Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
International Comparison and Consumer Survey Requirements in the Broadband Data Improvement Act	)	GN Docket No. 09-47
	)	
A National Broadband Plan for Our Future	)	GN Docket No. 09-51
	)	
Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act	)	GN Docket No. 09-137

COMMENTS OF THE BENTON FOUNDATION – NBP PUBLIC NOTICE #1

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SUMMARY

The Benton Foundation urges the FCC to define broadband in the context of the National Broadband Plan in such a way to ensure that it is serving the public interest in ubiquitous and affordable access to fast, reliable Internet services.

The FCC should adopt an application-based definition to directly advance the national purposes enumerated in the Recovery Act. Those purposes include advancing consumer welfare, civic participation, public safety and homeland security, community development, health care delivery, energy independence and efficiency, education, worker training, private sector investment, entrepreneurial activity, job creation and economic growth, and other national purposes. The definition must be technology-neutral to ensure that the FCC is accurately assessing the number of individuals with high-speed Internet access; it must enable reliable communications by setting maximum levels for latency and jitter; and it must rely on actual – not advertised – throughput speeds to reliably measure consumers' online capabilities.

The FCC should set a minimum threshold of 1 – 10 Gbps speeds to home and anchor institutions. These speeds are necessary to support applications that will directly advance the purposes of the Recovery Act, improve American lives, and allow the U.S. to regain its position as a global Internet leader.

As broadband demand continues to grow, so too must these minimum thresholds. The FCC should revisit and update them biennially to guarantee that Internet connections grow in speed and quality with the needs of the American people. Finally, as the definition of broadband is updated, data-gathering should include both past and present definitions and thresholds to ensure that policymakers can accurately measure progress.

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The Benton Foundation respectfully submits these comments in response to the Public Notice, DA 09-1842, issued August 20, 2009, seeking tailored comment on the definition of broadband for purposes of developing a National Broadband Plan ("NBP") pursuant to the American Recovery and Reinvestment Act ("Recovery Act").[1] Since January 2007 the Benton Foundation[2] has advocated for federal policymakers to craft a national broadband strategy with set benchmarks, deployment timetables, a commitment to demand drivers, and measurable

[1] American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, 123 Stat. 115 (2009) ("Recovery Act").
[2] The Benton Foundation's mission is to articulate a public interest vision for the digital age and to demonstrate the value of communications for solving social problems. Benton is a longtime supporter of research on universal service and the potential of high-speed Internet connections to improve American's lives.

thresholds.[3] The Benton Foundation has submitted comments on other aspects of the NBP, and welcomes the opportunity to advise the Federal Communications Commission ("FCC" or "Commission") on how to define broadband to ensure that its policies serve the public interest in ubiquitous and affordable access to fast, reliable Internet connections.

The Benton Foundation encourages the Commission to adopt an application-based definition of broadband to directly advance the national purposes enumerated in the Recovery Act, specifically, that the NBP advance consumer welfare, civic participation, public safety and homeland security, community development, health care delivery, energy independence and efficiency, education, worker training, entrepreneurial activity, job creation and economic growth.[4] This broadband definition should be technology-neutral and should include minimum thresholds for quality and for actual (not advertised) downstream and upstream speeds based on those necessary to achieve the purposes articulated in the Recovery Act: 1 – 10 Gigabits per second ("Gbps"). The Commission should revisit and update these thresholds on biennial basis to ensure that broadband connections continue to grow in speed and quality with the needs of the American people.

FACTUAL BACKGROUND

Congress mandated the development of a NBP, specifically directing the Commission to include "a plan for use of broadband infrastructure and services in advancing consumer welfare, civic participation, public safety and homeland security, community development, health care delivery, energy independence and efficiency, education, worker training, private sector investment, entrepreneurial activity, job creation and economic growth, and other national

[3] *See* Letter from Charles Benton, Chairman and CEO, Benton Foundation, to President George W. Bush (Jan. 2, 2007) *available at* http://www.benton.org/benton_files/bentonfoundationbroadband.pdf.
[4] Recovery Act §6001(k)(2)(D).

purposes" (collectively, these will be referred to as the "national purposes").[5] Public comments and presentations at the Commission's broadband workshops have revealed countless applications that will advance the national purposes as more and more and, eventually, all Americans have access to fast and reliable Internet connections. What follows is a small – and by no means exhaustive – summary of applications available to advance the national purposes articulated in the Recovery Act, along with the connection speeds and bandwidth characteristics necessary to support those applications. Taken together, the examples demonstrate that both anchor institutions and homes must have at least 1 – 10 Gbps bandwidth speeds to fully actualize the national purposes set out in the Recovery Act.

Consumer welfare. Broadband Internet access can protect and empower consumers. For instance, web-browsing allows consumers to become more informed, providing access to *Consumer Reports Online*,[6] and web-sites like www.hearusnow.org, which inform the public on how to protect personal information and avoid phishing scams whereby online predators obtain banking information, social security numbers and other personal data.[7] In addition, voice-over IP ("VOIP") and video streaming can improve the lives of people with disabilities through online translator services.[8]

To promote consumer welfare using the applications above, home users need bandwidth speeds of at least 5 – 10 Megabits per second ("Mbps") for those applications to operate at full capacity. Web-browsing requires anywhere from 500 kilobits per second ("kbps") – 5 Mbps

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[5] Recovery Act §6001(k)(2)(D).

[6] Transcript of National Broadband Plan Workshop, Consumer Context at 20, GN Dkt. No. 09-51, Sept. 9, 2009 ("BB WS #18").

[7] Consumers Union, *Internet Privacy*, *available at* http://www.hearusnow.org.internet/4/.

[8] Comments of Benton Foundation, Center for Creative Voices in the Media and Professor Heather E. Hudson at 34-35, *A National Broadband Plan for Our Future*, GN Dkt. No. 09-51, filed Jun. 8, 2009.

speeds.[9] And VOIP commands between 500 kbps and 1 Mbps.[10] Real-time, reliable sign-language translator services for the hearing-impaired use video streaming, demanding between 5 – 10 Mbps to operate proficiently.[11]

Civic participation. At present, too few people are able to fully participate in government, but universal broadband service can change how the public interacts with elected officials.[12] Web-browsing allows individuals to easily locate government services and data.[13] Many localities now stream and store video of governmental meetings online, allowing people with busy schedules or travel limitations to participate from afar.[14] In the 2008 presidential election the Democratic candidates engaged in a debate based on video questions submitted by members of the public over video-downloading-enabled YouTube.[15] Yet those without broadband access remain left out.[16]

To allow for all of the applications above, home users' bandwidth speeds must reach 5 – 10 Mbps. Web-browsing requires 500 kbps – 5 Mbps to search sites that host government data

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[9] Patricia Moloney Figliola, Angele A. Gilroy, Lennard G. Kruger, *The Evolving Broadband Infrastructure: Expansion, Applications, and Regulation* at Table 1, Congressional Research Service Report for Congress (Feb. 19, 2009) ("CRS Report").
[10] *Id.*
[11] *Id.*
[12] Transcript of National Broadband Plan Workshop, Open Government and Civic Engagement at 18, GN Dkt. No. 09-51, Aug. 6, 2009 ("BB WS #1").
[13] *Id.* at 18-24.
[14] *Id.* at 34, 131-132; Benton Foundation, *An Action Plan for America; Using Technology and Innovation to Address our Nation's Critical Challenges* at 33 (2008) ("Benton Action Plan").
[15] Benton Action Plan at 33.
[16] For more information about how broadband access can aid civic participation, please *see* Comments of Benton Foundation, Center for Creative Voices in the Media and Professor Heather E. Hudson at 32-34, *A National Broadband Plan for Our Future*, GN Dkt. No. 09-51, filed Jun. 8, 2009.

and contain the interactive abilities that allow home-users to apply for government services online.[17] Video streaming needs 5-10 Mbps, as does video downloading.[18]

Public safety and homeland security. Broadband connections enhance public safety measures and enable our government to operate more effectively in times of crisis. For instance, when the Government Accountability Office was evacuated during the anthrax scare, GAO employees with broadband connections were able to telework.[19] Wireless remote robots can enter dangerous locations to investigate crimes and provide humans with telepresence without threatening the lives of law enforcement officials.[20] Streaming video can enable video-based 9-1-1 services to provide emergency responders with a better sense of emergency scenes.[21]

To accomplish the above applications, home users and anchor institutions need bandwidths speeds of up to 1 – 10 Gbps. Telecommuting is known to require at least 5 – 10 Mbps speeds, 10 – 100 Mbps should the employee need a high quality video connection, 100 Mbps – 1 Gbps for remote server services, and 1 – 10 Gbps if an employee requires certain research applications.[22] Low definition telepresence demands between 5 – 10 Mbps speeds, high quality between 10-100 Mbps, and 1 – 10 Gbps speeds can accomodate telepresence using uncompressed HD video streams for optimal communications.[23] Finally, streaming video 9-1-1 services need bandwidth speeds between 5 – 10 Mbps.[24]

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[17] CRS Report at Table 1.
[18] *Id.*
[19] BB WS #1 at 26.
[20] *Id.* at 39.
[21] *Id.* at 62.
[22] CRS Report at Table 1.
[23] *Id.*
[24] *Id.*

Community development. Broadband connectivity enhances the current infrastructures in our communities to provide for the efficient use of public resources.[25] Those with web-browsing capabilities can apply for government services online, saving time and the costs of transportation to government offices.[26] Moreover, web-browsing enables communities of people to come together without leaving their homes, through social networking sites. Web-browsing, file sharing and video downloading allow neighbors to acquire and share community news in real-time, supplementing local broadcast news, which is wanting in many areas across the nation.[27]

These applications require that home users have connection speeds of up to 5 – 10 Mbps . Web-browsing demands from 500 kbps – 5 Mbps.[28] File sharing requires between 1 – 5 Mbps for small and medium-sized files, and 5 – 10 Mbps for larger files.[29] And video downloading demands speeds of 5 – 10 Mbps.[30]

Health care delivery. Broadband access and training in every home and medical facility can vastly improve health care delivery. Online medical file sharing can make health care delivery more efficient by facilitating the exchange of patient information between past and present medical providers, and to emergency rooms in urgent situations.[31] Consumers can use complex web-browsing to ensure that their online health profiles are secure and confidential; the Benton Foundation envisions a process by which consumers could access their health records online and limit which aspects of their health information can be shared with medical providers

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[25] National Broadband Plan Workshop, Technology/Fixed Broadband at 42, GN Dkt. No. 09-51, Aug. 13, 2009 ("BB WS #3").
[26] Many DMV, employment office and other government services are now available online.
[27] *See, e.g.,* Comments of the PIPA Coalition *et al*. at 8-9, MB Dkt. No. 04-233, filed Apr. 28, 2008.
[28] CRS Report at Table 1.
[29] *Id.*
[30] *Id.*
[31] BB WS #1 at 35; Benton Action Plan at 39.

and researchers.[32] Remote diagnosis and telemedicine can help doctors assess patients' symptoms from afar, minimizing travel expenses and time burdens for patients that live in remote areas.[33] And with telemedicine remote control of scientific and medical instruments, doctors can remotely monitor their patients, allowing for better out-patient services and quicker detection of irregular heart rates and a variety of other symptoms.[34]

The applications and throughput speeds necessary to achieve these improvements are varied, requiring connections speeds of up to 1 – 10 Gbps. Basic medical file sharing requires that medical facilities have bandwidth speeds of 5 – 10 Mbps.[35] Complex web-browsing requires that consumers have connections of 1 – 5 Mbps. [36] Basic remote diagnosis demands throughput speeds of 5 – 10 Mbps in medical facilities.[37] Basic telemedicine requires speeds between 10 – 100 Mbps, and advanced telemedicine involving remote control of instruments needs between 1 – 10 Gbps both in medical facilities and patients' homes.[38]

Energy independence and efficiency. Broadband-dependent technologies can advance the public interest in energy independence and efficiency. For example, real-time remote surveillance helped streamline a city's street sweeper routes,[39] lessening its carbon footprint. Remote building control and management allows the public, businesses and the government to monitor appliances and utility systems, leading to lower energy consumption as people learn how

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[32] Benton Action Plan at 39.
[33] BB WS #1 at 35-36.
[34] BB WS #3 at 32, 40. For more information on how broadband applications can improve health care delivery, please *see* Comments of Benton Foundation, Center for Creative Voices in the Media and Professor Heather E. Hudson at 23-28, *A National Broadband Plan for Our Future*, GN Dkt. No. 09-51, filed Jun. 8, 2009.
[35] CRS Report at Table 1.
[36] *Id.*
[37] *Id.*
[38] *Id.*
[39] BB WS #1 at 31-32.

energy use is tied to its costs, and are able to control energy-use while away from the premises.[40] Smart building controls take energy savings to the next level by monitoring and automatically shutting off appliances and utilities according to pre-set limits. Finally, telecommuting can vastly reduce energy consumption and carbon dioxide gas emissions.[41]

The aforementioned applications require bandwidth speeds of up to 1 – 10 Gbps. Basic remote surveillance needs speeds between 1 - 5 Mbps, and HD surveillance between 10 – 100 Mbps.[42] Basic building control and management takes 5 – 10 Mbps, smart building control between 10 – 100 Mbps.[43] Finally, telecommuting demands at least 5 – 10 Mbps speeds, 10 – 100 Mbps should the employee need a high quality video connection, 100 Mbps – 1 Gbps for remote server services, and 1 – 10 Gbps if that employee needs access to certain research applications.[44]

Education. Broadband opens up a world of educational opportunities for many who would otherwise go uneducated because of time, budget, childcare and travel constraints. Online learning has grown tremendously in the past decade, with people now earning college degrees online after work hours using a variety of applications, including VOIP, web-browsing, e-mail, streaming video, video downloading, remote education, educational services and research applications. Traditional public school education can also be enhanced with online learning. For

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[40] BB WS #1 at 37.

[41] Comments of Benton Foundation, Center for Creative Voices in the Media and Professor Heather E. Hudson at 29, *A National Broadband Plan for Our Future*, GN Dkt. No. 09-51, filed Jun. 8, 2009. *See also* Benton Action Plan at 41. For more information on how broadband infrastructure can aid energy independence and efficiency, *see* Comments of Benton Foundation, Center for Creative Voices in the Media and Professor Heather E. Hudson at 29-32, *A National Broadband Plan for Our Future*, GN Dkt. No. 09-51, filed Jun. 8, 2009.

[42] CRS Report at Table 1.

[43] *Id.*

[44] *Id*.

example, some public high schools are now offering a larger and more diverse number of foreign languages through online classes using high video connection interactivity.[45] The tools with which students learn are also going to rely more and more on broadband access, as digital textbooks requiring large file-sharing capabilities are likely to become commonplace over the next decade.[46]

These applications run the gamut in the amount of bandwidth speeds required, from 500 kbps up to 1 – 10 Gbps.[47] Home users as well as anchor institutions like schools and libraries, will require these speeds to provide all Americans with access to quality educational opportunities.

Worker training. Potential workers can now train online to develop their skills without having to bear the costs and inconveniences of transportation and childcare. Online training often entails interactive coursework, accomplished through VOIP, data and video sharing.[48] Streaming audio-visual courses with captions can assist the deaf and blind in ways that traditional classroom teaching cannot.[49] Simulations and instructional games are another tool utilized to train workers.[50] In addition, online recruitment and outreach tools and social media

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[45] BB WS #1 at 33.

[46] BB WS #3 at 124. For more information on how broadband access can improve educational opportunities, *see* Comments of Benton Foundation, Center for Creative Voices in Media and Professor Heather E. Hudson at 19-23, *A National Broadband Plan for Our Future*, GN Dkt. No. 09-51, filed Jun. 8, 2009.

[47] CRS Report at Table 1.

[48] National Broadband Plan Workshop, Job Training at 17, GN Dkt. No. 09-51, Aug. 26, 2009 ("BB WS #13"). Online learning includes English language acquisition courses for recent immigrants. National Broadband Plan Workshop, Opportunities for Small and Disadvantaged Businesses at 34, GN Dkt. No. 09-51, Aug. 18, 2009 ("BB WS #6"). Such courses otherwise require a two-year wait period. *Id.* at 35.

[49] BB WS #13 at 21.

[50] *Id.* at 30.

are available to help place people in jobs, but these generally require complex web-browsing capabilities.[51]

The benefits from online training cannot be actualized without home connection speeds between 5 – 10 Mbps, and anchor institution speeds between 100 Mbps – 1 Gbps. VOIP requires between 500 kbps and 1 Mbps speeds.[52] File sharing requires up to 5 – 10 Mbps, as does high definition video downloading and streaming video.[53] Basic gaming requires between 5 – 10 Mbps, while immersion gaming must have 100 Mbps – 1 Gbps speeds.[54] Complex web-browsing can be supported with 1 – 5 Mbps speeds.[55]

Entrepreneurial activity. Broadband connections make it easier for entrepreneurs to increase their profits in new and innovative ways. For instance, many farmers use the universe of information available through web-browsing and online video broadcasts to set prices, maximize profits and get their goods into the market.[56] Telecommuting enables the operations of the 52% of U.S. small business owners that work solely from their homes, as well as countless independent contractors who work from home offices.[57] Indeed, the very existence of ubiquitous broadband deployment will encourage U.S. innovation of broadband applications.[58]

To realize the Internet's ability to spur such entrepreneurial activity, home users must have speeds up to and exceeding 1 – 10 Gbps. Some of the applications mentioned above do not require such speeds, namely web-browsing, which requires 500 kbps – 5 Mbps, and HD

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[51] *Id.* at 35-36, 53-54, 59.
[52] CRS Report at Table 1.
[53] *Id.*
[54] *Id.*
[55] *Id.*
[56] BB WS #6 at 30-31.
[57] *Id.* at 21, 46.
[58] National Broadband Plan Workshop, Technology/Applications and Devices at 9-10, GN Dkt. No. 09-51, Aug. 27, 2009 ("BB WS #14").

broadcast video, which requires 100 Mbps – 1 Gbps.[59] Others, such as telecommuting, could require up to 1 – 10 Gbps, depending on the type of business one runs.[60] Still others, specifically those involving the innovation of broadband applications, require unknowable speeds. As many experts at the FCC's broadband workshops have noted, some of the best innovations have come from people exploring and testing ideas in garages during their spare time.[61] One particular expert noted that those innovations happen more often where bandwidth supply exceeds demand.[62]

Job creation and economic growth. Ubiquitous broadband can create high-wage jobs, restore the United State's global competitiveness, boost business productivity, and allow U.S. small businesses to reach global markets.[63] For instance, many U.S. businesses are anxious to bring outsourced telemarketing and customer service jobs back to the United States, but those jobs require VOIP capabilities.[64] Moreover, web-browsing and telecommuting allow small businesses to reach global markets by enabling the owners to virtually meet customers, partners and suppliers.[65]

These applications that further job creation and economic growth require home and anchor institution speeds of up to 10 – 100 Mbps. VOIP demands between 500 kbps and 1

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[59] CRS Report at Table 1.
[60] *Id*.
[61] *See, e.g.,* BB WS #14 at 20.
[62] *Id.* at 17-18.
[63] Comments of Benton Foundation, Center for Creative Voices in the Media and Professor Heather E. Hudson at 12, *A National Broadband Plan for Our Future*, GN Dkt. No. 09-51, filed Jun. 8, 2009.
[64] Peter Stenberg, Mitch Morehart, John Cromartie, *Broadband Internet Service Helping Create a Rural Digital Economy,* U.S. Department of Agriculture, AMBER WAVES (Sept. 2009), *available at* http://www.ers.usda.gov/AmberWaves/September09/Features/Broadband.htm; *see also* BB WS #6 at 26-27.
[65] BB WS #14 at 89-90.

Mbps., complex web-browsing needs 1 – 5 Mbps, and telecommuting that enables high quality video discussions between business owners and their customers, partners and suppliers, requires 10 – 100 Mbps.[66]

DISCUSSION

The Commission seeks comment on how the NBP should interpret the term broadband for purposes executing the Recovery Act's requirement that everyone in the United States have "access to broadband capability."[67] In particular, the Commission requests comment on the general form, characteristics, and performance indicators that should be included in a broadband definition, thresholds that should be assigned to those performance indicators today, and how the definition should be reevaluated over time.[68]

I. The Commission Should Formulate A Technology-Neutral Broadband Definition Based On The Actual Speed And Bandwidth Characteristics Needed To Accomplish The Recovery Act's Goals

The Commission seeks comment on the form, characteristics and performance indicators to be included in a broadband definition.[69] Specifically, the Commission seeks comment on the form that a broadband definition should take, whether to develop a single or multiple definitions, whether it should adopt an application-based approach, the key characteristics that should be used to define broadband, how a variety of different factors should be taken into account, whether different technologies should have different broadband definitions, and the feasibility and verifiability of different performance indicators.[70]

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[66] CRS Report at Table 1.
[67] *A National Broadband Plan for Our Future, NBP Public Notice* #1, DA 09-1842, rel. Aug. 20, 2009 ("Public Notice") (quoting the Recovery Act §6001(k)(2)).
[68] Public Notice.
[69] *Id* at 2.
[70] *Id.* at 2-3.

In Section 706 of the Telecommunications Act of 1996, "'advanced telecommunications capability' is defined, *without regard to any transmission media or technology*, as high-speed, switched, broadband telecommunications capability that *enables users to originate and receive high-quality voice, data, graphics, and video telecommunications using any technology*."[71] Congress' intent to breed high-quality voice, data, graphics and video communications is clear in this statute; what remains vague is the precise definition of broadband. The Commission should use Section 706 as a baseline definition for broadband, and insert specific details as needed to support the applications discussed above that further Congress' intent to advance the national purposes in the Recovery Act.[72]

To fully achieve the national purposes outlined in the Recovery Act, the Commission should embed minimum speeds and characteristics in the broadband definition, which should derive directly from speeds and characteristics required to accommodate the broadband applications above. Although the National Telecommunications and Information Administration and the Department of Agriculture's Rural Utility Service have defined broadband as "providing two-way data transmission with advertised speeds of 768 kbps downstream and at least 200 kbps upstream to end users, or providing sufficient capacity in a middle mile project to support the provision of broadband services to end users,"[73] these speeds are greatly incapable of supporting the applications necessary to accomplish the national purposes, and thus have no place in the Commission's NBP.

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[71] 47 U.S.C. §157 note (emphasis added).

[72] Recovery Act §6001.

[73] Broadband Technology Opportunities Program, Notice of Funds Availability and Solicitation of Applications, 74 Fed. Reg. 33,104 (Jul. 9, 2009); *accord* State Broadband Data and Development Grant Program, Notice of Funds Availability and Solicitation of Applications, 74 Fed. Reg. 32,545 (Jul. 8, 2009).

The Commission should define broadband based on actual, not advertised speeds. In Congress' most recent attempt to improve the federal data on broadband, it requested information on "actual," not advertised, data transmission speeds.[74] This is instructive for two reasons. First, it indicates Congress' belief that actual speeds represent the correct measurement for effective policymaking. Indeed, the Commission has itself recognized that "advertised throughput rates generally differ from actual rates, are not uniformly measured, and have different constraints over different technologies."[75] Second, with access to data on actual speeds,[76] the Commission will be able to periodically revisit and refine the definition of broadband. Thus the Commission should define broadband based on actual connection speeds to comply with Congressional intent and to set the building blocks for measurable, accurate policymaking.

In addition, the applications noted above require certain minimum bandwidth characteristics. Specifically, reliable broadband-enabled communication requires minimizing latency and jitter.[77] The Commission must set benchmarks that ensure signal integrity capable of high-quality, real-time voice and video communications.

II. The Commission Should Adopt A Minimum Threshold For Acceptable Broadband Speed And Quality

The Commission seeks comment on what minimum thresholds should be assigned to the performance indicators, the minimum thresholds necessary for broad classes of applications to

[74] Broadband Data Improvement Act, Pub. L. No. 110-385, §103, 122 Stat. 4096 (2008).
[75] Public Notice at 2 (citing public comments and white papers).
[76] In addition, there are now many sources of actual throughput speeds, such as the New America Foundation's Open Technology Initiative's M-Lab, Broadbandcensus.com, and speedmatters.org.
[77] BB WS #3 at 151-52.

function properly, and whether it should adopt multiple, escalating tiers of minimum thresholds.[78]

In 1999 the Commission set the minimum broadband speed at 200 kilobits per second (kbps). Stagg Newman, one of the FCC employees responsible for the 1999 benchmark, explained in a recent broadband workshop that he "never dreamed it would still be 200 kbps … a decade later."[79] Nonetheless we are left with this 20th century remnant, which is in dire need of updating. The Commission must set a new minimum threshold that is technology-neutral; this will ensure that the United States is not overestimating or underestimating the number of people with access to truly high-quality broadband. The Commission should refrain from adopting any self-interested broadband providers' assertions of low-ball definitions, which underestimate possibilities for growth and innovation. Instead, it should rely on independent data from neutral parties to establish progressive and realistic goals.

Given that 1-10 Gbps speeds are essential to accommodate the applications necessary to further the Recovery Act's national purposes, and to enhance our country's competitive position internationally, the Commission should set this as its minimum threshold. Some may argue that the speeds and characteristics necessary to achieve the applications and goals above are unreachable benchmarks, but experts at the Commission's NBP workshops suggest otherwise. One expert offered that, once cable is upgraded with DOCSIS technology, operators will be able to provide 1-5 Gbps,[80] and predicted speeds should only increase over time.

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[78] Public Notice at 3.
[79] BB WS #3 at 159.
[80] BB WS #3 at 29.

Finally, good arguments have been made for a higher speed standard for anchor institutions. The Commission should systematically examine the benefits and trade offs in this additional dimension.

III. The Commission Should Revisit And Update Its Broadband Definition On A Biennial Basis

The Commission notes that "Internet and broadband networks have been characterized by rapid evolution and change" and that "a static definition will fail to address changing needs and habits."[81] It thus seeks comment on what ongoing processes it should enact to update the definition and the thresholds, the frequency with which updates should occur, the criteria used to adjust thresholds, and how the updates will affect the Commission's ability to collect and publish meaningful data on broadband deployment and adoption.[82]

The CRS Report acknowledged the tremendous challenge facing today's policymakers, in that they must "develop a regulatory environment that not only addresses [] recent trends, but that also contains the flexibility to accommodate future and possibly unanticipated changes in technology, applications, and consumer demands."[83]

The Benton Foundation agrees that the FCC must strive to keep the broadband definition current, and urges the Commission to biennially revisit the minimum thresholds and shift them upwards as technological innovation and consumer demands dictate. Biennial reviews are especially necessary at the outset, as the broadband marketplace adjusts to the Commission's new definition. If the Commission sets the speed threshold anywhere below the advised 1 – 10 Gbps, it must aggressively update that threshold as soon as it is technologically possible. The

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[81] Public Notice at 3.
[82] *Id.*
[83] CRS Report at i.

biennial review will provide an excellent mechanism to keep the Commission's definition current.

Biennial reviews will not be unduly burdensome for the Commission or broadband providers. The Commission is already statutorily mandated to complete an annual inquiry into "whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion."[84] As part of these yearly inquiries,

> [f]or the purpose of evaluating, on a statistically significant basis, the national characteristics of the use of broadband service capability, the Commission shall conduct and make public periodic surveys of consumers in urban, suburban, and rural areas in the large business, small business, and residential consumer markets to determine – (A) the types of technology used to provide the broadband service capability to which consumers subscribe; (B) the amounts consumers pay per month for such capability; (C) the *actual* data transmission speeds of such capability; (D) the *types of applications* and services consumers most frequently use in conjunction with such capability; (E) for consumers who have declined to subscribe to broadband service capability, the reasons given by such consumers for declining such capability; (F) other sources of broadband service capability which consumers regularly use or on which they rely; and (G) any other information the Commission deems appropriate for such purpose.[85]

Moreover, the FCC also collects data from broadband providers every two years on Form 477, which was recently updated by the Broadband Data Improvement Act and the Recovery Act to provide more granular and precise data to inform policymaking.[86] Thus, the Commission should, after reviewing the information provided in the surveys and in the forms, either affirm its definition of broadband or revise it to remain current with technological and consumer demands. The Commission should also prescribe a time period in which it must complete the review to deter Commission inaction and overlapping reviews. These periodic reviews are necessary to

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[84] 47 USC §157 note.

[85] Broadband Data Improvement Act, Pub. L. No. 110-385, §103, 122 Stat. 4096 (2008).

[86] News Release, *Federal Communications Commission Releases Final Data on High-Speed Services Collected Under the Previous Form 477 Framework*, Jul. 23, 2009.

incentivize ubiquitous broadband deployment, to secure that the U.S. regain its global edge in broadband applications, and to keep pace with the rate of innovation.

Finally, as the Commission updates the definition of broadband, it should continue to gather data on broadband deployment and adoption according to both past and present definitions and thresholds to ensure that progress is accurately measured by policymakers, researchers and the public.

CONCLUSION

Wherefore, the Benton Foundation respectfully requests that the recommendations articulated above be implemented into the Commission's broadband definition.

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