing the breadth and quality of broadband access enjoyed by American end users and of foreclosing new business models, new types of services, and new applications.

78. There is no one business model or technological architecture that is best suited to achieve the goals of broadband investment, innovation, competition, and adoption. Thus, it is important that public policies toward broadband networks be “open policies.” That is, public policies should not discourage innovation or experimentation with many different business models and choices of network and system architectures. Public policies should not unduly

²⁸ An appendix provides a brief discussion of food labeling as an example of the potential for extensive unintended consequences of disclosure regulation.

²⁹ *Broadband Plan NOI*, ¶ 47.

restrict consumer choice by dictating the forms of services that broadband network providers can offer. Instead, public policies should allow service providers to offer many different options and consumers to choose those that best meet their needs. Some consumers may wish to have more open services, and other consumers may prefer more restricted services—providers should be allowed to offer both.

79. Many people are fond of citing the pre-breakup AT&T as an example of how a closed, managed network can stifle innovation. Anecdotal evidence suggests that the old AT&T did, in fact, pursue a business model that limited innovation. However, the key characteristic of the old AT&T was that—in part because of public policy—the firm faced little competition. The real lesson of the old AT&T is that monopoly power—whether exercised by a private party or a regulator—can harm innovation. Government-imposed open-network regulations run the risk of becoming another example of how a single decision maker can stifle innovation to the detriment of competition and consumers.

I declare under penalty of perjury that the foregoing is true and correct



Michael L. Katz
Executed June 8, 2009

APPENDIX: QUALIFICATIONS

80. I am the Harvey Golub Professor of Business Leadership at New York University's Stern School of Business. I also hold the Sarin Chair in Strategy and Leadership at the University of California, Berkeley, where I have a joint appointment in the Haas School of Business Administration and the Department of Economics. I have served on the faculty of the Department of Economics at Princeton University. I received my A.B. from Harvard University *summa cum laude* and my doctorate from Oxford University. Both degrees are in Economics.

81. I specialize in the economics of industrial organization, which includes the study of antitrust and regulatory policies. I regularly teach courses on microeconomics and business strategy. I am the co-author of a microeconomics textbook, and I have published numerous articles in academic journals and books. I have written academic articles on issues regarding the economics of network industries, systems markets, antitrust enforcement, and telecommunications policy. I am recognized as one of the pioneers in extending the theory of network effects to competitive settings. I am a co-editor of the *Journal of Economics and Management Strategy* and serve on the editorial boards of *Information Economics and Policy* and the *Journal of Industrial Economics*. I recently completed a term on the Computer Science and Telecommunications Board of the National Academies.

82. In addition to my academic experience, I have consulted on the application of economic analysis to issues of antitrust and regulatory policy. I have served as a consultant to both the U.S. Department of Justice and the Federal Communications Commission on issues of antitrust and regulatory policy. I have served as an expert witness before state and federal

courts. I have also provided testimony before state regulatory commissions and the U.S. Congress.

83. From January 1994 through January 1996, I served as the Chief Economist of the Federal Communications Commission under the Clinton Administration. I participated in the formulation and analysis of policies toward all industries under Commission jurisdiction. As Chief Economist, I oversaw both qualitative and quantitative policy analyses.

84. From September 2001 through January 2003, I served as the Deputy Assistant Attorney General for Economic Analysis at the U.S. Department of Justice under the Bush Administration. I directed a staff of approximately fifty economists conducting analyses of economic issues arising in both merger and non-merger enforcement. Our principal professional focus was on understanding and projecting the impacts of various business practices and public policy decisions on consumers' economic welfare. My title as Deputy Assistant Attorney General notwithstanding, I am not an attorney.

APPENDIX: FOOD LABELING AND UNINTENDED CONSEQUENCES

85. The 1990 Nutrition Labeling and Education Act (NLEA), which sets out federal labeling requirements for packaged foods sold by grocery stores, provides a useful illustration. Although some researchers have found beneficial effects of the NLEA, researchers have also raised several questions regarding unintended consequences and their implications for the NLEA's effectiveness. I cite these studies not to endorse their conclusions, but to demonstrate that there are very real issues about whether these regulations have had their intended effects of benefiting consumers. For example, one study found that subjects who ate a yogurt labeled "low fat" later consumed more calories at lunch than those who ate a yogurt labeled "high fat."³⁰ In other words, consumers did not use the information to reduce overall caloric intake, as some proponents of the regulation intended. Another study concluded that subjects found soups labeled "high fat" to be creamier and more pleasant than soups labeled "low fat," even when the labels did not reflect true fat content.³¹ Consequently, forcing manufacturers to disclose fat content could create economic incentives to *increase* fat content. Other studies have also found evidence of adverse unintended consequences.³²

³⁰ D.J. Shide and B.J. Rolls (1995) "Information about the fat content of preloads influences energy intake in healthy women," *Journal of the American Dietetic Association*, **95** (September): 993-998, as summarized by Jayachandran N. Variyam, "Nutrition Labeling in the Food-Away-From-Home Sector," United States Department of Agriculture, Economic Research Report Number 4, April 2005 (hereafter, *USDA Research Report*), at 11.

³¹ M.R. Yeomans, S. Lartramo, E.L. Procter, M.D. Lee, and R.W. Gray (2001) "The actual, but not labeled, fat content of a soup preload alters short-term appetite in healthy men," *Psychology & Behavior*, **73** (July): 533-540, as summarized by *USDA Research Report* at 11.

³² One other study found that, after implementation of the NLEA, suppliers increased their use of price promotions to induce consumers to purchase nutritionally poorer brands. (C. Moorman

(1998) “Market-Level Effects of Information: Competitive Responses and Consumer Dynamics,” *Journal of Marketing Research*, **35** (February): 82-98, as summarized by *USDA Research Report* at 13.) The authors of another paper observed that, by placing restrictions on certain diet-disease claims, the NLEA may have reduced the flow of information and even led some consumers to purchase less healthy foods. (Siva K. Balasubramanian and Catherine Cole (2002) “Consumers’ Search and Use of Nutrition Information: The Challenge and Promise of the Nutrition Labeling and Education Act,” *Journal of Marketing*, **66** (July): 112-127, at 125, and sources cited therein.)