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	)	
	)	

REPLY COMMENTS OF GOOGLE INC.

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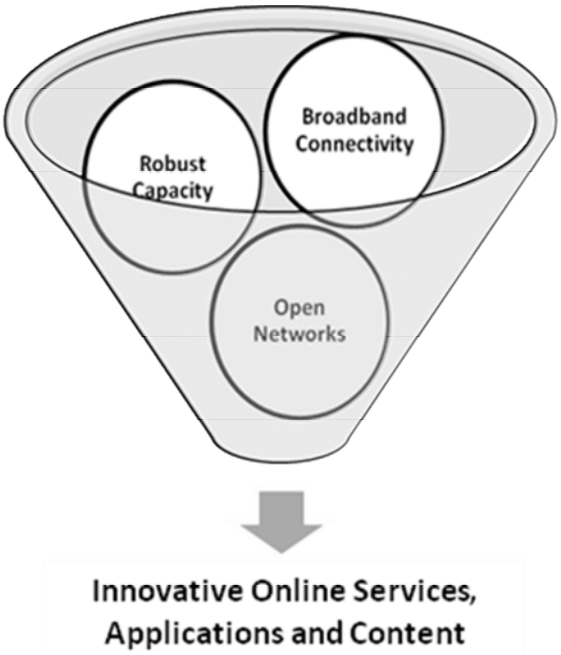
EXECUTIVE SUMMARY

The FCC's National Broadband Plan (NBP) is perhaps the Commission's greatest opportunity to make a lasting positive impact on communications in the early 21st Century. Google applauds Chairman Genachowski for setting the challenge of this proceeding: "If we do our jobs right and enable universal broadband that's fast, affordable, and open, we can unleash new waves of innovation that we can scarcely imagine today -- in the network and at the edge of the network." Google recommends that the Commission formulate and implement the NBP consistent with the following points:

- Broadband constitutes the next evolution in communications infrastructure.
- As a public policy matter, we care about broadband primarily for what it enables – namely, high-speed access to the Internet and all its services, applications, and content.
- The services and applications riding on top of the broadband infrastructure are essential to drive American job creation, productivity, education, and innovation into the 21st century. Infrastructure *and applications* matter.
- The FCC should assert jurisdiction over broadband as an essential communications input to numerous economic, social, and personal activities, and overall human interaction.
- The record strongly underscores that our nation's broadband infrastructure best serves as an Optimal Internet Platform – which means Net access over broadband must be Open, Robust, and Widely Available, to perform the myriad important tasks that Congress and the American people demand of it.
- Accurate broadband data and far-reaching input early and often will best ensure the FCC a new and optimal broadband policy.
- The Commission should commit to ensuring that by 2012 every American has access to at least one broadband connection providing 5/5 Mbps symmetrical access to the Internet.
- The record now includes an impressive array of concrete proposals that the Commission should work with other policy stakeholders and the private sector to make a reality.



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The scope of the initial comments filed in response to the Notice of Inquiry[1] on the development of a National Broadband Plan ("NBP" or the "Plan") for the build-out and use of high-speed broadband infrastructure highlights the critical importance of broadband to our nation's future. Diverse filers emphasize that the benefits of broadband will not be gained solely by deploying broadband infrastructure, although such facilities are certainly necessary. Rather, our nation's true broadband payoff will be found in the online services, applications, content and capabilities that ride on top of the broadband network layer.

Broadband best serves us as an optimal Internet platform, and the Internet is a key driver of economic growth and human connection.

With over 1,700 commenters, ranging from the largest corporations in America to individual citizens, the record reflects the challenges and opportunities of turning our collective broadband vision into a tangible reality to increase productivity, competitiveness, efficiency, education, and access. To be sure, the NBP is just a starting point, not an end in itself, and the Commission and other policymakers must assess the Plan's goals and benchmarks on an ongoing basis. Fundamentally, however, the broadband

[1] *In the Matter of A National Broadband Plan for Our Future*, Notice of Inquiry, GN Docket No. 09-51 (Apr. 8, 2009) ("NOI").

functionality our country requires for the early 21st century will be realized only if the NBP sets goals and metrics for delivering open and robust broadband connectivity to all Americans.

DISCUSSION

I. Clear Definitions and Accurate Data Will Foster Optimal Broadband Policy and the Concomitant Public Benefits

The initial comments offer varied solutions and opinions regarding our nation's broadband infrastructure, and myriad ideas about how best to bring broadband facilities to everyone. Google agrees that the NBP should be expansive, encompassing broadband infrastructure across all potential platform technologies, including wireline, wireless, cable, and satellite. As Google has noted, there are many paths to broadband build-out, each suited to a different set of circumstances. Ultimately, however, as a nation we care about broadband as a public policy matter primarily because it is infrastructure that facilitates high-speed access to the Internet and other online applications, content, and services, which in turn fuels growth and a host of other economic and non-economic public benefits.[2] In fact, the comments, which reflect many disparate perspectives, including those of platform owners, users, applications providers, and others, make clear that the benefits of broadband are found in what rides on top of the network layer.[3] The exchange of information and the forging of human connection – via text,

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[2] *See, e.g.*, Rob Tai, *Measuring the Impact of the Internet on the Economy*, Google Public Policy Blog, June 10, 2009, http://googlepublicpolicy.blogspot.com/2009/06/measuring-impact-of-internet-on-economy.html ("according to Harvard Business School professors John Deighton and John Quelch, the Internet is responsible for 3.1 million American jobs and $300 billion in economic activity spread throughout the United States.").

[3] *See, e.g.*, Comments of Comcast Corporation ("Comcast") at 8-9 ("broadband networks often serve as a platform for the delivery of a multiplicity of services, including broadband Internet services"); Verizon and Verizon Wireless at 21 ("The Internet, for example, is often praised for its modular structure, which allows for innovation at the application layer independent of the underlying layers."); Microsoft Corporation ("Microsoft") at 1 ("Convergence in

data, still and moving images – enabled by broadband connectivity creates unprecedented collaboration, experimentation, and innovation. This in turn creates opportunity, jobs, and a more cohesive, better functioning society. As such, the focal point of the NBP should be to promote the market's innovation and adoption of applications, content, and services, via policies that create availability, robustness, and openness of Internet access over broadband networks.

Defining Broadband. The initial comments confirm that in defining broadband, it is vital that the NBP make clear that the primary objective should be to foster broadband connections to the Internet. Broadband itself clearly is *not* the Internet, or access to the Internet.[4] While broadband refers to the diverse class of wired and wireless digital transmission technologies that are high-capacity and always-on, it is the ability to *use* these broadband connections to access the Internet and other interactive online capabilities that matters here. The comments of approximately 100 Internet luminaries put it succinctly:

> If the National Broadband Plan starts from the premise that the U.S. needs innovation, increased productivity, new ideas and

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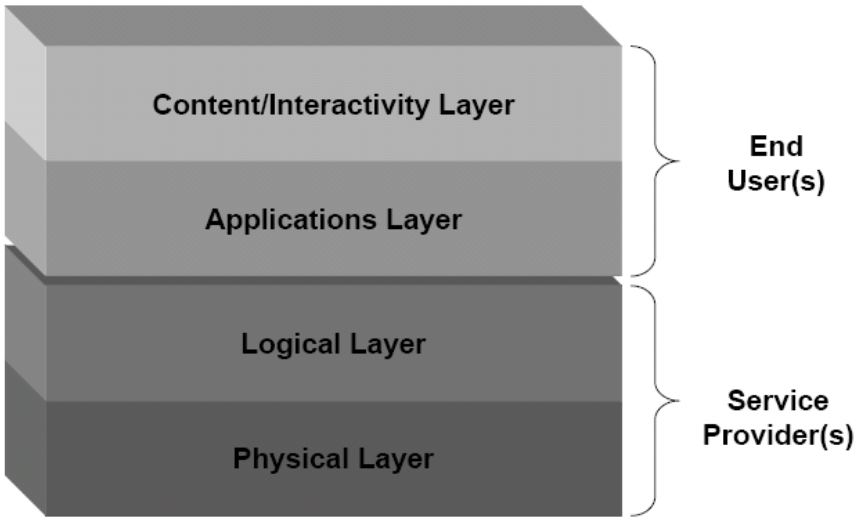
communications, long talked about, is rapidly occurring and in multiple dimensions. . . . In short, there is rapid evolution across the services and applications layers atop a relatively stable foundation of Web and Internet protocols, and IP networks.").

[4] *See* Comments of Big Think Strategies at 6 (FCC should "carefully distinguish between the basic infrastructure on which communications depends, and the notion of a 'service' provided using that infrastructure…. The point of the infrastructure is not to be a market-driven service *itself*. The point of the infrastructure is to enable and facilitate the *provision* of services that will be subject to the normal operation of market forces.") (emphasis in original); Home Telephone Co. at iii ("A national broadband plan is about networks, not services. . . . Services and applications will ride on the network, but not define the network."); Rural Telecommunications Congress at 3 ("A primary goal of broadband policy should be to assure that valid, reliable information about all components of information infrastructure, not just broadband, is readily available."), Comments of Allied Fiber, LLC ("Allied Fiber") at 1-2 ("The genius of the Internet -- or more broadly, Internet Protocol ("IP") enabled networks -- lies in its layered architecture. Although various specific layered models have been described, the common element is the separation of an underlying physical infrastructure layer on top of which network control functions, applications, and content ride.").

> freedoms of expression that the Internet affords, then the Plan will be shaped around the Internet…. The primary goal of the Plan should be broadband connections to the Internet.[5]

In other words, in defining broadband, articulating goals, and assessing metrics, the NBP must be careful not to confuse the broadband infrastructure/network layer with access to the Internet, or the Internet itself. Broadband is the virtual on-ramp and off-ramp of the Net. As a public policy matter, we care most about "Internet over broadband," and all the online services, content, and applications that open, interconnected broadband networks help to facilitate.



A MODULAR FRAMEWORK

At the same time, the NBP will be most useful if it also defines parameters of what constitutes a broadband connection and what level of connectivity should be targeted. Google agrees with the many parties urging that these definitions should evolve as consumers' broadband utilization and expectations rise over time.[6] While the Commission must decide

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[5] Comments of David S. Isenberg *et al.* at 1-2 (emphasis added).

[6] *See* Comments of Comcast at 10 (FCC should adopt "definitions for evolving levels of broadband Internet service as it assesses the marketplace"); Dell Inc. ("Dell") at 4-5 ("If the

where to aim, it must remember that the target will also move as technology and markets develop. At this juncture, the FCC should begin setting clear and specific goals and metrics for broadband networks, while acknowledging that these initial benchmarks will change over time and require adjustments to account for our varied national geography and demographics.

Basis for Government Involvement. The comments also underscore the need for the NBP to ensure that broadband networks are subject, at minimum, to oversight and potential enforcement by government regulators.[7] Even without revisiting the *Brand X* decision and its

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[NBP] adopts rigid definitions of broadband and narrow metrics for measuring broadband access, it risks eliminating the ability to promote higher-bandwidth broadband technologies than are generally available today. . . . The Commission should certainly adopt a definitional and measurement system that provides insight into broadband technologies that are widely available today, so it can expand access to these technologies to underserved and unserved areas. But it should also measure the higher-throughput technologies that are just around the corner, so the government can promote the next generation of broadband service."); National Association of State Utility Consumer Advocates ("NASUCA") at 18 ("any definition of "advanced services" adopted by the FCC should – indeed must – be dynamic rather than static"); Office for the Promotion and Advancement of Small Telecommunications Companies ("OPASTCO") at 2 ("the definition of 'broadband' should. . . evolve to keep pace with rapid changes in technology and consumer expectations."); United States Telecom Association ("USTelecom") at 10 (FCC "should not view the definition of broadband access as a static concept given the current fluid nature of broadband deployment."); TDS Telecommunications Corporation ("TDS") at 5 (FCC "should establish and routinely revisit definitions for these terms so they will evolve with the state of broadband technology and the services consumers access over those technologies"); Texas Statewide Telephone Cooperative at 2 ("Any definition of broadband must be flexible enough to allow for evolving technology. . . .").

[7] *See* Comments of Media Access Project ("MAP") at 6 ("The First Amendment's mandate, as well as the need to create a platform for economic growth, require the Commission to make plain that the [NBP] be based on strong and enforceable interconnection and non-discrimination obligations."); Michigan Public Service Commission at 4 (FCC "should closely monitor the competitive marketplace for broadband in order to address any areas where the market fails to provide broadband services at reasonable prices and with reasonable privacy protection."). *See also* Comments of Georgetown Center for Business and Public Policy at 17 ("The antitrust enforcement agencies should be directed to investigate and, if the evidence warrants, file actions to prevent abuses by Internet service providers with market power that distort competition on the Internet.").

regrettable progeny,[8] the FCC has ample statutory authority to fulfill this role.[9] Broadband, as contemplated by Congress, the FCC, NTIA, USDA, and other official bodies, refers to communications infrastructure that: (1) serves critical public policy goals, (2) utilizes public resources and inputs, and (3) voluntarily carries Internet traffic on behalf of end-users. As it turns out, these three fundamental factors mirror relevant prongs found in traditional common carriage precedent.[10] Importantly, these prongs historically have applied to communications infrastructure regardless of the current or projected competitive conditions in the relevant market. Google thus agrees with the many parties who note that broadband connectivity is sufficiently vital to our nation that there must be a clear legal path for agency oversight and enforcement mechanisms.[11]

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[8] *Nat'l Cable & Telecomms Ass'n v. Brand X Internet Servs*., 545 U.S. 967 (2005) ("*Brand X*"); *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities,* Report and Order and Notice of Proposed Rulemaking, 20 FCC Rcd. 14853 (2005) ("*Wireline Broadband Order*"), *aff'd, Time Warner Telecom, Inc. v. FCC,* 507 F.3d 205 (3d Cir. 2007).

[9] *See* American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, 123 Stat. 115 (2009) ("Recovery Act"). The Recovery Act instructs the FCC to implement a plan "to ensure that all people of the United States have access to broadband capability," and to develop "a detailed strategy for achieving affordability of such service and maximum utilization of broadband infrastructure and service by the public." Recovery Act, § 6001(k)(2). This task would be impossible to achieve without FCC oversight and enforcement.

[10] *See, e.g.,* Richard S. Whitt, *Evolving Broadband Policy: Taking Adaptive Stances to Foster Optimal Internet Platforms*, 17 COMMLAW CONSPECTUS 417, 472 (2009) (examining the "three intertwined aspects of common carriage that show up at various times and places: the state of competition, the nature of the business, and holding oneself out as a carrier.").

[11] At minimum this regulatory authority must be exercised to deal with alleged instances of discriminatory treatment by broadband providers of Internet packets based upon the sender, the recipient, or the contents of the packet. *See* Comments of New Jersey Division of the Rate Counsel ("NJ Rate Counsel") at 57-58 ("Rate Counsel has addressed non-discrimination and network interconnection obligations in various FCC proceedings, and urges the Commission to continue its efforts to establish and enforce appropriate non-discrimination and network interconnection obligations."); MAP at 6 ("The First Amendment's mandate, as well as the need to create a platform for economic growth, require the Commission to make plain that the [NBP]

Data Collection. While many of our nation's broadband policy decisions have been made in the past as a result of *predictions* about how broadband markets and deployment would evolve, including how platform owners might respond to potential competition and how technology might develop, there is now widespread agreement that *facts* are critical for sound broadband policy. As Chairman Genachowski recently emphasized, the Commission's decisions should be "fact-based and data-driven."[12] Today some public information regarding broadband deployment and adoption is available, and the FCC is improving its Form 477 data collection. Nonetheless the record is clear that we need more data, from more sources, encompassing both supply and demand, and at a more granular level, as a fundamental prerequisite to establishing meaningful broadband metrics.[13]

Additional data collection and database maintenance will not be unduly burdensome for most companies, and the benefits of broadband data collection to our nation – especially as the NBP is formulated – far outweigh the limited burdens individual companies might encounter. Moreover, measures to address concerns regarding misuse of company-specific and confidential

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be based on strong and enforceable interconnection and non-discrimination obligations."); Consumer Federation of America and Consumers Union ("CFA/CU") at 17-18 ("Regardless of the outcome of the pending court case, the Commission should undertake a rulemaking to ensure and improve the enforceability of the four freedoms.").

[12] Julius Genachowski, Chairman, Federal Communications Commission, Remarks to the Staff of the Federal Communications Commission, 4 (June 30, 2009).

[13] *See, e.g.*, Comments of BroadbandConsensus.com at 2; California Public Utility Commission ("CA PUC") at 32; Cox Communications, Inc. ("Cox") at 4; Free Press at 277-78; KM Broadcasting, Inc. at 5; Level 3 Communications LLC at 5; Massachusetts Broadband Institute and Massachusetts Department of Telecom and Cable at 7, 10; Media and Democracy Coalition at 2; NASUCA at 31-32; NJ Rate Counsel at 7; Public Knowledge, Media Access Project, The New America Foundation, and U.S. PIRG ("Public Knowledge *et al*.") at 39; The Rural Internet and Broadband Policy Group at 9; Rehabilitation Engineering Research Center for Wireless Technologies at 3.

data can and should be included. Depending upon the type of data in question, the FCC may choose for example to create a *de minimis* exception for small providers (possibly measured by annual gross revenues or average number of monthly broadband service arrangements in a given geographic area).

The record also supports revisiting any initial determinations made in the NBP.[14] Google continues to urge the FCC to commit to at least a biennial review to measure the robustness of "Internet over broadband" networks, an annual review of the state of openness of such networks, and annual revisions to the NBP to make modifications indicated by the periodic reviews. Similarly, data collection and review should be inclusive and transparent, and there should be additional opportunities for public comment on the Commission's draft NBP and proposed approaches to meeting broadband objectives, and on subsequent periodic reviews.[15] This course of action will achieve the desired transparency[16] and is most likely to foster optimal outcomes.

II. The Record Confirms that Our Nation's Internet over Broadband Networks Must be Open, Robust, and Widely Available

In its initial comments, Google identified three interrelated dimensions of Internet access provided over broadband facilities – the availability of broadband infrastructure, the robustness or sufficiency of capacity allocated to Internet access, and the openness or integrity of Internet

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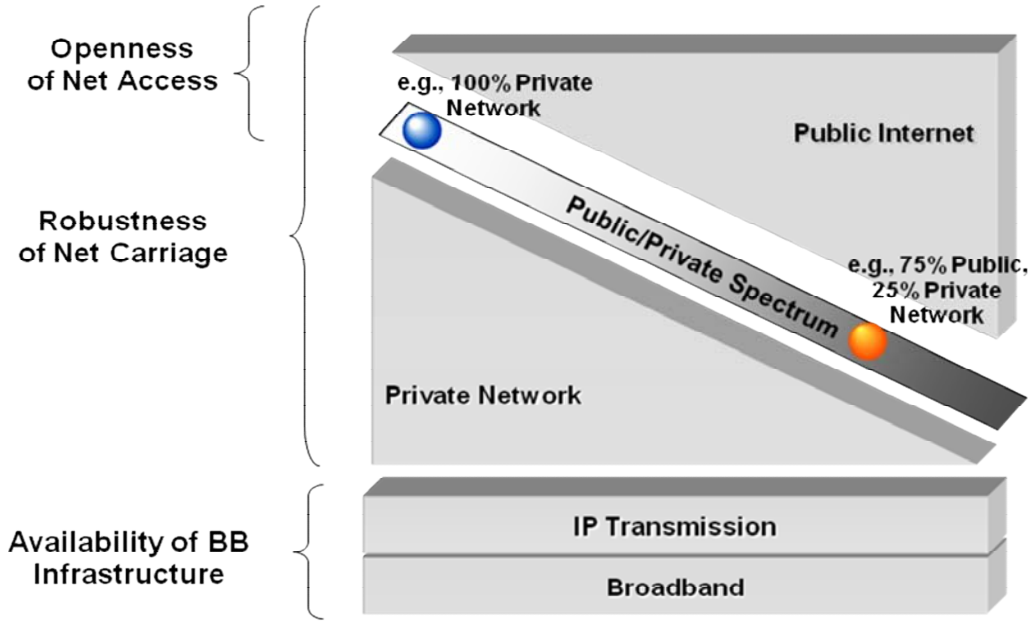
[14] *See, e.g.,* Comments of Cisco Systems, Inc. ("Cisco") at 9; TDS at 5. *See also* Comments of The Progress & Freedom Foundation ("PFF") at 3 ("The NBP should be treated as a framework to be revised and augmented as key data from broadband mapping and the Broadband Data Improvement Act become available.").

[15] *See* Comments of XO Communications, LLC at iv-v ("Before presenting this plan to Congress, the FCC should place a draft of its report on public notice to give consumers, the telecommunications industry, and other interested parties an opportunity to comment prior to its submission.").

[16] *See, e.g., Technology,* WhiteHouse.gov, http://www.whitehouse.gov/issues/technology/ (President Obama's support for transparency, participation, and collaboration in government).

access. Collectively these three dimensions constitute broadband as an optimal platform to facilitate high-speed access to the public Internet by consumers. We recommended that the Commission use the NBP as a vehicle for assessing each of these dimensions through a transparent, data-rich, and evolving process. The extensive record compiled in the initial comments in response to the NOI, encompassing an unprecedented cross-section of stakeholders and an impressive breadth and depth of proposals and perspectives, generally supports the components in Google's recommended policy framework. We will discuss each dimension in turn below.



THREE DIMENSIONS OF BROADBAND AS AN OPTIMAL INTERNET PLATFORM

A. The NBP Should Retain Flexibility in Assessing Broadband Availability and Demand

The initial comments overwhelmingly demonstrate the need for a comprehensive, ongoing assessment of broadband availability as the critical first step in developing a National

Broadband Plan.[17] In order to ensure that its efforts to map broadband availability are not underinclusive, the Commission should consider a multitude of approaches to gathering information, and analyze not just Form 477 data collections but also information from state and local governments, public/private partnerships, and others. Mapping efforts should take into account a broad array of data, including technology (wired or wireless), geographic location, whether the consumer is a business or residence,[18] and affordability.[19]

While supply may be the primary focus of the availability assessment, the analysis also must include demand-side issues.[20] The assessment must be broad in scope, encompass wireline and wireless broadband and expressly include hard-to-reach populations (for example, low-income areas and the elderly, disabled, and minority populations).

While the NBP should promote all types of broadband infrastructure, the comments accurately reflect that not all technologies currently are equivalent in their ability to deliver availability, reliability, and performance. Mobile wireless, fixed wireless, and wireline

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[17] *See, e.g.*, Comments of Cox at 4 ("The first step toward closing the broadband gap is to determine where broadband is and is not.").

[18] *See* Comments of IEEE-USA at 3.

[19] *See* Comments of Arizona Consumers Council at 22.

[20] *See, e.g.*, Comments of Public Knowledge *et al*. at 39 (FCC "should consider also addressing in a limited fashion the demand side of the broadband equation. . . . The research about why potential customers don't subscribe to broadband is very thin."); Media and Democracy Coalition at 2 ("Federal policymakers must have access to reliable data on where broadband presently exists, at what speeds, of what quality, by what provider, how it is used by consumers, why certain consumers do not use it, and how other consumers integrate it into their lives."). *See also* John B. Horrigan, *Home Broadband Adoption 2008*, Pew Internet & American Life Project, 10-15 (July 2008), http://www.pewinternet.org/~/media/Files/Reports/2008/PIP_Broadband_2008.pdf (finding that residential non-broadband users primarily cite availability, price, lack of interest, and lack of need as factors in their decision not to obtain broadband).

infrastructure all require different analytical approaches and tailored responses.[21] Although some commenters assert that wireless technologies compare unfavorably to wireline technologies,[22] they fail to recognize that all technologies are dynamic and meet an array of consumer and business needs, and at different costs. The broadband availability assessment thus should be sufficiently flexible to account for the varying capabilities of different broadband platforms.

The record also confirms the need for a comprehensive spectrum inventory – one that, at a minimum, includes both government and non-government spectrum.[23] Such an inventory should identify current utilization by incumbent users of all spectrum below 10 GHz suitable for broadband.[24] Only such a comprehensive inventory will identify bands and geographic areas of

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[21] *See, e.g.*, Comments of Clearwire Corporation ("Clearwire") at 4 (the FCC's definitions of "broadband,", "unserved," and "underserved" "must separately account for fixed wireline/wireless service and mobile wireless services."); Sprint Nextel Corporation ("Sprint Nextel") at 4 (FCC "should continue to support a flexible approach to defining broadband which both recognizes fiscal realities and accommodates the 'inherent capabilities and limitations' of the different types of technologies.") (citing Acting Chairman Copps, Bringing Broadband to Rural America, Report on a Rural Broadband Strategy (rel. May 22, 2009), at 34); T-Mobile USA, Inc. ("T-Mobile") at 12 (NBP "should take into consideration the inherent differences between wireline and wireless broadband and should make the provision of mobile broadband at flexible and evolving speeds a priority."); Rural Cellular Association at 7-8 ("Short-term benefits will accrue from a national broadband plan that defines broadband capacity differently for different technologies…. [A]lthough mobile wireless technology currently provides less broadband capacity than some other broadband transmission networks, mobile wireless broadband has other characteristics that make it highly attractive for deployment in unserved and underserved areas.").

[22] *See, e.g.*, Comments of Residents Engaged Against Cell Towers at 2; TDS at 12-13; Fiber-to-the-Home Council ("FTTH Council") at 14-15.

[23] *See* Comments of Microsoft at 8-9; Alcatel-Lucent at 12; Dell at 11; Native Public Media and the National Congress of American Indians ("NPM/NCAI") at 16; Public Knowledge *et al*. at 31.

[24] *See* Comments of Microsoft at 8 (FCC "should assess whether existing allocations are being fully utilized.… We believe there is more valuable spectrum going unused, but to find it the Commission must begin looking at actual usage."); New America Foundation, Public Knowledge, and MAP ("New America Foundation *et al*.") at 20 (inventory should make "publicly available how our public spectrum resource is being utilized or underutilized in at least

unutilized and underutilized spectrum. This approach will permit Congress and the Commission to craft and implement policies, including reallocating spectrum for broadband uses, that will ensure the availability of broadband to all Americans. Moreover, the inventory must not exclude certain bands based on narrow criteria established by incumbent users.[25] Only licensed spectrum for which the initial buildout deadline has not yet passed should be excluded from the initial inventory, provided that after the applicable buildout deadline such spectrum is included in any subsequent inventory. Once an initial spectrum inventory is completed, Congress, NTIA, and

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the most valuable bands below 6 GHz"); Public Knowledge *et al.* at 31 ("Without a clear understanding of the current use of spectrum, it is difficult to have an informed decision on how to allocate spectrum more efficiently."). *See also* J.H. Snider, *The Art of Spectrum Lobbying: America's $480 Billion Spectrum Giveaway, How it Happened, and How to Prevent it From Recurring*, New America Foundation, 37, Aug. 2007, http://www.newamerica.net/files/art_of_spectrum_lobbying.pdf; Michael Calabrese, *The End of Spectrum Scarcity: Building on the TV Bands Database to Access Unused Public Airwaves*, New America Foundation, June 2009, http://www.newamerica.net/publications/policy/end_spectrum_scarcity (recommending an inventory of the airwaves as part of national broadband policy); Victor Pickard and Sascha D. Meinrath, *Revitalizing the Public Airwaves: Opportunistic Unlicensed Reuse of Government Spectrum*, New American Foundation, June 2009, http://www.newamerica.net/publications/policy/revitalizing_public_airwaves (proposing reuse of government spectrum on an open and unlicensed basis); Michael J. Marcus, *New Approaches to Private Sector Sharing of Federal Government Spectrum*, New America Foundation, June 24, 2009, http://www.newamerica.net/publications/policy/new_approaches_private_sector_sharing_federal_government_spectrum (advocating for a federal spectrum management system that provides greater incentive to allow sharing of existing federal spectrum).

[25] *Compare* Comments of Verizon at 70 ("there is no reason to include in the [inventory] any spectrum bands the Commission has already identified for broadband use, such as the cellular, PCS, AWS, 700 MHz and BRS bands."); Southern Company Services at i-ii (spectrum inventory "should exclude … those bands that are critical to utility and CII operations."). For purposes of compiling a reliable inventory on which to base the NBP and other policy decisions, these bands should be included.

the FCC will have a substantial record on which to base decisions regarding spectrum reallocation for broadband uses as well as innovative solutions for matching resources to need.[26]

The NBP also should address the role of competition in promoting the availability and adoption of broadband.[27] In particular, the comments show that issues related to competition among and between wireline and wireless networks, including UNEs, copper retirement, and the price, terms, and conditions of special access,[28] deserve renewed scrutiny, in order to assess ways to enhance competition.

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[26] *See* Comments of Consumer Electronics Association at 8 ("Where it can be clearly demonstrated that inefficiencies exist, policymakers must reallocate underutilized spectrum and/or adopt market-driven policies such as flexible use and secondary markets to ensure greater consumer access to wireless broadband."); Alcatel-Lucent at 12 (supporting a spectrum inventory, "as well as an inquiry into innovative solutions such as allowing Federal users to lease spectrum to the public."); NPM/NCAI at 16 ("Congress and the FCC should conduct a thorough review of commercial and government spectrum holdings to identify bands that could be opened for use specifically on Tribal lands."); Telecommunications Industry Association at 19 ("New mobile broadband carriers and services cannot emerge without additional spectrum resources. Thus, it is vital that the Commission assess, through a spectrum inventory, what nongovernment spectrum bands are particularly suitable for deployment of commercial broadband Services").

[27] Chiehyu Li, *U.S. vs. Japan: Residential Internet Service Provision Pricing*, New America Foundation Issue Brief, June 23, 2009, available at: http://www.newamerica.net/publications/policy/u_s_vs_japan_residential_internet_service_provision_pricing.

[28] *See* Comments of Sprint Nextel at 8-34 ("reform of middle mile special access regulation is critical to achieving universal access to broadband."); BT Americas Inc. at 2 ("The rate of advancement and broadband penetration will slow if input markets such as high capacity access and backhaul necessary to deploy affordable broadband services . . . are not either fully competitive or well-regulated where such markets are uncompetitive."); T-Mobile at 18 ("To maximize mobile broadband deployment**,** the Commission should commit to ensuring there is substantial additional backhaul capacity…. Inflated special access costs in the wholesale market undermine the expansion of broadband service by raising the cost of deployment and service for business and consumers across America."); EDUCAUSE, Internet2 and ACUTA ("EDUCAUSE *et al.*") at 3 ("there is a severe shortage of adequate broadband facilities to meet the needs of the nation…. [T]o truly have access to broadband … last mile AND middle mile facilities must both be available and affordable.").

B. Robust Broadband Capacity for Internet Access Will Enable Important Economic and Social Benefits for Everyone

For consumers to experience the full benefits that broadband connectivity can support requires that available capacity be robust. In concept, robust broadband means that the speed and capacity of the user's broadband network access are sufficient to allow the user to utilize fully the myriad capabilities of the Internet and other online resources. In other words, while it is necessary that broadband infrastructure be available to all Americans, mere availability is not sufficient. As a second dimension of broadband as an optimal Internet platform, the robustness of broadband capacity must be sufficient to enable users to interact with the full richness and depth of the Internet. The record of this proceeding confirms that the American public could benefit from the plethora of two-way, interactive online applications and services for education, health care, disabilities access, energy efficiency, productivity, public safety, access to government, and more.[29]

Robust broadband means users have sufficient capacity available to facilitate easy access to the full range and forms of online information (*i.e.*, text, data, and video) and can create and interact with online users, directly and indirectly. The concept of robust broadband capacity must progress over time.

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[29] *See* Comments of Center for Accessible Technology and Inclusive Technology at 2 ("Access to broadband technologies is what levels the playing field for people with disabilities."); National Cable & Telecommunications Association ("NCTA") at 2 (FCC "should use this proceeding to identify policies that will increase the value and promote the affordability of high-speed Internet access services so that even more Americans will choose to take advantage of the tremendous benefits available through the use of broadband technology."); New York Public Service Commission, New York State Chief Information Officer and the New York State Office for Technology at 3 ("Broadband can boost the quality of American schools by providing and enhancing access to the resources today's students will need to solve tomorrow's problems and compete in the global economy. These objectives can only be achieved if students have access to sufficient bandwidth, possess sufficient digital literacy skills and are empowered with robust and useful online content and applications"); National Organization of State Offices of Rural Health at 1 ("Without an accessible broadband base, rural entrepreneurs cannot compete."); New America Foundation *et al.* at ii ("a key goal of the national broadband plan should be to deploy

Indeed, in addition to groundbreaking innovations yet to be conceived, a staggering array of applications and services will flourish from wide deployment of high capacity broadband networks, including:

- Cloud Computing: Wider capability to transfer data faster will allow greater adoption of cloud computing, which will significantly narrow the digital divide by reducing costs associated with traditional desktop computing and increase user mobility as applications, content and file storage can be accessed remotely from any terminal. The collaborative power of cloud computing will benefit users from all walks and organizations and businesses large and small.

- Health Care: Telemedicine and remote surgery applications, which promise to revolutionize health care delivery, can effectively be achieved through the high definition audio and video services and collaboration tools that high bandwidth brings. Online medical consultation will give medical specialists the ability to remotely reach patients anywhere.

- Education and Research: Distance learning, virtual laboratories and classrooms, and access to research information repositories are all dependent on high capacity broadband.

- Energy Efficiency: With the ability to do real time energy monitoring, all Americans will be able to leverage a smart electrical grid and take ownership of their energy consumption.

- Accessibility: People with disabilities, non-English speakers, and others who experience barriers in communication and mobility can leverage a wide assortment of high speed broadband enabled services including sign language video relays, telework opportunities, and audio captioning services.

- E-Government: Broadband has granted unprecedented access to government information and services to citizens. Policymakers and politicians have been able to reach out to masses in exciting new ways.

Assessing the robustness of Internet access to broadband infrastructure, therefore, means measuring the degree to which a given network connection offered to the American public permits users of that service to experience the full benefits of these online applications, services,

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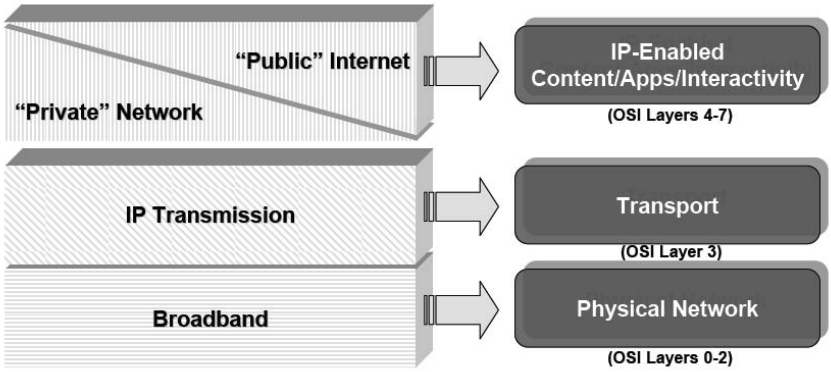
high capacity fiber into every community with points-of-presence at community anchor institutions…"); One Economy Corporation ("One Economy") at 8 ("capacity to use broadband and its tools will enhance civic engagement since so much public dialogue has shifted to the online space.").

and information resources. Users in particular should be able to easily access, create, and interact with the full range of information including text, data, and still and moving images (video).



BROADBAND "DECONSTRUCTED"

Further, in establishing policies that promote robust broadband capacity for Internet access, the FCC should ensure the allocation of greater network capacity than is typically available today, in order to more fully support the development of new applications and the growth of innovative and competitive services. To do otherwise – or effectively "low-ball" the metric of robustness – would disserve innovation and creativity on broadband platforms and applications, to the detriment of American consumers and the still-struggling American economy. New innovation and adoption of "cloud" computing technologies and services, for example, will likely serve the goal of the Recovery Act to make broadband functionality more affordable for consumers by lowering the retail costs of both computers and software/content access. However, that development may depend significantly on whether consumers have sufficiently robust broadband connections with which to connect to the "cloud" servers.

Nor is it in our national interest for providers to build out and invest in a bifurcated approach to "Internet over broadband" platforms. For example, providers have expressed the

desire to develop broadband network access services with a new "fast lane" for platform-affiliated Internet content and a separate "slow lane" service that consigns other Internet content and applications to a relatively bandwidth-starved portion of the broadband connection. Notably, a bedrock requirement in the NBP of the dimension of robustness of Internet access capacity will maximize consumer choice, allowing consumers themselves to decide what lawful content and interactions they want to utilize across all destinations on the Internet.

Setting and Adjusting Broadband Speed Objectives. As the initial comments highlight, the level of needed broadband throughput speed will vary depending on consumers' uses and objectives.[30] Likewise, broadband benchmarks may not fit every situation and may well have to be adjusted. At the same time, however, the NBP must establish metrics to address the need of the FCC and other stakeholders to measure progress objectively over time as consumers' needs evolve. Broadband metrics will permit the FCC and other stakeholders to evaluate comprehensively which policies are, and are not, working and to anticipate and encourage further broadband utilization. Many parties agree with Google that symmetrical broadband is an

[30] *See* Comments of Dell at 3 ("Whatever definitions and metrics the national broadband plan adopts, however, it is critical that the Commission both recognize the increasing need for faster broadband connections. . . ."); One Economy at 19 ("Which Next-Generation Network should be deployed is dependent on the geographic terrain, population density, network architecture, and other pertinent variables, but we should mandate and incentivize the deployment and adoption of Next Generation Networks in the target markets…"); PFF at 7 ("The wide array of technologies and services at issue, however, and the rapid pace at which these technologies and services evolve, suggest that any definitions adopted by the FCC in this proceeding should be extremely flexible and as nearly dynamic as the market itself."); TDS at 7 ("For now, broadband access at this speed allows for access to the array of online services and applications commonly sought in the marketplace today, including web browsing of reasonably complex interactive sites, access to government services and information, ordinary telecommuting, streaming video, and email with larger-sized attachments. But … the bandwidth needs of consumers are continuing to evolve rapidly and bandwidth speeds that may be sufficient today may not be sufficient tomorrow.").

important goal,[31] since it is most likely to create a future-proof starting point that recognizes that information exchange and virtual connectivity bring vital benefits, in contrast to the largely one-way data flow of other forms of communications technologies. Services like video conferencing and social networking are already beginning to increase the need for higher upstream speeds.[32] As such, the NBP should establish an initial forward-looking goal of universal consumer access to at least one 5 Mbps symmetric broadband network access connection by 2012. The Commission should re-visit this benchmark every two years and tailor it based on an assessment of the overall state of the market, as well as a determination of whether higher speed benchmarks are in the public interest. The agency should take into account any special situations, such as new impediments or gaps in deployment of broadband.[33]

At the same time, the NBP should not define broadband through a backward-looking lens. For example, AT&T argues that "the Plan should not *define* broadband to exclude services below a certain aspirational throughput threshold" and should include broadband connections that enable users to access "only relatively low-bandwidth applications (like web email and

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[31] *See* Comments of Cisco at 10-13; CFA/CU at 19, 27; FTTH Council at 9, 24; IEEE-USA at 2; Michigan Public Service Commission at 1; NASUCA at 27-28; NPM/NCAI at 7; National Association of Telecommunications Officers and Advisors, Alliance for Community Media, National Capital Association of Telecommunications Officers and Advisors, *et al.* ("NATOA *et al.*") at 7.

[32] *See* Robert D. Atkinson and Phil Weiser, *Executive Summary: A Roundtable on the End of Scarcity, Open Architecture, and the Future of Broadband Competition Policy*, Silicon Flatirons Center and Information Technology and Innovation Foundation, June 2009, http://www.silicon-flatirons.org/documents/publications/report/AtkinsonWeiserEndofScarcity.pdf (remarks of Stu Elby, Verizon).

[33] *See, e.g., Broadband Deployment Plan Should Include Performance Goals and Measures to Guide Federal Investment*, Government Accountability Office (May 2009) (GAO-09-494) at 11 (noting gaps to broadband infrastructure deployment in rural areas due to limited profit potential).

Internet search engines)."[34] This approach would effectively define almost all communications services as "broadband" and thus lead to a conclusion that the technology is widely available today. This "rigging the test" approach to examining America's vital challenges serves no useful purpose and undermines Congressional policy.

The NBP Should Encompass Adaptive Deregulation. As the FCC considers broadband metrics, including the level of robustness that platform owners offer, it may find that previous regulatory policies are inconsistent with current national broadband objectives. For example, as some commenting parties have noted, sharing of last-mile connectivity between "private" uses and the "public" Internet can raise concerns about whether consumers are being well-served by the profit-driven business decisions of platform owners.[35] While AT&T, for example, may argue that it is permitted to make such choices and allocate substantial DSL capacity to its private U-Verse services, rather than to independent data services (including competing video content), a more comprehensive public policy perspective would favor allocating greater capacity for Internet access, given the massive positive externalities, including tangible economic and social benefits of such access. The Commission therefore should incorporate into the NBP the possibility of re-examining prior policies to determine whether the analytical and/or empirical basis remains supportable and sound. Under such an "adaptive deregulation" approach, the Commission should focus on at least three separate scenarios: (1)

Allocating disproportionate last-mile connectivity to serve "private" uses, at the expense of the "public" Internet, raises fundamental questions about the role of a national broadband policy in maximizing online benefits for all Americans.

[34] Comments of AT&T Inc. ("AT&T") at 17-18.

[35] *See, e.g.*, Comments of NASUCA at 35-37.

instances where the premise for deregulation has changed; (2) instances where the FCC's predictive judgments have not been borne out by subsequent events; and (3) instances where promises by regulated entities that were the predicate for deregulation were not fulfilled.

As a general matter, the FCC may proceed with an analysis of broadband deployment by considering how its legal conclusions in the aftermath of deregulation might be altered if the facts before it differ from when it adopted a given deregulatory decision. For instance, the broadband providers' "Internet over broadband" services were deregulated on the assumption that the services offered were primarily consumer Internet access. Revisiting that particular decision would be appropriate if the factual record reveals that the services being offered are primarily not open Internet access services at all, but instead other broadband-based services of a more closed nature (*e.g.*, proprietary video or other online services).[36] The FCC may decide to evaluate that proportion of overall broadband capacity dedicated to proprietary services as opposed to public Internet access, and perhaps establish parameters specifying when additional regulatory responses may be indicated.

Should prior FCC predictions prove erroneous, the agency has an ongoing obligation to review and, where appropriate, reconsider its prior decisions.

Similarly, after gathering and assessing current facts, rather than yesterday's predictions, the FCC must be prepared to take corrective measures. Indeed, the agency has a legal obligation to do so. The courts have made clear that there is an affirmative obligation for the Commission to vigilantly monitor

[36] *Wireline Broadband Order*; *Inquiry Concerning High-Speed Access to the Internet Over Cable and Other Facilities*, Declaratory Ruling and Notice of Proposed Rulemaking, 17 FCC Rcd 4798 (2002) ("*Cable Modem Declaratory Ruling*"), *aff'd*, *Brand X*, 545 U.S. 967 (2005).

the consequences of its regulations.[37] Because predictive judgment is not "a talisman under which any agency decision is by definition unimpeachable,"[38] the FCC must reconsider its decision in accordance with its continued obligation to practice reasoned decision making should its predictions prove erroneous.[39] Finally, the FCC may seek to adapt its regulatory oversight and responses after reviewing unfulfilled commitments made by regulated entities.[40] To the extent these companies' promises diverge from their actions, the FCC should consider what regulatory response is appropriate.

Promote Tomorrow's Universal Connectivity. The comments reflect broad consensus that there is room to adjust today's federal universal service fund ("USF") regime to our future

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[37] *ACLU v. FCC*, 823 F.2d 1554, 1565 (D.C. Cir. 1987) ("However, where the Commission itself has recognized the tentative nature of its predictive judgments, and alluded to the possibility that future studies will alter its principal conclusions, we find it particularly appropriate to emphasize the need for the Commission to vigilantly monitor the consequences…").

[38] *Int'l Ladies' Garment Workers' Union v. Donovan*, 722 F.2d 795, 821 (D.C. Cir. 1983) (*citing Motor Vehicle Mfg. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 49 (1983).

[39] *Aeronautical Radio, Inc., v. FCC*, 928 F.2d 428, 445 (D.C. Cir. 1991); *See also Betchel v. FCC*, 10 F.3d 875, 880 (D.C. Cir. 1993) (*citing Betchel v. FCC*, 957 F.2d 873, 881 (D.C. Cir. 1992) (explaining that this "corrective duty" requires the FCC to re-evaluate its positions):

> There comes a time when reliance on unverified predictions begins to look a bit threadbare. The Commission's necessarily wide latitude to make policy based upon predictive judgments driving from its general expertise implies a correlative duty to evaluate its policies over time to ascertain whether they work – that is, whether they actually produce the benefits the Commission originally predicted they would.

[40] For example, one commenter alleges that AT&T repeatedly has made commitments to the FCC and other regulators regarding broadband throughout its territory in connection with the numerous mergers that have taken place over the last dozen years or so, including most recently, commitments in connection with the AT&T/BellSouth merger to provide stand-alone DSL and a $10.00 broadband offering to consumers and 100% broadband within AT&T's 22-state region by 2007. *See* Comments of New Networks Institute and TELETRUTH at 42, 142-43. At minimum, the Commission should investigate these allegations.

broadband-based world. As noted in its initial comments, Google agrees that the FCC should examine its USF policies and act swiftly, including by expanding its focus to universal broadband connectivity and access, rather than being constrained with the PSTN-centric services regime that is the outgrowth of a telephony-based narrowband era. In fact, to the extent the FCC determines to extend USF support to broadband, all distributions should come with certain strings attached, including adhering to the three dimensions of broadband as an optimal Internet platform.[41] Just as Recovery Act funds available through NTIA and RUS are geared to overall public sector benefit (and therefore awardees must agree to certain public interest terms and conditions),[42] so too should the FCC reform USF in a manner that serves the public generally rather than creates an additional private sector benefit.[43]

In the same vein, the FCC should conclusively reject inaccurate portrayals by some of Internet applications as somehow causing enormous broadband costs that must be recovered through expansion of USF telephone network charges.[44] Simply put, a consumer's use of Internet software applications over his or her home broadband network platform does *not* cause uncompensated costs to the underlying broadband provider. Moreover, it is simplistic, but wholly incorrect, to equate the market share of an applications or online content provider, such as Google, Yahoo, Ask.com, or Bing, with traffic and correlated costs. In any event, applications

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[41] Likewise, Google agrees with AT&T that comprehensive intercarrier compensation reform should be undertaken to create a forward-looking system. *See* Comments of AT&T at 83-85. Of course, here as always, the devil is in the details, and the NBP is not the proper place to resolve such complex and contentious issues.

[42] *See* Recovery Act, § 6000; Div. A, Title I.

[43] Such "strings attached" to the allocation of public monies to support private interests also is consistent with the traditional common carriage prong of treating subsidized communications infrastructure as a public good.

[44] Comments of National Telecommunications Cooperative Association ("NTCA") at 20-21.

providers *do* pay – they pay for their own network connections and facilities supporting access to the Internet just as consumers pay for theirs.[45] Arguments that users, including applications providers, are somehow getting a "free ride" have been soundly rejected before[46] and should be rejected here as well. In fact, the very structure of the Communications Act recognizes that users may not be assessed USF charges directly.[47] Rather than embrace the "smart edges" that the Internet and online content and applications have delivered, certain parties unfortunately seek instead to perpetuate the traditional telephone monopoly perspective and payment schemes, which are wholly inappropriate in today's applications- and services-driven marketplace.

The NBP Should Not Expand FCC Regulatory Jurisdiction. As the voluminous record shows, there are many issues that affect how broadband is deployed, used, and leveraged. While all are part of the larger mosaic, not every issue should be addressed in the NBP, and certain issues, while important, are almost wholly outside of the Commission's jurisdiction. The Commission should remain focused on the NBP's core objective – to bring broadband infrastructure, services, and applications to everyone throughout the United States.

Google understands that intellectual property rights are vital issues as digital media expand.[48] These issues, however, fall well outside the FCC's jurisdiction[49] and should not drive

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[45] *See* Richard Whitt, *Response to phone companies' "Google bandwidth" report*, Google public policy blog, Dec. 4, 2008, http://googlepublicpolicy.blogspot.com/2008/12/response-to-phone-companies-google.html (explaining flaws in the source study referenced by NTCA).

[46] *See Access Charge Reform*, First Report and Order, 12 FCC Rcd. 15982, ¶¶ 345-45 (1997), *aff'd*, *Sw. Bell Tel. Co. v. FCC*, 153 F.3d 523 (8th Cir. 1998).

[47] 47 U.S.C. § 254.

[48] *See, e.g.*, Comments of Entertainment Software Association at 1-2; Motion Picture Association of America at 5-6; Songwriters Guild of America 1-3; Walt Disney Co. at 1-2.

our national broadband policy. As a substantive matter, our copyright system must continue to embrace "fair use" of content, and it would be incredibly harmful to have network owners in the position of unilaterally making decisions on whether certain Internet packets constitute fair use as they are flowing through the network.

Likewise, the goal of promoting consumer privacy is a central public good.[50] Google has endorsed the Federal Trade Commission's consumer privacy principles addressing online advertising.[51] Except as applied to telecommunications carriers, however, the FCC is not the proper forum to debate or resolve these issues. Of course, as broadband services, online content, and similar applications continue to be rolled out, it is increasingly important for future growth and development that consumers have assurances that their network platform providers are adhering to rigorous privacy practices.[52]

The FCC Should Affirm An Unregulated Software Applications Marketplace. Given the demonstrated economic and productivity benefits derived from online applications and services, it is especially critical to supporting a vibrant "edge" marketplace that the FCC assure all innovators that software applications will remain unregulated. The applications market continues to experience incredible innovation, with new applications/services able to be

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[49] *See, e.g.*, *Sony Corp. of Am. v. Universal City Studios, Inc.*, 464 U.S. 417, 430-31 (1984); *Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming*, Third Annual Report, 12 FCC Rcd. 4358 ¶ 192 (1997).

[50] *See* Nicole Wong, *Giving consumers control over ads*, Google Public Policy Blog, Mar. 11, 2009, http://googlepublicpolicy.blogspot.com/2009/03/giving-consumers-control-over-ads.html.

[51] *See FTC Staff Report: Self-regulatory Principles for Online Behavioral Advertising*, Feb. 2009, http://www2.ftc.gov/os/2009/02/P085400behavadreport.pdf.

[52] As one example, Deep Packet Inspection (DPI) technology employed by broadband providers at the network layer is far different, qualitatively and quantitatively, than the ability of applications providers to access specific information voluntarily provided by advertisers and other users (interest-based advertising).

developed and deployed quite rapidly, especially in comparison to network infrastructure deployments.[53] It is not feasible or beneficial – nor would it be lawful – for the Commission to seek to expand its limited Title I "ancillary" jurisdiction into the software applications and content markets. The Commission repeatedly and correctly has concluded that software applications are not "telecommunications services" nor do they provide "telecommunications."[54] The NBP should not be used as a vehicle for upsetting this bedrock legal principle.

C. The Comments Overwhelmingly Support Open Internet Access over Broadband

The NBP Should Adopt the Fifth Principle. Google agrees with Commissioner Copps and numerous commenters that the FCC should adopt a fifth nondiscrimination and interconnection principle in addition to the four *Internet Policy Statement* principles.[55] Nondiscrimination serves the public interest goal of network "last mile" openness. As the history of the Internet shows -- and the comments filed in this proceeding reiterate -- last mile openness has served the public interest exceedingly well by fostering growth and adoption of the

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[53] For example, compare the deployment of consumer DSL services almost ten years after the technology was introduced with the exponential growth of an online application like Facebook, which in less than five years grew from a college student's start-up to a market leader with over 200 million active users worldwide.

[54] *Petition for Declaratory Ruling that pulver.com's Free World Dialup is Neither Telecommunications Nor a Telecommunications Serv.*, 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."); 47 U.S.C. § 230(b)(2) (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").

[55] Notably, the NTIA and RUS Notice of Funding Availability sets forth nondiscrimination obligations that require funding applicants to "offer interconnection, where technically feasible without exceeding current or reasonably anticipated capacity limitations, on reasonable rates and terms to be negotiated with requesting parties."

Internet by the American public.[56] As noted by the California Public Utilities Commission, "[i]nventions and new applications emerge from the edge of the Internet to its center; this receptivity to inventiveness is the core of the Internet's value as an engine of innovation and a spur to economic development;" therefore, the NBP "should encourage the continued openness of the network to developments from the edge and make such openness and nondiscrimination criteria for network deployment and usage."[57]

Adoption of a nondiscrimination principle strikes an appropriate balance among stakeholders and will ensure unfettered access to Internet content and IP communications.

Significantly, all sides now endorse the FCC's four principles in its *Internet Policy Statement.*[58] No one can dispute that unfettered access to Internet content and edge-driven communications has been one of the most significant technological and skills advancements for

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[56] *See, e.g.*, Michael J. Copps, Acting Chairman, Federal Communications Commission, Pike & Fischer's Broadband Policy Summary V, June 18, 2009 ("We should always be concerned about potential gatekeeper control. That is why … I have supported an open Internet, Internet freedom, network neutrality. . . . It is also why I believe the Commission should adopt a fifth principle of non-discrimination."); Comments of Public Knowledge *et al.* at 7-8. *See also* Comments of Google at 36-40, WC Dkt. No. 07-52 (June 15, 2007). Recently, even Comcast, Verizon, and AT&T have publicly acknowledged that a fifth principle may be acceptable. *See* John Eggerton, *Verizon Willing to Consider a Fifth FCC Internet Principle*, Broadcasting and Cable, June 4, 2009, http://www.broadcastingcable.com/article/278349-Verizon_Willing_To_Consider_Fifth_FCC_Internet_Principle.php?rssid=20065; Adam Bender, *AT&T Could 'Live With' Fifth FCC Internet Principle*, Comm. Daily (June 22, 2009); *CommDaily Notebook*, Comm. Daily (June 11, 2009) ("With the FCC considering a fifth Internet policy principle, on nondiscrimination, a Comcast executive said the company has always been willing to discuss network neutrality and management issues with policymakers.").

[57] Comments of CA PUC at 55.

[58] *See, e.g.*, Comments of AT&T at 98; Verizon at 86; Time Warner Cable at 27; USTelecom at 24.

humankind in generations. Indeed, the initial comments demonstrate that the Internet has generated unparalleled economic productivity and public benefits.[59]

Further, no party contends now (despite some prior positions to the contrary) that the FCC's *Internet Policy Statement* has deterred the network owners' incentives to make additional network investments.[60] Indeed, as some platform owners now acknowledge, where the broadband provider is subject to some form of competition, consumer choice, and the possibility of losing customers to another provider, that provider must and will make significant network

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[59] *See, e.g.*, Comments of Communications Workers of America ("CWA"), Attachment A ("Expanded access to high speed Internet generates major economic growth and rapid job creation. High speed connections accelerate business development by providing new opportunities for innovation, expansion, and e-commerce. Connected communities create wealth and opportunity by attracting businesses that want to locate in areas with a strong broadband presence. In the new global economy, access to broadband has become as essential to individual and community economic prosperity as electricity and roads."); Comcast at 2 ("Since the mid-1990s, the deployment of broadband networks and the widespread introduction of high-speed Internet services over those networks have directly and indirectly created millions of jobs and have been an integral part of this nation's economic growth and development."); Benton Foundation, Center for Creative Voices in the Media and Professor Heather E. Hudson ("Benton Foundation *et al*.") at 9 ("the Internet plays an important role in the economy, as an engine for productivity growth and cost savings. The Internet's profound impact accelerates daily."); USTelecom at 7 ("Broadband and ICT investment is a key driver of economic growth, productivity, consumer value, and millions of high-paying jobs. It is also integral to achieving policy goals, such as enhanced civic participation, health care delivery, energy independence, and education.").

[60] *See* Comments of Comcast at 2 ("[t]he cable industry alone has invested $145 billion in broadband networks" since the mid-1990s); AT&T at n. 13 ("For its part, AT&T has invested $38 billion over the past two years to enhance our wireline and wireless networks, and we plan to spend another $17 to $18 billion in 2009, with approximately two-thirds of this new investment slated to support broadband.); Verizon at 18 ("Verizon has invested more in capital expenditures over the last several years – more than $80 billion from 2004 through 2008 – than *any* other company in the United States in *any* industry.") (emphasis in original); USTelecom at 3 ("By some estimates, cumulative capital expenditures by broadband providers from 2000-2008 were over half a trillion dollars. In 2008 alone, broadband providers invested at least $64 billion to deploy and upgrade their networks.").

upgrades and investments.[61] It is equally true, therefore, that the *Internet Policy Statement* principles have enhanced platform owners' incentives to invest, as they have bolstered competition and protected consumer choice to select services, applications, and content that are not predetermined by the platform owner. Policies promoting investment in network platforms and infrastructure must be consistent with the public interest in promoting significant investment in applications and content.

The nondiscrimination principle recognizes that the end-to-end nature of the Internet is largely responsible for its brilliant success. Historically, a stable and open platform, including the lynchpin of a common carriage-style legal structure for last-mile access, has allowed content, device, and application providers on the "edge" of the network to take enormous risks by investing in a myriad of services and applications.[62] If end-user demand for these content/application services bears out in the marketplace, a new set of marketplace signals and incentives arises to address consumer tastes and wants. This "virtuous cycle" in the applications marketplace can grow and develop, however, only for as long as the applications innovators take their economic signals from consumers, and are not dependent upon the prior permission of the platform owners.

Promote Smart Edges. Moving forward from this broad consensus, the best approach to a fifth, nondiscrimination principle is one that neither depends on formal utility-style monopoly

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[61] *See, e.g.*, Comments of NCTA at 16-17 (noting that the cable industry's largest competitors, AT&T and Verizon, the two dominant telecom providers, plan significant wireline and wireless network upgrades).

[62] Kevin Werbach, Breaking the Ice: Rethinking Telecommunications Law for the Digital Age, 4 J. ON TELECOMM. & HIGH TECH. L. J. 59, 61-65 (2005) ("Intelligence moves to the edges of the network").

regulation, nor allows unbridled platform owner discrimination against any end users, whether "edge" applications providers or consumers. Consistent with the Commission's policies for decades, platform owners should be permitted to participate fully as "edge" providers both for their own network customers and for those connected to other platforms. Longstanding Commission precedent also has confirmed the inescapable truth that platform owners have the incentive and ability to undercut and diminish the growth of the greater and more diverse set of broadband services and applications in ways that are harmful to society. In large part, these are matters of real concern because platform owners today derive significant revenues and healthy margins from a variety of communications services and service bundles – commercially licensed wireless services,[63] traditional telephony with its USF subsidies, proprietary video content, dedicated lines. Each of these lines of revenues is subject to enormous competitive pressure from "edge" providers offering consumers better, cheaper, unbundled, and more useful IP-based alternatives. "Edge" providers are an undeniable threat to these high-margin revenue sources of platform owners.

What is at stake, then, with the nondiscrimination principle is not only the benefits the Internet currently delivers to the American public. Further applications and "edge" innovation in the future may be squelched if platform owners hold the ability and incentives to block, disfavor, or discriminate against any applications at their private discretion, or to demand compensation from the applications marketplace to not take such actions. The importance of these issues has

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[63] *See* Phone Bill Survey of UCAN Customers, Teletruth, New Networks Institute and LTC Consulting, Mar. 2009, http://www.teletruth.org/docs/UCANteletruth.pdf.

grown in the wake of the Commission's broadband deregulation completed some four years ago.[64]

Thus, an appropriate nondiscrimination principle is not about a particular business model or forcing governmental regulations to protect a given company interest. Rather, this principle addresses the matter of whether it is the *user* or the *platform owner* that should pick and choose the "winners and losers" in the online content and applications marketplace. Google believes it is the Commission's great opportunity, and statutory duty, to declare that *the user*, not the platform owner, *should decide* in order that the applications and content marketplace in America will remain vibrant and creative but not beholden to the interests of platform owners.

Should the *American Public* or the *Platform Owner* pick and choose the "winners and losers" in the online content and applications marketplace?

In the absence of a clear and legally enforceable nondiscrimination principle, the platform owner picks the winners among "edge" providers. As such, this scenario presents a classic negative externality caused by one member of society but borne by, and inflicting harm upon, all other members. While robust platform competition at least theoretically would be the best salve, such competition simply has not emerged sufficiently, and may not soon. The data in the record thus far, while incomplete, strongly indicates that too many Americans have either no or very limited choices in the marketplace today for the Commission to simply wait for the arrival of fulsome competition.

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[64] *See, e.g., Formal Complaint of Free Press and Public Knowledge Against Comcast Corp. for Secretly Degrading Peer-to-Peer Applications*, Memorandum Opinion and Order, 23 FCC Rcd. 13028 (2008); *Madison River Commc'n, LLC*, Order, 20 FCC Rcd. 4295 (2005).

No party seriously contends that undue discrimination by platform owners should be permitted, or that it somehow serves the public interest.[65] Google suggests that the best course forward is for the FCC to: (i) establish an enforceable Internet principle that discrimination by a platform owner violates the Communications Act; (ii) articulate a limited but non-exclusive set of discriminatory acts that are *per se* unreasonable; and (iii) proceed with case-by-case enforcement.[66] Enforcement of laws protecting against invidious acts, and thereby fortifying the continued end-to-end nature of Internet services, is most consistent with the Communications Act and the bulk of FCC precedent.

The NBP Focus Should Be On Open Net Access. As the record makes crystal-clear, there is a fundamental distinction between the "last mile" network layer (the broadband connection) and the applications and content layers residing at the "edge" of the network. Openness is needed at the "last mile" broadband network layer because it (1) serves the greater societal purposes of enabling consumer access to a myriad of broadband services, (2) re-affirms the necessary access to the end user marketplace for content/applications innovators and

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[65] *See* Comments of CWA at iv ("We must protect free speech on the Internet so that people are able to go to the websites they want and download or upload what they want when they want on the Internet. There should be no degradation of service or censoring any lawful content on the Internet."); MAP at 6 ("The First Amendment's mandate, as well as the need to create a platform for economic growth, require the Commission to make plain that the National Broadband Plan be based on strong and enforceable interconnection and non-discrimination obligations."); Public Knowledge *et al*. at 6 ("The success of the Internet as a world-changing communications medium and its ability to offer us new, unforeseen uses for communications is largely a product of its openness.").

[66] Example of unreasonable practices include surcharges on content providers that are not platform owners' retail customers, and prioritizing data packet delivery based on affiliation or source of content.

businesses, and (3) generates productivity and service revenues benefits for all, including networks *and* edges.

These same benefits would be lost if, as some suggest, the FCC were to impose a general nondiscrimination obligation on all participants in the Internet marketplace. Thus, for example, arguments that nondiscrimination obligations should apply to "all or to none" – including applications providers such as Google (*i.e.*, Google or Bing should not be able to prioritize search results or ads)[67] – are disingenuous at best. The reason stems from the modular, end-to-end nature of the Internet and broadband platforms. Unlike the lower layer broadband provider, no applications provider can impede, hinder, or deter consumer access to any other applications provider. Further, no party seriously proposes additional common carriage-style regulation of the content/applications marketplace for purposes of nondiscrimination. Indeed, an FCC nondiscrimination obligation applied to all content applications would raise a myriad of thorny legal and policy difficulties (such regulation plainly would be well outside the FCC's Title I "ancillary" jurisdiction, for example[68]) and would be impossible to enforce effectively. Further, such regulation would be contrary to the American public's well-grounded (and constitutional) expectation for free expression with and between content/application providers. Ultimately, such regulations would serve no public interest purpose. By contrast, the point of a network access

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[67] *See* Comments of AT&T at 113-14.

[68] In fact, many software applications are not information services at all, and thus are not within the FCC's limited and arguable Title I "ancillary" jurisdiction over such services. *See Cable Modem Declaratory Ruling*, ¶75 (the Commission's ancillary authority to regulate is not "unrestrained" and may only be exercised provided such action is "'necessary to ensure the achievement of the Commission's statutory responsibilities.'") (*citing FCC v. Midwest Video Corp.*, 440 U.S. 689, 706 (1979)). *See also U.S. v. Sw. Cable Co.*, 392 U.S. 157 (1968).

nondiscrimination principle is to serve the interests of unfettered communications between "edges" and consumers.[69]

It is also notable that, largely because it is consistent with the Internet approach to communications, many "edge" content/applications providers already invest in open solutions for innovators. Google's Android initiative in the wireless ecosystem is but one example.[70] Even AT&T acknowledges that the open nature of Android encourages application innovation, although its needless attack on the "inferiority" of open platforms misses the point.[71] As noted by the IEEE-USA, the "closed nature of the wireless market is not a technological imperative, as shown by investment in the open platform and open source Android by Google."[72] These efforts are pushing at least some quarters of the wireless industry to re-think legacy closed business models and to deliver services for consumers that are "brimming with thousands of apps that have unleashed new waves of creativity and innovation."[73]

D. Reasonable Network Management Can Be Consistent With Broadband Dimensions of Openness and Robustness

The initial comments filed addressing the critical issue of network management practices of platform owners seem to talk past one another. As a general matter, the platform owners

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[69] Comments of Telecom Consulting Associates at 19 ("Open networks will encourage investment and fuel creativity and entrepreneurship in content development, fuel competition from intermodal sources and drive down prices to make broadband more affordable for everyone.").

[70] Android is an open mobile operating system built on the Linux Kernel that enables applications developers to create mobile applications that have equal access to a phone's capabilities. *See* Android | Official Website, http://www.android.com/about/.

[71] *See* Comments of AT&T at 119.

[72] Comments of IEEE-USA at 12.

[73] Julius Genachowski, Chairman, Federal Communications Commission, Remarks to the Staff of the Federal Communications Commission, 2 (June 30, 2009).

claim that nondiscrimination would cripple their ability to manage in consumers' interests.[74] By contrast, some consumer-oriented commenters find the examples of invidious "network management" that affirmatively harmed the consumers' broadband experience as a basis to re-institute full Title II regulation and, perhaps, structural separations regime.[75] Between these two poles there is ample ground for dialogue, and even consensus.

Limitations on network practices ensure that an appropriate balance is struck for all stakeholders and that broadband networks remain open and robust.

Some network owners also argue that America's vital interests in cybersecurity have effectively trumped and superseded the need for clear and enforceable laws against unreasonable and invidious conduct done under the cover of "reasonable" network management.[76] Google agrees that cybersecurity is a very important issue, as President Obama has recently reiterated.[77] Yet, just as the President also pointed out, this national priority is not at odds with upholding broadband openness and consumer choice, and should not distract the FCC or industry from resolving these matters expeditiously. There is more than sufficient room to address cybersecurity concerns in a manner that avoids ceding all discretion to platform owners.

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[74] *See, e.g.,* Comments of AT&T at 103 ("The Creation of New, Prescriptive Net Neutrality Rules or the Addition of a 'Non-Discrimination' Requirement Would Inhibit Broadband Growth and Harm Consumers"); Time Warner Cable at 28-29 ("the adoption of additional regulatory mandates in this context would threaten to harm consumers by thwarting the continued deployment of broadband networks.").

[75] Comments of NASUCA at 60-62; Public Knowledge *et al*. at 25-26.

[76] Comments of AT&T at 67-69. *See also* Scott Cleland, *Why New WH Cybersecurity Focus is a Game-Changer – for the Internet and Net Neutrality*, The Precursor Blog, May 30, 2009, http://www.precursorblog.com/content/why-new-wh-cybersecurity-focus-a-game-changer-internet-and-net-neutrality.

[77] *See* Harry Wingo, Recapping last week's Google D.C. Talk on cybersecurity, July 2, 2009, Google Public Policy Blog, http://googlepublicpolicy.blogspot.com/2009/07/recapping-last-weeks-google-dc-talk-on.html.

Therefore, Google proposes as a reasonable middle ground for the Commission to focus on anti-user network control practices. The purpose of an express limit on network practices is to ensure that an appropriate and transparent balance is struck for all stakeholders – broadband networks remain open and robust for end users to communicate with unaffiliated applications and content, even as the network owners develop more vertically integrated "private network" offers of transport and content. Reasonable network practices that are limited to ensuring network security and to complying with the requirements of law enforcement should be expressly permitted. These functions should not be exploited, however, as "cover" for activities that harm users, including anticompetitive charging, as well as blocking, degradation, and discriminatory traffic prioritization, which should be expressly prohibited.

AT&T's position, however – that network owners should have the unfettered ability to charge all participants in the "two sided" or "multi-sided" marketplace[78] – is not a reasonable network management practice, in part because it hinges on commercial interests unrelated to any objectively reasonable management of the broadband network. Google believes that AT&T is proposing to initiate for the first time a fundamentally anti-user network practice, one that would significantly threaten both the openness and robustness dimensions of broadband as an optimal Internet platform.[79] Such private payment arrangements would preclude smaller or less

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[78] Comments of AT&T at 111 (proposing that the FCC sanction unregulated charging of access to "*both* end users and providers of Internet content and applications" by platform owners (emphasis in original)). AT&T's proposal would result in the equivalent of a terminating access charge or a modern "modem tax" without the regulatory oversight, *i.e.*, a digital "shake down."

[79] Indeed, Google and other Web companies already spend billions of dollars each year for network access and infrastructure to provide their content and applications to the Internet. *See* Comments of Google, WC Dkt. 07-52 (June 15, 2007) at 23-25 ("Allowing terminating charges could also lead to the 'balkanization' of the Internet, in which each of the hundreds of local telephone and cable operators around the country – and around the world – would assess its own

financially secure applications providers, as well as non-profit and educational applications, from any opportunity to consumers connected to (and already paying for) the platform owner's broadband service. Further, the private nature of these arrangements will bring discriminatory pricing of access; for example, some applications will be obliged to pay more while other, affiliated providers, are not saddled with the same costs. Over time these private arrangements would have the effect of eroding away the open and robust connections to the Internet. Finally, these private arrangements, if available at all, are also sure to include other restrictions and limitations on the services that the applications provider may offer. These significant distortive effects of platform owner "private" pricing/access arrangements on the applications and content marketplace, and the stultifying effect upon the services that Americans can experience, are fundamentally contrary to the public interest.

AT&T brands network management with a clever new slogan – "smart networks."[80] This term belies the fact that network management is not solely a technological issue. Rather, the platform owner can be expected to manage its network in its private economic interests, which can be at odds with the public values of consumer choice, growth of unaffiliated applications, services, and content, and "innovation without permission." Certainly, AT&T's proposed use of technical committees could be among a number of useful ways to deal with network management questions that could affect robust and open Internet access over broadband networks. To be effective, however, such committees would benefit from substantive guidance from the FCC, including enforceable legal norms and standards. In fact, in the absence of some

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set of fees for terminating traffic on its network."). For a further discussion of the considerable dangers of network prioritization to an open and robust platform for Internet access, *see id*. at 26-29.

[80] *See* Comments of AT&T at 69.

government role, industry technical groups are likely to devolve into never-ending debating societies, a result even AT&T apparently wants to avoid.[81]

Similarly, Google believes that the FCC, in cooperation with the Federal Trade Commission, should further study the effects of broadband "capacity caps" and tiered pricing imposed by network owners on end users' ability to obtain robust, open, and nondiscriminatory broadband capacity for Internet access. To be clear, pricing policies premised on consumers paying more for more broadband capacity generally are perfectly reasonable cost-causative practices. However, some commenters have raised serious concerns that some forms of capacity caps, especially combined with other network management practices, may deprive consumers of a robust Internet experience, and result in discrimination favoring the platform owner's affiliated content or services.[82] While Verizon's expert claims that capacity caps and usage pricing is a form of "price discrimination [that] can benefit consumers and promote broadband adoption" and that it may allocate network costs across users more efficiently,[83] thus far these claims are not supported by empirical evidence or the record. Further, the theoretical discussion appears to ignore that the platform owners' unregulated capacity cap/usage pricing decisions likely would be set according to its private gain, including its pecuniary interests in stifling competing services emerging in the applications marketplace (*e.g.*, Internet video as a threat to cable TV or VOD service), and so stifle broadband adoption.

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[81] *See id.* at 127.

[82] Comments of NASUCA at 62-63; Austin Broadband Interest Group at 4-5.

[83] Comments of Verizon, Declaration of Michael Katz at 35.

III. The Commission Should Work With Other Policy Stakeholders to Make Concrete NBP Proposals a Reality

The record is replete with proposals submitted by stakeholders who recognize the importance of ubiquitous adoption of broadband as an optimal Internet platform for all Americans. The impact upon reaching this goal is clear: building out broadband infrastructure to enable ubiquitous access to the Internet will bring enormous social and economic benefits. But the impediments to reaching this goal, including high deployment costs, delay and disruption of infrastructure upgrades, hard-to-reach populations, and assorted barriers to universal connectivity, also are clear, and well described in the record.

The Commission should not be incremental or narrow in its focus but instead should adopt a forward thinking approach, and propose to Congress specific projects that will provide both immediate and ongoing public benefits. With a better understanding of the barriers to uniform adoption, the Commission now is positioned to choose the best path to achieve the goals of the NBP and should explore specific, creative, and concrete solutions to overcome identified broadband deployment and utilization challenges.

The NBP should include ambitious yet concrete proposals that will provide both immediate and ongoing public benefits.

Fiber Deployment Test Beds. A number of parties have urged that the Commission adopt quite aggressive near-term goals for broadband deployment, with speeds ranging up to 100 Mbps and beyond.[84] Google sympathizes with the desire to deploy "ultra" broadband pipes as soon as

[84] *See, e.g.,* Comments of Cisco at 10 (FCC should aspire to ensure all Americans have access to a connection offering 100 Mbps both upstream and downstream); Covad Communications Company at 14 ("The next-generation network should offer speeds of at least 100 Mbps by 2015."); EDUCAUSE *et al.* at 3 ("Within a 5-10 year timeframe. . . we suggest an initial goal of 100Mbps to every home and business; for smaller anchor institutions such as schools, community colleges, libraries and health clinics, an initial goal of 100Mbps to 1 Gbps."); FTTH

possible, and to every American household. However, we should not simply assume that broadband is like the interstate highway system, and that the U.S. Government must enter the market to build the virtual equivalent of ten lanes everywhere. Instead, the FCC can take the lead in examining with greater precision the technical and economic obstacles to commercial entities deploying truly high-speed Internet connections to residential households. As one example, the Commission should select several U.S. communities as test beds for installing a minimum of 1 Gbps fiber connections to every residential household. By creating these test beds now, the agency can learn valuable lessons about the various technological and market challenges associated with such private sector deployments. These learnings in particular can foster greater understanding about where to place the appropriate dividing line between private sector and public sector support for build-outs of broadband plant. The test beds also can pave the way to establish loftier benchmarks for future fiber build-outs.

Broadband Conduit in Public Works Projects. To address the costs, disruption, and delays associated with broadband infrastructure, the NBP should require the laying of fiber, or the installation of conduit for later fiber deployment, in all new federally-funded road projects and other government-supported infrastructure projects (*e.g.*, water, electric, gas). This will serve to speed broadband facilities roll-out, promote competition and accommodate future

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Council at 4 (American consumers are already demanding "fixed access infrastructure supporting broadband services with transmissions at speeds of 100 [Mbps] bidirectionally. . . ."); IEEE-USA at 2 ("We further advocate the achievement of at least 100 [Mbps] bidirectional speed with availability to all businesses and households within 10 years."); NATOA *et al.* at 4 (definition of broadband should "aspire towards to the international standard of 100 [Mbps] to 1 [Gbps] symmetrical. . . .").

expansion with the lowest possible deployment costs and fastest installation.[85] Indeed, the pending "Broadband Conduit Deployment Act of 2009,"[86] recognizes the significant efficiencies of ensuring broadband conduits are installed in federally-funded high construction projects.

Community Hub Broadband Deployment. While Google continues to support a national residential benchmark for infrastructure build-out, the difficulty in reaching certain populations compels consideration of proposals that could act as a springboard for greater broadband usage and adoption for underserved, unserved and at-risk populations. Hard-to-reach populations may be best-served by community hub centers that have high-speed connectivity and serve as anchor facilities. There is overwhelming support in the comments for similar solutions, including support for deployment of fiber (or comparable facilities) to libraries, public housing, community medical facilities and K-12 schools, and for municipal broadband deployment.[87] The FCC should consider the importance of high-speed connectivity at anchor facilities and set even higher speed benchmarks of, for instance, 100 Mbps to all public libraries by the year 2012.

Reduce Barriers to Wireless Deployment. Many commenters, like Google, urge the FCC to reduce barriers to wireless deployment, including reducing and/or eliminating zoning and rights-of-way barriers for municipal networks and commercial deployments, and clarifying

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[85] *See* Comments of New America Foundation *et al.* at 9-10; One Economy at 22; Allied Fiber at iii-iv.

[86] Broadband Conduit Deployment Act of 2009, H.R. 2428, 111th Cong. (2009), introduced May 14, 2009, by Rep. Eshoo (D-CA).

[87] *See, e.g.*, Comments of American Library Association at 2; Benton Foundation *et al*. at 14; CA PUC at 9; EDUCAUSE *et al.* at 5; Microsoft at 6; NPM/NCAI at 8; New America Foundation *et al.* at 6; One Economy at 14.

timelines in the wireless facilities zoning approval process.[88] It is clear that the NBP should take immediate steps both to stimulate the use of wireless and to address regulatory impediments to deployment of wireless broadband facilities and technologies.

Other Proposals that Serve Our National Broadband Goals. Other insightful proposals also deserve attention, and Google urges the FCC to utilize the recently announced NBP workshops to explore these proposals further. For example, many commenters emphasize the importance of promoting consumer education to enhance broadband adoption and usage.[89] Specific ideas include a broadband adoption project for low-income students and their families,[90] targeted educational programs,[91] and public housing/building broadband requirement as a condition of receipt of federal funding. Commenters also suggest digital literacy programs,[92] accessible user interfaces for disabled persons[93] and a broadband adoption program for people of

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[88] *See, e.g.,* Comments of Alcatel-Lucent at 10; Clearwire at 5-7; PCIA – The Wireless Infrastructure Association and The DAS Forum at 5-7; PureWave Networks at 1; Wireless Communications Association International, Inc. at 24-25; Wireless Internet Service Providers Association at ii.

[89] *See, e.g.,* Comments of United States Internet Industry Association and NetLiteracy (proposing a community-based approach to achieving ubiquitous adoption of broadband).

[90] Comments of Cox at 5-6 ("The Commission could, however, initiate meaningful change by launching more narrowly-defined pilot programs that target at-risk, low-income students and their families in 10 communities across the country by the end of 2010.").

[91] *See* Comments of NASUCA at 63 ("The [NBP] should include an educational program and incentives that encourage broadband consumption. The education efforts should be oriented toward 'lifelong learning,' which will ensure that all members of society will have sufficient knowledge to understand the benefits of information technologies, including broadband.").

[92] *See, e.g.,* Comments of Broadband Diversity Supporters at 14-15 ("The [NBP] should address the relationship of economic growth, employment and technical skills education and training – particularly training in advanced telecommunications - to the social and economic stability of historically neglected communities.").

[93] *See, e.g.,* Comments of Center for Accessible Technology and Inclusive Technology at 3.

color.[94] The record also offers input on opportunities for broadband deployment to enhance energy efficiency through smart grids and smart buildings.[95] The record also raises substantial benefits of telemedicine, with proposals including changes to Rural Health Program and Rural Health Pilot Program, with particular emphasis on the benefit open networks could have on expanding access to health care.[96]

Through full and open participation in the NBP planning process and workshops, interest groups, consumers, and other industry stakeholders can provide the FCC much needed guidance on which proposals are most likely to bring about the widest, quickest, and most beneficial adoption of broadband by American consumers.

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[94] *See, e.g.,* Comments of Broadband Opportunity Coalition at 22 ("The Host Groups agreed that their initial efforts would focus on establishing a Broadband Adoption Program, with a focus on stimulating demand" for targeted communities of color.).

[95] *See, e.g.,* Comments of Motorola, Inc. at 32; Digital Energy Solutions Campaign at 1-2; New America Foundation *et al*. at 12; Utilities Telecom Council and the Edison Electric Institute at 4-5.

[96] *See, e.g.,* Comments of American Telemedicine Association at 1-2.

CONCLUSION

The record of this proceeding confirms that a National Broadband Plan focused on the three interrelated dimensions of universal broadband connectivity, robust Net access, and user openness and choice will best ensure that our Nation realizes the potential of broadband in the early 21st century.

Respectfully submitted,

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