

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

In the Matter of

Connect America Fund

WC Docket No. 10-90

DA 13-284

**COMMENTS
OF THE CALIFORNIA PUBLIC UTILITIES COMMISSION
AND THE PEOPLE OF THE STATE OF CALIFORNIA**

FRANK R. LINDH
HELEN M. MICKIEWICZ
KIMBERLY J. LIPPI

Attorneys for the California
Public Utilities Commission and
The People of the State of California

505 Van Ness Avenue
San Francisco, CA 94102
Phone: (415) 703-5822
Fax: (415) 703-4592
Email: kjl@cpuc.ca.gov

March 28, 2013

I. INTRODUCTION AND SUMMARY

The California Public Utilities Commission and the People of the State of California (CPUC or California) submit these comments in response to the Federal Communications Commission (FCC or Commission) Wireline Competition Bureau's (Bureau) Notice Seeking Further Comment on Issues Regarding Service Obligations for Connect America Phase II and Determining Who Is an Unsubsidized Competitor (*Notice*).¹ In this *Notice*, the Bureau seeks further comment on how it will determine, for purposes of Connect America Fund (CAF) Phase II funding of price cap carriers, which census blocks are served by an unsubsidized competitor, how price cap carriers will demonstrate they are meeting the Commission's requirements for reasonable comparability, and what other providers will need to demonstrate to be deemed unsubsidized competitors. The FCC particularly encourages input from State Broadband Initiative (SBI) grantees and other state authorities that may have relevant information.² The CPUC is the state SBI grantee for California.³ In the following comments, we provide information on the speed thresholds we have used to determine an area as served in California, our experience with cable broadband providers and their speed capabilities, our experience gathering and validating data from both mobile and fixed wireless providers, as well as quantitative analysis relating to these issues. Based on our

¹ Wireline Competition Bureau Seeks Further Comment on Issues Regarding Service Obligations for Connect America Phase II and Determining Who is an Unsubsidized Competitor, Dkt No 10-90, (DA 13-284); rel. Feb. 26, 2013.

² *Id.* at para. 10.

³ The CPUC is the California recipient of an \$8,000,000 State Broadband Initiative Grant, awarded by the National Telecommunications and Information Administration under the American Recovery and Reinvestment Act (ARRA).

experiences, the CPUC recommends that for purposes of CAF Phase II: 1) the model should treat an area as unserved if it is shown on the National Broadband Map as lacking broadband with speeds of at least 6 Megabits per second (Mbps) download/1.5 Mbps upload; 2) the FCC should treat an area with DOCSIS 3.0 or higher as served; and 3) if the FCC decides to consider a fixed or mobile wireless service provider as a possible unsubsidized competitor, such entities should demonstrate that they meet the necessary speed, capacity, latency and price criteria.

II. DISCUSSION

A. Unserved Areas

1. The FCC Should Adopt a Speed Threshold of 6 Mbps Upload/1.5 Mbps Download for Purposes of Identifying Areas that are Served by an Unsubsidized Competitor.

The FCC seeks comment on what speed threshold should be utilized as a proxy for 4 Mbps for downloads and 1 Mbps for uploads when identifying census blocks that are served by an unsubsidized competitor.⁴ While a speed threshold of 3 Mbps/768 Kbps was used as a proxy for 4 Mbps/1 Mbps in CAF Phase I, the FCC asks whether it should now use a threshold of 6 Mbps/1.5 Mbps for purposes of CAF Phase II.⁵ The FCC presumes that this change would result in a greater number of eligible census blocks. The Commission also asks for comments on the implication of using the National Broadband Map data regarding availability of broadband providing speeds of at least 6 Mbps/1.5

⁴ *Id.* at para. 9.

⁵ *Id.*

Mbps to identify census blocks that would be deemed served by an unsubsidized competitor under Phase II.⁶

The CPUC recommends that the CAF Phase II model should treat an area as unserved if it is shown on the National Broadband Map as lacking broadband with speeds of at least 6 Mbps/1.5Mbps. In December 2007, the CPUC authorized the California Advanced Services Fund (CASF) Program, which provides grants to facilities-based telephone corporations to spur deployment of broadband infrastructure in unserved and underserved areas within the state. When the CASF program began, an area was deemed by the CPUC to be served if broadband speeds were advertised to be at least 3 Mbps/1 Mbps.⁷ That benchmark became problematic for the CPUC because of the way speed data is collected. Provider availability data collected by the CPUC under its SBI grant uses the same speed tiers used by the National Telecommunications and Information Administration (NTIA) for the National Broadband Map and by the FCC for Form 477 data.⁸ As a result, the CPUC's original benchmark upload speed fell within a range that also includes slower speeds, making accurate determination of whether the benchmark is met impossible. The FCC recognized this problem when it chose to use 3 Mbps/768 Kbps as a proxy for 4 Mbps/1 Mbps in Phase I of the CAF.⁹

⁶ *Id.*

⁷ Interim Opinion Implementing California Advanced Services Fund, Decision (D.) 07-12-054, Dec. 21, 2007; <http://www.cpuc.ca.gov/PUC/Telco/Information+for+providing+service/CASF/>.

⁸ FCC Instructions for Local Telephone Competition and Broadband Reporting (FCC Form 477), 18 (2012) <http://transition.fcc.gov/Forms/Form477/477inst.pdf>. Speed Tier 3 for Upload Rates includes speeds that are “Greater than or equal to 768 kbps and less than 1.5 mbps.”

⁹ *Notice* at para. 9.

The CPUC addressed the problem of using the 3Mbps/1Mbps benchmark in the CASF by subsequently “raising the bar” and redefining “served” to mean that the maximum advertised speed is greater than or equal to 6 Mbps/1.5 Mbps.¹⁰ Those speeds are the lower bounds of one of the speed tiers used by both the NTIA and FCC, allowing us to identify broadband availability at the benchmark speeds accurately, without having to resort to a proxy.

Furthermore, using the benchmark speeds of 6 Mbps/1.5 Mbps to define served status allowed the CASF program to identify a greater number of underserved and unserved areas, which are now eligible for grant funding, than were found to be served using the 3 Mbps/1Mbps benchmark.

For example, based on the most recently available SBI data from June 30, 2012, approximately 25,771 households in California would have been considered unserved and underserved by mobile, fixed wireless and wireline service using the previous definition of 3 Mbps/1 Mbps.¹¹ However, under the current threshold of 6 Mbps/1.5 Mbps, approximately 301,907 households are considered unserved and underserved. The census blocks with these unserved and underserved households are therefore considered eligible for CASF grant funding. This is a difference of 276,136 more eligible

¹⁰ California has previously commented on its experience using 6 Mbps/1.5 Mbps as a benchmark for its California Advanced Services Fund (CASF) infrastructure grant in California Public Utilities Commission Comments, GN Docket No. 12-228 (filed Sept. 20, 2012) at 3-4; CPUC State Broadband Mapping Program: Guidelines for Data Submission <http://www.cpuc.ca.gov/PUC/Telco/Information+for+providing+service/Broadband+Mapping/guidelines.htm> (last visited Sept 17, 2012).

¹¹ Based on January 1, 2012 household projections.

households in areas when using the new benchmark. We would expect a similar increase in areas eligible for CAF subsidies.

Lastly, the CPUC recognized that the common uses of Internet access had changed and that using the benchmark of 6Mbps/1.5Mbps would better support popular capabilities such as streaming video.

2. The FCC Should Exclude any Census Block that is Served by a Cable Broadband Provider Using DOCSIS 3.0 from Support Calculations in the Adopted Model.

The FCC seeks comment on its proposal to exclude from support calculations in the adopted CAF Phase II Cost Model any census block that is served by a cable broadband provider that provides service meeting the defined speed threshold with a rebuttable presumption subject to challenge in a challenge process.¹² The FCC notes that its Model has the capability to calculate support amounts excluding census blocks that have cable broadband.¹³ The FCC collects SBI data for both transmission 40 (DOCSIS 3.0) and 41 (DOCSIS other).¹⁴

The CPUC supports the Commission's proposal to consider an area served by a cable broadband provider with DOCSIS 3 or higher to be "served", with that rebuttable presumption subject to challenge. Clearly, the DOCSIS 3.0 specifications support the provision of speeds far faster than 6Mbps/1.5 Mbps. Only in the event that a cable operator does not have sufficient backhaul capacity, or has not properly designed node

¹² *Notice* at para. 11.

¹³ *Id.*

¹⁴ *Id.* at footnote 18.

sizes might there be instances where speeds greater than 6 Mbps/1.5 Mbps could not be achieved. Such very infrequent exceptions are best handled in the challenge process, as the FCC suggests.

3. If Fixed or Mobile Wireless Providers Are Allowed to Be Considered Unsubsidized Carriers, They Should be Required to Demonstrate That They Meet the Necessary Speed, Latency, Capacity, and Price Criteria.

The FCC seeks comment on whether a fixed or mobile wireless provider should be allowed to demonstrate that it is an unsubsidized competitor by showing that it meets the necessary speed, latency, capacity, and price criteria.¹⁵ If the Commission decides to allow fixed and mobile wireless providers to be considered as unsubsidized providers for purposes of CAF Phase II, the Commission should require the wireless providers to prove that their services meet the speed, capacity, latency and price criteria, including the capability of supporting both voice and streaming video.

In the CPUC's experience, validating the service area of fixed wireless providers is difficult because there is limited FCC 477 data filed for fixed wireless service. Moreover, fixed wireless providers, like mobile broadband providers, generally do not show a degradation of service quality with increased distance from their towers in the data they provide to the CPUC for the SBI. Therefore, better validation should be performed if a fixed wireless provider's service would impact CAF eligibility.

The CPUC's SBI Grant also funds certain broadband mapping and planning projects through October, 2014. Approximately \$1,500,000 of the total grant is for a

¹⁵ *Id* at para. 11.

project to create a mobile application that can be used by the public to measure and report actual mobile broadband connection quality, and for drive tests to be conducted by the CPUC at six month intervals to measure service quality in urban areas, rural areas, and on tribal lands within the state. The mobile application created under the SBI grant has been useful in measuring the actual capabilities of fixed wireless providers in the state. The CPUC plans to release the crowd-sourced mobile testing application this spring. It can be used by consumers to measure their mobile provider's capabilities, and it sends the results to the CPUC for analysis. This application is open-sourced so it can be used by other entities to develop their own application. Additionally, experts and analysts can access it to review and analyze our methodologies. More details on this application are provided below.

The CPUC, in administering the California Advanced Services Fund, uses a benchmark advertised speed of 6 Mbps/1.5 Mbps for both fixed and mobile providers to determine whether an area is served.¹⁶ In California, we have determined that mobile and fixed wireless options play an important role in providing broadband access because they are often the only broadband option in significant areas of the state.

Table 1 shows fixed wireless and mobile provider information for served areas (speed >6 Mbps down/1.5 Mbps up) and underserved areas (speed <6 Mbps down/1.5 Mbps up) where there is only a mobile or a fixed wireless provider. The California road miles, population and household information are listed in each row. The last row is the

¹⁶ Decision Implementing Broadband Grant and Revolving Loan Program Provisions, D.12-02-015, Feb. 8, 2012, at Appendix 1 p. 2.

combination of both served and underserved areas. Both mobile provider and fixed wireless provider data are shown, and the full table is cut into two tables for easier reading. The row titles are repeated in the lower illustration. This table shows the magnitude of the potential areas and their populations which, based on provider data, could block others from being able to receive CAF funds for those areas.

Table 1

| Service | Total CA Square Miles | Area (Square Miles) | % Area | Total CA Road Miles | Road Miles | % Road Miles |
|----------------------------|----------------------------|---------------------|---------------------|----------------------------|-------------------|---------------------|
| Only Mobile | | | | | | |
| Served | 158,456 | 14,053 | 8.87% | 395,114 | 48,359 | 12.24% |
| Underserved | 158,456 | 62,101 | 39.19% | 395,114 | 94,729 | 23.98% |
| Served and Underserved | 158,456 | 76,154 | 48.06% | 395,114 | 143,088 | 36.21% |
| Only Fixed Wireless | | | | | | |
| Served | 158,456 | 5,887 | 3.72% | 395,114 | 17,080 | 4.32% |
| Underserved | 158,456 | 1,930 | 1.22% | 395,114 | 5,541 | 1.40% |
| Served and Underserved | 158,456 | 7,817 | 4.93% | 395,114 | 22,621 | 5.73% |
| Service | | | | | | |
| | Total CA Population | Population | % Population | Total CA Households | Households | % Households |
| Only Mobile | | | | | | |
| Served | 37,678,563 | 578,513 | 1.54% | 12,633,403 | 178,663 | 1.41% |
| Underserved | 37,678,563 | 244,315 | 0.65% | 12,633,403 | 80,358 | 0.64% |
| Served and Underserved | 37,678,563 | 822,828 | 2.18% | 12,633,403 | 259,021 | 2.05% |
| Only Fixed Wireless | | | | | | |
| Served | 37,678,563 | 106,286 | 0.28% | 12,633,403 | 35,676 | 0.28% |
| Underserved | 37,678,563 | 5,064 | 0.01% | 12,633,403 | 2,265 | 0.02% |
| Served and Underserved | 37,678,563 | 111,350 | 0.30% | 12,633,403 | 37,941 | 0.30% |

In order to validate speeds advertised by mobile providers, the CPUC has used the FCC’s mobile broadband test data gathered for California, our own feedback data and third party data.¹⁷ The most useful validation method we have found for mobile broadband has been the CPUC’s mobile field tests, which measure actual mobile

¹⁷ For example, BroadBand Scout is one of the third party dataset providers that processes Internet transactions and aggregates them at the census block and street segment level for the CPUC.

broadband connection quality of four major carriers (Verizon Wireless, AT&T Mobility, Sprint Nextel, and T-Mobile). Testers drive over 35,000 miles every six months to test 1,200 points in urban, rural and tribal land areas of the state.¹⁸ Two rounds of testing have been completed thus far. The test measures round trip latency, User Datagram Packets (UDP) jitter and loss, and Transmission Control Protocol (TCP) upstream and downstream throughputs.¹⁹ If the FCC decides to permit mobile providers to participate in the challenge process, the CPUC suggests using similar tests to the CPUC methodology to determine the speed and quality of the mobile broadband service. These tests could be conducted by a third party or by the challenger, but in any case, must be done in a transparent manner. Testing software and all results should be made public.

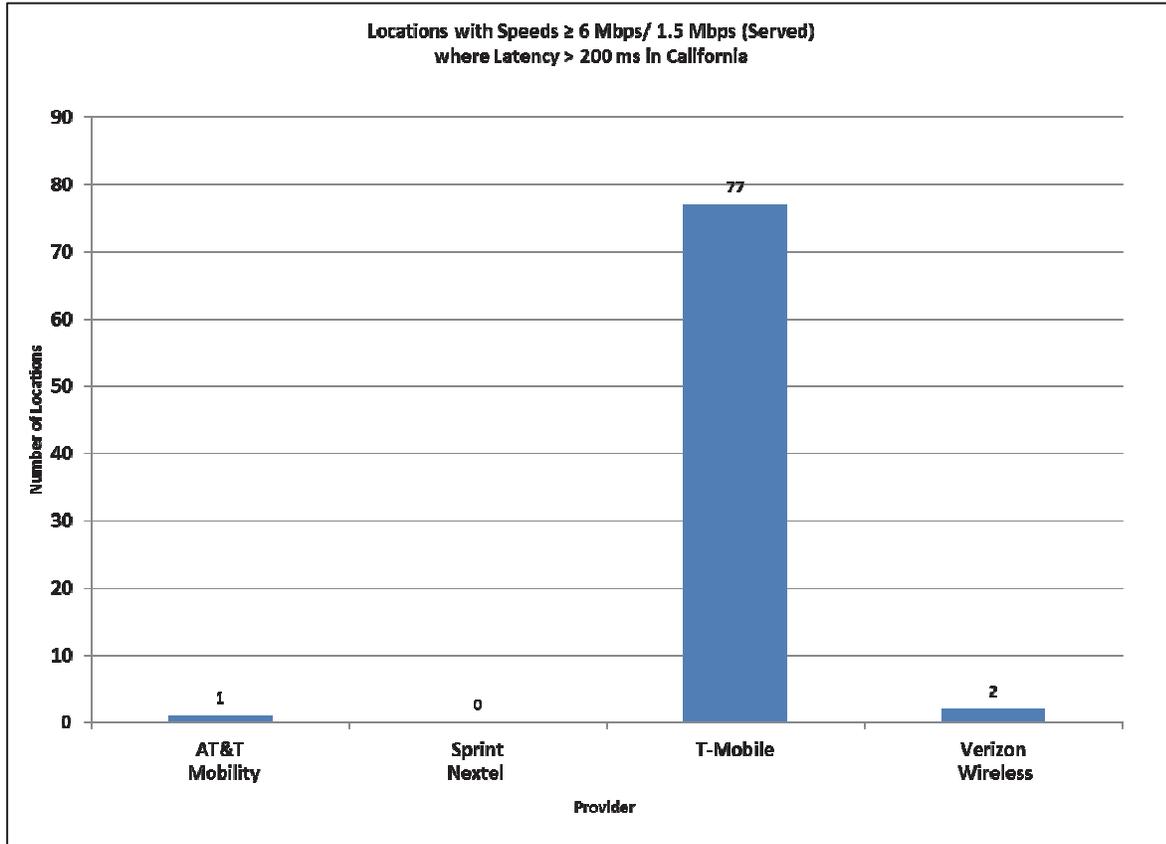
Additionally, the CPUC has found that meeting the speed and latency threshold as proposed by the Commission does not always guarantee that a provider can sufficiently support Voice over Internet Protocol (VoIP).²⁰ For example, as shown following in Chart 1, the CPUC has found that 77 locations that were field tested to have speeds greater or equal to 6 Mbps/1.5 Mbps had a round trip latency greater than 200 millisecond (ms).

¹⁸ The results from the measurements at 1,200 points are interpolated to create a map showing predicted service quality by a process called “kriging.” This map is used to predict both availability and upstream and downstream throughputs. The prediction map is used to validate both service availability and advertised speeds. Using these tests, the CPUC determines the percentage of difference in provider data and test data.

¹⁹ Latency measures the average packet round trip time. UDP is a network protocol used for streaming media such as video and Voice over Internet Protocol (VoIP). Jitter measures the degree to which the UDP signal becomes distorted during transmission. Loss is the amount of message that gets lost during transmission. TCP is a protocol used for connection-oriented IP communications, and hence the CPUC uses this for data throughput measurements expressed in downstream and upstream speed.

²⁰ The CPUC uses its field test data to determine whether a mobile broadband signal can support streaming video and VoIP.

Chart 1

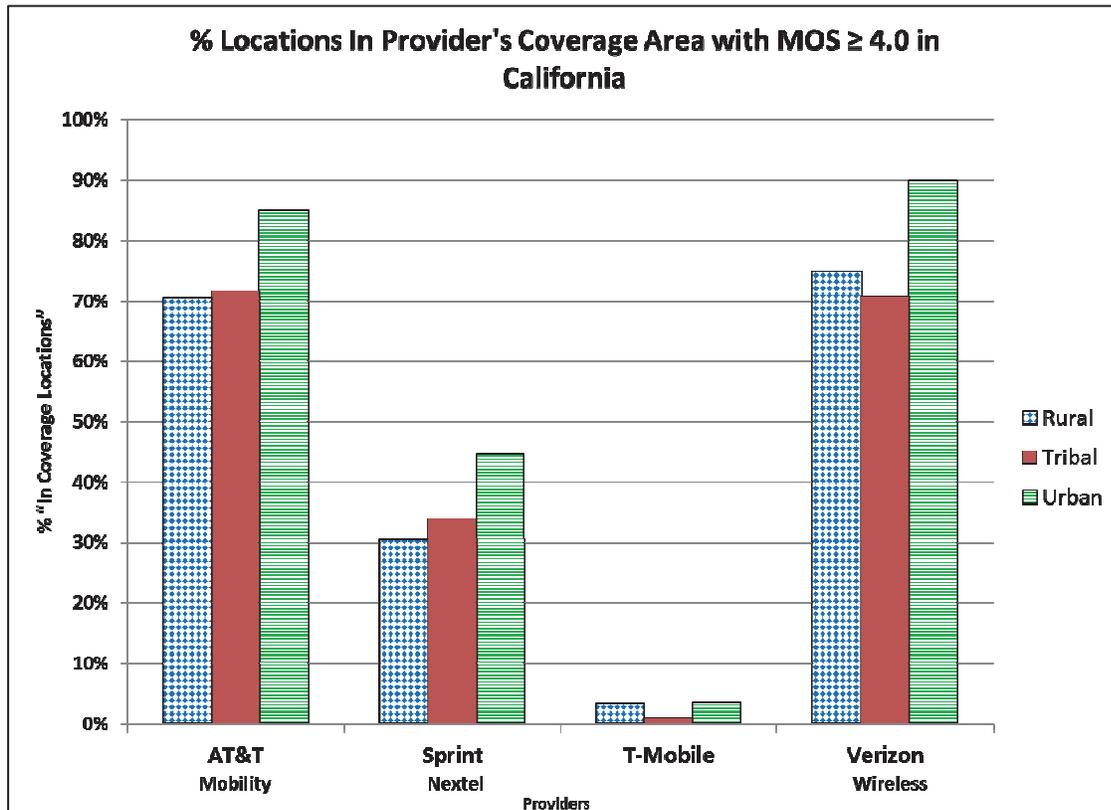


Data source: CPUC Mobile Speed Test, Fall 2012

In California, we have developed an estimated Mean Opinion Score (MOS) for VoIP services which measures latency, packet loss, and jitter to calculate an R-Factor. This R-Factor is used to estimate a MOS. This provides a more holistic picture of broadband service performance than speed or latency alone. A MOS of at least 4.0 out of 5.0 correlates to a user opinion of “satisfied,” or service reliable enough to support VoIP.

The following charts show the results of our MOS estimates for the 1,200 points tested during our mobile field tests. Chart 2 illustrates the percentage of the 1,200 points tested that were advertised as being within a provider’s coverage area that the CPUC found had a MOS of 4.0 or greater, shown by rural, urban and tribal areas.

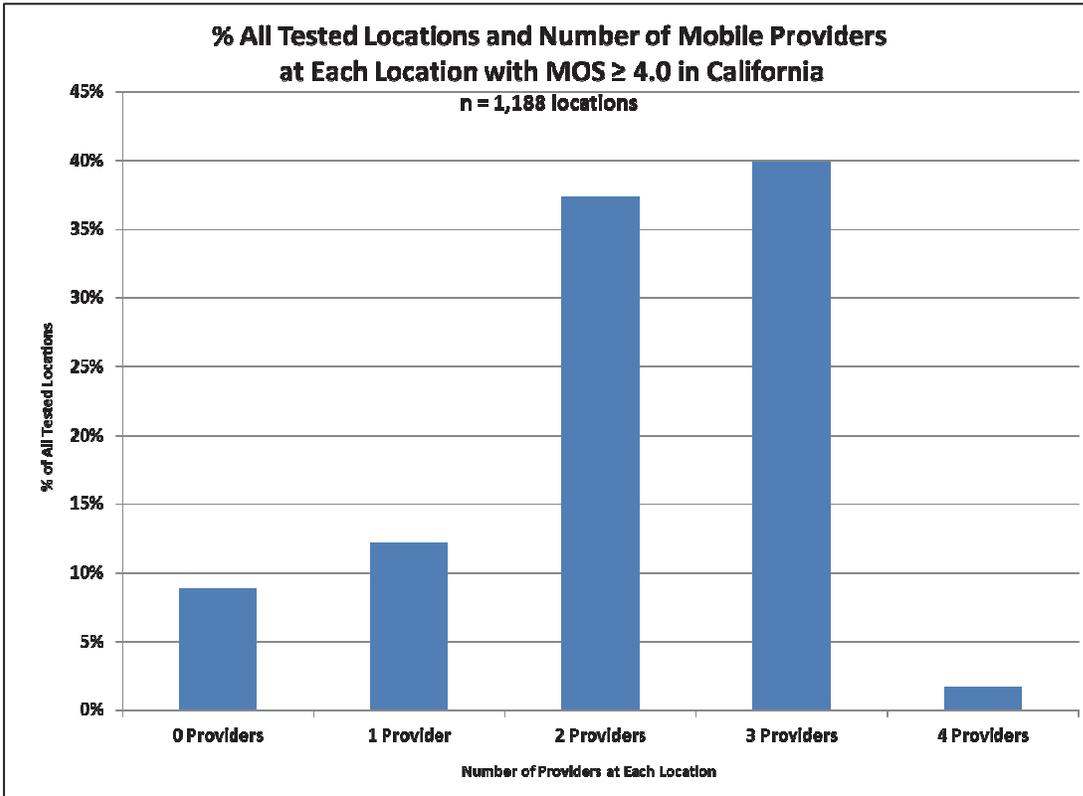
Chart 2



Data source: CPUC Mobile Speed Test, Fall 2012

Chart 3 illustrates the percentage of the 1,200 total tested points where 0, 1, 2, 3, or 4 providers had a MOS of 4.0 or greater.

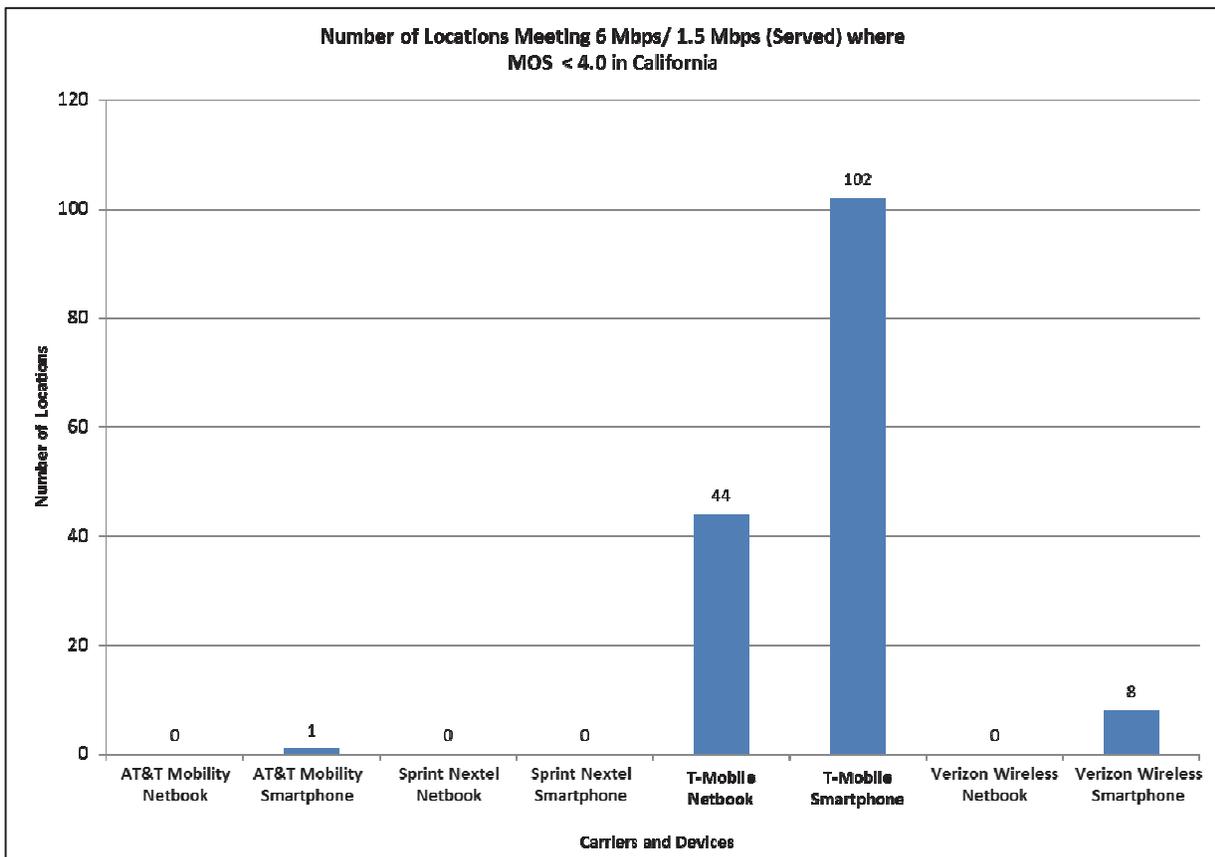
Chart 3



Data source: CPUC Mobile Speed Test, Fall 2012

Chart 4 illustrates the number of locations --of the 1,200 that were tested-- that were determined to have speeds of 6 Mbps/1.5 Mbps, but had MOS of less than 4.0. This chart shows test results for both smartphones and netbooks using USB data connections for each of the four providers tested. The chart shows that speeds of 6 Mbps/1.5 Mbps rarely result in MOS of less than 4.0 for most providers.

Chart 4



Data source: CPUC Mobile Speed Test, Fall 2012

III. CONCLUSION

For the reasons discussed above, the CPUC recommends that, for purposes of CAF Phase II funding for price cap carriers, the model should treat an area as unserved if

it lacks broadband with speeds of at least 6 Mbps/1.5 Mbps. The CPUC further recommends that an area served by a cable broadband provider with DOCSIS 3.0 or higher should be presumed to be served. Finally, if the FCC decides to consider fixed or mobile wireless service as a possible unsubsidized competitor, the CPUC recommends that such entities be required to show proof that they meet the necessary speed, capacity, latency, and price criteria for CAF Phase II. We appreciate this opportunity to comment on these matters and to share our experiences in collecting, validating, and analyzing provider data with the Commission.

Respectfully submitted,

FRANK R. LINDH
HELEN M. MICKIEWICZ
KIMBERLY J. LIPPI

By: /s/ KIMBERLY J. LIPPI

KIMBERLY J. LIPPI
Staff Counsel

Attorneys for the People of the
State of California and the
California Public Utilities
Commission

505 Van Ness Avenue
San Francisco, California 94102
Phone: (415) 703-5822
Fax: (415) 703-2262
Email: kjl@cpuc.ca.gov

March 28, 2013