

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

In the Matter of)	
)	
International Comparison and Consumer)	GN Docket No. 09-47
Survey Requirements in the Broadband Data)	
Improvement Act)	
)	
A National Broadband Plan for Our Future)	GN Docket No. 09-51
)	
Comment Sought on Defining “Broadband”)	GN Docket No. 09-137

COMMENTS OF SPRINT NEXTEL CORPORATION – NBP Public Notice #1

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EXECUTIVE SUMMARY

In defining broadband, the Commission should focus on the only thing that matters: the end-user experience. The Commission should define “broadband” as an always-on, interactive internet protocol service that permits the rapid transmission of data traffic between any connected points on systems that use a common addressing system. To establish thresholds for this definition, the Commission should use a functional approach that first identifies a “basket” of interactive Internet applications and services and then determines whether the service allows an end-user to meaningfully interact with the basket of applications and services. While modifications to the basket should not occur more frequently than every five years to allow sufficient time for network planning and deployment, the basket of Internet applications and services would evolve over time in response to the changing needs and habits of consumers and businesses.

Focusing on the end-user experience of broadband – as opposed to the intermedial technologies used to deliver it – will permit the Commission to ensure that the definition of broadband is both pragmatic enough to capture existing concepts and dynamic enough to respond to changing needs. The Commission should not exclude mobile Internet connections from the definition of “broadband” even though they may not offer the same raw throughput possible over some fixed connections. Similarly, the Commission should not exclude fixed Internet connections from the definition of “broadband” even though they cannot offer location-based services or seamless, wide-area coverage. By adopting an end-user focused definition of broadband, the Commission can best capture popular sentiment that – whether mobile or fixed – an always-on Internet connection that offers a highly functional experience across a wide variety of core Internet services should be treated as “broadband.”

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I. Introduction.

Sprint Nextel Corporation (“Sprint Nextel”) submits these Comments in response to the Federal Communications Commission’s (“FCC” or “Commission”) August 20, 2009 Public Notice (“*Notice*”) in the above-referenced proceeding.¹ Pursuant to the American Recovery and Reinvestment Act of 2009,² the Commission must submit to Congress a national broadband plan (“Plan”) that seeks to ensure that every American has access to broadband capability. In the *Notice*, the Commission seeks comment on how it should define “broadband” for purposes of the Plan and the Recovery Act and structures the inquiry into: (1) the general form, characteristics, and performance indicators that should be included in a definition of broadband; (2) the thresholds that should be assigned to these performance indicators today; and (3) how the

¹ *Comment Sought on Defining “Broadband” – NBP Public Notice #1*, Public Notice, DA 09-1842 (rel. Aug. 20, 2009) (“*Notice*”).

² American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, 123 Stat. 115 (2009) (“*Recovery Act*”).

definition should be reevaluated over time.³ As discussed below, the Commission should:

- Apply a practical approach to defining broadband;
- Adopt a functional definition of broadband that identifies whether an end-user can substantially and beneficially access a core basket of applications;
- Ensure that the power and value of mobility is reflected explicitly in the definition of broadband;
- Implement thresholds to the extent they support the functional end-user approach; and
- Periodically update the definition of broadband, but allow sufficient time between updates to allow for broadband investment and construction to occur.

II. Form, Characteristics, and Performance Indicators: The Commission Should Adopt a Functional Definition of Broadband Focused on the End-User Experience.

In the *Notice*, the Commission seeks comment on the form that a definition of broadband should take and whether there should be a single definition or multiple definitions.⁴ The *Notice* also seeks comment on a variety of issues related to the key characteristics and performance indicators that should be incorporated into the definition(s) of broadband.⁵ Sprint Nextel respectfully recommends that the Commission adopt a practical approach for defining broadband that focuses on whether an end-user can substantially and beneficially access a specific basket of applications. The definition should also explicitly account for the unique benefits of mobility—a key feature for many broadband users.

A. The Commission Should Adopt a Practical Approach for Defining Broadband.

As the Commission recognizes in the *Notice*, “broadband” is an evolving concept. There are many broadband technologies and distribution platforms, and broadband providers continue to expand and enhance their service offerings in response to technological progress and

³ *Notice* at 2.

⁴ *Id.*

⁵ *Id.* at 2-3.

consumer demand. Mobile wireless broadband services, for example, are very different from the fixed or “static” broadband offered by cable and wireline providers. New broadband technologies are also being developed and designed for specific locations in traditionally underserved markets in rural and remote areas and specialty customers, such as public safety users, enterprise users, and government agencies. Any definition of broadband services must account for these differences.

Using a pragmatic, user-driven framework, the core definition of “broadband” should include the “always-on” immediate accessibility of information to end-users through a common addressing system. For example, broadband services should permit users to access content on, through, or by the Internet as a whole by entering a Uniform Resource Locator (“URL”).

Broadband is more than the mere presence of Internet packet technology. Regardless of the speed or other technical thresholds involved, a broadband service must, at a minimum, permit the interactive transmission of data traffic from end-users between any pair of connected points.

Beyond this core functionality, any attempt to squeeze broadband offerings into a narrow, one-size-fits-all definition for broadband inevitably will fail to recognize the true number of broadband options available in the marketplace and the extent to which these services provide unique solutions for consumers and businesses. Business broadband services, for example, comprise a large portion of all Internet traffic and are critical to increased efficiency within the economy in areas such as healthcare and the environment. Any definition of “broadband” must encompass these business uses, including telecommuting, sales, video conferencing and data transfers that permit end-users or machines to interact with others at high speeds. Therefore, the Commission should proceed thoughtfully as it attempts to define broadband, understanding that a

practical, end-user focused approach with multiple categories, classifications, or definitions may be needed to capture actual consumer needs and experiences more effectively.⁶

A variety of commenters responding to the Commission’s Notice of Inquiry in this proceeding⁷ reinforced the notion that a singular definition of broadband is not ideal for the Plan.⁸ T-Mobile, for example, encourages the Commission to, at a minimum, “adopt different definitions or standards of what constitutes ‘broadband’ based on the technology being used to provide the service or the context in which the service is applied.”⁹ The Rural Cellular Association, General Communication, Inc., and the National Rural Electric Cooperative Association each propose that the Plan define broadband capacity differently for different technologies.¹⁰ PCIA—The Wireless Infrastructure Association and The DAS Forum also champion practical standards.¹¹ Similarly, the National Rural Telecommunications Cooperative

⁶ In fact, the Commission has recognized that the market for broadband services is neither homogenous nor stagnant. *See Development of Nationwide Broadband Data to Evaluate Reasonable and Timely Deployment of Advanced Services to All Americans*, Report and Order and Further Notice of Proposed Rulemaking, 23 FCC Rcd 9691 ¶ 20 n. 66 (2008) (“*Broadband Development R&O*”) (stating that the terms used to classify broadband services “are evolving definitions that could change over time based on advances in technology”).

⁷ *A National Broadband Plan for Our Future*, Notice of Inquiry, 24 FCC Rcd 4342 (2009).

⁸ *See, e.g.*, Comments of Comcast Corporation, GN Docket No. 09-51, 7-14 (filed June 8, 2009) (stating that the Commission should take a flexible and evolving approach to defining access to broadband).

⁹ Comments of T-Mobile USA, Inc., GN Docket No. 09-51, 11-12 (filed June 8, 2009) (“T-Mobile Comments”) (stating that the definition of broadband capability should make “the provision of mobile broadband at flexible and evolving speeds a priority” and should be defined broadly to adjust with changes in technology).

¹⁰ Comments of Rural Cellular Association, GN Docket No. 09-51, 7-8 (filed June 8, 2009) (“RCA Comments”); Comments of General Communication, Inc., GN Docket No. 09-51, 4, 16-17 (filed June 8, 2009) (explaining that the definition of “broadband” should be flexible, should not be a single Mbps-based definition that applies to enterprise, mass market fixed, and mobile broadband, and should identify customized speeds for each market if the Commission determines that that threshold speed requirements are necessary); Comments of the National Rural Electric Cooperative Association, GN Docket No. 09-51, 7 (filed June 8, 2009) (advocating that the definitions should remain flexible so difficult to serve areas are not precluded from receiving service due to a one-size-fits-all definition of threshold speed).

¹¹ Comments of PCIA—The Wireless Infrastructure Association and The DAS Forum, GN Docket No. 09-51, 4 (filed June 8, 2009).

and DigitalBridge Communications Corp. suggest that the Commission’s “concept of broadband might require different definitions and requirements for rural deployments,” and should consider “reliability, sustainability, scalability, upgradability, affordability, and mobility.”¹²

A practical approach to defining broadband will allow the Commission, as it develops the Plan, to account for the unique features and benefits of different technologies used to provide “readily available” broadband service. It also facilitates the Commission’s long-held technological and competitive neutrality goals. As described in the next section, Sprint Nextel has developed a functional definition for broadband focused on the end-user experience.

B. The Commission Should Adopt a Functional Definition of Broadband that Identifies Whether an End-User Can Substantially and Beneficially Access a Core Basket of Applications.

The Commission seeks comment in the *Notice* on how to define broadband generally, including both mobile and fixed broadband services and how such an approach could be expressed in terms of performance indicators.¹³

The Commission’s existing broadband definition focuses too heavily on a single performance criterion – the speed of uplink and downlink connections.¹⁴ Uplink and downlink speeds undoubtedly play a major role in whether an end-user can interact with a wide variety of web-based applications and services. But a continued focus by the Commission on network speeds to the exclusion of other key performance-enhancing measures, such as improved encoding and decoding, improved device performance, enhanced buffering, reduced latency, or more robust backhaul, may lead broadband providers to misallocate resources. If network speed

¹² Joint Comments of the National Rural Telecommunications Cooperative and DigitalBridge Communications Corp., GN Docket No 09-51, 9 (filed June 8, 2009).

¹³ *Notice* at 3.

¹⁴ See *Broadband Development R&O* ¶ 20.

is the only (or predominant) measure of what constitutes “broadband,” then carriers will invest in measures to improve nominal network speeds even when investing in innovations or improvements in network architecture, software, backhaul, or devices could give end-users a demonstrably better broadband experience for the same expense. Thus, an overly narrow emphasis on one (or even a handful) of objective performance criteria could unintentionally lead carriers to over-invest in limited network hardware and under-invest in new technologies or improved coding, thereby curtailing innovation, increasing costs, and stifling new entry in the broadband marketplace.

Therefore, instead of establishing a performance threshold that focuses on only one element of a broadband service (such as speed, which depends on end-to-end performance), the Commission should focus on what people care about: the end-user experience. End-users typically do not know or care about the precise technical specifications of the data service they use, but have an acute interest in whether, functionally speaking, they can access and interact with a variety of Internet content and applications. Similarly, broadband service providers are not typically concerned with the specific upgrades they use to improve the end-user experience, but instead select in a more or less agnostic fashion from among a multitude of network, technical, and device innovations that can most cost effectively enhance the end-user’s experience. Broadband service providers have many tools in their toolboxes to advance the end-user experience, and increasing over-the-air throughput speeds to the end-user is just one of those tools.

By way of example, consider the time necessary to render a graphic-intensive web page on a smart phone. According to one industry analyst, one of the best-selling smart phones in the

world requires 40 seconds to fully render a visually rich webpage.¹⁵ The network data transfer consumes only 8 of those 40 seconds; the computing necessary for the device to convert the data into fully rendered images consumes the other 32 seconds, four times as much time as the network data transfer. These real-world performance observations mean that a 50% increase in network data throughput would prove less meaningful to an end-user than a mere 15% increase in data rendering speed in the device. Therefore, any definition of broadband that the Commission adopts should be flexible enough to recognize that the end-user's total end-to-end experience depends not only on the broadband facilities subject to the FCC's jurisdiction, but also on end-user "CPE" decisions that are typically outside of the FCC's traditional sphere of influence.

To assess end-users' functional expectations in the broadband context, the Commission should identify a basket of interactive applications and services accessible via the core broadband functionality and then determine whether a reference population of American consumers can substantially and beneficially interact with those services on a particular network. "Broadband" would exist whenever the reference population of end-users can substantially and beneficially use this basket of services and applications. The core broadband content for reference testing would consist of a basket of applications and services that would evolve over time in response to the changing needs and habits of consumers and businesses. As an example, at the outset, the basket might logically include always-on, interactive access to seven components: (1) video sites, such as YouTube and Hulu; (2) rich media sites, such as ESPN; (3) music sites, such as Pandora; (4) location-based services, such as TeleNav or Loopt; (5) news

¹⁵ See Jeremy Liew, General Manager, Lightspeed Venture Partners, *Federal Communications Commission Broadband Workshop: Technology, Applications and Devices* (Aug. 27, 2009), available at http://www.broadband.gov/ws_tech_applications.html.

and information sites, such as CNN and the New York Times; (6) social networking sites, such as Facebook or MySpace; and (7) search engines and content aggregation sites, such as Google, Yahoo, or Bing. End-user performance would be assessed based on tests conducted by the carrier pursuant to Commission-specified criteria, or by a third-party testing service.

The performance benchmark for broadband could consist of a composite measurement of the end-user experience across each of the core services. For music streaming, for instance, the relevant benchmark based on end-user assessments might be whether the end-user is able to view or hear the music with adequate quality without delays, gaps, pauses, or jitter. For audio content, end-users would typically experience exceptional audio quality at 256 kbps. For video streaming, end-users may have different expectations based on the typical picture size for devices on the network. Rendering high quality images on personal computers with a typical screen resolution of 1280x800 would be more demanding than rendering images on a smart phone with a typical screen resolution of 320x480. The composite broadband benchmark would identify satisfactory end-user experiences and associate each with performance across a variety of commonly used services and applications. Defining “broadband” in this manner will not only provide a market-neutral incentive to invest in all aspects of broadband service delivery, but also help ensure that the definition of broadband remains functional and experiential enough to stay relevant to consumer needs that will grow more demanding over time.

At the same time, the Commission should not inadvertently exclude existing broadband services that meet the needs of many consumers by adopting performance indicators or thresholds that are tailored towards wireline or other fixed services. Moreover, because mobile wireless broadband services provide many consumer and public interest benefits that are not available from fixed broadband services, the Commission should evaluate mobile and fixed

broadband services using different criteria based on the end-user functional approach outlined above.

C. A Functional, End-User Focused Definition of Broadband Best Reflects the Trade-Offs Between Mobile and Fixed Broadband Connections.

An “always-on” broadband connection is of limited value if no one is around to use it. Mobile broadband services maximize the capability and functionality available to users by delivering the connection to the individual rather than to a specific location. A key characteristic for any mobile broadband service is the ability of the network to provide service to consumers while moving from place to place.¹⁶ Users value mobility highly and, as other commenters have noted, mobile broadband usage is increasing extraordinarily rapidly.¹⁷ Mobile wireless broadband services are also often less expensive to construct, and faster to deploy, to end users than fixed broadband networks are, which means mobile services can be well-suited for deployment in rural, unserved, and underserved areas.¹⁸ Lower construction costs, in turn, often make mobile wireless broadband services to end users more affordable – and more sustainable –

¹⁶ The Commission defines “mobile service” in Part 20 of its rules as a radio communication service carried on between mobile stations or receivers and land stations, and by mobile stations communicating among themselves, and includes: (a) both one-way and two-way radio communications services; (b) a mobile service which provides a regularly interacting group of base, mobile, portable, and associated control and relay stations (whether licensed on an individual, cooperative, or multiple basis) for private one-way or two-way land mobile radio communications by eligible users over designated areas of operation; and (c) any service for which a license is required in a personal communications service under Part 24. 47 C.F.R. § 20.3. It also defines “mobile service” in Part 27 of its rules as a “radio communication service between mobile and land stations, or between mobile stations.” 47 C.F.R. § 27.4.

¹⁷ See, e.g., Comments of CTIA—The Wireless Association, GN Docket No. 09-51, 6-8 (filed June 8, 2009); Comments of the Wireless Communications Association International, Inc., GN Docket No. 09-51, 14-15 (filed June 8, 2009) (“WCA Comments”).

¹⁸ See Comments of Sprint Nextel Corporation, GN Docket No 09-51, 5 (filed June 8, 2009); see also WCA Comments at 12; RCA Comments at 9.

than fixed broadband services offered by wireline and cable providers.¹⁹ As the Commission has noted, mobile networks “[c]an offer cost-effective connectivity where no broadband exists, as well as complementary or competitive service where it does.”²⁰

At the same time, both fixed and mobile broadband connections have their role in the broadband marketplace. No one expects fixed or static broadband connections to offer the seamless, wide-area mobility of 3G and 4G broadband networks. And few would anticipate that mobile broadband connections would offer the same raw throughput as the fastest fixed broadband connections can. For this reason, the Commission should no more treat fixed Internet connections as something less than “broadband” because they cannot offer location-based services or seamless, wide-area coverage than it should disqualify mobile Internet connections as something less than “broadband” because they do not offer the same raw throughput achievable over a fixed connection. Adopting a functional, end-user focused definition of broadband best realizes popular sentiment that – whether mobile or fixed – an always-on Internet connection that offers a highly functional experience across a wide variety of core Internet services should be treated as “broadband.”

III. Thresholds: The Definition of Broadband Should Remain Focused on the End-User Experience.

In the *Notice*, the Commission seeks comment on acceptable thresholds for the key characteristics and performance indicators of broadband services.²¹ Broadband technologies continue to advance rapidly, and the specific performance features of a particular service vary

¹⁹ Acting Chairman Michael J. Copps, *Bringing Broadband to Rural America: Report on a Rural Broadband Strategy* ¶ 142 (rel. May 22, 2009) (“Rural Broadband Report”), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-291012A1.pdf; T-Mobile Comments at 6-7.

²⁰ Rural Broadband Report ¶ 142.

²¹ *Notice* at 3.

from network to network. As noted above, the focus of the Commission’s inquiry should be on whether an end-user can substantially and beneficially use the evolving basket of broadband content.

Separate from and in addition to this functional approach, the Commission could establish safe harbors using performance thresholds. It also could “prequalify” certain technologies based on the technology specifications (analogous to device certification). If the Commission adopts safe harbors and prequalification processes, however, service providers that meet the functional test would still be deemed to be providing “broadband” even if they do not meet the safe harbor or prequalification standards.

IV. Updates: The Commission Should Update the Definition of Broadband Periodically to Reflect Changing Consumer Needs, but It Should Do So No More Frequently Than Every Five Years.

The strength of a functional approach to defining broadband through a basket of applications – and, indeed, its usefulness as an assessment tool – lies in the Commission’s ability to update the basket of applications in response to application innovations and changing consumer demands. Updates to the composite benchmark should occur at periodic intervals, no more frequently than every five years, so that any change to the availability, scope, and deployment of “broadband” can occur gradually over time. An overly dynamic definition of broadband, with updates occurring more frequently, would make investment difficult to manage and could lead to wild swings in the reported availability of broadband services.

V. Conclusion.

For the foregoing reasons, the Commission should adopt a practical approach to defining broadband that recognizes and promotes mobility. It also should adopt a functional definition of

broadband based on whether an end-user can substantially and beneficially access a core basket of applications and ensure that any thresholds support the functional end-user approach. Finally, it should update the definition of broadband periodically, but no more frequently than every five years to allow time for investment, construction and planning.

Respectfully submitted,

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