

**BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF CALIFORNIA**

Order Instituting Investigation into the State of  
Competition Among Telecommunications  
Providers in California, and to Consider and  
Resolve Questions Raised in the Limited  
Rehearing of Decision 08-09-042

Investigation 15-11-007  
(Filed Nov. 5, 2015)

Testimony of

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Submitted as Supplemental Information Request Response

on Behalf of Writers Guild of America, West, Inc.

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3 **Introduction and Summary**

4 This testimony represents the Supplemental Response of the Writers Guild of America,  
5 West, Inc. (“WGAW”) to the California Public Utilities Commission (“CPUC” or  
6 “Commission”)’s Order Instituting Investigation to Assess the State of Competition Among  
7 Telecommunications Providers in California, and to Consider and Resolve Limited Rehearing of  
8 Decision 08-09-042, filed November 5, 2015 (“OII”), and in consideration of the clarifications  
9 and schedule laid out in the Administrative Law Judge’s February 4, 2016 Ruling on Pending  
10 Motions and Issues Discussed at January 20, 2016 Prehearing Conference (“February 4 Ruling”).  
11 Specifically, I submit this Supplemental Response on behalf of WGAW to Information Requests  
12 9 and 12:

- 13 • 9: “Please describe the extent to which wireless and wireline services are substitutes for  
14 one another, or separate markets, based on your experience and on such evidence and  
15 documentation that you can supply. Are there barriers to such substitution, and what are  
16 the limits of such substitution?”<sup>1</sup> Specifically, WGAW will comment on this question as  
17 related to high-speed broadband/data services.
- 18 • 12: “How much competition is there for advanced telecommunication services at the new

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<sup>1</sup> Order Instituting Investigation to Assess the State of Competition Among Telecommunications Providers in California, and To Consider And Resolve Limited Rehearing Decision (D.) 08-09-042 (Nov. 12, 2015) at B-4 (“OII”).

1 national standard of 25 Mbps down (and 3 Mbps up)?”<sup>2</sup>

2 As noted in the February 4 Ruling, the date for Supplemental Responses was intended to  
3 provide time for parties to analyze data provided in the course of the March 15, 2016 and April  
4 15, 2016 deadlines.<sup>3</sup> WGAW had intended to review and analyze the Form 477 broadband  
5 subscription data at the census block level to contribute to the above-listed questions. However,  
6 the May 3, 2016 Assigned Commissioner and Administrative Law Judge’s Ruling on TURN’s  
7 Motion to Compel, Comcast’s Objection to Writers Guild of America’s Acknowledgement,  
8 Outstanding Motions for Reconsideration, and Other Issues determined that WGAW’s  
9 Representatives could not have access to the Highly Confidential Information at issue in the  
10 proceeding. In light of this determination, I have produced an analysis of broadband deployment  
11 in California based on the most recent (data as of June 30, 2015) publically-available Form 477  
12 broadband deployment information from the Federal Communications Commission (“FCC”) in  
13 order to contribute to Question 12 which asks for an assessment of the amount of competition in  
14 the state for advanced telecommunications services at the 25 Mbps threshold.

15 This dataset, which illustrates broadband availability by census block, has certain  
16 limitations in what it can reveal regarding the level of broadband competition in California. It  
17 cannot entirely reflect, for instance, the relative levels of market power of the various market  
18 participants, because it does not indicate subscribership for the providers. While the data can be  
19 used to ascertain or approximate the number of broadband companies providing service  
20 (including at a certain speed or of a certain technology) to a given census block, the level of  
21 competition may also be exaggerated. For instance, data may reflect multiple providers in a  
22 given census block, but those providers may not serve the same households.

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<sup>2</sup> *Id.*

<sup>3</sup> Ruling on Pending Motions and Issues Discussed at January 20, 2016 Prehearing Conference (February 4, 2016) at 10.

1           Despite the inherent limitations of the publically available data, we believe that the data  
2 and the other commentary offered here illuminate a significant lack of competition for advanced  
3 telecommunication services in California, and one which the CPUC should make efforts to  
4 recognize and address in this proceeding.

5   **Q: What factors should the Commission consider when identifying relevant product**  
6 **markets and assessing competition in advanced telecommunications services in the context**  
7 **of this proceeding?**

8           In this proceeding, the CPUC seeks to evaluate competition in telecommunications  
9 markets in California.<sup>4</sup> The FCC’s reclassification of broadband as a telecommunications service  
10 in 2015<sup>5</sup> makes clear that this should include evaluation of competition in broadband markets.  
11 The OII takes guidance as well from the FCC’s update of broadband speed thresholds to 25  
12 Mbps downstream and 3 Mbps upstream,<sup>6</sup> and asks specifically whether wireless and wireline  
13 services are substitutes or separate product markets.<sup>7</sup> It is consistent with these parameters to  
14 adopt a view of competition and product market definitions that incorporate consideration of  
15 consumer behaviors. This is supported as well by guidelines used for identification and analysis  
16 of product markets in merger reviews. The Department of Justice and Federal Trade  
17 Commission’s Horizontal Merger Guidelines note that a “market definition focuses solely on  
18 demand substitution factors, i.e., on customers’ ability and willingness to substitute away from  
19 one product to another in response to a price increase or a corresponding non-price change such  
20 as a reduction in product quality or service.”<sup>8</sup> Specifically, the Commission should define

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<sup>4</sup> OII at 1-2.

<sup>5</sup> OII at 8, citing Protecting and Promoting the Open Internet, *Report and Order on Remand, Declaratory Ruling, and Order*, GN Docket No. 14-28, 30 FCC Rcd. 5601, 5610, 5615, ¶¶ 29, 47 (2015) (“*Open Internet Order*”).

<sup>6</sup> OII at 8.

<sup>7</sup> OII at B-4.

<sup>8</sup> U.S. Department of Justice and the Federal Trade Commission, *Horizontal Merger Guidelines* (Aug. 19, 2010) at 7, available at <https://www.justice.gov/sites/default/files/atr/legacy/2010/08/19/hmg-2010.pdf>.

1 competition in broadband as the availability of multiple connections that would support data-  
2 intensive broadband usage, such as online video viewing, video game playing and distance  
3 learning. These same qualifications should be used when identifying relevant product markets.

4 This is consistent with the FCC’s rationale for adopting the increased speed threshold of  
5 25 Mbps down/3 Mbps up when delineating the broadband services that would qualify as  
6 advanced telecommunications capability. The FCC noted that “[i]n reaching this finding, the  
7 Commission relied in particular on the expanding demand for online video services, increasing  
8 simultaneous usage of multiple devices in a single household, and growing adoption of 25  
9 Mbps/3Mbps services by consumers in areas where such services were available, among other  
10 trends.”<sup>9</sup> In addition, usage that pushes the capacity of high-speed broadband also promotes  
11 further investment and expansion, a well-recognized feature of the virtuous cycle.<sup>10</sup> High-  
12 bandwidth activities such as watching video, gaming, distance learning and real-time online  
13 collaboration necessitate fast, reliable broadband connections. Online video viewing is also one  
14 of the most prominent uses of the Internet – 70% of peak downstream traffic is now from  
15 streaming video and audio.<sup>11</sup> As the FCC confirmed, it is important to consider consumer  
16 behaviors such as the technologies and speeds that consumers are purchasing, not merely those  
17 that are available.

18 When taken together, these factors lead to an important differentiation between speeds  
19 and technology types when considering broadband markets. Many broadband technologies are

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<sup>9</sup> 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 Improvement Act, *2016 Broadband Progress Report*, GN Docket No. 15-191, ¶ 14 (2016) (“*2016 Broadband Progress Report*”).

<sup>10</sup> *Open Internet Order*, 30 FCC Rcd. at 5663, ¶ 142 (“As the *Verizon* court recognized, Internet openness drives a “virtuous cycle” in which innovations at the edges of the network enhance consumer demand, leading to expanded investments in broadband infrastructure that, in turn, spark new innovations at the edge.”).

<sup>11</sup> Press Release, Sandvine, *Over 70% Of North American Traffic Is Now Streaming Video And Audio* (Dec. 7, 2015), <https://www.sandvine.com/pr/2015/12/7/sandvine-over-70-of-north-american-traffic-is-now-streaming-video-and-audio.html>.

1 inadequate for high-capacity usage such as online video due to latency and consistency issues,  
2 pricing (particularly usage-based pricing) or other factors. The CPUC’s use of a 25 Mbps/3  
3 Mbps speed threshold is entirely appropriate in this regard, as are other distinctions discussed  
4 further below.

5         Though WGAW is not able to comment on this absent access to the subscriber-level  
6 Form 477 broadband data, it is important for the CPUC to also consider market power of the  
7 various participants when evaluating the level of competition in broadband markets. For  
8 instance, I contend below that DSL, unlike fiber, is an inadequate competitive restraint for  
9 incumbent cable providers. Through analysis of the subscriber information, the CPUC will be  
10 able to compare the respective market shares of DSL and fiber technologies to understand  
11 whether, despite widespread availability of DSL, that technology can command a competitive  
12 market share against cable or fiber.

13 **Q: To what extent are wireless and wireline services substitutes for one another, or**  
14 **separate markets, specifically in the context of broadband services?**

15         As noted above, WGAW appreciates the CPUC’s inclusion of this question in its  
16 evaluation of broadband competition in California, because such analysis must take into account  
17 the purposes for which consumers are utilizing these different types of connections. As the  
18 FCC’s transaction analysis notes, products are part of the same product market if consumers  
19 consider them to be “reasonably interchangeable for the same purpose.”<sup>12</sup> Though use of  
20 wireless or mobile broadband services is extremely prevalent, it is not a functional substitute for  
21 use of a wired broadband connection.

22         As an initial matter, discussion of mobile broadband can obscure the distinction between

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<sup>12</sup> Applicants of Charter Communications, Inc., Time Warner Cable Inc., and Advance/Newhouse Partnership for Consent to Assign or Transfer Control of Licenses and Authorizations, *Memorandum Opinion and Order*, MB Docket No. 15-149, ¶ 53 (2016) (“*Charter-TWC Order*”).

1 use of mobile devices (smartphones, tablets, etc.) and use of mobile or wireless broadband  
2 connections. Consumers may use their smartphones to access the Internet for a variety of  
3 purposes, but depending on the purpose, may shift their connection from a mobile service  
4 (cellular data) to a fixed one. The FCC has noted that the most high-capacity broadband  
5 activities, such as streaming video, generally take place using a fixed broadband connection.<sup>13</sup>  
6 The 2015 ARRIS Consumer Entertainment Index found that when viewing TV on a smartphone,  
7 tablet or laptop outside of the home, free wi-fi is the most-used option. Indeed, a domestic  
8 average of 74% of people who watch mobile TV at least once a week do so using a free Wi-Fi  
9 connection.<sup>14</sup> For those who don't watch TV outside of the home, the cost of data is the second  
10 most prevalent reason given after screen size.<sup>15</sup>

11 Cost provides a significant barrier to substitution in the context of online video and other  
12 data-intensive applications, particularly given the usage-based pricing and low data thresholds  
13 common to wireless. This continues to be true regardless of speed increases for wireless  
14 broadband. WGAW has previously documented the prohibitive cost of using a Verizon Wireless  
15 plan for an average month of television viewing, as opposed to a wired connection. Verizon  
16 currently charges \$20 per month for 2 GB of data for a tablet. Data plans for smartphones start at  
17 \$30 a month for 1 GB and \$15 for each GB over.<sup>16</sup> Using a mobile device to replace an average  
18 month of television viewing, currently 147 hours,<sup>17</sup> with HD video on a mobile network would

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<sup>13</sup> *2016 Broadband Progress Report* at ¶ 2.

<sup>14</sup> ARRIS, 2015 Consumer Entertainment Index – Global Results at 22 (July, 2015), *available at* <http://success.arris.com/arriscei>.

<sup>15</sup> *Id* at 23.

<sup>16</sup> *Data Only Plan*, Verizon, <http://www.verizonwireless.com/landingpages/data-only-plan/> (last visited May 16, 2016); *Verizon Plan*, Verizon, <http://www.verizonwireless.com/landingpages/verizon-plan/> (last visited May 16, 2016).

<sup>17</sup> Nielsen, *The Total Audience Report*, Q4 2015, at 20, tbl.3A (2016) (“Total Audience Report”) (data shows viewers spent 147 hours and 47 minutes watching live and DVR/time-shifted television per month).

1 require at least 147 GB of data for a tablet<sup>18</sup> and 35 GB a month for a smartphone.<sup>19</sup> Data costs  
2 would exceed \$710 for a tablet—the price for a 100 GB plan—and \$300 a month for a  
3 smartphone—the cost for a 40 GB plan.<sup>20</sup>

4 AT&T’s current pricing is similarly prohibitive. AT&T’s shared data plans (which are  
5 available for any devices) start at \$20 for 300 MB with overage charges of \$10 per additional  
6 300 MB. The next plan is \$30 for 2 GB with overage charges of \$15 per additional GB.<sup>21</sup> AT&T  
7 estimates that each hour of Standard Definition (“SD”) video streamed on either a smartphone or  
8 tablet uses 240 MB per hour and High Definition (“HD”) video uses 900 MB per hour.<sup>22</sup> Data  
9 costs would exceed \$300 monthly to replace an average month of television viewing with SD  
10 streaming (the price for a 40 GB plan). The same amount of television viewing with HD  
11 streaming would require nearly an additional 100 GB over AT&T’s highest-capacity shared data  
12 plan of 50 GB for \$375 per month, and the \$15 per 1 GB overage charge would add hundreds of  
13 dollars more. While AT&T ceased offering standalone “unlimited” wireless data plans in 2010,  
14 customers who had purchased these plans prior were allowed to remain on them. The monthly

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<sup>18</sup> *Data Calculator*, Verizon, <http://www.verizonwireless.com/b2c/splash/dataShareCalculator.jsp> (last visited May 16, 2016). Select “Tablet” on the “Add a Device” drop-down menu and scroll down to “How much data does a 4G Tablet use?” Verizon estimates that each hour of HD video streamed on a tablet uses 1 GB of data. To stream 147 hours of HD video on a tablet would require 147 GB of data.

<sup>19</sup> *Data Calculator*, Verizon, <http://www.verizonwireless.com/b2c/splash/dataShareCalculator.jsp> (last visited May 16, 2016). Select “Smartphone” on the “Add a Device” drop-down menu and scroll down to “How much data does a 3G/4G Smartphone use?” Verizon estimates that each hour of video streamed to a smartphone over a 3G network requires 250 MB of data and each hour of video streamed to a smartphone over a 4G network requires 350 MB of data. Streaming 147 hours of video over a 3G network would take 36,750 MB or 35.9 GB. Streaming 147 hours of video over a 4G network would take 51,450 MB or 50.2 GB.

<sup>20</sup> *Data Only Plan*, Verizon, <http://www.verizonwireless.com/landingpages/data-only-plan/> (last visited May 16, 2016); *Verizon Plan*, Verizon, <http://www.verizonwireless.com/landingpages/verizon-plan/> (last visited May 16, 2016).

<sup>21</sup> *Mobile Share Plans*, AT&T, <https://www.att.com/shop/wireless/data-plans.html> (last visited May 25, 2016).

<sup>22</sup> *Cell phone and device plans: Figure out your data needs*, AT&T, <https://www.att.com/att/planner/> (last visited May 25, 2016). Under Device 1 select Smartphone and then click “Estimate my monthly usage in detail,” repeat selecting “Tablet.” AT&T reports that for either device, streaming 147 hours of video in SD would take 35,280 MB or 34.5 GB of data. Streaming the same amount in HD would require 132,300 MB or 129.2 GB or data.

1 price for these plans is now \$35.<sup>23</sup> However, these customers can currently only use 22 GB of  
2 data during a billing period before being subject to “network management practices” (i.e.,  
3 throttling) that may severely limit speed and increase latency.<sup>24</sup> In other words, “unlimited”  
4 wireless data comes with many caveats, even in the case of T-Mobile’s Binge-On service, which  
5 purports to allow its customers unlimited streaming of participating video services. However, a  
6 closer examination reveals that utilizing this service involves throttling: customers must agree to  
7 “optimization” that reduces the quality of all video (not only the video of participating services)  
8 to a lower resolution, preventing HD-quality streaming.<sup>25</sup>

9         Given these costs and quality limitations, wireless Internet is not a competitive alternative  
10 to wired broadband, particularly for online video consumption. In the context of the recent  
11 Charter-Time Warner Cable-Bright House merger, the FCC analyzed confidential information  
12 from the companies involved and came to a substantially similar conclusion, noting, “For  
13 example, it would cost an average Netflix subscriber using the Applicants’ cable BIAS many  
14 hundreds of dollars each month to view that same Netflix programming over a wireless  
15 provider.”<sup>26</sup>

16         The FCC’s treatment of wireless or mobile broadband services in various contexts  
17 (regulatory and transaction-specific) is also instructive. Prior to the 2016 Broadband Progress  
18 Report, the FCC did not include mobile services in its findings on the availability of advanced  
19 telecommunication services, noting concerns over “the quality and reliability of the mobile and

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<sup>23</sup> Nicole Lee, *AT&T hiking price of unlimited data to \$35 a month*, Engadget (Nov. 30, 2015), <http://www.engadget.com/2015/11/30/att-unlimited-data-price-increase/> (unlimited plans are currently available for new customers only if bundled with DIRECTV or U-verse TV service).

<sup>24</sup> *Support / Unlimited Data – Data Speeds*, AT&T, <https://www.att.com/esupport/datausage/datausage.d.jsp> (last visited May 25, 2016).

<sup>25</sup> Jeremy Gillula, *EFF Confirms: T-Mobile’s Binge On Optimization is Just Throttling, Applies Indiscriminately to All Video* (Jan. 4, 2016), <https://www.eff.org/deeplinks/2016/01/eff-confirms-t-mobiles-bingeon-optimization-just-throttling-applies#results>.

<sup>26</sup> *Charter-TWC Order*, ¶ 56.

1 satellite service data, and also...concerns about other factors, such as latency concerns and usage  
2 allowances...”<sup>27</sup> In the 2016 Report, mobile services were included in the assessment of  
3 progress, but the FCC concluded that advanced telecommunications capability requires access to  
4 both fixed and mobile broadband because of the differing capabilities and manner in which the  
5 two types of services are “marketed to and used by consumers, and evidence suggesting that  
6 consumers overwhelmingly purchase both services when they have the financial means.”<sup>28</sup> The  
7 FCC reiterated that “[a]s they currently exist, fixed and mobile broadband services are not  
8 functional substitutes for one another...”<sup>29</sup>

9 In the context of the Charter-Time Warner Cable-Bright House merger, the FCC’s  
10 transaction review included the identification of relevant markets, and this resulted in a similar  
11 finding. The FCC noted that “as a general matter, consumers do not view wireless, satellite, or  
12 legacy DSL BIAS as close substitutes for cable or fiber BIAS offerings,”<sup>30</sup> citing again issues  
13 related to the differentiated use of wired and wireless services and the limitations of wireless  
14 plans for heavy data consumption due to data caps or usage-based billing.<sup>31</sup>

15 As affirmed by consumer behavior and WGAW’s and FCC’s analyses, wired and  
16 wireless broadband are not substitutable, particularly when data-intensive applications are  
17 considered, and thus should be considered separate product markets. Further, this indicates that  
18 wireless service does not provide competitive pricing pressure for fixed or wired high-speed  
19 broadband.

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<sup>27</sup> 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, *2015 Broadband Progress Report and Notice of Inquiry on Immediate Action to Accelerate Deployment*, GN Docket No. 14-126, 30 FCC Rcd. 1375, 1379, ¶ 9 (2015) (“*2016 Broadband Progress Report*”).

<sup>28</sup> *2016 Broadband Progress Report*, ¶ 24, internal citations omitted.

<sup>29</sup> *Id.*, ¶ 17.

<sup>30</sup> Charter-TWC Order, ¶ 50.

<sup>31</sup> *Id.*, ¶ 56.

1 **Q: Please describe the analysis carried out in order to respond to the CPUC’s question of**  
2 **how much competition there is for advanced telecommunications services at the new**  
3 **national standard of 25 Mbps down (and 3 Mbps up)?**

4 As noted above, lacking access to the Form 477 broadband subscription information, I  
5 instead utilized the most up-to-date publically available broadband deployment information: the  
6 June 30, 2015 dataset for the state of California from the FCC. This dataset contains broadband  
7 availability information by U.S. census block, including broadband providers, technology types  
8 and download and upload speeds offered, and whether the provider can or does offer  
9 consumer/residential service as opposed to business service. The dataset includes only census  
10 blocks that are served by a provider and excludes unserved blocks. Included in the dataset but  
11 excluded from my analysis were Fixed Wireless and Satellite broadband technologies and rows  
12 in which the provider indicated that “Provider cannot or does not offer consumer/mass  
13 market/residential service in the block.” The analyzed data, in other words, consisted of  
14 residential broadband service via DSL, copper, cable modem or fiber by census block.

15 This data was then analyzed to determine the level of competition in broadband in the  
16 state of California by assessing how much of the California population resides in census blocks  
17 containing zero, one, two, three, etc., providers of high speed broadband, and how that  
18 information differs when reviewed according to the technology provided as opposed to speed.

19 This data has several inherent limitations. For purposes of this analysis, a census block  
20 (and the population residing in the block according to the 2010 Census) is considered “served”  
21 by a given provider if that provider reports offering service anywhere in that census block. This  
22 is a likely overstatement of broadband availability as each provider may not offer service to all of  
23 the residents of that census block. It is likely also an overstatement of the level of competition, as

1 census blocks may appear as though they are served by two providers, but the providers may not  
2 offer service to the same homes.

3 In addition, a number of providers listed more than one and up to five service offering(s)  
4 for a given census block, meaning a separate line of data for each type of technology the provider  
5 purported to offer. In order to avoid counting these providers multiple times for each census  
6 block, my analysis reflected the fastest or maximum listed download and upload speeds and the  
7 technology type associated for a given provider in each census block.<sup>32</sup>

8 **Q: What were your findings regarding the level of competition in the state of California at**  
9 **25 Mbps download, 3 Mbps upload?**

10 The data illustrates clearly that there is very little competition for broadband services at  
11 the current FCC threshold of 25 Mbps or higher down/ 3 Mbps or higher up.

12 Table 1

<b>Number of Providers (Any Speed or Technology)</b>	<b>Population</b>	<b>% of Served CA Pop.</b>
1	2,261,453	6.2%
2	27,680,564	76.4%
3	4,939,747	13.6%
4	1,106,592	3.1%
5	216,370	0.6%
6	17,637	0.0%
7	2,916	0.0%
Total	36,225,279	100%

13  
14 While 76.4% of the served population of California resides in census blocks served by two  
15 providers of any speed or technology, 69.4% of the population have only one option for a

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<sup>32</sup> For instance, provider Sonic.Net provided up to five rows of data for a number of census blocks, appearing to indicate that it offered AxDSL, ADSL2 or 2+, VDSL, SxDSL and Optical Carrier/Fiber in a single block, with the listed Maximum Advertised Download speeds varying from 12 Mbps to 1000 Mbps. In this case, the data analysis would reflect a single provider offering Optical Carrier/Fiber technology with a maximum download speed of 1000 Mbps.

1 provider of 25 Mbps/3Mbps or faster broadband. 3.3% of the population resides in census blocks  
 2 with no provider of high-speed broadband at all, and just over one-quarter have access to two or  
 3 more competing high-speed providers.

4 Table 2

<b>Number of Providers (25 Mbps+/3 Mbps+ Only)</b>	<b>Population</b>	<b>% of Served CA Pop.</b>
0	1,212,856	3.3%
1	25,147,464	69.4%
2	9,221,216	25.5%
3	577,922	1.6%
4	61,746	0.2%
5	4,075	0.0%
Total	36,225,279	100.0%

5  
 6 To assess the state of competition with a forward-looking view, I also analyzed the  
 7 availability of broadband at a speed threshold of 100 Mbps or higher downstream and 3 Mbps or  
 8 higher upstream. Over 9% of the state population currently lacks access to such an offering.

9 Table 3

<b>Number of Providers (100 Mbps+/3 Mbps+ Only)</b>	<b>Population</b>	<b>% of Served CA Pop.</b>
0	3,323,528	9.2%
1	24,519,291	67.7%
2	8,030,494	22.2%
3	351,966	1.0%
Total	36,225,279	100.0%

10  
 11 I also reviewed the availability of 25 Mbps/3 Mbps broadband by county, as there is  
 12 significant variation in the proportion of the population with access to two or more 25 Mbps/3  
 13 Mbps or higher speed providers. For instance, in Riverside County, nearly 50% of the served  
 14 population has access to two high-speed providers. San Francisco County is by far the most

1 competitive county, with 54.3% of the population served by two providers and another 30.7%  
 2 served by three to five providers. However, in Los Angeles, the state's largest county, only  
 3 30.6% of the population is served by two providers, and other large and small counties are  
 4 similarly or even more uncompetitive. Several smaller counties are mostly or entirely unserved  
 5 by 25 Mbps/3 Mbps broadband, such as Plumas County, Mariposa County and Amador County.  
 6 Table 2 illustrates the five largest counties; a comprehensive chart can be found in Appendix A.

7 Table 4

<b>Number of Providers (25 Mbps+/3 Mbps+)</b>	<b>Population</b>	<b>% of County</b>
<b>Los Angeles County – 9,784,656</b>		
0	25,234	0.3%
1	6,676,818	68.2%
2	2,993,841	30.6%
3	88,763	0.9%
<b>Orange County – 2,982,305</b>		
0	29,746	1.0%
1	2,495,427	83.7%
2	451,933	15.2%
3	5,199	0.2%
<b>San Diego County – 2,979,954</b>		
0	48,801	1.6%
1	2,712,990	91.0%
2	210,815	7.1%
3	7,348	0.2%
<b>Riverside County – 2,143,658</b>		
0	35,576	1.7%
1	1,025,738	47.8%
2	1,065,165	49.7%
3	17,179	0.8%
<b>San Bernardino County – 1,984,718</b>		
0	52,688	2.7%
1	1,005,502	50.7%
2	914,271	46.1%
3	12,257	0.6%

8

1 **Q: Were there other aspects of the analysis that may be relevant for purposes of the**  
2 **Commission’s Investigation?**

3 It is also important to examine competition in California in terms of the availability of  
4 different technologies, because evidence illustrates that incumbent cable providers, who are  
5 responsible for the vast majority of high-speed broadband connections,<sup>33</sup> respond competitively  
6 to the availability of fiber, but not other technologies such as legacy DSL. The FCC explored and  
7 confirmed this in the recent Charter-TWC proceeding, noting, “Evidence in the record confirms  
8 that fiber, FTTP, and FTTN are reasonable substitutes for cable BIAS, while other technologies  
9 are not. The evidence shows that the Applicants alter their pricing and product offerings  
10 materially in response to FTTP and FTTN offerings from companies like Google (Google Fiber),  
11 Verizon (FiOS), and AT&T (U-verse) but not in response to other technologies.”<sup>34</sup> This  
12 conclusion was based on an analysis of the pricing behaviors of Charter and Time Warner Cable  
13 in areas where they competed with Verizon FiOS and AT&T U-verse. Given that the level of  
14 competition in broadband markets is determined not only by the number of providers offering  
15 service but by the technology offered, it is necessary to consider the availability of different  
16 broadband technologies in the state.

17 Though the data I analyzed in this proceeding does not distinguish FTTN from DSL,  
18 identifying “fiber” only as “fiber to the end user,” the dataset shows that California’s available  
19 DSL and other copper technologies are rarely able to provide high speeds. Eighty-six percent of  
20 the California population served by at least one DSL or copper provider can access speeds only  
21 up to 24 Mbps, while just 13.6% have access to DSL or copper that achieves speeds of 25 Mbps

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<sup>33</sup> FCC, Industry Analysis and Technology Division, Wireline Competition Bureau, Internet Access Services: Status as of December 31, 2014 (Mar. 2016) at 28-29 (finds that Cable Modem provides 86% of residential fixed connections of at least 25 Mbps upstream and 3 Mbps downstream).

<sup>34</sup> *Charter-TWC Order*, ¶ 57.

1 or greater. The most common DSL or copper speed is 18 Mbps, which is the maximum  
 2 DSL/copper speed available to 48.3% of the DSL and copper-served population. Though DSL  
 3 and copper technologies are broadly available, covering 83.1% of the state’s served population,  
 4 they generally do not provide a competitive alternative to cable and fiber.

5 Table 5 illustrates that the vast majority of California’s population resides in blocks  
 6 served by two or three providers including one or two cable or fiber providers and one or two  
 7 DSL or copper providers. The largest portion of the state (62.9% of the analyzed population) is  
 8 served by two providers, one of which offers either cable or fiber<sup>35</sup> and the other of which offers  
 9 either DSL or other copper technologies.<sup>36</sup> Another 10.3% are served by one cable provider and  
 10 two DSL or copper providers, and 13.4% are served by one cable provider and one fiber  
 11 provider.

12 Table 5

Total Providers	Technologies	Population	% of Served CA Pop.
2	1 Cable or Fiber and 1 DSL or Copper	22,791,464	62.9%
	1 Cable and 1 Fiber	4,839,133	13.4%
3	1 Cable and 2 DSL or Copper	3,726,192	10.3%
Total		31,356,789	86.6%

13  
 14 Tables 6 and 7 examine the subsets of California that may be considered more  
 15 competitive: census blocks served by fiber and census blocks served by three or more providers.  
 16 These tables illustrate the limits of competition for even these comparatively better-served  
 17 populations. Table 6 examines the fiber-served population, which consists just 15.3% of the  
 18 served California population, or 5.5 million people. Within that population, 87.1% resides in

<sup>35</sup> In this context, “Fiber” refers to “Optical Carrier/Fiber to the end user.” “Cable,” unless otherwise specified, indicates Cable Modem - DOCSIS 1, 1.1, 2.0, 3.0, or other Cable Modem.

<sup>36</sup> DSL refers to varieties of ADSL, VDSL and SDSL.

1 census blocks with just one other provider.

2 Table 6

Subset: Census Blocks Served by Fiber			
<b>Total Providers (inc. 1 or 2 Fiber)</b>	<b>Population</b>	<b>% of Subset</b>	<b>% of Served CA Pop.</b>
1	44,983	0.8%	0.1%
2	4,842,542	87.1%	13.4%
3	543,736	9.8%	1.5%
4	115,331	2.1%	0.3%
5	8,803	0.2%	0.0%
6	2,082	0.0%	0.0%
Total:	5,557,477	100.0%	15.3%

3  
4 Table 7 examines the population served by three or more providers. While 17.3% of  
5 California's population have access to three or more broadband providers, most (73.1%) of that  
6 population is served only by one cable or fiber provider. Overall, incumbent cable providers'  
7 dominance is rarely challenged by substantive competition from fiber or other overbuilders.

8 Table 7

Subset: Census Blocks Served by 3 or more providers (any speed or technology)			
<b>Number of Cable or Fiber Providers</b>	<b>Population</b>	<b>% of Subset</b>	<b>% of Served CA Pop.</b>
0	8,633	0.1%	0.0%
1	4,594,202	73.1%	12.7%
2	1,562,471	24.9%	4.3%
3	117,956	1.9%	0.3%
Total:	6,283,262	100.0%	17.3%

9  
10 In addition, WGAW isolated the five largest providers in the state by number of census  
11 blocks served, to examine their footprints by population, technology and speeds offered. AT&T  
12 has by far the largest footprint, covering 282,885 census blocks containing nearly 26.5 million  
13 people. However, for 62.6% of those residents, the fastest speed AT&T offers is 18 Mbps.

1 AT&T offers speeds above 25 Mbps downstream to under 1 million individuals, and the fastest  
 2 speed of 1000 Mbps are available to a population of less than 20,000. Its next lowest speed, 75  
 3 Mbps, is available to less than 200,000.

4 Verizon has a smaller footprint, and offers higher speeds across more of its served census  
 5 blocks. Its most commonly offered speed is 100 Mbps, available to 60% of its footprint by  
 6 population. Except for Charter Communications, the cable companies offer higher speeds than  
 7 the telco providers, and all three offer their top speed to the vast majority of their footprints.  
 8 Charter’s top speed of 100 Mbps is available to 98% of its served population, Time Warner  
 9 Cable’s 300 Mbps service is available to 90% of its served population, and Comcast’s 250 Mbps  
 10 service is available to 81%.

11 Table 8

Provider	Number of Census Blocks Served	Served Population:	Technologies Offered in Footprint:	Speed Range (Max Download):	Most Common Speed Offered:
AT&T	282,885	26,464,851	AxDSL ADSL2, ADSL2+ VDSL Optical Carrier/Fiber	0.768 Mbps – 1000 Mbps	18 Mbps (16,559,318)
Time Warner Cable	151,828	14,615,740	Cable Modem DOCSIS 3.0	50 Mbps – 300 Mbps	300 Mbps (13,078,655)
Comcast	129,254	11,822,826	Cable Modem DOCSIS 3.0	150 Mbps – 250 Mbps	250 Mbps (9,587,700)
Verizon <sup>37</sup>	85,273	7,925,150	AxDSL Optical Carrier/Fiber	0.768 Mbps – 100 Mbps	100 Mbps (4,753,721)
Charter	62,777	4,328,664	Cable Modem DOCSIS 1, 1.1 or 2.0 Cable Modem DOCSIS 3.0	30 Mbps – 100 Mbps	100 Mbps (4,257,348)

12  
 13 The CPUC should analyze these providers’ footprints in comparison to the Form 477  
 14 subscriber data in order to have a more complete picture of competition in high-speed

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<sup>37</sup> Verizon’s wired systems in California have been transferred to Frontier since this data was collected.

1 broadband. For instance, AT&T's footprint represents significant *availability* of primarily lower-  
2 speed broadband (below the national threshold), but its subscriber information may reveal a low  
3 market share for its lower speed technology because AT&T competes primarily with higher  
4 speed cable.

5 **Q: What are the implications for this analysis?**

6           This analysis definitively shows that there is very little competition in advanced  
7 telecommunications services in the state of California, with only a quarter of the state having  
8 access to two providers of broadband that meets the FCC's national threshold of 25 Mbps/3  
9 Mbps. Given the well-understood economics of overbuilding, a substantial increase in high-  
10 speed competition seems highly unlikely. This means that the existing level of competition is all  
11 that consumers can expect in terms of choice and downward pricing pressure.

1 **Statement of qualifications of Laura Blum-Smith**

2 My name is Laura Blum-Smith and my business address is 7000 West 3<sup>rd</sup> Street, Los  
3 Angeles, California 90048. I am a Senior Research and Policy Analyst for the Writers Guild of  
4 America, West Inc. Since joining WGAW in 2013 my work has focused substantially on  
5 telecommunications policy matters as they relate to screen and television writers' employment  
6 and business. My work has concerned telecommunications company mergers in particular. I have  
7 been responsible for a significant portion of WGAW's participation in the regulatory reviews of  
8 the Comcast-Time Warner Cable merger before the Federal Communications Commission, the  
9 New York Public Service Commission and the California Public Utilities Commission. I  
10 represented WGAW before this Commission in that proceeding. I assisted in the authoring of  
11 WGAW's *LA Consolidation: the Effects of the Comcast-Time Warner Cable Merger in Los*  
12 *Angeles* report (February 18, 2015). I have lead staff responsibility for WGAW's participation in  
13 the regulatory reviews of the Charter-Time Warner Cable merger at the FCC and the CPUC. In  
14 several areas of my work, I have been tasked with carrying out analysis of data obtained from  
15 both external and internal sources.

16 My education includes a Bachelor of Arts degree in History and Anthropology from  
17 Oberlin College (2009), and a Certificate of Completion from University of Southern  
18 California's Marshall School of Business, Office of Executive Education for its Understanding  
19 Finance & Accounting Online Program.

**DECLARATION IN SUPPORT OF TESTIMONY OF LAURA BLUM-SMITH**

I declare under penalty of perjury under the laws of the State of California that the foregoing testimony is my own and was prepared by me, and that the statements therein are true and correct to the best of my knowledge and belief.

Executed in Los Angeles, CA on this 26<sup>th</sup> day of May, 2016



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Laura Blum-Smith  
Senior Research & Policy Analyst  
Writers Guild of America, West, Inc.

# EXHIBIT A

## WGAW Methodology for California Broadband Deployment Analysis

I analyzed wireline broadband data to understand residential Internet service choices for residential consumers in California. The primary data set used was the state-level fixed broadband deployment data by census block for the state of California, taken from Form 477s filed with the Federal Communications Commission. I used the most recent available data – data as of June 30, 2015, version 2. I also utilized Census block population data from the 2010 Census. I analyzed provider availability at the census block level because it is the smallest geographic unit for which broadband data is publicly available. For purposes of this analysis, I consider the population of any census block in which a given provider reports service to be “served” by that provider however, that provider’s services may not be available to every household within a served block.

### 1. Data Sources

- a. State-Level Fixed Broadband Deployment Data for California, data as of June 30, 2015 (version 2, includes satellite):<sup>1</sup>
- b. Census block population for the state of California (Census File 1).<sup>2</sup>
- c. Census County Codes for California.<sup>3</sup>

### 2. Data Exclusions

- a. Transmission Technologies excluded from the analysis: Satellite, Terrestrial Fixed Wireless, Electric Power Line, All Other.<sup>4</sup>
- b. Consumers coded as 0 were excluded from the analysis (where 1= Provider can or does offer consumer/mass market/residential service in the block).
- c. Where a given broadband provider (by DBA Name) provided multiple rows of data for a given census block reflecting multiple technology types, the maximum or highest reported downstream and upstream speeds and related technology were used for analysis to avoid double-counting the number of provider options for that block.

### 3. Analysis of Broadband Service in California

- a. Totaled all broadband providers by census block regardless of speed or technology
- b. Created summary of all broadband providers by census block, broken out by speeds and isolating speeds of 25 Mbps downstream/3 Mbps upstream or faster.
- c. Created summary of all broadband providers by census block, broken out by technologies:<sup>5</sup>
  - Asymmetric xDSL
  - ADSL2, ADSL2+
  - VDSL
  - Symmetric xDSL<sup>6</sup>
  - Other Copper Wire

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<sup>1</sup> Broadband Deployment Data from FCC Form 477, California, Wireline Competition Bureau (CSV format June 30, 2015), <https://www.fcc.gov/general/broadband-deployment-data-fcc-form-477>.

<sup>2</sup> Missouri Census Data Center, Standard Summary File 1 (2010 Census) Extract Assistant, California, [http://mcdc.missouri.edu/cgi-bin/broker?\\_PROGRAM=websas.sf12010x\\_extract\\_menu.sas&\\_SERVICE=appdev&st=](http://mcdc.missouri.edu/cgi-bin/broker?_PROGRAM=websas.sf12010x_extract_menu.sas&_SERVICE=appdev&st=).

<sup>3</sup> US Census Bureau, 2010 FIPS Codes for Counties and County Equivalent Entities, <https://www.census.gov/geo/reference/codes/cou.html>

<sup>4</sup> Note: the CA data does not contain any Technologies coded as Electric Power Line or All Other.

<sup>5</sup> In the census blocks where providers reported multiple technologies and the fastest reported speeds were used, the technology may not have been identifiable in more specificity than the DSL/copper general category.

<sup>6</sup> The FCC data notes that Symmetric xDSL services are not typically marketed to residential end users. However, certain providers in this analysis (mainly Sonic.Net) report offering SxDSL to census blocks in which they can or do offer consumer/mass market/residential service. My analysis did not have the capacity to question this assertion.

- Cable Modem other than DOCSIS 1, 1.1, 2.0 or 3.0
  - Cable Modem DOCSIS 1, 1.1 or 2.0
  - Cable Modem—Docsis 3.0
  - Optical Carrier/Fiber to the End User
- b. Created subcategories of technology types, grouping DSL and Copper, All Cable and Fiber.

4. Dataset Overview

<b>California Dataset</b>	
California Population in Served Census Blocks <sup>7</sup>	36,225,279
Total Served Census Blocks	447,885

<b>Number of Providers (All Technology and Speeds)</b>		
Number of Providers	Population	%
1	2,261,453	6.2%
2	27,680,564	76.4%
3	4,939,747	13.6%
4	1,106,592	3.1%
5	216,370	0.6%
6	17,637	0.0%
7	2,916	0.0%
Total	36,225,279	100%

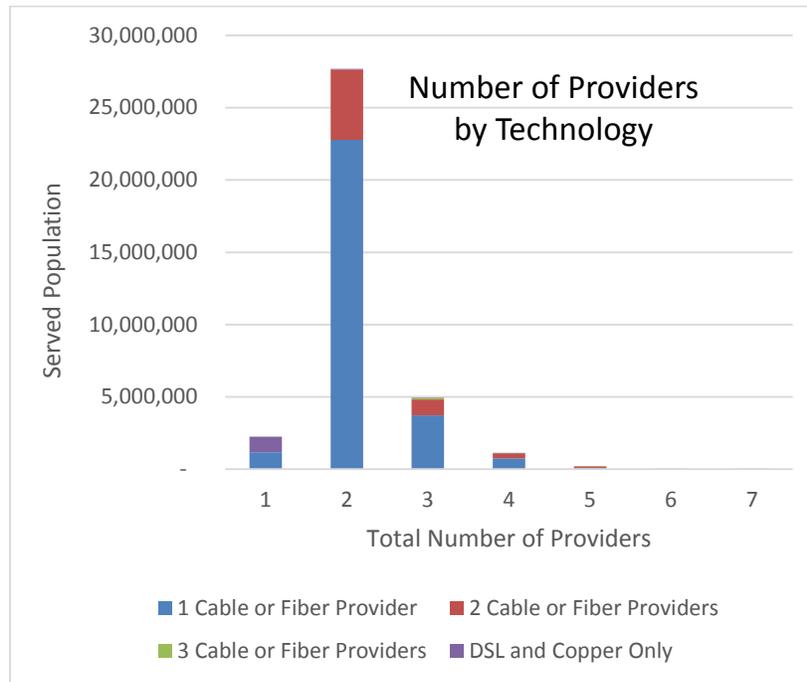
5. Analysis by Speed

<b>Number of Providers (Minimum 25 Mbps down/3 Mbps up)</b>		
Number of Providers	Population	%
0	1,212,856	3.3%
1	25,147,464	69.4%
2	9,221,216	25.5%
3	577,922	1.6%
4	61,746	0.2%
5	4,075	0.0%
Total	36,225,279	100%

<sup>7</sup> This analysis excludes the unserved population of CA, which is not included in the FCC's dataset.

<b>Number of Providers (Minimum 100 Mbps down/3 Mbps up)</b>		
<b>Number of Providers</b>	<b>Population</b>	<b>%</b>
0	3,323,528	9.2%
1	24,519,291	67.7%
2	8,030,494	22.2%
3	351,966	1.0%
Total	36,225,279	100%

6. Analysis by Technology



<b>Number of Providers by Technology - Detail</b>			
<b>Total Providers</b>	<b>Technologies</b>	<b>Population</b>	<b>% of Served CA Pop.</b>
1	1 Cable	1,124,776	3.1%
	1 DSL or Copper	1,091,694	3.0%
	1 Fiber	44,983	0.1%
2	1 Cable or Fiber and 1 DSL or Copper	22,791,464	62.9%
	1 Cable and 1 Fiber	4,839,133	13.4%
3	1 Cable and 2 DSL or Copper	3,726,192	10.3%
	2 Cable or Fiber and 1 DSL or Copper	1,098,276	3.0%
4	1 Cable and 3 DSL or Copper	762,090	2.1%
2 - 4	Other (2 to 4 providers; any technology combination not listed above)	509,748	1.4%
5 - 7	Other (5 to 7 providers; any technology)	236,923	0.7%
Total		36,225,279	100%

<b>Number of Cable and Fiber Providers</b>		
<b>Number of Providers</b>	<b>Population</b>	<b>% of CA Served Population</b>
0	1,129,291	3.1%
1	28,555,425	78.8%
2	6,422,607	17.7%
3	117,956	0.3%
Total	36,225,279	100%

<b>Number of Total Providers (Subset: Blocks Served by 2 or more Providers including 1 Cable or Fiber Provider and 1 or more DSL or Copper Provider)</b>			
<b>Number of Providers</b>	<b>Population</b>	<b>% of Subset</b>	<b>% of CA</b>
2	22,791,464	83.2%	62.9%
3	3,726,278	13.6%	10.3%
4	762,090	2.8%	2.1%
5	98,359	0.4%	0.3%
6	7,149	0.0%	0.0%
7	326	0.0%	0.0%
Total	27,385,666	100.0%	75.6%

<b>Number of Cable or Fiber Providers (Subset: Blocks Served by 3 or more Providers of any speed or technology)</b>			
<b>Number of Cable or Fiber Providers</b>	<b>Population</b>	<b>% of Subset</b>	<b>% of CA Served Population</b>
0	8,633	0.1%	0.0%
1	4,594,202	73.1%	12.7%
2	1,562,471	24.9%	4.3%
3	117,956	1.9%	0.3%
Total:	6,283,262	100.0%	17.3%

<b>Number of Providers (Subset: Blocks Served by Fiber)</b>			
<b>Total Providers (inc. 1 or 2 Fiber)</b>	<b>Population</b>	<b>% of Subset</b>	<b>% of CA Served Population</b>
1	44,983	0.8%	0.1%
2	4,842,542	87.1%	13.4%
3	543,736	9.8%	1.5%
4	115,331	2.1%	0.3%
5	8,803	0.2%	0.0%
6	2,082	0.0%	0.0%
Total:	5,557,477	100.0%	15.3%

<b>Speeds Offered by Population (Subset: Blocks Served by DSL or Other Copper)</b>			
<b>Maximum DSL or Copper Speed Available</b>	<b>Population</b>	<b>% of Subset</b>	<b>% of CA</b>
3 Mbps or slower	3,932,428	13.1%	11.3%
Under 25 Mbps	20,000,429	86.4%	71.8%
Over 25 Mbps	4,842,542	13.4%	40.1%
18 Mbps (most common speed)	14,529,036	48.3%	10.9%
Total:	30,087,919	100%	83.1%

7. Review of Five Largest Providers<sup>8</sup>

<b>Provider</b>	<b>Number of Census Blocks Served</b>	<b>Served Population:</b>	<b>Technologies Offered in Footprint:</b>	<b>Speed Range (Max Download):</b>	<b>Most Common Speed offered (by population):</b>
AT&T	282,885	26,464,851	AxDSL ADSL2, ADSL2+ VDSL Optical Carrier/Fiber	0.768 Mbps – 1000 Mbps	18 Mbps (16,559,318)
Time Warner Cable	151,828	14,615,740	Cable Modem DOCSIS 3.0	50 Mbps – 300 Mbps	300 Mbps (13,078,655)
Comcast	129,254	11,822,826	Cable Modem DOCSIS 3.0	150 Mbps – 250 Mbps	250 Mbps (9,587,700)
Verizon	85,273	7,925,150	AxDSL Optical Carrier/Fiber	0.768 Mbps – 100 Mbps	100 Mbps (4,753,721)
Charter	62,777	4,328,664	Cable Modem DOCSIS 1, 1.1 or 2.0 Cable Modem DOCSIS 3.0	30 Mbps – 100 Mbps	100 Mbps (4,257,348)

<sup>8</sup> As measured by number of census blocks served.

8. Breakdown of High-Speed Providers by County:

Number of Providers (25 Mbps/3 Mbps)	Population	% of County
<b>Alameda County - 1,493,479</b>		
0	22,114	1.5%
1	926,250	62.0%
2	523,887	35.1%
3	21,228	1.4%
<b>Alpine County – 862</b>		
0	739	85.7%
1	102	11.8%
2	21	2.4%
<b>Amador County – 35,731</b>		
0	26,409	73.9%
1	9,254	25.9%
2	68	0.2%
<b>Butte County – 206,398</b>		
0	13,267	6.4%
1	193,131	93.6%
<b>Calaveras County – 40,066</b>		
0	8,051	20.1%
1	30,234	75.5%
2	1,781	4.4%
<b>Colusa County – 12,452</b>		
0	4,981	40.0%
1	7,418	59.6%
2	53	0.4%
<b>Contra Costa County – 1,034,672</b>		
0	9,702	0.9%
1	677,635	65.5%
2	295,885	28.6%
3	50,425	4.9%
4	1,025	0.1%
<b>Del Norte County – 27,055</b>		
1	27,055	100.0%
2	-	0.0%
<b>El Dorado County – 165,676</b>		
0	27,497	16.6%
1	136,770	82.6%

Number of Providers (25 Mbps/3 Mbps)	Population	% of County
2	1,409	0.9%
<b>Fresno County – 881,115</b>		
0	83,109	9.4%
1	763,908	86.7%
2	34,098	3.9%
<b>Glenn County – 23,237</b>		
0	5,186	22.3%
1	17,809	76.6%
2	242	1.0%
<b>Humboldt County – 113,012</b>		
0	7,424	6.6%
1	105,075	93.0%
2	513	0.5%
<b>Imperial County – 158,840</b>		
0	12,463	7.8%
1	146,377	92.2%
<b>Inyo County – 15,655</b>		
0	822	5.3%
1	14,833	94.7%
<b>Kern County – 773,159</b>		
0	45,811	5.9%
1	705,180	91.2%
2	22,168	2.9%
<b>Kings County – 121,760</b>		
0	14,803	12.2%
1	102,430	84.1%
2	4,527	3.7%
<b>Lake County – 58,747</b>		
0	4,446	7.6%
1	54,301	92.4%
<b>Lassen County – 18,402</b>		
0	4,325	23.5%
1	14,077	76.5%
<b>Los Angeles County – 9,784,656</b>		
0	25,234	0.3%
1	6,676,818	68.2%

Number of Providers (25 Mbps/3 Mbps)	Population	% of County
2	2,993,841	30.6%
3	88,763	0.9%
<b>Madera County – 132,647</b>		
0	33,453	25.2%
1	92,147	69.5%
2	7,047	5.3%
<b>Marin County – 245,036</b>		
0	7,918	3.2%
1	145,485	59.4%
2	90,088	36.8%
3	1,545	0.6%
<b>Mariposa County – 14,863</b>		
0	14,832	99.8%
1	31	0.2%
<b>Mendocino County – 69,427</b>		
0	9,226	13.3%
1	28,900	41.6%
2	31,301	45.1%
<b>Merced County – 235,145</b>		
0	25,878	11.0%
1	198,364	84.4%
2	10,903	4.6%
<b>Modoc County – 3,686</b>		
0	3,686	100.0%
<b>Mono County – 9,049</b>		
0	7,645	84.5%
1	1,404	15.5%
<b>Monterey County – 385,306</b>		
0	101,039	26.2%
1	272,375	70.7%
2	11,892	3.1%
<b>Napa County – 129,324</b>		
0	5,183	4.0%
1	95,393	73.8%
2	28,375	21.9%
3	373	0.3%
<b>Nevada County – 88,722</b>		
0	18,079	20.4%

Number of Providers (25 Mbps/3 Mbps)	Population	% of County
1	69,537	78.4%
2	1,106	1.2%
<b>Orange County – 2,982,305</b>		
0	29,746	1.0%
1	2,495,427	83.7%
2	451,933	15.2%
3	5,199	0.2%
<b>Placer County – 332,902</b>		
0	29,627	8.9%
1	207,278	62.3%
2	92,705	27.8%
3	3,292	1.0%
<b>Plumas County – 12,282</b>		
0	12,282	100.0%
<b>Riverside County – 2,143,658</b>		
0	35,576	1.7%
1	1,025,738	47.8%
2	1,065,165	49.7%
3	17,179	0.8%
<b>Sacramento County – 1,397,520</b>		
0	41,024	2.9%
1	917,484	65.7%
2	391,176	28.0%
3	46,731	3.3%
4	1,105	0.1%
<b>San Benito County – 51,694</b>		
0	4,115	8.0%
1	46,088	89.2%
2	1,491	2.9%
<b>San Bernardino County – 1,984,718</b>		
0	52,688	2.7%
1	1,005,502	50.7%
2	914,271	46.1%
3	12,257	0.6%
<b>San Diego County – 2,979,954</b>		
0	48,801	1.6%
1	2,712,990	91.0%
2	210,815	7.1%

Number of Providers (25 Mbps/3 Mbps)	Population	% of County
3	7,348	0.2%
<b>San Francisco County – 804,952</b>		
0	2,859	0.4%
1	117,728	14.6%
2	436,824	54.3%
3	194,158	24.1%
4	49,322	6.1%
5	4,061	0.5%
<b>San Joaquin County – 656,832</b>		
0	25,003	3.8%
1	608,331	92.6%
2	23,498	3.6%
<b>San Luis Obispo County – 250,583</b>		
0	17,094	6.8%
1	232,913	92.9%
2	576	0.2%
<b>San Mateo County – 714,713</b>		
0	13,539	1.9%
1	317,480	44.4%
2	276,877	38.7%
3	96,657	13.5%
4	10,146	1.4%
5	14	0.0%
<b>Santa Barbara County – 404,947</b>		
0	11,157	2.8%
1	389,056	96.1%
2	4,734	1.2%
<b>Santa Clara County – 1,740,945</b>		
0	39,388	2.3%
1	1,258,975	72.3%
2	424,291	24.4%
3	18,198	1.0%
4	93	0.0%
<b>Santa Cruz County – 252,836</b>		
0	7,195	2.8%
1	128,156	50.7%
2	111,225	44.0%
3	6,205	2.5%

Number of Providers (25 Mbps/3 Mbps)	Population	% of County
4	55	0.0%
<b>Shasta County – 164,287</b>		
0	30,292	18.4%
1	133,607	81.3%
2	388	0.2%
<b>Sierra County – 1,683</b>		
0	1,630	96.9%
1	53	3.1%
<b>Siskiyou County – 37,879</b>		
0	37,879	100.0%
<b>Solano County – 393,914</b>		
0	10,911	2.8%
1	340,739	86.5%
2	41,789	10.6%
3	475	0.1%
<b>Sonoma County – 472,193</b>		
0	11,070	2.3%
1	169,801	36.0%
2	286,462	60.7%
3	4,860	1.0%
<b>Stanislaus County – 500,855</b>		
0	18,279	3.6%
1	461,587	92.2%
2	20,989	4.2%
<b>Sutter County – 90,717</b>		
0	4,678	5.2%
1	84,665	93.3%
2	1,374	1.5%
<b>Tehama County – 54,989</b>		
0	20,894	38.0%
1	34,095	62.0%
<b>Trinity County - 574</b>		
0	574	100.0%
<b>Tulare County – 403,836</b>		
0	123,008	30.5%
1	266,170	65.9%
2	14,658	3.6%
<b>Tuolumne County – 45,812</b>		

<b>Number of Providers (25 Mbps/3 Mbps)</b>	<b>Population</b>	<b>% of County</b>
0	8,906	19.4%
1	36,906	80.6%
<b>Ventura County – 816,401</b>		
0	10,150	1.2%
1	468,771	57.4%
2	337,479	41.3%
3	1	0.0%
<b>Yolo County – 188,287</b>		
0	13,684	7.3%

<b>Number of Providers (25 Mbps/3 Mbps)</b>	<b>Population</b>	<b>% of County</b>
1	120,965	64.2%
2	50,601	26.9%
3	3,028	1.6%
<b>Yuba County – 64,841</b>		
0	7,485	11.5%
1	54,666	84.3%
2	2,690	4.1%
<b>Total</b>	<b>36,225,279</b>	<b>100.0%</b>