

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 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 GOOGLE INC. – NBP PUBLIC NOTICE #24

Google Inc. (“Google”) hereby responds to the Federal Communication Commission’s (the “Commission”) Public Notice #24, which seeks comment on broadband measurement and consumer transparency of fixed residential and small business services in the United States for purposes of developing the National Broadband Plan (the “NBP”).¹

I. USER ACCESS TO CLEAR AND COMPLETE INFORMATION ABOUT BROADBAND SERVICE OFFERINGS IS ESSENTIAL TO PRESERVING A FREE AND OPEN INTERNET.

Markets rely on information in order to function properly. Transparency systems increasingly are emerging as a mainstream regulatory tool, so that policymakers can

¹ See *A National Broadband Plan for Our Future*, NBP Public Notice #24, DA 09-2474 (Nov. 24, 2009) (“NBP Public Notice #24”). See also *A National Broadband Plan for Our Future*, Notice of Inquiry, 24 FCC Rcd. 4342 (2009) (“NOI”).

Google Inc.

Comments on NBP Public Notice #24

assist in improving the information flows between producers and users. Importantly, transparency also enables accountability, as more information allows agents to be held responsible for their actions.²

Google has long believed that transparency is key to a free and open Internet. As the Commission recently acknowledged, “accurate information plays a vital role in maintaining a well-functioning marketplace that encourages competition, innovation, low prices, and high-quality services.”³ Currently, despite the importance of broadband to our nation, there is a lack of reliable, up-to-date, and readily-accessible information about the broadband service offerings available in the marketplace today.⁴ By their very nature, network management practices occurring within the broadband providers’ physical and logical networks may have effects on application and content performance that are difficult for a user to discern and understand.

For these reasons, Google strongly supports the enactment of an enforceable Internet policy principle requiring transparency from broadband Internet access service providers about their service offerings.⁵ However, for purposes of this proceeding, the

² See generally Richard S. Whitt, *Adaptive Policymaking: Evolving and Applying Emergent Solutions for U.S. Communications Policy*, 61 F.C.L.J. 483, 585-88 (2009).

³ See *In the Matter of Consumer Information and Disclosure; Truth-in-Billing and Billing Format; IP-Enabled Services*, Notice of Inquiry, 24 FCC Rcd 11380, ¶ 5 (2009).

⁴ For instance, very little robust data is available about actual – as opposed to advertised – broadband speeds. See, e.g., BERKMAN CENTER FOR INTERNET & SOCIETY, *NEXT GENERATION CONNECTIVITY: A REVIEW OF BROADBAND INTERNET TRANSITIONS AND POLICY FROM AROUND THE WORLD* 47-58 (Oct. 2009), available at http://cyber.law.harvard.edu/newsroom/broadband_review_draft (reviewing available data in the U.S. and elsewhere).

⁵ *In the Matter of Preserving the Open Internet, Broadband Industry Practices*, Notice of Proposed Rulemaking, GC Dkt. No. 09-191, WC Dkt. No. 07-52, FCC 09-93, ¶¶ 118-132 (rel. Oct. 22, 2009).

Commission must take additional concrete steps to foster the development and adoption of measurement tools and other technologies that ensure the accuracy of service providers' disclosures.

In particular, consumers should have access to clear, accurate, and useful information about broadband Internet access service offerings to understand what they are paying for – and they should get the value that they are expecting. Similarly, applications, service, and content providers, and others doing business over the Internet as users should have access to this information, on which they rely to design and invest in their applications and services. In short, broadband Internet access service providers should be required to provide all current and potential users of their services with sufficient information to enable them to make intelligent decisions about the choices available to them.

II. THE NATIONAL BROADBAND PLAN SHOULD INCLUDE A FOCUS ON GATHERING DATA ABOUT BROADBAND PERFORMANCE.

As discussed in our comments and reply comments on the NBP, and our response to NBP Public Notice #1, Google recommends that the NBP include a focus on gathering timely data and setting metrics regarding broadband performance that cover a range of pertinent factors.⁶ We also have recommended that the NBP include a dynamic, iterative data collection process that can evolve over time.⁷ Both approaches require disclosure of relevant information by broadband providers, as well as broadband measurement.

⁶ Comments of Google Inc., GN Dkt. No. 09-51 (filed June 8, 2009); Reply Comments of Google Inc., GN Dkt. No. 09-51 (filed July 21, 2009); Comments of Google Inc. – NBP Public Notice # 1, GN Dkt. No. 09-51 (filed August 31, 2009).

⁷ Google Inc., *Evolving a National Broadband Plan*, submitted with, *ex parte* letter of Donna N. Lampert, counsel for Google Inc., to Marlene H. Dortch, FCC, GN Dkt. No. 09-51 (filed October 1, 2009).

A. Consumer Transparency Regarding Broadband Services

Broadband service providers should be required to make available clear and conspicuous terms of service that should cover all pertinent terms of their service offerings, including rates, terms, and conditions of service. Should a broadband provider fail to comply with any aspects of their posted statements, they should be held liable for committing fraudulent commercial practices.

Providers should supply information about features, including the speed and availability of service, in clear and conspicuous language. Providers also should provide information about the average and minimum speeds, as well as the average and maximum intra-network latency. These basic service guarantees can help users make informed decisions.

Where network management practices impact the user's experience, the provider should disclose what this impact will be and when the mechanisms will be employed. In particular, consumers should know: (1) what devices, protocols, applications, services, or content are subject to special management techniques; (2) under what circumstances these techniques are applied; and (3) what the intended effects of the applied techniques are, whether or not these effects are ostensibly detectable by the consumer. Disclosures should include information regarding: traffic prioritization; traffic blocking or throttling; processes to address traffic congestion, such as usage download or upload restrictions; any content/message examination processes (e.g., deep packet inspection); and traffic routing processes that are based on sender/receiver, or type of traffic.

In order to facilitate the collection and dissemination of relevant and timely broadband data, Google urges the Commission to require all broadband providers to

begin submitting semiannual reports that provide accurate, timely, and comprehensive data about broadband deployment and uptake. Disclosure of this information to the Commission, which Google believes should be publicly posted on the Commission's website, also would provide all users with a single source to determine a given broadband provider's practices, and would allow for easy comparison of broadband providers' service offerings. As policies and practices change over time, providers should be required to supplement the accuracy of their disclosures with the Commission. Such disclosure would better ensure that, should disputes arise, the Commission possesses information regarding the disclosed practices at issue, and that there is a single policy/practice description at issue, which will ensure better compliance and swifter enforcement, if necessary.

B. Measurement of Broadband Services

Broadband measurement is a necessary, complementary part of improving broadband transparency. The Commission should independently determine the level of service that is actually being delivered to users, and verify data collected from providers' themselves. Measurement can serve other important roles as well, including advancing network research,⁸ and empowering users with ways to diagnose problems with their connections and take steps to address them, to the extent that is within their control.

With this in mind, the Commission should adopt policies that maximize the openness and transparency of its broadband measurement. The Commission should seek

⁸ See kc claffy, "Ten Things Lawyers Should Know About the Internet," (2008), available at http://www.caida.org/publications/papers/2008/lawyers_top_ten/ (discussing key areas where better data is needed, and how it will impact Internet users); Letter from Sascha Meinrath, Director, Open Technology Initiative, New America Foundation, to Marlene H. Dortch, Secretary, FCC, WC Dkt. No. 07-38, GN Dkt. No. 09-51 (July 29, 2009) (articulating key gaps in empirical research).

to enable third-parties to effectively “look under the hood” of the tools and techniques on which the Commission relies, and make collected broadband data widely available and open to re-use. Researchers and others can then independently verify and provide feedback on the Commission’s methods, as well as analyze and build upon the results. In this way, the Commission can foster the development of robust, reliable broadband measurement, which will ultimately influence and enhance the Commission’s own iterative process. The degree of transparency may differ depending on the particular measurement data collected,⁹ but the Commission should initiate a measurement process that is as open as possible.

The Commission should collect data on a range of metrics, including peak and average throughput, upload and download speeds, latency, jitter, diurnal patterns, the impact of network management practices on application and content performance. The Commission also should consider measuring performance of different protocols and applications, e.g. HTTP and VoIP traffic.

Furthermore, the Commission should develop its own measurement efforts as well as building on existing ones. The research community, along with businesses, have long focused on both the challenges and opportunities in this area, and a wide array of network measurement tools already exist that may assist the Commission.

For example, Measurement Lab (M-Lab) is an open, distributed server platform that allows researchers to deploy active measurement tools.¹⁰ Researchers already have deployed tools that allow users to attempt to measure the speed of their connections and

⁹ For example, passively measured data may need to be anonymized first, with limits on appropriate data sharing, in order to protect user privacy.

¹⁰ See M-Lab website, at <http://www.measurementlab.net>.

Google Inc.

Comments on NBP Public Notice #24

available bandwidth; assess latency and jitter; run diagnostics to address common connection problems; discern if their Internet access provider is blocking or throttling particular applications; identify certain forms of traffic shaping; and more. Users can run these tests to learn information about their own connection, and all data are made publicly available and open to re-use. The project is a collaborative effort led by researchers, and resources have been provided by Google, Amazon Web Services, BitTorrent Inc., Voxel, Hellenic Telecommunications and Post Commission (EETT) and the Greek Research and Technology Network (GRnet). EETT, Greece's telecommunications regulator, has announced that it will incorporate M-Lab's tools into the country's broadband mapping efforts, along with providing servers for the platform.¹¹

NBP Public Notice #24 asks for comments on which particular methodologies should be used for measurement. Rather than selecting a single method, Google believes that the Commission should consider the complementary ways in which it can rely on multiple data sources and methodologies. Because there are trade-offs with different techniques, the Commission should seek to combine different measures in order to empower consumers as well as to inform policymaking.

For example, publicly-available, user-initiated Web-based tests can provide helpful information to consumers, but by themselves the resulting data are not adequate to fully understand the state of the broadband market. Because these tests can be designed such that they are relatively easy for users to run – often requiring just a single click – they can facilitate testing across a large number of users and provide indicators of

¹¹ See EETT, *The Broadband Quality Measurements Node (BQMN) is Operational* (Aug. 24, 2009), available at http://www.eett.gr/opencms/opencms/admin_EN/News/news_0111.html.

Google Inc.

Comments on NBP Public Notice #24

actual conditions. However, selection bias and other confounding factors (e.g., other traffic on the user's local network) limit the utility of the aggregate data.

The Commission, therefore, should also incorporate additional options, including software- and hardware-based tests, as well as well-designed customer panels across a representative sample of users. The British telecommunications regulator OFCOM's partnership with SamKnows provides an example of this strategy in action. In 2008, SamKnows carried out a comprehensive study of broadband providers in the United Kingdom, in which it deployed measurement tests embedded in wireless routers to a representative sample of broadband users.¹² The devices performed speed, latency, jitter, and other measurements at regular intervals over the course of six months, and they could control for certain factors that might affect test validity, such as the impact of a user's PC or other users on the broadband connection. The results suggested that average actual speeds were significantly below advertised speeds, and illuminated how certain factors such as access technologies and the level of contention within a network may impact performance.

The Commission also should consider both active and passive measurement techniques. Active measurement involves generating traffic in a pre-determined way in order to measure the results, whereas passive measurement analyzes actual network activity without introducing new traffic into the network. Both types of tools provide

¹² See OFCOM, *UK Broadband Speeds 2009* (July 28, 2009), available at http://www.ofcom.org.uk/research/telecoms/reports/broadband_speeds/broadband_speeds/ (finding that actual broadband speeds are significantly below the advertised headline speeds).

opportunities for the collection and analysis of useful data.¹³

III. CONCLUSION

Google believes that the availability of clear and accurate information about broadband Internet access service offerings is essential for a free and open Internet. Therefore, Google urges the Commission to adopt an enforceable principle of transparency, to require broadband providers to supply consumers, other users, and the Commission with information about their service offerings, and to engage in measurement techniques that will enable the Commission to study the performance of broadband service offerings.

Respectfully submitted,



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¹³ See, e.g., kc claffy, et. al, *Community-Oriented Network Measurement Infrastructure (CONMI) Workshop Report*, ACM SIGCOMM Computer Communication Review, Vol. 36, Issue 2 (Apr. 2006), available at <http://www.caida.org/outreach/papers/2005/conmi/conmi-workshop2005.pdf> (discussing the opportunities and challenges to the development of user-initiated passive and active measurement tools).