

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

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

COMMENTS OF GOOGLE INC.

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have access to broadband capability,” with “benchmarks for meeting that goal.”⁴ Congress also set the following specific requirements for the national broadband plan:

The plan shall also include—

- (A) an analysis of the most effective and efficient mechanisms for ensuring broadband access by all people of the United States;
- (B) a detailed strategy for achieving affordability of such service and maximum utilization of broadband infrastructure and service by the public;
- (C) an evaluation of the status of deployment of broadband service, including progress of projects supported by the grants made pursuant to this section; and
- (D) a plan for use of broadband infrastructure and services in advancing consumer welfare, civic participation, public safety and homeland security, community development, health care delivery, energy independence and efficiency, education, worker training, private sector investment, entrepreneurial activity, job creation and economic growth, and other national purposes.⁵

Congress plainly is directing the Commission to treat broadband as a high priority policy matter, one which the market by itself may not be fully equipped to handle. The Commission should initiate this process by effectively convening all interested stakeholders, establishing a uniform framework that includes an initial minimum national benchmark for ubiquitous symmetric Internet capabilities, gathering pertinent and timely data from a variety of sources, and considering specific proposals to spur deployment of 21st century communications infrastructure throughout the country. In so doing, the FCC’s National Broadband Plan can stimulate our country’s growth-oriented network economy, drive user innovation, and exploit the immense potential of the applications and functionality that broadband platforms support.

⁴ *Id.*, at § 6001(k)(1).

⁵ *Id.*, at § 6001(k)(2)(A)-(D).

INTRODUCTION AND SUMMARY

The overarching goal of this proceeding should be to better harness the power of the Internet and broadband capacity to create an open, robust arena where the dynamic forces of change, choice, free expression, innovation, and competition reign. As President Obama has reiterated, broadband can “help build a new foundation for the 21st century,” where all Americans can compete – and win – in the global economy.⁶ The National Broadband Plan, building upon the FCC’s Report on Broadband Strategy for Rural America, is an important opportunity for the Commission to advance this vision significantly.⁷

There appears to be a growing consensus that the United States, as a whole, could do markedly better in terms of the penetration, speed, and price for broadband. By most measures, the United States continues to lag other industrialized nations in broadband performance, and its ranking has been falling since at least 2001. Whether one interprets these findings as the proverbial glass half empty or half full, it is clear that the full capacity of the glass is not being utilized.⁸ Ordinary Americans suffer when we fail to have in place a national policy that honestly analyzes the strengths and weaknesses of the market, and provides tailored policy responses.

⁶ See, <http://www.whitehouse.gov/issues/technology> (Feb. 5, 2009).

⁷ See, *Bringing Broadband to Rural America, Report on a Rural Broadband Strategy*, ¶25 (2009) (“*Rural Broadband Report*”) (noting that broadband “is the interstate highway of the 21st century..., the vital connection to the broader nation and, increasingly, the global economy.”).

⁸ In 2008, the Information Technology & Innovation Foundation (“ITIF”) ranked the United States as 15th in the world in broadband access. See, ITIF 2008 Broadband Rankings, *available at* <http://www.itif.org/files/2008BBRankings.pdf>; Stephen Ezell, Robert Atkinson, Daniel Castro, and George Ou, *The Need for Speed: The Importance of Next-Generation Broadband Networks*, 4, ITIF (March 2009), *available at* <http://www.itif.org/index.php?id=231>; Rob Frieden, *Lies, Damn Lies, and Statistics: Developing a Clearer Assessment of Market Penetration and Broadband Competition in the United States*, 23-25, Penn State University - Dickinson School of Law Legal Studies Research Paper No. 13-2008 (2008), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=115972.

These broadband challenges require both a comprehensive overarching framework and strategy and feasible interim objectives, and are not likely met by a single “silver bullet” solution. Consistent with the express goals of the Recovery Act, Google recommends the FCC’s initial National Broadband Plan (the “Plan”) include the following multi-prong approach:

- **Define Our Terms:** Broadband is communications infrastructure. As a matter of public policy, we care about broadband primarily because it provides the potential to serve as a robust and open platform for Internet connectivity. The Commission should focus in this proceeding on building a conceptual framework for optimal “Internet over broadband” access, identifying near-term objectives, establishing data metrics, and recommending concrete projects that collectively will best further broadband as an optimal Internet platform.
- **Assess Broadband Across Three Critical Dimensions:** The Commission should assess three different dimensions of broadband as a network platform for providing consumers with optimal access to the Internet: (1) the availability of broadband infrastructure on a ubiquitous basis; (2) the robustness of broadband capacity sufficient to support Internet access; and (3) the openness of Internet access itself. All three dimensions are necessary in order for broadband infrastructure to serve as an optimal Internet platform.
- **Gather Timely Data and Set Metrics Covering a Range of Pertinent Factors:** Data gathering should encompass information regarding broadband platform availability, bandwidth (capacity), usage and demand, latency and congestion, affordability, value, competition, and openness. The FCC should rely on its existing data collection tools and develop new ones, including measurements of availability of choices, impediments such as capacity caps, restrictions on applications, industry and consumer-reported information, state and local statistics, and other private and public data sources. The FCC should also consider broadband education efforts for both young and older Americans, examining and publishing regularly, through surveys and other tools, what broadband services are available for specific purposes. The Plan should also set a series of reasonable but challenging broadband metrics by which the FCC can evaluate, on an ongoing basis, how effective are its current market-based policies and its future policy responses.
- **Encourage Growth and Vitality of the Broadband Applications Marketplace:** FCC decisions should focus expressly on the impact of federal broadband “last mile” policies and regulations upon the fuller utilization of broadband by end users and the innovation/growth of broadband Internet application services. The FCC should adopt an explicit objective to encourage broadband applications growth and innovation, which spurs demand for broadband and provides greater

depth of uses and experiences for the American public. The Plan should recognize the importance of maintaining an unregulated environment and other low entry barriers for the enhanced applications marketplace, even as some convergence of ownership of broadband applications and facilities occurs. FCC policies should ensure that “last mile” broadband platforms are open and accessible to enable direct end-user/applications interaction and create an efficiently functioning applications marketplace.

- **Adopt National Benchmarks, Beginning with Residential Symmetrical 5 Mbps Broadband Internet Connectivity for All Americans by 2012:** As part of assessing the dimension of sufficiently robust Internet access, the FCC should set an initial minimum benchmark seeking to provide all Americans with availability to symmetric, always-on Internet capacity to residences of at least 5 Mbps. The FCC should review and expand upon this benchmark on a regular basis, perhaps every two years. Google believes that the 5 Mbps benchmark is a reasonable first-step, but also that it is likely even more ambitious benchmarks with much higher capacity levels will be necessary over the course of the next decade.
- **Explore a Variety of Projects Designed to Foster Greater Broadband Deployment and Penetration:** There are many pathways to achieving broadband as an optimal Internet platform. In addition to establishing a uniform conceptual framework and developing the appropriate metrics, the Commission should consider endorsing a number of possible projects to further our ultimate objective. Some examples include:
 - **Broadband Conduit in Public Works Projects:** The FCC should consider how installation of broadband conduit in all new federally-funded road projects and other government-supported infrastructure projects (*e.g.*, water, electric, gas) will meet current needs, allow for competition and accommodate future expansion with the lowest possible deployment costs and disruption along with the speediest installation.
 - **Community Hub Broadband Deployment:** The Plan should consider support for deployment of fiber (or comparable facilities) to libraries, public housing, community medical facilities and K-12 schools, as well as municipal broadband deployment, so that these anchor institutions can help bring broadband access to traditionally un-served, under-served, and at-risk populations.
 - **Multiple Home-Run Fiber Deployment Incentives:** The FCC should explore creation of incentives for network providers to install multiple home-run fiber deployments when networks are being rolled out to avoid capacity constraints, increase competition, and create new business models.

- Reduce Barriers to Wireless Deployment: Use of unlicensed devices in White Spaces spectrum should be encouraged by eliminating unnecessary requirements (*e.g.*, sensing requirement for wireless microphones); power limits and interference standards should be eased in rural areas where no actual harmful interference would occur; and zoning and rights-of-way barriers that slow wireless broadband deployment should be targeted.

These recommendations recognize that the FCC's Plan will be one piece of a larger broadband infrastructure mosaic, which already includes billions of dollars provided for in the 2009 Recovery Act,⁹ ongoing industry initiatives, and numerous policy efforts already underway. These latter efforts are taking place not just at the FCC and in Congress, but through other Federal entities, State programs, undertakings of localities, community groups, non-profits, and others. As a nation, it will take both considerable focus and substantial resources – both private and public – to create a communications infrastructure capable of meeting the demands of the 21st century. This only underscores the need for the FCC's Plan to be both far-reaching and flexible.

To be clear, formulating an objective of broadband as an optimal Internet platform, and acknowledging the three intertwined “Internet over broadband” dimensions of availability, robustness, and openness, is not the same as reflexively adopting a broad swath of regulations intended to promote and preserve those important attributes. There can be many paths to achieving a desired end, and here, as elsewhere, neither the government nor the market alone has all the answers. Moreover, there is a broad array of potential mechanisms at the FCC's disposal,

⁹ In addition to the over \$7 billion for broadband specific endeavors, the 2009 Recovery Act includes \$11 billion for smart-grid related activities, including modernization of the electric grid, \$4 billion for public housing projects, and over \$111 billion for infrastructure projects, including the deployment of communications infrastructure in the United States. *See*, Press Release, United States Congress, *The American Recovery and Reinvestment Act of 2009* (Feb. 12, 2009), available at <http://appropriations.house.gov/pdf/PressSummary02-12-09.pdf>.

running a gamut from the highly prescriptive to the flexibly adaptive, to achieve its chosen broadband agenda. These include regulations, policies, forms of self-regulation and co-regulation, advisory opinions, bully pulpits, industry standards, and even social norms.¹⁰ The Commission also should determine what legal institutions should serve as the underpinnings of its authority to take certain actions in the marketplace. In particular, the agency can rely on legacy conceptions for regulating communications and transportation infrastructure to help understand which, if any, such rationales should survive in modern day U.S. broadband policy. For example, the history of common carriage, and its different prongs related to the existence of market concentration, public callings, and voluntary bailment, offers one potential form of institutional legal grounding for the Commission's decisions.¹¹ The bottom line is that the Commission has many institutional tools at its disposal to help achieve its National Broadband Plan.

As a result, we believe the Commission's regulatory stance here should be a forward looking and flexible one. While it is true that the current state of U.S. broadband has been significantly shaped by previous federal policies, the FCC's Plan should not seek simply to "roll back the clock," or to re-regulate under past paradigms. Instead, a more careful and searching process is required to ensure that the proper balance between private and public actions is struck. For purposes of the National Broadband Plan, the Commission should take a close look at the

¹⁰ See Richard S. Whitt, *Adaptive Policymaking: Evolving and Applying Emergent Solutions for U.S. Communications Policy*, 61 FED. COMM. L.J. No. 3 (forthcoming 2009).

¹¹ See, e.g., Richard S. Whitt, *Evolving Broadband Policy: Taking Adaptive Stances to Foster Optimal Internet Platforms*, 17 COMMLAW CONSPECTUS 417, 469-99 (2009) (examining these and other potential candidates to serve as the legal institutions governing broadband networks) ("*Evolving Broadband Policy*").

agency's current policies and goals, ascertain our current broadband situation and future needs, and embark on a fresh course to realize the best future vision of broadband for our nation.

DISCUSSION

I. DEFINING OUR TERMS: BROADBAND AS AN OPTIMAL INTERNET PLATFORM

The *NOI* acknowledges that “broadband can be defined in myriad ways.”¹² Initially we need to determine exactly what broadband is, and why we care about it as a public policy matter. For purposes of this *NOI* proceeding, the FCC should define broadband as technology-neutral, high-speed communications infrastructure that allows users to harness the Internet, access and upload content, and otherwise engage in high speed two-way connectivity and interactivity. Metaphorically, broadband serves as a potential platform for connecting people, transporting data, and enabling highly desirable emergent properties.

Importantly, broadband is not the Internet, or even access to the public Internet. The network layers model serves us well here.¹³ Broadband constitutes the lower layer network activities provided by carriers, while “the Internet” is the upper layer activities supplied by users such as applications and content providers. Internet service providers (“ISPs”) typically provide consumers with access to the public Internet, utilizing last-mile, middle mile, and backbone communications facilities, as well as access to stored information hosted on an array of servers. In other words, broadband is the physical connective pathway that allows consumers to reach the Internet and utilize its capabilities. One should think metaphorically of online applications and

¹² *NOI* at ¶ 15.

¹³ Richard S. Whitt, *A Horizontal Leap Forward: Formulating A New Communications Public Policy Framework based on the Network Layers Model*, 56 FED. COMM. L.J. 587, 653-62 (2004) (explaining the utility of a network layered model for analyzing broadband-related policy issues); Kevin Werbach, *A Layered Model for Internet Policy*, JOURNAL OF TELECOMMUNICATIONS AND HIGH-TECH LAW, Vol. 1, 37 (2002).

content (including but not limited to access to the public Internet) as “riding on top of” broadband networks. In these comments, we will refer to “broadband Internet” or “Internet over broadband” when describing this joint functionality.

Broadband can be harnessed for many other online services and applications other than access to the public Internet. For example, broadband can serve as a conduit for managed network service offerings utilizing virtual private networks (“VPNs”), and for online applications that do not necessarily utilize the public Internet. Broadband also can be used to deliver proprietary streaming video content. None of these functions necessarily involves access to the public Internet, although they may all well employ the Internet Protocol (“IP”) as the Layer 3 transmission medium. IP, of course, is merely a software routing protocol, and not itself the Internet either. While using broadband as a private, one-way entertainment medium is not the same as using it as an interactive, two-way information, communications, and/or entertainment medium, they do raise similar concerns about the incentives and ability of a vertically-integrated broadband provider to discriminate or act in an anticompetitive manner.

This distinction between broadband and what it carries is a crucial one for many reasons. Policymakers should have different policy goals, and different policy priorities, geared towards these varied uses. For purposes of this proceeding, our public policy concern with broadband is precisely as a means of accessing the public Internet, and all its richness. When used as an Internet platform, broadband – like most forms of basic infrastructure – can generate a myriad of positive externalities. These large social benefits typically are not subject to capture by the underlying broadband provider. Among other things, the FCC’s Plan must determine whether all Americans, under the FCC’s current broadband policies, are in the best position to gain full

access to these myriad social benefits on an affordable basis, and, if not, what policy course corrections are warranted.

II. THE FCC SHOULD ASSESS THE THREE INTERRELATED DIMENSIONS OF AVAILABILITY, ROBUSTNESS, AND OPENNESS OF BROADBAND INFRASTRUCTURE AND CAPACITY, USING A TRANSPARENT AND DATA-RICH PROCESS

The 2009 Recovery Act requires the Commission to establish a useful and forward-looking National Broadband Plan that has a clear picture of the state of broadband as it exists today.¹⁴ As a threshold matter, the FCC, as discussed above, should clarify that broadband is not the Internet, or even access to the Internet. Rather, broadband is a technology-neutral, high-speed communications platform that allows users to harness the Internet, access and upload content, and otherwise engage in high speed two-way connectivity and interactivity.

Currently, despite the importance of broadband to our nation, there is a lack of reliable, up-to-date, and readily-accessible information about many vital aspects of broadband. To fill this gap, the FCC should begin with an overarching framework that considers three key dimensions: (1) Is there ubiquitous access to affordable broadband infrastructure for Americans?; (2) Do the deployed broadband facilities have sufficient capability and capacity to provide consumers with robust access to the Internet and other online capabilities?; and (3) How open is the “Internet over broadband” connectivity?

Beyond the timely and relevant data the FCC collects, the Plan should acknowledge the expertise of individual consumers and grassroots groups, the role of other federal agencies, and of State and local authorities regarding the facts of broadband deployment. All are likely to have timely and accurate input, including regarding impediments to universal broadband access,

¹⁴ 2009 Recovery Act, § 6001(k)(2)(C) (requiring “an evaluation of the status of deployment of broadband service”).

making participation in ongoing data collection efforts valuable. “Bottom up” approaches may well substitute for or complement “top down” prescriptions. With transparent and accessible information, the FCC will be best positioned to prioritize and create a Plan based on actual facts “on the ground” and avoid relying primarily on isolated anecdotes and guesswork, or even its own predictive judgments.

To promote a clear path and avoid inadvertently discouraging broadband platform owners from taking pro-active steps, the Plan should also establish a continuing process of data collection, decisionmaking, and metrics testing. Thus, the Commission should set deadlines of less than one year for its initial data collection and examination, and then identify and initiate FCC initial policy actions and responses within the following 12 months. Once those policies have been established, the FCC should examine against reliable metrics whether those policy shifts have yielded the expected results and progress. This cyclical process of data collection, policy course correction (if warranted), and evaluation against reliable metrics should become a continuous and periodic FCC regimen. This way, the agency will be well positioned to tailor recommendations to the evolving and dynamic nature of broadband, gather any additional information, and exercise a strong leadership role.

A. The Availability of Broadband Infrastructure: Do Consumers Have Access to Broadband Platform Facilities?

To develop the Plan, the FCC obviously needs comprehensive and accurate data on the availability of physical broadband infrastructure to users throughout the country, encompassing all technology platforms: wireless (unlicensed/licensed, mobile, fixed, and satellite); wireline; and cable. In considering this first dimension of broadband infrastructure availability, the FCC should focus initially on last mile connectivity as the critical piece of the broadband platform,

especially in light of defined Congressional goals in context of the 2009 Recovery Act, while recognizing that “middle mile” and backbone facilities are also important. While national statistics are useful for some purposes, it is also true that broadband availability and functionality are often essentially local issues. After all, the individual’s broadband connection (including throughput speed, congestion, and capacity) and usage factors (including pricing, computer and Internet literacy) impact utility broadband Internet services, not the aggregated national or even state statistics on broadband capacity and demand data. Thus, the FCC should welcome reliable and unbiased data from diverse sources, including non-traditional sources such as community-based and private data surveys,¹⁵ as well as traditional sources, including state and other federal data as well as industry reports.¹⁶

1. Broadband Data Collection: The FCC’s broadband data collection efforts already under way are a good starting point. This process should yield pertinent information regarding (1) the number of wired and wireless network provider subscribers in each Census Tract; (2) the number of connections in service to residential households and businesses in each Census Tract, broken down by technology type and upload/download speed; (3) reporting by mobile wireless broadband providers of Census Tract data for each of the speed tiers in which they offer service

¹⁵ See, e.g., John B. Horrigan, Pew Internet & American Life Project, *Home Broadband Adoption 2008*, 3 (July 2008), available at http://www.pewinternet.org/~media/Files/Reports/2008/PIP_Broadband_2008.pdf (“Pew Internet Study”); See, also, e-NC, *Broadband Access in North Carolina*, available at <http://e-ncbroadband.org/>.

¹⁶ See, e.g., Stephen J. Blumberg, et. al, National Health Statistics Reports, *Wireless Substitution: State-level Estimates From the National Health Interview Survey, January–December 2007* (Mar. 11, 2009) available at <http://www.cdc.gov/nchs/data/nhsr/nhsr014.pdf>; California Broadband Taskforce, *The State of Connectivity, Building Innovation Through Broadband* (Jan. 2008) available at http://www.calink.ca.gov/pdf/CBTF_FINAL_Report.pdf; NTCA 2007 Broadband/Internet Availability Survey Report (Sept. 2007) available at <http://www.usdoj.gov/atr/public/workshops/telecom2007/submissions/228008.htm>.

and the number of subscribers with data plans that allow them to browse the Internet and access the Internet content of their choice; and (4) a voluntary system designed and implemented by the FCC that households may use to report availability and speed of broadband Internet access service at their premises.¹⁷ As the FCC evaluates the information it receives, it should also bear in mind that an important factor in assessing of the available consumer options is to look beyond the number of individual broadband technology platforms. An honest appraisal would examine as well the number of *independent* platforms available to the consumer, as wireline/wireless cross-ownership invariably affects the economic incentives to producer diverse and competing business models.¹⁸

The FCC's open rulemaking on broadband reporting obligations¹⁹ also provides options to improve the understanding of broadband availability.²⁰ Collecting address-by-address service

¹⁷ *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, Report and Order and Further Notice of Proposed Rulemaking*, 23 FCC Rcd. 9691, ¶¶ 12-18 (2008) (“*Broadband Data Collection R&O and FNPRM*”). See, also, Broadband Data Improvement Act of 2008, Pub. L. No. 110-385, 122 Stat. 4097 (2008) (codified at 47 U.S.C. §§ 1301–04) (requiring the U.S. Census Bureau to expand data collection on broadband data services, and computer use and ownership, and requires the Census Bureau Comptroller General to report within a year on improved metrics and standards for use in FCC broadband data collection; establishing a Commerce Department matching grant program for state-level projects analyzing broadband deployment and use, and requiring the Office of Advocacy of the Small Business Administration to study the impact of broadband speed and price on small businesses).

¹⁸ *Prometheus Radio Project v. FCC*, 373 F.3d 372, 383 (3d Cir. 2004) (recognizing that “[i]n setting its licensing policies, the Commission has long acted on the theory that diversification of mass media ownership serves the public interest by promoting diversity of program and service viewpoints, as well as by preventing undue concentration of economic power.” (quoting *FCC v. Nat'l Citizens Comm. for Broad.*, 436 U.S. 775, 780 (1978)); see also, *Promoting Diversification of Ownership In the Broadcasting Services, Report and Order and Third Notice of Proposed Rulemaking*, 23 FCC Rcd. 5922, ¶ 102 (2007) (noting that promoting “diversity of ownership of media outlets in order to promote diversity and competition” are “longstanding and important Commission goals”).

¹⁹ *Broadband Data Collection R&O and FNPRM*.

²⁰ See, *Id.*, ¶ 34-35 (seeking comment on developing nationwide broadband availability map).

availability to create a highly detailed map of broadband availability nationwide, as well as gathering delivered-speed information with reporting of actual broadband connection speeds experienced by customers, would capture meaningful information to guide next steps.

The Plan should also expressly encompass complementary endeavors such as the Measurement Lab (M-Lab),²¹ which operate as an open, distributed server platform for users as well as researchers to create active network measurement, to share data, and to enhance transparency. The goals of these projects are to advance network research and to empower the public with useful information about their broadband connections.²²

It is equally important for the FCC to evaluate the *demand side* of the broadband adoption challenges. The FCC should collect data, or support collection of reliable data concerning, on the usage of broadband by the American public. This data collection would provide significant insight into how Americans use broadband connections (*i.e.*, for personal, informational or entertainment uses, for work or income opportunities, for interaction with federal, state, or local governments), and what segments of American society use broadband more or less than others. Such data would also examine why some Americans choose not to use broadband Internet services, which may depend on pricing/income considerations, differences in the perceived value of broadband, and/or computer and Internet literacy issues. These compilations of demand data, in turn, will provide the Commission and other policymakers with

²¹ See, www.measurementlab.net. The Measurement Lab was founded by the New America Foundation's Open Technology Institute, the PlanetLab Consortium, Google Inc. and academic researchers. M-Lab was developed in 2008 after Vint Cerf and others at Google initiated conversations with network researchers to learn more about challenges to the effective study of broadband networks.

²² See, <http://www.measurementlab.net/about>.

a greater understanding of what is important to Americans today, and what factors would help Americans to transition to more effective use of broadband for the 21st Century.

Similarly, the FCC should consider educational projects to inform the public of what broadband services and applications are available, and how these services and applications can improve American's ability to improve access to critical health, community, economic, and political information and services. This education should focus on both the young and older Americans. As broadband capacity and availability rises over time, the FCC should evaluate and survey the marketplace for mobile, nomadic, and fixed broadband services and applications, and publish these results for all Americans to review and to gain a better understanding of what services are available. While Google believes that the marketplace ultimately is the best repository of information on available services, it is important for the Commission to likewise examine these burgeoning services, and to include information on the range of offerings available for use in the educational efforts of the Commission and other government and private/public efforts. In order to keep this information current, the Commission should conduct a bi-annual survey of mobile, nomadic, and fixed broadband services and applications available to Americans, and how those services can be used to improve the quality of our citizens' health, education, economic well-being, and civic lives.

2. Use of our Nation's Spectrum: In light of the strong growth opportunities of wireless to deliver a resilient and reliable broadband platform, it is vital that the FCC and the public have a more complete and accurate understanding of how the country's airwaves are

today being utilized.²³ For this reason, as was noted in the *Rural Broadband Report*,²⁴ the Plan should include a recommendation for a funded mandate for the FCC and NTIA to conduct a spectrum inventory to include spectrum currently in use by both private and governmental entities.²⁵ This valuable information will assist government, users, and commercial enterprises engaged in wireless policy decisions and help stimulate innovation and private-sector investment in new spectrum-based technology.

The logical and efficient starting point for this endeavor should be to make more accessible the information that already exists at the FCC and elsewhere regarding aspects such as license terms and construction requirements, geographic partitioning/disaggregation activities, ownership, affiliations, cell tower registrations, and coverage and build-out data. Similarly, the FCC's website and online databases could better organize materials on unlicensed spectrum availability, the technical rules and limits for each unlicensed and hybrid-licensed bands (*e.g.*, power limits, non-interference standards, out-of-band emissions limits, database coordination requirements). While the Internet and technology has greatly facilitated public transparency of government information, it is still far too difficult for even sophisticated users to obtain complete and current information about how and where spectrum is being used, by whom, and what spectrum may be available.

Coordination and linking of existing FCC databases can provide a significant amount of this information. There may even be a role for the private sector, *e.g.*, making the FCC's ULS or

²³ See, *Taking Stock of the Nation's Airwaves*, Google Public Policy Blog (May 4, 2009), available at <http://googlepublicpolicy.blogspot.com/2009/05/taking-stock-of-nations-airwaves.html>.

²⁴ *Rural Broadband Report*, at ¶ 150.

²⁵ One such laudable effort is the Radio Spectrum Inventory Act, which would require the FCC to conduct such a spectrum inventory. See, Radio Spectrum Inventory Act, S. 649, 111th Cong. (2009).

other information accessible online. Ultimately, the goal should be a database that permits any individual to examine, for a particular geographic location, whether particular frequencies are assigned for use to a commercial or governmental entity and, if so, a point of contact; whether facilities have been constructed; transmitter locations and equipment types; and other spectrum occupancy data relevant to determining the extent of the entity's spectrum usage.

3. Broadband Competition and Deployment: Beyond facts about broadband infrastructure now deployed, the Plan should also encompass data on the pace of deployment of “next generation” networks, retail and wholesale competition on broadband, broadband demand drivers, and today's facts versus prior predictions about how broadband networks and services would evolve. For example, the FCC previously found that elimination of incumbent providers' fiber unbundling obligations would promote “deployment of the network infrastructure necessary to provide broadband services to the mass market” and create a “race to build next generation networks and the increased competition in the delivery of broadband services.”²⁶ What are the facts regarding whether this has or has not occurred? Likewise, it was previously surmised that “The threat of competition ... whether satellite, fixed or mobile wireless, or a yet-to-be-realized alternative, will further stimulate deployment of broadband infrastructure, including more advanced infrastructure such as fiber to the home”²⁷ and that a viable and growing wholesale

²⁶ *Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers, Report and Order and Order on Remand and Further Notice of Proposed Rulemaking*, 18 FCC Rcd. 16978, ¶¶ 272, 278 (2003) (“TRO”).

²⁷ *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities, Report and Order and Notice of Proposed Rulemaking*, 20 FCC Rcd. 14853, ¶ 57 (2005) (“Wireline Broadband Order”).

market for broadband network capacity would emerge.²⁸ Have the facts since then proved these predictions to be accurate, or is it time for re-evaluation and a change of course?

The FCC should also expand its data gathering to allow for other types of data that may address particular areas of concern affecting deployment and availability, including data about broadband demand drivers, including accessibility, price impediments and market competition. Given that the greatest value of broadband infrastructure lies in the information flow it facilitates, the FCC should complete a review of the level of provisioning of wholesale broadband telecommunications by incumbent network providers (including telcos, cable operators, and wireless carriers) to unaffiliated information services providers.²⁹ By examining competition between broadband access providers and platforms, as well as other factors impacting availability, the FCC will be best able to pinpoint needed next steps.

4. Crafting Regulatory Responses: The broadband facts may show that the FCC's prior "predictive judgments" were overly optimistic. They may show that reasonable wholesale access on competitive terms is not available. The factual examination may even conclude that a lack of vigorous competition – along with considerable barriers to entry and consumer switching costs – enables and even invites discriminatory conduct and/or broadband service provisioning decisions such as broadband capacity caps that would not occur in a competitive arena. It is also

²⁸ *Petition for Forbearance of the Verizon Telephone Companies Pursuant to 47 U.S.C. § 160(c), Memorandum Opinion and Order*, 19 FCC Rcd. 21496, ¶26 (2004) ("271 Forbearance Order").

²⁹ See, *Wireline Broadband Order*, at ¶ 64 ("we expect that facilities-based wireline carriers will have business reasons to continue making broadband Internet access transmission services available to ISPs without regard to the *Computer Inquiry* requirements"). Notably, however, as Free Press recently pointed out that, "once [the incumbent providers] were granted relief from providing reasonable wholesale access, incumbents refused to offer wholesale altogether or jacked up the rates so high that third-party ISPs would lose money." Free Press Report, *Changing Media: Public Interest Policies for the Digital Age*, 17-18 (2009) available at http://freepress.net/files/changing_media.pdf.

a fair question whether the further development of future competition, which in itself is not a given, would prove sufficient to deter such conduct. To the extent there is a problem to be solved inherent in the concentrated nature of the broadband market itself, or the critical importance of broadband overall to the national economy and overall well-being, rather than in a roster of actual and potential “bad acts,” the Commission can adjust its course accordingly. In these cases, the FCC should underscore its flexibility to adopt tailored safeguards as a viable proxy for the intense broadband platform competition that has thus far proven elusive.

Finally, in addition to gathering data about broadband infrastructure availability, the FCC should use the Plan to describe the potential range of responses, from laissez-faire to prescriptive regulations and intermediate options, as well as appropriate enforcement processes, which will allow it to address quickly any market deficiencies found. In doing so, the FCC should take a balanced and tailored approach to regulating broadband. Certainly, there are laudable and successful market-driven deployments, such as Verizon’s fiber-based FIOS services available to residential users. These capital-intensive projects serve to highlight that we must give ample room for, and not detract from, private efforts to address our national broadband challenges. The experiences of other nations can also offer useful input for U.S. policy.³⁰ Rather than jump to

³⁰ For example, countries that enjoy a more open regulatory environment, such as the United Kingdom and Japan, tend to provide more bandwidth at lower prices. *See*, Press Release, Ofcom, *Ofcom proposes a new range of wholesale prices for Openreach* (May 12, 2008), available at http://www.ofcom.org.uk/media/news/2008/12/nr_20081205 (describing the agreement between Ofcom and BT that required BT to provide local loop unbundling to allow competitive providers to offer their own retail services over BT’s copper network. States that “[i]n three years, the number of ‘unbundled’ lines has increased from 123,000 to over 5 million, offering consumers more choice and better value for money.”). BT’s wholesale service is offered as a “bitsream access service” through Openreach, a separate business unit. Broadband providers in other countries are exploring wholesale models similar to Openreach, including New Zealand and its “Chorus” program. *See*, <http://www.chorus.co.nz/how-we-work>. Furthermore, the Organization for Economic Cooperation and Development (“OECD”) recognizes the role that open networks play in promoting competitive markets. *See*, OECD Report, *The Role of*

past regulatory models, or superimpose on a new Title I-based regime, the FCC would be wise to leverage the lessons of the past. As one possibility, the agency could assess whether certainty and efficiency in achieving our future broadband goals are best-served by a case-by-case, common law-type enforcement regime incorporating some aspects of Title II precedent.³¹

The Plan should also set a series of reasonable but challenging broadband metrics by which the FCC can evaluate, on an ongoing basis, how effective are its current market-based policies and its future policy responses. Metrics would provide the FCC, policymakers, and the industry with goals to attain. Further, objective metrics and goals will permit all stakeholders to recognize if the market data falls short of the objectives of the FCC's Plan. The Commission should look first to industry participants, public interest groups, and other interested parties to develop a set of objective and reasonable broadband metrics and goals.

B. The Robustness of Capacity: Is the Broadband Capability Sufficient to Allow Users to Access And Utilize Their Choice of Online Information, Content and Applications?

The second key dimension to understanding the present state of broadband is to discern whether available transmission capacity is sufficiently robust to allow users to access their choice of content, information, and applications. Policymakers should be particularly concerned when broadband connections slow or exhibit latency issues when users access particular content,

Communication Infrastructure Investment in Economic Recovery, 25 (May 19, 2009) available at <http://www.oecd.org/dataoecd/4/43/42799709.pdf> (stating that “open access networks play an important role promoting competition...”).

³¹ Part of this re-examination could encompass the FCC's prior decisions eliminating all common carriage requirements from the vertically-integrated ISP/broadband provider. Regardless of whether one agrees or not with the Commission's market concentration analysis in those decisions, there are other traditional aspects of common carriage, such as the public callings and bailment prongs, which offer alternative underpinnings for a new broadband legal regime. *See, Evolving Broadband Policy*.

video applications, online software, gaming applications, or unaffiliated services. Such limitations dampen productivity, squelch innovation, and hinder the free dissemination of ideas.

1. Setting National Residential Broadband Benchmarks: It is almost certain that what Americans perceive as “robust” broadband capabilities today will become outdated before long, and we cannot know how and when technological breakthroughs will bring capacity improvements. Nonetheless, the 2009 Recovery Act requires the Commission to analyze and to develop a “detailed strategy” for achieving the goal of robust and affordable broadband for all Americans,³² and so it remains important for the FCC’s Plan to establish a benchmark. A reasonable first measure is a benchmark establishing a symmetrical standard of “Internet over broadband” connectivity for all American residences, starting with 5 Mbps throughput by 2012. This symmetrical standard will permit all Americans to make the most of Internet over broadband: tele-working and tele-medicine opportunities; interactive video communications; access to an array of information and applications; and the ability to interact with such applications.

Symmetric broadband speeds that allow users both to receive *and* generate online information are necessary to maximize value to Americans. Broadband, as an optimal Internet and communications platform, directly serves the free flow of information that lies at the heart of our society, embodied in the First Amendment’s foundation of a vibrant marketplace of ideas.³³

³² 2009 Recovery Act, § 6001(k)(2)(A), (B).

³³ *ACLU v Reno*, 521 U.S. 844, 885 (1997) (describing the Internet itself as a “marketplace of ideas”). *See also, Abrams v. United States*, 250 U.S. 616, 630 (1919) (J. Holmes dissenting) (“the best test of truth is the power of the thought to get itself accepted in the competition of the market”).

Consistent with the goals of the 2009 Recovery Act,³⁴ symmetry enables Americans to use broadband for much more than just entertainment purposes and helps users create home businesses, enjoy telecommuting options, and become publishers of bandwidth-rich content, such as videos and applications, allowing ideas and innovation to grow in new ways as individuals are empowered to exploit their high-speed connectivity fully. While 5 Mbps of Internet access may be viewed by some as a modest goal, even relatively moderate symmetrical speeds appear to be preferable as a ubiquitous broadband foundation than asymmetrical, ultra-broadband pipes in few geographic locations. Our first priority should be to get all Americans online, enjoying always-on broadband capabilities. For this reason, the FCC should find that universal end user connectivity to symmetric broadband networks is a higher priority public policy objective today than non-ubiquitous and asymmetric ultra-high broadband speeds.

The Commission should also commit to review the robustness of broadband for all Americans, and to setting definite goals, on a bi-annual basis. Once this foundation of end user usage is established, then the FCC can assess the overall state of the market and determine whether higher speed benchmarks are in the public interest. Google believes that the 5 Mbps benchmark is an ambitious yet attainable first-step, but also that it is highly likely that even more challenging benchmarks with much higher capacity levels will be necessary over the course of the next decade.

2. Refashioning USF for the Broadband Age: Reform of the current universal service mechanisms has been pending for too many years. In particular, a program instituted

³⁴ 2009 Recovery Act, § 6001(k)(2)(D) (“use of broadband infrastructure and services” is to “advanc[e] consumer welfare, civic participation, public safety and homeland security, community development, health care delivery, energy independence and efficiency, education, worker training, private sector investment, entrepreneurial activity, job creation and economic growth, and other national purposes”).

during the dawn of dial-up consumer access to the Internet over in-place copper wiring should be revamped to match our aspirations for the nationwide, ubiquitous deployment of broadband.

The FCC should commit to take action within one year on pending proposals regarding Federal Universal Service Funds for broadband. This includes support mechanisms available on a technology-neutral basis for provision of broadband in rural areas.³⁵ Rather than a PSTN “universal service” focus, the stated objective should be universal access to broadband encompassing connectivity, ubiquity, and symmetry.³⁶

3. User Demand: To evaluate whether broadband capacity is sufficiently robust to serve all Internet user needs, it is essential to understand how user demand affects deployment and provisioning decisions. For this reason, the Plan should also include data on usage and demand metrics to determine how much broadband capacity consumers are actually using. How much Internet uploading and downloading is occurring today and what are reasonable expectations going forward? What exactly do consumers use broadband for? Are there affordability, accessibility or similar considerations that affect demand? How does an end user’s computer and Internet literacy impact her demand for broadband capacity and broadband Internet services? How does the presence of school-age children or an adult with at-home employment affect a household’s usage of broadband and demand for broadband capacity?

The FCC should also examine capacity and usage restrictions, as well as proprietary devices and interfaces that affect broadband utility (e.g., cable set top boxes), and similar

³⁵ See, *Federal-State Joint Board on Universal Service Recommended Decision, Recommended Decision*, ¶¶ 11-15 (2007), available at, *High Cost Universal Service Support, Notice of Proposed Rulemaking*, 23 FCC Rcd. 1531, Appendix A (2008) (recommending that high-cost universal service support should be delivered through three distinct funds: the broadband fund, the mobility fund, and the carrier of last resort fund.).

³⁶ See, *Comments of Google*, WC Docket No. 05-337 (Nov. 26, 2008).

provisioning practices to determine if they encourage Internet over broadband usage, whether they are detrimental and inhibit broadband usage, and/or whether they demonstrate a possible competitive market failure. For example, do open connection devices better meet consumers' needs and expectations and drive demand? Do proprietary devices and equipment have a negative impact on Internet connectivity? Are capacity caps (or even the threat of usage caps) affecting users' behaviors? Does it vary based on whether the connection is wired or wireless? Depending upon the answers to these questions, the FCC may need to address these concerns going forward.

4. Capacity and Constraints: A key metric that directly affects the broadband user's experience is the delivered speed versus the advertised "up to" speed. Measurement tools for users, including Google's M-Lab³⁷ and the BroadbandCensus.com efforts,³⁸ certainly offer the promise of assistance. At the same time, consumers should be provided accurate and full disclosure of information regarding actual and average network speeds from their broadband platform providers so that consumers can make informed choices regarding service options, pricing, and performance.

Given the importance of broadband capacity, especially as video applications and services continue to grow exponentially, the Commission should also be wary of false choice arguments that limit users' Internet over broadband experiences on the grounds of network "scarcity." The FCC should reject arguments of broadband platform providers that posit a supposed trade-off to be made between limitations of network capacity and end-user's freedom

³⁷ See, <http://measurementlab.net/measurement-lab-tools>.

³⁸ See, <http://broadbandcensus.com>.

of online usage. There is no actual bandwidth scarcity if platform owners establish ample “private network” capacity for their pre-defined services and content (*e.g.*, their video channel-line up or similar “prioritizing” practices) while simultaneously leaving little or no adequate bandwidth for consumers to select and interact with online applications unaffiliated with the platform owner. Similarly, users who purchase access to the network owner’s broadband platform should be offered capacity for user-driven and/or unaffiliated online content and applications on terms that are affordable and are not inferior to the platform-owner’s affiliated content/applications.

C. The Integrity of the Online Experience: Are the Broadband Platforms Open?

The third critical dimension of broadband is the degree to which the platforms are open to the fullness of the Internet. This corresponds roughly to the concept of “network neutrality” that has been the source of much industry and political discussion over the past four years.

1. Openness as a Public Policy Virtue: Internet access that is unimpeded by the underlying network provider maximizes the end users’ potential to produce inspired applications, content, and technologies. Connectivity rooted in open and accessible broadband networks is most likely to breed innovation and ideas, create spillover effects, and generate positive externalities. The single best example of an open platform, the Internet, has generated enormous tangible benefits for the U.S. in the form of true economic growth and enhanced human potential. Openness is especially needed in the last-mile connectivity to foster users’ competitive choices and discipline incentives for discrimination on pricing, access, and reliability for third

party applications, content and service providers. For these reasons, the 2009 Recovery Act,³⁹ the Obama Administration,⁴⁰ and the FCC have all embraced the policy virtue of open broadband “last mile” networks. As emphasized in the *Rural Broadband Report*, “‘Openness’ is not just another bromide, but a principle we must tenaciously preserve.”⁴¹

Open platforms also create tremendous business opportunities for the providers of such platforms. Ideally, all network providers would come to understand the economic virtues of allowing users to access the applications, service providers, and devices of their choice, and consequently, would adopt open platforms as a viable business model going forward.⁴² Fortunately, despite initial resistance by some, there is increasing recognition that open networks maximize value and investment returns, so that markets are adapting to openness as a key broadband dimension that consumers find attractive. In fact, where many network providers previously rejected the very concept of open networks, today those same carriers appear to

³⁹ See, 2009 Recovery Act, § 6001(j) (“non-discrimination and network interconnection obligations shall be contractual conditions of grants, including, at a minimum, adherence to the principles contained in the Commission’s broadband policy statement (FCC 05-15, adopted August 5, 2005).”), *id.*, Division A, Title I, RUS Appropriations (priority for awarding funds given to project applications for broadband systems that deliver end users a choice of more than one service provider).

⁴⁰ As recently as May 29, 2009, President Obama reiterated, “I remain firmly committed to net neutrality so we can keep the Internet as it should be – open and free.” http://www.whitehouse.gov/the_press_office/Remarks-by-the-President-on-Securing-Our-Nations-Cyber-Infrastructure/.

⁴¹ *Rural Broadband Report* ¶ 139.

⁴² Economics has driven openness policies in other nations. For example, Singapore’s national high-speed network to be deployed by 2012 will be open and offer wholesale dark fiber services to downstream operators on a non-discriminatory basis at attractive prices. In addition to helping stimulate a vibrant and competitive retail market, this approach will make use of existing ducts and other underlying infrastructure, minimizing disruption to the public and enabling the network to reach homes and buildings more quickly. See, Press Release, *IDA Singapore, Singapore’s Next Generation National Broadband Network To Be Nationwide by 2012*, available at <http://www.ida.gov.sg/News%20and%20Events/20080926174755.aspx?getPagetype=20>.

accept, and in some cases even embrace, consumer choice of applications, services, and interfaces.⁴³

2. The Uncertain Role of Competition: Theoretically at least, a vigorously competitive marketplace that allows users to choose their broadband providers also makes it more difficult for platform owners to impose “artificial scarcity” constraints on users. However, the jury still appears to be out on this critical point. It is not clear that we can expect robust facilities-based competition, beyond the existing legacy telephone and cable companies.⁴⁴ There is some evidence to suggest that broadband competition is an unrealistic, and perhaps even “ruinous,” policy objective.⁴⁵ Further, even where competition can occur, it is not clear that it

⁴³ Cf. Letter from Robert W. Quinn, Jr., Senior Vice President, Federal Regulatory, AT&T Services, Inc. to Marlene H. Dortch, Secretary, FCC, WT Docket No. 06-150 (Jul. 12, 2007) (opposing “all or any aspect of” proposed 700 MHz open access conditions), with Leslie Caulie, USA Today, *AT&T flings cellphone network wide open*, (Dec. 12, 2007), available at http://www.usatoday.com/tech/wireless/phones/2007-12-05-att_N.htm.

⁴⁴ Telecommunications networks can be characterized by high threshold levels of investment, which causes the existence of substantial sunk costs and a high fixed to variable cost ratio, significant economies of scale and scope, and externalities. Eun-A Park and Richard Taylor, TPRC Conference Paper, *Barriers to Entry Analysis of Broadband Multiple Platforms: Comparing the U.S. and South Korea*, 9 (2006), available at <http://web.si.umich.edu/tprc/papers/2006/636/TPRC2006BarriersToEntry.pdf>. Networks also exhibit significant economies of scale and scope, access to patents, rights of way, and spectrum, and network externalities. *Id.*, at 9. In particular, costs due to installing networks, establishing billing and support systems, and acquiring customers constitute substantial barriers to entry, and incumbents can control influential barriers in various ways. *Id.* at 9, 10.

⁴⁵ Some contend that additional competition in the broadband market may actually harm incentives to invest. See, Robert Atkinson, *The Role of Competition in a National Broadband Policy* (Oct. 2007), available at <http://www.itif.org/files/JTHTL.pdf>:

If in the face of more competitors, broadband providers are forced to amortize the fixed costs of their networks over significantly fewer customers, total broadband costs will rise – and prices will almost certainly have to rise as well, even if profits are squeezed and efficiencies maximized. The only way this situation could be averted would be if a new entrant was not successful in gaining any broadband customers. In this case, overall broadband costs would still increase but the costs would be borne by the new entrant’s bondholders and stockholders. If all new entrants gained customers, however, then the incumbents by definition would have fewer customers and hence less revenue to amortize the costs of their networks.

will provide a sufficient constraint on the market behavior of the incumbent providers.⁴⁶ The FCC should make it a priority to study more carefully the competitive dynamics of the broadband market, and ascertain whether a public policy framework built solely on incenting additional broadband facilities competition actually is in the public interest.

For now, the best course to ensure the openness and integrity of broadband networks may be for the FCC to analyze its competition data and policies to encourage wholesale access as well as resale opportunities. Given the changes in the last decade, the FCC should also commit to re-examine the scale and scope of special access deregulation and its impact on broadband access, including the impact on rural broadband deployment, costs, backhaul, and related issues.⁴⁷

3. Enabling “Internet over Wireless”: Openness should be a component of all broadband networks. Nonetheless the FCC may approach its openness objectives differently in the wireless context, as wireless is different than wireline, both technically and in terms of

⁴⁶ According to some economic experts, competition may even increase the likelihood that existing broadband providers will exercise market power to exclude or discriminate against competitors in the complementary market of Internet services. Barbara van Schewick, *Towards an Economic Framework for Network Neutrality Regulation*, J. TELECOMM. AND HIGH TECH L 5 (2007).

⁴⁷ As the New America recently pointed out:

A great deal of the discussion on improving rural broadband access in the U.S. has focused on last-mile issues, connecting the residences and businesses in a local community. While this remains a difficult challenge, another key obstacle to universal high-speed broadband access is the connection of those last-mile networks to the Internet backbone. No community or network is an island; and increasingly access to the high-speed middle-mile links that carry Internet traffic to the backbone, and the escalating costs associated with transporting traffic among networks, have become fundamental barriers to spreading connectivity, promoting broadband competition, improving speeds and lowering prices.

Comments of The New America Foundation at 5, GN Dkt. No. 09-29 (Mar. 25, 2009).

market competitiveness. That said, the FCC should acknowledge that its *Internet Policy Principles*⁴⁸ apply to all broadband platforms and are legally enforceable.

4. Enforceability: A speedy enforcement process should be established to address restrictions at the network, device, and service levels, as well as to redress competitive restrictions that impede users and alternate connectivity providers. The FCC could even incorporate prior experiences and precedent regarding unreasonable conduct and practices to inform its future decisions and guide network owners, users and competitors and promote a flourishing marketplace without intrusive regulation.⁴⁹ It is equally important for the FCC to underscore that it retains the flexibility to adjust its approach to open networks as market conditions change.

In order to inform the public and policymakers, as well as encourage more full industry compliance, the FCC should also set an “openness” metric by which to measure whether wireline, cable, and wireless networks are measuring up. The FCC should annually solicit comment on the degree to which networks have met the openness principles, where they have fallen short, and what further efforts industry could take to advance openness principles. After gathering such data and diverse views, the FCC could then issue a report on the state of openness, tracking its progress and benefits.

5. Reasonable Network Management: The principle of open broadband networks is fully consistent with reasonable network management practices. While broadband providers

⁴⁸ See, *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities, Policy Statement*, 20 FCC Rcd. 14986, ¶ 4 (2005) (“2005 Internet Policy Statement”).

⁴⁹ See, e.g., *Orloff v. Vodafone Airtouch, Memorandum Opinion and Order*, 17 FCC Rcd. 8987 (2002), *aff’d*, *Orloff v. FCC*, 352 F.3d 415 (D.C. Cir. 2003), *cert. denied*, 124 S. Ct. 2907 (2004); *In re DeMoss*, 23 FCC Rcd. 5547, *Memorandum Opinion and Order* (2008).

should have the ability to manage their networks, as well as engage in a broad array of business practices, network management practices should not be permitted to undermine and interfere with applications and content layer activities.⁵⁰

Some of today's network management practices pose competition and discrimination issues. Many practices help enhance network utility rather than impede it – such as application and content-neutral practices that halt harmful denial of service (“DOS”) attacks, prioritize packets of a certain application type due to latency concerns (*e.g.*, VoIP or streaming video), and block IP address sources due to objective network harms, such as viruses or worms. Other techniques of platform owners, however, while euphemistically called “network management,” are instead being used for anticompetitive ends, such as blocking, degrading, or prioritizing certain applications or content, in order to control the user's usage of content or applications or to impair the offerings of broadband content/applications competitors. To ensure that the integrity of broadband capacity cannot be breached in this way, the Commission should describe with specificity the available regulatory and market options, including a speedy and accessible enforcement process, to promote open networks.

III. ENCOURAGING THE GROWTH AND VITALITY OF THE BROADBAND APPLICATIONS MARKETPLACE

As recognized by the 2009 Recovery Act,⁵¹ the prevalence of broadband-based Internet applications, content, services, and devices that meet a vast array of different consumer demands

⁵⁰ See, *Rural Broadband Report*, ¶ 141 (noting that network management techniques cannot be allowed to limit the transformative power of the Internet).

⁵¹ 2009 Recovery Act, § 6001 (k)(2)(D) (“use of broadband infrastructure and services” are to “advanc[e] consumer welfare, civic participation, public safety and homeland security, community development, health care delivery, energy independence and efficiency, education, worker training, private sector investment, entrepreneurial activity, job creation and economic growth, and other national purposes”).

and needs – along with the unregulated marketplace for the development of such computer applications via broadband – are as critical to our nation as the broadband infrastructure itself. After all, a high-capacity transmission medium to American homes and businesses is only as good as the software applications which utilize it. When it comes to the online applications marketplace, the FCC for the most part has a solid legacy of non-regulation and facilitation that has served American consumers and businesses well for some three decades.⁵² Consistent with the new direction and goals set forth in the 2009 Recovery Act, these principles should be explicitly included and supported in the National Broadband Plan.

To be sure, the Commission should proceed forward on its national broadband policies, and Google is not necessarily advocating here for an automatic return of *Computer II*-style regulation. At the same time, it is impossible to avoid the fact that, for some but not all services offered across wireline broadband networks, the *Wireline Broadband Order* dismantled the long-held distinction between “basic” and “enhanced” services, and removed user safeguards intended

⁵² The FCC’s Computer Inquiries drew a sharp distinction between non-regulated information services and the underlying regulated carrier telecommunications services used to reach consumers. This regulatory dichotomy allowed policymakers to attain twin goals: any entity, including incumbents, could participate in the burgeoning Internet and data processing markets free from traditional common carriage regulation, and competing information service companies could bring their array of innovative services to consumers without being stifled by anticompetitive conduct designed to drive competitors out of the market. See, *Regulatory and Policy Problems Presented by the Interdependence of Computer and Communications Services and Facilities*, Notice of Inquiry, 7 F.C.C. 2d 11 (1966); *Regulatory and Policy Problems Presented by the Interdependence of Computer and Communications Services and Facilities*, Tentative Decision, 28 F.C.C. 2d 291 (1970); Final Decision and Order, 28 F.C.C. 2d 267 (1971) (“Computer I”) (*subsequent history omitted*); *Amendment of Section 64.702 of the Commission’s Rules and Regulations*, Final Decision, 77 F.C.C. 2d 384 (1980) (“Computer II”) (*subsequent history omitted*); Report and Order, 104 F.C.C. 2d 958 (1986) (“Computer III”) (*subsequent history omitted*) (together, “Computer Inquiries”). The Commission should assess whether we need to return to a public policy that in some fashion mandates or incents a separation between broadband networks and the payload they carry.

to promote information services competition.⁵³ As a result, there has been a legitimate groundswell of concerns rallied around “neutrality” principles to protect against Internet access service practices of broadband platform owners perceived to be abusive. Many of these concerns have also arisen or intensified because the Commission’s partial lifting of Title II obligations on providers of broadband connectivity had the effect of eliminating centuries’ worth of common carriage principles otherwise applicable to purveyors of basic infrastructure to the public.⁵⁴ More importantly, the agency essentially replaced this governing legal superstructure with nothing but apparently unenforceable and incomplete “principles.”⁵⁵ To Google, one necessary

⁵³ Notably, however, the *Wireline Broadband Order* was expressly limited only to wireline broadband Internet access service, and held that all *Computer Inquiry* rules would continue to apply to all other “broadband information services when provided by facilities-based wireline carriers.” *Wireline Broadband Order*, at n.15. In subsequent forbearance orders, the Commission has lifted some, but not all, *Computer Inquiry* obligations for various carriers’ broadband networks.

⁵⁴ See Barbara A. Cherry, *Utilizing "Essentiality of Access" Analyses to Mitigate Risky, Costly, and Untimely Government Interventions in Converging Telecommunications Technologies and Markets*, 11 COMMLAW CONSPECTUS 251, 275 (2003) (stating that the lack of common carriage requirements on cable modem or wireline broadband Internet access “could adversely affect the availability of broadband and narrowband services at reasonable rates.”); see also Barbara A. Cherry, *Institutional Governance For Essential Industries Under Complexity: Providing Resilience Within the Rule of Law*, *CommLaw Conspectus*, 17 COMMLAW CONSPECTUS 1, 8-9 (2008) (“The forthcoming analysis also shows how recent [FCC] policy decisions affecting broadband access services – whereby common carriage obligations are not imposed in either the wholesale or retail markets – is a radical departure from the deregulatory policies that have been adopted for the transportation or narrowband telecommunications networks. . . . the elimination of common law principles applied to broadband through deregulation, but without replacement by some other legal rules to fulfill a similar function, may render the development of critical communications infrastructures unsustainable with the desired emergent properties.”).

⁵⁵ “Chairman Kevin J. Martin Comments on Commission Policy Statement,” *FCC Press Release* (Aug. 5, 2005) (While supporting *2005 Internet Policy Statement*, Chairman Martin states “policy statements do not establish rules nor are they enforceable documents . . .”); See, Stephen Labaton, N.Y. Times, *F.C.C. Eases High-Speed Access Rules*, Aug. 6, 2005 (“The commission also adopted a policy statement that, while not enforceable as a rule, commits the agency to promote unfettered public access to the Internet -- so that no provider can, for example, block certain sites for commercial reasons.”) available at <http://query.nytimes.com/gst/fullpage.html?res=9F01E3DC163EF935A3575BC0A9639C8B63>; Op-Ed, *Broadband Is Too Important to Be Left to Cable-Phone Duopoly*, Wash. Post., Aug. 14, 2005, at F17 (“As a start, the FCC should turn its recent broadband policy statement – a declaration that customers

implication is for the FCC Plan to adopt core principles and goals supporting the unregulated online applications marketplace.

Specifically, the FCC should adopt an express goal for its broadband “last mile” policies to encourage “Internet over broadband” applications innovation, which will spur broadband demand and provide greater depth of uses for the public. To examine the societal costs and benefits of its regulatory measures accurately, the Commission must widen its view to include the impact of regulation (or deregulation) on the marketplace for software applications and associated functionality, rather than focusing on just the perspective of the broadband “last mile” platform owner. When the interests of broadband platform owners and applications providers are in alignment, consumers will likely see greater investment in both necessary components of the broadband marketplace. Where the two interests diverge, however, the Commission must take a more holistic view of costs and benefits, including the public interest benefits in retaining a vibrant applications marketplace for meeting consumers’ varied and ever-changing uses of broadband.

Further, the Plan should re-affirm the importance of maintaining the *unregulated* environment for enhanced applications. A commercial marketplace that is not directly regulated by the FCC or subject to regulatory costs-of-doing-business means that entrepreneurs and innovators can maintain their focus on developing new online services, content, and applications to be enjoyed by all facets of the American public. When applications providers are unregulated, they are free to remain independent rather than by necessity align themselves with large platform owners or vertically integrate with content providers. This means applications providers can

should be able to access any legal Internet site and run any legal Internet application -- into an enforceable regulation.”).

offer a diversity of content and competing offerings, keeping quality and innovation high and prices low or free to consumers.⁵⁶ A vibrant small-business application marketplace also creates well-paid jobs and enhances America's technology services' leadership and exports. A path of occasional (and unclear) FCC incursion into the unregulated marketplace, by contrast, raises uncertainty for investors and tilts the advantage toward ownership consolidation and vertical ownership of platforms with applications providers, since platform providers better understand and are already fully invested in the regulatory processes.

Finally, the FCC should engage in outreach and possible funding mechanisms to encourage innovation in broadband applications. Google notes that the BTOP program provides for government funding of educational efforts designed to foster broadband adoption.⁵⁷ The FCC should recommend that NTIA use a portion of such funding to educate students in America's colleges, universities, and other institutions about the opportunities and potential of broadband applications innovation and growth. NTIA funding should also be used for the education of older Americans and low-income Americans who may require additional assistance in making the transition to broadband services and applications. Both the Commission and

⁵⁶ 47 U.S.C. § 230(b)(2) (declaring that it is a national communications policy "to preserve the vibrant and competitive free market that presently exists for the Internet and other interactive computer services, unfettered by Federal or State regulation"); *Petition for Declaratory Ruling that pulver.com's Free World Dialup is Neither Telecommunications Nor a Telecommunications Service*, Memorandum Opinion and Order, 19 FCC Rcd 3307, ¶ 17 (2004) ("Several decades ago, the Commission recognized in its *Computer Inquiry* proceeding that enhanced services would continue to develop best in an unregulated environment and, given the competitive nature of the market, regulation of enhanced services was thus unwarranted.")

⁵⁷ See, 2009 Recovery Act, § 6001(b)(3)(A) ("The purposes of the program are to provide broadband education, awareness, training, access, equipment, and support to schools, libraries, medical and healthcare providers, community college and other institutions of higher education, and other community support organizations and entities to facilitate greater use of broadband service by or through these organizations.").

NTIA should also examine ways to assist municipal and civic organizations that are themselves dedicated to broadband educational efforts.

IV. THE FCC SHOULD CONSIDER CONCRETE PROPOSALS TO INCREASE DEPLOYMENT SPEED, EXPAND BROADBAND TECHNOLOGIES, AND ADDRESS IMPEDIMENTS TO UNIVERSAL CONNECTIVITY

Given the enormous potential of the Internet, and especially video and high-bandwidth services, to add core economic and social value to American society, the importance to our nation of sufficient support for projects that provide adequate bandwidth and opportunities for growth cannot be overemphasized. These benefits extend to virtually every aspect of who we are as Americans, from education to healthcare, for industry and consumers, and for vital public dialogue on issues that affect the nation.

While we are recommending adoption of a uniform framework based on achieving broadband as an optimal Internet platform for all Americans, there are many pathways forward to achieve this overarching objective, and our concomitant dimensions of broadband availability, robustness, and openness. Many of these pathways rely primarily on market forces, and companies investing private capital to construct advanced broadband infrastructure.⁵⁸ Others require direct government involvement, through the use of subsidies or regulatory mandates. A third type involves a conscious mix of private and public resources.

No doubt myriad broadband solutions will be presented by parties to this proceeding, some better suited to certain areas of our diverse geography and population sectors than others. Nonetheless the FCC should also explore specific, creative solutions to identified broadband

⁵⁸ Verizon, for example, to its credit has invested \$23 billion to date in rolling out its FiOS network. *See*, Saul Hansell, N.Y. Times, *Verizon's FiOS: A Smart Bet or a Big Mistake* (Aug. 18, 2008) available at http://www.nytimes.com/2008/08/19/technology/19fios.html?_r=1&partner=rssnyt&emc=rss.

deployment and utilization challenges. Known impediments include high deployment costs, delays and disruption of infrastructure upgrades, obstacles in serving hard-to-reach populations, anticipation of future needs, and assorted barriers to universal connectivity. The Commission's National Broadband Plan should commit to identifying and addressing these obstacles, including listing a number of the more promising ways to achieve our objectives, and commit to undertake annual revisions to the Plan to reflect technological evolution and market developments.

A. Installation of Broadband Conduit in Public Works Projects

As recent legislative efforts highlight,⁵⁹ a substantial impediment to broadband infrastructure deployment are the costs, disruption, and delays associated with network construction and facilities installation. The Federal Highway Administration has previously estimated that nearly 90 percent of the cost of deploying fiber is associated with digging trenches and repairing roads.⁶⁰ Laying fiber, or even simply installing the conduit for later fiber deployment, during the construction or repair of roads, as well during similar public works projects including utility lines for water, electricity and gas, will significantly reduce fiber deployment costs. Given the high costs of road construction and infrastructure deployment, including direct and indirect costs due to disruption, lost business and similar impacts, and the

⁵⁹ See, "Broadband Conduit Deployment Act of 2009," H.R. 2428, 111th Cong. (2009), introduced on May 14, 2009 in the House by Rep. Eshoo, which directs the Secretary of Transportation to ensure broadband conduits are installed in federally-funded highway construction projects, and to coordinate with the FCC on broadband demand and access.

⁶⁰ See, *Telecommunications Handbook for Transportation Professionals*, U.S. Department of Transportation, Federal Highway Administration, 41 (Sept. 2004) available at http://ops.fhwa.dot.gov/publications/telecomm_handbook/telecomm_handbook.pdf ("Digging a four (4) foot deep trench, placing conduit in the trench, and repairing the street carries the same cost regardless of the strand count, and that's about 90% of the total cost of deploying fiber optic cable."). See, also, Benjamin Lennett and Sascha Meinrath, New America Foundation Issue Brief, *Building a 21st Century Broadband Superhighway* (Jan. 2009) ("*Building a 21st Century Broadband Superhighway*") available at http://www.newamerica.net/publications/policy/building_21st_century_broadband_superhighway.

low incremental cost of deploying conduit at the time of construction,⁶¹ this proposal is an especially attractive mechanism to speed broadband facilities roll-out, promote competition and accommodate future expansion with the lowest possible deployment costs and the speediest installation.⁶²

B. Community Hub Broadband Deployment

While the FCC's Plan should include a national residential benchmark for broadband infrastructure build-out, it should also acknowledge that there are hard-to-reach populations that may be best-served by community hub centers that have high-speed connectivity and that can serve as "anchor" facilities. Municipal networks have already been shown to help serve these populations, with both wired and wireless networks having a significant impact on economic growth and development.⁶³

To expand beyond these public and public/private endeavors, the FCC should also examine how the deployment of fiber, or comparable facilities, to particular community centers

⁶¹ See, *Building a 21st Century Broadband Superhighway* ("Installing conduit and fiber in open trenches during road construction, costs between \$10,000 and \$30,000 per mile. Low-end construction costs for highways are around \$3 million per lane, per mile, although they can be substantially higher depending upon the area. Thus, adding fiber would increase highway construction costs by as little as 1 percent on average.") (internal citations omitted).

⁶² The reauthorization this year of the Federal-Aid Highway Program ("FAHP"), which funds capital improvements and maintenance of the national transportation grid, creates an opportunity to leverage federal spending on traditional infrastructure (roads, bridges and possibly railways) by earmarking \$1.2 to \$3.6 billion for build-out of open access, fiber-optic infrastructures with the construction, resurfacing and upgrading of highway systems. The most recent multi-year reauthorization act for the FAHP, the Safe, Accountable, Flexible, Efficient Transportation Equity Act of 2005, P.L. 109-59, 119 Stat. 1144 (2005) ("SAFETEA"), is set to expire at the end of FY 2009. See, SAFETEA §1101.

⁶³ A notable survey on municipal networks found that broadband can alleviate the slumping business economy, and also make our current and potential workforce more efficient in a global, digital economy. See, Craig Settles, *Municipal Broadband Snapshot Report™, The Economic Development Impact of Municipal Broadband* (Dec. 2008).

might meet today's needs and those of future generations.⁶⁴ Libraries, schools, and community medical facilities have already been identified as possible centers where fiber, or comparable facilities, could well serve their communities and act as a springboard for greater broadband usage and adoption for underserved, unserved and at-risk populations.⁶⁵ For example, it is estimated that deploying fiber-class connectivity to all 16,500 libraries in the country would both enhance access and usage and increase familiarity with high-speed broadband opportunities.⁶⁶ Numerous studies also confirm that online instructional programs for K-12 students increase writing scores, technology proficiency and motivation.⁶⁷

⁶⁴ For example, the Metropolitan Nashville Public Schools, which installed fiber to nearly all of its classrooms in early 2001, determined that deploying fiber would cost approximately the same as overhauling its "troublesome" copper network, and would allow educators and students to make full use of high-bandwidth multimedia educational applications without making costly network upgrades when more bandwidth is needed in the future. See, Fiber Optic Business, *Fiber Installation Prepares Nashville Schools for the Future – creation of fiber optic network for use by public schools* (Feb. 28, 2001) available at http://findarticles.com/p/articles/mi_m0IGK/is_4_15/ai_73959086/ ("*Fiber Installation Prepares Nashville Schools for the Future*").

⁶⁵ See, Letter from Lynne Bradley, American Library Association, to Marlene H. Dortch, Secretary, FCC, GN Dkt. No. 09-29 (Mar. 30, 2009) ("...in the next several years our public libraries will need extremely high-speed broadband connections that can handle gigabit transmission speeds. Fiber optic cables are the only technology available to address the Internet demands of the future. Fiber optic cables are 'future-proof'; in that they can transmit almost unlimited data simply by adding the electronics on either end of the cable."); See, Letter from Bryan Tramont, Counsel for the Telecommunications Industry Association, to Marlene H. Dortch, Secretary, FCC, 2, GN Dkt. No. 09-29 (Mar. 16, 2009) (stating that the FCC's national broadband strategy should focus on expanding broadband availability and adoption in rural areas, not only for residential end-users but also for schools, hospitals, and community anchor institutions).

⁶⁶ See, Don Means, *Fiber to the Library: Next Generation Broadband for Next Generation Libraries* (May 2009). Less than 40 percent of libraries nationwide report that their current connection speed is sufficient to meet library patron needs at all times. Furthermore, only 12.3 percent of libraries nationwide (23.9 percent of urban libraries, 12.4 percent of suburban libraries, and only 7.9 percent of rural libraries) report that the maximum speed of public library internet access is greater than 10 Mbps. See, American Library Association, *2008-2009 Public Library Funding & Technology Access Study*, available at <http://www.ala.org/ala/aboutala/offices/ors/plftas/connectivity09.cfm#F1>.

⁶⁷ See, California Department of Education, *Online instructional program increases writing scores, technology proficiency and motivation*, available at http://www.k12hsn.org/files/snapshots/focus_on/write_on.pdf; see also *Fiber Installation Prepares Nashville Schools for the Future*.

Likewise, fiber connections to community health care centers can radically transform the level, quality and access to health care in many areas.⁶⁸ In light of economic and similar “digital divide” concerns, the FCC should also consider including public housing facilities as the focus of high-speed deployments. According to Housing and Urban Development statistics, approximately 1.2 million households live in public housing units.⁶⁹ It has been demonstrated that low-income Americans are increasingly left out of the digital revolution, as broadband adoption among low-income Americans decreased from 28 percent in 2007 to 25 percent in 2008, even as overall home broadband adoption increased during the same time period.⁷⁰ Community anchor institutions can help close this gap.

In addition to the direct benefits that community hub fiber connectivity could provide, it is also likely that communities served in this way will help increase demand for fiber connectivity overall – so-called “priming the pump” – by demonstrating its benefits, and help provide incentives to become an “anchor tenant” for other community institutions that would benefit from fiber links.

C. Multiple Home-Run Fiber Deployment Incentives

The FCC should additionally explore projects that create incentives for network providers to install multiple home-run fiber deployments when networks are being rolled out in order to avoid capacity constraints, increase competition, and create new business models. For example, a Swiss project underway requires every provider wishing to build new network infrastructure

⁶⁸ See, Letter from Craig Mundie, Chief Research & Strategy Officer, Microsoft, to Marlene H. Dortch, Secretary, FCC, 1, GN Dkt. No 09-29 (Mar. 25, 2009); Comments of Microsoft, at 7, GN Dkt. No. 09-40 (Apr. 30, 2009).

⁶⁹ See, <http://www.hud.gov/renting/phprog.cfm>.

⁷⁰ See, *Pew Internet Study* at ii.

lay fiber-optic cable containing multiple fibers.⁷¹ The unused optical fibers will be offered to interested network operators for sale or exchange and network operators will offer to lease individual naked optical fibers, as well as comprehensive transmission services, to interested service providers who do not wish to invest in their own cabling. In this way, deployment increases along with competition. While the U.S. has its own economic, geographic and market circumstances, this type of project, along with appropriate industry incentives, is worth exploring, particularly in connection with universal service reform, public funding and/or other carrier regulatory reforms.

Likewise, customer-owned fiber, sometimes referred to as “Homes With Tails,” is another option that has been successfully implemented that may help improve deployment.⁷² Under this “condominium” model for fiber ownership, individual strands of fiber are sold to consumers, with maintenance and other collective needs managed jointly. In the same way, private firms and municipalities could consider selling fiber connections based on this model and governments could consider using various mechanisms to support consumer purchases, including a tax credit to homeowners or renters who purchase a broadband connection. An experiment in Ottawa, Canada has demonstrated that the costs of these connections can be covered in

⁷¹ See, Swisscom Media Conference Presentation, *Into the fibre-optic future with “fibre suisse”* (Dec. 9, 2008) available at http://www.swisscom.com/NR/rdonlyres/E8387FA6-A8E8-4A13-B6F2-D9C8DAAA7FB1/0/20080912_MM_Presentation_FTTH_en.pdf.

⁷² See, Derek Slater and Tim Wu, New America Foundation, Working Paper #23, *Homes with Tails: WHAT IF YOU COULD OWN YOUR INTERNET CONNECTION?* (Nov. 2008) available at http://www.newamerica.net/files/HomesWithTails_wu_slater.pdf.

innovative ways, such as by spreading costs out over a five-year period by bundling it with electrical bills.⁷³

D. Reducing Barriers to Wireless Deployment

Finally, the FCC should take steps to stimulate use of wireless broadband deployment and establish processes to address quickly regulatory impediments to deployment of broadband facilities and technologies. As the FCC has already acknowledged in the *White Spaces Second R&O*, spectrum for unlicensed devices can bring significant benefits to the public and FCC's broadband deployment goals.⁷⁴ The FCC should continue to lower barriers to access valuable white spaces spectrum and eliminate the "sensing requirement" for wireless microphones when white spaces devices already are operating under the control of geo-location database.

The FCC also should consider easing power limits/interference standards in rural areas to deploy wireless broadband more cost-effectively, assuming no harmful interference occurs.⁷⁵ Similarly, the FCC, working with State and local governments, should focus on ways to reduce

⁷³ See, Bill St. Arnaud, CANARIE, *An Alternate Business Strategy for FTTH*, (Aug. 27, 2007) available at www.canarie.ca/canet4/library/customer/Green_Broadband.ppt

⁷⁴ *Unlicensed Operation in the TV Broadcast Bands, Second Report and Order and Memorandum Opinion and Order*, 23 FCC Rcd. 16807, ¶ 2 (2008) ("We anticipate that allowing use of the TV white spaces by unlicensed devices will have significant benefits for both businesses and consumers and thereby promote more efficient and effective use of the TV spectrum."); *See Id.*, at Statement of Commissioner Jonathan Adelstein ("Because we are a nation of innovators and entrepreneurs, the Commission's decision to open fallow spectrum to new uses will give our country an opportunity to reclaim its place as a world leader in broadband deployment.").

⁷⁵ See, Comments of Motorola, 17-19, ET Docket No. 04-186 (May 8, 2009) ("As previously stated, Motorola does not believe that sensing technologies are sufficiently mature to rely on such methods because of the difficulties involved in implementing sensing technology in this environment. Motorola therefore recommends that database and location information should be the final source for determination on whether or not to transmit.")

or eliminate zoning and rights-of-way barriers that slow wireless deployment both for municipal networks⁷⁶ and commercial deployments.⁷⁷

Finally, the wireless facilities zoning approval process can be extremely time-consuming, and can be a major cost component and delay factor in deploying wireless services. Therefore, the FCC should act expeditiously on CTIA's "Shot Clock Petition" to clarify the time periods in which a state or locality must act on wireless facility siting requests, clarify what constitutes a "failure to act" by zoning authorities under Section 332(c)(7)(B) of the Communications Act in considering siting applications, and consider the interplay between the goal of promoting wireless technologies and innovation and local ordinances and state laws that subject wireless siting applications to burdensome requirements.⁷⁸

CONCLUSION

President Obama has reiterated that "America's digital infrastructure ... is the backbone that underpins a prosperous economy."⁷⁹ With a National Broadband Plan focused on the three interrelated dimensions of universal connectivity, robust Net access, and user openness and

⁷⁶ For example, two versions of the Community Broadband Act, introduced in the House and Senate in 2007, would overturn existing state bans on municipal broadband deployments to businesses and residences, provide a starting point. *See*, S. 1853, 110 Cong. (2007); H.R. 3281, 110 Cong. (2007).

⁷⁷ One such proposal was made by PCIA and the DAS Forum, which requested that the Commission provide a statutory interpretation of what is a "reasonable period of time" under Section 332(c)(7)(B) of the Telecommunications Act of 1996, in which a local jurisdiction must act on a wireless infrastructure application. *See*, Comments of PCIA and the DAS Forum, 8, GN Dkt. No. 09-40 (Apr. 3, 2009).

⁷⁸ *See*, *CTIA Petition for a Declaratory Ruling to Clarify Provisions of Section 332(c)(7)(B) to Ensure Timely Siting Review and to Preempt under Section 253 State and Local Ordinances that Classify All Wireless Siting Proposals as Requiring a Variance, Petition for a Declaratory Ruling*, WT Docket No. 08-165 (filed July 11, 2008).

⁷⁹ *See*, http://www.whitehouse.gov/the_press_office/Remarks-by-the-President-on-Securing-Our-Nations-Cyber-Infrastructure/ (May 29, 2009).

choice, we can help ensure that our growing yet still constrained virtual world fully meets our 21st Century challenges.

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