

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

In the Matter of	)	
	)	
Comment Sought on Residential Fixed	)	CG Docket No. 09-158
Broadband Services Testing and	)	CC Docket No. 98-170
Measurement Solution	)	WC Docket No. 04-36

**COMMENTS OF VERIZON – CONSUMER INFORMATION AND  
DISCLOSURE PN, DA 10-670**

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Verizon is a strong proponent of informed consumer choice and of providing consumers with the information they need about wireline broadband services in order to make those choices. Developing a solution that accurately measures broadband performance, produces comparable data across different broadband platforms, and presents results in a fair and meaningful way for consumers is a complex task. As Verizon and others have previously explained, the successful completion of that task can benefit from the technical expertise that resides in the industry. As such, the Commission has taken the correct approach in seeking input on SamKnows' proposed testing methodology.<sup>1</sup>

Along those same lines, Verizon is encouraged that the Commission has suggested that SamKnows reach out to broadband providers. Because of the importance of understanding the unique characteristics of varying network architectures and technologies and to help identify unforeseen technical issues that might affect the test results, it is critical that SamKnows engages providers. Conducting this due diligence would not unduly delay the commencement of the tests and would enhance the validity of the testing methods and results.

The high-level summary of the proposed methodology set out in the *Notice* is a promising start to the process. With certain adjustments, the proposal makes sense as an initial step toward developing an appropriate testing methodology. Given the proposal's limited scope (with a sample of only 10,000 users) and the numerous, highly complex issues that are not addressed in the *Notice*, this phase of the project should be aimed at

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<sup>1</sup> See *Comment Sought on Residential Fixed Broadband Services Testing and Measurement Solution*, Public Notice, CG Docket No. 09-158, CC Docket No. 98-170, WC Docket No. 04-36; DA 10-670 (April 20, 2010) ("*Notice*").

finalizing the methodology for larger scale tests or proving in the concept of the appropriate testing methodology. However, the proposed test set forth in the *Notice* would not yield sufficient data to draw or publish statistically valid conclusions regarding provider-specific performance for the broadband population at large.

Based on the description of the proposal in the *Notice*, Verizon has identified certain issues and offers various suggestions pertaining to the proposed selection of test participants, the method for collection of data, and the presentation of results that should be resolved with input from providers and relevant academic professionals before SamKnows begins testing. Specifically, to ensure that the results are statistically valid, SamKnows should make certain that the test participants reflect (to the extent possible with the limited size of the test panel) the broadband user population in key respects, such as technical issues like local loop length (for DSL) and more subjective issues like satisfaction with a broadband provider. Second, the tests should control for various factors that could influence the test results, including the file sizes to be used for testing, the locations to which tests for websites will be run, and the effect of other in-home Internet traffic. Third, the reporting of test results should fairly portray service performance across technology platforms and be meaningful to consumers, including ensuring that any measurements that include public Internet performance are not attributed to specific providers that do not control all of the network segments tested. In addition, in order to ensure the accuracy of the results, the Commission and SamKnows should disclose provider-specific results to each provider before such data is made available to the general public. Fourth, SamKnows should implement its tests in a manner that does not interfere with the effective operation of tested broadband networks.

The number and extent of these issues demonstrate the complexity of developing accurate, comparable data for different broadband technologies and platforms. After this first phase of testing is completed, SamKnows should analyze the results and consult with the Commission and providers to determine what, if any, changes should be made to the methodology before expanding the testing to more consumers and attempting to draw more granular conclusions. Because any reported data would have an immediate impact on the highly competitive marketplace for broadband services and infrastructure investment, it is essential that the *Notice*'s proposed methodology be just the initial step in an iterative process to obtain the most fair and meaningful data.

**I. Metrics Should Be Obtained From an Unbiased, Representative Sample of Broadband Users.**

The proposed methodology correctly posits selecting a panel “that is representative of the ‘broadband population’ in terms of technology, geography and service level.”<sup>2</sup> The *Notice*, however, does not indicate how SamKnows will account for important attributes of the broadband population, such as distance from the serving location (in the case of DSL), level of satisfaction with broadband service, and any other factors that may bear on whether the panel of volunteers is properly reflective of the broader subscriber base. For example, DSL users who are further from the central office or remote terminal may be likely to see slower speeds. While it is not clear from the *Notice* how SamKnows intends to address this potential for bias, SamKnows should

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<sup>2</sup> *Id.* at 2.

select panelists whose distance from the central office (or other serving location) reflects the distribution present in the broader population.<sup>3</sup>

In addition, SamKnows' test panel should be comprised of end users whose satisfaction with their broadband performance mirrors the general broadband user population. If satisfaction levels are not part of the selection criteria, a strong negative bias could contaminate any test results. There is likely to be a linkage between a dissatisfied customer and the customer's broadband performance. Dissatisfied customers may be connected through the same network infrastructure as other dissatisfied customers; may have unique usage patterns that stretch the limits of their broadband service; might generally be found on more distant network segments (e.g., longer DSL loops); and may be more vocal about recruiting their friends and neighbors to participate in the study, thus exacerbating the potential network, usage, or location effects.

SamKnows' proposed recruitment strategy entails attracting volunteers through "a media campaign using social and traditional media, such as consumer and technology press, alongside Twitter and independent bloggers and opinion formers."<sup>4</sup> Yet these same media have likely previously reported or would concurrently report the Commission's oft-stated conclusion that a considerable gap exists between actual and advertised performance – the accuracy of which has recently been called into question.<sup>5</sup> Thus, these media may be particularly attractive to technologically savvy users that may

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<sup>3</sup> The *Notice* suggests that SamKnows will obtain "straight-line distance from exchange" for all panelists. *Id.* at 6. Because straight-line distance would not reliably reflect the true distance, the best source of this information may be the provider.

<sup>4</sup> *Id.* at 2.

<sup>5</sup> See Ex Parte Letter from Neal M. Goldberg, NCTA, to Joel Gurin, FCC, *National Broadband Plan*, GN 09-51; *Consumer Information and Disclosure*, CG 09-158 (March 26, 2010).

be unhappy with their broadband performance and wish to prove the Commission right. To attract an unbiased sample of broadband users, the press, blog, and Twitter content that accompanies the solicitations of volunteers should be completely objective and not suggest that broadband performance falls short of what broadband providers advertise. And to further limit the possibility of negative bias among test participants, any websites that link to these registration websites should meet those same requirements.

To address this potential for bias, SamKnows could instead obtain its panel of test subjects from research companies, such as National Family Opinion and Nielsen, that have already formed geographically and demographically balanced panels of broadband users, rather than seeking volunteers through the media with the attendant risk of negative bias. Depending on the criteria used to construct the panel, it may still be necessary for SamKnows or the research company providing the panel to further screen the potential test candidates for satisfaction levels as described above. That said, the risk of a negative bias is far lower for panel members provided by a research company than for volunteers recruited via social and traditional media.<sup>6</sup>

Alternatively, SamKnows could survey the volunteers' level of satisfaction with their broadband provider's performance on the short form that it intends to use to qualify volunteers to participate in the first test panel. Although SamKnows' proposal anticipates collecting this information from its panelists *after* the test subjects are chosen, it should be done *before*. SamKnows could then compare the reported levels of satisfaction among the survey respondents to the levels of satisfaction previously

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<sup>6</sup> Moreover, SamKnows or the research company could further screen the panel before beginning testing if there are reasonable concerns that certain demographics would be less likely to complete the tests.

documented by independent market research firms with respect to broadband users generally, and use that information to help select a representative panel of volunteers. Broadband users' general satisfaction with broadband service is periodically reported by a number of research entities, including PCMag.com and J.D. Power and Associates.<sup>7</sup> Furthermore, SamKnows could acquire user satisfaction information through its own appropriately designed survey of broadband users. Such a survey could be undertaken for a reasonable cost and would not materially delay the start of performance testing.

Regardless of how SamKnows acquires the panel, to help ensure that the final test panel is sufficiently representative of the broadband population, SamKnows should have an independent statistician review and approve the test panel before actual testing begins. Doing so would allow SamKnows to confirm that its sample is as representative as possible, thus affording the project greater credibility from the outset.

## **II. The Performance Tests Should Control for Certain Factors That May Skew the Results and Produce Data That Fairly Reflects the Performance of Specific Networks and Technologies.**

The *Notice*'s description of the proposed data collection methodology does not address certain technical aspects of the proposed testing, the details of which are essential to ensuring the validity and usefulness of the resulting data.

For example, the *Notice* does not indicate how SamKnows will ensure that end users' distances from the test servers will be accounted for such that no provider would be disadvantaged by a test server far from its customer base. Longer distances exert a negative influence on latency and other statistics.

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<sup>7</sup> See, e.g., PCMag.com, "Methodology for PCMag 2009 Service & Reliability Survey," <http://www.pcmag.com/article2/0,2817,2352797,00.asp> (Sept. 15, 2009), (reflecting an overall consumer rating of ISPs of 7.4 out of 10).

Nor does the *Notice* state the size of the files that would be used for the various tests. File size is important because different networks and technologies may have been optimized for specific types of usage and thus benefit from test protocols that happen to play to their strengths, but not their weaknesses. For example, speed tests based on a 1Mb file may be insufficient to truly elucidate differences between particular technologies or the performance of high-speed tiers. On the other hand, using a 50Mb file may load unnecessary traffic on network segments, particularly if multiple test panelists run such tests over the same outside-plant network segment during peak busy hour.

In the same vein, it is unclear how SamKnows will account for factors that may have a disproportionate effect on throughput speeds derived from smaller file transfers;<sup>8</sup> whether the tests will support multiple simultaneous TCP streams, which can affect results for high-bandwidth services; and whether SamKnows will optimize its “whitebox” using procedures providers recommend that their subscribers follow to ensure optimal performance for higher speed-tier services.

In those instances where the *Notice* does touch on how SamKnows intends to address specific issues that would impact the tests, the *Notice* does not provide enough detail to discern whether such measures would be sufficient. For instance, competing uses of the broadband service at the time of the performance tests would negatively skew the results. Tests should not be run – or if they are run, not be included in the reported results – at the same time that a test customer is using his or her broadband service. The

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<sup>8</sup> One such factor is TCP slow start, which is part of the congestion control strategy used by TCP, the data transmission protocol used by many Internet applications. Slow-start is used in conjunction with other algorithms to avoid sending more data than the network is capable of transmitting.

*Notice* acknowledges this, but does not describe how SamKnows will ascertain customer usage through non-computer devices, such as set-top boxes or other in-home network-connected devices that may access Internet content through applications, such as widgets, interactive video guide, or video-on-demand.

In addition, because the proposed tests involve testing to and including the public Internet, providers control only a sub-segment of the overall network segments tested. Understanding the mechanisms by which SamKnows intends to account for and eliminate the impact of upstream public Internet activity from any provider-specific results is essential to understanding what type of conclusions can be drawn from the test results, as well as whether the data can be fairly published or provides meaningful information to consumers.

### **III. Test Data Should Be Analyzed Accurately and Presented Clearly So That It Is Meaningful to Consumers.**

The *Notice* provides little detail with respect to how the data will be analyzed and what metrics SamKnows or the Commission will ultimately disclose to end users. It is important that SamKnows correctly analyzes the test results and presents them in a manner that best meets the needs of consumers, without deluging them with data.

For instance, the *Notice* does not indicate how throughput would be presented to consumers. Throughput should be reported based on the 90% and 50% intervals. In other words, 90% (or 50%) of the time, the tests showed a speed of  $x$  or greater. Unlike an average, these measures take into account variability and consistency of performance and better reflect the overall customer experience. By contrast, a measure, such as the average, that might be unduly influenced by a few outlying high-speed test results may not fairly portray the typical performance of the network or service. Such results could

be detrimental to consumers, who may end up relying on such information which, although technically accurate, may in fact be misleading for that particular consumer's purposes. Such results could also harm the service provider and its ability to competitively market its service.

Similarly, the *Notice* says nothing about how technical measures like latency and jitter might be disclosed or explained to consumers. It is unclear whether it would be useful to consumers to have granular information about differences in latency, which is usually measured in milliseconds. A star-rating system or other means of data presentation might be more useful to consumers.

Moreover, the *Notice* appears to contemplate that throughput and other measurements would be reported by service tier. To accomplish this, a common definition of "advertised speed" is necessary. The "advertised speed" is defined by some providers as the maximum throughput that a customer can achieve. By contrast, other providers allow the "advertised speed" to be exceeded for certain-sized downloads and uploads via "speed burst," and customers may make purchase decisions in contemplation of getting more than the advertised speed tier in light of marketing claims around the effect of the "speed burst" feature. Although testing could be done in the meantime, the ultimate development of comparable metrics across providers, technologies, and speed tiers requires grappling with the issues presented by diverse marketing and network provisioning activities.

To the extent that advertised speed tier is relevant to the published statistics, SamKnows must have reliable information regarding the advertised speed subscribed to by each testing participant. The *Notice's* methodology proposes asking participants to

self-report this information, with verification being provided by a single web-based speed test.<sup>9</sup> However, self-reporting is notoriously inaccurate as consumers may not know their advertised speed and simply guess or refuse to answer. And a single web-based speed test is not sufficiently reliable to verify a user's recollection. Instead, because this information is so critical to the performance analysis, SamKnows may need to obtain this information directly from the service provider for each panelist. SamKnows can develop a process to obtain this information from providers while concealing the identity of actual test participants to eliminate any risk of providers optimizing the performance of test subjects, and thereby gaming the system.

Finally, as indicated above, this initial phase of testing is insufficient to draw statistically valid provider-specific conclusions about performance. With respect to any other analyses or conclusions, before SamKnows reports any test results or analyses, the results and analyses should be approved by an independent statistician.

In addition, providers should be allowed to review the data and any corresponding analyses of that data sufficiently in advance of when SamKnows makes the data available to the public. This would enable providers to work with SamKnows to identify and correct any abnormalities that may exist in the data.<sup>10</sup> A significant risk of irreparable harm to a provider's reputation exists if the data reported is inaccurate and distorts network performance. This risk would be minimized by permitting providers an opportunity to review such data. In the event a disagreement relating to the data or the analyses arises, the Commission could play a role in mediating the dispute.

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<sup>9</sup> *Notice at 2.*

<sup>10</sup> Providers could be required to agree not to use any information provided by SamKnows for marketing purposes unless or until such information is made public by SamKnows or the Commission.

#### **IV. Tests Must Be Conducted So That They Do Not Interfere with Providers' Operations.**

Although not addressed in the *Notice*, SamKnows should implement its tests in a manner that does not interfere with the performance of the tested broadband networks and that introduces the minimum amount of traffic necessary to obtain valid results. The *Notice* names the applications that SamKnows will test, but provides little detail on the size or other characteristics of the applications.<sup>11</sup> Because testing these applications could adversely impact network performance – particularly if the number of test subjects increases dramatically in the future, as may be contemplated – SamKnows should consult with providers to ensure that the tests will have a *de minimis* impact on the networks, and by extension, the customer experience. In addition, to the extent that customers participating in the test experience detrimental changes in their broadband performance, SamKnows should provide technical support to all test participants. This would aid test participants by facilitating prompt trouble-shooting and resolution of any technical problems arising from the testing. To minimize customer confusion and frustration, SamKnows should instruct all test participants to contact SamKnows' technical support team (and provide an appropriate toll free number), rather than their provider's technical support staff, in the first instance.

#### **CONCLUSION**

The SamKnows proposal is a sound first step, but there are a number of issues with and questions raised by the proposed methodology that must be cared for before testing begins so that broadband performance is measured in a manner that is fair to

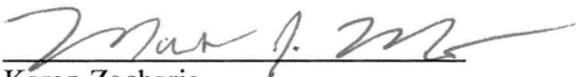
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<sup>11</sup> *Notice* at 3.

providers and meaningful and comprehensible to consumers. Verizon looks forward to the opportunity to continue to participate in discussions towards those ends.

Respectfully submitted,

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