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

COMMENTS
OF THE CALIFORNIA PUBLIC UTILITIES COMMISSION

KAREN V. CLOPTON
HELEN M. MICKIEWICZ
505 Van Ness Avenue
San Francisco, CA 94102
Phone: (415) 703-1319
Fax: (415) 703-4592
Email: HMM@cpuc.ca.gov

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Attorneys for the
California Public Utilities Commission
I. INTRODUCTION

The California Public Utilities Commission (CPUC or California) submits these comments in response to the Notice of Inquiry (NOI) released by the Federal Communications Commission (FCC or Commission) on August 5, 2014, in the above captioned dockets. In this NOI, among other issues, the FCC seeks comment on how to define “advanced telecommunications capability;” whether the FCC should establish separate benchmarks for fixed and mobile services; what data the FCC should rely on in measuring broadband; and whether and how the FCC should take into account differences in broadband deployment, particularly between urban areas versus non-urban and tribal areas.

The CPUC wishes to share its experience studying broadband measurement techniques, particularly with regard to mobile broadband service. With funding from the National Telecommunications Information Administration (NTIA), the CPUC undertook the following: 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.² Beginning in 2012, every six months, the CPUC collects approximately 2,000,000 test results at the same 1,986

¹ 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, Tenth Broadband Progress Notice of Inquiry, GN Docket No. 14-126, rel. August 12, 2014. (NOI)

² The data sets of CalSPEED testing results are available to the public at http://www.cpuc.ca.gov/PUC/Telco/bb_drivetest.htm.
locations 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. The Assessment is attached to these comments as Appendix A.

Ken Biba has also published a report, *CalSPEED, Measuring California Mobile Broadband – A Comparison of Methodologies* (“Comparison”), which provides an 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. The Comparison report is attached to these comments as Appendix B.

In the Discussion below, our outline numbering tracks the outline numbering of the NOI.

II. DISCUSSION

A. What is Advanced Telecommunications Capability?

1. Broadband Benchmark: Speed

The FCC seeks comment on the appropriate speed benchmark that would permit users to achieve the purposes identified in section 706. The Commission asks whether it should adopt a higher download speed benchmark, such as 10 Mbps, to more

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3 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.

4 *Id.*, ¶6.
appropriately reflect the statutory requirements in section 706. Additionally, the Commission asks whether it should retain or increase the 1 Mbps benchmark speed for upload speeds.

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The CPUC’s analysis of its testing results estimate that 51.4 percent of Californians has access to mobile broadband at the proposed mean of 10Mbps/1 Mbps benchmark and 51.3 percent of Californians has access to the proposed mean of 10 Mbps/4 Mbps benchmark. The Assessment report contains more detail and analysis on these statistics.

2. **Broadband Benchmark: Latency**

The FCC also seeks comment on whether to include latency as part of the benchmark for assessing broadband deployment under section 706 (b), noting that price cap carriers which accept Connect America funding in Phase II locations are required to meet a latency requirement of 100 milliseconds (ms) or less. In addition, the Commission asks what data are available to measure latency, particularly for mobile services.

The Assessment report shows that, on average, a latency benchmark of 100 ms, is necessary to support real-time services like Voice over IP (VoIP). Our results show that this is currently a difficult benchmark for mobile providers to achieve – particularly in

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5 *Id.*, ¶14.
6 *Id.*, ¶16.
7 *Id.*, ¶25.
8 *Id.*, ¶26.
9 CalSPEED measures latency differently than the FCC, testing end-to-end round trip latency to both near and distant servers.
rural and tribal areas. As discussed in the Assessment report, latency is a key impact that determines whether the network can support real-time services like VoIP services. The inability to meet this latency benchmark is a reason that many areas of California still are not served by networks robust enough for VoIP capabilities.

There is a significant difference in how the CPUC measures latency and how the FCC measures it. With CalSPEED, data is gathered through field testing from areas where there are no crowds to provide test results. This field testing gives a much better picture of actual latency across the State 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 types of results and do not use them at all 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 access the local radio, but also the time it takes to reach both east and west coast servers.

3. Relationship Among Fixed, Mobile, and Satellite Services

The FCC also seeks comment on whether it should develop speed benchmarks independently for each technology platform and additionally whether it should set different latency, data usage, or other criteria for fixed and mobile services.\textsuperscript{10} The Assessment report includes a technical analysis of the different characteristics of wireless broadband service, as compared to wireline broadband service. For example, the report

\textsuperscript{10} Id., §31.
shows that wireless broadband service is much more variable than wireline service. Accordingly, the CPUC is wary of using mean throughput as an indicator of the service most customers will experience. The mean is heavily influenced by a relatively few very fast readings. Therefore, in order to determine the actual level of service most consumers experience most of the time, for grant evaluation purposes, the CPUC staff will lower a provider’s tested mean throughput by one standard deviation to determine if that service meets the CPUC’s current CASF \(^{11}\) benchmark throughput of 6/1.5. Based on our findings, the FCC may want to consider the high degree of variability in speeds and latency when setting mobile thresholds, and hence the threshold for mobile, if measured by mean, may need to be adjusted or viewed differently than thresholds for wireline services, which are more stable.

**B. How Should Broadband Deployment Be Measured**

**Mobile Services**

The FCC also asks whether there are additional data that the Commission should consider when determining the extent of mobile broadband deployment in the United States.\(^ {12}\) The Comparison report provides an explanation of the methodology used to analyze data obtained using the CPUC’s CalSPEED application. 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 CASF grant challenge review process includes use of

\(^{11}\) The California Advanced Services Fund provides grants and loans to entities for deployment of broadband services in unserved or underserved areas of California. Underserved is defined as less than 6/1.5.

\(^{12}\) Id., ¶34.
CalSPEED to demonstrate the availability of mobile services for determination of grant eligibility.

The CPUC is also in the process of developing a web-based wireline test, which, like our mobile tests, we expect to yield results more representative of service that customers actually receive. Recipients of CPUC CASF grants and loans will also use CalSPEED’s coming wireline tester to show that they have deployed service with the required speeds on their CASF-subsidized infrastructure. The FCC could easily modify CalSPEED and use it for both purposes – to determine if an area is unserved, and thus grant-eligible, and to verify that federally-subsidized providers deliver the quality of broadband that they are supposed to provide under their grants.

C. Is Broadband Being Deployed to All Americans in a Reasonable and Timely Fashion?

The FCC notes that there is a disparity in deployment trends between urban and rural areas.\(^13\) Therefore, the Commission asks how this disparity and the trend in such disparities over time should inform its inquiry.\(^14\) The Assessment report includes analyses of the quantified differences in service quality observed in urban, non-urban, and tribal areas in California, which can help inform the FCC’s decision-making regarding this topic.

\(^{13}\) Id., ¶41.
\(^{14}\) Id.
III. CONCLUSION

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

Respectfully submitted,

KAREN CLOPTON
HELEN M. MICKIEWICZ

By: /s/ HELEN M. MICKIEWICZ

HELEN M. MICKIEWICZ

505 Van Ness Avenue
San Francisco, CA 94102
Phone: (415) 703-1319
Fax: (415) 703-4592
Email: hmm@cpuc.ca.gov

Attorneys for the California Public Utilities Commission And

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