BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554

In the Matter of Inquiry Concerning Proposed Methodology for Connect America High-Cost Universal Service Support Recipients to Measure Speed and Latency Performance to Fixed Locations	WC Docket No. 10-90

COMMENTS OF THE CALIFORNIA PUBLIC UTILITIES COMMISSION

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I. INTRODUCTION

The California Public Utilities Commission (CPUC or California) submits these comments in response to the Notice of Inquiry (NOI) the Federal Communications Commission (FCC or Commission) released on October 16, 2014, in the above captioned docket.[1] In this *NOI*, among other issues, the FCC seeks to develop further the record on how compliance with speed obligations should be determined for recipients of high-cost support that deploy broadband networks to serve fixed locations. Specifically, the Commission is asking what parameters should be used for speed testing and if there are better or more reliable methods of measuring performance.[2]

The CPUC has collected the largest known public database in the United States of mobile broadband quality information gathered from open source testing. The CPUC's testing program, CalSPEED, was developed as a project commissioned by the National Telecommunications Information Administration (NTIA) as part of the CPUC's State Broadband Initiative ARRA grant. In September of this year, the CPUC filed two reports (Reports), along with comments in the FCC's recent *Notice of Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans*, regarding

[1] *Wireline Competition Bureau, Wireless Telecommunications Bureau, and the Office of Engineering and Technology Seek Comment on Proposed Methodology for Connect America High-Cost Universal Support Recipients to Measure and Report Speed and Latency Performance to Fixed Locations, WC Docket No. 10-90*, rel. October 16, 2014. (*NOI*)

[2] *Id.*, ¶1.

how to measure mobile broadband performance, and considerations in selecting mobile benchmark speeds.[3]

Nearly all of the information in California's September comments and the appended Reports regarding mobile broadband measurement issues relates directly to the wireline service and to the questions raised in this NOI. Our intent here is to incorporate by reference into the instant set of comments our September comments and appended reports. Consistent testing methods can and should be used for both fixed and mobile testing, and to determine compliance with service requirements. Further, any and all testing methods and results should be open and transparent.

II. DISCUSSION

A. Are there better and more reliable methods of measuring speed? What testing parameters should be used for speed testing?

The FCC asks if there are more reliable methods for measuring speeds and what parameters should be used to test speed.[4] In comparison with other currently available testing applications the FCC may consider using, the CPUC's speed testing application, CalSPEED, yields data that is more representative of consumers' experience most of the

[3] *See* California Public Utilities Commission Comments *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 Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act*, GN Docket No. 14-126, filed September 4, 2014. The comments can be found at http://apps.fcc.gov/ecfs/document/view?id=7521827883, and the reports are at http://apps.fcc.gov/ecfs/document/view?id=7521827884

[4] NOI at ¶¶ 5 and 7.

time, and measures certain important metrics not captured by other testing methods, but which are critical for informed policy-making.

With funding from the NTIA, the CPUC has completed the following activities: 1) created and implemented CalSPEED, a program to measure mobile broadband speeds and quality; 2) published an Android mobile crowd-sourcing application; and 3) performed semi-annual field testing of mobile broadband service quality in urban, rural and tribal areas throughout the State.[5] Beginning in 2012, every six months the CPUC has collected approximately 2,000,000 test results at the same 1,986 locations[6] throughout the State. Based on the data gathered to date, CPUC consultant, Ken Biba, with the technical, logistic, and geostatistical assistance of CPUC staff, California State University at Monterey Bay, and California State University at Chico, has published a report, *CalSPEED: California Mobile Broadband - An Assessment* ("Assessment"), which provides a unique and valuable analysis of the availability and quality of mobile broadband service deployed in California.[7]

Mr. Biba has also published a report, *CalSPEED, Measuring California Mobile Broadband – A Comparison of Methodologies* ("Comparison"), which provides an

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[5] The data sets of CalSPEED testing results are available to the public at http://www.cpuc.ca.gov/PUC/Telco/bb_drivetest.htm .

[6] Originally, the CPUC gathered results at 1,200 locations, but this was increased in the fourth testing round to improve predictive precision of the interpolation models.

[7] Appendix A of Comments of the California Public Utilities Commission, *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 Accelerate Such

Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act, GN Docket No. 14-126, filed September 4, 2014.

explanation of the testing methodology that powers the CPUC's testing program and compares those methodologies to those embedded in the FCC's and Ookla's tests.[8] The CPUC has found that its methodology yields more realistic results than the methodologies that the FCC and Ookla currently use, and results that reflect actual mobile service better than data submitted by providers.

The CPUC is now creating and testing a web-based version of CalSPEED to allow measurement of wireline and fixed wireless broadband service in addition to mobile. This version will run on desktop and tablet platforms, as well as on smartphones. Like our mobile tests, we expect to capture results better reflecting service that customers actually receive most of the time than do tests using other methods.

The CPUC's California Advanced Services Fund (CASF) grant review process includes the use of CalSPEED to demonstrate the availability of mobile services to help determine project eligibility for grant consideration. Recipients of CPUC CASF grants and loans will also use CalSPEED's coming wireline test to demonstrate that they have deployed service with the required speeds on their CASF-subsidized infrastructure.

The same principles also apply to measuring latency. There is a significant difference in how the CPUC measures latency and how the FCC's own mobile app measures it. With CalSPEED, data is gathered through field testing from areas where

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[8] Appendix B of Comments of the California Public Utilities Commission, *In the matter of Inquiry Concerning the Deployment of*

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Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act, GN Docket No. 14-126, filed September 4, 2014 Ookla is a company that specializes in broadband Internet speed testing, and operates speedtest.net..

there are no crowds to provide test results. This field testing gives a much better picture of actual latency across California than if we were to rely on crowd-sourced data alone. Additionally, CalSPEED collects and reports all results, including results of "no service," zero throughput, and very high latencies. By contrast, the FCC and Ookla apps filter out these results and does not use them in calculating mean results.

Lastly, CalSPEED measures latency to reflect the end-to-end user experience, which includes not only the time it takes to traverse the cellular company's system, but also the time it takes to reach both east and west coast servers. Our CalSPEED analysis has documented a large and growing Mobile Digital Divide in urban versus rural and tribal areas. The data suggests that even paired with LTE technology, unreliable backbone and peering arrangements are the major contributing factors to poor quality rural mobile service. "Dropped" cellular data connections fail as much as three times more frequently in California's rural and tribal areas than in urban areas. Similarly, even gigabit service provided over fiber-to-the-home facilities may be poor in rural areas if backhaul and peering are provisioned in the same manner as cellular. Unless that poor experience is captured by testing methods, the rural and tribal Digital Divide may worsen, as has our Mobile Divide, without regulators able to realize that it is the backhaul or backbone speed that is impacting the last mile speed. It is important that FCC-mandated fixed testing ferret out that information. If CAF recipients cannot provision backbone quality sufficient to support the future demands of expected IP-enabled services, subsidizing last mile broadband infrastructure projects in high cost areas will

not solve the Digital Divide, and will not bring high-quality broadband service to rural areas.

B. Transparency

Whether the FCC, state commissions, third parties, or the broadband providers themselves conduct mandated tests, the CPUC urges the FCC to require that all broadband testing results submitted to state or federal regulatory agencies, be available in a transparent manner, using open source testing tools. Open access to this data will enhance public confidence in its accuracy, assist in identifying deficiencies in that information and allow the research community to perform its own third-party analysis.

III. CONCLUSION

The CPUC appreciates this opportunity to share our speed test and other information with the FCC.

Respectfully submitted,

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