

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

In the Matter of)
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A National Broadband Plan for Our Future) GN Docket No. 09-51
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COMMENTS OF AT&T INC.

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INTRODUCTION AND EXECUTIVE SUMMARY

The American Recovery and Reinvestment Act of 2009 sets an ambitious objective for the nation: ubiquitous broadband for “all people of the United States.”¹ As Congress recognized, broadband infrastructure and services can play a transformative role in advancing core national interests, including job creation and economic growth, public safety and homeland security, energy independence and efficiency, health-care delivery, consumer welfare, and civic participation. But reaching that broadband-powered future requires leadership and vision. The Recovery Act directs the Commission to take up that mantle and, in effect, take the pen for the government in developing the first comprehensive, cohesive, and forward-looking national broadband strategy.

The Act creates both a duty and an opportunity for the Commission to chart the nation’s course toward achieving the objective of ubiquitous broadband—and to engage the government, the private sector, public institutions, and individuals across the country in pursuit of that objective.² To that end, the National Broadband Plan should set its aim high, and move aggressively in its timeline by establishing two quantifiable, core national goals that should be achieved by February 2014—four years after the Plan is presented to Congress:

- **Ensure Broadband Access for 100 Percent of Americans;** and
- **Enable Broadband Adoption by 100 Percent of Americans.**

Every proposal presented to the Commission in this proceeding should be evaluated carefully to determine whether it furthers these core goals. Only proposals that do so should merit serious consideration for inclusion in the Plan. Conversely, proposals that do not directly further these goals should have no place in the Plan—however well-intentioned they might otherwise be.

The task the Recovery Act imposes is not “business as usual” for the Commission. Drafting a National Broadband Plan will require the Commission to think well outside of its typical jurisdictional box. It calls for involving parties beyond those with whom the Commission typically engages; addressing issues that require the expertise, collaboration, and cooperation of many other government agencies and private-sector actors; and resolving matters for which traditional “regulatory” solutions will not always be appropriate. But it is precisely the overarching nature of the Plan that gives it its promise. If the Plan reaches as far as it should, in terms of the scope of its vision and the breadth of the stakeholders that it engages, it can serve as a transformative tool for America.

¹ American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, 123 Stat. 115, div. B, tit. VI, § 6001(k)(2) (Feb. 17, 2009) (“Recovery Act”).

² As discussed below in Part II, *infra*, the term “broadband” covers a wide range of networks, services, and products, including but not limited to broadband Internet access service.

To achieve the core goals of ensuring broadband access for, and enabling broadband adoption by, 100 percent of Americans, the National Broadband Plan must stay true to four fundamental principles.

- *First*, the Plan must strive to create a more **inclusive** society in which every American has the opportunity to participate in the digital ecosystem.
- *Second*, the Plan must be **expansive** in its solutions, which should involve input from, and responsibilities assumed by, a diverse array of federal, state, and local agencies, public institutions, and private-sector actors.
- *Third*, the Plan must be **user-focused**, enabling end users to obtain the broadband services they want, rather than attempting to dictate what they should have. Policymakers must understand and address not only the impediments to broadband deployment, but also the many barriers to broadband *adoption* that consumers face today. The Plan ultimately must be about what broadband *does for consumers*, not what broadband is to policymakers.³
- *Fourth*, the Plan must ensure **regulatory alignment** with Congress’s overall objective of ubiquitous broadband. Government regulations and policies must be designed and reformed to encourage the substantial private-sector investment in broadband facilities necessary to meet that ambitious objective. Proposals that thwart such investment have no place in the Plan.

With an eye to these four attributes, we next briefly address the tremendous benefits that broadband holds for America, what has already been achieved, what needs to be done, and how we should do it.

What Is at Stake?

Broadband is much more than a conduit or a communications tool. It is a force multiplier: Broadband deployment and adoption lead to the creation of innovative services that not only are economic drivers themselves, but also have the unique power to enhance the benefits of investments in other industries and institutions. They can enable the transportation system to run more smoothly, deliver new efficiencies to the electric grid, expand access to the health-care system while improving its quality, provide new work options that enable us to cut travel and reduce emissions, connect students to expanded educational resources, bring increased effectiveness to government, and otherwise improve the lives of citizens in countless ways that we have only begun to understand.

³ When referring to “users” or “consumers” in these comments, we use those terms broadly to encompass residential, business, government, institutional, and industrial customers, and potential customers, unless otherwise indicated.

Broadband also can be a great unifier, an agent of inclusiveness that can deliver new opportunity to every community and to every citizen. By ensuring 100 percent broadband access and enabling 100 percent adoption, we can begin to close the gaps in education and economic prosperity that threaten to leave too many of our citizens permanently behind. Harnessing broadband's transformative potential to accomplish these fundamental objectives should be at the heart of the National Broadband Plan.

What Has Been Achieved So Far?

In less than a decade, broadband deployment and adoption have exploded. The private sector has invested hundreds of billions of dollars to build broadband networks from coast to coast over a variety of different fiber, copper, cable, wireless, satellite, and other platforms, and to create the broadband-enabled services, applications, and content to fill those networks.⁴ Consumers have responded in droves. In December 1999, there were fewer than three million broadband connections in the United States. Eight years later, in December 2007, there were more than 121 million broadband connections. And today, there are likely more broadband connections in the United States than there are telephone lines.⁵ Thus, in roughly a decade since its introduction, broadband has leap-frogged landline telephony despite the latter technology's 100-year head start.

As a result of this tremendous investment and deployment, some type of terrestrial broadband Internet access service is now available to approximately 92 percent of American households⁶—a figure that is even higher when satellite broadband is factored in. And because of technological innovation and healthy competition, broadband prices have steadily decreased, speeds have increased, consumer choices have expanded, and service quality has improved. Against this backdrop, and with minimal Commission intervention, Internet service providers of all types have supported the development of the Internet as an “open communications platform.”

⁴ See, e.g., National Telecommunications & Information Administration, U.S. Department of Commerce, *Networked Nation: Broadband in America 2007*, at 32-34 (Jan. 2008), available at <http://www.ntia.doc.gov/reports/2008/NetworkedNationBroadbandinAmerica2007.pdf>.

⁵ See Federal Communications Commission, Wireline Competition Bureau, Industry Analysis and Technology Division, *High-Speed Services for Internet Access: Status as of December 31, 2007*, at tbl. 1 (Jan. 2009), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-287962A1.pdf (showing 121,165,311 high-speed lines as of December 2007, with an annual rate of increase over 30 percent); Federal Communications Commission, Wireline Competition Bureau, Industry Analysis and Technology Division, *Local Telephone Competition: Status as of December 31, 2007*, at tbl. 1 (Sept. 2008), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-285509A1.pdf (showing 158,436,758 end-user switched access lines as of December 2007, with an annual rate of decrease over 5 percent).

⁶ Jon M. Peha, The Brookings Institution, *Bringing Broadband to Unserved Communities*, at 11-12 (July 2008), available at http://www.brookings.edu/~media/Files/rc/papers/2008/07_broadband_peha/07_broadband_peha.pdf.

All of these developments have enabled consumers to take advantage of the tremendous diversity of online services, applications, and content that helps us communicate, learn, conduct business, entertain ourselves, and more.

What Still Needs to Be Done?

Despite the substantial progress of the last decade, not all Americans are benefitting equally from broadband, and the capacity of broadband to create a digitally connected nation has not been fully tapped. As Acting Chairman Copps observed in his recent report on rural broadband, some areas of the country remain unserved or underserved by terrestrial broadband networks.⁷ Thus, ensuring 100 percent access to broadband (*i.e.*, broadband “supply”) is an important issue that policymakers must address, and closing the gap between today’s 92 percent availability and ubiquitous availability should be a principal focus of the National Broadband Plan.

But simply increasing the supply of broadband is not a magic bullet. In seeking to enable broadband adoption for 100 percent of Americans, we face a potentially greater challenge on the “demand” side of the equation. Even though broadband Internet access service is available to at least 92 percent of U.S. households, only 55 percent of households subscribe to it—meaning that roughly 40 percent of American households that could get broadband service decline to do so.⁸ Identifying and successfully addressing the range of economic, social, technological, and other reasons for this significant gap in demand is perhaps the biggest contribution that the National Broadband Plan can make to broadband ubiquity.

Finally, broadband’s potential for transforming government and helping to solve some of the most challenging and broad-reaching social issues, like health care, education, and energy conservation, has not been fully harnessed. The National Broadband Plan must challenge government to lead not only by adopting new policies, but, perhaps more importantly, by setting examples and using broadband as its own tool to solve social problems. Government itself is the largest “anchor institution” in the county. By making more use of broadband, not only can government serve as a catalyst for expanding broadband’s availability and driving new adoption, but it also can enable technology to address critical social needs.

⁷ Michael J. Copps, Acting Chairman, Federal Communications Commission, *Bringing Broadband to Rural America: Report on a Rural Broadband Strategy* (May 22, 2009), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-291012A1.pdf (“*Rural Broadband Report*”).

⁸ John B. Horrigan, Pew Internet & American Life Project, *Home Broadband Adoption 2008*, at i, 3 (July 2008), available at <http://www.pewinternet.org/Reports/2008/Home-Broadband-2008.aspx>; see also U.S. Census Bureau, *2007 Internet and Computer Use Supplement to the Current Population Survey*, at tbl. 1 (June 2009), <http://www.census.gov/population/socdemo/computer/2007/tab01.xls> (finding that approximately 51 percent of U.S. households subscribe to broadband).

How Do We Do It?

1. ***Embrace the Diversity of Broadband.*** While “broadband” was originally understood by most policymakers in the late 1990s as simply a faster version of dial-up Internet access service that was based on a static, desktop-computer-centric user experience, today’s broadband marketplace has evolved far beyond that limited vision. The number of platforms has grown (copper, cable, fiber, fixed and mobile wireless, and satellite); the customer base has expanded (consumers, businesses, government, and public and non-profit institutions, including schools, libraries, hospitals, and public-safety agencies); and the range of uses has multiplied exponentially (e-commerce, health-care delivery, voice and video communication, entertainment, fleet management, government services, education, job training, and many more). Indeed, broadband is not just about Internet access, nor is it limited to *human* interaction, as machine-to-machine (M2M) connections and applications rapidly proliferate (smart electric meters, wireless heart monitors, alarm systems, vehicle telemetry, inventory tracking, and more).

The National Broadband Plan should recognize and embrace *all* of these platforms, users, and services as part of the broadband ecosystem that will help ensure 100 percent broadband *access* and deliver the many societal benefits envisioned by Congress in the Recovery Act that will, in turn, promote 100 percent broadband *adoption*. Thus, the Plan must not define broadband rigidly, and must in particular eschew definitions based on arbitrary speed thresholds, which do not adequately capture performance capabilities and often will not be the most important characteristic of a particular service for a particular user. For example, a first responder may assign more value to mobility and security, whereas a smart electric meter may need coverage, reliability, and low cost. To be sure, the Plan should encourage deployment of the fastest broadband connections for those elite users who need them, but it should not dictate one “right” type of broadband for all. As an influential Commission white paper wisely recommended at the dawn of the broadband era, policymakers should “let the marketplace, not the government, pick the winners and losers among new services.”⁹

2. ***Engage All Broadband Stakeholders.*** The National Broadband Plan is a plan for the entire *nation*, not just those entities traditionally regulated by this Commission. It must therefore engage a diverse collection of parties that have roles to play in achieving the 100 percent broadband goals discussed above: the private sector (*e.g.*, network providers; service, application and content providers; the financial community); consumers (residential and business); public institutions (*e.g.*, schools, hospitals, libraries, public safety); public-interest advocates (*e.g.*, the disability community, the elderly, the economically disadvantaged); and the government (federal, state, and local).

⁹ Jason Oxman, Office of Plans and Policy, Federal Communications Commission, OPP Working Paper No. 31, *The FCC and the Unregulation of the Internet*, at 24 (July 1999), available at http://www.fcc.gov/Bureaus/OPP/working_papers/oppwp31.pdf.

In drafting the Plan, the Commission should call upon the expertise and resources of these many stakeholders early and often by establishing advisory committees, holding workshops, and, where appropriate, involving fellow government agencies in specific activities to promote ubiquitous broadband. For example, the Commission should reach out to Wall Street bankers and Silicon Valley venture capitalists to understand which public policies will attract broadband investment and which will repel it. Similarly, the Plan should involve the Departments of Education and Labor to promote broadband education and training; the Department of Health and Human Services to encourage broadband in e-health; the Department of Energy to promote broadband use in our nation's energy infrastructure; the Department of Homeland Security and the Administration's cybersecurity policy official to address cybersecurity and broadband use by the public-safety community—as well as many other federal agencies and their state and local counterparts. Notably, Acting Chairman Copps recommends a similar multi-faceted, coordinated approach in addressing *rural* broadband issues¹⁰—and such an approach is all the more important when the issues to be addressed are even broader in scope.

3. ***Promote Broadband Innovation, Investment, Deployment, and Jobs.*** The private sector has invested hundreds of billions of dollars in broadband-enabled facilities, services, applications, and content over the last decade, and this investment has been, and should continue to be, the primary engine of broadband growth in the United States. Above all else, the Plan should seek to encourage and enhance private-sector efforts to expand and upgrade the supply of broadband facilities and services that are necessary to ensure 100 percent broadband access and enable 100 percent broadband adoption—and to create the much needed job-producing economic growth associated with those efforts,¹¹ particularly given the current economic environment. Indeed, for the first time in nearly a quarter-century, global annual revenue for the information and communications technology industry is projected to decrease this year, with U.S. revenue falling more than the global average.¹² And capital expenditures in the U.S. telecommunications industry are expected to fall by 13 percent in 2009.¹³ While analysts are hopeful that capital investment will rebound in the

¹⁰ *Rural Broadband Report* ¶¶ 5-7, 13.

¹¹ See Information Technology & Innovation Foundation, *The Digital Road to Recovery: A Stimulus Plan to Create Jobs, Boost Productivity and Revitalize America*, at 2 (Jan. 2009), available at <http://www.itif.org/files/roadtorecovery.pdf> (spurring additional investments in broadband, health IT, and smart-grid infrastructures can create nearly 1 million new or retained jobs).

¹² Telecommunications Industry Association, Press Release, *TIA Forecasts 3.1 Percent Loss for ICT Industry in 2009* (May 21, 2009), available at http://www.tiaonline.org/news_events/press_room/press_releases/2009/PR-521_TIA_Forecasts_3_1_Percent_Loss_for_ICT_Industry_in.cfm.

¹³ Telecommunications Industry Association, *ICT Market Review and Forecast 2009*, at 9, available at http://www.tiaonline.org/market_intelligence/documents/Market_Review_Presentation_5-21_press_conference.pdf. For its part, AT&T has invested \$38 billion over the past two years to enhance our wireline and wireless networks, and we plan to spend another \$17

years ahead, any such resurgence will be dependent in significant part on the policy choices endorsed by the National Broadband Plan.

Thus, as it considers various policy proposals for inclusion in the Plan, the Commission should carefully consider whether those proposals will incentivize *facilities* investment and associated job growth, including deployment of broadband networks where they do not exist today and upgrades to the capabilities of existing networks to keep pace with ever-increasing traffic volumes and user demands for robust services. And it must also ask whether such proposals will promote a *stable*, minimally-regulated environment that enables service providers to attract and deploy capital in an efficient manner.¹⁴ Proposals that merely insulate certain competitors from competition or favor one competitor's business model over another, or those intended to address *theoretical* concerns about *potential* behavior that may never occur, should have no place in the Plan—particularly where such proposals could chill investment and job creation or limit practices that would further expand consumer choice.

- 4. *Provide Targeted Government Support for Broadband Deployment Where Needed.*** Even in the best economic environment, there will be some remote areas of the nation where the private sector alone will not be able to shoulder the financial burdens of deploying broadband facilities required to achieve 100 percent broadband access. In those circumstances, the government should provide targeted assistance to ensure that every potential user has access to at least a baseline level of broadband capability. The stimulus provisions of the Recovery Act are a good first step toward that goal, but more comprehensive and lasting solutions are needed.

As AT&T and others have urged, the Commission should act on pending proposals to reform the universal service program (and the related intercarrier compensation regime) to provide support for broadband deployment. The existing system remains wedded to a circuit-switched, voice-centric vision for supporting America's communications needs, and it is spiraling toward collapse in today's broadband Internet world.¹⁵ Likewise, the

to \$18 billion in 2009, with approximately two-thirds of this new investment slated to support broadband. AT&T, Press Release, *AT&T to Invest More Than \$17 Billion in 2009 to Drive Economic Growth* (Mar. 10, 2009), available at <http://www.att.com/gen/press-room?pid=4800&cdvn=news&newsarticleid=26597>. In fact, according to Bloomberg, last year AT&T invested more than any other publicly traded company in the United States and more than any other publicly traded global telecommunications company. See AT&T, Press Release, *AT&T Leads the U.S. in Smartphones and Integrated Devices* (May 15, 2009), available at <http://www.att.com/gen/press-room?pid=4800&cdvn=news&newsarticleid=26819>.

¹⁴ As discussed below, such pro-investment policies would include, among other things, rationalizing the nation's spectrum policies and broadband tax structures.

¹⁵ Analysts have warned that the legacy telephone network is in the throes of a deadly downward spiral, as consumers transition from traditional wireline voice service to wireless and VoIP services. They conclude that a complete reassessment of the current intercarrier compensation and universal service regime will be necessary to facilitate the transition to

Commission's E-Rate and rural health-care programs can both be modified to enhance their roles in promoting broadband adoption and deployment. Swiftly reforming these programs should be a top priority of the National Broadband Plan.

- 5. *Remove Impediments to Broadband Adoption.*** To close the significant gap between broadband access and broadband adoption, the National Broadband Plan must address the impediments that have kept some populations offline. Lack of education and training about the benefits of broadband keep some Americans away out of fear or indifference; low income levels make it challenging for some Americans to afford either the upfront equipment (*e.g.*, computers) or monthly subscription for broadband service, notwithstanding the relatively low-cost offerings that some providers have made available;¹⁶ and some Americans with disabilities struggle to identify or access the services or equipment they need. The Plan must engage the many stakeholders listed above—both inside and outside the government—to overcome these impediments by providing training and public access to broadband services; economic assistance for the acquisition of broadband services and equipment; and incentives for the development of technology and content aimed at specific users' needs.

Americans must also be confident that their sensitive, confidential data will stay private and secure when they go online. The Plan should encourage ongoing private-sector efforts to create clear and understandable privacy policies that give consumers individual control over how their data are used. The Plan should similarly encourage improvements in identity-management capabilities and practices to give consumers greater confidence in the security of their identities. These efforts must include a commitment by *all* providers in the broadband ecosystem to adopt pro-consumer privacy practices.

- 6. *Encourage Maximum Utilization.*** To enable 100 percent adoption and achieve Congress's objective of "maximum utilization of broadband infrastructure and service,"¹⁷ the Plan must encourage the deployment of more efficient and cost-effective—*smarter*—broadband networks, services, applications, and content that can serve the many societal goals identified in the Recovery Act as efficiently as possible. As broadband becomes more ingrained in our everyday lives—from web surfing to video conferencing to smart grids to e-commerce and e-government to telemedicine and beyond—networks will need to dynamically provide the performance capabilities required by the increasingly diverse array of services, applications, and content traveling over them. At the same time, the services, applications, and content that ride those networks will need to dynamically adapt to function

broadband-enabled voice services. *See, e.g.*, Craig Moffett, Bernstein Research, *Weekend Media Blast: The Wireline Problem* (May 15, 2009).

¹⁶ *See, e.g.*, AT&T, *AT&T High Speed Internet Basic*, <http://www.att.com/gen/general?pid=10934> (offering DSL Internet access service at speeds up to 768 Kbps for \$19.95 per month, with no activation fee and no term commitment, and with Wi-Fi hotspot access and security software included at no additional charge).

¹⁷ Recovery Act, § 6001(k)(2)(B).

properly on different types of networks with different performance characteristics (throughput, latency, congestion-sensitivity, etc.).

The National Broadband Plan should foster new technologies and innovative solutions that can enable these smarter broadband networks, services, applications, and content. And it should categorically reject the misguided “dumb pipes” vision of the Internet espoused by some, which would thwart the substantial efficiencies to be gained from smarter networks, and which is therefore directly antithetical to the Congressional objective of maximum utilization.

- 7. *Enhance Cybersecurity and Online Safety.*** Ensuring 100 percent broadband access and enabling 100 percent adoption will be an utterly wasted effort if the National Broadband Plan does not also include a robust strategy for ensuring cybersecurity and online safety. As broadband services play an increasingly instrumental role in virtually all facets of our cultural, economic, social, and governmental institutions, a secure and safe online environment is an imperative. Without an effective and comprehensive cybersecurity strategy, all broadband-enabled services, including e-commerce, telemedicine, smart grids, telecommuting, inventory tracking, voice and video conferencing, and others, would be vulnerable to serious disruption. This is not a mere academic concern; in 2007, the sovereign nation of Estonia was effectively disconnected from the Internet for several days by a massive, well-coordinated “botnet” attack.

Yet, despite these high stakes, cybersecurity and online safety receive comparatively little attention in broadband policymaking. Indeed, the Recovery Act does not even identify these issues as components of the National Broadband Plan. Fortunately, substantial private-sector and government expertise and resources exist to address these urgent matters. But a lack of awareness, coordination, and overall leadership has thus far hampered any efforts to craft consolidated solutions. The Administration’s recent efforts to make this issue a priority are an encouraging step in the right direction, but more concrete steps are needed in the immediate future.¹⁸ As discussed below, the Plan should include specific roles for all of the relevant private- and public-sector stakeholders (network operators, software vendors, application providers, government agencies, and others) to work on the critical mission of securing and safeguarding our broadband future.

While all of the goals and policies enumerated above are crucially important to promoting the deployment of broadband facilities and the adoption of broadband services in general, they are indispensable to a thriving, publicly accessible broadband Internet in particular. More so than any other communications medium in history, the Internet has the ability to transform our society, our economy, and our way of life. To realize its full potential for “all people of the United States,” however, the Internet must be *universal*, in that it must be available and affordable to consumers everywhere. The Internet also must be *open*, in that the Internet ecosystem must enable consumers to exchange ideas and communicate freely, give them

¹⁸ See *Cyberspace Policy Review, Assuring Trusted and Resilient Information and Communications Infrastructure* (May 2009), available at http://www.whitehouse.gov/assets/documents/Cyberspace_Policy_Review_final.pdf.

freedom to access the lawful applications and content they want to use, and afford them the ability to choose and assemble packages of services and equipment that meet their needs. The Internet must respect *privacy*, so that consumers are in control of how, when, and by whom their private information is used. And the Internet must be *safe*, so that networks and services are protected from harm and consumers are secure when they go online. By endorsing—and properly balancing—these four fundamental Internet values, the National Broadband Plan will foster not only greater broadband deployment and use in general, but greater development of the Internet’s potential as a transformative engine of economic and societal advancement.

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In the pages below, we develop these recommendations in depth. We thank Congress and the Commission for this opportunity, and urge all stakeholders to seize this chance to accomplish real progress toward a more prosperous, broadband-networked future.

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DISCUSSION

AT&T Inc., on behalf of itself and its affiliates (collectively, “AT&T”), respectfully submits these comments in response to the Commission’s April 8, 2009 Notice of Inquiry, which seeks comment on the formulation of the National Broadband Plan¹⁹ mandated by the American Recovery and Reinvestment Act of 2009.²⁰

I. THE NATIONAL BROADBAND PLAN REQUIRES INCLUSIVENESS IN ITS GOALS AND SOLUTIONS—IT MUST SEEK TO INCLUDE ALL AMERICANS IN THE INTERNET SOCIETY AND INVOLVE ALL GOVERNMENTAL AND PRIVATE STAKEHOLDERS AS PARTNERS IN ACHIEVING THAT GOAL

Achieving the broadband goals that America has set for itself in the Recovery Act—ensuring 100 percent broadband access and enabling 100 percent broadband adoption in order to advance consumer welfare, civic participation, public safety and homeland security, energy independence and efficiency, health-care delivery, economic growth, and job creation²¹—will require a new and far more inclusive approach to broadband policy than the government has pursued in the past. Although Congress has put the pen in this Commission’s hands to draft a plan for accomplishing these goals, it expects the Commission to think outside the Communications Act’s defined jurisdictional box to develop a truly “national” plan that includes *all* of the stakeholders necessary to satisfy the Recovery Act’s objectives. Thus, instead of looking for solutions only within its own limited regulatory toolkit, the Commission must approach the job from a broader perspective.

¹⁹ Notice of Inquiry, *A National Broadband Plan for Our Future*, GN Docket No. 09-51, FCC No. 09-31 (rel. April 8, 2009) (“*Notice*”).

²⁰ American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, 123 Stat. 115, div. B, tit. VI, § 6001(k)(2) (Feb. 17, 2009) (“*Recovery Act*”).

²¹ *Recovery Act*, § 6001(k)(2).

First and foremost, the Plan must recognize that the private sector has invested hundreds of billions of dollars in broadband networks, services, applications, and content over the last decade, and this investment has been, and should continue to be, the primary engine of broadband growth in the United States. Thus, above all else, the Plan should seek to encourage and enhance private-sector efforts to expand and upgrade the supply of broadband networks and services.

Second, even with this massive private-sector investment, which has made broadband service available to the overwhelming majority of U.S. households, there are still some areas and populations in this country that cannot get broadband service today. And even though most households have broadband service available, little more than half subscribe to it. As discussed below, to address these gaps in deployment and adoption, the Plan will need to provide targeted government support to facilitate an expansion of the *supply* of broadband networks in certain areas and for certain populations. And, perhaps even more importantly, the Plan will need to closely examine, and develop a strategy to overcome, consumer-oriented *demand* barriers that inhibit broadband adoption. Acting Chairman Copps identified the need to take this same dual-pronged approach in his report on broadband issues in rural areas, noting that the problem was not one of supply alone.²² And, as the Acting Chairman also recognized,²³ a solution on both fronts cannot be shaped merely from an FCC-centric perspective, but must take a “whole government” point of view—federal, state, and local—so that the appropriate resources and

²² Michael J. Copps, Acting Chairman, Federal Communications Commission, *Bringing Broadband to Rural America: Report on a Rural Broadband Strategy*, ¶ 105 (May 22, 2009), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-291012A1.pdf (“*Rural Broadband Report*”).

²³ *Id.* ¶ 57.

expertise are brought to bear in reaching our national goals of broadband ubiquity: “access” for, and “maximum utilization” by, all Americans.

Thus, as it drafts that Plan, the Commission must examine *every* proposal presented to it with the same basic question: How (if at all) will the proposal in question accomplish the broadband ubiquity and utilization goals identified by Congress in the Recovery Act? If a proposal will lead to greater investment in and deployment of broadband facilities where there are none today (or where those that do exist are inadequate), then it may be worthy of serious consideration. Likewise, if a proposal will spur demand for and adoption of broadband services—particularly among populations that have lagged in broadband subscribership—then it should get a closer look. But proposals premised merely on favoring one competitor over another or addressing some *theoretical* problem that may or may not occur in the future should have no place in the National Broadband Plan. As a nation in pursuit of ubiquitous broadband, we simply cannot afford to get bogged down in another decade of litigation over “synthetic,” non-facilities-based competition or devote yet more time and attention to rhetorical debates about hypothetical behavior that has not caused any harm and may never do so. Instead, consistent with the Recovery Act’s mandate, the Commission must stay sharply focused on proposals that will move Americans closer to a broadband-powered future.

A. Pursuing Inclusive Goals: Broadband Opportunity for All Americans by 2014

The goal of broadband ubiquity cannot be achieved overnight, but as Congress recognized in the Recovery Act, and as the Commission recognized in its *Notice*, this is a time for ambition. The overarching goal of the National Broadband Plan should be to give every American, by 2014, the opportunity to safely and securely participate in the digital, broadband society of the 21st century—including people with low incomes or education levels, rural

residents, minorities, and people with disabilities—by ensuring they have access to broadband networks and enabling them to use broadband services in new and innovative ways. As the Commission itself observed nearly a decade ago at the dawn of broadband deployment, this goal can be met in part by letting broadband itself create an ever-growing surge of usage, investment, and adoption:

As the cycle [of use and service deployment] gains momentum and cost decreases and performance increases, we expect that companies will provide new applications and services for broadband consumers. As a result, more consumers will demand broadband, and the virtuous cycle will accelerate. In this way, we will reach our ultimate goal that all Americans have meaningful access to advanced telecommunications capability and the benefits of the Information Age. We expect consumers to demand, and the market to deliver, much more in coming years.²⁴

Unfortunately, however, as effective as this cycle has been in promoting broadband growth, not all have shared equally to date in our expanding broadband society. According to the most recent data from the Pew Internet and American Life Project, only 55 percent of adult Americans subscribe to broadband Internet access service in their homes.²⁵ Some of those who lack such service live in areas where broadband is unavailable or, more commonly, where there are only limited or insufficient broadband options. But the reasons for non-subscription to broadband are not solely, or even predominantly, a question of supply. Indeed, recent reports from a variety of sources suggest that more than 90 percent of U.S. households have at least one

²⁴ See Report, *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996*, 14 FCC Rcd 2398, 2448 ¶¶ 96, 97 (1999) (“*First Section 706 Report*”).

²⁵ John B. Horrigan, Pew Internet & American Life Project, *Home Broadband Adoption 2008*, at i, 3 (July 2008), available at <http://www.pewinternet.org/Reports/2008/Home-Broadband-2008.aspx> (“*Pew Study*”); see also U.S. Census Bureau, *2007 Internet and Computer Use Supplement to the Current Population Survey*, at tbl. 1 (June 2009), <http://www.census.gov/population/socdemo/computer/2007/tab01.xls> (“*Census Bureau Survey*”) (finding that approximately 51 percent of U.S. households subscribe to broadband).

broadband provider from which they could obtain service,²⁶ and satellite broadband covers virtually every household in the continental United States.

With some form of current-generation broadband service available to nearly all households in the United States, but little more than half of those households subscribing to service, it is clear that the nation's broadband *demand* is lagging significantly behind its broadband *supply*. Thus, while filling in any gaps in the nation's broadband supply must be a top priority so that all Americans who want broadband can get it, the National Broadband Plan cannot focus exclusively on promoting investment in more broadband networks everywhere in the hope that demand will materialize. Such a one-sided, "build it and they will come" business model would be economically imprudent and unsustainable. Instead, policymakers must first understand and successfully address the *demand-side* issues that are preventing consumers from subscribing to broadband services today.

These issues are diverse, as Acting Chairman Copps already has noted in the context of his rural broadband analysis.²⁷ For example, Pew data show that income, education level, and age are three of the biggest factors in determining whether a household subscribes to broadband service. Specifically, 85 percent of households with incomes above \$100,000 per year have broadband service, while only 25 percent of households with incomes below \$20,000 per year have it. Seventy-nine percent of households with an adult with a college degree or greater level

²⁶ Jon M. Peha, The Brookings Institution, *Bringing Broadband to Unserved Communities*, at 11-12 (July 2008), available at http://www.brookings.edu/~media/Files/rc/papers/2008/07_broadband_peha/07_broadband_peha.pdf ("*Brookings Institution Report*") (estimating that 9 to 10 million of the approximately 128 million U.S. households have no terrestrial broadband option); see also *Rural Broadband Report* ¶ 27 (estimating, based on American Roamer February 2009 coverage maps, that 95.6 percent of the U.S. population is covered by at least one mobile broadband network).

²⁷ *Rural Broadband Report* ¶¶ 106-07.

of education have broadband service, but only 28 percent of households where the adults have less than a high-school degree subscribe to broadband. And 70 percent of households in the 18-29 age range had broadband service, but only 19 percent of households in the 65-or-greater age range had it.²⁸

Moreover, when asked why they do not subscribe to broadband, only 10 percent of dial-up users (and 15 percent of dial-up users in rural areas) ascribe this to lack of availability.²⁹ A far greater number of those who do not subscribe to broadband (including 62 percent of dial-up users) express no desire for the service, and many say they would “never” be interested.³⁰ Reasons range from the cost of service, to frustration and complexity, to general lack of interest.³¹ The National Broadband Plan must identify, and set forth a comprehensive approach to addressing, these and other major “demand-side” impediments to the “maximum utilization” of broadband by all Americans.³²

And while a primary focus of the Plan should be to ensure broadband access for American *consumers*, the inclusive goals established in the Recovery Act extend far beyond the household-centric consumer market for broadband services. Public institutions, businesses, and government agencies must all have access to, and make productive use of, broadband networks

²⁸ *Pew Study* at ii, v, 2-4.

²⁹ *Id.* at iii, 11-12.

³⁰ *Id.* at iii, 10-12.

³¹ *Id.* at iii, 10-13; *see also* John B. Horrigan, Pew Internet & American Life Project, *Obama’s Online Opportunities II: If you build it, will they log on*, at 3 (Jan. 21, 2009), available at <http://www.pewinternet.org/Reports/2009/Stimulating-Broadband-If-Obama-builds-it-will-they-log-on.aspx> (“*Pew Online Opportunities Report*”) (“[O]ne-in-five Americans currently don’t have broadband for reasons that won’t be addressed by price cuts or a fiber node in the neighborhood.”).

³² Recovery Act, § 6001(k)(2)(B).

and services if this nation is to achieve the societal-welfare goals that Congress identified. Indeed, using broadband to advance public safety and homeland security, health-care delivery, energy independence and efficiency, education, worker training, and job creation will only become a reality if the entities principally engaged in these activities have access to broadband networks and services.

Moreover, these “anchor tenants” or “anchor institutions” play a synergistic role today in making broadband available to historically underserved populations and communities and could play an even bigger role in the future with the right public policies. To begin with, where a broadband provider deploys the facilities needed to connect a major public institution, business, or government agency to the broadband network, those same broadband facilities may provide the foundational infrastructure to support additional facilities deployment and broadband services for the community. And many of these institutions are well placed to directly share the benefits of broadband with individuals in their communities who may not be able to afford their own equipment or service subscriptions—or who may need education and training concerning the benefits of broadband. For example, broadband connectivity at a local library or community center might be transformative for a community that is new to broadband, or where economic challenges make penetration to the home unrealistic. Congress recognized these benefits when it tasked the National Telecommunications and Information Administration (“NTIA”) with providing stimulus funding directly to these institutions.³³ The National Broadband Plan accordingly should consider these institutions—both in assessing the level of broadband access today and in crafting policies going forward.

³³ *Id.* § 6001(b)(3), (4); *id.* § 6001(e)(1)(B); *id.* § 6001(g)(3)-(5).

Finally, policymakers should recognize that broadband networks increasingly serve people not only through direct connections to the home and to institutions, but indirectly through connections to the *machines* that support our day-to-day lives, so-called “machine-to-machine” or “M2M” communications. In the words of the International Telecommunication Union, “connect[ing] everyday objects and devices to large databases and networks” represents “the future of computing and communications.”³⁴ That future is already an incipient reality: Various smart “machines” connected at the edge of the broadband network have begun to support remote monitoring of power usage and medical devices,³⁵ remote security applications,³⁶ and wireless tracking of merchandise and automotive fleets.³⁷ And these productivity-enhancing services are

³⁴ International Telecommunication Union, *ITU Internet Reports 2005: The Internet of Things—Executive Summary*, at 3 (Nov. 2005), available at http://www.itu.int/osg/spu/publications/internetofthings/InternetofThings_summary.pdf.

³⁵ See, e.g., GSM Association, *Case Study Series: Huawei, China* (Electric Metering Case Study), available at http://www.gsmworld.com/huawei_electric_metering_case_study_02_09.pdf (describing deployment of an embedded mobile automated meter-reading solution that allowed a Chinese utility company to remotely collect data from across its meter and power grid); ScienceDaily, *New Implant Device Remotely Monitors Heart Failure Patients* (Aug. 8, 2008), available at <http://www.sciencedaily.com/releases/2008/08/080806152438.htm> (describing new implant that remotely monitors heart disease); ScienceDaily, *Peer-to-peer Heart Monitoring: Spreading The Computational Load To Monitor Heart Patients Remotely* (Mar. 9, 2009), available at <http://www.sciencedaily.com/releases/2009/03/090309093040.htm> (describing remote health-monitoring systems using P2P technology).

³⁶ See, e.g., IT-Online, *Technology drives security advances* (Aug. 22, 2007), available at <http://www.it-online.co.za/content/view/140037/143/> (describing how advances in communications technology and online services are supporting advances in security monitoring).

³⁷ See, e.g., GSM Association, *Case Study Series: Huawei, Japan* (Vending Case Study), available at http://www.gsmworld.com/huawei_vending_case_study_02_09.pdf (case study of wireless tracking of vending machine contents); MoreRFID, *Checkpoint Systems’ RFID Solution Brings Real-Time Asset Tracking and Merchandise Visibility Solutions to SAP Customers* (Apr. 16, 2009), available at http://www.morerfid.com/details.php?subdetail=Report&action=details&report_id=5681 (remote tracking of assets and merchandise).

just the tip of the iceberg; countless other M2M services and applications will spring up organically as more broadband networks are deployed and upgraded.³⁸

B. The Ambitious Goal of Ubiquitous Broadband Can Be Achieved Only Through Multi-Lateral Actions by the Public and Private Sectors

Accomplishing the ambitious goal of ubiquitous broadband will require solutions that involve a wide range of private- and public-sector actors, working together in ways that they have not always done in the past.³⁹ As noted above, while the government's role in crafting and executing the National Broadband Plan will be critically important to the Plan's success, the Commission must recognize that the private sector will be the primary source of the investment and innovation needed to deploy broadband networks and develop the compelling services, applications, and content to achieve "maximum utilization" of those networks. Over the last decade, the telecom, cable, and wireless industries, together with broadband service, content, and application providers, have invested hundreds of billions of dollars to deploy broadband infrastructure across the country and to develop an ever-expanding range of services, applications, and content that give end users the reasons to consume broadband.⁴⁰

³⁸ See M2M Magazine, *What's Ahead for M2M* (Jan./Feb. 2009), available at http://www.m2mmag.com/issue_archives/story.aspx?ID=7437; M2M Magazine, *Machine-to-Machine Stimulus* (May/June 2009), available at http://www.m2mmag.com/issue_archives/story.aspx?ID=7633.

³⁹ See Forrester Consulting, *Achieving Universal Broadband in the US*, at 17 (Nov. 2008) ("*Forrester Consulting Report*") ("To successfully drive access to and adoption of broadband technology," service providers, governmental agencies, non-profit organizations, and consumers "must come together collaboratively"); *Rural Broadband Report* ¶ 57 ("Consequently, we believe that increasing coordination—among federal departments and agencies; Tribal, state, and local governments; community groups; and individuals—is a critical preliminary step toward ensuring that the various government programs accomplish their broadband goals and objectives in an efficient and effective way.").

⁴⁰ See Section IV.B.1, *infra*.

Government cannot hope to supplant the private sector in these endeavors. The costs of any governmental effort to take over, or even manage, all of the roles that the private sector has played—constructing and maintaining networks, continually investing in innovative products to keep America’s broadband competitive with the rest of the world, meeting the customer-service needs of consumers and business users—would be astronomical. Instead, government should seek to work cooperatively with the private sector to establish an economic and regulatory climate that will encourage that sector’s deployment of facilities and services across the nation. Policymakers should *promote* private-public partnerships that preserve investment incentives while supporting public needs, and should seek to *remove* regulatory roadblocks to private-sector investment and innovation.

In engaging the private sector, the Plan must consider the role of private-sector stakeholders of all stripes, many of whom typically receive little, if any, attention from this Commission as it goes about its day-to-day regulatory activities. These include the investment community whose bankers and venture capitalists will finance the deployment of broadband networks and services; the equipment vendors who will design and produce the building blocks of those networks and services; the IP-based service, application, and content providers whose wares will fill those networks; and the non-profits and public-interest coalitions (*e.g.*, AARP, the Coalition of Organizations for Accessible Technology, Connected Nation, Pew Internet and American Life Project, and many others) that can expand access and adoption by educating their constituencies about the benefits of broadband.

To leverage the substantial efforts of these private-sector stakeholders, the Plan must tap into the expertise of other agencies at the federal, state, tribal, and local levels. For example, educating and training the nation’s school-age population to become the tech-savvy workers of

tomorrow may require the Department of Education’s leadership to help infuse K-12 curriculums across the country with courses on Internet use and online safety. Similarly, the Environmental Protection Agency’s and Energy Department’s SmartGrid and environmental initiatives could play a key role in fostering broadband deployment and improving energy conservation—perhaps in partnership with Labor Department initiatives to promote tele-working. The Department of Health and Human Services could play a role improving health-care delivery through e-health initiatives, such as telemedicine. The intelligence agencies can provide critical support for safeguarding the nation’s broadband networks, which, in turn, will allow greater reliance on those networks for the delivery of an increasing array of vital services, applications, and content. The Department of Homeland Security and the Commission could work together to ensure that there is a workable national broadband solution for public-safety communications. The Treasury Department and Internal Revenue Service could play a role in helping to facilitate investment in broadband networks and services through pro-broadband tax policies. The National Institute of Standards and Technology (NIST), the National Academies of Sciences and Engineering, and the vast collection of National Laboratories and Technology Centers associated with the Energy Department,⁴¹ along with the nation’s leading research universities, could all contribute their world-class expertise to the development of robust, affordable, next-generation broadband networks and services. The Department of Labor and similar state and local agencies could work in partnership with various non-profits and public-interest coalitions to increase broadband awareness, education, training, and, ultimately, subscribership. Each of these entities has its own

⁴¹ See U.S. Department of Energy, *National Laboratories and Technology Centers*, <http://www.energy.gov/organization/labs-techcenters.htm>.

key role to play in broadband deployment and adoption, and the Commission would be remiss if the Plan failed to engage them and other relevant federal agencies to their fullest potential.

State and local agencies also must be part of the National Broadband Plan. They are our first responders, our educators, and our foremost providers of social services and many other government services—essential functions that all stand to help achieve *and* be transformed by ubiquitous broadband. Perhaps even more than the federal government, state and local agencies may be able to reach into remote communities or lower-income neighborhoods within their jurisdictions to help provide broadband education and training and address the unique adoption challenges faced in those areas. In addition, because many local governments are beginning to provide broadband-enabled content and services themselves, they may be particularly well-situated to expand their offerings of broadband-enhanced public services (for example, online motor-vehicle services and tax payments). Finally, state and local governments have regulatory authority over various issues that may directly affect broadband deployment and that will have to be carefully coordinated to ensure realization of the National Broadband Plan’s goals—such as zoning and right-of-way authorization. For all of these reasons, an effective Plan will require close consultation with state and local agencies in both its formulation and implementation.

By taking an inclusive approach to address these issues through collaborative private-public partnerships, the Commission can craft a workable Plan to reach the goal of a fully connected nation by 2014.

II. THE NATIONAL BROADBAND PLAN SHOULD DEFINE “BROADBAND” IN A MANNER THAT RECOGNIZES THE WIDE VARIETY OF NETWORKS, SERVICES, AND APPLICATIONS THAT ARE NEEDED TO MEET CONSUMERS’ DIVERGENT NEEDS

In directing the Commission to develop a national plan to ensure 100 percent broadband access and to enable 100 percent broadband adoption, Congress chose not to narrowly define

“broadband” in terms of a particular technology or “speed.”⁴² Instead, it left the definitional task to the Commission, with the proviso that broadband be maximally utilized in furtherance of a wide variety of societal goals, including the advancement of consumer welfare, public safety and homeland security, health-care delivery, energy independence and efficiency, education, and worker training, among others.⁴³ In the *Notice*, the Commission poses many questions about “broadband” that are framed generically, as if that term represents a single, homogenous product.⁴⁴ But the marketplace is teeming with a multitude of distinct services and applications that would likely qualify, in one way or another, as “broadband.” Thus, a blunt, one-size-fits-all analytical framework for “broadband” will necessarily produce policies that miss the mark. Instead, the Plan must examine broadband in terms that reflect the marketplace realities of how it is offered to, and used by, consumers. While there are potentially many different ways to describe these marketplace categories, we offer the following suggestions for the Commission’s consideration.

First, the Commission should recognize that Americans do not consume “broadband” in the abstract; rather, they use an array of distinct types of broadband-based services that, either in isolation or in combination with other broadband-based services, give them the features and functionalities they desire to meet their needs. This large and multi-faceted universe of “broadband” products includes search services (*e.g.*, Google); voice and video services (*e.g.*, VoIP, IPTV, video conferencing, YouTube); transmission services (*e.g.*, DS-3, OCn, ATM, Ethernet, wireless backhaul); texting services (*e.g.*, Twitter); social networking services (*e.g.*,

⁴² H.R. Rep. No. 111-16, at 775 (2009) (Conf. Rep.).

⁴³ Recovery Act, § 6001(k)(2).

⁴⁴ *See, e.g., Notice* ¶¶ 9, 13, 52-53.

Facebook, MySpace); news and entertainment services (*e.g.*, cnn.com, espn.com); e-commerce services (*e.g.*, Amazon, eBay); cloud computing and storage services (*e.g.*, Amazon S3); content delivery services (*e.g.*, Akamai, Limelight); e-health services (*e.g.*, remote diagnostics, tele-surgery); fleet management services (*e.g.*, vehicle telemetry); inventory tracking (*e.g.*, RFID); and many, many more. And, of course, “broadband” includes Internet access in all of the many forms in which it is offered (*e.g.*, DSL, FTTH, cable modem, 3G, WiMAX, Wi-Fi, satellite, powerline).

Some of these services⁴⁵ are provided over broadband transmission links without the capability to access the Internet; others rely on broadband Internet access services for their underlying transmission. Some are integrated with an underlying transmission component; others are not. Some are intended to be accessible by the general public; others are designed for private use by specific individuals or institutions. Some are classified as telecommunications services and subject to common-carrier regulation under Title II; others are classified as information services and subject to the Commission’s ancillary jurisdiction under Title I; and still others, like VoIP, are as yet unclassified but subject to regulation under both Titles I and II. In crafting the National Broadband Plan, the Commission must strive to understand, at least in general terms, what these varied products are, how they can advance the different societal goals of the Recovery Act, and what types of facilities and policies are needed to support them.

Second, to the extent the Plan adopts policies that focus specifically on deployment and adoption of broadband *Internet access service* (and the broadband-enabled services, applications,

⁴⁵ In the broadband or Internet policymaking context, the terms “services,” “applications,” and “content” are often used interchangeably (*e.g.*, is VoIP a service or an application; are RSS feeds an application or content?). Unless otherwise noted or evident from the context, we use those terms interchangeably in these comments as well.

and content provided via broadband Internet access service), it should rely on the Commission’s prior descriptions of that service. Although the Commission has never formally defined the term “broadband Internet access service,” it has consistently described its salient attributes: the functional integration of computer processing, information provision, and computer interactivity with data transport to provide end users the capability to access and run a variety of services, applications, and content over the public Internet.⁴⁶ To ensure regulatory continuity and certainty, the Plan should strive for consistency with this existing description to the extent the Plan defines broadband Internet access service in crafting related policies.

Third, to date, the Commission’s preferred metric for defining broadband has been the “authorized maximum information transfer rate (‘speed’)” of the customer’s connection.⁴⁷ This emphasis on “speed” is not surprising since, when the Commission initiated its first Section 706 inquiry in 1998,⁴⁸ broadband was understood by most policymakers as simply a faster version of dial-up Internet access service. Most consumers at that time accessed fixed broadband networks

⁴⁶ See, e.g., Report to Congress, *Federal-State Joint Board on Universal Service*, 13 FCC Rcd 11501, 11531, 11536 ¶¶ 63, 73-74 (1998) (“*Report to Congress*”); Report and Order and Notice of Proposed Rulemaking, *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities (and related proceedings)*, 20 FCC Rcd 14853, 14860-61 ¶ 9 (2005), *aff’d*, *Time Warner Telecom, Inc. v. FCC*, 507 F.3d 205 (3d Cir. 2007).

⁴⁷ Federal Communications Commission, *Instructions for Local Telephone Competition and Broadband Reporting Form (FCC Form 477)*, at 6, available at <http://www.fcc.gov/Forms/Form477/477inst.pdf> (“*Form 477 Instructions*”). “Speed,” which is a measure of distance traveled over a particular period of time (for example, miles per hour), is a misnomer in this context. Absent network congestion, all packets travel between points in a network at essentially the same speed, namely, the speed of light. Thus, the more accurate term here is “throughput,” which is a measure of data transfer capacity over a particular period of time (for example, megabits per second). To the extent we use the term “speed” in these comments, we do so colloquially to mean “throughput,” unless otherwise noted.

⁴⁸ Notice of Inquiry, *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996*, 13 FCC Rcd 15280 (1998).

using stationary computers in their homes or offices, the majority of which ran on a single operating system from a single vendor. The primary consumer uses of broadband networks were email and browsing the Web. Based on this relatively homogeneous customer experience, the Commission chose a single metric to describe broadband in a way that distinguished it from dial-up—authorized maximum information transfer rate—and set that definitional threshold at 200 Kbps.

But as should be evident from the plethora of broadband services available today—not to mention the services that will be developed in the future—there is no one-size-fits-all “metric” by which policymakers could hope to assess or measure the relevant attributes of every one of these wildly diverse broadband products. Indeed, just one decade after the *First Section 706 Report*,⁴⁹ the broadband marketplace consists of a multitude of networks (including cable, DSL, fiber-to-the-home, satellite, 3G wireless, Wi-Fi, WiMAX, and powerline), connected to a wide range of devices (including desktops, laptops, netbooks, smartphones, VoIP phones, e-book readers, video cameras, smart-meters, and telemedicine equipment), supporting a variety of services, applications, and content (including email, web browsing, VoIP, video streaming, gaming, telemetry, and inventory tracking). This tremendous diversity results in numerous benefits for consumers and society, including greater access to broadband services and innovative new applications and devices that permit use of data networks in previously unimaginable ways.

In this dynamic environment, it no longer makes sense to use “speed” as the only, or even primary, means of defining whether a service qualifies as broadband. Speed is not the sole variant that distinguishes different broadband services or determines which service will best meet

⁴⁹ See generally *First Section 706 Report*, 14 FCC Rcd 2398.

a consumer's needs. Depending on the context, factors such as cost, reliability, coverage, mobility, energy consumption, or security can be much more important than the throughput of a particular broadband network or service. For example, a fixed wireline service that meets some artificial throughput floor will not satisfy the needs of rural health-care providers who make house calls in remote areas or the needs of public-safety officers who must respond to emergencies wherever and whenever they arise—and a Plan that embraced only such a service would fall short of “advancing . . . public safety and homeland security . . . [and] health care delivery.”⁵⁰

To be sure, the National Broadband Plan should *promote* the accessibility of the highest-throughput capabilities for users who need them. Indeed, the marketplace is already offering residential and business consumers a growing array of exceptionally fast services (*e.g.*, fiber-to-the-home and fiber-to-the-node wireline services, DOCSIS 3.0 cable-modem services, OCn-level enterprise services) and the Plan unquestionably should encourage the further deployment of these services and the networks that support them. But the Plan should not *define* broadband to exclude services below a certain aspirational throughput threshold, and thereby ignore and potentially deny government support to services that not only serve important needs but may do so better and more cost-effectively than some arbitrarily “faster” service. Indeed, excessive emphasis on *any* one service attribute would have this effect. The economic stimulus and other goals that Congress articulated in the Recovery Act can best be realized if the Plan encourages deployment of the full range of services that individuals, businesses, and public institutions need.

To that end, the Commission should reject suggestions that it define broadband for purposes of the Plan as including only the fastest, most advanced service that can be envisioned

⁵⁰ Recovery Act, § 6001(k)(2)(D).

using existing or reasonably foreseeable technology. It makes no sense to embrace a national strategy that has no relation to actual user needs or marketplace demand. Many consumers do not need—or want—the fastest connections possible, nor can they afford them.⁵¹ Consumers who use only relatively low-bandwidth applications (like web email and Internet search engines) have no need for ultra-high-throughput connections to the home, which would make it difficult for them to justify the costs of such a connection. And for many Americans with *no* service today, the likely next step is an introduction to and immersion in *basic* broadband service. Super-high-speed offerings also may overshoot the mark for many business and industrial needs. A producer of wind power might require a broadband connection to monitor output from wind turbines it operates in a remote area, but a high-capacity fiber link might provide far more throughput and come at a far greater cost than necessary. A network linking wireless heart monitors to a central diagnostics hub might require only limited, but highly reliable information-transfer capacity. In other words, to ensure meaningful access to broadband that is affordable and maximally utilized, as the Recovery Act requires,⁵² the National Broadband Plan’s definition of broadband must include and promote the deployment of services that are tailored to meet an array of needs, not just the super-fast connections that one small segment of users can envision.⁵³

⁵¹ This is also true for business services. Faster connections are not always preferable to slower connections, as evidenced by the massive purchases of DS1 and DS3 lines by businesses even when higher speed OC-level services are available.

⁵² Recovery Act, § 6001(k)(2)(B).

⁵³ Some commenters have suggested that wireless services are not “true broadband,” given today’s relatively lower throughput rates for wireless broadband services as compared to some fixed services. *See, e.g.*, Reply Comments of Consumers Union, Consumer Federation of America, and Free Press, WC Docket No. 07-38, at 11-12 (filed July 16, 2007). Of course, as noted above, wireless broadband may in many cases be the only “true” broadband service that supports certain needs, such as public safety, wireless telemetry, location-based tracking services, and the like—notwithstanding relatively slower speeds. And it may also be the most efficient way to deploy broadband in certain remote areas. But beyond that, the problem with

Moreover, a flexible, technology-neutral definition of broadband is consistent with Congress's intent in enacting the stimulus provisions of the Recovery Act. The Conference Report explains that the Act includes a "broad definition of entities that are eligible to receive grants" because "[i]t is the intent of the Conferees that . . . as many entities as possible be eligible to apply for a competitive grant, including wireless carriers, wireline carriers, backhaul providers, satellite carriers, public-private partnerships, and tower companies."⁵⁴ And it is consistent with the approach Congress took in Section 706 of the Telecommunications Act of 1996, which mandates that the term "advanced telecommunications capability" be defined "without regard to any transmission media or technology."⁵⁵ The Commission thus far has

such "true broadband" arguments is that they are backward-looking. They ignore the rapid evolution in mobile wireless broadband capabilities, which were once offered at throughput rates of tens of kilobits per second (2G) or hundreds of kilobits per second (early 3G), but are now rapidly becoming available in multiple megabits per second (advanced 3G), and in the near future will be available at rates approaching 10 megabits per second (4G or Long Term Evolution (LTE)). See Kevin Fitchard, Telephony Online, *AT&T Doubling 3G Capacity* (Apr. 20, 2009), <http://telephonyonline.com/wireless/news/att-3g-network-capacity-increase-0420/index.html>; AT&T, Press Release, *AT&T to Deliver 3G Mobile Broadband Speed Boost: Initiatives Will Deliver Faster Speeds, Enhancements to Mobile Broadband Performance, Availability* (May 27, 2009), available at <http://www.att.com/gen/press-room?pid=4800&cdvn=news&newsarticleid=26835> ("AT&T 3G Press Release"). And those are the *typical* throughput rates consumers can expect to receive; peak rates of tens or even hundreds of megabits per second will be possible with some advanced 3G and LTE services. See, e.g., International Telecommunications Union, *Background on IMT—Advanced*, at 1 (Mar. 7, 2008), available at [http://www.3gpp.org/article/lte-advanced](http://www.itu.int/md/dologin_md.asp?lang=en&id=R07-IMT.ADV-C-0001!!MSW-E; 3rd Generation Partnership Project and Technical Specification Group Radio Access Network, Requirements for further advancements for Evolved Universal Terrestrial Radio Access (E-UTRA) (LTE-Advanced) (Release 8), at 8, available at <a href=).

⁵⁴ H.R. Rep. No. 111-16, at 775 (2009) (Conf. Rep.).

⁵⁵ 47 U.S.C. § 1302(d)(1).

heeded Congress's instruction, making technological neutrality a key element of its general policy approach.⁵⁶ It should be careful to do the same here.

Fourth, and relatedly, rather than selecting “speed” as the single metric for broadband in general, or for broadband Internet access in particular, the Commission should look at a series of performance characteristics—including speed—that individuals, businesses, and public institutions actually require. To do so, the Commission should convene a panel of experts made up of network engineers, application and content developers, consumer representatives, and others. The panel—which should begin work as quickly as possible so that its findings and recommendations can be used by the Commission in formulating the National Broadband Plan—should consider the importance of different factors to various users and services, including throughput, latency, packet loss, jitter, reliability, security, and any other relevant service characteristics.⁵⁷

⁵⁶ See, e.g., Jason Oxman, Office of Plans and Policy, Federal Communications Commission, OPP Working Paper No. 31, *The FCC and the Unregulation of the Internet*, at 24 (July 1999), available at http://www.fcc.gov/Bureaus/OPP/working_papers/oppwp31.pdf (“*Unregulation of the Internet*”) (“[T]he FCC has met the introduction of new communications technologies with the right attitude: let the marketplace, not the government, pick the winners and losers among new services.”).

⁵⁷ We note that satellite-based broadband Internet access services are likely to possess some highly desirable characteristics, while significantly lagging behind terrestrial platforms in other respects. For example, satellite broadband may be the most cost-effective means to make broadband available in the most remote and least densely populated areas of the country. And it may offer sufficient performance to meet some user needs, like basic household Internet access for email and web surfing. But satellite-based broadband Internet access also typically suffers from relatively high up-front customer premises equipment costs, throughput constraints, and latency issues that might make it less likely to measure up on many of the factors that the panel recommends as core elements of Internet access service. See, e.g., HughesNet, *Frequently Asked Questions*, <http://go.gethughesnet.com/faq/internet-transmission-latency.cfm> (discussing latency). Thus, in especially hard-to-serve areas, policymakers may wish to consider policies that promote a combination of satellite Internet access to the home together with other types of terrestrial broadband Internet access service to central anchor institutions in the community.

The expert panel should then develop recommendations for how policymakers should measure the degree to which broadband services have these characteristics and performance capabilities. The goal should be to devise a measurement and reporting process that produces accurate information, minimizes data collection burdens, and—consistent with the Commission’s approach to measuring a *range* of speeds in the Form 477 data-collection process—captures information on a range of values for each metric studied. These data ultimately will help policymakers assess whether and where providers are offering consumers the range of services and capabilities they need, and should also help identify any stumbling blocks to the provision of those services and capabilities.

III. DEFINING AND MEASURING “ACCESS” TO BROADBAND

As with the term “broadband,” there is no explicit definition of the term “access” in either the Recovery Act or the Communications Act. Nevertheless, Congress provided important guidance on this threshold definitional question in three critical respects. *First*, Congress directed that the National Broadband Plan ensure that “all”—100 percent—of the “people of the United States” have access to broadband.⁵⁸ Thus, Congress clearly intended widespread *availability* to be a component of any definition of access. *Second*, Congress stated that the Plan should have a detailed strategy to achieve *affordability*.⁵⁹ *Third*, Congress mandated that the Plan be designed to accomplish “maximum utilization of broadband infrastructure and service by the public.”⁶⁰ Thus, Congress recognized that even plentiful, inexpensive broadband can

⁵⁸ Recovery Act, § 6001(k)(2)(A).

⁵⁹ *Id.* § 6001(k)(2)(B).

⁶⁰ *Id.*

advance the nation’s interests only if it is usable, and in fact used by, the public. Accordingly, *usability* must also be a key component of any definition of broadband “access.”

In both formulating policies to promote broadband “access” under the Plan and measuring the success of those policies, policymakers across the government should account for each of these three critical and interrelated components of “access”—*availability*, *affordability*, and *usability*.⁶¹ Below, we offer suggestions for defining and interpreting these terms, as well as recommendations for measuring progress with regard to each component.

A. Availability

Defining Availability. Congress specified that the National Broadband Plan “shall seek to ensure that *all* people of the United States have access to broadband capability.”⁶² This is an appropriately high level of ambition—and as the Commission suggests in its *Notice*, it entails making broadband capability ubiquitous. That goal should undoubtedly include making broadband available to any household that wants it. But limiting the question of availability to a household-by-household analysis would be far too narrow an approach to assessing where the country stands in terms of broadband availability.

In many neighborhoods, including those where broadband is not yet offered to every household, broadband may nevertheless be available through community centers, public schools, or libraries. In addition, broadband is available to consumers today in many commercial settings: coffeehouses, hotels, airports, and the like, as well as at many business locations and

⁶¹ In his separate statement appended to the *Notice*, Acting Chairman Copps identified these three elements as central to the National Broadband Plan: “Today we commence a national dialogue on how we as a nation can make high-speed broadband available, affordable and easily useable to citizens and businesses throughout the land.” *Notice*, Statement of Acting Chairman Michael J. Copps, at 1.

⁶² Recovery Act, § 6001(k)(2) (emphasis added).

public institutions—such as offices, hospitals, and government facilities—that serve as anchor tenants in many communities. And broadband is increasingly available in industrial settings for use in a variety of productivity-enhancing initiatives, including SmartGrid projects, inventory tracking, and fleet management. Thus, for purposes of the National Broadband Plan, availability must be considered not only from the household perspective, but also from the perspective of *all* potential user groups: residential consumers, businesses, government, and industrial/machine users.

However, as discussed above, the Plan must recognize that “availability” is only one piece of the “access” puzzle, and not necessarily the most significant one. As we have pointed out, more than 90 percent of U.S. households have some form of terrestrial broadband service available to them, and nearly all households have access to satellite broadband service,⁶³ but only 55 percent of households subscribe to broadband service.⁶⁴ Thus, as discussed further below, understanding and addressing the other two components of broadband access—affordability and usability—will be critically important to closing the gap between broadband supply and broadband demand.

Measuring Availability. In enacting the Broadband Data Improvement Act of 2008 (“BDIA”), Congress sought to “[i]mprov[e] Federal data on the deployment and adoption of

⁶³ See, e.g., *Forrester Consulting Report* at 14 (reporting an overall deployment rate of nearly 87 percent); *Brookings Institution Report* at 11-12.

⁶⁴ See, e.g., Comments of Connected Nation, Inc., *Rural Broadband Strategy*, GN Docket No. 09-29, at 9 (filed Mar. 25, 2009) (“[W]hile approximately over 90% of households across America have access to some form of broadband service, survey data suggests that only 50% of households choose to subscribe to the service”); Connected Nation, Inc., *Consumer Insights into America’s Broadband Challenge*, at 5 (Oct. 13, 2008), available at http://www.connectednation.org/_documents/ConsumerInsightsBroadbandChallenge_20081013.pdf; *Pew Study* at i, 3 (reporting 55 percent broadband adoption rate).

broadband service”⁶⁵ by establishing a comprehensive grant program to facilitate the creation of a state-by-state “geographic inventory map of broadband service.”⁶⁶ Congress then allocated up to \$350 million in the Recovery Act to fund implementation of the broadband inventory map provisions of the BDIA.⁶⁷ Given the emphasis on, and substantial resources devoted to, broadband mapping in these two statutes, Congress clearly intended this mapping program to be the principal and authoritative source for data about broadband availability in the United States. Thus, rather than pursue proposals to create a separate measure of broadband availability to compete with the one mandated by Congress,⁶⁸ the Commission should make the BDIA mapping program the focal point of the availability analysis in the National Broadband Plan.

While data collected via the BDIA mapping program will provide an important source of information about the *actual* deployment and availability of broadband facilities and services, policymakers should also consider gathering additional information about consumer *perceptions* of broadband availability. As AT&T has explained previously, the U.S. Census Bureau has substantial expertise in conducting consumer surveys on broadband issues,⁶⁹ and obtaining such data will give policymakers critically important information about whether consumer perceptions

⁶⁵ Broadband Data Improvement Act, Pub. L. No. 110-385, 122 Stat. 4096, § 102(3) (2008) (codified at 47 U.S.C. § 1301(3)).

⁶⁶ *Id.* at 122 Stat. 4096, 4101 § 106(e)(10).

⁶⁷ Recovery Act, div. A, tit. II.

⁶⁸ See Report and Order and Further Notice of Proposed Rulemaking, *Development of Nationwide Broadband Data to Evaluate Reasonable and Timely Deployment of Advanced Services to All Americans, Improvement of Wireless Broadband Subscriberhip Data, and Development of Data on Interconnected Voice over Internet Protocol (VoIP) Subscriberhip*, 23 FCC Rcd 9691, 9709 ¶ 35 (2008) (“2008 Broadband Data Order and Notice”) (requesting comment on broadband availability measurement processes).

⁶⁹ Comments of AT&T Inc., *International Comparison and Consumer Survey Requirements in the Broadband Data Improvement Act*, GN Docket No. 09-47, at 8-9 (filed Apr. 10, 2009) (“AT&T BDIA Comments”).

are in synch with actual availability of broadband services. And if they are not, then policymakers can take appropriate steps to improve consumer education and awareness about broadband availability.

Taken together, these data should provide a comprehensive picture of this country's existing broadband coverage and help identify any gaps in that coverage, whether real or perceived.⁷⁰

B. Affordability

Defining Affordability. Congress recognized that even where broadband services are available, the services will not be accessible (or maximally utilized) if potential customers cannot afford to purchase them. Thus, it instructed the Commission to craft “a detailed strategy for achieving affordability of such service[s].”⁷¹

The notion of affordability must account for the fact that there will be trade-offs involved in reaching an optimal solution in different contexts. For example, the only way to provide affordable service in a large, remote area may be to deploy a less expensive technology that enables greater coverage but provides less robust throughput or higher latency. These same trade-offs may not be needed to make a more robust broadband service “affordable” in a lower cost, urban area.

But the notion of “affordability” should also take into account the range of ways that broadband is made available in different communities. For example, broadband services may be “affordable” in a community if consumers can access robust broadband services through anchor

⁷⁰ Indeed, the BDIA program is designed not only to map broadband inventory, but also to develop information concerning barriers to broadband adoption by individuals and businesses, among other goals. *See* Broadband Data Improvement Act, § 106(e)(1)-(10).

⁷¹ Recovery Act, § 6001(k)(2)(B).

institutions (such as community centers, libraries, local government offices, community colleges, and hotels and conference centers). This might be a reasonable solution, particularly in a high-cost area, if those same users also have household access to lower-priced basic broadband service appropriate for everyday activities (*e.g.*, web browsing and e-commerce). In other words, an assessment of “affordability” may need to account for the different ways in which broadband may be “available” in different communities, given those communities’ unique characteristics.

In all events, concerns about “affordability” underscore why it is so important for the Commission to reject the notion advocated by some parties that the Plan should be dedicated exclusively to promoting the newest, most aggressively high-speed networks uniformly across the United States. Even if adoption of the most advanced networks were a valid aspirational goal, these services would inevitably be well beyond the reach of many Americans, and there is no reasonable prospect that they could *become* affordable without enormously expensive government subsidization. As the Consumer Federation of America and Consumers Union recently observed:

[M]aximum coverage should be the goal, rather than chas[ing] a gold-plated network that will restrict the number of households that can be reached in the near future. We need to get people connected for basic communications that open[] the door to economic and civic participation in cyberspace.⁷²

In other words, the goal of the Plan should be to ensure a fully networked nation by 2014, which means promptly getting services to Americans (and their businesses and institutions) that they can afford.

⁷² Comments of the Consumer Federation of America and Consumers Union, *Report on Rural Broadband Strategy*, GN Docket No. 09-29, at 3 (filed Mar. 25, 2009); *see also id.* at 8 (“[T]he FCC and other agencies should give priority to projects that are willing to make commitments on target levels of consumer prices that are affordable.”).

Concerns about affordability also underscore the importance of rejecting calls for regulatory obligations—such as extreme versions of net neutrality—that will not address any real-world problem, yet will increase the costs of deploying and operating broadband platforms and prevent providers from offering services on their platforms to all entities that may wish to purchase them, including providers of content, applications, and services. These proposals, however well-intended, will only increase the cost to consumers and reduce the availability of broadband Internet access and thus are antithetical to the goal of broadband affordability.

Measuring Affordability. To measure broadband affordability, the Plan should look to the same methods that the Commission has successfully used for decades to study the affordability of traditional telephone service. For that task, the Commission collects data from the Bureau of Labor Statistics, the Bureau of Economic Analysis, and TNS Telecoms’s Bill Harvesting service, and uses the data to analyze how much Americans spend annually on telephone service, both in terms of dollars spent per household and as a percentage of total household expenditures.⁷³ These same sources, as well as the Census Bureau, could be tapped again to obtain similar data on broadband expenditures and would give policymakers a familiar, consistent, and reliable means for examining broadband affordability over time.

Given the broad, national focus of the Plan, data should be collected regarding residential, business, and government customers, and should cover broadband expenditures at a sufficiently granular level—for example, by technology, state, geography (*e.g.*, rural versus urban), and customer demographics (*e.g.*, age, income, education). And the data collection

⁷³ See Federal Communications Commission, Wireline Competition Bureau, Industry Analysis and Technology Division, *Trends in Telephone Service*, at 3-1 (Aug. 2008), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-284932A1.pdf (“2008 Trends in Telephone Service Report”).

should not be limited merely to how much consumers spend on a monthly or annual basis on their broadband subscriptions. For example, the costs of the broadband-enabled *devices* used to access the Internet (*e.g.*, computers, smartphones) may be an important element to consider when assessing whether consumers can affordably access broadband services. For some consumers, the upfront cost of such devices may prove to be an insurmountable impediment to service adoption. The Plan thus should ensure that device costs are included in any assessment of affordability.⁷⁴

In addition, any assessment of broadband affordability must reflect the fact that not all broadband service is actually purchased on a monthly subscription basis. For example, some consumers rely on (or supplement their broadband service with) pay-as-you-go or even “free” Wi-Fi available at coffeehouses, city centers, airports, and the like.⁷⁵ Other consumers’ broadband experiences may include (or even be limited to) a broadband access device for which *no* monthly service fee is incurred. The upfront device price of the Amazon Kindle, for instance, includes unlimited, wireless broadband access, including access to an online “Kindle Store” and “basic” Web functionality, which is optimized for particular services, applications, and content that Amazon expects its customers to access using the Kindle.⁷⁶ For its part, AT&T is exploring

⁷⁴ One phenomenon that is important to track is the service uptake rate where the broadband pricing model includes a subsidized device bundled with the service. For example, the entry cost for wireless broadband service is often reduced through packages that include a subsidized device, and this pricing model has been instrumental in growing wireless subscription rates.

⁷⁵ Wi-Fi service is often described as “free” in these circumstances because the end-user consumer is not being charged to use the service. But the provision of such services is not without costs—including the costs for Wi-Fi access points and related equipment, backhaul transport, customer service and helpdesk functions, and other costs—that are often borne by premises owners in order to encourage end users to patronize their establishments.

⁷⁶ See Kindle User’s Guide, 3rd Edition, at Chapters 5-6, *available at* http://s3.amazonaws.com/kindle/Kindle2_Users_Guide.pdf.

a variety of business models that would offer consumers innovative devices packaged with short-term (*i.e.*, hours or days) or pre-paid wireless broadband service.⁷⁷ In short, monthly subscription-based pricing is just one of many pricing models in today's broadband marketplace.

An assessment of broadband affordability also should acknowledge that some individuals who face serious economic challenges and thus do not subscribe to home broadband service may nevertheless have "affordable" access to broadband resources at their workplace, library, school, public community center, or a nearby bookstore, coffeehouse, or restaurant. Regardless of the price of any particular service, these public resources may represent the most "affordable" solution for these individuals, and while efforts should be focused on making broadband more affordable so that home subscription is an option, policymakers should not discount the significance of these alternative sources. And finally, of course, any assessment should consider the impact Lifeline and Link-Up support could have for broadband services, which we discuss below, and which may play a key role in making services "affordable" for lower-income consumers.

In all events, the Commission should not base its affordability analysis on raw pricing data collected from broadband providers. As AT&T previously has explained,⁷⁸ the Commission would impose a monumental burden on the nearly 1,400 broadband providers in the United States, as well as the agency itself, if it required them to report on all of their different pricing

⁷⁷ Matt Richtel, New York Times Bits Blog, *AT&T Plans for a Proliferation of Wireless Gadgets* (May 7, 2009), <http://bits.blogs.nytimes.com/2009/05/07/att-plans-for-a-proliferation-of-wireless-gadgets/>?

⁷⁸ Comments of AT&T Inc., *Development of Nationwide Broadband Data to Evaluate Reasonable and Timely Deployment of Advanced Services to All Americans, Improvement of Wireless Broadband Subscriberhip Data, and Development of Data on Interconnected Voice over Internet Protocol (VoIP) Subscriberhip*, WC Docket No. 07-38, at 6-14 (filed Aug. 1, 2008).

packages for all of their different products (and at all of the different speed tiers available) in all of the states and for each of the customer classes they serve. Nor is it clear what the resulting data would show beyond the information the Commission could more easily obtain and process from the government agencies (BLS, BEA, Census) and vendors (TNS Telecoms) that it relies on now for telephony pricing information.

But even more to the point, affordability should not be judged primarily from the perspective of the rates that a particular *provider* charges for a specific service or product, because such data do not address the *consumer* side of the equation: How much (or little) of a particular consumer's budget does a particular broadband service consume, and how much (or little) value does the consumer ascribe to that service? The Commission seems to have implicitly recognized this point decades ago when it took a consumer-focused approach in collecting trend data on consumer expenditures for telephone service.⁷⁹ It should take the same consumer-focused approach in studying the broadband marketplace as well.⁸⁰

By the same token, the Commission should not replicate its highly controversial, cumbersome, and ultimately unproductive cost-modeling experiment for traditional telephone service by seeking to “model” how much broadband service *should*, in theory, cost to provide.⁸¹ That effort, like a carrier-by-carrier rate analysis, would do nothing to answer the pressing question here: Can consumers afford the broadband services they need, or are end-user costs a

⁷⁹ 2008 *Trends in Telephone Service Report* at 3-1.

⁸⁰ To the extent that the Commission does collect data from carriers, it should continue to follow its well established practice of safeguarding confidential and proprietary data from public disclosure. *See, e.g.*, Defendant's Motion for Summary Judgment, *Center for Public Integrity v. FCC*, D.D.C. Civil Action No. 06-1644 (ESH) (filed Jan. 8, 2007).

⁸¹ Moreover, since we recommend below that broadband universal service support be allocated pursuant to a competitive bidding mechanism, *see* Section IV.B.2.a, *infra*, such a model would be unnecessary even for universal service support purposes.

significant impediment to adoption? And in any event, the model the government would need for any type of useful assessment of broadband “costs” would be virtually impossible to construct. The arduous and complex task of devising and maintaining a single-platform cost model for traditional wireline telephone service was difficult and controversial enough—even now, debates continue to rage about the utility of that model for estimating real-world costs.⁸² A meaningful broadband model would have to model the costs of broadband services provided over existing ADSL, VDSL, fiber-to-the-home, cable modem, 3G, Wi-Fi, WiMAX, BPL, and satellite platforms, as well as any new platforms that may develop in the future. Leaving aside the enormous burden that would be involved in collecting the relevant input data, any quixotic modeling effort of this type would inevitably result in the same heated disputes and investment-draining litigation that ensued for years in response to universal service and TELRIC cost modeling efforts. In short, attempting to create a broadband cost model would be an exercise in futility and would waste valuable time and resources that could be better spent promoting the deployment and adoption of broadband services.

C. Usability

Defining Usability. A core goal of the National Broadband Plan is to ensure that broadband networks and services are “maxim[ally] utiliz[ed]” by the public once they are deployed.⁸³ That goal cannot be met unless (i) the broadband networks and services offer appropriate capabilities to meet the particular needs of broadband users, and (ii) there are no

⁸² See, e.g., Comments of Sprint Nextel Corporation, *Special Access Rates for Price Cap Local Exchange Carriers*, AT&T Corp. Petition for Rulemaking to Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services, WC Docket No. 05-25, at 41 & n.119 (filed Aug. 8, 2007) (urging the Commission to use its forward-looking cost model and endorsing long-term price-cap system for special access).

⁸³ Recovery Act, § 6001(k)(2)(B).

barriers preventing some people (or businesses or institutions) from making use of those capabilities.

Capabilities. As discussed above, there is no single broadband network or service that can satisfy the performance needs of all users in all circumstances, and the National Broadband Plan would do a great disservice to potential broadband users (residential, business, *and* governmental) if it attempted to promote a single network or service as the one “right” solution for everybody. A fiber-to-the-premises broadband network will be of little use to a first responder at the scene of an emergency who needs mobile wireless connectivity; a satellite service will provide little utility to a business owner whose shop is located on the first floor of a high-rise building in an “urban canyon;” and a 100 Mbps service will be tremendously inefficient for a vending-machine owner who merely wants to receive notifications from his broadband-enabled machines when they are running low on contents or their coin slots are jammed. Likewise, a network’s or service’s capabilities will not be “usable” if they do not satisfy the particular performance criteria of their prospective customers, such as high security for a bank or other financial institution, or low latency and packet loss for a VoIP service or telemedicine application. In other words, “usability” should be defined to include an assessment of whether consumers are being offered the broadband networks, services, applications, and content with capabilities that are suitable to their needs.

To ensure that such capabilities are being provided in a way that fosters “maximum utilization of broadband infrastructure and service” as required by Congress,⁸⁴ broadband networks, services, applications, and content will need to be *smarter*. Networks will need to provide the performance capabilities required by the increasingly diverse array of services,

⁸⁴ Recovery Act, § 6001(k)(2)(B).

applications, and content traveling over them, and, at the same time, those services, applications, and content will similarly need to adapt to function properly on different types of networks. For instance, a network that can dynamically adjust to support the real-time needs of a video conferencing application, at the same time it handles the upload of a large movie file for a peer-to-peer application, while also delivering bursty Web traffic, will support “maximum utilization” far more effectively than a network optimized to handle only one of these tasks. Similarly, a video application that can dynamically optimize its bit rate and resolution to recognize the performance capabilities and congestion sensitivities of different wireline and wireless networks and customer equipment (*e.g.*, desktop monitors, smartphone screens) will better promote maximum utilization than an application that works on a single network. Thus, encouraging *smarter* networks, services, applications, and content should be a key priority of the Plan.

Barriers. Even when broadband networks and services are available and affordable and possess the capabilities end users need, the Plan will not achieve maximum utilization if potential broadband users face barriers that prevent them from making use of those networks and services. In some cases, the barriers may be economic, such as when a consumer cannot afford a computer or other broadband-enabled device (as discussed above). In other cases, the barriers may be educational, as when a consumer does not understand the benefits of broadband or lacks training in how to use the Internet. And in some situations, the barriers may be legal or regulatory, such as when concerns over piracy and copyright protection inhibit the amount of digital content available to consumers; when medical licensing issues prevent telemedicine services from being offered across state borders; when state or federal tax policies hinder e-commerce and online entrepreneurship; or when lack of teacher training discourages broadband applications in the classroom. These and a variety of other issues may pose significant

impediments to Congress's vision of maximum utilization and must be addressed in the National Broadband Plan and by all policymakers throughout government.

Measuring Usability. The most telling information for purposes of measuring usability is data regarding whether individuals, businesses, government agencies, and others are actually subscribing to and using the broadband services that are available to them. An obvious source of information for that assessment is the Commission's Form 477 data on broadband subscribership in the United States.⁸⁵ The Commission recently updated the Form 477 reporting requirements to include subscribership data at the census tract level, broken out by speed tier.⁸⁶ To be sure, these data do not answer every question: They do not reveal *why* a consumer subscribed (or did not subscribe) or what service characteristics the subscriber needs.⁸⁷ But they nevertheless cover all forms of broadband service and serve as the Commission's primary and most reliable source of subscribership statistics.⁸⁸

To answer the more subjective, consumer-oriented questions about whether the capabilities of the broadband services available in a given area adequately meet the community's needs, and what the needs in that community are, the National Broadband Plan should again tap the expertise of the Census Bureau to ask these questions directly. The Commission should work with the Census Bureau to design a more in-depth survey approach that asks each respondent whether the broadband service that exists in his or her area is *appropriate* for the individual's (or

⁸⁵ *Form 477 Instructions.*

⁸⁶ *2008 Broadband Data Order and Notice*, 23 FCC Rcd at 9700-01 ¶ 20.

⁸⁷ *See id.* at 9712 ¶ 40 (asking for comment on proposal to include consumer surveys in future reporting).

⁸⁸ *See id.* at 9693 ¶ 5 (“The reporting entities include incumbent and competitive local exchange carriers (LECs), operators of terrestrial and satellite wireless facilities, cable companies, municipalities, and any other facilities-based providers of broadband connections to end users.”)

the business's or institution's) needs. These questions could explore what broadband capabilities respondents want, what their perceptions are concerning available offerings, and how the two match up.

This type of survey should also explore whether respondents are deterred from subscribing to broadband by various barriers, such as those identified in the work of the Pew Foundation and others that have extensively studied why some consumers do not use broadband even when it is available.⁸⁹ Only after cataloguing such barriers to adoption can policymakers design effective strategies to overcome them.

D. Government Implementation of the National Broadband Plan

When measuring America's progress in reaching the National Broadband Plan's goals, the government must candidly evaluate its own successes and failures and adjust course accordingly to ensure 100 percent broadband deployment and enable 100 percent broadband adoption. In conducting that evaluation, the government (federal, state, and local) must assess its efforts as both a broadband market participant and as a broadband policymaker.

Government as Market Participant. Satisfying many of the core goals of the Recovery Act will require the government to act as a consumer of broadband services and also as a provider of broadband services, applications, and content. For example, to advance public safety and homeland security, federal, state, and local governments will need to acquire and deploy broadband-enabled communications services and devices to enhance the effectiveness of their

⁸⁹ See, e.g., *Pew Study*; *Pew Online Opportunities Report*; Comments of Connected Nation, Inc. on Broadband Mapping, *Development of Nationwide Broadband Data to Evaluate Reasonable and Timely Deployment of Advanced Services to All Americans, Improvement of Wireless Broadband Subscriberhip Data, and Development of Data on Interconnected Voice over Internet Protocol (VoIP) Subscriberhip*, WC Docket No. 07-38, at 8 (filed July 17, 2008) ("*Connected Nation Broadband Mapping Comments*") (explaining that Connected Nation conducts research to identify community-level barriers to broadband adoption).

first responders and other public-safety personnel. Likewise, to encourage civic participation, governments at all levels will need to make more public services and information accessible to their constituents online.⁹⁰ The Plan should address how such government efforts can be funded and should include mechanisms to facilitate ongoing assessment of government follow-through to ensure that any gaps in implementation are identified and remedied.

Government as Policymaker. Success of the National Broadband Plan also will depend on the extent to which governments implement the policy recommendations in that Plan and actively *remove* barriers to broadband investment and adoption. For example, recommendations that state and local governments take affirmative steps to address zoning and rights-of-way access issues in order to facilitate broadband deployment, or proposals for government taxing authorities to lighten tax burdens that deter broadband investment, will accomplish little if they are never implemented.

The Commission must take this concern to heart with respect to its own regulatory agenda, as well, and ensure that it is actively working to promote the Plan's broadband objectives. In the past, the agency has too frequently delayed resolution of some of the most

⁹⁰ The Commission has already taken its own steps in this regard. Acting Chairman Copps recently requested funding from Congress for this purpose: "During Fiscal Year 2010, the FCC also proposes to take some necessary steps forward to modernize our technological infrastructure, for which we seek \$15 million. First, we will upgrade and integrate our IT systems to make our processes more transparent and easier for the public to access. For instance, we will upgrade our website capabilities so that consumers will be able to perform keyword searches of comments filed in ongoing proceedings, thereby permitting and encouraging increased public participation in our decision-making process." *The FCC's Fiscal Year 2010 Budget Request: Hearing Before the Subcomm. on Financial Services & General Government of the H. Comm. on Appropriations*, 111th Cong., at 2 (Apr. 29, 2009) (statement of Michael J. Copps, Acting Chairman, Federal Communications Commission), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-290479A1.pdf.

pressing broadband policy issues of the day.⁹¹ For example, it took the Commission nearly six years, and a trip to the Supreme Court, to rule that broadband Internet access service (*i.e.*, cable, wireline, wireless, powerline) is an information service. And the Commission has been ruminating over the regulatory classification of VoIP for more than a decade with no resolution in sight.⁹² The lack of guidance on this basic question has created significant uncertainty, promoted regulatory arbitrage on a massive scale, spawned litigation, and skewed investment decisions about VoIP services and the underlying broadband networks that support them.⁹³ The same holds true with respect to long-pending proceedings concerning reform of intercarrier compensation and universal service, which hold the key to unshackling wireline providers from their legacy voice-centric, regulatorily-prescribed business models and enabling them to invest more aggressively in modern broadband networks and services—an issue some commentators

⁹¹ See, e.g., TR Daily, *Rurals Back New 700 MHz Plan; Martin Proposes Minor Changes*, 2007 WLNR 14601938 (July 30, 2007) (“Regulatory uncertainty and delay function as entry barriers, limiting investment and impeding deployment of new services”); TR Daily, *Manufacturers Urge Lawmakers to Create Level Playing Field*, 2005 WLNR 25543207 (Feb. 9, 2005) (“[Alcatel North America CEO Michael] Quigley blamed regulatory uncertainty over the past few years for pushing the U.S. from first down to 13th or so in the international rankings of broadband deployment.”).

⁹² See *Report to Congress*, 13 FCC Rcd at 11541-49 ¶¶ 83-99 (discussing potential regulatory frameworks for VoIP service).

⁹³ See, e.g., *Minnesota Pub. Utils. Comm’n v. FCC*, 483 F.3d 570, 582-83 (8th Cir. 2007) (holding that the New York Public Service Commission’s argument that fixed VoIP services are the same as traditional telephone services was not ripe for review and stating, “NYPSC’s contention that state regulation of fixed VoIP services should not be preempted remains an open issue”); TR Daily, *Missouri PSC Asserts Authority over Comcast VoIP Offering*, 2007 WLNR 21679085 (Nov. 2, 2007) (reporting Missouri Public Service Commission decision ordering Comcast to comply with fixed VoIP service regulation).

have suggested is becoming ever-more pressing as the legacy network loses customers and costs mount.⁹⁴

To ensure that the Commission and other federal and state agencies are accountable for timely implementation of the policies and proposals adopted in the National Broadband Plan, the GAO, agency Inspectors General, and/or their state counterparts should conduct regular assessments of whether the relevant government agencies are accomplishing the tasks assigned to them in the Plan. Further, to the extent the Plan contains any legislative recommendations, GAO should also review whether Congress has implemented those recommendations in a timely manner. As with measuring broadband access and adoption in the marketplace, such government-focused assessments are a critical component of ensuring that government remains actively engaged in achieving the nation's broadband objectives.

E. International Comparisons

To the extent that policymakers rely on comparative international data in measuring progress under the Plan,⁹⁵ they should draw conclusions, if any, only from meaningful “apples-to-apples” comparisons. As Congress recognized in the Broadband Data Improvement Act, the broadband progress of communities in other countries cannot be compared simply by looking at raw subscribership or throughput data.⁹⁶ Instead, comparisons must account for a variety of different technical, demographic, economic, regulatory, and other factors that may influence

⁹⁴ See, e.g., Craig Moffett, Bernstein Research, *Weekend Media Blast: The Wireline Problem* (May 15, 2009) (“*Moffett Wireline Problem Analysis*”).

⁹⁵ See, e.g., *Notice* ¶ 30 (asking whether the Commission should look to international comparative data to measure U.S. broadband progress).

⁹⁶ Broadband Data Improvement Act, 122 Stat. at 4907 § 103(b)(3) (providing that in performing international comparisons, the Commission shall identify various relevant similarities and differences in each community).

broadband deployment and adoption. Thus, to ensure that international comparisons are meaningful, policymakers should acknowledge and give due weight to: demographic factors such as income, education, and age; regional and national considerations that favor particular technologies; the extent of any subsidies; and the range of variables that affect throughput and pricing.⁹⁷ AT&T has previously provided detailed comments to the Commission on the importance of considering these factors, and we incorporate those comments here by reference.⁹⁸

IV. MECHANISMS FOR ENSURING ACCESS AND ENABLING ADOPTION

The *Notice* seeks comment on many potential mechanisms for ensuring broadband access and enabling broadband adoption, some of which affect suppliers of broadband services (network operators and application, content, and service providers) and others that are more focused on broadband consumers (residential, business, government, and institutional). AT&T has structured its comments to address “demand side” issues first and then “supply side” issues. We do so to emphasize the increasing importance of the demand side of the broadband equation in enabling 100 percent broadband adoption throughout the United States. Indeed, as noted above, the number of households that *could* get broadband service but do not subscribe is many times larger than the number of households that have no broadband available at all.

This is not to say that issues of broadband supply are any less important, particularly to those populations living in unserved or underserved communities. To the contrary, making broadband available to all people of the United States (*i.e.*, ensuring 100 percent broadband

⁹⁷ For instance, comparing throughput measures across platforms is problematic: Throughput tends to be measured in different ways on different platforms, and is not stable across even one platform. *See, e.g.*, Motorola, *White Paper: Performance in Broadband Wireless Access Systems*, at 1-3 (May 2003), available at <http://www.kern.com/files/Performance111503.pdf>; *AT&T BDIA Comments* at 5-7.

⁹⁸ *See generally AT&T BDIA Comments.*

access) is a principal goal of the Recovery Act. But understanding the reasons *why* some potential customers decline to subscribe when broadband service is available will be critical, not just to increasing demand where supply already exists, but also to stimulating demand in the most remote, high-cost, and financially risky areas to serve, where supply is currently lacking.⁹⁹ Thus, while the Commission has traditionally focused mainly on supply-side issues with its broadband policies, we believe the National Broadband Plan should include a more balanced approach to increasing broadband accessibility, starting with demand.

In all events, as the Commission fulfills its statutory duty to analyze various demand-side and supply-side mechanisms for ensuring 100 percent broadband access and enabling 100 percent broadband adoption, it should keep in mind that Congress has already expressed strong preferences for the form those mechanisms should take. Specifically, in Section 706 of the Telecommunications Act of 1996, Congress instructed the Commission to encourage broadband deployment by “removing barriers to infrastructure investment and by promoting competition in the telecommunications market.”¹⁰⁰ And in Section 230 of the Communications Act, Congress found that the Internet has “flourished, to the benefit of all Americans, with a minimum of

⁹⁹ As the *Forrester Consulting Report* explains, “downward drivers of demand” also impact the supply-side equation, “present[ing] a Catch-22:”

Providers must sense demand at a level that justifies their business model, but in order for demand to exist, consumers must see a benefit to a service that does not yet exist in their local area. Thus, encouraging providers to extend their networks into currently unserved or underserved rural areas requires bolstering demand by educating consumers about the benefits of broadband.

Forrester Consulting Report at 15; see also *Rural Broadband Report* ¶ 105 (“Given that sustained deployment of broadband services is unlikely without sufficient consumer demand for broadband services, a strategy designed to promote rural broadband adoption must examine and address the discrepancy between broadband availability and broadband adoption.”).

¹⁰⁰ 47 U.S.C. § 1302(b).

government regulation” and declared that “the vibrant and competitive free market that presently exists for the Internet” should be preserved “unfettered by Federal or State regulation.”¹⁰¹

These are not “Republican” policies or “Democratic” policies—they are *national* policies, and they have been faithfully followed by Administrations from both political parties over the past dozen years. Indeed, the Clinton FCC was perhaps the most outspoken advocate of a “hands-off” approach to the Internet, telling governments around the world:

The Internet has evolved at an unprecedented pace, in large part due to the absence of government regulation. Consistent with the tradition of promoting innovation in new communications services, regulatory agencies should refrain from taking actions that could stifle the growth of the Internet. During this time of rapid telecommunications liberalization and technology innovation, unnecessary regulation can inhibit the global development and expansion of Internet infrastructure and services. To ensure that the Internet is available to as many persons as possible, the FCC has adopted a “hands-off” Internet policy. We are in the early stages of global Internet development, and policymakers should avoid actions that may limit the tremendous potential of Internet delivery.¹⁰²

Thus, as the Commission considers mechanisms for ensuring broadband access by all people of the United States, it should not break faith with these fundamental tenets of our national broadband policy.

A. Measures to Address Demand-Side Issues

1. Demand Aggregation

In many unserved or underserved areas, demand may exist, but it is fragmented. There may be many individual households that are interested in broadband service (or that would be once educated about its advantages); particular institutions that could enhance their services if

¹⁰¹ 47 U.S.C. § 230(a)(4), (b)(2).

¹⁰² Federal Communications Commission, *Connecting the Globe: A Regulator’s Guide to Building a Global Information Community*, at sec. IX (1999), available at <http://www.fcc.gov/connectglobe/sec9.html>; see also *Unregulation of the Internet* at 24 (“Perhaps the most important contribution to the success of the Internet that the FCC has made has been its consistent treatment of IP-based services as unregulated information services.”).

broadband were available; or existing or potential business owners who could capitalize on broadband's efficiency-enhancing attributes. But standing alone, none of those isolated pockets of demand may be enough to attract broadband to the area. And these potential customers may not be informed enough to understand the available options or sophisticated enough to negotiate the arrangements required to bring broadband to their communities.

The National Broadband Plan can make a significant difference by endorsing demand-aggregation efforts at the state and local levels.¹⁰³ Such efforts already have begun to spring up across the country—and the Commission has deemed them a successful method of bringing meaningful broadband “to unserved areas.”¹⁰⁴ These private-public partnerships work at identifying communities where there are unmet needs for service and matching those communities with provider resources to arrange service.¹⁰⁵ Connected Nation, for example, has made particular strides in demand aggregation, implementing demand-side technology assessments, organizing community-based technology planning to create and aggregate demand for broadband, and helping to bring together this new demand with potential providers, which are

¹⁰³ See *Forrester Consulting Report* at 19 (arguing that demand aggregation can successfully convince providers of the value of deployment, and convince potential consumers of the benefits of adoption).

¹⁰⁴ See *2008 Broadband Data Order and Notice*, 23 FCC Rcd at 9708-09 ¶ 34 (recognizing success of ConnectKentucky and “other efforts at the state level”); see also *Forrester Consulting Report* at 19 (reporting that ConnectKentucky increased broadband availability in the State by 35 percent and broadband adoption by 22 percent from 2004 to 2007).

¹⁰⁵ Reply Comments of AT&T Inc., *Further Notice of Proposed Rulemaking on Broadband Availability Mapping*, WC Docket No. 07-38, at 2-3 (filed Aug. 1, 2008) (“*AT&T Broadband Availability Mapping Reply Comments*”) (describing the ConnectKentucky program, which identifies underserved communities in the State of Kentucky and the barriers limiting broadband deployment in those communities); see also Robert D. Atkinson & Daniel D. Castro, *Digital Quality of Life: Understanding the Personal & Social Benefits of the Information Technology Revolution*, at 14 (Oct. 2008) (“*Digital Quality of Life Report*”) (recommending that governments enhance digital development by utilizing ConnectKentucky and similar private-public collaborations).

more apt to recognize the economic feasibility of deploying service in previously unserved or underserved areas once the demand has been packaged.¹⁰⁶ Public “anchor” institutions like community centers, libraries, and schools also can play a key role in demand aggregation efforts by serving as a focal or gathering point for education about and access to broadband for those otherwise unfamiliar with or unable to access it on their own.¹⁰⁷

The National Broadband Plan should identify state and local government support for these various aggregation efforts as a core part of the national solution. And it should require the federal government to explore ways that it, too, can endorse and support such efforts, including through direct financial support.

2. Education and Training

Lack of education stands as one of the key impediments to broadband adoption.¹⁰⁸ The Pew Internet and American Life Project has found that only 40 percent of Americans who did not continue their educations after high school have adopted broadband at home, whereas 66 percent of those with some college education and 79 percent of those who are educated beyond

¹⁰⁶ See *AT&T Broadband Availability Mapping Reply Comments* at 3-4 (describing efforts of Connected Nation and related programs).

¹⁰⁷ See Comments of AT&T Inc., *American Recovery and Reinvestment Act of 2009 Broadband Initiatives*, NTIA Docket No. 090309298–9299–01, at 3-7 (filed Apr. 13, 2009) (attached as Exhibit A to Submission of AT&T Inc., *Federal Communications Commission’s Consultative Role in the Broadband Provisions of the Recovery Act*, GN Docket No. 09-40 (filed Apr. 13, 2009)) (“*AT&T NTIA/RUS Comments*”) (explaining the value of anchor institutions).

¹⁰⁸ See, e.g., National Telecommunications & Information Administration, U.S. Department of Commerce, *Networked Nation: Broadband in America 2007*, tbl. at 1 (Jan. 2008), available at http://www.ntia.doc.gov/reports/2008/Table_HouseholdInternet2007.pdf (“*NTIA Networked Nation Table*”) (showing that education level is positively correlated with broadband use in the home).

college have broadband at home.¹⁰⁹ Adoption rates are particularly low for those who did not complete high school: Only 28 percent of these Americans subscribe to broadband at home.¹¹⁰

Limited education may signal that individuals have had less exposure to the Internet over their lifetimes and may hold jobs that are also less likely to involve high-tech broadband services and applications. They may thus be unfamiliar with the benefits of the Internet—a factor also prevalent among older Americans, regardless of education level: 50 percent of 50-64 year-olds, and only 19 percent of those 65 and older, were broadband subscribers in 2008.¹¹¹ Indeed, many Americans who do not subscribe to broadband services appear not to understand the benefits those services offer;¹¹² large percentages of such non-subscribers deem the Internet “irrelevant” to their lives.¹¹³

Lack of education or experience with the Internet also may make some people uncomfortable navigating in the online environment.¹¹⁴ It is thus not surprising that surveys

¹⁰⁹ *Pew Study* at 3; *see also Census Bureau Survey* at tbl. 1 (reporting that approximately 37 percent of Americans with only a high school diploma, 56 percent of those with only some college, and 74 percent of those with at least a college diploma have adopted broadband at home).

¹¹⁰ *Pew Study* at 3; *see also Census Bureau Survey* at tbl. 1 (reporting that approximately 17 percent of Americans who did not complete high school have adopted broadband at home).

¹¹¹ *Pew Study* at 3; *see also Census Bureau Survey* at tbl. 1 (reporting that approximately 38 percent of those aged 55 and older have adopted broadband at home).

¹¹² *Forrester Consulting Report* at 12 (reporting that “lack of understanding of the technology and the benefits of a home broadband connection are the main downward drivers of demand among consumers who don’t currently have broadband at home”).

¹¹³ *Pew Online Opportunities Report* at 2 (51 percent of non-broadband subscribers deem it “irrelevant” to their lives).

¹¹⁴ *Forrester Consulting Report* at 12 (“[T]he consumers who don’t see the value of broadband are those who have had the least hands-on experience with the technology.”).

show that many Americans are unwilling to subscribe to online and broadband services because they view them as “difficult.”¹¹⁵

These demand-side barriers must be addressed head-on, through programs designed by government agencies, anchor institutions, and private entities to create broadband and Internet “readiness.” The challenge will be to develop programs that highlight the “value proposition of broadband”¹¹⁶ to disparate users—those who are less educated, those who are older, those from more rural areas, and others. Training will also be needed to give non-adopters the opportunity to become “competent online users”¹¹⁷ who feel confident making the leap and beginning to use broadband services.

As the Pew Research Center points out, “[d]oing this is not a Herculean task—plenty of models exist to provide online training for low-income and elderly people.”¹¹⁸ Nevertheless, some have questioned whether the government should spend precious broadband stimulus dollars on such efforts, which may be prolonged and may not produce immediate economic results.¹¹⁹ The Broadband Plan should answer that question emphatically in the affirmative. Past

¹¹⁵ *Pew Online Opportunities Report* at 2.

¹¹⁶ *Connected Nation Broadband Mapping Comments* at 20.

¹¹⁷ *Id.* at 3; see National Telecommunications & Information Administration, U.S. Department of Commerce, *Networked Nation: Broadband in America 2007*, at 176 (Jan. 2008), available at <http://www.ntia.doc.gov/reports/2008/NetworkedNationBroadbandinAmerica2007.pdf> (“*NTIA Networked Nation Report*”) (recognizing the need for training to promote digital literacy).

¹¹⁸ *Pew Online Opportunities Report* at 3. Indeed, studies also show that barriers to broadband adoption can be overcome. While three percent of non-Internet users have said that the main reason they do not use the Internet or email is that they are “too old to learn,” *id.* at 2, last year the growth rate of home broadband subscription among Americans over 50 nonetheless was relatively high—26 percent from 2007 to 2008, a greater increase than many other demographic groups, *Pew Study* at ii.

¹¹⁹ *Pew Online Opportunities Report* at 3.

experience has demonstrated the concrete value of such educational efforts. For example, the *Washington Post* recently detailed how coordinated training and education played an important role in the successful adoption, and subsequent economic growth, associated with a broadband deployment effort in one rural Virginia town. That success stood in stark contrast to the stagnation in a similar rural Virginia town, where broadband was deployed without a coordinated educational or training effort.¹²⁰

To address these issues, the National Broadband Plan should encourage the U.S. Department of Education both to broaden its existing efforts¹²¹ and to work with state and local school officials to make computer and Internet literacy part of the national education curriculum. This step would level income-related educational disparities to some degree; it would have a collateral benefit in terms of students' overall school performance, given the greater access to online materials; and it would position these students to participate more fully in the Internet economy as young adults, when they first seek jobs. The National Broadband Plan also should recommend that the Department of Labor work with state and local officials to strengthen

¹²⁰ Cecilia Kang, *Washington Post*, *Rural Riddle: Do Jobs Follow Broadband Access?* (Apr. 23, 2009), available at <http://www.washingtonpost.com/wp-dyn/content/article/2009/04/22/AR2009042203637.html>.

¹²¹ In October 2008, the Department of Education issued a report recognizing deficiencies in education in light of new technologies and calling for steps to better prepare children for the information age. U.S. Department of Education, *Harnessing Innovation to Support Student Success: Using Technology to Personalize Education* (Oct. 2008). The Education Department also recently hosted a conference on educational technologies. U.S. Department of Education, Press Release, *Department Hosts Mega-Event on Educational Technologies and Student Learning* (May 7, 2009), <http://www.ed.gov/news/pressreleases/2009/05/05072009.html>. Notably, as AT&T has argued here, the Education Department has recognized that “[i]ncreased access to technology alone . . . will not fundamentally transform education.” U.S. Department of Education, *National Education Technology Plan, The Plan*, <http://www.ed.gov/about/offices/list/os/technology/plan/2004/site/edlite-background.html>.

computer and Internet training programs for adults, so that older citizens outside of the education system may enhance their computer and Internet-literacy skills.

3. Low-Income Issues

The National Broadband Plan must include measures to help remove the barriers that impede broadband adoption by Americans with lower incomes. As discussed above, only 25 percent of Americans with household incomes under \$20,000 subscribe to broadband services; by contrast, 55 percent of all Americans subscribe to broadband, and the subscription rate is 82 percent for Americans with household incomes between \$75,000 and \$100,000.¹²²

Americans with lower incomes are far less likely to use broadband services than other consumers even when there are broadband facilities in or near their neighborhoods.¹²³ Yet these Americans have much to gain from broadband adoption, including access to educational and job-training programs that do not require travel or time off from work, online job boards and employment-opportunity sites, and online government programs and social services. Addressing the adoption challenges for this population should therefore be an important priority of the Plan.

As with other vulnerable populations, a high percentage of low-income Americans lack knowledge about the benefits of broadband services and do not have the training necessary to make use of the Internet. But an even more fundamental concern is affordability: Low-income households struggling to make ends meet may be reluctant to, or simply unable to, spend precious funds on broadband service, even where the costs of that service are relatively

¹²² *Pew Study* at i-ii, 1-3.

¹²³ *Id.* at ii, 11-12; Order on Remand and Report and Order and Further Notice of Proposed Rulemaking, *High-Cost Universal Service Support*, WC Docket No. 05-337 (and related proceedings), FCC No. 08-262, at Appx. A ¶ 74 (rel. Nov. 5, 2008) (“*IC/USF NPRM*”) (“The Commission’s most recent data reveal that where the median income is under \$21,000, approximately 99.5 percent of households have high-speed service available with speeds in excess of 200 kbps in at least one direction.”).

modest.¹²⁴ One way to address both of these challenges is to ensure that broadband services are made available at community institutions that serve lower-income populations, and that training opportunities are provided at those institutions. This will provide broadband access to individuals who may not otherwise have any means to afford it, while also helping to equip those same individuals to become broadband adopters on their own if their resources allow it. The Recovery Act funding distributed by NTIA and RUS should help in making broadband more available at community institutions, but the Broadband Plan should support additional efforts in this regard.

In particular, the Plan should support measures that bring the costs of broadband adoption closer to what lower income Americans can afford. For decades, the Commission has overseen programs designed to support access to traditional telephone service by these same Americans. The Lifeline and Link-Up programs have helped millions of people obtain and maintain basic telephone service.¹²⁵ The Plan should extend these programs to support broadband access services; this will ensure that consumers with lower incomes can both acquire broadband access and afford the monthly service charges.¹²⁶ The Commission already has recognized that, consistent with existing law, it has authority to establish a Lifeline support mechanism for broadband (and a similar broadband Link-Up program).¹²⁷

¹²⁴ See note 16, *supra* (describing AT&T's \$19.95-per-month 768 Kbps DSL service).

¹²⁵ Order, *Federal-State Joint Board on Universal Service, Lifeline and Link-Up*, 20 FCC Rcd 16883, 16887 ¶ 8 (2005) ("Since its inception, Lifeline/Link-Up has provided support for telephone service to millions of low-income consumers. Nationally, the telephone penetration rate is 92.4 percent, in large part due to the success of the Lifeline/Link-Up program and our other universal service programs.").

¹²⁶ See, e.g., 47 C.F.R. § 54.401(a)(3); *id.* § 54.411(a).

¹²⁷ As the Commission recently explained, its "authority to provide universal service support to low-income consumers pre-dates the adoption in 1996 of section 254 of the Act, and arises out

To encourage providers to participate in the broadband Lifeline program, the Plan should create a special Lifeline Service Provider designation for companies that commit to providing broadband services to low-income households. This designation should be independent from (and not subject to the requirements of) the traditional “eligible telecommunications carrier” (or “ETC”) designation under Section 214 of the Communications Act.¹²⁸ Such a designation would encourage participation by many new providers, including some cable operators and wireless companies that have thus far been unwilling to offer Lifeline service, in part because of the many non-Lifeline-related obligations that apply to traditional ETCs. It would also allow participation by entities such as VoIP providers or Internet access providers that do not qualify as “telecommunications carriers” and thus cannot participate in the universal service programs established under Section 254 of the Communications Act.¹²⁹ Permitting participation by a

of sections 1, 4(i), 201, and 205 of the Act.” *IC/USF NPRM* at Appx. A ¶ 71 n.174. It further noted that “Section 254(b)(2) of the Act instructs the Commission to base policies for the advancement of universal service on the principle that ‘[a]ccess to *advanced* telecommunications and *information services* should be provided in all regions of the Nation.’ Similarly, section 254(b)(3) states that ‘low-income consumers . . . should have access to . . . *advanced* telecommunications and *information services*, that are reasonably comparable to those services provided in urban areas and that are available at rates charged for similar services in urban areas.’” *Id.* at Appx. A ¶ 72 (footnotes omitted) (emphasis added).

¹²⁸ 47 U.S.C. § 214(e); see Comments of AT&T Inc., *High-Cost Universal Service Support, Federal-State Joint Board on Universal Service*, WC Docket No. 05-337 and CC Docket No. 96-45, at 25-27 (filed Apr. 17, 2008) (“*AT&T USF NPRMs Comments*”); Comments of AT&T Inc., *High-Cost Universal Service Support*, WC Docket No. 05-337, at 53-54 (filed Nov. 26, 2008) (“*AT&T IC/USF Comments*”).

¹²⁹ 47 U.S.C. § 254(e); *id.* § 214(e). As AT&T has explained, the Commission has authority to establish such a designation under Title I. *AT&T IC/USF Comments* at 53-54; *AT&T USF NPRMs Comments* at 26. The Commission relied on its Title I authority when establishing the Lifeline program. See Report and Order, *Federal-State Joint Board on Universal Service*, 12 FCC Rcd 8776, 8952-57 ¶¶ 329-40 (1997). And in a recent order approving an ETC application, the Commission permitted a provider to offer Lifeline service but granted forbearance with respect to some non-Lifeline ETC obligations. See Order, *Federal-State Joint Board on Universal Service, Tracfone Wireless, Inc.*, 23 FCC Rcd 6206 (2008).

wider range of providers will expand the scope of the Lifeline program and promote wider adoption of service by eligible consumers. The Commission should commence a rulemaking as soon as possible to determine how the broadband Lifeline and Link-Up programs should be structured, and it should use the affordability data described above to assist in that endeavor.

While an enhanced Link-Up program might help defray the costs of initiating broadband service, the Commission must remain cognizant that some Americans may also lack the resources to purchase computers or other devices that are necessary for the use of broadband service.¹³⁰ A broadband Link-Up program might not address this issue because Link-Up generally focuses on the provider's charges for installing service, not the consumer's purchase of customer premises equipment (CPE) (e.g., a modem) or computer hardware.¹³¹ And in any event, not all service providers are in a position to supply equipment to end users as a condition of receiving support.¹³²

Instead, the federal government and state and local agencies should provide funding and additional support to programs that supply low-income households with the equipment they need to access the Internet. For example, programs such as Connected Nation's "No Child Left Offline Program" bring together public and private entities to help "children and their families join the Information Age. . . . by placing computers in the hands of disadvantaged populations so

¹³⁰ See, e.g., Arik Hesseldahl, Business Week, *Bringing Broadband to the Urban Poor* (Dec. 31, 2008), available at http://www.businessweek.com/technology/content/dec2008/tc20081230_015542.htm?chan=technology_technology+index+page_top+stories; *Pew Online Opportunities Report* at 2; *Forrester Consulting Report* at 20.

¹³¹ See, e.g., Universal Service Administrative Company, *What is Link Up Support?*, <http://www.lifelinesupport.org/li/low-income/benefits/linkup.aspx>; 47 C.F.R. § 54.411(a)(3). But see *IC/USF NPRM* at Appx. A ¶ 81 (proposing that, for purposes of the broadband pilot program, support be provided for "50 percent of the cost of broadband Internet access service installation, including a broadband Internet access device, up to a total amount of \$100").

¹³² See *AT&T IC/USF Comments* at 52-53.

that they have access to abundant technological resources.”¹³³ In Kentucky, the program has delivered approximately 2,000 Internet-ready computers throughout the state to people with lower incomes.¹³⁴ Similarly, One Economy Corporation, a global non-profit organization that uses innovative approaches to deliver broadband technology and information to low-income households, partnered with AT&T and the city of San Francisco to bring free Wi-Fi service, low-cost computers, free training, and other support to over 2,200 residents in the Sunnydale Housing development.¹³⁵ The Plan should encourage such private-public partnerships, which greatly facilitate adoption of broadband by consumers with lower incomes.¹³⁶

4. The Disability Community

The Plan should promote private and government-supported efforts to ensure that people with disabilities can access broadband services. As Congress made clear when it directed the Commission to develop a National Broadband Plan to ensure access for “all Americans,” people with disabilities should have the same opportunities to benefit from new and innovative communications technologies as other Americans. Indeed, access to such technologies is even *more* important for people with disabilities because broadband services stand to offer powerful

¹³³ Connected Nation, *Every Child Online* (2008), available at http://www.connectednation.org/community_programs/.

¹³⁴ *Id.*

¹³⁵ See, e.g., Press Release, *Mayor Newsom Announces Expansion of San Francisco’s Free Wi-Fi Network* (Jan. 15, 2009), available at http://www.sfgov.org/site/mayor_index.asp?id=96789.

¹³⁶ The Plan should also encourage lawmakers to facilitate broadband adoption by consumers who have declared bankruptcy or who receive public assistance. These individuals often face a significant impediment to adopting or maintaining broadband service, because such service is effectively deemed an “unnecessary” household expense in the context of the relevant bankruptcy or assistance program. There may be program penalties and restrictions if the consumer expends household funds on broadband. The Plan should encourage reform of public assistance and bankruptcy frameworks to recognize basic broadband access as a “necessary” expense, just like telephone service and utility services (e.g., electric, water).

resources that could be particularly valuable to these Americans. As the Commission has recognized, “Persons with disabilities can benefit, perhaps more than any other group of Americans, from advanced services. Advanced services can bring this population significant educational, employment, and recreational opportunities.”¹³⁷ For example, for those with mobility or sensory disabilities, a broadband connection can open the door to rich educational opportunities, employment options, government resources, news, entertainment, and shopping that might otherwise be cumbersome or out of reach. Real-time broadband-based communications that can support video conferencing, IP captioning, or video or text-based IP relay services can assist individuals with hearing and speech disabilities, providing both social benefits and a more level playing field in terms of participation in the workplace and professional activities.¹³⁸ Internet access also opens up a world of self-help, medical support, and social networking that can be life-changing for those who might otherwise be isolated.¹³⁹

Nevertheless, the evidence suggests that people with disabilities are far *less* likely to use the Internet than other Americans. The Commission has identified persons with disabilities as

¹³⁷ Second Report, *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996*, 15 FCC Rcd 20913, 21000 ¶ 234 (2000) (“*Second Advanced Services Report*”).

¹³⁸ See, e.g., *id.*; Fifth Report, *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996*, 23 FCC Rcd 9615, 9643, 9647 ¶¶ 57, 66 (2008) (“*Fifth Section 706 Report*”).

¹³⁹ See Kerry Dobransky & Eszter Hargittai, *The Disability Divide in Internet Access and Use*, 9 Info. Comm. & Soc’y 313, 315 (June 2006), available at <http://www.eszter.com/research/pubs/dobransky-hargittai-disabilitydivide.pdf> (“*Disability Digital Divide*”) (noting that “people with disabilities are able to obtain more and better information” about their conditions online, resulting in “improve[d] health outcomes”); *id.* (discussing self-help groups that “mimic many of the social support and therapeutic processes of offline self-help and social work groups” without requiring disabled individuals to leave their homes).

“particularly vulnerable to not having access to advanced services.”¹⁴⁰ Data from a large-scale survey by the U.S. Bureau of Labor Statistics and the Census Bureau reveal that only 26.4 percent of American adults with disabilities use the Internet at home, compared to 54.4 percent of those without disabilities.¹⁴¹ Some of this disparity may be attributable to affordability issues, because a high percentage of people with disabilities are either unemployed or have reduced incomes.¹⁴² In addition, hardware, software, applications, user interfaces, and content on the Internet frequently are not designed to be usable by many people with disabilities. Even where hardware or software exists that is specially designed to overcome these barriers, such technology solutions can cost thousands of dollars—and the people who most need them may not be aware that those options are available.¹⁴³ Indeed, as is the case with other vulnerable populations, limited computer training and reduced levels of higher education among people

¹⁴⁰ *Second Advanced Services Report*, 15 FCC Rcd at 20918 ¶ 8; *see also id.* at 21000 ¶ 234 (“There appears no doubt, however, that persons with disabilities do not have as much access to advanced services as fully abled persons.”).

¹⁴¹ *Disability Digital Divide* at 319, 324.

¹⁴² In February 2009, the official unemployment rate for persons with disabilities was 14 percent, compared to 8.7 percent for persons without disabilities. Bureau of Labor Statistics, *Employment status and disability status*, at tbl. 1 (May 8, 2009), available at http://www.bls.gov/cps/cpsdisability_032009.htm. But because those statistics do not take into account individuals who have not had work for eleven consecutive months, the actual unemployment rate for persons with disabilities is likely much higher. *See* Cornell University, *Disability Statistics: Online Resource for U.S. Disability Statistics*, <http://www.ilr.cornell.edu/edi/disabilitystatistics/> (perform search under American Community Survey) (estimating unemployment rate of 63 percent in 2007). Similarly, the poverty rate for working-aged people with disabilities is 24.7 percent, compared to 9 percent for people without disabilities. William Erickson & Camille Lee, Cornell University, *2007 Disability Status Report: United States*, at 3, 34 (2008), available at <http://digitalcommons.ilr.cornell.edu/cgi/viewcontent.cgi?article=1256&context=edicollect> (“*Disability Status Report*”).

¹⁴³ *Disability Digital Divide* at 317.

with disabilities are factors contributing to the low adoption rates for this population.¹⁴⁴ Public facilities such as libraries, schools, and community centers may not have assistive technologies available or may not have staff members who are able to train others to use these technologies. And for some individuals with disabilities, assistive technologies may need to be customized for an individual user. Finally, the scope of this problem may increase over time, since disability rates tend to increase significantly with age.¹⁴⁵

The Plan should address these issues in several ways. First, it should emphasize the importance of government at all levels ensuring accessibility of *governmental* online services and content.¹⁴⁶ For instance, online government services should comply with universal design principles so that functionality does not rely exclusively on sight—for example, incorporating alternatives to touch screens, icons, and text. Online government services and content also should be offered in a mode that is compatible with adaptive equipment and software commonly used by people with disabilities.¹⁴⁷ For example, website designs should be capable of being interpreted by screen-reader programs.¹⁴⁸ Government should also take the unique requirements

¹⁴⁴ See *Second Advanced Services Report*, 15 FCC Rcd at 21000 ¶ 234 (citing lack of computer training as “among the reasons for this lack of access”). In 2007, the percentage of working-aged individuals with disabilities having only a high-school diploma or equivalent was 35.3 percent, compared to 28.1 percent for people without disabilities. *Disability Status Report* at 3, 38.

¹⁴⁵ *Disability Status Report* at 3, 8-9, 14-17 (describing differences in disability rates among age groups).

¹⁴⁶ This approach is consistent with existing law. A 1998 amendment to Section 508 of the Workforce Rehabilitation Act requires federal agencies to make their electronic and information technology accessible to workers and members of the public who are disabled. 29 U.S.C. § 794d.

¹⁴⁷ See *Disability Digital Divide* at 316-17.

¹⁴⁸ A number of entities are working to develop web accessibility standards. One such initiative can be found at <http://www.w3.org/WAI/>, the official site for the World Wide Web Consortium’s (W3C) Web Accessibility Initiative.

of this community into account in crafting support programs for individuals with low incomes and in crafting programs to promote broadband adoption more generally; those with disabilities may need support for different services and devices than those without disabilities.¹⁴⁹

The Plan should also include an assessment of the need to modernize current accessibility statutes to promote the accessibility of new communication services to people with disabilities.¹⁵⁰ And the Plan should encourage government to explore grants and research development tax credits to promote development of broadband products and services that are accessible by people with disabilities.

Finally, user-focused data-collection efforts concerning broadband deployment and adoption must include a specific focus on the extent to which people with disabilities are served and/or make use of broadband services. Acting Chairman Copps has suggested that there also may be a specific need to focus on whether the needs of people with disabilities in *rural* areas are being met.¹⁵¹ In any event, the Census Bureau and other survey efforts we discuss above¹⁵² should focus on producing more data concerning the particular barriers to broadband subscribership that Americans with disabilities face wherever they live, and which applications and services are most likely to be adopted by people with disabilities (*e.g.*, video telephony for people who are deaf). A better understanding of these factors will allow both the government and the private sector to develop more effective strategies for promoting broadband adoption by Americans with disabilities.

¹⁴⁹ See, *e.g.*, *Notice* ¶ 54 n.80.

¹⁵⁰ 47 U.S.C. §§ 225, 255.

¹⁵¹ See, *e.g.*, *Rural Broadband Report* ¶¶ 13, 22, 28-29, 67.

¹⁵² See Part III, *supra* (discussing means of measuring the availability, affordability, and usability of broadband services).

5. Privacy

To achieve the Congressional goal of “maximum utilization” of broadband networks and services, consumers must feel confident that their personal and private data will remain safe and secure when they go online. As we live greater portions of our everyday lives online—banking and shopping, accessing electronic health records, engaging in job training and education—we produce, share, and store unprecedented amounts of electronic data, making online privacy increasingly important. AT&T’s work with its customers has shown that Internet users clearly understand and accept that information will be collected in commercial relationships, and that the information will be used to offer goods and services that are of value to them. But as a general industry matter, consumers need more information about what data are collected, how personal information is used and shared, and how it is protected. Uncertainty about these issues can be a significant barrier to further adoption and use of the Internet. One recent study estimated that online retailers lost *\$21 billion* in 2008 due to consumers’ security and privacy fears.¹⁵³

Privacy and data security must therefore play a central role in the Broadband Plan’s consumer-focused, demand-side framework. The Plan should stress that maximum utilization of online services will depend on *all* stakeholders in the Internet ecosystem addressing these issues—search engines, application providers, network providers, advertisers, publishers, email providers, and others. As we have seen in the past, the nature of privacy and security concerns will continue to evolve with changes in technology and business models, making it critical that

¹⁵³ Javelin Strategy & Research, Press Release, *Survey Finds Retailers Missed Out on \$21 Billion in Sales in 2008 Due to Online Shopping Fears* (Mar. 17, 2009), available at <http://www.javelinstrategy.com/2009/03/17/survey-finds-retailers-missed-out-on-21-billion-in-sales-in-2008-due-to-online-shopping-fears/>. This survey of more than 2,000 American consumers also found that 39 percent believe that online stores will sell their information, and 50 percent believe that they will receive junk mail and spam if they shop online. *Id.*

all stakeholders be engaged in an effort to protect and educate consumers about privacy issues. Already, a wide variety of privacy issues have surfaced—ranging from the collection, retention, and use of search-query data;¹⁵⁴ the security of “cloud computing” applications;¹⁵⁵ and the data-collection practices of website advertising networks and their partners.¹⁵⁶

While the Plan should promote industry-wide progress on privacy and data security, it need not reinvent the wheel. The Plan should instead endorse the considerable work that the Federal Trade Commission has done in addressing online privacy issues generally, including those related to advertising, through a largely self-regulatory model. In its recently-revised Staff Report on online targeted advertising practices, the FTC reaffirmed its support for self-regulation as the best way to “address evolving online business models,” but at the same time sought to “guide industry in developing more meaningful and effective” models to ensure the safety and security of consumers navigating ad-supported Internet content.¹⁵⁷ To that end, the FTC urged businesses to honor four principles: (1) transparency and consumer control, (2) security and

¹⁵⁴ See, e.g., Miguel Helft, New York Times, *Yahoo Limits Retention of Search Data* (Dec. 17, 2008), available at <http://www.nytimes.com/2008/12/18/technology/internet/18yahoo.html?em> (discussing pressure on other search-engine providers to match Yahoo!’s announcement of a 90-day retention period for user search data); FTC Staff Report, *Self-Regulatory Principles for Online Behavioral Advertising*, at 23 n.51 (Feb. 2009), available at <http://www.ftc.gov/os/2009/02/P085400behavadreport.pdf> (“*FTC Staff Report*”) (discussing 2006 AOL user-search data breach).

¹⁵⁵ See Jessica E. Vascellaro, Wall Street Journal, *Google Discloses Privacy Glitch* (Mar. 8, 2009), available at <http://blogs.wsj.com/digits/2009/03/08/1214>; Electronic Privacy Information Center, *In re Google and Cloud Computing* (Mar. 27, 2009), available at <http://epic.org/privacy/cloudcomputing/google/> (discussing FTC complaint against Google filed by EPIC).

¹⁵⁶ See *FTC Staff Report* at i-ii (discussing privacy concerns relating to behavioral advertising).

¹⁵⁷ *Id.* at 11.

limited retention, (3) affirmative express consent for new uses of data, and (4) affirmative express consent for collection of “sensitive” data, such as financial information.¹⁵⁸

This approach already has borne fruit. The Network Advertising Initiative, a cooperative of online advertising networks, has issued *binding* member rules governing notice and choice for consumers and retention and security of consumer data.¹⁵⁹ Heeding the FTC’s call for more research into consumer understanding of online privacy practices, the non-profit Future of Privacy Forum has announced a major research initiative exploring different methods of communicating with consumers in the hopes of improving awareness and understanding of how information is used online.¹⁶⁰ Individual companies also are making changes to better engage consumers and improve transparency and control. For example, AT&T has embraced the FTC’s approach and has adopted four core principles to guide its approach to online privacy and advertising. As AT&T recently explained to Congress,¹⁶¹ it will ensure:

¹⁵⁸ *Id.* at 45-47. While the Staff Report is non-binding, the FTC made clear that it may investigate non-compliant industry practices to determine if they are “unfair or deceptive” and thus a violation of the FTC Act. *See id.* at 48 (citing 15 U.S.C. § 45).

¹⁵⁹ Network Advertising Initiative, *The NAI Releases the Updated 2008 NAI Principles*, http://www.networkadvertising.org/networks/principles_comments.asp. In addition, the Interactive Advertising Bureau, a trade group whose members are responsible for selling 86 percent of all online advertising in the United States, has partnered with the Direct Marketing Association, Better Business Bureau, and other advertising groups to develop a “cross sector set of privacy principles for online behavioral advertising in order to respond to the challenge issued [by the FTC] for comprehensive industry self regulation.” Interactive Advertising Bureau, Press Release, *Key Advertising Groups Committed to Strong Industry Self-Regulation and the Development of Privacy Guidelines for Online Behavioral Advertising Data Use and Collection* (Feb. 12, 2009), available at http://www.iab.net/about_the_iab/recent_press_releases/press_release_archive/press_release/pr-021209.

¹⁶⁰ Future of Privacy Forum, Press Release, *Future of Privacy Forum Announces Research Initiative To Develop Effective Messages to Communicate with Users about Online Data Use* (May 2009).

¹⁶¹ *See Communications Networks and Consumer Privacy: Hearing Before the Subcomm. on Communications, Technology, and the Internet of the H. Comm. on Energy and Commerce,*

- **Transparency.** Consumers must have full and complete notice of what information will be collected, how it will be used, and how it will be protected.
- **Consumer Control.** Consumers must have easily understood tools that will allow them to exercise meaningful consent. *AT&T will not use consumer information for online behavioral advertising without an affirmative, advance action by the consumer* that is based on a clear explanation of how the consumer’s action will affect the use of her information.
- **Privacy Protection.** The privacy of consumers and their personal information will be vigorously protected, and AT&T will deploy technology to guard against unauthorized access to personally-identifiable information.
- **Consumer Value.** Behavioral advertising programs should be designed to increase consumer value, both by offering more relevant online advertisements and by allowing users to more fully customize and differentiate their Internet experience.

AT&T thus pledges strong protection for consumer privacy, particularly in the context of any future behavioral advertising programs.

In short, the industry is already at work to reinforce and improve consumer privacy through increased transparency and control—and these efforts promise to make a significant contribution to the advancement of broadband use and adoption. The National Broadband Plan thus should embrace and encourage the work that the FTC and the industry are doing, and it should encourage industry-wide commitment to practices that will enhance consumer privacy and increase consumers’ understanding about and control over use of their personal data.¹⁶²

111th Cong., at 4-5 (2009) (statement of Dorothy Attwood, Senior Vice President, Public Policy, and Chief Privacy Officer of AT&T Inc.), *available at* http://energycommerce.house.gov/Press_111/20090423/testimony_attwood.pdf.

¹⁶² Relatedly, the Plan should reject the notion raised in the *Notice* to focus particularly on Deep Packet Inspection (“DPI”). *See Notice* ¶ 59. DPI is a *technology*, not a practice. The focus of government and industry efforts should be on establishing acceptable *practices* with regard to consumer privacy, not mandating or restricting the *technology* providers use. That is particularly the case with DPI, which has many beneficial network uses utterly unrelated to consumer privacy concerns. Even Free Press concedes that “DPI technology itself need not be anti-consumer if it is used to resolve congestion or security problems.” M. Chris Riley & Ben Scott, Free Press, *Deep Packet Inspection: The End of the Internet As We Know It?* at 10 (Mar.

6. E-Government

In addition to adopting pro-broadband policies and using broadband to solve some of this country's most pressing problems, the government can reduce barriers to adoption and increase incentives to use broadband services by participating in the broadband marketplace as both a consumer of broadband services and as a provider of broadband-enabled services, applications, and content to the public.

First, in its role as a *consumer* of broadband services, government can turn public buildings—hospitals, libraries, schools, community colleges, public-safety organizations, community centers, and even governmental agencies—into broadband “anchor institutions” that bring high-speed Internet closer to targeted populations.¹⁶³ Providing connectivity to institutions accessible to the public, such as libraries or community centers, may in many cases be the fastest means of overcoming barriers that have prevented some people from accessing broadband services.¹⁶⁴ Moreover, the underlying broadband infrastructure necessary to bring broadband services to large, centrally-located government buildings can often be leveraged to support further broadband deployment to neighboring unserved or underserved areas, thereby increasing the efficiency and lowering the cost of deployment in those areas. As we have discussed, the

2009), available at http://www.freepress.net/files/Deep_Packet_Inspection_The_End_of_the_Internet_As_We_Know_It.pdf (“*Free Press DPI Report*”); see also *id.* at 3 (“DPI devices were used for manual troubleshooting of network problems and to block viruses, worms and Denial of Service attacks.”).

¹⁶³ See *Rural Broadband Report* ¶ 111 (“Entities that can function as anchor tenants with adequate demand to both spur broadband infrastructure investment and ensure sustainability can function as an integral part of a rural broadband strategy.”).

¹⁶⁴ See *id.* ¶ 110 (“Rural libraries can also function as public computing centers, providing broadband Internet access to patrons, which in turn can help stimulate further demand for consumer broadband services.”). Improving Internet service at public institutions also improves the efficiency and usefulness of the institutions themselves, enabling them to better serve the educational, health-care, and job-training needs of vulnerable populations.

Broadband Plan will be most effective where it leverages market-based incentives like these to encourage network expansion.

Second, government can spur broadband adoption by becoming a more robust *provider* of broadband-enabled services, applications, and content. Expanding the range and quality of online government services can increase civic participation and government efficiency, while also significantly affecting consumer perceptions of the value of broadband access. Many, though not all, government agencies have created websites that make valuable civic information available online, including laws and regulations, property records, and police reports and crime statistics. Many also offer online services, such as the ability to apply for and renew a variety of government-issued licenses and the ability to submit tax payments.

Agencies at all levels of government should offer these “basic” services and information to the public, but there is more that can be done. As the Brookings Institution recommends, state and federal agencies need to invest more resources into their web presences, including expansion of available content, increased interactive features and online services, robust search tools, and improved consistency and design.¹⁶⁵ Some innovative government websites already include podcasts, streaming video, RSS feeds, foreign-language support, and online tutorials.¹⁶⁶ Other jurisdictions are working to improve access to health-care information. For instance, Wyoming’s online portal allows residents to “chat online with health-care providers” and Minnesota allows users to compare prescription drug prices.¹⁶⁷

¹⁶⁵ Darrell M. West, Brookings Governance Studies, *State and Federal Electronic Government in the United States, 2008*, at 8, http://www.brookings.edu/~l/media/Files/rc/reports/2008/0826_egovernment_west/0826_egovernment_west.pdf.

¹⁶⁶ *See id.* at 3.

¹⁶⁷ *See id.*

Allowing citizens to access government services online can be especially beneficial for certain populations that may have difficulty accessing those same services in the physical world: Elderly citizens, persons with mobility-related disabilities, and citizens in far-flung rural areas all could reduce their travel burdens through online access to government services. Furthermore, moving government online will further stimulate the virtuous cycle of investment in and adoption of broadband services. Robust availability of public information and services online can be leveraged by private actors to offer creative and efficient tools, such as real-time applications for mass-transit riders, applications that show parking availability or traffic flow, or maps of underground utility hazards to assist the construction industry—all of which further increase adoption incentives.¹⁶⁸ The National Broadband Plan accordingly should encourage federal, state, and local governments to redouble their efforts across the board to invest in and expand e-government offerings.

7. Public Safety and Homeland Security

The Recovery Act directs that the Plan provide a coordinated strategy for the use of broadband to advance public safety and homeland security in the United States.¹⁶⁹ This is a critical imperative. Efforts to utilize broadband for those purposes are still preliminary and fragmented. Yet it is clear that broadband can vastly improve the ability of the public-safety and homeland-security communities to detect threats and respond to emergencies. In the wake of the

¹⁶⁸ Daniel Castro & Robert Atkinson, StateTech, *The Next Wave of E-Government* (Feb. 2, 2009), available at <http://statetechmag.com/events/updates/the-next-wave-of-e-government.html>. The federal government recently has made greater strides in this area with the introduction of Data.gov, which will allow members of the public to search large government data sets. Mary Hayes Weier, InformationWeek, *Federal Government Launches Data.Gov* (May 21, 2009), available at http://www.informationweek.com/news/government/federal/showArticle.jhtml?articleID=217600488&cid=RSSfeed_IWK_All.

¹⁶⁹ Recovery Act, § 6001(k)(2)(D); *id.* § 6001(b)(4), (g)(5).

collapse of the Interstate 35W Bridge in Minneapolis, for example, local officials relied on Wi-Fi to support voice communications for the public and for first responders, to share maps and visual images of the disaster, and to support relief and traffic-rerouting efforts.¹⁷⁰ First responders in Oregon are using laptops enabled with wireless broadband around the site of a chemical plant to monitor the plant's emissions.¹⁷¹ Not only does this community's innovative use of broadband support an early-warning system, but it also provides access to maps, traffic, and weather information online if there is a need for safety officials to oversee an emergency evacuation. More generally, broadband, IP-based systems can help tie together various first responder groups, facilitate sharing of and immediate access to information, and allow remote, real-time monitoring from sensors and high-quality video cameras.

To enhance and expand these successful yet patchy uses of broadband so that *all* public-safety and homeland-security professionals and the communities they serve can benefit, a government-wide effort will be needed that includes Congress, the Department of Homeland Security, the Commission, other federal and state agencies, and, of course, the first responders themselves. The Plan should make such government-wide efforts a priority. While there are many measures and technological innovations that will be needed to support broadband public-safety services, we focus our discussion here on two tasks that should be at the top of policymakers' to-do lists: (1) providing a dedicated wireless broadband network to the public-safety community, and (2) ensuring that broadband networks can adequately deliver necessary services during a pandemic.

¹⁷⁰ Benton Foundation, *An Action Plan for America: Using Technology and Innovation to Address Our Nation's Critical Challenges*, http://www.benton.org/initiatives/broadband_benefits/action_plan/public_safety_and_homeland_security.

¹⁷¹ *Id.*; see also Nicholas Kristof, New York Times, *When Pigs Wi-Fi* (Aug. 7, 2005), available at <http://www.nytimes.com/2005/08/07/opinion/07kristof.html>.

a. The Plan Should Establish a Dedicated, Interoperable 700 MHz Wireless Network for the Public-Safety Community

As the *Notice* acknowledges,¹⁷² and as the examples discussed above indicate, mobile broadband provides an enormously important resource for public-safety providers. Indeed, more than four years ago, the 9/11 Commission recommended that Congress “increase[] assignment of radio spectrum for public safety purposes.”¹⁷³ The Commission has sought to advance those goals by auctioning the 700 MHz “D Block” to a commercial entity for use in a private-public network dedicated to both commercial and public-safety uses.¹⁷⁴ But the first attempt to auction that spectrum failed because the Commission’s plan for development of that spectrum was economically untenable, and controversy and regulatory uncertainty about the ultimate disposition of the D Block have stalled public-safety broadband efforts.

The Commission should now rectify its initial mistake by rejecting the notion—once and for all—that the D Block should be auctioned to a commercial entity.¹⁷⁵ Instead, the Broadband Plan should advocate a new approach that will more effectively and quickly advance the goal of

¹⁷² *Notice* ¶ 75.

¹⁷³ The National Commission on Terrorist Attacks Upon the United States, *The 9/11 Commission Report*, at 397 (July 2004), available at <http://govinfo.library.unt.edu/911/report/911Report.pdf>.

¹⁷⁴ See Third Further Notice of Proposed Rulemaking, *Service Rules for the 698-746, 747-762 and 777-792 MHz Bands; Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band*, 23 FCC Rcd 14301 (2008) (“Third Further Notice”).

¹⁷⁵ It is unclear whether commercial operators could even be convinced to bid in a new auction, and public-safety representatives appear almost unanimous in their opposition to a re-auction. Indeed, many have indicated their strong opposition to a shared network. See, e.g., Comments of Public Safety Officials and CIO Task Force on Wireless Spectrum Allocation, *Service Rules for the 698-746, 747-762 and 777-792 MHz Bands*, WT Docket No. 06-150, at 1-2 (filed Oct. 29, 2008); Comments of San Francisco/Oakland, WT Docket No. 06-150, at 17-18 (filed Nov. 3, 2008); Comments of Miami-Dade County, WT Docket No. 06-150 (filed Nov. 3, 2008); NYPD Comments, WT Docket No. 06-150 and PS Docket No. 06-229, at 4, 6 (filed Nov. 3, 2008).

a national, interoperable wireless public-safety network. Specifically, AT&T recommends that the D Block spectrum be allocated *entirely* to public safety, with public-safety entities partnering at the local or regional level with commercial operators to construct broadband public-safety networks based on national, interoperable standards. The Plan should recommend the following:

- The D Block would be repurposed as public-safety spectrum, providing a total of 20 MHz of contiguous spectrum for public-safety broadband use.¹⁷⁶
- Congress would allow the public-safety community to use new or existing grant programs to fund the purchase of fully-dedicated “radio access network” (RAN) equipment and managed broadband services.
- Public-safety entities would use standard “request for proposal” (RFP) processes to determine capital and operational expense projections, select the network management model that best meets their needs, and apply for grants from the federal program.
- The Commission would establish minimum network standards to ensure interoperability, and condition the grant of 20 MHz broadband licenses to local or regional public-safety applicants on timely construction of a network and compliance with the national interoperability standards.¹⁷⁷

¹⁷⁶ Ten MHz of spectrum, adjacent to the D Block, have already been allocated to public safety. See *Third Further Notice*, 23 FCC Rcd at 14307-08 ¶¶ 17-19.

¹⁷⁷ These specifications should permit the use of Long Term Evolution (“LTE”) technology, which is widely recognized as the most advanced and spectrum-efficient technology for the foreseeable future. According to 3G Americas, the following U.S. operators have committed to LTE: Alltel, AT&T Mobility, CenturyTel, Cox Communications, Leap Wireless Cricket Communications, Metro PCS, T-Mobile, US Cellular, and Verizon Wireless. See 3G Americas, *LTE Commitments* (May 2009), <http://www.3gamericas.org/documents/LTE%20Commitments%20May%202009.pdf>; see also 3G Americas, Press Release, *555 Million Subscriptions for GSM Technologies in the Americas at End of First Quarter 2009* (May 20, 2009), <http://www.3gamericas.org/index.cfm?fuseaction=pressreleasedisplay&pressreleaseid=2234> (noting that more than 120 wireless operators worldwide have announced plans to pursue LTE). Given the broad support for LTE among wireless providers, use of LTE in public-safety networks will ensure interoperability with commercial networks and compatibility with future network deployments, while also enabling public-safety users to benefit from global economies of scale. Accordingly, proposals to use technology other than LTE in a public-safety network would raise significant questions about the degree to which the interoperability requirements the Commission adopts can be satisfied.

- Based on the RFPs, public-safety entities would negotiate agreements with commercial operators, system integrators, infrastructure vendors, and/or tower-site vendors for network equipment and systems based on their preferred network management model.
- Each public-safety entity would enter into a spectrum-manager lease with the selected commercial operator to enable the connection of its dedicated 700 MHz public-safety RAN equipment to the operator’s core networks, giving the provider access to provisioning, billing, and other IT systems to support the public-safety services.

This approach has many benefits over the prior “shared network” approach considered for D block deployment. It would avoid the need for priority access mechanisms and the uncertainty of relying on shared resources. It would allow individual public-safety entities to work with commercial operators to develop *localized* network design and features that best serve their particular region or local area, consistent with national interoperability standards. And it would save billions of dollars by leveraging economies of scale and investments already made by commercial operators. For example, some have estimated that a nationwide network deployed through the leveraged-model approach would have an initial cost of \$13 billion and a 10-year total cost of \$35 billion—a savings of \$26 billion over the estimated 10-year cost of a stand-alone public-safety broadband network.¹⁷⁸ Moreover, such an approach would avoid years of delay by leveraging the existing facilities and operations of experienced commercial operators rather than constructing a nationwide network from scratch.

To be sure, this plan requires a legislative amendment to the auction requirement applicable to the D Block.¹⁷⁹ The National Broadband Plan should recommend such an

¹⁷⁸ See Letter from John T. Scott III, Verizon Wireless, to Marlene H. Dortch, Secretary, FCC, PS Docket No. 06-229, Appx. 2 at 4 (filed Apr. 4, 2007), *available at* http://fjallfoss.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6519107918.

¹⁷⁹ See 47 U.S.C. § 337(a)(2).

amendment, and Congress should act expeditiously to implement that recommendation in order to make good on the long-delayed promise to public safety.¹⁸⁰

b. To Ensure That Broadband Remains Available During a Pandemic, the Plan Must Give Providers Flexibility to Actively Manage Networks

Broadband is a critical tool in the nation's readiness to respond to a pandemic virus or bioterrorism attack. It could help first responders and health-care providers stay in touch, assist the government in broadly disseminating information to the public, and help citizens confined to their homes stay in touch with their workplaces and one another. But as the *Notice* recognizes,¹⁸¹ this type of widespread threat also could present unique challenges for broadband availability given the likely shift in usage patterns that would occur. This is an issue of vital national importance, and the outbreak of the H1N1 influenza, or swine flu, dramatically illustrates that point. The National Broadband Plan should encourage the Department of Homeland Security, the National Communications System, the Commission, and other agencies to continue developing and refining their emergency plans for such situations—and the Plan must ensure in particular that broadband providers have the tools they need to do their part to respond to such crises.

A flu pandemic or other emergency that keeps many people in their homes could radically alter network traffic patterns. It would greatly increase the number of workers and students forced to stay home due to closed businesses and schools.¹⁸² Many displaced workers

¹⁸⁰ See Comments of AT&T, *Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band*, WT Docket No. 06-150, at 8-9 (filed June 20, 2008).

¹⁸¹ *Notice* ¶ 79.

¹⁸² Department of Homeland Security, *Pandemic Influenza Impact on Communications Networks Study*, at 4-1 (Dec. 2007) (unclassified version), available at <http://www.aba.com/>

would turn to the Internet for connectivity to their offices, and that connectivity would be essential to keep the national economy functioning. Similarly, students would rely on the Internet for connectivity to their schools to continue their educations remotely until the pandemic subsided. And, even more so than they do today, both groups would look to the Internet for recreational activities while confined to their homes.

Daytime network traffic would accordingly shift quite rapidly from commercial areas to residential ones, and lead to substantially heavier-than-normal peak usage in those areas. The network congestion that would likely result from such a dramatic shift in usage patterns would impair the online experience of all users, and could particularly degrade latency-sensitive applications like streaming video or VoIP, as well as Virtual Private Networks (VPNs), which depend on reliable, uninterrupted connectivity. The Department of Homeland Security estimates that a pandemic that leads to a worker absentee rate over 40 percent would render connectivity so impaired as to be unusable for telecommuting.¹⁸³ And these same problems could cause alarming failures in the systems that support first responders, health-care providers, and other public-sector entities whose missions are vital to addressing any pandemic and maintaining a stable government.

To address such radical shifts in network usage during pandemics or similar nationwide emergencies, network operators must have robust network management tools at their disposal. By effectively managing congestion, operators can minimize the inevitable network disruptions that would otherwise impair critical communications and exacerbate the economic impact of the crisis. To do so, providers must have the flexibility to invest in and utilize “smarter” networks

NR/rdonlyres/668AC437-7CEF-4B55-92F7-79BC1AB870B4/50864/PandemicCommsImpact StudyDecember20072.pdf (“*DHS Pandemic Study*”).

¹⁸³ *Id.* at iii.

that can differentiate between various types of traffic to ensure that the most vital communications get through. For example, few would dispute that, during such an emergency, a doctor’s home Internet connection to the hospital where she works should receive priority over her neighbor’s web surfing session when network congestion arises—even if that means the neighbor waits a bit longer for web pages to load.¹⁸⁴ The Department of Homeland Security agrees and recommends the building of sophisticated “Next Generation Network Priority Services” into broadband networks.¹⁸⁵

Thus, the National Broadband Plan should affirm the importance of allowing network operators the flexibility to develop and employ the smart network management tools they will need to meet such challenges—and to serve the needs of their public-safety customers and the public at large. Among other things, the Plan should make clear that policymakers will not allow ancillary debates about “net neutrality” and theoretical concerns about potential market developments to eclipse the importance of enabling investment in and use of robust network management capabilities to meet critical public-safety needs.

8. Energy Efficiency and Independence

As President Obama has made clear, energy efficiency, energy independence, and reducing carbon emissions are not just environmental causes but are necessary for national

¹⁸⁴ This scenario exemplifies the recklessness of “dumb pipe” proposals like that of Free Press, which would forbid *any* prioritization of Internet traffic under *any* circumstances. See S. Derek Turner, Free Press, *Dismantling Digital Deregulation: Toward a National Broadband Strategy*, at 76 (May 11, 2009), available at http://www.freepress.net/files/Dismantling_Digital_Deregulation.pdf (“*Dismantling Digital Deregulation*”) (“No Internet packets should be given priority over others—whether the priority comes in the form of access, latency or bandwidth.”). See Section IV.B.4, *infra*.

¹⁸⁵ *DHS Pandemic Study* at ii.

security and economic stability.¹⁸⁶ The Recovery Act reflects this same understanding and directs the Commission to develop a strategy for promoting the use of broadband networks and services to advance the cause of “energy independence and efficiency.”¹⁸⁷

The foundation for that strategy has already been laid by groups such as the Global e-Sustainability Initiative (GeSI). Created in 2001 by a group of network providers, equipment makers, and members of the environmental community, GeSI’s mission is to further sustainable development in the communications industry.¹⁸⁸ GeSI recently published a report detailing how broadband networks and technology can help the United States lower its annual CO₂ emissions by *13 to 22 percent* by 2020.¹⁸⁹ AT&T, together with leading communications, equipment, software, and other high-tech companies, participated in the creation of this report, which explains how Information and Communication Technology (ICT) can revolutionize energy consumption and management in four major areas:

- A **smart electric grid** built on better information and communication could reduce CO₂ emissions by 230–480 million metric tons (MMT), and save \$15–35 billion in energy and fuel costs.
- More efficient **road transportation** could reduce travel time and congestion, eliminating 240–440 MMT of CO₂ emissions and saving \$65–115 billion.
- **Smart buildings** that consume less energy could abate 270-360 MMT of CO₂ and save \$40–50 billion.

¹⁸⁶ The White House, *Issues: Energy & Environment*, http://www.whitehouse.gov/issues/energy_and_environment/.

¹⁸⁷ Recovery Act, § 6001(k)(2)(D).

¹⁸⁸ Global e-Sustainability Initiative, *About GeSI*, http://www.gesi.org/index.php?article_id=5.

¹⁸⁹ Global e-Sustainability Initiative, *SMART 2020: Enabling the low carbon economy in the information age: United States Report Addendum* (2008), available at http://www.gesi.org//index.php?article_id=210&clang=0 (“*GeSI Report*”).

- **Travel substitution** through virtual meetings and flexible work arrangements (*e.g.*, telecommuting) could reduce CO₂ by 70–130 MMT and save \$20–40 billion.¹⁹⁰

As the GeSI Report describes, the technology to accomplish these savings already exists or is on pace to reach the marketplace soon. But the regulatory structures and policies necessary to permit these revolutionary changes are lagging behind. Accordingly, the report recommends that the President, Congress, and the relevant agencies (including the Commission and the Departments of Energy and Transportation): (1) recognize the importance of ICT in meeting the nation’s energy goals; (2) establish federal responsibility for data collection, efficiency standards and metrics, and best practices; (3) encourage ubiquitous broadband; and (4) create market-based mechanisms to reward energy efficiency and carbon reduction—including through monetization of carbon emissions.¹⁹¹ The report goes on to offer specific policy recommendations to further each of the four major energy-saving opportunities and explains how ICT can be leveraged in each area to achieve maximal energy savings.¹⁹²

The National Broadband Plan should endorse these proposals and encourage policymakers to begin transforming them into concrete initiatives. For example, the Departments of Energy and Transportation can redouble their efforts to leverage ICT in their own energy-efficiency plans.¹⁹³ And the Plan should recognize and look to the significant strides that the private sector already has made on its own. For its part, AT&T is working to bring ICT

¹⁹⁰ *Id.* at 6.

¹⁹¹ *Id.*

¹⁹² *See generally id.*

¹⁹³ FERC, for example, recently launched a proceeding to examine Smart Grid Policy in the United States, and AT&T offered several recommendations in that proceeding. *See* AT&T Comments, *Smart Grid Policy*, FERC Docket No. PL09-4 (urging FERC to “prioritize the development of interoperability and cybersecurity standards” for use in smart grids).

energy-efficiency solutions to the market in a variety of different industries.¹⁹⁴ AT&T is involved in projects that provide cost-effective and secure two-way wireless connectivity between “smart meters” and the electric utility grid infrastructure. We recently announced partnerships with Itron and SmartSynch to deliver smart-meter platforms that will help consumers better manage their electricity usage.¹⁹⁵ AT&T is bringing ICT to transportation as well, offering “Fleet Management” services to improve routing, scheduling, mileage, and reporting for business vehicles—all of which save money, time, and energy.¹⁹⁶ To improve the ability to telecommute and conduct remote meetings, AT&T offers businesses end-to-end, managed telepresence services that can save money and cut energy consumption.¹⁹⁷ In just one recent example, AT&T held a regional sales conference for 21 of its Asia Pacific customers via its Telepresence conferencing solution, rather than in person, and saved more than \$100,000 in travel costs, eliminated three to four days of meeting and travel time, and reduced carbon-dioxide

¹⁹⁴ Of course, AT&T also is working to reduce its own energy use and carbon footprint through a corporate focus on sustainability, as well as through specific initiatives, like the investment of up to \$565 million on alternative-fuel vehicles to replace AT&T’s current fleet. See AT&T, *Citizenship and Sustainability, Minimizing our Environmental Impact*, <http://www.att.com/gen/corporate-citizenship?pid=8506>; AT&T, Press Release, *AT&T to Deploy More Than 15,000 Alternative-Fuel Vehicles* (Mar. 11, 2009), <http://www.att.com/gen/press-room?pid=4800&cdvn=news&newsarticleid=26598>.

¹⁹⁵ AT&T, Press Release, *AT&T Powers AMI Platform from Itron* (Aug. 18, 2008), <http://www.att.com/gen/press-room?pid=4800&cdvn=news&newsarticleid=26020>; Michael Lee, Red Herring, *AT&T Jumps into Smart Grids* (Mar. 17, 2009), <http://www.redherring.com/Home/25925>. The first large-scale residential deployment of the technology is just getting underway in Texas, where 10,000 “SmartMeters” will allow the local utility to actively manage power distribution and allow customers to monitor and regulate their own power use via the Internet. *Id.*

¹⁹⁶ AT&T, *Fleet Management*, <http://www.wireless.att.com/businesscenter/business-programs/mid-large/cross-industry/fleet.jsp>.

¹⁹⁷ AT&T, *Telepresence Solution*, <http://www.business.att.com/enterprise/Service/unified-communications-enterprise/conferencing-services-enterprise/telepresence-enterprise/>.

emissions by the equivalent of more than 62 metric tons—all while providing meeting participants with a high-definition, interactive meeting experience.¹⁹⁸

These initiatives and services are just a start. The Plan should endorse investment by the private sector for similar projects, and should encourage support for such initiatives by all sectors of government.

9. Health Information Technologies

Widespread investment in health information technologies will advance two of the Recovery Act's goals: increased efficiency and efficacy of health-care systems, and “maximum utilization” of broadband to support the new health IT technologies. Congress has already set this process in motion with the Health Information Technology for Economic and Clinical Health (HITECH) Act, adopted as part of the Recovery Act,¹⁹⁹ which should help spur adoption of health IT. The National Broadband Plan can complement these efforts by encouraging the development and deployment of systems and services designed to support health-care providers, and by advocating rules that support health-care-provider use and procurement of such systems.

New and developing health IT offers enormous potential benefits for health-care providers, patients, and taxpayers. For instance, telemedicine—the provision of remote health services over telecommunications systems—enables specialists to serve rural communities more

¹⁹⁸ AT&T, Press Release, *AT&T Reduces Environmental Impact and Delivers Savings of More than US\$100,000 by Hosting Regional Customer Meeting Via Telepresence* (June 1, 2009), available at <http://www.att.com/gen/press-room?pid=4800&cdvn=news&newsarticleid=26843> (“[T]he meeting involved 21 customers from 15 companies including Air Products, Intel, Cargill, Tata Consultancy Services and DuPont along with 15 AT&T staff in ten locations—Dallas, Chicago and New Jersey in the US, London, Sydney, Singapore, Hong Kong, Shanghai, Mumbai and Bangalore.”).

¹⁹⁹ Recovery Act, §§ 3003(b)(1), 3011, 13401.

readily, as noted in the recent Rural Broadband Report.²⁰⁰ For those suffering from chronic diseases, two-way video visits and remote health monitoring can minimize hospital trips. And electronic health records give providers a comprehensive view of patients' medical histories and enable better coordination of care, electronic claims processing, and electronic physician order entries, among other things.²⁰¹ At the same time, health IT promises significant cost savings for the health-care industry. One study has shown that after a five-year investment, telemedicine applications could generate \$4.28 billion in savings nationwide.²⁰² Others have estimated that societal cost savings from health IT use are as much as \$80 billion per year in the United States.²⁰³ In one specific case, Penn State University estimated that remote home health monitoring of diabetes patients reduced hospital-care expenses from approximately \$232,000 per patient to \$87,000 per patient—over 60 percent.²⁰⁴

²⁰⁰ See *Rural Broadband Report* ¶ 20 (“With sufficiently robust broadband services, clinics in rural areas can have access to facilities and specialists in more-densely populated areas.”).

²⁰¹ See, e.g., *Digital Quality of Life Report* at 26 (telecommunications-dependent health technologies also increase access to health information and health care, and improve the quality of health care).

²⁰² Center for Information Technology Leadership, *The Value of Provider-to-Provider Telehealth Technologies*, at 63 (2007), available at http://www.citl.org/_pdf/CITL_Telehealth_Report.pdf.

²⁰³ *Digital Quality of Life Report* at 26 (citing Federico Girosi et al., RAND Corp., *Extrapolating Evidence of Health Information Technology Savings and Costs* (2005), available at http://www.rand.org/pubs/monographs/2005/RAND_MG410.pdf, and Jan Walker et al., Health Affairs, *The Value of Health Care Information Exchange and Interoperability* (Jan. 19, 2005), <http://content.healthaffairs.org/cgi/content/full/hlthaff.w5.10/DC1>).

²⁰⁴ Jonathan Rintels, Benton Foundation, *An Action Plan for America Using Technology and Innovation to Address Our Nation's Critical Challenges: A Report for the Next Administration*, at 15 (2009), http://www.benton.org/initiatives/broadband_benefits/action_plan/health_care#telehealth (citing Kathryn H. Dansky, et al., *Cost Analysis of Telehomecare*, 7 *Telemedicine J. & e-Health* 225, 231 (2001)). One report estimates that broadband-based remote monitoring could reduce health-care costs by \$197 billion over the next 25 years. Robert E. Litan, Better Health Care Together, *Vital Signs Via Broadband: Remote Health Monitoring Transmits Savings, Enhances Lives*, at 2 (Oct. 2008) (“*Better Health Care Together Report*”).

Widespread deployment and use of health IT will both require and spur increased use of robust, intelligent broadband infrastructure and services.²⁰⁵ Physicians and institutions that practice or share records remotely will need broadband in their homes and/or offices; patients seeking to take advantage of telemedicine applications will similarly require broadband access. Beyond this, widespread use of health IT will require specific offerings that are highly reliable and highly secure.²⁰⁶ The National Broadband Plan should recommend support for projects aimed at developing and/or deploying such services to health-care providers and institutions. Models already exist: For example, Tennessee’s eHealth Exchange Zone uses broadband infrastructure and managed services to allow practitioners to access health-care records across the state over a virtual private network. User authentication protocols ensure security and privacy of data, while a user-friendly data-aggregation and view function ensures ease of use. Doctors securely provide remote diagnoses, share health records and images, and prescribe pharmaceuticals from anywhere with a broadband connection.²⁰⁷ AT&T—which has assisted in the building of the eHealth Exchange Zone²⁰⁸—has plans to make the solution used in Tennessee

²⁰⁵ See *Better Health Care Together Report* at 17 (recognizing that health IT relies on broadband services); *Forrester Consulting Report* at 12 (same). As noted below, “dumb pipes” arguments by Free Press and others—which call for all Internet packets to be treated exactly the same—are antithetical to building smarter networks that can meet the needs of health-care providers and patients by supporting tele-surgery, medical telemetry, remote diagnostics, and other health-care applications that require highly reliable, quality-assured broadband capabilities.

²⁰⁶ The HITECH Act requires the U.S. Department of Health and Human Services to issue guidance specifying what technologies and methodologies are sufficient to make HIPAA-protected health information secure, and to work with the Federal Trade Commission to develop recommendations to Congress concerning privacy and security concerns raised by vendors of personal health records and related entities. Recovery Act, §§ 13401(c), 13424(b).

²⁰⁷ AT&T, *AT&T to Deliver Country’s First Statewide eHealth Exchange Zone: Tennessee eHealth Network to Enable Improved Health Care Access and Collaboration* (Feb. 25, 2008), <http://www.att.com/gen/press-room?pid=4800&cdvn=news&newsarticleid=25204>.

²⁰⁸ *Id.*

generally available nationwide with technology partners Microsoft and Covisint. The AT&T solution allows individuals to securely store and manage their personal health records as they see fit.²⁰⁹

The Commission itself can and should promote health-care-provider use of broadband in general—and in particular projects such as the eHealth Exchange Zone—by revisiting its decision to limit participation in the Rural Health Care Pilot Program to applicants that connect their state or regional health-care networks to the Internet2 and National LambdaRail backbones.²¹⁰ That discriminatory limitation is inconsistent with efforts to promote widespread broadband adoption for telemedicine purposes because it restricts consumer options and forecloses innovation by other broadband providers. The Commission should instead establish basic network performance criteria for any backbone that is used in connection with the Rural Health Care Pilot Program, and let each health-care network provider make its own selection of any qualifying provider.²¹¹

More broadly, the Plan should encourage state governments and licensing boards to review their rules to determine whether they are inadvertently deterring use of broadband and health IT. For example, some licensing rules do not permit doctors and nurses to practice across state lines remotely, and some medical reimbursement rates do not reflect the varieties of IT-based delivery methods. While this obviously goes well beyond this Commission's jurisdiction, the Plan can and should enlist the help of other agencies and government bodies, such as the U.S.

²⁰⁹ AT&T, *eHealth Initiatives Streamline Medical Record Sharing*, at 3, available at <http://www.corp.att.com/healthcare/docs/ehealth.pdf>.

²¹⁰ Order on Reconsideration, *Rural Health Care Support Mechanism*, 22 FCC Rcd 2555, 2555 ¶ 1 (2007).

²¹¹ See, e.g., Reply Comments of AT&T Inc., *Rural Health Care Support Mechanism*, WC Docket No. 02-60, at 1 (filed Nov. 28, 2006).

Department of Health and Human Services and its state counterparts, to suggest measures that will facilitate and promote broadband-based health-care services and databases.

B. Measures to Address Supply-Side Issues

As noted above, broadband providers have invested enormous amounts of capital to deploy, in little more than a decade, all manner of fiber, copper, cable, fixed and mobile wireless, powerline, and satellite broadband networks that offer service to most of the households in the United States and provide well over 121 million broadband connections to residential, business, and government customers across the nation.²¹² This private-sector investment and deployment is the engine of the broadband economy, and the policies in the National Broadband Plan should ensure that this engine continues to run in high gear.

Policymakers must encourage the private sector to continue to take the substantial risks of investing in innovative products and services that will bring broadband to areas and populations that lack it, and in upgrading and expanding broadband networks and services for those who already have it today. And the best way to promote risk-taking, investment, and innovation is to create a stable, deregulatory environment that promotes *facilities-based* intermodal competition of the kind that has driven speeds up, pushed prices down, and increased

²¹² Although the most recent data published by the Commission are from December 2007, the trends in that data suggest that there are likely more broadband connections in the United States today than there are telephone lines. See Federal Communications Commission, Wireline Competition Bureau, Industry Analysis and Technology Division, *High-Speed Services for Internet Access: Status as of December 31, 2007*, at tbl. 1 (Jan. 2009), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-287962A1.pdf (“*FCC 2007 High-Speed Services Report*”) (showing 121,165,311 high-speed lines as of December 2007, with an annual rate of increase over 30 percent); Federal Communications Commission, Wireline Competition Bureau, Industry Analysis and Technology Division, *Local Telephone Competition: Status as of December 31, 2007*, at tbl. 1 (Sept. 2008), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-285509A1.pdf (showing 158,436,758 end-user switched access lines as of December 2007, with an annual rate of decrease over 5 percent).

coverage in the United States over the last several years. But where market forces alone are insufficient to deliver broadband networks and services to certain discrete areas or populations, the government will need to provide targeted assistance to encourage and supplement private-sector efforts so that we can achieve 100 percent broadband access. With a commitment to this type of private-public partnership, the National Broadband Plan can achieve Congress's goal of broadband access for all Americans.

1. The Existing Broadband Ecosystem Has Been an Effective Engine for Broadband Deployment, and the Plan Should Focus Primarily on Those Areas That Are Unserved or Underserved

As it considers how to design the Plan to best promote broadband deployment, the Commission should recognize how much already has been accomplished. Notwithstanding a chorus of critics complaining about the position of the United States in international broadband rankings, the simple truth is that America has a strong broadband foundation on which it can build. The broadband market in the United States is a highly robust, highly competitive marketplace on all fronts. As the *New York Times* recently reported, the United States scored highest among 25 developed countries on a "Connectivity Scorecard" that ranks the extent to which consumers, businesses, and government entities make use of broadband and computer technology.²¹³ That is not to say, of course, that more cannot be done. But the solution must be tailored to fit the problem. We do not face, as some claim, a broadband "crisis" requiring radical industry-wide restructuring or the re-imposition of common-carrier-style regulations designed

²¹³ Saul Hansell, New York Times Bits Blog, *Surprise: America Is No. 1 in Broadband* (Feb. 23, 2009), <http://bits.blogs.nytimes.com/2009/02/23/surprise-america-is-no-1-in-broadband/> (citing Leonard Waverman & Kalyan Dasgupta, *Connectivity Scorecard 2009*, <http://www.connectivityscorecard.org/images/uploads/media/TheConnectivityReport2009.pdf>).

for the era of black rotary-dial telephones. Quite the contrary: Over the past decade, as we have discussed briefly above, broadband has spread explosively throughout most of the country.

During this time, incumbent wireline carriers and the cable industry have spent far more than a hundred billion dollars to lay millions of miles of fiber, copper, and coaxial cable, and to deploy countless routers, multiplexers, and other equipment.²¹⁴ More recently, wireless carriers have been investing in and expanding 3G and even 4G wireless broadband services—not to mention the investments of WiMAX and unlicensed Wi-Fi providers.²¹⁵ Broadband-over-powerline (BPL) and satellite services offer yet more broadband access options.²¹⁶ The most recent broadband data collected by the Commission show that the number of broadband providers in all categories has increased steadily every year, with newer technology providers (Wi-Fi, WiMAX, and BPL) increasing nearly three-fold between 2004 and 2007.²¹⁷ Just this year, the State of Texas—which has the second-highest number of high-speed lines in the nation—reported the “tremendous growth of broadband provided over media other than ADSL and cable over the last two years” and noted that, in Texas, these new forms of broadband

²¹⁴ See, e.g., *Fifth Section 706 Report*, 23 FCC Rcd at 9651 ¶ 74 (noting that the industry plans \$50 billion in capital expenditures in 2008 and 2009); AT&T, Press Release, *AT&T to Invest More Than \$17 Billion in 2009 to Drive Economic Growth* (Mar. 10, 2009), available at <http://www.att.com/gen/press-room?pid=4800&cdvn=news&newsarticleid=26597>; NCTA, *Industry Data*, available at <http://www.ncta.com/Stats/BroadbandAvailableHomes.aspx> (showing almost 120 million homes with access to cable broadband service, and industry capital investments of \$146.8 billion since 1996).

²¹⁵ See, e.g., Marguerite Reardon, CNET Reviews, *Verizon promises 4G wireless for rural America* (Apr. 1, 2009), available at http://reviews.cnet.com/8301-12261_7-10209933-51.html. See generally Comments of AT&T Inc., *Broadband Industry Practices*, WC Docket No. 07-52, at 58-61 (filed June 15, 2007) (“*AT&T Net Neutrality Comments*”).

²¹⁶ See *Rural Broadband Report* ¶ 10 (discussing various broadband technologies); *Fifth Section 706 Report*, 23 FCC Rcd at 9619-29 ¶¶ 7-24 (same).

²¹⁷ *FCC 2007 High-Speed Services Report* at tbl. 7.

“exceeded the market share held individually by ADSL and cable.”²¹⁸ The State also noted that the trend of having at least two providers per county was steadily increasing.²¹⁹

At the same time, subscribership more than tripled between 2003 and 2007, as the Commission found last year in its most recent Section 706 Report.²²⁰ Moreover, competition has steadily forced prices down even while service quality is improving. As the FTC noted in 2007, the broadband marketplace is characterized by “declining prices for higher-quality service.”²²¹ AT&T reported to the Commission last year that it has quadrupled the maximum speed of its top-tier residential DSL service while cutting the price of that service by 30 percent.²²² And nationwide, the average monthly broadband bill *fell* 4 percent between 2005 and 2008, even as connection speeds increased.²²³ USTelecom estimates that consumers paid *\$11 less per month* in 2007 for a 7 Mbps connection than they paid in 2001 for a 1.5 Mbps connection.²²⁴

Of course, this should not be news—the Commission has uniformly found the broadband market to be robustly competitive.²²⁵ Other agencies agree. In January of last year, NTIA

²¹⁸ Comments of Texas House of Representatives on NTIA Broadband Technology Opportunities Program, at 2 (filed Apr. 8, 2009), *available at* <http://www.ntia.doc.gov/broadbandgrants/comments/7976.pdf>.

²¹⁹ *Id.*

²²⁰ *Fifth Section 706 Report*, 23 FCC Rcd at 9631-32 ¶ 33.

²²¹ See Federal Trade Commission, *Staff Report: Broadband Connectivity Competition Policy*, at 10-11 (2007), *available at* <http://www.ftc.gov/reports/broadband/v070000report.pdf> (“*FTC Net Neutrality Report*”).

²²² *AT&T Net Neutrality Comments* at 62.

²²³ *Pew Study* at 8. The Pew Study also shows steady year-over-year growth in home broadband penetration. *Id.* at 1.

²²⁴ USTelecom, *Wireline Broadband Pricing 2001-2007* (June 2008), *available at* <http://www.ustelecom.org/uploadedFiles/Learn/Broadband.Pricing.Document.pdf>.

²²⁵ See *Fifth Section 706 Report*, 23 FCC Rcd at 9645 ¶ 59 (“Based on our analysis in this Report, we conclude that the deployment of advanced telecommunications capability to all

released a report finding “substantial growth in the broadband marketplace punctuated by demonstrable increases in capital investment, innovation, and entry, as well as superior productivity relative to other countries.”²²⁶ And the FTC found that broadband competition is “moving in the right direction.”²²⁷

All of this belies lingering arguments about a vaguely defined failure in the broadband market that can be addressed only if the Commission imposes across-the-board regulation. In particular, the state of the market today is flatly inconsistent with the notion that broadband is simply “stagnant” or a cozy “duopoly” in which providers’ investment incentives are suppressed or nonexistent.²²⁸ And the facts on the ground similarly refute calls for the Commission to

Americans is reasonable and timely. The data reflect the industry’s extensive investment in broadband deployment, including at higher speeds, as evidenced by increased subscribership for those higher-speed services. The record also reflects that providers are continuing to make significant investments in broadband facilities going forward. Further, while section 706 does not require the Commission to report on actual broadband subscribership, we believe that subscribership to broadband services continues to increase steadily as new broadband-dependent services and applications emerge in the marketplace, and that subscribership growth is important due to its relationship with deployment.”). *See also* Report and Order and Notice of Proposed Rulemaking, *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities*, 20 FCC Rcd 14853, 14880-81 ¶ 50 (2005) (“*Wireline Broadband Order*”); Memorandum Opinion and Order, *AT&T Inc. and BellSouth Corp. Application for Transfer of Control*, 22 FCC Rcd 5662, 5730 ¶ 127 (2007); Memorandum Opinion and Order, *Applications for Consent to the Assignment and/or Transfer of Control of Licenses, Adelphia Communications Corp., Assignors*, 21 FCC Rcd 8203, 8296-97 ¶¶ 217-18 (2006) (finding that “competition among providers of broadband service is vigorous” and “cable modem service and DSL service are facing emerging competition from deployments of cellular, Wi-Fi, and WiMAX-based competitors, and [BPL] providers”).

²²⁶ *NTIA Networked Nation Report* at 2.

²²⁷ *See FTC Net Neutrality Report* at 155.

²²⁸ *See Dismantling Digital Deregulation* at 8; Comments of the Consumer Federation of America, Consumers Union, and Free Press, *Broadband Industry Practices*, WC Docket No. 07-52, at 7-29 (filed June 15, 2007); Comments of Google, Inc., *Broadband Industry Practices*, WC Docket No. 07-52, at 10-21 (filed June 15, 2007) (“*Google Net Neutrality Comments*”).

commit its time and limited resources to pursuing academic exercises in “traditional market analysis” for the nascent and rapidly evolving broadband marketplace.²²⁹

Instead, the Plan should focus government and private-sector resources first and foremost on crafting targeted solutions for those corners of America where broadband has not reached at all, or where existing broadband services are rendered practically inaccessible or unusable because of affordability or other constraints. And the solution to the supply problems in the few areas where broadband facilities are lacking will not be found in a host of regulatory mandates focused on intramodal competition.²³⁰ As the Commission learned from its experience with perhaps the most onerous of recent regulatory experiments, even imposing stringent unbundling rules does not promote facilities-based deployment in rural or otherwise hard-to-serve areas.²³¹ Instead, spurring this deployment requires a policy and regulatory climate that welcomes private-sector investment and innovation. Policymakers can promote such a climate by eliminating regulatory burdens and uncertainty, providing economic incentives for innovation and investment, and addressing security and other concerns that divert providers’ resources and attention—issues that we discuss in more detail below.

²²⁹ See Notice ¶ 35 (asking whether the Commission should “undertake a traditional market analysis with respect to *any* relevant market related to broadband”) (emphasis added).

²³⁰ Even where supply is lacking, the root of the problem is often related to lack of demand as much as to costs. Providers are wary of expending resources to reach customers that may not sign up for service in sufficient numbers. As one recent study concluded, the solution to this is not regulatory mandates, but increased incentives and private-public collaboration that can spur demand and increase the economic viability of new deployment. *Forrester Consulting Report* at 19-20.

²³¹ More generally, as a recent study has shown, policies promoting intramodal, non-facilities-based entry via unbundling result in *less* fiber deployment than policies promoting intermodal, facilities-based competition. See Scott J. Wallsten & Stephanie Hausladen, *Net Neutrality, Unbundling, and Their Effects on International Investment in Next-Generation Networks* (Mar. 2009), available at http://www.techpolicyinstitute.org/files/wallsten_unbundling_march_2009.pdf.

2. Intercarrier Compensation and Universal Service Reform Is a Key Element of Achieving the National Broadband Plan’s Deployment Goals

There may be no set of pure, FCC-focused regulatory issues more critical to unleashing more broadband investment than reform of intercarrier compensation and universal service. This is an area where the Commission can and must quickly move from “planning” to taking bold, much-needed action. As Acting Chairman Copps has advocated,²³² the Commission should commit itself to resolving longstanding legacy disputes that have mired the entire communications industry in yesterday’s problems. And it should do so promptly: The status quo is hastening the demise of the legacy wireline business model, and undermining our transition to the broadband model of the future. The Commission must quickly undertake proactive, forward-looking reform of intercarrier compensation and universal service in a manner that will promote achievement of the Plan’s overarching broadband supply goals.

a. The Commission Should Remedy Serious Flaws in the Existing Intercarrier Compensation Regime and the High-Cost Universal Service Mechanism

As AT&T has discussed in various contexts, the Commission’s intercarrier compensation and universal service rules were designed for yesterday’s narrowband communications system, and they are ill-suited to today’s intermodal, competitive, and increasingly Internet-oriented communications environment.²³³ Dramatic changes and convergence in technology and business

²³² *Rural Broadband Report* ¶¶ 138, 155.

²³³ *See, e.g.*, Letter from Henry Hultquist, AT&T, to Marlene H. Dortch, Secretary, FCC, CC Docket No. 01-92 (filed July 17, 2008); Letter from NARUC Task Force on Intercarrier Compensation to Chairman Kevin Martin, FCC, attaching Missoula Plan, *Developing a Unified Intercarrier Compensation Regime*, CC Docket No. 01-92 (filed July 24, 2006) (“*Missoula Plan*”); Letter from Robert W. Quinn, Jr., AT&T, to Kevin J. Martin, FCC, CC Docket Nos. 01-92 and 96-45, and WC Docket Nos. 05-337, 99-68, and 07-135, at 1-4 (filed July 17, 2008) (“*AT&T Intercarrier Compensation Ex Parte*”); Reply Comments of AT&T Inc. on the Missoula

models have rendered meaningless legacy regulatory distinctions based on the geographic endpoints of a call and the type of service used to originate or complete it. The continued application of inconsistent sets of rules has given rise to inefficient arbitrage and even outright fraud, as providers seek to exploit these distinctions to their own economic advantage. And these rules not only disregard but exacerbate the access line and access revenue losses that wireline carriers face as consumers shift from traditional wireline services to wireless and VoIP services. As many analysts have recognized, the legacy telephone network faces a deadly downward spiral, and a “complete reassessment” of the existing intercarrier compensation and universal service regime is needed in order to facilitate the transition to a broadband telecommunications infrastructure.²³⁴

As AT&T has explained in prior submissions, mere adjustments to the existing system will not be enough to remedy these problems.²³⁵ Only fundamental, integrated reform will resolve these issues once and for all and enable the industry to develop and deploy broadband networks and services in a more stable environment.²³⁶ Ultimately, the Commission must move the industry away from reliance on legacy intercarrier compensation charges and toward a more efficient regime in which carriers do not shift costs to one another but instead compete more

Plan for Intercarrier Compensation Reform, *Developing a Unified Intercarrier Compensation Regime*, CC Docket No. 01-92, at 8-13 (filed Feb. 1, 2007) (“*AT&T Missoula Reply Comments*”).

²³⁴ *Moffett Wireline Problem Analysis* at 3.

²³⁵ *See generally AT&T Intercarrier Compensation Ex Parte; AT&T Missoula Reply Comments; AT&T IC/USF Comments.*

²³⁶ *See, e.g., AT&T Missoula Reply Comments* at 13 (“[B]y creating greater regulatory certainty, the Plan . . . will encourage greater capital investment in new networks and services. . . . These reforms will allow carriers to refocus their energies on creating consumer value rather than exploiting (or closing) regulatory loopholes.”).

directly based on the costs they recover from their end users.²³⁷ Thus, as AT&T and many others have advocated, the Commission must gradually reduce and unify intercarrier compensation charges and shift to increased reliance on certain end-user charges. At the same time, the Commission must reform its universal service rules to provide additional targeted universal service support where necessary to offset particularly high service costs and ease the transition for rural and other high-cost carriers—and ultimately shift to supporting broadband deployment rather than legacy services.²³⁸

Notably, these reforms may have the biggest impact in hard-to-serve rural areas, where eroding intercarrier compensation charges threaten to destabilize the network, and where the fear of access charge bypass may have caused some providers to slow the pace of broadband deployment in order to discourage consumer migration to VoIP.²³⁹ Putting in place a forward-looking intercarrier compensation system (together with appropriate interconnection rules) will eliminate regulatory anomalies that are contributing to the free-fall of the traditional wireline

²³⁷ As AT&T notes in its reply comments in the Commission’s Tenth Circuit *NOI* proceeding, the current system—which relies on interstate and intrastate access charges and federal and state universal service funding—today provides almost \$25 billion in explicit and implicit support. Reply Comments of AT&T Inc., *High-Cost Universal Service Support; Federal-State Joint Board on Universal Service; Notice of Inquiry Seeking to Refresh the Record Regarding the Issues Raised by the Tenth Circuit in the Qwest II Decision*, WC Docket No. 05-337, CC Docket No. 96-45 (filed June 8, 2009).

²³⁸ See generally *AT&T IC/USF Comments*.

²³⁹ See T. Randolph Beard & George S. Ford, *Do High Call Termination Rates Deter Broadband Deployment?*, Phoenix Center Policy Bulletin No. 22, at 3 (Oct. 2008), available at <http://www.phoenix-center.org/PolicyBulletin/PCPB22Final.pdf> (“We find evidence that compared to the current system, a lower, more uniform compensation rate can promote and spur broadband deployment, especially in areas where current call termination rates are very high.”); see also *id.* at 8 (“Our model finds that in high-cost areas, the incentive of an incumbent LEC to upgrade its network to broadband service is diminished—and perhaps even outright deterred—by the current system of high, carrier-specific call termination rates.”).

telephone system and free carriers to turn their focus and their funds toward the new era of broadband services.

The high-cost universal service funding system is also hopelessly out of touch with the forward movement in the industry, and is likewise in need of fundamental reform. Indeed, a recent analyst's report observes that the legacy wireline network is rapidly evolving into a network that is *all* "high cost," as carriers lose legacy lines and revenues to VoIP and other broadband services—revenues that cannot be made up simply by taxing the remaining lines under the existing universal service system.²⁴⁰ While short-term changes are needed to reform traditional wireline support so that funding is targeted to those areas where it is most needed,²⁴¹ the Commission's real priority at this point should be to direct these scarce funds toward the construction of forward-looking broadband facilities that will support the next era of communications. Accordingly, the Commission should begin a transition away from the existing mechanism to new broadband and mobility-focused support programs.²⁴² Existing wireline high-cost funding should be transitioned to a Broadband Incentive Fund that will support deployment of fixed broadband service in unserved areas.²⁴³ And the Commission also should transition

²⁴⁰ *Moffett Wireline Problem Analysis* at 3 ("[I]t is simply not feasible to continuously increase collections on the remaining lines with the intention of redistribution to 'high cost' areas. All areas are becoming high cost areas.").

²⁴¹ See Comments of AT&T Inc., *Notice of Inquiry Seeking to Refresh the Record Regarding the Issues Raised by the Tenth Circuit in the Qwest II Decision*, WC Docket No. 05-337, CC Docket No. 96-45, at 5-6, 29-37 (filed May 8, 2009) ("AT&T Tenth Circuit NOI Comments") (proposing specific reforms).

²⁴² See *IC/USF NPRM* ¶ 4; see also *AT&T IC/USF Comments* at 3 ("American consumers are poorly served by today's universal service system because, among other deficiencies, it does little to support the network investment necessary to deploy broadband services in unserved areas."); *AT&T Tenth Circuit NOI Comments* at 5, 18-25.

²⁴³ *AT&T Tenth Circuit NOI Comments* at 5, 18-24; *AT&T USF NPRMs Comments* at 3-5, 8-25.

legacy funding for CETCs to a separate Advanced Mobility Fund designed to support mobile wireless broadband deployment in high-cost areas.²⁴⁴ These new funds should be distributed pursuant to a competitive application framework with clear and detailed criteria for ranking applications. This approach will ensure that funding is used most efficiently and that only those providers engaged and ready to actively deploy broadband are funded.²⁴⁵ It also will repurpose universal service funding to its original goal—ensuring the availability of affordable, quality services and facilities in high-cost areas, rather than funding numerous competitors in the same area.²⁴⁶

Finally, the Commission must reform the revenues-based contribution methodology, which the Commission itself declared unsustainable back in 2001.²⁴⁷ In the eight years since, the contribution base has eroded in the face of migration away from traditional technologies and toward bundled, all-distance services, while demand on the fund has increased.²⁴⁸ The Commission’s efforts to repeatedly patch the system have been ineffective even to support traditional wireline telephone facilities.²⁴⁹ Indeed, the latest filings by the Universal Service Administrative Company (“USAC”) suggest that, in order to collect sufficient support, the contribution factor will exceed 12 percent for the first time in the history of the universal service

²⁴⁴ *AT&T Tenth Circuit NOI Comments* at 5, 18-24; *AT&T USF NPRMs Comments* at 3, 5, 8-10, 12-24, 40-41; *AT&T IC/USF Comments* at 43.

²⁴⁵ *See AT&T Tenth Circuit NOI Comments* at 20-23 (discussing method of awarding funding).

²⁴⁶ *Id.* at 23.

²⁴⁷ Notice of Proposed Rulemaking, *Federal-State Joint Board on Universal Service*, 16 FCC Rcd 9892, 9899-9900 ¶¶ 12-13 (2001).

²⁴⁸ *IC/USF NPRM*, Appx. C ¶ 93.

²⁴⁹ *Id.*; *AT&T Tenth Circuit NOI Comments* at 14.

program.²⁵⁰ Clearly, more than a patch is needed to ensure stable and predictable funding for the industry's transition to broadband. It is time for the Commission to move from the broken revenues-based contribution mechanism to one based on numbers and connections. As AT&T has explained elsewhere,²⁵¹ such an approach would not only be equitable, easily enforceable, and technology-neutral—it also would be far more sustainable and predictable, which is critical if the Commission hopes to expand support to the broadband wireline and wireless networks of the future.

b. Reforms to the Schools and Libraries and Rural Health Care Programs Would Help Promote the National Broadband Plan's Goals

The Commission should also consider revising the Schools and Libraries (“E-Rate”) and Rural Health Care Programs to further support the National Broadband Plan's goals.

i. E-Rate Program

Many features of the E-Rate program make it an ideal platform to support the type of institutional broadband deployment projects the Recovery Act envisions. In particular, the E-Rate program exemplifies in many ways, and proves the efficacy of, the “anchor tenant” model

²⁵⁰ See Universal Service Administrative Company, *Federal Universal Service Support Mechanisms Fund Size Projections for the Third Quarter 2009* (filed May 1, 2009), available at http://www.universalservice.org/about/governance/fcc-filings/2009/Q3/3Q2009%20Quarterly%20Demand%20Filing%20_FINAL%205.1.09_.pdf; Universal Service Administrative Company, *Federal Universal Service Support Mechanisms Quarterly Contribution Base for the Third Quarter 2009* (filed June 1, 2009), available at <http://www.universalservice.org/about/governance/fcc-filings/2009/Q3/3Q2009%20Contribution%20Base%20Filing.pdf>.

²⁵¹ See, e.g., Reply Comments of AT&T Inc., *High-Cost Universal Service Support*, WC Docket No. 05-337, at 30-39 (filed Dec. 22, 2008); *AT&T Tenth Circuit NOI Comments* at 13-14; Letter from Mary L. Henze, AT&T, to Marlene Dortch, FCC, WC Docket No. 06-122 and CC Docket Nos. 96-45 and 01-92 (filed Nov. 21, 2008); Letter from Mary L. Henze, AT&T, and Kathleen Grillo, Verizon, to Marlene Dortch, FCC, WC Docket No. 06-122 and CC Docket No. 96-45 (filed Oct. 20, 2008); Letter from Mary L. Henze, AT&T, and Kathleen Grillo, Verizon, to Marlene Dortch, FCC, WC Docket No. 06-122 and CC Docket No. 96-45 (filed Sept. 11, 2008).

that AT&T has advocated here and elsewhere.²⁵² The program provides funds to enable eligible schools and libraries to purchase telecommunications, Internet access, and internal connections at deep discounts. By making advanced technology more affordable, the E-Rate program has dramatically improved the availability of technology in our K-12 schools and has enabled more libraries to offer Internet access to the communities they serve. These are just the sorts of outcomes the Recovery Act seeks to promote throughout the nation.²⁵³

While the E-Rate program already supports the purchase of broadband and covers both recurring and nonrecurring costs,²⁵⁴ the program would better support national broadband goals with certain targeted modifications. The existing mechanism has struggled to accommodate the realities of how schools and libraries purchase and service providers provide the wide range of equipment and services now eligible for support. It thereby constrains the impact the program could have on achieving ubiquitous broadband.

²⁵² See generally Section I.A. and Part III, *supra*; *AT&T NTIA/RUS Comments*.

²⁵³ See, e.g., Recovery Act, § 6001(g)(3)-(4) (directing that stimulus funding be used to “ensure access to broadband service by community anchor institutions” and to facilitate access to broadband services and training for “vulnerable populations”); *id.* § 6001(b)(3)(B) (directing that support be provided to “organizations and agencies that provide outreach, access, . . . and support services to facilitate greater use of broadband service by low-income, unemployed, aged, and otherwise vulnerable populations”); *id.* § 6001(k)(2)(B), (D) (instructing the Commission, in its National Broadband Plan, to include “a detailed strategy for achieving affordability of such service and maximum utilization of broadband infrastructure and service by the public” and “a plan for use of broadband infrastructure and services in advancing consumer welfare, civic participation, . . . education, [and] worker training”).

²⁵⁴ Universal Service Administrative Company, *Eligible Services List, Schools and Libraries Support Mechanism for Funding Year 2009* (Nov. 21, 2008), available at http://www.usac.org/_res/documents/sl/pdf/ESL_archive/EligibleServicesList_112108.pdf (discussing eligible services); see Government Accountability Office, *Telecommunications: Long-Term Strategic Vision Would Help Ensure Targeting of E-Rate Funds to Highest-Priority Uses*, at 7 (Mar. 2009) (same).

AT&T believes that the Commission could greatly enhance the efficiency and efficacy of the E-Rate program by simplifying the disbursement of funding. Currently, schools and libraries either get an E-Rate discount on their service-provider bills or pay their service provider in full and subsequently receive reimbursement from the Universal Service Fund, again, via their service provider. In both cases, the school's or library's receipt of USF funding is largely dependent upon extensive ongoing coordination among the applicant, the service provider, and USAC. Requiring that the service provider be in the middle of the flow of funding to the applicant is administratively inefficient, costly, and error-prone for the applicants, service providers, and USAC. Not only is this indirect funding process difficult to implement on the front end, but it greatly complicates (and increases the expense of) monitoring and auditing. To enable the E-Rate program to expand and serve an important role in meeting national broadband goals, funds should be provided directly to the schools and libraries that are the direct E-Rate beneficiaries.²⁵⁵

The Commission also should consider updating the program by dividing it into two “sections,” one section designed to fund (on a one-time project basis) charges associated with facilities design and engineering, facilities deployment, or equipment purchases, and one section designed to fund recurring service charges. Today, a single set of rules and procedures is used to try to accommodate these two very different types of purchasing arrangements—with very mixed success. Under a bifurcated approach, the application and discount mechanism for the first section could be designed to better accommodate projects that involve significant one-time network investment—and would therefore be a more effective catalyst for broadband

²⁵⁵ See Letter from Mary L. Henze, AT&T, to Marlene Dortch, FCC, WC Docket No. 05-195 and CC Docket No. 02-6 (filed Sept. 14, 2007).

deployment. The section of the program that funds discounts on recurring monthly service charges could then be designed specifically to address the unique, recurring features of ongoing broadband service contracts.²⁵⁶

In addition, the goals of the Recovery Act would be better served if schools, libraries, and broadband service providers were encouraged to focus on wider-scale projects that ultimately could result in deployment of community-wide, state-wide, or even multi-state broadband networks. While consortia are permitted to apply for E-Rate funding today, the process is complicated by the fact that the existing program is designed primarily with discrete contracts for individual projects in mind.²⁵⁷ The Commission should look for ways to use the E-Rate program to support more cooperative efforts among multiple institutions, perhaps through rule changes that would make it easier for joint applications to receive funding.

And finally, the Commission should consider updating the current E-Rate technology plan development and review process to ensure that it is coordinated with national broadband goals. Currently, E-Rate recipients draft their plans in isolation, focusing on their individual funding and service needs. Those plans are then evaluated in isolation by a certified approver and potentially again during Program Integrity Assurance review. The Commission should re-examine the current standards for technology plan development and review to ensure that those standards promote technology plans that are consistent with, and further, the goals set forth in the Recovery Act and the National Broadband Plan.

²⁵⁶ Under a bifurcated program, both Priority 1 and Priority 2 projects would be eligible for funding under the first section (for one-time charges), while only Priority 1 services would be covered under the second section (for recurring charges).

²⁵⁷ See, e.g., Universal Service Administrative Company, *Schools and Library Applicants* (Feb. 22, 2008), <http://www.usac.org/sl/applicants/> (discussing the application process).

ii. Rural Health Care Program

As Acting Chairman Copps recently recognized, the Commission also should revisit its universal service support programs for rural health-care providers to see how such funding can better advance the Recovery Act's goals.²⁵⁸ The focus of the Commission's efforts should be expanding the Rural Health Care Pilot Program ("Pilot Program"), which—with certain modifications—could provide meaningful support for deployment of innovative, broadband-based health-provider networks.²⁵⁹

To better direct its efforts and health-care-related support dollars, the Commission should begin to phase out the legacy Rural Health Care Program. Constrained by the language of the 1996 Act, that program does little to support broadband health-care networks. For the most part, funding under the existing program is available only to offset high distance-sensitive telecommunications charges that health-care providers located in rural areas would otherwise incur.²⁶⁰ Lack of participation in the program suggests it meets only a limited need.²⁶¹ The Commission should transition all beneficiaries of the legacy program to the Pilot Program (though it could grandfather those participants for whom the legacy mechanism provides

²⁵⁸ See *Rural Broadband Report* ¶ 128 ("Despite modifications the Commission has made to the Rural Health Care Program, the program continues to be greatly underutilized and is not fully realizing the benefits intended by the Telecommunications Act of 1996 and the Commission's rules.").

²⁵⁹ As Acting Chairman Copps notes, in contrast to the legacy program, "[t]he goal of the Pilot Program is to stimulate the deployment of the broadband infrastructure necessary to support innovative telemedicine services to rural America." *Id.* ¶ 129.

²⁶⁰ Order, *Rural Health Care Support Mechanism*, 22 FCC Rcd 20360, 20363 ¶ 8 (2007) ("*Pilot Program Order*").

²⁶¹ *Id.* at 20366 ¶ 14 ("[A]lthough \$400 million dollars per year has been authorized for funding this program, since the program's inception in 1998, the program generally has disbursed less than 10 percent of the authorized funds each year."); *Rural Broadband Report* ¶ 128 (same).

meaningful support), which more effectively supports the construction of health-care-provider broadband facilities and monthly broadband service charges,²⁶² and thus directly advances the Recovery Act's goals.²⁶³

As it focuses on and expands the Pilot Program, the Commission should take a fresh look at the program rules. Although the program is quite new, it is already clear that certain modifications would be necessary to make it an appropriate vehicle to promote investment in and adoption of broadband health-care-provider networks on a wider scale. For one thing, funding should be provided directly to the plan beneficiaries themselves, not to broadband service provider intermediaries. This will make the program more efficient and efficacious, as discussed above with respect to the E-Rate program. The Commission also should consider bifurcating the program into two sections (as proposed above for the E-Rate program) to fund one-time design and deployment charges separately from recurring service charges. In addition, as discussed previously, the program must be expanded to allow participants to use backbones other than Internet2 and National LambdaRail. Giving rural health-care providers more flexible options will enhance innovation and broadband investment.²⁶⁴ And the Commission should invite comments from all stakeholders to explore other measures that would be appropriate and that would align the Pilot Program with the Recovery Act's goals.

²⁶² As the *Rural Broadband Report* explains, the Pilot Program provides “funding for the construction of state or regional broadband networks and for the advanced telecommunications and information services provided over those networks for health care providers.” *Rural Broadband Report* ¶ 129.

²⁶³ Recovery Act, § 6001(b)(1)-(3) (directing that support be provided to “medical and healthcare providers” and “unserved” and “underserved” areas); *id.* § 6001(k)(2)(D) (instructing that the National Broadband Plan include “a plan for use of broadband infrastructure and services in advancing . . . health care delivery”).

²⁶⁴ See *Pilot Program Order*, 22 FCC Rcd at 20367 ¶ 16; Section IV.A.9, *supra*.

To that same end, the Commission should ensure that the Pilot Program is tightly aligned with the programs and agendas of other government agencies that are responsible for advancing rural health-care initiatives. For example, in awarding funding, the Commission and USAC should coordinate directly with the Department of Health and Human Services, which is more likely to know the needs of communities and individual hospitals and clinics. The existing Pilot Program already takes a number of steps in this direction,²⁶⁵ but the Commission should go even further. Specifically, the Commission could partner with the Department’s Office of Rural Health Policy on that agency’s initiatives.²⁶⁶

3. The Plan Should Endorse Tax Policies That Will Promote Broadband Deployment and Adoption

Government at both the federal and state levels should harness tax policy to support the nation’s broadband goals. Tax policy has long been understood as an effective tool for incentivizing technology investment and deployment. For example, the Internet Tax Freedom Act, enacted in 1998, and its subsequent amendments²⁶⁷ sought to promote “Internet use for

²⁶⁵ Indeed, the *Rural Broadband Report* recognizes that a strength of the Pilot Program is its coordination with HHS to “support the advancement of HHS’s health information technology (health IT) initiatives for electronic health records and [to] create vital broadband links for disaster preparedness and emergency response to any large-scale emergency or public health crisis.” *Rural Broadband Report* ¶ 129. See also *Pilot Program Order*, 22 FCC Rcd at 20362-63 ¶ 7 (“[S]elected participants shall coordinate the use of their health care networks with the Department of Health and Human Services (HHS) and, in particular, with its Centers for Disease Control and Prevention (CDC) in instances of national, regional, or local public health emergencies Similarly, selected participants shall use Pilot Program funding in ways that are consistent with HHS’ health information technology (IT) initiatives”).

²⁶⁶ See U.S. Department of Health and Human Services, Health Resources and Services Administration, *Rural Health Policy*, <http://ruralhealth.hrsa.gov/> (discussing HHS rural health programs).

²⁶⁷ See Internet Tax Freedom Act (codified at 47 U.S.C. § 151 note); Internet Tax Freedom Act Amendments Act of 2007, Pub. L. No. 110-108, 121 Stat. 1024 (codified at 47 U.S.C. § 151 note).

distance learning, telemedicine, commerce and other important services” by barring federal and most state taxes on Internet access.²⁶⁸ The law is widely understood to have effectively helped promote investment in Internet technologies.²⁶⁹

Congress is considering making the Internet tax moratorium permanent, which is an important step in the right direction.²⁷⁰ But more along these lines is needed. While the pending Permanent Internet Tax Freedom Act of 2009 (H.R. 1560) would preclude most state taxes that specifically assess Internet access services, federal law does not protect from taxation “voice, audio, or video programming, or other products and services . . . that utilize Internet protocol or any successor protocol and for which there is a charge.”²⁷¹ And studies have concluded that states and localities tax communications services at two to three times the rate of other

²⁶⁸ Eric Bangeman, *Senate passes Internet tax moratorium extension: 7 more years tax-free* (Oct. 26, 2007), <http://arstechnica.com/tech-policy/news/2007/10/senate-passes-internet-tax-moratorium-extension.ars> (quoting Senator Stevens’s expression of support for 2007 amendment). In his administrative statement in support of the original Internet Tax Freedom Act, President Clinton similarly recognized the importance of legislative action to promote Internet growth. President William J. Clinton, Statement of Administration Policy: S. 442 – Internet Tax Freedom Act, Oct. 1, 1998, *available at* <http://www.presidency.ucsb.edu/ws/index.php?pid=74542> (stating that “[t]he Administration believes it is important to establish a temporary moratorium on Internet access taxes and taxes that discriminate against electronic commerce” and opposing an amendment to the proposed act that would “undermine . . . investment in research and development that will lead to new breakthroughs in high speed networks, networking technology, and Internet applications such as telemedicine and distance learning”).

²⁶⁹ See Austan Goolsbee, Nat’l Bureau of Econ. Research, Working Paper No. 11994, *The Value of Broadband and Deadweight Loss of Taxing New Technology*, at 2 (2006) (“[I]n several medium sized markets, applying a tax on broadband would have reduced the potential producer surplus enough that suppliers would not be able to cover their fixed costs and would choose to delay the diffusion of broadband in those markets. By doing so, however, the tax would have eliminated the entire potential consumer surplus from those markets (as well as the firm profits) in the interim.”).

²⁷⁰ See Permanent Internet Tax Freedom Act of 2009, H.R. 1560, 111th Cong. (2009).

²⁷¹ 47 U.S.C. § 151 note.

industries.²⁷² That disparate treatment creates a disincentive to invest in communications services generally, including in particular broadband infrastructure and services,²⁷³ and is out of touch with national policy favoring such investment and related innovation. The National Broadband Plan should recommend that Congress require state and local governments to permanently eliminate special tax burdens for communications-related services (especially as they relate to broadband), and require that the effective tax rate applied to communications services not exceed the tax rate applied to other goods and services.

Vestigial monopoly-era property taxes that extract a heavy toll from the incumbent telephone companies remain in place in many states and—worse yet—have been extended in some cases to providers of wireless telecommunications, imposing exceptionally high and discriminatory assessment ratios, tax rates, or valuation on telephone-company-owned property.²⁷⁴ These excessive taxes in turn raise the cost of broadband network deployment and equipment for telephone companies, a result antithetical to the Recovery Act’s goals. Beyond that, these taxes do *not* encumber broadband companies that do not qualify as telephone

²⁷² See TR Daily, *Larger Tax Burdens Fall on Telecom*, 2005 WLNR 25544571 (May 25, 2005) (citing study by Council on State Taxation concluding that telecom services are taxed at twice the rate); Scott Mackey, State Legislatures Magazine, *Telecommunications and the Tangle of Taxes* (Feb. 2000), available at <http://www.ncsl.org/programs/pubs/200tele.htm> (“*Telecommunications and the Tangle of Taxes*”) (“[An] industry study . . . found that telecommunications companies and their customers pay, on average, effective tax rates of about 18 percent of charges. This compares with an average sales and use tax rate of about 6 percent on other goods and services.”).

²⁷³ See Robert W. Hahn et al., American Enterprise Institute for Public Policy Research, *Bandwidth for the People* (Oct. 1, 2004), <http://www.aei.org/article/21593> (“[A] tax on access to broadband or on services delivered over broadband, such as Internet telephony, is likely to slow the spread of broadband and is also an economically wasteful way of raising revenues. Internet access or applications, therefore, should not be taxed.”).

²⁷⁴ *Telecommunications and the Tangle of Taxes* (“[A]bout one-third of the states tax telecommunications property at higher effective rates than other types of business property.”).

companies, and thus they provide an artificial advantage to some market participants.²⁷⁵ The National Broadband Plan should recommend that Congress eliminate this discriminatory treatment as part of a program to incentivize broadband deployment, and ensure that taxes on broadband property are no higher than those on other commercial and industrial property.

In addition to recommending the elimination of excessive tax *burdens*, the Plan should advocate the adoption of specific types of tax *incentives*. Tax incentives need to be designed in a way that promotes the objectives of the Plan, and they should not impose counterproductive limitations on the nature of the technology or network at issue. For example, if the Plan recognizes, as it should, that wireless broadband facilities are the optimal solution for many unserved areas and individuals, it would be unproductive for Congress to provide tax incentives that are linked to broadband speeds that only fixed wireline services can achieve today. One approach would be to endorse tax incentives that encourage technology investment by businesses generally, which will in turn promote ongoing infrastructure and service investment, without biasing which technologies are pursued.

Both steps—eliminating existing disincentives to broadband investment and providing new incentives—could play a critical role in promoting widespread broadband investment and deployment. And tax policy is an optimal tool to use in the context of the Plan, because it allows Congress and other policymakers to chart a direction and set milestones for the private sector without adopting cumbersome and prescriptive rules.

²⁷⁵ See *id.* (recognizing that Internet service providers and cable companies do not want to be subject to telecommunications companies' tax treatment).

4. Prescriptive “Net Neutrality” Regulation Would Not Enhance Supply or Demand for Broadband Services, and Likely Would Have the Precise Opposite Effect

a. The Current Approach to Implementing the *Internet Policy Statement* Provides the Right Balance for Protecting Consumers and Advancing Broadband Deployment and Adoption

More than four years ago, in conjunction with its order classifying wireline broadband Internet access service as a Title I information service,²⁷⁶ the Commission adopted four consumer-focused principles in its *Internet Policy Statement*.²⁷⁷ In light of the dynamic, competitive, and rapidly evolving Internet marketplace and the potential consumer harms that could result from imposing unnecessary, prescriptive, one-size-fits-all rules, the Commission declined to codify these principles as rules and deliberately adopted an oversight model instead. In doing so, the Commission elected to maintain a watchful eye on the broader Internet ecosystem and intervene only on a provider-specific basis using its *post hoc* enforcement powers to address concrete and specific incidents of wrongdoing.²⁷⁸

The Commission’s oversight of industry adherence to the principles embodied in the *Internet Policy Statement* has been more than sufficient to ensure compliance with those principles and to foster an open Internet. Indeed, in the ensuing four years, the Commission has found it necessary to enforce the principles in the *Internet Policy Statement* only *twice*: first, to stop Madison River Communications, a small rural carrier, from unreasonably blocking the use of certain VoIP services by its customers; and second, to prevent Comcast from unreasonably

²⁷⁶ *Wireline Broadband Order*.

²⁷⁷ See Policy Statement, *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities*, 20 FCC Rcd 14986 (2005) (“*Internet Policy Statement*”).

²⁷⁸ *Wireline Broadband Order*, 20 FCC Rcd at 14904 ¶ 96.

interfering with certain peer-to-peer applications used by its customers.²⁷⁹ In both cases, the Commission’s enforcement actions directly targeted the specific practices in question and resolved the issues rapidly and effectively. In fact, even before the Commission issued its decision in the Comcast matter, Comcast and BitTorrent came together to acknowledge the network-management issue posed by peer-to-peer applications and worked collaboratively to develop solutions.²⁸⁰

Net neutrality proponents themselves have conceded that they are unable to produce a “roster of actual and potential ‘bad acts’” because there is “not [a] behavioral” problem in the broadband market today.²⁸¹ And this is so notwithstanding that cable modem service—still over half of the wireline broadband market²⁸²—has been largely unregulated for over a decade. Similarly, in the absence of any regulatory mandate, mobile service providers have responded to consumer demand by enhancing the broadband capabilities of their networks, expanding the choice of devices and mobile operating systems, enabling new platforms for innovative mobile applications, and supporting the development of tens of thousands of such applications—while,

²⁷⁹ See Memorandum and Order, *Formal Complaint of Free Press and Public Knowledge Against Comcast Corp. for Secretly Degrading Peer-to-Peer Applications*, 23 FCC Rcd 13028 (2008), *petns. for review filed sub nom. Comcast v. FCC*, No. 08-1291 (D.C. Cir. filed Sept. 4, 2008); Order, *Madison River Commc’ns, LLC*, 20 FCC Rcd 4295 (2005). The Commission’s *Madison River* decision pre-dates the *Internet Policy Statement* by several months, but was premised on the same fundamental principles found in that statement.

²⁸⁰ See Comcast Corp., Press Release, *Comcast and BitTorrent Form Collaboration to Address Network Management, Network Architecture and Content Distribution* (Mar. 27, 2008), available at <http://www.comcast.com/About/PressRelease/PressReleaseDetail.aspx?PRID=740&fss=bittorrent>.

²⁸¹ *Google Net Neutrality Comments* at 10; see also Comments of Open Internet Coalition, *Broadband Industry Practices*, WC Docket No. 07-52, at 3-12 (filed June 15, 2007) (citing concerns only of future discrimination).

²⁸² *FCC 2007 High-Speed Services Report* at tbl. 1.

at the same time, continuing to meet customers' expectations of a reliable, secure, and high-performing mobile service.²⁸³

Notably, the FTC has recognized that the broadband Internet access industry is “young and dynamic” and is “moving in the direction of more, not less, competition, including fast growth [and] declining prices for high-quality service.”²⁸⁴ In a report unanimously endorsed by Republican and Democratic Commissioners alike, the FTC warned that “[p]olicy makers should be wary of enacting regulation solely to prevent prospective harm to consumer welfare,” both because there is no demonstrated *need* for prospective regulations of general application and because “[i]ndustry-wide regulatory schemes—particularly those imposing general, one-size-fits-all restraints on business conduct—may well have *adverse effects* on consumer welfare.”²⁸⁵

The longstanding government policy of avoiding unnecessary regulation of the Internet has been a marked success. It has allowed the Internet to flourish beyond measure as an open ecosystem supporting a broad range of choices, to the benefit of all stakeholders—consumers, content and application providers, and network providers. In the Commission’s prescient words over a decade ago:

[T]he most important contribution to the success of the Internet that the FCC has made has been its consistent treatment of IP-based services as unregulated information services [T]he Commission should continue the approach of

²⁸³ See, e.g., AT&T, *Welcome to devCentral, AT&T’s Official Resource for Development*, <http://developer.att.com/developer/>; Leslie Cauley, USA Today, *AT&T flings cellphone network wide open* (Dec. 5, 2007), available at http://www.usatoday.com/money/industries/telecom/2007-12-05-att_N.htm; Open Handset Alliance, <http://www.openhandsetalliance.com/>; Sprint, Press Release, *Sprint Launches Open Software Platform at Eighth Annual Application Developer Conference to Help Millions More Developers Create Products for Sprint Customers* (Dec. 9, 2008), available at http://newsreleases.sprint.com/phoenix.zhtml?c=127149&p=irol-newsArticle_Print_newsroom&ID=1234093&highlight=.

²⁸⁴ *FTC Net Neutrality Report* at 10-11.

²⁸⁵ *Id.* at 1 (emphasis added).

studying new technologies and only stepping in where the purpose for which the Commission was created, protecting the public interest, demands it. . . . The Commission’s instinct, as it has always been, should be to permit market forces to work, because competition leads to the widest variety of consumer choices.²⁸⁶

The fruits of the Commission’s determination to stay on that path are all around us today. As discussed above in Section IV.B.1, the number and variety of broadband competitors increase every year, broadband providers are investing billions of dollars to increase broadband availability and enhance the capabilities of their networks, and new customers are signing up for service in droves. As a result of this increased competition, broadband prices have declined even as capacity has increased and new ways of connecting have emerged. That is not to say that there is not more to be done: Some areas of the country remain underserved, and too many Americans remain “off-net,” unable or unwilling to connect even when access is available to them. But the trend has been toward continued progress and enhancement of consumer welfare through an open Internet ecosystem that provides consumers across the country with a robust choice of services, applications, content, and end-user equipment.

Indeed, providers have increased capacity and improved the quality of service on a dizzying array of Internet devices. The market for online applications and services is vigorously competitive, dynamic, and rich with options that consumers can access without restraint.²⁸⁷ The video giant YouTube did not even exist in January 2005 but now delivers nearly 7 billion videos each month in the United States.²⁸⁸ Hulu, an online video site founded in March 2008, already

²⁸⁶ *Unregulation of the Internet* at 24-26.

²⁸⁷ *See FTC Net Neutrality Report* at 85 (“In addition, the Internet provides users with a wealth of choices of content and applications.”).

²⁸⁸ *See* comScore, Press Release, *Americans Viewed a Record 16.8 Billion Videos Online in April Driven Largely by Surge in Viewership at YouTube* (June 4, 2009), available at http://www.comscore.com/Press_Events/Press_Releases/2009/6/Americans_Viewed_a_Record_16.8_Billion_Videos_Online_in_April.

attracts 8.5 million users per month and will generate an estimated \$175 million in revenue this year thanks to content from Fox, NBC, ABC, Comedy Central, and more than 100 other sources.²⁸⁹ Social networking site Facebook claims over 200 million users and a valuation over \$10 billion.²⁹⁰ And the Internet ecosystem is awash with a mix of devices from all types of providers and choices that include “closed” or limited-purpose offerings—like the Amazon Kindle—and broad, unmitigated access services of all speeds and bandwidths over a wide variety of platforms.

In short, the vibrant and open Internet market is promoting precisely the virtuous cycle that the National Broadband Plan hopes to advance—and there is no evidence of harm to cloud the horizon.²⁹¹ Thus, the Commission should reaffirm that the current oversight formula—which relies on targeted enforcement of the *Internet Policy Statement* to safeguard openness in the Internet ecosystem—strikes the right balance and should be relied on going forward. The Plan should endorse the Commission’s proven *post hoc* enforcement policies and oversight to serve as a backstop to a market that is functioning well and producing desired, beneficial results.

²⁸⁹ See Daniel Lyons, Newsweek, *Old Media Strikes Back* (Feb. 21, 2009), available at <http://www.newsweek.com/id/185790>; Chris Preimesberger, eWeek, *Could the Hulu, Disney Deal Create a Tangled Video Web?* (May 2, 2009), available at <http://www.eweek.com/c/a/Services-Web-20-and-SOA/Could-the-Hulu-Disney-Deal-Create-a-Tangled-Video-Web-822881/>.

²⁹⁰ Douglas McIntyre, Daily Finance, *Facebook gets funding offer from Russian private equity firm* (May 23, 2009), available at <http://www.dailyfinance.com/2009/05/23/facebook-gets-funding-offer-from-russian-private-equity-firm/>.

²⁹¹ As a Google-funded research paper recently concluded, “the markets might be more effective than Congress in ‘punishing’ providers who try to set up proprietary roadblocks.” See Jeffrey F. Rayport & Andrew Heyward, MarketSpace Point of View, *Envisioning the Cloud: The Next Computing Paradigm*, at 29 (Mar. 20, 2009), available at <http://www.marketpaceadvisory.com/cloud/> (“*Envisioning the Cloud*”).

b. The Creation of New, Prescriptive Net Neutrality Rules or the Addition of a “Non-Discrimination” Requirement Would Inhibit Broadband Growth and Harm Consumers

The discussion above should dictate the Commission’s response to proposals to expand the principles or substitute prescriptive rules in their place. To begin with, there is no reason to do so, because there is no market failure to solve. As the Commission repeatedly has recognized, policymakers should “avoid regulation based solely on speculation of a potential future problem.”²⁹² Moreover, such proposals undermine the Commission’s and the nation’s most pressing objectives over the near term: expanding deployment of broadband facilities and investment in related technologies and services in order to increase not only availability but adoption.

The FTC has warned that “regulation . . . may . . . be welfare reducing in the long term, particularly in terms of product and service innovation”:

For example, prohibitions of certain business conduct, such as vertical integration into content and applications or the offering of prioritization services by broadband providers . . . could result in a long-term decline in investment and innovation in broadband networks. Broadband providers that cannot differentiate their products or gain new revenue streams may have reduced incentives to upgrade their infrastructure.²⁹³

Similarly, the Organisation for Economic Co-operation and Development (OECD) and economists across the board have observed that regulation based on speculation of future harm is premature and potentially damaging.²⁹⁴ As the market-research firm IDC has found, prescriptive

²⁹² *Unregulation of the Internet* at 25.

²⁹³ *FTC Net Neutrality Report* at 160.

²⁹⁴ Organisation for Economic Co-operation and Development, *Internet Traffic Prioritisation: An overview*, at 5 (Apr. 6, 2007), available at <http://www.oecd.org/dataoecd/43/63/38405781.pdf> (concluding that it would be “premature for governments to become involved at the level of network-to-network traffic exchange and demand neutral packet treatment for content providers”).

net neutrality regulation “would almost certainly delay broadband upgrades” by causing “operational paralysis while the facilities-based providers figured out what they could and could not do.”²⁹⁵ And the risk is not simply that deployment may be deterred, but that consumers’ needs may unwittingly be frustrated. Blunt, one-size-fits-all prescriptive rules could, for example, limit innovation and the availability of services over the Internet by precluding providers’ ability to ensure that users have the bandwidth they need or the service quality necessary to enable more sophisticated, quality-sensitive applications.

Nor should the Commission adopt a non-discrimination requirement, as some parties advocate.²⁹⁶ The market demonstrates no more need for such a rule than it does for any other move toward greater regulation. No proponent of a non-discrimination requirement has demonstrated that the existing *Internet Policy Statement* is in any way insufficient or that hypothetical concerns about “discrimination” have become a real-world problem. Indeed, the absence of a non-discrimination requirement did not in any way prevent the Commission from addressing the issues presented by *Madison River* or *Comcast*. Thus, the Commission would do well to heed its own sage advice and “avoid regulation based solely on speculation of a potential future problem.”²⁹⁷

Proponents of a non-discrimination requirement argue that a prohibition is nevertheless needed to govern business-to-business arrangements between broadband providers and

²⁹⁵ IDC, *U.S. Consumer Internet Traffic 2007-2011 Forecast: The Impact of Net Neutrality on Service Provider Infrastructure Investment*, at 7 (June 2007), available at <http://www.the-infoshop.com/study/id53339-internet-traffic.html> (“*IDC Report*”).

²⁹⁶ *Notice* ¶ 48. Although we disagree with Acting Chairman Copps’s recommendation of such a “fifth principle,” *Rural Broadband Report* ¶ 141, we applaud his continued endorsement of *post hoc*, case-by-case enforcement of the *Internet Policy Statement* principles, *id.*

²⁹⁷ *Unregulation of the Internet* at 25.

application and content providers seeking enhanced quality of service. In its most aggressive form, this argument would prohibit *any* such arrangements, on the theory that any type of differentiation among packets is inherently discriminatory. This is the view taken by Free Press, which continues to insist that the Commission adopt “rules [that] ensure equal treatment for all communications on the Internet regardless of their source, ownership, destination, application or content. No Internet packets should be given priority over others—whether the priority comes in the form of access, latency or bandwidth.”²⁹⁸

This extreme approach is absurd on its face. First, the differential treatment of packets (known today as “diff serv”) was approved more than a quarter-century ago by the Internet Engineering Task Force (IETF), which serves as the primary standards body for the Internet.²⁹⁹ Thus, notwithstanding its professed mission to “preserve” the open Internet and its disdain for Comcast’s purportedly “non-standard” use of TCP reset packets, Free Press undeniably is trying to re-write the open, IETF-approved standards that have made the Internet such a tremendous success. Indeed, even Free Press itself acknowledged—just three months ago—that diff serv is an appropriate mechanism for enabling priority treatment of certain packets that require special handling.³⁰⁰ Free Press’s flip-flop on the differential treatment of Internet traffic is as

²⁹⁸ See *Dismantling Digital Deregulation* at 76.

²⁹⁹ See Information Sciences Institute, *Internet Protocol DARPA Internet Program Protocol Specification, RFC 791*, at 11 (Sept. 1981), available at <http://www.ietf.org/rfc/rfc0791.txt>; *AT&T Net Neutrality Comments* at 38 (discussing RFC 791). DiffServ, or “Differentiated Services,” is a standard to support classification of IP traffic for quality-of-service management. See IETF, *Differentiated Services (diffserv)*, <http://www.ietf.org/html.charters/OLD/diffserv-charter.html>.

³⁰⁰ *Free Press DPI Report* at 8. This is not the first time Free Press has reversed itself on the issue of differential treatment. The “Save the Internet Coalition,” which lists Free Press as its lead coordinator, formerly advocated that “every Web site, every feature, and every service” on the Internet “should be treated exactly the same,” but subsequently retreated from that demand

inexplicable as it is misguided, and it provides a stark reminder of why engineering decisions about the Internet are best left to engineering experts rather than inside-the-Beltway interest groups.

Second, banning all differential treatment of packets on the Internet would prevent services, applications, and content from obtaining the quality of service they need to function optimally.³⁰¹ For example, latency-sensitive applications like streaming video would have to be given the same priority as email; an Internet VoIP 911 call could be treated no differently than a YouTube download; and a telemedicine application would need to be handled in precisely the same manner as the contents of a Web page. Carried to its logical conclusion, the ban proposed by Free Press would also mean the abolition of content-delivery networks like Akamai or Limelight that leverage edge networks to provide online customers with lower latency and higher quality of service than the competition. Likewise, Free Press's position that all Internet communications must receive "equal treatment" regardless of their "application or content" would require *all* application and content providers to design their applications and content using the same transport protocol—so that, for example, UDP-based applications that lack the ability to automatically "self-throttle" when faced with congestion do not receive priority over TCP-based applications that can "self-throttle."³⁰²

and excised "exactly the same" from its advocacy. See Reply Comments of AT&T Inc., *Petitions of Free Press and Vuze*, WC Docket No. 07-52, at 7 n.19 (filed Feb. 28, 2008).

³⁰¹ See Comments of AT&T Inc., *Petitions of Free Press and Vuze*, WC Docket No. 07-52, at 6-11 (filed Feb. 13, 2008) ("*AT&T Free Press/Vuze Comments*").

³⁰² UDP applications "send out data as fast as [they] can," even when they encounter congestion, "while [conventional] TCP-friendly applications deliberately send fewer and fewer packets" and may thus end up "starved of network resources." Jon M. Peña, *The Benefits and Risks of Mandating Network Neutrality, and the Quest for a Balanced Policy*, 1 Int'l J. of Comm'n 644, 651 (2007), available at <http://www.ijoc.org/ojs/index.php/ijoc/article/viewFile/154/90>. Nonetheless, when properly managed, UDP's attributes can be beneficial for a range of

Free Press’s position is simply untenable, both as a matter of public policy and as a matter of common sense. In fact, the absurdity and heavy-handedness of the “dumb pipes” position have led most net neutrality advocates to abandon the idea. Even Tim Wu, a leading net neutrality proponent—and the Chairman of the Free Press Board of Directors³⁰³—concedes that “certain classes of applications will never function properly unless bandwidth and quality of service are guaranteed,” and he cautions that the absence of such network management “can interfere with application development and competition.”³⁰⁴

In connection with its arguments in favor of homogenizing all Internet-based communications to ensure “equal treatment,” Free Press identifies another class of services that it calls “managed services,” which are delivered over some or all of the same facilities as Internet communications but that “do not connect to the Internet.”³⁰⁵ Free Press identifies “high-performance video games,” “VoIP,” and “direct connections between rural hospitals and urban medical research facilities to allow for rapid remote diagnosis and consultation” as three

purposes, including Domain Name System (DNS) queries. By the same token, some applications that use TCP can and do aggressively consume disproportionate amounts of subscriber bandwidth simply by opening up multiple streams (or “torrents,” as featured in some P2P technologies) to seize capacity for themselves. *See, e.g.,* Bob Briscoe, *Flow rate fairness: Dismantling a Religion*, 37 *Computer Comm’n Rev.* 63 (2007), available at http://www.cs.ucl.ac.uk/staff/bbriscoe/projects/2020comms/refb/fair_ccr.pdf (“*Flow Rate Fairness*”). But according to Free Press’s demand for “equal treatment” of all Internet communications, the disparate characteristics of these and other transport protocols would need to be homogenized to ensure that “no Internet packets [are] given priority over others.” *Dismantling Digital Deregulation* at 76.

³⁰³ Free Press, *Board of Directors*, http://www.freepress.net/about_us/board.

³⁰⁴ *See* Tim Wu, *Network Neutrality, Broadband Discrimination*, 2 *J. Telecomm’n & High Tech. L.* 141, 155 (2003) (“*Broadband Discrimination*”).

³⁰⁵ *Dismantling Digital Deregulation* at 78.

examples of managed services.³⁰⁶ According to Free Press, it may be appropriate to allow managed services to receive priority as compared to Internet communications because they “will clearly bring benefits that far exceed any harms resulting from their receiving favorable (*i.e.*, discriminatory) treatment,” and they “can increase efficient use of the broadband network and provide additional incentive for providers to expand capacity and coverage.”³⁰⁷

Notwithstanding these pro-consumer benefits, however, Free Press hypothesizes that there is still a risk that managed services could “squash the Internet” because service providers “*may* have strong incentives to allocate a disproportionate share of capacity to managed services,” leaving “insufficient bandwidth” for the Internet, thereby “reduc[ing] consumer choice, innovation and competition.”³⁰⁸ Unsurprisingly, Free Press offers no evidence to support its hypothetical concerns about today’s open Internet being “squashed”—and it willfully ignores the real-world facts that undermine its claims. If, as Free Press claims, ISPs plan to turn the Internet into a “dirt road” so they can reserve the broadband “superhighway” for their managed services,³⁰⁹ then one would expect to see static or decreasing Internet access speeds in the marketplace. But just the opposite is happening. Broadband providers are investing billions of

³⁰⁶ *Id.* In discussing managed services, Free Press asserts that AT&T’s IPTV service is a “cable service” under Title VI of the Communications Act because “[u]sers ‘flipping the dial’ are served up a requested channel using IP, but that IP request never reaches the wider public Internet [and] [t]hus, it is clearly a Title VI cable service, and is regulated as such.” *Id.* Contrary to Free Press’s misunderstanding of Title VI, transmission over the “public Internet” is not the litmus test for determining whether a video service is a “cable service” and, in all events, AT&T’s IPTV service is not a “cable service” under Title VI. *See, e.g.*, Letter from Jim Lamoureux, AT&T, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 04-36 (filed Aug. 14, 2006) (explaining that AT&T’s IPTV service is not a “cable service”); Letter from James C. Smith, AT&T, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 04-36 (Jan. 12, 2006) (same).

³⁰⁷ *Dismantling Digital Deregulation* at 78.

³⁰⁸ *Id.* (emphasis added).

³⁰⁹ *Id.* at 69.

dollars to substantially *increase* the amount of bandwidth available to their Internet access customers with products and services like AT&T’s U-verse Internet access service and upgraded 3G wireless service, Verizon’s FIOS service, the cable industry’s DOCSIS 3.0 services, and the wireless industry’s migration to Long Term Evolution (“LTE”).³¹⁰ If Free Press’s concerns had any basis in reality, these services presumably would not even exist. But they do exist, in large part for reasons the FTC has aptly identified: “ISPs have incentives to maintain sufficient best-efforts service that allows access to all content and applications providers because the value of an ISP priority service to a provider would be affected by the size of the ISP’s customer base,” and “ISPs may lose subscribers if they do not provide sufficient access.”³¹¹

Not only is the concern Free Press describes entirely hypothetical, but in addition, the anticipatory “solutions” it proposes would seriously impede job-producing investment in, and continued deployment of, higher-capacity broadband services. Free Press’s proposal to have “the FCC and Congress . . . require ISPs to allocate *enough* capacity to maintain a robust Internet

³¹⁰ Cablevision, for example, recently launched a 101 Mbps broadband Internet access service using DOCSIS 3.0 technology. See Karl Bode, Broadband DSL Reports, *Cablevision DOCSIS 3.0 Speeds “Within Months”* (Dec. 10, 2008), available at <http://www.dslreports.com/shownews/Cablevision-DOCSIS-30-Speeds-Within-Months-99611>.

³¹¹ *FTC Net Neutrality Report* at 91; see also *IDC Report* at 8 (noting that any benefit to be gained from auctioning off capacity to the highest bidder “pales in comparison to revenue opportunities associated with present and future consumer services”). More generally, as AT&T previously has explained, modern scholarship on the “internalization of complementary externalities” has demonstrated that a non-price-regulated, vertically integrated platform provider generally lacks incentives to devalue its platform by discriminating unreasonably against unaffiliated providers of complementary applications, even if it is dominant in the platform market. See, e.g., Joseph Farrell & Philip J. Weiser, *Modularity, Vertical Integration, and Open Access Policies: Towards a Convergence of Antitrust and Regulation in the Internet Age*, 17 *Harv. J.L. & Tech.* 85 (2003); see also Richard A. Posner, *Antitrust Law* 223-29 (2d ed. 2001); Christopher S. Yoo, *Network Neutrality and the Economics of Congestion*, 94 *Geo. L.J.* 1847, 1885-87 (2006); Christopher S. Yoo, *Vertical Integration and Media Regulation in the New Economy*, 19 *Yale J. on Reg.* 171 (2002). See generally *AT&T Net Neutrality Comments* at 66-71.

access service” on the “unmanaged” portion of their network³¹² would force legislators and the Commission to second-guess every bandwidth investment decision made by a network provider—hardly a conducive means of creating a stable, pro-investment regulatory environment. Free Press’s alternate proposal is equally absurd: It asks the Commission to rule that “no single managed service would be able to be offered at higher bandwidth than any consumer Internet access service offered by the same provider in the same area”—regardless of whether any consumers actually want or could afford that level of Internet access service if it were available.³¹³ Thus, if Free Press had its way, a rural hospital seeking a high-capacity “direct connection” to an urban medical center (a “managed service” according to Free Press)—which might require, for example, an OC-12 (622 Mbps) broadband transmission link—would not be able to obtain that service unless the provider of the managed service also offered a 622 Mbps Internet access service to consumers in the same area.

In short, Free Press’s “solutions” boil down to having the government dictate which broadband services and capabilities consumers *must* have rather than letting consumers *choose* the services and capabilities that best meet their needs. Such an approach is fundamentally at odds with this Commission’s long-standing practices of letting the “marketplace, not the government, pick the winners and losers among new services” and of “avoid[ing] regulation based solely on speculation of a potential future problem.”³¹⁴ And it undermines Congress’s

³¹² *Dismantling Digital Deregulation* at 78-79 (emphasis in original).

³¹³ *Id.* at 79.

³¹⁴ *Unregulation of the Internet* at 24-25.

directive for this Commission to focus on “achieving affordability of [broadband] service and maximum utilization of broadband infrastructure and service by the public.”³¹⁵

Perhaps recognizing the emptiness of the “dumb pipes” and “dirt road” arguments, some net neutrality proponents have suggested a variant of the “non-discrimination” requirement under which providers would be permitted to manage quality of service for certain applications, but be prohibited from *charging* for this network prioritization,³¹⁶ or be permitted to charge only “under the condition that the network operator did not price discriminate within a category of similar content providers.”³¹⁷ Neither proposal has merit.

To begin with, there is nothing improper or unusual about a broadband provider, which serves *both* end users and providers of Internet content and applications, from recovering a portion of its costs from each group. As intermediaries in a classic “two-sided” or “multi-sided” marketplace, broadband providers should be free to spread their costs between each side of that market in the manner dictated by competitive forces.³¹⁸ And in any event, prohibiting such arrangements would have the perverse effect of subjecting consumers to higher broadband rates than they might otherwise pay—an outcome hardly consistent with efforts to promote broadband adoption. Moreover, it is highly ironic that some of the biggest critics of the notion that network providers might recoup some costs from content and applications providers are themselves

³¹⁵ Recovery Act, § 6001(k)(2)(B).

³¹⁶ See, e.g., *Google Net Neutrality Comments* at 24; Comments of Earthlink and New Edge, *Broadband Industry Practices*, WC Docket No. 07-52, at 7 (filed June 15, 2007).

³¹⁷ See J. Gregory Sidak, *A Consumer-Welfare Approach to Network Neutrality Regulation of the Internet*, 2 J. Competition L. & Econ. 349, 426-27 (2006). Such a one-size or one-price-fits-all policy will only ensure that applications requiring higher than average service quality will be unable to secure it. See Benjamin Hermalin & Michael Katz, *The Economics of Product-Line Restrictions with an Application to the Network Neutrality Debate*, Info. Econ. & Pol’y, Vol. 19, 215-48 (2007).

³¹⁸ See *AT&T Net Neutrality Comments* at 75-77.

intermediaries in a two-sided market who shift all costs *away* from the end-user customers they serve. For example, Google offers its extensive search services to end users for free—and it recovers *all* its costs through charges to advertisers who want to reach Google end users. No one would suggest that Google be *forced* to charge users while allowing advertisers to post their ads for free.

Imposing a ban on “discrimination” in arrangements between broadband providers and content or application providers would be equally unjustifiable and misguided. For one thing, not even Title II services are subject to a complete ban on discrimination, which can in many cases be *welfare-enhancing*; Section 202 of the Act prohibits only “*unjust or unreasonable* discrimination.”³¹⁹ Moreover, the Commission repeatedly has determined that Title II-type common-carrier regulation is inappropriate for broadband Internet access services and would subvert multiple statutory provisions, including Section 230 of the Communications Act and Section 706 of the Telecommunications Act of 1996.³²⁰ Having concluded that it serves the public interest to allow a broadband provider to negotiate on an individualized basis with particular ISPs, there is no reasonable basis on which the Commission could look at the same dynamic marketplace and conclude that it would be *contrary* to the public interest for providers to negotiate individualized commercial arrangements with application and content providers—

³¹⁹ 47 U.S.C. § 202(a) (emphasis added). And the Commission and the courts have long made clear that this standard should be applied with great flexibility. *See, e.g., Orloff v. FCC*, 352 F.3d 415, 420 (D.C. Cir. 2003), *aff’g Orloff v. Vodafone AirTouch Licenses LLC d/b/a Verizon Wireless*, 17 FCC Rcd 8987 (2002).

³²⁰ *See, e.g., Wireline Broadband Order*, 20 FCC Rcd at 14865, 14877-78 ¶¶ 19, 44.

especially when these arrangements would encourage, not discourage, an array of innovative services and applications by making available new quality-of-service capabilities.³²¹

Common-carrier regulation would deter the free-wheeling experimentation that is at the heart of the Internet's success as a platform open to a broad range of consumer choices. Non-discrimination rules are "hard to write, and hard to enforce."³²² In the face of new rules whose reach is unclear, providers will tend to err on the side of caution and experiment less, not more.³²³ And even where the rules are clear, providers will be less likely to launch risky new offerings or enter into creative business alliances if they are bound to offer the same terms to all comers before even determining whether the offerings or deals are profitable.

In sum, a strict non-discrimination requirement would be utterly divorced from the consumer-focused nature of the principles in the *Internet Policy Statement*. The National Broadband Plan's goals of incenting more broadband deployment and increasing consumer adoption of broadband service require allowing providers the flexibility to offer new and unique services to attract and keep users online and enhance the quality and value of their experience.

Finally, if the Plan *were* nevertheless to endorse a non-discrimination requirement on the mistaken theory that this was "necessary" to advancing broadband deployment or adoption, that

³²¹ Further, as we have argued elsewhere, the Commission would lack the *legal authority* to adopt common-carrier-like non-discrimination rules for the Internet, having determined that the service is an "information service" exempt from Title II regulation, and having found that such regulation would chill "deployment and innovation" and frustrate the goals of the Act. *See AT&T Net Neutrality Comments* at 81.

³²² Edward W. Felten, *Nuts and Bolts of Network Neutrality*, at 6 (July 6, 2006), available at <http://itpolicy.princeton.edu/pub/neutrality.pdf>.

³²³ *See, e.g., Wireline Broadband Order*, 20 FCC Rcd at 14865 ¶ 19 ("[F]ast-paced technological changes and new consumer demands are causing a rapid evolution in the marketplace for [broadband Internet access] services. Wireline broadband carriers are constrained in their ability to respond to these changes in an efficient, effective, or timely manner as a result of the limitations imposed by [non-discrimination] obligations.").

same prohibition would need to be extended to all players in the broadband Internet environment—not only to broadband providers, but to application and content providers, including Internet-search and cloud-computing providers.³²⁴ All of these companies exert structural influence on whether the Internet will treat applications and content “neutrally.”³²⁵ Perhaps more than any other service, search providers like Google affect what consumers see, which websites will succeed or fail, and which viewpoints will influence public debate.³²⁶ Indeed, the very essence of an Internet search service is discrimination, *i.e.*, ranking results pursuant to an algorithm that inherently favors some websites over others, and the fairness of those rankings has been called into question on more than one occasion.³²⁷ Likewise, cloud-computing platforms (as with PC-desktop platforms) can “lock in” users—creating power that

³²⁴ On this basis, some have argued that neutrality rules should be extended to content providers. *See, e.g.*, David Hatch, CongressDaily, *Limited-Access Web Sites Gaining Favor, Raising New Issue of “Content Neutrality”* (May 20, 2009).

³²⁵ *See AT&T Net Neutrality Comments* at 85-92.

³²⁶ As AT&T has discussed, Google’s success is due in part to its worldwide private network, which guarantees it reliability and quality of service that competitors cannot match. *AT&T Net Neutrality Comments* at 16-20. Google’s enormous edge network, and other content-delivery networks like Akamai and Limelight, explode the net neutrality advocates’ myth that the Internet levels the playing field for every participant, regardless of size. *See SavetheInternet.com Coalition, Frequently Asked Questions*, <http://www.savetheinternet.com/=faq>. Quite apart from anything access or backbone networks might do, application and content providers with the capital resources needed to buy content delivery network services—or to build out their own global networks, as Google has done—will provide consumers with better performance than can any “mom-and-pop” site.

³²⁷ *See, e.g.*, *AT&T Free Press/Vuze Comments* at 38 (describing Google’s discriminatory treatment of certain political positions in its search results and blocking of political ads by Senator Susan Collins); Steve Lohr & Miguel Helft, New York Times, *New Mood in Antitrust May Target Google* (May 17, 2009), available at <http://www.nytimes.com/2009/05/18/technology/companies/18antitrust.html?ref=business> (describing how Google is giving its new social-networking application, “Google Profiles” priority treatment in search results, which “could give Google Profiles an edge over profiles from Facebook and other social networks, which have to earn their search result rankings”).

can be leveraged to make some services more attractive and reliable than others.³²⁸ There is simply no coherent way to apply non-discrimination rules in one context and not the other. Indeed, if, as Google and other application and content providers claim, a non-discrimination requirement is essential to ensuring an “open” Internet, *they can have no possible objection to being subject to that same requirement themselves.*

Of course, AT&T and most observers agree that such regulation is ill-advised; as a recent research report on “cloud computing” stated, “over-regulation could create a climate that impedes the cloud’s growth.”³²⁹ But it would be especially perverse to regulate broadband access—one component of the open Internet ecosystem—while ignoring the same issues everywhere else they arise.

c. The National Broadband Plan Should Not Apply Open-Platform Requirements to Wireless Networks Beyond the Experimental Upper 700 MHz C Block

For many years, through Democratic and Republican Administrations alike, the Commission has recognized that wireless services are provided in an intensely competitive and dynamic marketplace, and that regulation of the terms on which such services are offered would disserve the public interest. The Commission’s reliance on market forces to drive consumer benefits has been a resounding success. As the Commission’s own reports document, prices for wireless services have declined dramatically and are among the lowest in the world;³³⁰ service

³²⁸ See *Envisioning the Cloud* at 31-32 (noting the danger of “lock-in” and resulting consumer harm with proprietary cloud-computing systems like Google’s).

³²⁹ *Id.* at 44 (“For the cloud to grow naturally, the majority of experts consulted for this paper advocated that government take a ‘wait and see’ approach before rushing in to legislate and regulate this dynamic new space.”).

³³⁰ Thirteenth Report, *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*, WT Docket No. 08-27, ¶ 189 (rel. Jan. 16, 2009) (“[A]ll

quality has steadily improved and is at the highest level since measuring began,³³¹ and consumers are being greeted with a dizzying array of revolutionary new devices, features, and applications.³³² For example, in the year since Apple launched its online application store, more than 40,000 iPhone applications have been introduced, and more than *one billion* applications have been downloaded.³³³ At the same time, other handset manufacturers, operating-system developers, and carriers have responded with their own application stores, bringing even more innovation and investment to the benefit of consumers and the economy at large. Indeed, the mobile wireless marketplace—and, in particular, *broadband* wireless—has been one of the few bright spots during this historic economic downturn. While most sectors of the economy are experiencing severe contraction, job losses, and reduced investment, the broadband wireless industry continues to expand rapidly and remains a magnet for infrastructure investment,

of the indicators show that the cost of mobile telephone service fell in 2007.”); *id.* ¶ 219 (finding that average revenue per minute in the United States is “less than one-third of the European average” and one fourth of the average revenue per minute in Japan).

³³¹ *Id.* ¶¶ 214-15; *see also id.* ¶ 216 (noting particularly high service quality for 3G users).

³³² Indeed, Google’s senior director for mobile platforms has said that, “in general, carriers will be slower in the United States to introduce Android phones than in Europe . . . [because] the *domestic market is so competitive that carriers and handset makers want to create highly distinctive versions of the Android phone to give themselves an edge.*” Matt Richtel, New York Times Bits Blog, *Google: Expect 18 Android Phones by Year’s End* (May 27, 2009), <http://bits.blogs.nytimes.com/2009/05/27/google-expect-18-android-phones-by-years-end/> (emphasis added). *See also* T-Mobile, Press Release, *T-Mobile Unveils the T-Mobile G-1 – the First Phone Powered by Android* (Sept. 23, 2008), available at http://www.t-mobile.com/company/PressReleases_Article.aspx?assetName=Prs_Pr_20080923&title=T-Mobile%20Unveils%20the%20T-Mobile%20G1%20-%20the%20First%20Phone%20Powered%20by%20Android (the world’s first Android-based phone to be launched first in the United States, followed by later European launch).

³³³ Fortune Magazine Apple 2.0 Blog, *iPhone App Store: 40,000 and counting* (May 7, 2009), <http://apple20.blogs.fortune.cnn.com/2009/05/07/iphone-app-store-40000-and-counting/>; Apple, *Thanks a billion*, <http://www.apple.com/itunes/billion-app-countdown/>.

innovation, and new jobs. If ever there were a sector in which the government should be wary of unnecessary intervention, this is it.

Yet despite this stark evidence that the wireless market is vigorously serving both consumers *and* third-party content and application providers, some parties persist in urging the Commission not only to extend the *Internet Policy Statement* principles to wireless, but to interpret that policy to impose the new requirement that *every* wireless network be open to *every* device and application.³³⁴ Some of those parties go so far as to claim that the Commission should apply those requirements *retroactively*, and open investigations to determine whether wireless carriers *already* have violated them.³³⁵ The Commission should reject such suggestions as wholly unnecessary and inimical to the public interest.

To begin with, the Commission has stated repeatedly that it has not yet determined whether to apply the *Internet Policy Statement* to wireless or made any “finding regarding whether to apply open access requirements to wireless broadband services generally.”³³⁶ Thus, those who claim that the principles already apply to wireless services are demonstrably wrong. And even if the *Internet Policy Statement* did apply to wireless networks, those principles certainly would not require that every wireless device and operating system be “open” to every

³³⁴ See Notice ¶¶ 48, 99 (asking for comment on wireless open-network rules); Letter from Ben Scott, Free Press, to Acting Chairman Michael J. Copps, FCC, WC Docket No. 07-52 (Apr. 3, 2009) (“*Free Press Wireless Ex Parte*”) (advocating the application of universal open-platform rules to all wireless network providers).

³³⁵ See *Free Press Wireless Ex Parte*.

³³⁶ See Notice ¶ 24 n.28 (“The extent to which the principles in the Internet Policy Statement apply to wireless service providers is currently before the Commission.”); Second Report and Order, *Service Rules for the 698-746, 747-762, and 777-792 Bands*, 22 FCC Rcd 15289, 15363 ¶ 202 n.463 (2007) (“*700 MHz Second Report and Order*”) (“[T]he Commission has not yet made a finding regarding whether to apply open access requirements to wireless broadband services generally, and in this *Order*, defers that determination to the appropriate pending proceedings.”).

possible application. To the contrary, the only such “any device/any application” requirement that the Commission has *ever* imposed is the specific license condition on the 700 MHz C Block spectrum. Recognizing that this unique license condition goes far beyond the *Internet Policy Statement* principles, the Commission imposed open-platform rules on the C Block so that it could “observe the real-world effects of such a requirement;” the Commission flatly denied requests to extend the rules to other 700 MHz spectrum because of concern for “unanticipated drawbacks” from such an untested approach.”³³⁷

The Commission’s decision to tread cautiously in this area—limiting open-access requirements to the C Block—was a wise one. For one thing, there is no market failure warranting broader regulatory intervention. As noted, the wireless marketplace exhibits all the indicia of a vigorously competitive marketplace—rising output, falling prices, improving service quality, and aggressive capital investment. Moreover, dozens of providers, hundreds of devices, numerous competing operating systems, tens of thousands of applications, and a host of different value propositions are all providing an incredible array of choices to consumers.³³⁸ For example, AT&T offers its customers the world’s major operating systems and environments, including Blackberry, Java, Mac OS X Leopard (iPhone), Microsoft Windows Mobile, Palm OS, and

³³⁷ 700 MHz *Second Report and Order*, 22 FCC Rcd at 15364 ¶¶ 196, 205 (emphasis added).

³³⁸ For example, AT&T’s customers are free to choose any of a wide array of handsets with varying operating systems, features, functionalities, and prices, including, for example, handsets that support VoIP over AT&T’s 3G network. AT&T supports and markets numerous Windows Mobile handsets (produced by Samsung, LG, HTC, Pantech, and Motorola), and any AT&T customer using these handsets can download and use Skype software to make Skype calls over AT&T’s 3G network—which treats the Skype packets like other data packets, neither restricting nor prioritizing their delivery. *See* AT&T Wireless, *PDAs and Smartphones – Data Only*, <http://www.wireless.att.com/cell-phone-service/cell-phones/pda-phones-smartphones.jsp> (listing all available smartphones); Skype 2.5 for Windows Mobile, <http://www.skype.com/download/skype/windowsmobile> (offering full-featured Skype software usable on Windows Mobile). Consumers also may bring their own handsets, including those that are pre-loaded with Skype, and use those handsets on AT&T’s 3G network.

Symbian, and the company works with developers to create applications and content that work in these environments. AT&T's own wireless Internet portal, MEdiaNet, offers a rich array of applications and content, and AT&T recently launched MEdia Mall 2.0, which has more than 90,000 choices from more than 115 different content providers that AT&T customers can download to their wireless handsets. And AT&T customers can, of course, download virtually any compatible application without restriction directly from the Internet, including the more than 4,000 applications that AT&T has helped developers optimize for our network.³³⁹ As an alternative, AT&T also offers its customers the option of the iPhone and use of Apple's "App Store," which provides customers an enhanced level of quality and safety, as compared with downloading applications directly from the Internet.

Another option available to customers in the wireless marketplace is the Google/Android model, which provides an operating system that purports to be open to any applications developer with no pre-certification process. This offers consumers a different, competing experience—one in which they bear greater risks related to quality and security.

In addition, in the 700 MHz C Block model, consumers may use *any and all devices of their choosing* on the licensee's C Block network, regardless of the manufacturer. The C Block licensee *may not disable features* on devices provided to customers *or lock devices* so that they work only on the licensee's network, must allow devices to access *any and all capabilities* of the licensee's C Block network, and must ensure that devices the licensee provides to customers are *open to any and all applications*.³⁴⁰

³³⁹ All of this and more is detailed at the AT&T Choice website, www.att.com/choice.

³⁴⁰ See 47 C.F.R. § 27.16(b), (e). See also *id.* § 27.16(b)(1) & (2) (establishing limited exception to open devices and applications requirements where "use would not be compliant with published technical standards reasonably necessary for the management or protection of the

With such a wide variety of models for consumers to choose from, there is no reason for the government to step in and homogenize the wireless marketplace by dictating that every single provider must adopt one model to the exclusion of all others. As discussed further below, forcing all wireless broadband offerings into a one-size fits-all model would only reduce competition and consumer choice.

But apart from the lack of any need for government intervention, the imposition on wireless networks of principles devised for *wireline* networks would impose significant social costs. There are critical differences between wireless and wireline networks—differences that wireless net neutrality proponents simply ignore. One is in the area of network management: Wireless providers cannot simply expand capacity at will to address congestion. To the contrary, wireless networks must be engineered and dynamically managed to address unique spectrum-based bandwidth constraints and the challenge of serving a diverse range of devices that support different functions. This process is all the more crucial and challenging given that voice and data services share the same bandwidth, and wireless networks must accommodate the shifting usage patterns of a mobile customer base. The failure of any wireless carrier to manage its network adequately—especially in response to congestion caused by just a small percentage of especially heavy users—could degrade the quality of basic service (voice and data) experienced by the majority of the carrier’s customers. To the extent net neutrality requirements would constrain carriers from properly managing their wireless networks, those requirements would harm consumers.

licensee’s network,” or “[a]s required to comply with statute or applicable government regulation”).

Another difference between wireline and wireless networks is in the way products are delivered to customers. Specialized devices have long been a hallmark of the wireless customer experience. Some devices support Wi-Fi, but some do not; some support full-motion video capture or playback, some do not; some support GPS location-based social-networking applications and others do not; some are designed for only limited Internet functionality and do not even permit voice calls.

This diversity of device-application combinations allows consumers to find the package that best suits their needs and their price point—and a great deal of the competition and innovation that drives the wireless broadband market results from providers competing to design device-service packages targeted at specific user groups. A classic example of this is the Amazon Kindle, which is offered in support of *one specific* wireless application: downloading and reading books and other print materials from Amazon’s online collection. Because it is equipped with memory, a processor, and a 3G connection, the Kindle actually *could* be used to perform any Internet access function, but Amazon has offered the device with deliberately limited service (and terms of use that require users to agree to this limitation)³⁴¹ in order to serve a particular market need at a particular cost. The Kindle provides an alternative to the iPhone, for example, which similarly supports e-book reader applications but also includes broader Internet access—and accordingly requires users to pay monthly connectivity fees. A range of

³⁴¹ See Amazon Kindle: License Agreement and Terms of Use, § 2, http://www.amazon.com/gp/help/customer/display.html/ref=kin2w_ddp?nodeId=200144530&#wireless (“You agree you will use the wireless connectivity provided by Amazon only in connection with Services Amazon provides for the Device. You may not use the wireless connectivity for any other purpose”; “You may be charged a fee for wireless connectivity for your use of other wireless services on your Device, such as Web browsing and downloading of personal files, should you elect to use those services,” and Amazon reserves the right to change those fees at any time).

other specialty wireless devices exist that, like the Kindle, are optimized to support a specific application and address a particular consumer need.³⁴²

Requiring every wireless device to support every application uniformly would eliminate the rich diversity and choice that characterizes the wireless marketplace today. For example, such a rule would absurdly force the Kindle off the shelves (or force Amazon to add monthly service fees) despite its popularity and unique value proposition.³⁴³ More generally, mandating an open-platform model would force many customers to forgo the quality assurances they value, effectively degrading their wireless experience. Today, wireless providers aim to offer their customers seamless integration among their device, their operating system, the application they select, and their wireless connection. This provides end users with a reliable and predictable customer experience, as well as high-level security and reliability. That model of service

³⁴² See, e.g., AT&T, Press Release, *Mednet to Offer Wireless Heart Monitoring with AT&T* (Mar. 27, 2009), <http://www.att.com/gen/press-room?pid=4800&cdvn=news&newsarticleid=26659>; Amol Sharma & Roger Cheng, Wall Street Journal, *Sprint Looks to Power Gadgets Beyond Cellphones* (Mar. 24, 2009), available at <http://online.wsj.com/article/SB123785070580819121.html> (reporting that Sprint “is now talking with companies such as GPS device maker Garmin Ltd., Eastman Kodak Co. and SanDisk Corp., which makes storage devices, about delivering wireless Internet service for their products”); Nilay Patel, Engadget Blog, *T-Mobile Announces Tiny New ‘Embedded SIM’ For Connected Devices* (Apr. 23, 2009), <http://www.engadget.com/2009/04/23/t-mobile-announces-tiny-new-embedded-sim-for-connected-devices/> (“T-Mobile’s . . . new SIMs are the size of a pinhead and made of silicon instead of plastic, which allows them to be coded at the factory and hard-mounted directly to a device. . . . Devices with the new SIMs are expected to be out and sending data over T-Mo’s network in as little as six months—the first is an energy meter from Echelon that should hit soon.”); AT&T, *Fact Sheet: AT&T and Consumer Choices* (2008), <http://www.att.com/Common/merger/files/pdf/Wireless-choices-fs.pdf> (listing more than 100 manufacturers of AT&T-supported specialty devices, including taxi dispatch systems, wireless construction-management systems, point-of-sale terminals, remote fiber-inspection devices, vehicle security devices, dual-mode wireless and landline phones, and devices for special-needs consumers).

³⁴³ See Johna Till Johnson, Network World, *What’s an ISP? (That’s Not a Trick Question)* (Nov. 24, 2008), available at <http://www.networkworld.com/columnists/2008/112408johnson.html> (“So if you support net neutrality, you’ll need to tell Amazon to close up shop, at least for the Kindle. (And I’ll probably have to come whack you with my now-useless book reader.)”).

contrasts with the wireline model, where users typically assemble their own total-service platforms—purchasing a device from one provider, virus and malware security software from another, the broadband connection from yet another—and where users bear full responsibility for troubleshooting the interactions between these and other components.

To be sure, as noted above, wireless customers who prefer a more “wired” experience can choose devices and operating systems that offer that experience. For example, the Google/Android platform provides users with a more “PC-like” experience, in which users are free to run any application, at their own risk. But neither consumers nor providers should be *forced* to adopt this do-it-yourself model, which may leave many consumers facing risks and burdens they would rather avoid. It was recently suggested, for example, that Google’s “Open Source” Android operating system was vulnerable to applications that might allow hackers to take control of a user’s phone and, for example, snoop on the user’s browser history and web transactions.³⁴⁴ Users may prefer the iPhone model, in which Apple has reviewed and approved the applications available in the iTunes App Store as being secure. And the issue is not just safety. In contrast to the models adopted by Google/Android and required for the C Block licensee, the iPhone model guarantees consumers a certain level of quality and a certain customer experience. The degree to which consumers value this was illustrated by the outcry that ensued when the offensive “Babyshaker” application “slipped through the cracks” and appeared in the iTunes App Store for one day.³⁴⁵ While some users may choose the “Android”

³⁴⁴ See Samantha Rose Hunt, TG Daily, *Android: Browser So Vulnerable Users Urged Not to Use It* (Feb. 13, 2009), available at <http://www.tgdaily.com/content/view/41445/108> (“[A] security researcher presented a new vulnerability in Google’s mobile OS Android, which lets hackers take control of the phone’s web browser and other processes from a remote location.”).

³⁴⁵ See Jessica Mintz, ABC News, *Apple Pulls Plug on “Baby Shaker” iPhone Program After Outcry Online* (Apr. 22, 2009), <http://i.abcnews.com/Technology/wireStory?id=7406406>.

or “C Block” models, the availability of the more managed and customized iPhone option clearly *enhances* the consumer experience for many, and there is no public interest to be served by eliminating that option.³⁴⁶

In short, each device and operating system represents myriad trade-offs among network management, design specifications, and the types of customers that are targeted. An inflexible “openness” requirement would eliminate all of this innovation and disserve consumers. It matters little if this approach is prescriptive or enforced after the fact. Commission decisions on the “reasonableness” of particular aspects of these offerings would represent purely arbitrary second-guessing of network management decisions and business judgments, leaving providers, manufacturers, and application developers uncertain about what, if any, offering might pass muster. It is hard to see what consumer interest could be served by deterring the development of the next Kindle or iPhone.

As noted, open-platform requirements *have* been imposed on the Upper 700 MHz C Block, but the Commission declined to impose such requirements on other spectrum, noting, “we cannot rule out the possibility that *such a requirement may have unanticipated drawbacks as well.*”³⁴⁷ To reverse course now, suddenly, would be utterly arbitrary, unfair to licensees that

See also Gibson’s Blog, *Baby Shaker Slipup* (April 25, 2009), <http://www.gibsontang.com> (“The Android Market allows developers to have instant upload without any review process. So does that mean that offensive apps such as Baby Shaker or those in a similar vein will make it into the market? The answer is yes.”).

³⁴⁶ Further, the Commission lacks authority to dictate to operating-system developers which functionalities, features, and content they must support, which APIs they must publish, and which applications they must approve.

³⁴⁷ *700 MHz Second Report and Order*, 22 FCC Rcd at 15364 ¶ 205 (emphasis added); *see also id.* at 15361 ¶ 195 (“We conclude, however, that it would not serve the public interest to mandate, at this time, requirements for open platforms for devices and applications [even] for all unauctioned commercial 700 MHz spectrum.”); 47 C.F.R. § 27.16.

invested billions in 700 MHz and other spectrum on the understanding that they would be *unencumbered* by open-platform requirements, and would be in any event a hazardous experiment for all the reasons set forth above. And there is demonstrably no justification for the Commission to impose this experiment on a market that already is aggressively responding to consumers' needs for wireless service, access to the Internet and to a range of applications and content, and customized devices and services. In this context, there would be little to be gained that providers do not already offer—and there would be much to lose.³⁴⁸

d. Rather Than Adopt Prescriptive Regulation, the Commission Should Encourage and Facilitate Industry Collaboration to Resolve Network Management Issues

Almost everyone recognizes the need for, and benefit of, reasonable network management. As one researcher wrote in a recent report, certain applications “on unmanaged networks can use a disproportionately high amount of bandwidth and cause network congestion.”³⁴⁹ This is a classic tragedy-of-the-commons dynamic, in which each network user

³⁴⁸ In all events, the Commission could not lawfully open investigations into whether wireless carriers' *past* actions complied with either the *Internet Policy Statement* or any other “openness” principles. It is well settled that the Commission cannot lawfully penalize a private party for violating a rule if the party did not have fair notice of the substance of the rule or whether it applied. *See, e.g., Satellite Broad. Co. v. FCC*, 824 F.2d 1, 3 (D.C. Cir. 1987) (“Traditional concepts of due process incorporated into administrative law preclude an agency from penalizing a private party for violating a rule without first providing adequate notice of the substance of the rule.”); *NetworkIP LLC v. FCC*, 548 F.3d 116, 122 (D.C. Cir. 2008) (“‘[I]ndividuals should have an opportunity to know what the law is and to conform their conduct accordingly,’ [and a]nything less ought not to be dignified with the title of law.”) (quoting *Landgraf v. USI Film Products, Inc.*, 511 U.S. 244, 265 (1994)). The Commission has never even arguably put wireless carriers on notice that the *Internet Policy Statement* or any other openness requirement applies to their services.

³⁴⁹ George Ou, The Information Technology and Innovation Foundation, *Managing Broadband Networks: A Policymaker's Guide*, at 3 (Dec. 2008), available at http://www.itif.org/Network_Management.pdf. The report urged regulators to “provide ISPs the flexibility they need to manage complex networks while also ensuring oversight to insure that network management practices are not being applied in anti-competitive ways.” *Id.* at 2.

has strong incentives to hoard shared bandwidth for itself at the expense of others. Left unchecked, the resulting congestion and degradation of Internet service for other users would impose deadweight losses on the industry and consumers alike. And those who use and need only moderate amounts of bandwidth would suffer the most, since they would both see their service quality suffer *and* be forced to subsidize higher system-wide costs attributable to those users with the greatest bandwidth needs.

To date, however, network providers have been forced to cope with network congestion on their own—having to guess at how their attempts at network management will be received by other stakeholders.³⁵⁰ The goal must be to move beyond this one-sided approach and these one-off debates and engage all stakeholders in a cooperative effort to tackle the real-world congestion-management problems that ultimately harm the entire Internet economy. Achieving this goal will require all parties to recognize that, in addition to their own rights, each has responsibilities to help ensure a healthy and open Internet.

Many Internet stakeholders—network providers, application providers, and members of the technical community—are already doing just that. For example, Comcast and BitTorrent came together to reach a deal on handling BitTorrent’s traffic flows—which is a far more productive use of both companies’ resources than lawyer-driven complaint proceedings before

³⁵⁰ For example, although Time Warner Cable and Comcast have been criticized for proposing usage-based pricing models, *see* Rob Pegoraro, Washington Post, *Broadband Caps Can Cost You* (May 3, 2009), *available at* <http://www.washingtonpost.com/wp-dyn/content/article/2009/05/02/AR2009050200123.html>, some net neutrality advocates contend that usage-based pricing can be beneficial for consumers, *see, e.g.*, David Sohn, Policy Beta, Center for Democracy and Technology, *Don’t Slam the Door on Usage-Sensitive Pricing* (Apr. 24, 2009), *available at* <http://blog.cdt.org/2009/04/24/1048/>.

the Commission.³⁵¹ More broadly, AT&T is part of an industry-wide working group—composed of representatives from BitTorrent, Joost, LimeWire, Cisco, Verizon, Verisign, and researchers from Yale and Washington Universities, among others—that is trying to develop an efficient, network-aware, peer-to-peer technology. Known as “P4P,” this new generation of technology is being developed to optimize network resources rather than hoard them.³⁵² In addition, some in the technical community are pondering how to improve the Internet’s transfer protocols. Researchers at BT and University College London, for example, have suggested that there are some inherent problems in TCP’s focus on “relative flow rate” fairness, for example, and that “cost fairness”—a concept that would judge transport control mechanisms by how well “they share out the ‘cost’ of each user’s actions on others”—would be more appropriate.³⁵³ Efforts to bring the industry together for overarching technical solutions would be far more productive than continued warring over entrenched policy positions. The National Broadband Plan should promote these and similar cooperative efforts going forward.

5. The Commission Should Ensure That Its Approach to Spectrum Policy Does Not Undermine Achievement of the National Broadband Plan’s Goals

Wireless services are a core part of the future of broadband, and promoting their deployment and adoption should be a key component of the National Broadband Plan and the

³⁵¹ Anne Broache, CNET News Blog, *Comcast and BitTorrent agree to ‘collaborate’* (Mar. 27, 2008), http://news.cnet.com/8301-10784_3-9904494-7.html.

³⁵² See Distributed Computing Industry Association, *DCIA P4P Working Group Mission Statement*, available at http://www.dcia.info/documents/P4PWG_Mission_Statement.pdf. The working group’s mission is to “work jointly and cooperatively . . . to ascertain appropriate and voluntary best practices for the use of ‘P4P’ mechanisms to accelerate distribution of content and optimize utilization of ISP network resources in order to provide the best possible performance to end user customers.” *Id.*

³⁵³ See, e.g., *Flow Rate Fairness* at 63-74.

Commission's regulatory agenda going forward. As we have explained above, wireless broadband provides an exceptionally efficient and flexible means of reaching large numbers of subscribers over far-flung distances, making it ideal for many areas that remain unserved or underserved by broadband today. These services also make possible a range of applications requiring mobility and portability that wireline broadband services cannot support, including public-safety applications and machine-to-machine uses such as remote meter reading and medical monitoring. Wireless broadband services also yield unique public-welfare benefits, such as mobile commerce and navigational assistance.

What is more, mobile broadband services complement the way Americans increasingly live and communicate. Already, a fifth of U.S. homes no longer have traditional landlines and use only wireless service.³⁵⁴ And the rate at which consumers are using wireless devices to access data is skyrocketing. Between 2005 and 2008, the percentage of wireless-subscriber revenues attributable to data use nearly *tripled*, reaching over 23 percent.³⁵⁵ Smartphone use is expanding rapidly throughout the United States and the world, making up about 10 percent of the mobile-phone market in 2007, with predicted annual growth rates of between 30 and 60

³⁵⁴ Alan Fram, *The San Jose Mercury News*, *A fifth of US homes have cell phones, no landlines* (May 6, 2009), available at http://www.mercurynews.com/breakingnews/ci_12308733?nclick_check=1; see also Robert F. Roche, CTIA—The Wireless Association, *Wireless Performance and Promise: The U.S. Wireless Case*, at 15 (Apr. 2, 2009) (“*CTIA Wireless Performance Report*”); Dr. Robert F. Roche & Lesley O’Neill, CTIA—The Wireless Association, *CTIA’s Wireless Industry Indices—Semi-Annual Data Survey Results: A Comprehensive Report from CTIA Analyzing the U.S. Wireless Industry, Year-End 2008 Results*, at 32-33 (May 2009), available at <http://www.ctia.org/advocacy/research/index.cfm/AID/10316> (“*CTIA Semi-Annual Report*”).

³⁵⁵ *CTIA Wireless Performance Report* at 5; *CTIA Semi-Annual Report* at 1-2, 6, 9, 112-13, 115 (in the second half of 2008, the wireless industry generated \$75.35 billion in revenues, including \$17.54 billion in wireless data revenues).

percent.³⁵⁶ And in 2007 alone, 68 percent of all broadband subscribers added in the United States were mobile subscribers.³⁵⁷

Wireless providers have been investing in broadband at an unprecedented pace to meet this growing need.³⁵⁸ As discussed above, many carriers are deploying 3G networks across the United States—AT&T itself offers this technology in nearly 350 markets.³⁵⁹ Wireless companies currently offer Wi-Fi and WiMAX, and upgrades to LTE are coming soon.³⁶⁰ Nevertheless, wireless broadband is still a relatively new market phenomenon, and its full promise has yet to be realized. Some wireless broadband providers, like Clearwire, are just launching their networks, and next-generation technologies, like LTE, have not yet reached the

³⁵⁶ Al Sacco, CIO, *Apple Tops Motorola, Microsoft in Global Smartphone Sales; Nokia, RIM Still Market Leaders* (Feb. 7, 2008), available at http://www.cio.com/article/181001/Apple_Tops_Motorola_Microsoft_in_Global_Smartphone_Sales_Nokia_RIM_Still_Market_Leaders.

³⁵⁷ *An Examination of Competition in the Wireless Industry: Hearing Before the Subcomm. on Communications, Technology, and the Internet of the House Comm. on Energy and Commerce*, 111th Cong., at 4 (May 7, 2009) (statement of George S. Ford, Chief Economist, Phoenix Center for Advanced Legal and Economic Public Policy Studies), available at http://energycommerce.house.gov/Press_111/20090507/testimony_ford.pdf (“*Ford Hearing Testimony*”).

³⁵⁸ See, e.g., *Fifth Section 706 Report*, 23 FCC Rcd at 9625 ¶ 19; *Ford Hearing Testimony* at 5 (“The industry incurs about \$20 billion in capital expenditures annually.”); AT&T, *AT&T Wireless Network at a Glance* (2008), available at <http://www.att.com/Common/merger/files/pdf/wirelessnetwork/network-glance.pdf> (“Between 2005 and the end of this year, AT&T will have invested more than \$20 billion to expand and enhance the scope and capability of its wireless network.”) (“*AT&T Network Fact Sheet*”).

³⁵⁹ *AT&T Network Fact Sheet; AT&T 3G Press Release* (“AT&T’s 3G mobile broadband network is now available in nearly 350 U.S. major metropolitan areas, with about 20 additional metro areas planned for deployment in 2009.”).

³⁶⁰ Marguerite Reardon, CNET Reviews, *Verizon promises 4G wireless for rural America* (Apr. 1, 2009), available at http://reviews.cnet.com/8301-12261_7-10209933-51.html.

point of widespread commercial deployment.³⁶¹ And there are many parts of the country where even more established providers offering time-tested technologies have not yet made the substantial investments required to deploy wireless broadband networks. The question that the National Broadband Plan must address is how to promote conditions that will facilitate the investment and innovation necessary to expand wireless broadband beyond incipient promise and make it a widespread reality.

The answer lies in large part in the light-touch regulatory approach that has fueled the spectacular success of the existing wireless industry. The vast majority of Americans now have access to three or more wireless providers³⁶² and can choose from dozens of handset options.³⁶³ The number of cell sites in service has been increasing by 13.5 percent year-over-year, with 242,130 cell sites in operation at the end of 2008; cumulative wireless capital expenditures reached more than \$264 billion by the end of 2008; and wireless providers directly employ almost 270,000 people and create millions of ancillary jobs.³⁶⁴ And the “virtuous cycle”

³⁶¹ See, e.g., New Mexico Business Weekly, *Clearwire, Cisco Join for WiMAX* (May 14, 2009), available at <http://www.bizjournals.com/albuquerque/stories/2009/05/11/daily43.html> (“Clear 4G mobile service will be available in more than 80 U.S. markets by the end of 2010. Cisco aims to introduce its first mobile WiMAX device later this year.”).

³⁶² According to the Commission’s most recent report on the state of competition in the wireless market, more than 95 percent of U.S. consumers live in areas served by at least three wireless service providers, and nearly 65 percent live in areas served by at least five. *Thirteenth Wireless Competition Report* ¶¶ 2, 40; see also *CTIA Semi-Annual Report* at 1, 4 (more than 150 wireless companies compete to offer service in the United States).

³⁶³ *Ford Hearing Testimony* at 3. AT&T alone offers devices from more than a dozen manufacturers, including handsets that are compatible with six different operating systems and five different e-mail applications. *AT&T 3G Press Release*.

³⁶⁴ CTIA—The Wireless Association, *Semi-Annual Wireless Industry Survey, Year-End 2008 Top-Line Survey Results*, at 10 (2009), available at http://files.ctia.org/pdf/CTIA_Survey_Year-End_2008_Graphics.pdf (“*CTIA 2008 Year-End Report*”) (number of cell sites); *CTIA Semi-Annual Report* at 150-52 (same); *CTIA Wireless Performance Report* at 9 (capital expenditures); *CTIA Semi-Annual Report* at 1-2, 7, 124 (same); CTIA—The Wireless Association, *Wireless*

discussed above³⁶⁵ is accelerating rapidly in the wireless industry: As of the end of 2008, more than 270 million Americans subscribed to wireless services³⁶⁶—87 percent of the population has a wireless phone.³⁶⁷ In 2008, U.S. consumers used 2.2 trillion minutes of wireless service³⁶⁸—and the monthly minutes of use per subscriber in the United States far exceeded those for any other country.³⁶⁹ Moreover, Americans pay *less* per minute than wireless users in other countries.³⁷⁰ Indeed, revenues per minute have declined dramatically over the past decade,³⁷¹ even as carriers have offered more and more options and applications to their customers, including location-based services, parental protections, wireless video, wireless broadband, family plans, prepaid offerings, street-level coverage maps, customer-service summaries listing service-plan information, and pro-rated early-termination fees (“ETFs”).³⁷²

This robust marketplace is the result of Congress’s prescient decision to adopt a deregulatory approach to the wireless industry at both the state and federal levels, *see* 47 U.S.C.

Quick Facts, <http://www.ctia.org/advocacy/research/index.cfm/AID/10323> (employment figures); *CTIA Semi-Annual Report* at 8, 166-68 (same).

³⁶⁵ *See, e.g.*, Section I.A.

³⁶⁶ *CTIA 2008 Year-End Report* at 5; *CTIA Semi-Annual Report* at 1, 30.

³⁶⁷ *Ford Hearing Testimony* at 3; *CTIA Semi-Annual Report* at 1, 30.

³⁶⁸ *CTIA 2008 Year-End Report* at 7; *CTIA Semi-Annual Report* at 187-88.

³⁶⁹ Letter from Christopher Guttman-McCabe, CTIA–The Wireless Association, to Marlene Dortch, FCC, GN Docket No. 09-51 and WC Docket No. 07-52, at i-ii, 4 (filed May 12, 2009) (“*CTIA May 2009 Ex Parte*”); *Ford Hearing Testimony* at 3.

³⁷⁰ *CTIA May 2009 Ex Parte* at i-ii, 3.

³⁷¹ *CTIA Semi-Annual Report* at 116-22 (showing average revenue per subscriber remaining relatively stable); *id.* at 188, 191-97 (showing dramatically increased minutes of use per subscriber over the past decade).

³⁷² *See, e.g.*, *CTIA Semi-Annual Report* at 1 (“Consumers are getting more value for their wireless dollars—including both more voice minutes, as well as non-voice applications such as text messaging, music, games, and other downloads, while continuing to pay just about \$50 a month.”).

§ 332(c)(1), (3)—and the Commission’s steadfast application of that policy.³⁷³ In charting the course forward, the National Broadband Plan should maintain this approach of minimal regulation to preserve, replicate, and expand on this wireless success story in the wireless broadband market. The Plan at the same time should recognize the importance of, and commit the government to establishing, regulatory stability and certainty for the wireless broadband industry. These are prerequisites—especially in unstable economic times—for the enormous investments in spectrum, technology, and infrastructure that providers will need to make to bring robust wireless broadband to all corners of this country. One of the most important steps the

³⁷³ See, e.g., Second Report and Order, *Implementation of Sections 3(n) and 332 of the Communications Act, Regulatory Treatment of Mobile Services*, 9 FCC Rcd 1411, 1510-11 ¶ 272 (1994) (describing the Commission’s forbearance from enforcement of several statutory provisions); First Report and Order and Further Notice of Proposed Rule Making, *Amendment of the Commission’s Rules to Permit Flexible Service Offerings in the Commercial Mobile Radio Services*, 11 FCC Rcd 8965, 8966 ¶ 1 (1996) (giving licensees maximum flexibility to offer all types of fixed, mobile, and hybrid services so that wireless providers may “better respond to market demand” and to “increase competition in the provision of telecommunications services”); Report and Order, *Biennial Regulatory Review—Amendment of Parts 0, 1, 13, 22, 24, 26, 27, 80, 87, 90, 95, 97, and 101 of the Commission’s Rules to Facilitate the Development and Use of the Universal Licensing System in the Wireless Telecommunications Services*, 13 FCC Rcd 21027, 21031 ¶ 4 (1998) (streamlining licensing rules for all wireless services so as to “introduce new entrants more quickly into this already competitive industry”); Report and Order, *2000 Biennial Regulatory Review Spectrum Aggregation Limits for Commercial Mobile Radio Services*, 16 FCC Rcd 22668, 22670 ¶ 6 (2001) (eliminating spectrum cap in favor of case-by-case review of transactions “in light of the strong growth of competition in CMRS markets”); Report and Order, *Year 2000 Biennial Regulatory Review Amendment of Part 22 of the Commission’s Rules to Modify or Eliminate Outdated Rules Affecting the Cellular Radiotelephone Service and Other Commercial Mobile Radio Services*, 17 FCC Rcd 18401, 18406 ¶ 8 (2002) (adopting a five-year sunset for requirement that cellular licenses provide analog services because the rule “imposes costs and impedes spectral efficiency” and its “objectives can largely be accomplished by market forces without the need for regulation”). Many commenters have recognized that “wireless service is a transformative technology that has benefited greatly from the ‘hands off’ approach started back in 1992 in the Clinton/Gore Administration.” *Ford Hearing Testimony* at 21.

Plan can take in this regard is to commit to the following concrete principles regarding spectrum allocation and use.³⁷⁴

a. Auction Winners Should Receive Clear and Stable Spectrum Rights

The deployment of wireless broadband will occur much more quickly if winners of spectrum auctions are awarded clear and secure spectrum rights. In recent years, carriers have spent *billions* of dollars on spectrum auctions. The last two auctions alone (AWS and 700 MHz) netted the government \$13,700,267,150 and \$18,957,582,150 respectively,³⁷⁵ with spectrum averaging \$0.54 per MHz-pop for the AWS-1 licenses and \$1.92 per MHz-pop for the 700 MHz A and B block licenses.³⁷⁶ Yet the industry needs reassurance that the Commission is committed to respecting the reasonable, investment-backed expectations of auction winners. Concerns were raised by the recent AWS-3 debate, in which the Commission considered changing the established rules of the game for pre-existing AWS-1 auction winners and exposing them to

³⁷⁴ In addition to reaffirming the spectrum principles we discuss, the Commission should resolve to streamline its own tower authorization processes, and it should consider how best to encourage state and local governments to resolve local zoning and related issues. New broadband deployment will require collocation on existing cell sites and installation of new cell sites across the country, and the Commission must be an active partner in efforts by providers to obtain approval for these collocations and to get new towers on the ground with all necessary authorizations in place. Delays that are commonplace in the industry today would be a major impediment to prompt national broadband deployment.

³⁷⁵ See “Auction of Advanced Wireless Services Licenses Closes, Winning Bidders Announced for Auction No. 66,” Public Notice, DA 06-1882 (rel. Sept. 20, 2006), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-06-1882A1.pdf; “Auction of 700 MHz Band Licenses Closes, Winning Bidders Announced for Auction 73,” Public Notice, DA 08-595 (rel. Mar. 20, 2008), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-08-595A1.pdf.

³⁷⁶ Kim Randolph, BIAfn, *Analysis of Auction 66—Advanced Wireless Services (AWS) Spectrum* (Sept. 6, 2006), *available at* http://www.bia.com/data_perspective_090606.asp (AWS auction); *Before the House Comm. on Energy and Commerce*, 110th Cong., at 9 (April 15, 2008) (statement of Kevin J. Martin, Chairman, Federal Communications Commission), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-281550A1.pdf (700 MHz auction).

unanticipated interference long after that auction was complete.³⁷⁷ The Commission should reaffirm that it will adhere to the approach it adopted when it ultimately rejected the notion of allowing DTV translators in channels 52 through 59 of the 700 MHz spectrum, on the ground that the translators could have interfered with existing 700 MHz licensees.³⁷⁸

More generally, to create stability and thereby encourage additional wireless investment, the Commission should establish unambiguous “property-like” rights with respect to the spectrum it allocates by auction—including non-interference rights from contiguous spectrum holders and clear categories of acceptable use for auction winners. It should, by the same token, establish explicit responsibilities and limitations on the auction winners, so that expectations are clear and so that new winners do not impinge on the rights of other operators. These rights and responsibilities should be established *prior* to the relevant spectrum auctions, and should not change after the auctions. Any other approach will chill the investment needed for expanded broadband services, depress auction revenues, and divert industry attention from deployment and investment and focus it instead on the type of regulatory morass that the AWS-3 proposals engendered.

³⁷⁷ Further Notice of Proposed Rulemaking, *Service Rules for Advanced Wireless Services in the 2155-2175 MHz Band*, 23 FCC Rcd 9859 (2008) (“AWS-3 Further Notice”); see also Comments of AT&T Inc., *Service Rules for Advanced Wireless Services in the 2155-2175 MHz Band*, WT Docket No. 07-195 (filed July 25, 2008).

³⁷⁸ Report and Order, *Amendment of Parts 73 and 74 of the Commission’s Rules to Establish Rules for Replacement Digital Low Power Television Translator Stations*, MB Docket No. 08-253, FCC 09-36, ¶ 10 (rel. May 8, 2009) (agreeing that the translators might “impede and complicate the prompt deployment of advanced wireless services by Auction 73 and other 700 MHz licensees,” and acknowledging AT&T’s argument that it could be “difficult, costly, and time consuming” for licensees to enforce their rights against interfering translators).

b. Spectrum Licenses Should Be Exclusive to Promote Broadband Investment, but Shared Uses in Unlicensed Spectrum May Play an Important Role in Broadband Services

Before wireless providers can invest millions or billions of dollars to build out wireless broadband networks and purchase facilities and equipment, they must be secure in the knowledge that their spectrum licenses are truly exclusive, unless different terms were established *at the time of the initial license agreement*. Licensees who have made substantial investments for the right to use spectrum should not be subject, after the fact, to overlays, underlays, easements, or other sharing with licensed or unlicensed users. Unanticipated and compelled sharing of this sort increases burdens for licensees enormously, forcing them to constantly be on guard against interference threats, especially as technology continuously changes. And it drains resources that should be spent on broadband deployment, as carriers instead focus on administering and enforcing sharing arrangements. Uncertainty concerning present and future sharing obligations also deters new investment, since coordination requirements could impose new burdens or require system or equipment reconfiguration at any time.³⁷⁹

³⁷⁹ The Plan can further support the rights of spectrum holders and increase the reliability of wireless broadband connectivity by taking appropriate steps to bar harmful interference caused by cellular and PCS boosters and repeaters. These products, which are marketed to improve signal strength, generate harmful interference that impairs wireless voice and data services. The wireless industry has complained for years about rampant and unchecked use of boosters and repeaters. *See generally* CTIA—The Wireless Association, *White Paper on the Harmful Impacts of Unauthorized Wireless Repeaters* (May 1, 2006), *available at* http://files.ctia.org/pdf/CTIA_Repeater_White_Paper_Final_050106.pdf. Boosters and repeaters that are too powerful, too close to cell towers, or installed incorrectly cause dropped calls, data loss, decreased battery life, and other serious and lasting disruptions to the networks of all local wireless providers, including public-safety networks. *See, e.g.*, Letter from Audrey Wolf, Director, Facilities Development and Operations, Palm Beach County, Florida, to Kevin Martin, Chairman, FCC (filed Mar. 27, 2008) (expressing concern about the impact of boosters and repeaters on public-safety communications). AT&T has spent considerable time and energy identifying and reporting these incidents, but the providers of these devices must also face responsibility for their

That is not to say that sharing is incompatible with broadband deployment goals. For example, the Commission's *Secondary Market* rules have facilitated all sorts of creative arrangements in which carriers can lease spectrum that the licensee is not currently using.³⁸⁰ Facilitating such *voluntary* arrangements will allow broadband providers to invest in spectrum with the certainty that they can manage their holdings efficiently, and will promote various creative arrangements in secondary broadband markets.

In the context of *unlicensed* spectrum, where sharing is appropriate,³⁸¹ some shared uses are proving to be important elements of the broadband ecosystem. The best example, of course, is Wi-Fi, which has had a transformative effect on broadband availability and adoption. Thus, the Commission should continue to make unlicensed spectrum available as appropriate for shared uses, including wireless broadband solutions in particular. Nevertheless, shared use over unlicensed spectrum is only a very partial answer to the future of broadband. The absence of dedicated spectrum creates inherent reliability and security concerns.³⁸² In addition, unlicensed services may be inappropriate for mobile applications because movement decreases predictability and increases power needs, which complicates interference issues. Accordingly, it

misrepresentations and product failures. *See, e.g.,* Complaint, *AT&T Mobility, LLC v. Digital Antenna, Inc.*, S.D. Fla. Civil Action No. 09-60639 (filed Apr. 30, 2009).

³⁸⁰ *See* Report and Order and Further Notice of Proposed Rulemaking, *Promoting Efficient Use of Spectrum Through Elimination of Barriers to the Development of Secondary Markets*, 18 FCC Rcd 24817 (2003); Second Report and Order, Order on Reconsideration, and Second Further Notice of Proposed Rulemaking, *Promoting Efficient Use of Spectrum Through Elimination of Barriers to the Development of Secondary Markets*, 19 FCC Rcd 17503 (2004).

³⁸¹ Carriers do not have the same investment-backed expectations of exclusivity with respect to unlicensed spectrum, and they often enter the market with technology specifically designed to sniff out and respond to interference issues.

³⁸² *Ford Hearing Testimony* at 9 (“Licensed spectrum allows for secondary markets to emerge where spectrum assets can be traded, borrowed, and shared. This promotes more effective spectrum usage without the interference and congestion problems inherent to unlicensed spectrum.”).

is critical that the Commission continue to separately allocate licensed spectrum pursuant to exclusive licenses that can support the type of robust broadband services users need.

c. The Plan Should Reaffirm the Government’s Commitment to Using Auctions to Allocate Spectrum

Because licensed spectrum will remain essential, the Plan should, as a general matter, reaffirm the government’s commitment to auctions as the best way of allocating that spectrum.³⁸³ Of course, Section 309(j) of the Communications Act already requires the Commission to use spectrum auctions for all mutually exclusive applications for commercial spectrum.³⁸⁴ But M2Z’s unsuccessful request for a dedicated grant of spectrum outside of the auction process³⁸⁵—and the uni-purpose auction that was proposed in the wake of that failed effort³⁸⁶—demonstrate the creative efforts some will undertake to avoid the auction requirement.

As the Commission has recognized repeatedly, auctions are the fairest and most non-discriminatory methodology for allocating spectrum.³⁸⁷ The Commission also has noted that

³⁸³ The one exception to this policy, discussed above, is the allocation of spectrum to public-safety and homeland-security agencies, whose sole mission is to protect the health and safety of the American public.

³⁸⁴ The statute mandates that the Commission generally must process “mutually exclusive applications . . . through a system of competitive bidding.” 47 U.S.C. § 309(j)(1).

³⁸⁵ See Petition of M2Z Networks, Inc. for Forbearance under 47 U.S.C. § 160(c) Concerning Application of Sections 1.945(b) and (c) of the Commission’s Rules and Other Regulatory and Statutory Provisions (filed Sept. 1, 2006); Order, *Applications for License and Authority to Operate in the 2155-2175 MHz Band*, 22 FCC Rcd 16563 (2007), *aff’d* M2Z Networks, Inc. v. FCC, 558 F.3d 554 (D.C. Cir. 2009) (denying M2Z’s petition and similar petitions filed by other prospective providers).

³⁸⁶ See, e.g., *AWS-3 Further Notice*; Comments of M2Z Networks, Inc., *Service Rules for Advanced Wireless Services in the 2155-2175 MHz Band*, WT Docket No. 07-195 (filed July 25, 2008).

³⁸⁷ Congress and the courts have recognized this as well. Indeed, it was Congress’s dissatisfaction with other methods for allocating spectrum that led it to enact Section 309(j). In the House Report, legislators noted that “in many respects the FCC’s current licensing methods for assigning spectrum have not served the public interest.” Omnibus Budget Reconciliation Act

“the use of competitive bidding to award . . . licenses, as compared with other licensing methods, will speed the development and deployment of new services to the public with minimal administrative or judicial delay, and will encourage efficient use of the spectrum.”³⁸⁸ And the upfront financial payments that auctions require provide a safeguard against spectrum warehousing and motivate auction winners to build out quickly and offer innovative and attractive services quickly, so that they can recoup—and enhance the value of—their investments.³⁸⁹ As the Commission has recognized, “the bidder who is willing to pay the most will be highly motivated to rapidly put the license to a use that the public finds valuable because only such a use will make its investment worthwhile.”³⁹⁰ For these reasons, the Commission should make clear in the Plan that it continues to believe that competitive bidding is the most efficient way to allocate future spectrum blocks.

of 1993, H.R. Rep. 103-111, at 248 (1993), *reprinted in* 1993 U.S.C.C.A.N. 378, 575. Congress enacted the auction procedure “as a means of improving the FCC’s licensing process and promoting efficient use of the spectrum.” *Id.* at 247, 574. Similarly, the Second Circuit has recognized that the primary purpose of enacting Section 309’s auction requirement was to improve the efficiency of spectrum allocation vis-à-vis the comparative-hearing and lottery methods. *See In re NextWave Personal Communications, Inc.*, 200 F.3d 43, 51-54 (2d Cir. 1999) (“[A] method was needed that would direct licenses toward those entities and technologies that would put them to the best use.”).

³⁸⁸ Fifth Report and Order, *Implementation of Section 309(j) of the Communications Act—Competitive Bidding*, 9 FCC Rcd 5532, ¶ 23 (1994).

³⁸⁹ *See* Second Report and Order, *Implementation of Section 309(j) of the Communications Act—Competitive Bidding*, 9 FCC Rcd 2348, 2358 ¶ 58 (1994) (“[L]icensees’ need to recoup the out-of-pocket expenditure for a license should provide additional motivation to get the most value out of the spectrum.”); *id.* at 2361 ¶ 71 & n.65 (quoting Comments of PacBell) (“Since a bidder’s abilities to introduce valuable new services and to deploy them quickly, intensively, and efficiently increase the value of a license to a bidder, an auction design that awards licenses to those bidders with the highest willingness to pay tends to promote the development and rapid deployment of new services in each area and the efficient and intensive use of the spectrum.”).

³⁹⁰ Report and Order, *Implementation of Competitive Bidding Rules to License Certain Rural Service Areas*, 17 FCC Rcd 1960, 1968 ¶ 13 (2002).

d. Auction Winners Should Have Flexibility in Their Use of Spectrum

The National Broadband Plan should guarantee auction winners flexibility with respect to how they use their spectrum. Spectrum licenses should not dictate or limit the services licensees provide, or the technology they use. Until the Commission proposed the overly specific AWS-3 rules last year, it had moved overwhelmingly in the direction of permitting open, flexible use of wireless spectrum. In the AWS-1 auction, for example, the Commission expressly recognized that giving bidders “flexibility” in how they use spectrum “allows spectrum to move to its highest valued use without regulatory lag, an economically efficient result,” and “spur[s] investment in communication services and systems and technology development.”³⁹¹ Similarly, the Commission recognized that efficiency is best served by a “licensing plan [that] will allow the marketplace rather than the Commission to ultimately determine what services are offered in this spectrum and what technologies are utilized to provide these services.”³⁹² The Commission should recommit itself to that policy,³⁹³ which permits the types of flexibility broadband providers need to experiment with new services and applications that most enhance the value of the spectrum. Similarly, build-out rules should be flexible. Milestones are important to prevent

³⁹¹ Report and Order, *Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands*, 18 FCC Rcd 25162, 25167-68 ¶¶ 13-14 (2003) (“*AWS-1 Rules Order*”).

³⁹² *Id.* at 25164 ¶ 1.

³⁹³ In those cases where the Commission has moved away from allowing licensees broad flexibility to meet the demands of the marketplace, and has instead prescribed business models, auction results have been suboptimal. The 700 MHz D Block, for which the Commission prescribed a public/private partnership with public safety, attracted only *one* bid, which was more than \$850 million below the reserve price of \$1.33 billion. *Third Further Notice*, 23 FCC Rcd at 14313 ¶ 30 n.49. Similarly, the winning bids for the Upper 700 MHz C Block, for which the Commission prescribed an open-access model, barely exceeded the reserve price—unlike the other unencumbered spectrum in the same auction. Federal Communications Commission, *Auction 73, 700 MHz Band*, http://wireless.fcc.gov/auctions/default.htm?job=auction_summary&id=73/.

warehousing, but overly prescriptive rules that dictate precisely how carriers must meet the relevant deadlines may have the unintended consequence of delaying or deterring new, resource-intensive service experiments by requiring quick build-out of legacy facilities.

e. Service Rules Should Be Consistent Across Spectrum Bands

As technology supporting wireless broadband services evolves to enable multiple services (*e.g.*, voice, data, video) to operate seamlessly on the same spectrum, carriers will have incentives to integrate their existing spectrum allocations, as well as new ones, in support of new, robust wireless broadband. That goal requires consistency of service rules across spectrum bands. Today, many of the licensed bands—such as cellular, PCS, and AWS—remain subject to distinct rules. For example, cellular licenses are still subject to site-specific licensing requirements rather than market-based ones.³⁹⁴ A given cell tower might be subject to as many as four different sets of rules, and complying with these disparate regimes consumes tremendous carrier resources and makes transitioning to new technologies more difficult. To promote integration of different spectrum bands in support of broad new offerings, service rules should be harmonized to the greatest extent possible.³⁹⁵ Indeed, some distinctions merely reflect legacy policy approaches that were in place when the bands initially were licensed but that have become obsolete as the Commission’s policies have evolved. Keeping up with these legacy distinctions is an unnecessary diversion of resources today and will needlessly complicate the transition of

³⁹⁴ See Petition for Rulemaking of CTIA–The Wireless Association, RM No. 11510 at 1 (filed Oct. 8, 2008) (petitioning the Commission to expeditiously transition cellular licensing from a system based upon transmitter sites to geographic-market, cellular-market-area based licensing).

³⁹⁵ To be sure, complete uniformity may not be a realistic goal, because these bands have different propagation characteristics and different interference issues and, for the reasons explained above, the rules cannot be changed retroactively where doing so would harm investment-backed expectations of other existing licensees in adjacent bands.

that spectrum to broadband uses in the future. The Commission should identify and seek ways to relieve licensees of unnecessary restrictions and obligations that make it harder to create unified spectrum platforms.

f. Band Sizes and Geographic License Areas Should Be Designed to Facilitate the Transition to Broadband

By the same token, band sizes and geographic license areas should be designed to facilitate the transition to broadband. For example, moving to LTE and even later technologies will require large spectrum blocks for high-bandwidth services. While carriers can accumulate larger bands by aggregating smaller spectrum blocks, this causes unnecessary transaction costs and an overall reduction in efficiency (especially if rules among the various blocks are inconsistent, as noted above). Bands that are allocated to support frequency division duplexing, which many wireless broadband services use, should therefore be allocated in paired blocks of ten, fifteen, or twenty MHz per block.³⁹⁶

As for geographic license areas, the Commission should support a range of both large areas (through Regional Economic Area Grouping licenses) and smaller areas (through Economic Area, Metropolitan Statistical Area, and Rural Statistical Area licenses) to provide opportunities for both large and small operators. This will help ensure that “usable” wireless broadband is deployed across the country, including particular niche services that fulfill specialized needs in certain areas.

³⁹⁶ *AWS-1 Rules Order*, 18 FCC Rcd at 25178 ¶ 44 (recognizing, with respect to AWS-1 spectrum, that larger spectrum blocks “enable a broader range of broadband services, including Internet access at faster speeds. These larger blocks should also accommodate future, higher data rates, and provide operators with additional capacity, and, importantly, with greater flexibility.”).

g. Spectrum Allocations Should Be Harmonized Internationally

Spectrum allocations should be harmonized internationally to the greatest extent possible. Such harmonization helps create efficiencies that promote broadband deployment by driving economies of scale for the manufacture of network and customer equipment. And this in turn allows faster and more efficient introduction of new services. It also promotes consumer interests by increasing roaming opportunities.

One example of a pressing opportunity for harmonization arises in connection with AWS spectrum. Combining the AWS-3 band (2155-2175 MHz) with current government-controlled spectrum at 1755-1775 MHz would create a block of spectrum for wireless broadband that is harmonized with similar blocks abroad.³⁹⁷ By contrast, allocating that spectrum to another purpose would:

make the U.S. a spectrum island, to the detriment of U.S. consumers. Without a global allocation, wireless equipment vendors cannot realize the same economies of scale achievable with a global market. Equipment produced solely for the U.S. market will cost U.S. operators more, with such additional costs being borne by consumers.³⁹⁸

The National Broadband Plan should contain mechanisms to ensure that *all* future allocations are harmonized to the greatest extent possible. Otherwise, policymakers will repeatedly be confronted with difficult integration issues like those that have plagued the 800

³⁹⁷ See, e.g., Letter from Patricia Paoletta, Counsel to 3G Americas, to Marlene Dortch, Secretary, FCC, WT Docket No. 07-195 (filed June 25, 2008) (“*3G Americas Ex Parte*”) (discussing the numerous problems that would arise if the United States were to allocate the AWS-3 spectrum in a way that is inconsistent with international plans to allocate the spectrum to downlink-only operations); Comments of AT&T Inc., *Service Rules for Advanced Wireless Services in the 2155-2175 MHz Band*, WT Docket No. 07-195, at 25 (filed July 25, 2008) (“[I]nternational filters in commercial use stretch from 2110 to 2170 MHz. These commercial filters have been developed to accommodate not only the United States market, but also markets in South America, Europe and Asia.”).

³⁹⁸ *3G Americas Ex Parte* at 2.

MHz band, where coordination issues with Canada and Mexico have delayed rebanding efforts.³⁹⁹ The Plan should also ask NTIA to review spectrum use by the U.S. Government to determine if spectrum can be reallocated to support greater international harmonization.

* * *

The Plan should endorse these principles as a way to promote investment by wireless providers in tomorrow's broadband networks and to ensure that existing spectrum is used for provision of wireless broadband services. But even this cannot stand alone. As explained above, the Commission must ensure that the Plan does not focus on one technology, like fiber, to the exclusion of other services based on the fatuous assumption that fiber facilities are "future proof." Nor can the Commission *implicitly* disfavor wireless by preferring speeds and services that *today's* technology supports only over fiber. And finally, the most essential element in forging a wireless broadband future is the Commission's reaffirmation of a deregulatory approach to wireless services generally. That approach has been the key to wireless deployment to date; maintaining it for the future will similarly advance the full panoply of broadband goals articulated in the Recovery Act.

V. ENHANCING ONLINE SAFETY AND CYBERSECURITY MUST BE A CRITICAL PART OF OUR NATIONAL BROADBAND PLAN

Ensuring 100 percent broadband access and enabling 100 percent broadband adoption in order to achieve the long list of societal benefits identified in the Recovery Act (advancing consumer welfare, civic participation, community development, public safety and homeland

³⁹⁹ See, e.g., "Public Safety and Homeland Security Bureau Extends 800 MHz Rebanding Negotiation Period for Wave 4 Border Area NPSPAC and Non-NPSPAC Licensees Along The U.S.–Mexico Border," Public Notice, WT Docket No. 02-55, DA 08-2218 (Oct. 1, 2008), available at http://fjallfoss.fcc.gov/edocs_public/attachmatch/DA-08-2218A1.pdf; Second Report and Order, *Improving Public Safety Communications in the 800 MHz Band*, DA 08-1094 (rel. May 9, 2008) (discussing negotiations with Canada).

security, health-care delivery, energy independence and efficiency, education, worker training, private-sector investment, entrepreneurial activity, job creation, and economic growth through greater broadband access and adoption)⁴⁰⁰ are objectives that are fundamentally dependent on the existence of safe and secure broadband networks and services. Yet online safety (ensuring a safe online experience for consumers) and cybersecurity (protecting networks and services from harm) all too often fail to receive the attention they deserve in the formulation of U.S. broadband policy. Indeed, the Recovery Act itself neglects to identify either issue as a core element of the National Broadband Plan.

But these issues *must* be a part of that Plan. Expanding broadband deployment and adoption without sufficient attention to both online safety and cybersecurity could actually make Americans *worse off* than they were with lesser access to broadband. As consumers and businesses share more sensitive information online, as e-commerce expands on the Internet, and as more devices and equipment are connected to broadband networks, the vulnerability of, and potential harm to, everyone and everything using these networks will increase exponentially unless adequate safeguards are in place.

Fortunately, there is a tremendous amount of expertise for addressing these critical issues in the private sector and in the government. In the private sector, numerous software and equipment vendors provide security products to consumers, businesses, and government users, and broadband providers offer effective, network-based security capabilities to these customer groups as well. And inside the government, the Department of Homeland Security, the Department of Defense, and the intelligence agencies play important roles in helping to protect our nation's broadband infrastructure from cyber-attacks, while the Federal Trade Commission

⁴⁰⁰ Recovery Act, § 6001(k)(2)(D).

and the Departments of Justice and Commerce have taken the lead in promoting online safety.

What is lacking at times, however, is coordination and leadership among all of these different efforts.⁴⁰¹ As the Administration recently acknowledged:

The Federal government is not organized to address this growing problem effectively now or in the future. Responsibilities for cybersecurity are distributed across a wide array of federal departments and agencies, many with overlapping authorities, and none with sufficient decision authority to direct actions that deal with often conflicting issues in a consistent way. The government needs to integrate competing interests to derive a holistic vision and plan to address the cybersecurity-related issues confronting the United States. The Nation needs to develop the policies, processes, people, and technology required to mitigate cybersecurity-related risks.⁴⁰²

And while the Administration's recent emphasis on cybersecurity is encouraging, a key objective of the National Broadband Plan should be to promote greater collaboration and cooperation among all of these experts in furtherance of enhancing online safety and cybersecurity.

⁴⁰¹ See Ellen Nakashima, Washington Post, *Defense Dept., Industry Join to Protect Data* (May 25, 2009) (describing DoD trial program to improve coordination with defense contractors to address cyber threats: "The Pentagon's trial program with industry illuminates the promise and the pitfalls of such partnerships. The goal is a swifter, more coordinated response to threats facing the defense industry. But intelligence and law enforcement agencies have been reluctant to release threat data they consider classified. And the companies have been reluctant to share intrusion data, for fear of losing control over personal or proprietary information.").

⁴⁰² See *Cyberspace Policy Review, Assuring Trusted and Resilient Information and Communications Infrastructure*, at i (May 2009), available at http://www.whitehouse.gov/assets/documents/Cyberspace_Policy_Review_final.pdf ("White House Cybersecurity Review").

A. Cybersecurity

1. Cybersecurity Threats Are Growing

Cybersecurity threats are growing rapidly in number and sophistication.⁴⁰³ As a senior White House official recently explained: “[O]ur global digital infrastructure, based largely upon the Internet, is neither secure enough nor resilient enough for what we use it for today and will need into the future. This poses one of the most serious economic and national security challenges of the 21st century.”⁴⁰⁴ Some unsecured networks today can be disabled or sabotaged fairly readily, making them unavailable or worse. Attacks are cheap and relatively easy to conduct; the defensive perimeter is nearly infinite; and defensive measures are expensive.⁴⁰⁵ In one recent high-profile example, the country of Estonia was the subject of a coordinated botnet attack, with government and private computer systems flooded with up to a million times more

⁴⁰³ See Brian Prince, eWEEK, *Little-Known Botnets Can Pose Biggest Threat* (May 13, 2009), available at http://securitywatch.eweek.com/enterprise_security_strategy/little-known_botnets_can_pose_biggest_threat.html (“*Little-Known Botnets*”) (describing, for instance, botnets that pose new security concerns); Audio MP3: *Botnet Threats and Countermeasures*, Security Wire Weekly (May 13, 2009), available at <http://itknowledgeexchange.techtarget.com/security-wire-weekly/botnet-threats-and-countermeasures/> (explaining botnet threat challenges and potential solutions).

⁴⁰⁴ Remarks by Melissa E. Hathaway, Acting Senior Director for Cyberspace for the National Security and Homeland Security Councils, RSA Conference 2009, San Francisco, CA, at 1 (April 22, 2009), available at <http://voices.washingtonpost.com/securityfix/Melissa%20Hathaway%20Speech%20at%20RSA.pdf>.

⁴⁰⁵ *Cybersecurity: Network Threats and Policy Challenges: Hearing Before the Subcomm. on Communications, Technology, and the Internet of the House Comm. on Energy and Commerce*, 111th Cong., at 2 (May 1, 2009) (statement of Larry Clinton, President and Chief Executive Officer, Internet Security Alliance), available at http://energycommerce.house.gov/Press_111/20090501/testimony_clinton.pdf.

data than normal.⁴⁰⁶ The country was effectively disconnected from the Internet, and the event has come to be known as “WWI” for “Web War 1.”

The consequences of a similar attack in the United States could be severe. For instance, cyber-attacks have targeted critical infrastructure that all Americans depend on, such as power plants, hospitals, and even national-defense infrastructure.⁴⁰⁷ As one cybersecurity expert recently said of the possibility of electricity grid attacks: “If you shut down power for about three days . . . it causes very little damage. We can handle a long weekend. But if you shut down power for longer, all kinds of other things begin to happen. After about 10 days the curve levels off with about 72% of all economic activity shut down. . . . Thousands of people die.”⁴⁰⁸ Thus, even as broadband makes enormous contributions to health-care delivery, energy

⁴⁰⁶ See Peter Finn, Washington Post, *Cyber Assaults on Estonia Typify a New Battle Tactic*, at A1 (May 19, 2007), available at <http://www.washingtonpost.com/wp-dyn/content/article/2007/05/18/AR2007051802122.html> (“*Estonia Cyber Assaults*”); National Security Telecommunications Advisory Committee, *Report to the President on International Communications*, at ES-1, 2 (Aug. 16, 2007), available at <http://www.ncs.gov/nstac/reports/2007/NSTAC%20International%20Report.pdf> (“*International Presidential Report*”).

⁴⁰⁷ See, e.g., Elinor Mills, CNET, *Conficker infected critical hospital equipment, expert says* (April 23, 2009), available at http://news.cnet.com/8301-1009_3-10226448-83.html?tag=mncol (“The Conficker worm infected several hundred machines and critical medical equipment in an undisclosed number of U.S. hospitals recently It is unclear how the devices, which control things like heart monitors and MRI machines, and the PCs got infected The computers are older machines running Windows NT and Windows 2000 in a local area network that was not supposed to have access to the Internet”); Stephanie Overby, CIO Magazine, *Your World . . . Hacked* (Oct. 2, 2007), available at http://www.cio.com.au/article/194653/your_world_hacked?fp=4&fpid=51238&pf=1 (“Titan Rain was ‘the most systematic and high-quality attack we have seen’ Chinese hackers successfully breached hundreds of unclassified networks within the US Department of Defense, its contractors and several other federal agencies. One Air Force general admitted at an IT conference last year that China had downloaded 10 to 20 terabytes of data from US DoD networks.”); Bradley Graham, Washington Post, *Hackers Attack via Chinese Web Sites: U.S. Agencies’ Networks Are Among Targets*, at A1 (Aug. 25, 2005), available at http://www.washingtonpost.com/wp-dyn/content/article/2005/08/24/AR2005082402318_pf.html.

⁴⁰⁸ Brett Stephens, Wall Street Journal, *Hiroshima, 2.0* (April 14, 2009), available at <http://online.wsj.com/article/SB123966785804815355.html>.

efficiency, e-government, public safety, and the like, it also creates new risks that must be aggressively managed. As we rely on networked, broadband facilities to support more and more “mission critical” services for our nation, we cannot help but dramatically increase both the number of potential targets of, and the potential damage from, cyber-attacks.

Ensuring that networks are secure while maintaining their connectivity and openness is a core technical challenge to which AT&T and many others in the private sector devote significant resources. AT&T offers a wide variety of network-security services and capabilities, which we continuously upgrade to address new and emerging threats.⁴⁰⁹ For instance, AT&T doubled, and is now redoubling, capabilities to provide global coverage to scrub traffic for denial-of-service attacks. AT&T went from one domestic scrubbing complex to multiple locations across the United States, as well as nodes in Europe and Asia. This gives us the ability to filter out attack traffic as close to the source of the threat as possible.⁴¹⁰

2. Recommendations

To address growing cybersecurity threats, the Plan should endorse three actions, which build on President Obama’s vision for a coordinated, national cybersecurity infrastructure.

First, security must be a top priority in government systems and therefore government procurement. President Obama’s commitment to make cybersecurity one of his “key management priorities” is an important step in the right direction—one that must be reflected all

⁴⁰⁹ See AT&T, *Enterprise Solutions, Security & Business Continuity*, <http://www.business.att.com/enterprise/Portfolio/business-continuity-enterprise/>; AT&T, *Government Solutions, Managed Security Solutions*, http://www.corp.att.com/gov/solution/network_services/mss.html.

⁴¹⁰ *Cybersecurity—Assessing Our Vulnerabilities and Developing an Effective Defense: Hearing Before the Senate Comm. on Commerce, Science, and Transportation*, 111th Cong., at 4 (Mar. 19, 2009) (statement of Edward Amoroso, Senior Vice President and Chief Security Officer, AT&T Inc.), available at http://commerce.senate.gov/public/_files/TestimonyofEdAmoroso31709.pdf.

the way down to the operational levels of government.⁴¹¹ There is much to be done in this regard. The denial-of-service threat, for example, is largely overlooked in most civilian agency networks. This is a wasted opportunity to improve cybersecurity, as numerous vendors (including AT&T) offer solutions to mitigate the threat of denial-of-service attacks before they arrive on an agency's doorstep. But without a strategic emphasis to build strong cybersecurity protections into federal procurement processes, those protections are unlikely to find their way into federal networks and systems.

Second, the Plan should call on governments to establish an international partnership to enable real-time global coordination in addressing cyber-attacks—a priority objective identified in the White House's recently released Cyberspace Policy Review.⁴¹² When a botnet is aimed at a critical asset, the servers controlling the attack are often scattered across the world.⁴¹³ The local service provider that provides connectivity to the compromised server is often in the best position to take suitable security action, but this requires international cooperation that to date has been inadequate. Instead, coordination on incident response remains largely *ad hoc*. The National Security Telecommunications Advisory Committee (“NSTAC”) recently recognized the problem and made recommendations in this regard—including development of international cyber-incident warning and response capabilities—that the National Broadband Plan should

⁴¹¹ See *White House Cybersecurity Review* at 37.

⁴¹² *Id.* (recommending “an international cybersecurity policy framework and . . . international partnerships to create initiatives that address the full range of activities, policies, and opportunities associated with cybersecurity”).

⁴¹³ For instance, while the attack on Estonia appeared to have been coordinated from Russia, reports indicated that roughly one million unwitting computers worldwide were employed, with bots traced to countries including the United States, China, Vietnam, Egypt, and Peru. See *Estonia Cyber Assaults* at A1.

endorse.⁴¹⁴ The continuing absence of a coordinated, scalable, international structure for response that includes all relevant stakeholders undercuts efforts to develop systemic solutions to cybersecurity threats.

Finally, the Plan should call for closer coordination between the government and network service providers. As attacks become more mobile and are perpetrated through networks of computers, the service provider has the best vantage point from which to mitigate the threat. Yet, too often, government and business security measures are designed with the service provider at arms-length, resulting in yet another missed opportunity to improve cybersecurity.⁴¹⁵

To this end, the Plan should adopt recent NSTAC recommendations that encourage rethinking of such relationships.⁴¹⁶ The public and private sectors can and should create structures for timely and secure sharing of cybersecurity threat and response information between government and industry, and between and among critical infrastructures in a trusted, collaborative environment. In partnership with the private sector, the government can and should create a secure and responsive framework for identity management to ensure emergency responders access to critical infrastructure in support of cyber-attack recovery in a way that does not compromise network security. Further, in collaboration with industry, the government can and should create a comprehensive incident-response architecture embracing critical infrastructure facilities and core infrastructure services. Perhaps most importantly, the government should collaborate with industry on research and development efforts in pursuit of

⁴¹⁴ See *International Presidential Report* at ES-3.

⁴¹⁵ “[Security threats are] not just a security industry issue. . . . It really needs the help of government agencies and, more importantly, end-user awareness.” *Little-Known Botnets* (quoting Brian Perry, executive director of AT&T Managed Security Services).

⁴¹⁶ *International Presidential Report* at ES-3, 4.

critical cybersecurity capabilities, and in furtherance of interoperable identity management processes between government and the private sector. To that end, the government must be careful not to adopt legislation or policies (such as restrictions on deep packet inspection), that would hinder private-sector efforts to detect, protect against, and mitigate cybersecurity threats.

B. Online Safety

While the Internet provides innumerable social benefits and holds the promise for even broader social development, for many, concerns about online safety stand as significant barriers to more widespread use of broadband services. Consumers worry about the spread of viruses, spam, and other types of computer malware over the Internet; threats to their personal security, particularly identity theft and other forms of fraud and consumer abuse; and the need to protect minors from harmful content, contact, and conduct.

A study issued just last year reported that 75 percent of online consumers worry about computer viruses, worms, and spyware, as well as the risk of identity theft.⁴¹⁷ And according to one estimate, as many as one in five Internet-connected computers are now infected with malicious software, or malware.⁴¹⁸ Security software vendor McAfee reported that in just the first three months of this year, 12 million more U.S. computers joined the ranks of the “botnets”—meta-networks of “zombie” personal computers that remote actors can surreptitiously control via malware.⁴¹⁹ McAfee estimates that 18 percent of IP addresses in the

⁴¹⁷ *Forrester Consulting Report* at 13 & n.19.

⁴¹⁸ Michel J.G. van Eeten & Johannes M. Bauer, OECD Directorate for Science, Technology, and Industry, *Economics of Malware: Security Decisions, Incentives and Externalities*, at 6 (Jan. 2008), available at <http://www.oecd.org/dataoecd/53/17/40722462.pdf> (“*OECD Malware Report*”).

⁴¹⁹ McAfee, *McAfee Threats Report: First Quarter 2009*, at 4 (May 2009), available at http://img.en25.com/Web/McAfee/5395rpt_avert_quarterly-threat_0409_v3.pdf.

United States are now part of botnets.⁴²⁰ Personal computers infected with botnets can be used to attack other networks or computers *en masse* and from seemingly trusted sources, leading to substantially greater danger to all users.⁴²¹

These threats to consumer safety and security cause real harm both to consumers and the economy more broadly. Even if they suffer no other harm, owners of compromised systems must pay to clean up and secure their PCs. Those who suffer identity theft often spend years attempting to restore their credit, and many lose trust in online commerce altogether.⁴²² These costs add up quickly. The Conficker worm, the widely-discussed virus that turned millions of computers into botnet zombies, has already caused economic losses of more than \$9 billion globally.⁴²³ And even this pales in comparison to the global loss of productivity caused each year by the need to cull spam from e-mail inboxes. Billions of dollars more are spent by security firms, ISPs, and large private networks in the “technological arms race” against sophisticated spammers.⁴²⁴ Financial institutions and e-commerce firms similarly lose more and more each year to online financial fraud.⁴²⁵ Denial-of-service and other malicious attacks—often launched via botnets—can cut off online services or networks for hours or days at a time.

⁴²⁰ *Id.* at 5.

⁴²¹ See *OECD Malware Report* at 51.

⁴²² See Javelin Strategy & Research, Press Release, *Survey Finds Retailers Missed Out on \$21 Billion in Sales in 2008 Due to Online Shopping Fears* (Mar. 17, 2009), available at <http://www.javelinstrategy.com/2009/03/17/survey-finds-retailers-missed-out-on-21-billion-in-sales-in-2008-due-to-online-shopping-fears/> (finding that 12 percent of the identity-theft victims surveyed had ceased shopping online and 25 percent had reduced their online shopping). See also *OECD Malware Report* at 35 (discussing similar results in a U.K. study).

⁴²³ Cyber Secure Institute, *Cyber Secure Institute on the Conficker Controversy* (Apr. 20, 2009), <http://cybersecureinstitute.org/blog/?p=15>.

⁴²⁴ See *OECD Malware Report* at 10.

⁴²⁵ See *id.* at 36 (citing statistics from the U.K.).

Finally, concerns over Internet safety, especially concerns about the safety of minors, serve as a deterrent for broader Internet adoption by families across the country. The industry, of course, makes available many tools to help families protect their children online.⁴²⁶ But the evidence shows that addressing this issue goes beyond making tools available. It requires a multi-faceted and collaborative approach that begins with education and awareness and involves all stakeholders—parents, the Internet community, law enforcement, child-safety experts, teachers, researchers, public-health officials, and others. And government leadership is particularly critical to enable and promote this type of comprehensive collaboration and to advance the research and education initiatives that are required.

Therefore, the National Broadband Plan should identify the need for government leadership and improvements in online security and safety as a priority over the coming years. Enabling consumers to use the Internet more securely and safely will not only increase efficiency and save money, but it will directly serve the goal of increased adoption of broadband service. Consumers more trustful of doing business online are more likely to sign up for or upgrade their Internet access. And those who better understand how to protect themselves and their children from online threats are more likely to embrace broadband and utilize the tremendous opportunities that broadband offers.

⁴²⁶ See, e.g., Internet Safety Technical Task Force to the Multi-State Working Group on Social Networking of State Attorneys General of the United States, *Enhancing Child Safety & Online Technologies*, at 6 (Dec. 31, 2008), available at http://cyber.law.harvard.edu/sites/cyber.law.harvard.edu/files/ISTTF_Final_Report.pdf; Family Online Safety Institute, *Making Wise Choices Online—Online Safety Initiatives* (2008), available at <http://www.fosi.org/cms/index.php/making-wise-choices-online-report08.html>; Adam Thierer, *Parental Controls & Online Child Protection: A Survey of Tools and Methods*, Progress & Freedom Found. v. 3.1 (Fall 2008), available at <http://www.pff.org/parentalcontrols/>.

One of the key elements in addressing this serious barrier to increased adoption is consumer education: As one study found, end users lack both the information and incentives to adequately secure their PCs and networks.⁴²⁷ This means that even if ISPs and software vendors implement perfect security policies, users can still fall victim to malware via insecure online applications.⁴²⁸ To address this, non-profit groups like Consumer Reports and the National Cyber Security Alliance have developed comprehensive online-security guides.⁴²⁹ ISPs and online businesses have developed many useful resources and tools to help users better protect themselves: For example, AT&T offers a comprehensive website that serves as a resource on malware, spam, Wi-Fi security, and other issues. This site also offers information on the wide variety of parental controls that AT&T makes available to its customers.⁴³⁰ Moreover, AT&T is involved in a number of online-safety initiatives through membership organizations such as the Family Online Safety Institute, and by sponsoring various educational initiatives offered by online-safety advocacy groups, such as iKeepSafe and Enough is Enough.

In order to ensure that measures such as these have a broad impact, however, the government must take a lead role in promoting them, and the Plan should make such educational initiatives a priority. Parts of the framework for doing so already exist. For example, legislation was enacted this past fall requiring the FTC to adopt new online-safety education initiatives and

⁴²⁷ *OECD Malware Report* at 51.

⁴²⁸ See, e.g., PC Magazine Security Watch Blog, *More Facebook Malware* (Mar. 16, 2009), http://blogs.pcmag.com/securitywatch/2009/03/more_facebook_malware.php (describing an increase in malware delivered via Facebook).

⁴²⁹ National Cyber Security Alliance, StaySafeOnline.org, <http://www.staysafeonline.info/>; Consumer Reports, *Guide to Online Security*, <http://www.consumerreports.org/cro/electronics-computers/resource-center/cyber-insecurity/cyber-insecurity-hub.htm>.

⁴³⁰ AT&T, *Parental Controls and Online Safety*, <http://www.att.com/gen/landing-pages?pid=6456>.

requiring NTIA to form an Online Safety and Technical Working Group to evaluate and issue a report on industry efforts to promote a safe online environment for children.⁴³¹ In addition, the FTC's existing consumer-online-safety education efforts are an invaluable resource to both providers and consumers.⁴³² The Plan should recognize and incorporate these developments into its recommendations, but it must also recognize the need for more comprehensive and sustained efforts. Toward that end, the Plan should outline specific ways in which to advance Internet-safety awareness and education and to ensure that the information is delivered and heard more broadly by, for example, tapping the expertise of the Departments of Education, Commerce, and Labor to educate and train our citizens and businesses about online safety.

The National Broadband Plan should engage policymakers in efforts beyond education, as well. In particular, the Plan should encourage the adoption of "best practices" by software designers and online providers.⁴³³ Broadband users need better and *simpler* tools to protect their PCs, and policymakers should take steps to encourage the development and deployment of such tools. The expense and difficulty of maintaining up-to-date PC security often is far too taxing for the average consumer. Even if a consumer understands the threats and wants to take action, he or she might have to obtain security software from multiple vendors (anti-virus software, firewalls, malware removal tools, filtering software, etc.); distinguish legitimate security

⁴³¹ Broadband Data Improvement Act, Pub. L. No. 110-385, 122 Stat. 4096, 4103 §§ 212, 214 (2008) (codified at 47 U.S.C. § 1301 *et seq.*).

⁴³² The FTC, the federal agency most directly responsible for online consumer protection, has published helpful information online, including fact sheets on identity theft, phishing scams, and protecting children online. Federal Trade Commission, Consumer Protection, *Computers & the Internet: Privacy & Security*, <http://www.ftc.gov/bcp/menus/consumer/tech/privacy.shtm>.

⁴³³ See, e.g., Thomas Duebendorfer & Stefan Frei, *Why Silent Updates Boost Security*, *ETH Tech Report TIK302*, available at <http://www.techzoom.net/silent-updates> (showing that silent updates are the most effective way to get users of Web browsers to surf with the latest browser version).

warnings from sophisticated, illegitimate malware; and monitor his or her Wi-Fi network and LAN to detect unauthorized use. Short of hiring a full-time IT security professional, there is a dearth of one-stop, one-click tools that can keep users safe online. As the White House has done for cybersecurity generally, the Plan should support research in and development of new, comprehensive tools and integrated solutions for online safety.⁴³⁴

CONCLUSION

AT&T respectfully requests that the Commission carefully consider the recommendations and ideas set forth above when developing the National Broadband Plan. We firmly believe that, with an inclusive approach, a consumer-focused perspective, and well-aligned regulatory and other governmental policies, the nation's ambitious broadband goals can be met. AT&T looks forward to working with the Commission, other policymakers, and other private-sector stakeholders toward the goal of making ubiquitous broadband a reality by February 2014.

Respectfully Submitted,

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⁴³⁴ See *White House Cybersecurity Review* at 37.