Before the
Federal Communications Commission
Washington, D.C. 20554

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

COMMENTS OF WINDSTREAM COMMUNICATIONS, INC. – NBP PUBLIC NOTICE #1

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COMMENTS OF WINDSTREAM COMMUNICATIONS, INC.

Windstream Communications, Inc., on behalf of itself and its affiliates (collectively "Windstream"), submits the following comments in response to the Federal Communications Commission ("Commission") request for comment on defining "broadband."[1] As the largest broadband provider focused on serving primarily rural areas, Windstream enthusiastically supports the goals of expanding broadband access to unserved consumers and increasing broadband adoption rates in rural areas. Now more than one million of Windstream's three

[1] *Comment Sought on Defining Broadband*, GN Dockets No. 09-47, 09-51, 09-137, Notice of Inquiry (rel. Apr. 8, 2009).

million voice customers subscribe to its broadband service, with customers typically able to purchase offerings at 3 Mbps downstream or higher (up to 12 Mbps downstream in some areas).[2] Windstream and other private sector broadband providers have demonstrated their shared commitment to broadband deployment by spending, in aggregate, tens of billions of dollars annually to connect much of the Nation to broadband services.[3]

To better assess these marketplace developments, Windstream recommends that the Commission transition from defining and measuring "broadband" based on advertised peak speeds, to defining and measuring "broadband" based on average throughput speeds available to an end user during the most common utilization periods. A successful transition will require industry experts with relevant engineering knowledge and experience to work together to develop a uniform methodology that can be readily implemented – a process that should be should be launched by the Commission in the near term, and addressed in the Commission's National Broadband Plan recommendations. Average throughput data, when based on the common methodology, will be useful information for consumers seeking to compare one broadband provider's offerings to another's.

Updates to the definition of basic broadband, however, should not impact the Commission's determination of standards for broadband service deployed with government support. Performance standards for receipt of public funds should not be defined by the bare minimum of what service qualifies as broadband. Instead, these projects should be required to

[2] Speeds listed indicate downstream offerings provisioned as advertised.

[3] Windstream has devoted hundreds of millions of dollars to deploy broadband to 88 percent of its voice customers. *See also* Fawn Johnson, *Obama Official: Rural Networks Key To Internet Buildout*, WALL ST. J., Apr. 29, 2009 (citing USTelecom data indicating that private technology companies have invested an average of $68 billion annually over the last several years in landline and wireless networks); Press Release, Leichtman Research Group, 5.4 Million Added to Broadband from Top Cable and Telephone Companies in 2008 at 1 (Mar. 6, 2009) (reporting that the 20 largest cable and telephone providers now offer high-speed service to nearly 67.7 million subscribers).

produce speeds that provide meaningful online functionality now and in the foreseeable the future. In particular, these projects should be capable of supporting speeds needed to achieve policymakers' goals of ensuring, for example, students can engage in distance learning, small business owners can host web sites, and employees can telecommute from their homes.[4]

To facilitate review by Commission officials, Windstream's comments below adhere to the organization and structure of issues raised in the Public Notice.[5]

1. **Form, Characteristics, and Performance Indicators**.

[4] *See, e.g.*, Remarks of Chairman Julius Genachowski to the Staff of the Federal Communications Commission (Jun. 30, 2009) (transcript available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-291834A1.pdf) ("If we do our jobs right and harness the power of communications to confront these challenges, we will have chosen the right course, and we will make a real positive difference in the lives of our children and future generations. Just imagine: A small business in Gettysburg will be able to connect and compete with businesses in Pittsburgh, or even Johannesburg. An elderly person in Georgia will be able get remote medical monitoring from a specialist at Georgetown, better health care at lower cost. A struggling eighth grader in Columbia, South Carolina will be able to get tutoring from a student at Columbia University. And parents in Baltimore will be able to connect with live video to their son or daughter serving in Baghdad or Afghanistan."); U.S. Congressman Rick Boucher, Remarks at Ewing Fiber Optic Project Lighting Event (May 18, 2009) ("Just as first canals, then railroads and then highways were the major arteries of commerce in earlier eras, in the 21st Century, access to broadband will be a defining feature of economic success for rural communities.") (transcript available at http://www.boucher.house.gov/index.php?option=com_content&task=view&id=1680&Itemid=77); Press Release, U.S. Senator Jay Rockefeller, Rockefeller Announces Billions for Broadband in Senate Stimulus Bill (Jan. 28, 2009) ("Broadband access links people to so many possibilities. It helps small businesses grow, creates jobs, helps our students learn, and improves access to health care. It is imperative that we expand this critical technology infrastructure to all parts of the United States. Broadband expansion will boost economic activity nationwide, and it would help ensure that communities across West Virginia have the technology – and the opportunities – they deserve.") (transcript available at http://rockefeller.senate.gov/press/record.cfm?id=307430); ACTING CHAIRMAN MICHAEL J. COPPS, FEDERAL COMMUNICATIONS COMMISSION, BRINGING BROADBAND TO RURAL AMERICA: REPORT ON A RURAL BROADBAND STRATEGY (May 22, 2009) at ¶ 9 (articulating the goal "that all rural Americans, like their counterparts in more densely populated areas of the country, have the opportunity to reap the full benefits of broadband services"); U.S. President-Elect Barack Obama, Remarks at George Mason University (Jan. 8, 2009) ("To build an economy that can lead us to this future . . . means expanding broadband lines across America so that a small business in a rural town can connect and compete with their counterparts anywhere in the world.") (transcript available at http://change.gov/newsroom/entry/president-elect_obama_speaks_on_the_need_for_urgent_action_on_an_american_r/); THE 2008 DEMOCRATIC NATIONAL PLATFORM: RENEWING AMERICA'S PROMISE at 22 (Aug. 25, 2008) ("We will implement a national broadband strategy (especially in rural areas, and our reservations and territories) that enables every American household, school, library, and hospital to connect to a world-class communications infrastructure. We will rededicate our nation to ensuring that all Americans have access to broadband and the skills to use it effectively.").

[5] Windstream uses bold text to highlight questions it is answering, and italics when it declines to provide a response.

a. the form that a definition of broadband should take;

The definition of broadband should demarcate the minimum threshold for what qualifies as broadband service. This definition should be based on measurements that (i) best reflect average users' online experience while on a broadband provider's network and (ii) enable ready comparisons across various technological platforms.

In any event, it would be inappropriate to rely on the definition of broadband to establish performance standards for broadband deployment supported by federal funds. Such performance standards should not be defined by the minimum level of functionality needed to qualify for designation as "broadband." Instead, federally supported projects should be required to produce speeds that provide consumers meaningful online functionality both now and in the future. In particular, these projects should be capable of providing capacity needed to achieve policymakers' goals of ensuring, for example, students can engage in distance learning, small business owners can host web sites, and employees can telecommute from their homes.[6]

b. whether to develop a single definition, or multiple definitions;

One definition of "broadband" should apply uniformly across all technologies. Relying on a single definition will permit objective comparison of functionality offered to consumers by a given broadband provider, regardless of the technological platform on which its service relies. In contrast, adopting technology-specific definitions would complicate cross-sector assessments. Developing technology-specific definitions also could be tantamount to picking winners and losers in the marketplace, which would be inconsistent with American Recovery and

[6] *See supra* note 4.

Reinvestment Act language that calls for federal policymakers to implement broadband programs in a "technologically neutral manner."[7]

c. whether an application-based approach to defining broadband would work, and how such an approach could be expressed in terms of performance indicators;

While application requirements may factor into how broadband is measured, the Commission should not designate a specific definition of broadband as the "minimum threshold" needed for use of a specific application. Minimum speeds required for particular applications are changing with development of new compression technologies and advances in encoding algorithms. An application-specific "minimum threshold," therefore, would become outdated as these developments alter bandwidth needs over time.

With respect to voice service in particular, the Commission should not presume that *interconnected* Voice over Internet Protocol ("VoIP") service is readily available just because broadband can support *some form* of VoIP service. First, replacing a working public switched telephone network ("PSTN") with a new interconnected VOIP service would require considerable expense for many providers. To deploy a new interconnected VoIP service, a telecommunications carrier would need to make broadband available to 100 percent of its customers. Most broadband networks today, however, are not engineered to support 100 percent subscription rates, and the cost of deploying broadband for interconnected VoIP would be far more significant than the cost of deploying broadband at reasonably expected demand rates,

[7] American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, 123 Stat. 115 (2009) at § 6001(e)(1)(C).

requiring additional public support.[8] Second, interconnected VoIP service offers the same basic functionality as PSTN service. It would not make business or policy sense to require carriers to replace a working PSTN service with a new technology that performs the same function from the consumer's perspective.

d. the key characteristics and specific performance indicators that should be used to define broadband;

The most important performance indicator is the average throughput speed. At a minimum, any reform to how the FCC approaches the definition of broadband should, therefore, address average throughput speeds available to a broadband user during the most common utilization hours. Data based on these average throughput speeds would help consumers better compare one broadband provider's offerings to another's.

To ensure meaningful provider-by-provider and sector-by-sector comparisons, the Commission should designate an industry working group of technical experts to develop a detailed, common methodology for measuring average throughput speeds. Broadband providers likely have differences in how they currently assess network performance. Thus, it is important

[8] *See* Letter from Eric Einhorn, Windstream, to Marlene H. Dortch, Secretary, FCC, CC Docket Nos. 96-45 and 01-92; WC Docket Nos. 99-68, 05-337, 06-122, 07-135, and 08-152 (Oct. 27, 2008) at 3 ("Consistent with common practice for mid-sized price cap carriers, Windstream installs broadband ports sufficient to support the percentage of its customers forecasted to subscribe to its broadband service (as opposed to competitive cable, wireless, satellite, or other broadband service offerings) in the reasonably foreseeable future. This practice sufficiently meets Windstream customers' broadband demands. The use of softswitch technology for voice traffic, however, would require all voice lines to be supported by broadband ports. Thus, in areas where it already offers broadband, Windstream would need to augment existing broadband facilities with additional DSLAMs and other equipment. These upgrades likely would cause Windstream to spend about the same amount to deploy additional broadband facilities to its remaining access lines as it did for existing broadband-capable access lines – or in the aggregate, hundreds of millions of dollars.").

to bring technical experts into a room together so they can agree to a workable, common methodology for assessing average throughput available during heavy utilization hours.

Development of this uniform methodology should be guided by general parameters adopted by the Commission. In particular, the Commission should ensure the methodology will produce data reflective of user experience by considering the following:

- Source of measurement: The assessment should be based on historical data collected directly from broadband networks. Such data provide the best, most direct source of average utilization statistics. In contrast, speed assessments based on records external to the network (e.g., drive test data for wireless networks) can be unreliable and manipulated.

- Segment measured: One end point of the segment should be the broadband end user (as described below). The other end point should fall somewhere *internal* to the broadband provider's network – e.g., as close as possible to the point where the provider's network connects to the Internet. This approach is tailored to factors under a broadband provider's control. If segments outside of a broadband provider's network are considered, assessments might unduly reflect bottlenecks outside of the provider's network – and produce results that suggest the provider is offering speeds slower than what is actually the case.

- The measurement should reflect actual throughput experienced by end users, excluding capacity dedicated to network overhead.

- Time measured: Engineers base their network designs around peak utilization periods so they are sufficiently confident that their network designs can consistently support use throughout the day. Likewise, the FCC's assessment should focus on times when customers are likely to use the network; otherwise, "average throughput speeds" may be distorted by data produced at odd hours (e.g., 3-4 AM) that are unlikely to reflect an average user's online experience. To ensure appropriate time measurements, the Commission, for example, could ask that assessments be based upon the busiest hour for each calendar day. The Commission could account for outliers in such data (e.g., spike in traffic due to a significant national news event) by disregarding data that are more than three standard deviations above or below the average value.

- Measurement on an End User Basis: Measuring throughput available on an individual line basis may be administratively prohibitive. To address this issue, speeds available to a group of end users, as measured in aggregate at the closest access link, should be divided by number of users who are online and actively supported by the link to determine average throughput available to an end user during the specific time period at issue. If a broadband provider markets broadband offerings in separate speed tiers, this assessment should be conducted for separate tiers of service offered. Outlier data should be disregarded (as described above for time measured).

The Commission also should publish the working group's proposed methodology for public comment and review prior to adoption. This measure would give technical experts who do not participate in the working group generally, or in development of the methodology for a particular technology specifically, an opportunity to assess and weigh in on whether alternations

are needed. The Commission then would be the final arbiter of whether the proposed methodology provides an accurate reflection of consumers' experiences, and would produce data that are comparable across various technological platforms.

Once a common methodology is adopted by the Commission, broadband providers would need a significant transition time to either upgrade or install systems needed to measure average throughput, pursuant to the methodology adopted by the Commission.

e. what segment(s) of the network each performance indicator should measure, such as the local access link to the end user, or an end-to-end path;

See (1)(d).

f. how factors such as latency, jitter, traffic loading, diurnal patterns, reliability, and mobility should specifically be taken into account;

g. whether different performance indicators or definitions should be developed based on technological or other distinctions, such as mobility or the provision of the service over a wired or wireless network;

A single sufficiently robust definition of "broadband" should apply uniformly across all technologies. See (1)(b).

h. the feasibility and verifiability of measuring different performance indicators.

Verification could be provided by requiring all broadband providers to offer a publicly available speed test on their website, pursuant to methodology developed as specified in 1(d).

Windstream already offers this sort of speed test on its website (http://speedtest.windstream.net). Many broadband providers likely have similar tests in place, so they can provide ready facts in response consumer concerns. Such concerns may stem from third party tests that, in part, are based upon network segment conditions outside of the broadband provider's control.

2. Thresholds.

a. what minimum thresholds should be assigned to the performance indicators;

After a uniform average throughput methodology is developed, the Commission should set the minimum threshold for "basic broadband tier 1" at an *average throughput* speed of 768 Kbps downstream (measured pursuant to the methodology described in 1(d)). 768 Kbps would continue to demarcate the low end of the range of services defined as "basic broadband tier 1." But as explained above, the methodology for defining this minimum standard should be modified to enable sharper comparisons of functionality offered by various broadband providers.

b. the minimum thresholds necessary for broad classes of applications to function properly;

Not applicable. As explained in 1(c) above, the Commission should not attempt to designate "minimum thresholds" needed for a class of applications to function properly.

c. whether we should adopt multiple, escalating tiers of minimum thresholds.

The Commission should adopt new reporting tiers based on average throughput, rather than advertised peak speeds. For consistency with the prior reporting regime, the numerical levels assigned to the new downstream minimum thresholds should correspond to levels

currently used under the Commission's Form 477 reporting regime (i.e., 768 Kbps, 1.5 Mbps, 3 Mbps, 6 Mbps, 10 Mbps, 25 Mbps, 100 Mbps). These new, escalating thresholds will allow the Commission to better track broadband deployment, and may serve as a basis for robust performance requirements and scoring criteria developed for publicly funded broadband deployment projects.

3. <u>Updates.</u>

a. what ongoing process should be put in place to update the definition, particularly the threshold levels;

The Commission should periodically ask the industry working group (proposed in 1(d)) to evaluate whether there is a better way to assess average throughput. Modifications may be preferred, if not required, due to changes to equipment and advances in technology.

Speed tiers also may need to be updated to keep pace with innovations in applications. For example, in the future, there may be a meaningful difference between a user's online functionality at downstream speeds of 25 Mbps versus 100 Mbps, so the Commission at some point may want to establish a new reporting tier to account for that distinction in user experience.

b. how often should such updates should occur;

c. what criteria should be used to adjust thresholds over time;

d. how modifications over time to the definition will affect the Commission's ability to collect and publish meaningful data on broadband deployment and adoption.

Conclusion

Windstream encourages the Commission to reform the definition of "broadband" to better reflect the average user's online experience. In particular, Windstream recommends that the Commission transition to a new regime where measurements and a single definition of broadband focus on average throughput speeds. Such speeds should be assessed in a uniform manner that considers average throughput available to an end user during the most common utilization periods. Performance standards for broadband deployment projects, likewise, should be based upon average throughput speeds (under the uniform methodology), but in no event should these performance standards be set at the minimum level needed for a service to qualify as "broadband." Projects using public funds should be capable of supporting speeds that will offer consumers significant online functionality now and in the foreseeable the future.

Respectfully submitted,

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