July 15, 2016

EX PARTE VIA ECFS

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Room TW-A325
Washington, D.C. 20554

Re: Guidance on Open Internet Transparency Requirements
GN Docket No. 14-28

Dear Ms. Dortch:

Mosaik respectfully submits this letter to outline concerns regarding the May 19, 2016 Federal Communications Commission Public Notice on wireless network-performance measurement.[1] Without prior notice or public comment, the FCC's Public Notice unnecessarily narrowed the pool and types of available wireless network data and selected the information provided by Measuring Broadband America ("MBA") as the safe harbor for information disclosures required by the 2015 *Open Internet Order*.[2] The FCC should have sought public comment on its approach prior to its release. Had the FCC done so, the agency would likely have realized that allowing the use of a greater variety of data sources and collection technologies would ensure more detailed, robust and accurate wireless network-performance measurements. The FCC should solicit public comment and reconsider the approach taken in its May 29, 2016 Public Notice.

About Mosaik

Mosaik provides a unique combination of datasets, network-experience software and geospatial-analytical services to an array of carriers, MVNOs, infrastructure and telematics companies. Mosaik has the largest mobile network coverage, spectrum and infrastructure database in the world and has

[1] *Guidance on Open Internet Transparency Rule Requirements*, Public Notice, GN Docket No. 14-28, DA 16-569 (rel. May 19, 2016) ("Public Notice"). CTIA and Competitive Carriers Association ("CCA") filed applications for review of this Public Notice. *See* Application for Review of CTIA, GN Docket No. 14-28 (filed June 20, 2016) ("CTIA Application for Review"); Application for Review of Competitive Carriers Association, GN Docket No. 14-28 (filed June 20, 2016) ("CCA Application for Review").

[2] Both CCA and CTIA have explained how the FCC's decision unlawfully seeks to establish new rules without a Notice of Proposed Rulemaking. *See* CCA Application for Review at 5; CTIA Application for Review at 3.

provided unbiased support for the telecommunications industry for 28 years. Mosaik's telecommunications databases address spectrum, infrastructure, wireless and wired technologies, including 1,750 mobile networks from more than 850 carriers worldwide. As of the second quarter of 2016, Mosaik's mobile-coverage database in the United States includes 250 networks from 130 carriers. Mosaik has also made considerable investment to augment its core network-coverage database, which collects billions of measurements every year by leveraging end-user devices as network sensors and by recording network performance across mobile and Wi-Fi networks. Mosaik combines these considerable datasets and software assets to offer a comprehensive representation of the wireless user experience. Mosaik currently provides datasets or services to 22 of the largest 25 mobile operators in North America and has provided data to the FCC for 12 years.

Diverse Data Sources and Analytical Methods Increase Accuracy

Mobile network-performance measurements are far more accurate and reliable when the analysis draws from diverse datasets and uses multiple collection methodologies. Assembling and processing data to create a composite view of network performance can overcome method-specific limitations and anomalies and produce more accurate and reliable measurements than using a single method or process. Drive-testing, for example, can be a useful data-collection tool for measuring wireless networks outdoors. It can also be expensive and impractical, especially in rural and remote areas, while also not considering network experiences indoors. Combining drive-testing with other tools – such as crowdsourcing and indoor testing options, when collected pursuant to well-designed methodologies – can allow for a more robust and accurate measure of wireless network speeds and network coverage than drive-testing alone. Aggregating the results from multiple collection methodologies and data sources provides researchers with more depth and breadth of information because each source of data acts as a check on the accuracy of the other sources, which helps identify inconsistencies and discrepancies.

In its Application for Review of the Public Notice, CTIA described the narrow pool of data available from the initial MBA results, which will "only utilize scheduled test results from Android devices and will exclude data collected from iPhone users."[3] CTIA noted that these limitations "skew results and provide consumers with a very imperfect picture of network performance."[4] CTIA is correct. Any safe-harbor provision should encourage the use of multiple data-collection methodologies and diverse datasets. Across industries, companies that collect and use different data sources perform better.[5] In the wireless context, combining a variety of sources of data, including crowdsourcing, drive-testing, and signal measurements produces the highest level of accuracy.

The MBA Data Is Seriously Flawed

While the MBA data might offer one type of relevant information, the MBA data suffers from serious flaws that promise confusing, inaccurate and inconsistent information about wireless network performance. The MBA mobile broadband effort uses a speed test app developed by the contractor

[3] CTIA Application for Review at 13.

[4] *Id*.

[5] Andrew McAfee and Erik Brynjolfsson, *Big Data: The Management Revolution*, HARVARD BUSINESS REVIEW (Oct. 2012), http://bit.ly/11bRO4X (explaining how the airline industry improved flight arrival and departure time predictions by moving from a single source of data to multiple sources of data).

SamKnows.[6] Consumers with either Android or iPhone devices can download the app, which will then measure performance in four active categories (download speed, upload speed, latency, and packet loss), as well as certain passive metrics, such as signal strength and device manufacturer and model. The FCC encourages volunteers that download the apps to use automated testing, but users can disable automated testing and conduct manual tests instead.[7]

The FCC states that mobile broadband providers can disclose actual performance metrics for a Cellular Market Area ("CMA") based on the data collected by the MBA program for that CMA. The MBA program, however, reports data averaged across CMAs, which can produce misleading results.[8] In the Los Angeles CMA, for example, median downlink speeds range from 25.1 Mbps to 9 Mbps. As other commenters have noted, averaging this data could lead to performance results that are misleading because each carrier's typical speeds vary across large areas.[9]

This variation also skews the MBA data in such a way that reporting either the mean or median could be misleading. Neither the mean nor median are necessarily representative of the speeds in a given test area, especially if the area has both urban and rural sections. A better approach is to engage with experts to discuss and address geographic considerations instead of arbitrarily using outdated CMA boundaries. Mosaik, and perhaps other companies, have the statistical expertise to understand and develop methodologies and innovative analytical outputs to accurately reflect network experiences, beyond the limited MBA.

More generally, the all-volunteer pool of SamKnows app users is unlikely to be representative of the population, and the MBA website acknowledges that "manual testing can lead to biased results when performed only at specific times or places, and may provide a less accurate picture of overall broadband performance."[10] For the data to be useful, the data must be collected in an organized and systematic way, not merely aggregated and averaged, and then processed in conjunction with other performance-measurement tools. Relying on a single source of data – especially when that data source suffers from serious flaws – introduces a high likelihood of misleading information that will not accurately represent actual network performance.

An Insufficient and Skewed Safe Harbor Will Frustrate Informed Consumer Choice

Reliance on a single, skewed data source also has the potential to frustrate consumer choice. The SamKnows app relies on voluntary participation and can collect when and where wireless subscribers who have downloaded the app trigger the measurement function. This type of selective, subjective data collection can yield uneven, misleading results. Rural areas, for example, will have far fewer points of measurement than urban areas, which can reduce reliability. Similarly, consumers may choose to trigger the measurement function only when they have experienced coverage limitations or other performance issues, which reduces reliability still further. Moreover,

[6] *Measuring Mobile Broadband Methodology – Technical Summary*, FCC.GOV, http://fcc.us/2a0mz60 (last visited July 7, 2016).

[7] *Measuring Mobile Broadband Performance*, FCC.GOV, http://fcc.us/2a0mz60 (last visited July 7, 2016).

[8] Comments of RootMetrics, GN Docket No. 14-28 (filed June 27, 2016).

[9] *Id*. at 7.

[10] *Measuring Mobile Broadband Performance*, FCC.GOV, http://fcc.us/2a0mz60 (last visited July 7, 2016).

because consumer willingness to download and use a government-sponsored app may vary by demographic, customer variations among carriers could distort performance measurements in unpredictable ways. Furthermore, consumers have limited incentive to participate in the program and this lack of incentive will result in limited data collection. The end result of these and other limitations of the voluntary app approach are difficult to assess, but are highly unlikely to offer an accurate depiction of network performance. Consumer reliance on these flawed measurements would frustrate informed consumer choice and could ultimately thwart the Commission's end goal of improved wireless competition.

Instead of choosing a safe harbor based on a voluntary app that operates on a limited range of wireless devices, the Commission should engage with carriers and third-party data and software providers as well as industry and public resources to identify state-of-the-art wireless network information-collection techniques and vendors. While the MBA is limited to broadband performance, the Commission is also concerned with closing "coverage gaps" and ensuring broadband networks are available throughout the country.[11] The Commission should ensure that comprehensive data collection and analytical options are leveraged to fulfill emerging information needs. Measuring wireless broadband coverage and network performance is extremely complex and requires field-proven methodologies and statistically valid sampling techniques. When attempting to measure performance and evaluate consumer satisfaction, more intelligence and more data are needed from diverse sources, particularly from parties that have institutional knowledge and background in this area. The Commission should seek further comment on its network-performance measurement safe harbors or hold a workshop to collect much-needed information on how to improve its safe-harbor approach for the benefit of wireless consumers.

A Single, Ill-Suited Safe Harbor Will Stymie Private-Sector Investment and Innovation

Identification of the SamKnows app as the sole safe-harbor data source threatens to supplant established private-sector jobs and investment in wireless performance measurement. The federal government long ago adopted a policy against the displacement of private-sector jobs through agency action. OMB Circular A-76 directs agencies to "rely on the private sector for needed commercial services."[12] Relying on commercial competition, OMB has explained, helps "ensure that the American people receive maximum value for their tax dollar."[13]

In the wireless network performance measurement sector, private-sector companies have developed and refined sophisticated data-collection and analytical techniques for more than twenty-five years.

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[11] *See, e.g.*, FCC, CONNECTING AMERICA: THE NATIONAL BROADBAND PLAN 3 (2010) ("*National Broadband Plan*"), http://bit.ly/1JHqKMN (identifying the goal of the FCC's National Broadband Plan as developing "broadband networks that reach higher and farther, filling the troubling gaps we face in the deployment of broadband networks, in the adoption of broadband by people and businesses and in the use of broadband to further our national priorities").

[12] Office of Management and Budget, Circular A-76, *Performance of Commercial Activities* (May 29, 2003), *available at* http://bit.ly/29UNmO3. The circular applies to executive branch departments and agencies.

[13] *Id.* The principles of OMB Circular A-76 originated in the Eisenhower Administration as a statement of federal policy, and it developed into the formal A-76 policy statement in 1966. *See* VALERIE ANN BAILEY GRASSO, CONG. RESEARCH SERV., R40854, CIRCULAR A-76 AND THE CURRENT MORATORIUM ON DOD COMPETITIONS 1 (2013).

Wireless carriers, enterprise customers and the government rely on the market to determine the optimal performance-measurement information based on how well those firms collect, process and analyze data from a variety of sources. The current competitive market for network-performance measurement creates incentives for continuous investment and innovation. Private-sector companies, including Mosaik and other vendors, have responded to these incentives by pouring considerable financial resources into perfecting data-collection methods and analytical techniques that offer much greater reliability, accuracy and currency than voluntarily used, crowd-sourced apps.[14] But the FCC's proposed safe harbor threatens to upend this functioning market for network-performance measurement.

Government identification of a single, seriously flawed method offered by a single preferred vendor as the sole safe harbor for broadband-performance measurement would discourage private investment in data collection and information processing. However defective and distorted the results of the government-endorsed benchmark might be, consumers could view the safe harbor as the more trusted, more accurate methodology simply by virtue of the FCC's having selected it. Carriers would have less incentive to use third-party vendors such as Mosaik to validate consumer network experiences, and third-party vendors would, in turn, have less incentive to continue to refine and perfect their network-measurement and analytical techniques. In this way, the FCC's attempt at greater transparency could perversely lead to consumers having access to less current and less accurate information about wireless carriers' network performance than they enjoy today.

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The Public Notice selected the MBA as the safe harbor for the disclosures of mobile broadband providers without public input. Informed comment from the public would produce a better result.[15] The FCC should build on private-sector investment and revisit its identification of a single, flawed standard from a single vendor as the safe harbor for broadband-performance measurement. Doing so promises to increase informed consumer choice and ultimately promote increased competition among wireless broadband service providers.

Under Section 1.1206(b)(2) of the Commission's rules, an electronic copy of this letter is being filed in the above-referenced proceeding.

Respectfully submitted,

/s/ Bryan Darr

Bryan Darr
President and CEO
Mosaik

CC: Michele Farquhar, Hogan Lovells US LLP
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[14] CTIA Application for Review at 14 (listing "third-party data sets that are far more robust than the MBA program," including OpenSignal, Sensorly, Mosaik, Ookla, and Nielsen).

[15] CCA Application for Review at 9.