

State of California

Public Utilities Commission
San Francisco

MEMORANDUM

Date : August 25, 2014

To : The Commission
(Meeting of August 28, 2014)

From : Kimberly Lippi
Public Utilities Counsel, Legal Division

Roxanne L. Scott
Program and Project Supervisor, Communications Division

Subject: Filing of Comments in Response to FCC's Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion

RECOMMENDATION: In response to the Federal Communications Commission's (FCC) Notice of Inquiry (NOI)¹ regarding the deployment of advanced telecommunications capability, the California Public Utilities Commission (CPUC) should file informational comments regarding the state of mobile broadband service in California. Comments are due September 4, 2014.

BACKGROUND: As required by statute, the FCC annually reports to Congress on whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion.² In this NOI the FCC solicits data and information that will help it make this annual determination.

The FCC did not adopt a Ninth Broadband Progress Report, but in the Eighth Broadband Progress Report the FCC determined that approximately 19 million Americans, or six percent of the population, still lacked access to fixed broadband service at threshold speeds. The Eighth report was also the first report to include data on mobile broadband.

¹ Tenth Broadband Progress Notice Of Inquiry (NOI), 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, (FCC 14-113); rel. August 5, 2014. (NOI).

² Section 706 of the Telecommunications Act of 1996, as amended (1996 Act), requires the Commission to determine and report annually on "whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion." *See*. 47 U.S.C. § 1302.

CPUC Communications Division (CD) Staff have been studying broadband measurement techniques, particularly with regard to mobile broadband service. With funding from the National Telecommunications Information Administration (NTIA), Staff have: 1) created and implemented CalSPEED, an application to develop measurement techniques; 2) published a 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. Every six months since 2012, CD Staff have collected approximately 2,000,000 test results at the same 1,986 locations throughout the State.³

Based on the data gathered, CD's project consultant, Ken Biba, with the technical, logistic and geostatistical assistance of CD Staff, California State University at Monterey Bay, and California State University at Chico has published two reports which provide a unique and valuable analysis of the availability and quality of mobile broadband service deployed in the State.

In addition, pursuant to funding from the NTIA grant, CD Staff and experts from CSU Chico have analyzed California mobile broadband deployment and subscription data from 2008 to 2021, and have identified important trends in subscription speeds and quantified differences in urban/rural/tribal results which inform many of the policies at issue in the NOI.

Among the conclusions in the reports are the following:

There is wide variation in mobile broadband performance geographically across California, and the data shows that there is a growing digital divide between urban, rural, and tribal areas. Furthermore, the bulk of the mobile network is not yet Voice over Internet Protocol (VoIP) ready. Lastly, there is substantial and growing difference in the coverage and quality of mobile broadband service between the best performing and worst performing carriers.

The CPUC's data also shows that some carriers' advertised service locations and speeds are highly overestimated in comparison to actual service likely to be experienced by users.

The CalSPEED analysis can also inform the FCC regarding how upgrading the speed benchmark to a more aggressive standard would affect the total number of households in California with access to mobile advanced telecommunications capability. The number of households and square miles in California with access to mobile service by at least one of the four largest wireless providers that meets or exceeds the 10 Mbps downstream/ 1 Mbps upstream benchmark, as well as the 10 Mbps downstream /4 Mbps upstream benchmark.

The CPUC's testing methodology used in CalSPEED to gather mobile broadband data, when compared with the FCC's and Ookla's⁴ testing tools, is the most rigorous, all inclusive test demonstrating actual end user experience, rather than measuring solely the performance of radio access networks. This difference is important because the data demonstrates that the speed of mobile broadband service is not only dependent on local factors such as radio access, but also on

³ Test locations increased from 1,200 to 1,896 as of Fall 2013.

⁴ Ookla operates online broadband testing and network analysis tools, including www.speedtest.net.

the Internet backbone interconnection and peering strategies of the carrier. CalSPEED's sampling method also produces the most reliable results because it includes data from periodic surveys of the same location. Lastly, CalSPEED is unique in that it also tests streaming capability, and evaluates service in terms of its capability to provide VoLTE.⁵

DISCUSSION AND RECOMMENDATION: Using the data the CPUC has collected on wireless mobile broadband service in California, Staff recommends the CPUC file informational comments in response to the FCC's following questions⁶:

(1) What benchmarks should the FCC use to define "advanced telecommunications capability:"

The FCC has previously used a speed benchmark of 4 Mbps downstream and 1 Mbps upstream to define advanced telecommunications capability. In its NOI, the FCC has raised the possibility of using a more aggressive speed benchmark of either 10 Mbps downstream/ 1 Mbps upstream or 10 Mbps downstream/ 4 Mbps upstream. The reports discussed above, which Staff recommend providing to the FCC, include an analysis of mobile broadband speed data. Using this information, the CPUC can provide the FCC with an estimate of the percentage of California's population that has access to mobile broadband service at the proposed 10 Mbps/ 1Mbps and the 10 Mbps/ 4 Mbps benchmarks. We also can show how this contrasts with percentage of California's population that has access to California's current benchmark for "served" broadband, which is defined by the CPUC as 6 Mbps/ 1.5 Mbps.

Latency is also an important component of "advanced telecommunications capability." Our data show that, on average, the FCC's proposed standard of 100 milliseconds, necessary to support real-time services like VoIP, is a difficult threshold for mobile providers – particularly in rural and tribal areas. And, because of this, many areas of California are still not VoIP ready for mobile networks. The CPUC comments should include an explanation of our method for measuring latency, which differs from how other testing tools determine it, and why the FCC might want to adopt the CPUC methodology.

(2) Whether the FCC should establish separate benchmarks for fixed and mobile services:

The reports that Staff recommend the CPUC provide to the FCC include a technical analysis of the different characteristics of wireless broadband service, in comparison to wireline broadband service. These differences may drive the consideration of different benchmarks based on technology type with a goal of approximating the same level of consumer experience across all technologies. For example, the reports show that wireless broadband service is much more variable. Therefore, in order to determine the actual level of service experienced by most consumers, and to increase the predictive probability of a user reaching a certain throughput threshold on mobile, CD Staff lowered by one standard deviation the interpolated mean of the speed tests results. Our findings

⁵ VoIP over LTE (VoLTE) refers to a service that provides IP-enabled voice applications over a 4G LTE cellular data network. LTE was designed to allow voice to be transported as data.

⁶ NOI at ¶3.

suggest that the FCC should take into account 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.

(3) What data the FCC should rely on in measuring broadband:

Staff recommends the CPUC provide the FCC with the data Staff has gathered and an explanation of how Staff analyzed that data. Staff has found that our measurement methodologies may yield more realistic results than the methodology that the FCC and Ookla currently use. The CPUC should also inform the FCC of the CPUC's ongoing effort to develop a wireline web-based test, which we expect will be more representative of service actually being received by consumers. This methodology may also be used to verify that federally-subsidized providers deliver the quality of broadband that they are supposed to provide.

(4) Whether and how the FCC should take into account differences in broadband deployment, particularly between urban areas versus non-urban and Tribal areas:

The reports include analyses of the quantified differences in service quality observed in urban, rural and tribal areas, which can help inform the FCC's decision making regarding this topic.

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