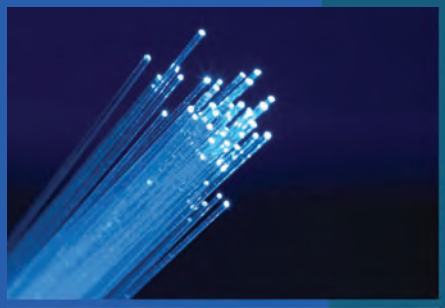
CALIFORNIA PUBLIC UTILITIES COMMISSION

Communications Division

Annual Report to the Governor and the Legislature

Annual DIVCA Report

For the Year Ending December 31, 2017



The Digital Infrastructure and Video Competition Act of 2006

"...the state should establish a state-issued franchise authorization process that allows market participants to use their networks and systems to provide video, voice, and broadband services to all residents of the state . . ." DIVCA 5810

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The Digital Infrastructure and Video Competition Act (DIVCA) was signed into law in 2006, transfering responsibility for issuing cable television franchises from cities and counties to the California Public Utilities Commission (CPUC or Commission). State Video Franchise (SVF) Holders are required to provide certain information to the Commission by April 1 annually and the Commission is required to submit this Report to the Governor and the Legislature each year by December 31 based on year-end data, on an aggregated basis.[1]

This Report provides such aggregated data for the year ending December 31, 2017. In addition, because it has been ten years since full implementation of DIVCA,[2] this Report will also provide historic data showing the trends in holders' video and broadband data over time.

1. Executive Summary

On September 29, 2006, the Governor signed into law Assembly Bill 2987, the Digital Infrastructure and Video Competition Act of 2006 (DIVCA).[3] DIVCA's goals are to promote rapid, widespread competition in the broadband and video markets and accelerate the deployment of additional infrastructure in California. The CPUC implements parts of DIVCA, primarily by issuing state video franchises. Other aspects of DIVCA are delegated to local entities or the courts.

The data presented in this Report were collected as provided in DIVCA. The analysis in the report relates to the twin goals described above. Data contained in this report show that substantially more California households now have a greater choice of video providers than in 2007. Most of the growth in video choice occurred during the first five years after

[1] Cal. Pub. Util. Code § 914.3.

[2] Although new entrants could apply for state video franchises beginning in 2007, incumbent cable companies could not apply until 2008.

[3] A.B. 2987, Ch. 700, Stats. 2006.; Cal. Pub. Util. Code, §§5800 – 5970 - Digital Infrastructure and Video Competition Act of 2006 (DIVCA).

implementation of state video franchising. While some households still lack video service entirely, other households have a choice of three (or in some cases four) video providers.[4]

During the first five years after the passage of DIVCA, Verizon (now Frontier) was required to deploy video to a minimum of 40% of the households in its telephone service territory and AT&T was required to deploy video service to 50% of the households in its telephone service territory. During 2017, AT&T and Frontier increased their combined deployment of video services by 3% (approximately 230,000 Households) to 8.01 million households, 61.5% of the 13.02 million households in the state. At the end of 2017, AT&T and Frontier exceeded their combined statutorily required deployment levels by 19.7% or approximately 1.3 million households.

State-wide video deployment increased by 75.6% between 2007 and 2017, but during this ten-year-period, video subscribership decreased by 8.9% (628,695) to 6.45 million subscribers in 2017. In 2017, the number of households offered video (deployment) increased by 1.7%.

Broadband deployment by incumbent local exchange carriers (ILECs) & small local exchange carriers (LECs) increased by 1.1% (129,226) to 12.2 million households during 2017, while broadband deployment by incumbent cable providers increased by 0.5% (56,698) to 12.3 million households.

Broadband connections (also referred to as subscriptions) increased by 2.8% (296,000) during 2017 to 11 million. Between 2010 and 2017, broadband connections increased by 23.3% (2.1 million) to 11 million. During this time period, ILEC & small LEC broadband connections declined by 19.2% (840,446), while incumbent cable subscribers increased by 62.7% (2.8 million).

[4] Linear video is a television service where the viewer must watch a scheduled program at the time it is offered, and on the "channel" it is presented, or recorded for later viewing. Alternatives to this are Over-The-Top (OTT) streaming services, digital video recorders (DVRs) and video-on-demand services. Broadband providers are not required to have an SVF in orderahybe to provide video service on an OTT basis.

Gross video revenues form the basis upon which the CPUC's Annual Fee is allocated among all franchise Holders. Gross video revenues include all revenue related to the sale of video services, such as video advertising revenue. Gross video revenues also form the basis upon which local entities can collect both franchise fees and Public Educational and Governmental Access fees (PEG fees). Franchise fees may not exceed 5% of gross video revenues, and PEG fees may not exceed 1% of gross video revenues.

Gross video revenues peaked in 2015 at $6.5 billion and have remained at that level through 2017. Because of trends in the video market, such as cord cutting, smaller video bundles and increasing Over-the-Top video streaming services, the amount of franchise fees and PEG fees that cities and counties collect could begin to see actual declines in the future.

Several technology-related developments are noteworthy in the way broadband deployment has evolved over the past few years in California. First is the large increase in the deployment by ILECs of asynchronous digital subscriber line 2 (aDSL2) and aDSL2+ that was reported in 2017, as well as a significant increase in the deployment of very-high-bit-rate digital subscriber line (vDSL) technology. Each of these technologies support substantial potential increases in broadband speeds compared to aDSL, which was the telephone industry standard as recently as 2014.

A second technology-related development in broadband deployment is the reported shift by incumbent cable companies from Docsis 3.0 to Docsis 3.1, technology which can support multi-gigabit broadband speeds. During 2017, incumbent cable companies upgraded 35.5% (4.4 million) of their embedded base of customers to Docsis 3.1. Third, is the 44% increase in deployment of Fiber-to-the-home (or FTTH), which was reported in 2017. FTTH will also support the introduction of multi-gigabit broadband speeds as needed in the future and is being deployed by each industry segment.

The five largest state video franchise holders reported a total of 35,132 employees in California, as of December 31, 2017. In aggregate, the total number of people employed by all the State Video Franchise (SVF) Holders declined by 4.6% (-1,683) to 35,132 during 2017. Between 2007 and 2017, the total number of employees declined by 28.9% (-14,295).

2. DIVCA Overview

A. Implementation

The DIVCA statute provides that the CPUC is the sole franchising authority for issuing state video franchises[5] (SVF) and prohibits the Commission from imposing requirements on state-issued franchise holders not expressly provided by DIVCA.[6]

DIVCA expressly provides authority to the Commission in the following areas:

- Issuing and renewing 10-year video franchises;[7]
- Gathering data from state-issued video franchise holders on their deployment of video and broadband services on an annual basis;[8]
- Aggregating data submitted by holders for use in an Annual Report from the CPUC to the Governor and Legislature;[9]
- Verifying that holders of video franchises have complied with build-out and anti-discrimination requirements;[10]
- Enforcing the prohibition of telco-video cross-subsidization;[11]
- Collecting fees from video franchise holders to equal the cost of carrying out its duties.[12]

As of December 2017, the CPUC has issued 55 state video franchises and 197 amendments to those franchises. A full list of SVF Holders is available on the CPUC website in the Video Franchising section of the Communications Division's webpage at: http://www.cpuc.ca.gov/General.aspx?id=2134. The methods of video, broadband and

[5] Cal. Pub. Util. Code § 5840(a).

[6] The statute also provides that a "holder of a state franchise shall not be deemed a public utility as a result of providing video service under this division," and SVF Holders otherwise operating as public utilities may be subject to public utility requirements.

[7] Cal. Pub. Util. Code § 5840 (a).

[8] Cal. Pub. Util. Code § 5960 (b).

[9] Cal. Pub. Util. Code § 914.3.

[10] Cal. Pub. Util. Code § 5890.

[11] Cal. Pub. Util. Code §§ 5940, 5950. See Decision Adopting a General Order and Procedures to Implement the Digital Infrastructure and Video Competition Act of 2006 at p. 174 [D. 07-03-014] (2007) (Phase 1 Decision). See pp. 15-16 of the 2013 DIVCA Report for a discussion of the telco-video cross-subsidization issue.

[12] Cal. Pub. Util. Code § 5810(a)(3).

employment data and the history of DIVCA are described in prior DIVCA reports.[13]

The next sections of this Report summarize data as of December 31, 2017 relating to video and broadband services that were provided by state-issued video franchise holders and their local affiliates in response to the statutory requirements of DIVCA. While the first state video franchises were granted in 2007, incumbent cable operators could not apply for franchises until 2008. Thus, this Report marks the tenth full year since DIVCA was implemented. Accordingly, in addition to our 2017 snapshot, we also present, where possible, data from each year since 2007.[14]

The Commission was directed to provide aggregated data in this Report. Staff's analysis aggregates video data by the type of entity holding a SVF into several industry segments. Entities are categorized as ILECs (which includes both rate-of-return regulated LECs (sometimes referred to as small or rural LECs) and incumbent cable companies. In addition, we include data for a group of new entrants (neither LECs nor incumbent cable companies), that have entered the video marketplace since DIVCA implementation began, typically using fiber-to-the-home (FTTH) technology. Grouping our analysis in this fashion will also help illustrate DIVCA's impact over time.

2. Video Information Submitted by SVF Holders for the Year Ending December 31, 2017

Among the information SVF Holders report is the number of households to which they offer video service and the number of households subscribing to their video service. This Section will present this data for each of these subjects, at the appropriate level of aggregation, as of December 31, 2017.

[13] See DIVCA Report, year ending December 31st, 2016, Appendices A through E; http://www.cpuc.ca.gov/General.aspx?id=2241. Further, the limitations and challenges of broadband data collection and reporting are described in the California Broadband Data Processing and Validation document available at: ftp://ftp.cpuc.ca.gov/telco/BB%20Mapping/California%20Broadband%20Validation%20Methods%20-%20Version%20FINAL.pdf.

[14] The number of years for which historic data is presented in this Report varies. In some circumstances, the Commission changed the data collection format, precluding valid year-to-year comparison.

A. Households Offered Video and Households Subscribing to Video by Industry Segment for 2017

SVF Holders report video data annually at the census tract level. The table below shows data reported as of year-end 2017, for the total number of households in census tracts in which video service was provided, the number of households in each census tract actually offered video, and the number of households subscribing to video. At the end of 2017, there were 13,113,840 households in the state. The totals below show many more households, and households offered video than there are in the state due to the fact that there can be multiple video providers in the same census tracts.

2017 Video Data Summary

Provider Type	Total HH in Census Tracts where Video is Offered	HH Actually Offered Video	HH Subscribing to Video
ILEC & Small LEC	14,272,274	8,243,924	1,108,172
Incumbent Cable	16,310,562	15,000,194	5,337,420
New Entrant	1,415,504	21,449	1,131
Grand Total	**31,998,340**	**23,265,567**	**6,446,723**

The New Entrants combined represent less than 0.1% of the households offered video, and less than 0.02% of the total number of video subscribers in the state. Even in 2017, ILECs/small LECs and incumbent cable companies still clearly dominate the environment with regard to state-issued video franchisees.

B. Households Offered Video by Industry Segment Since DIVCA was Implemented

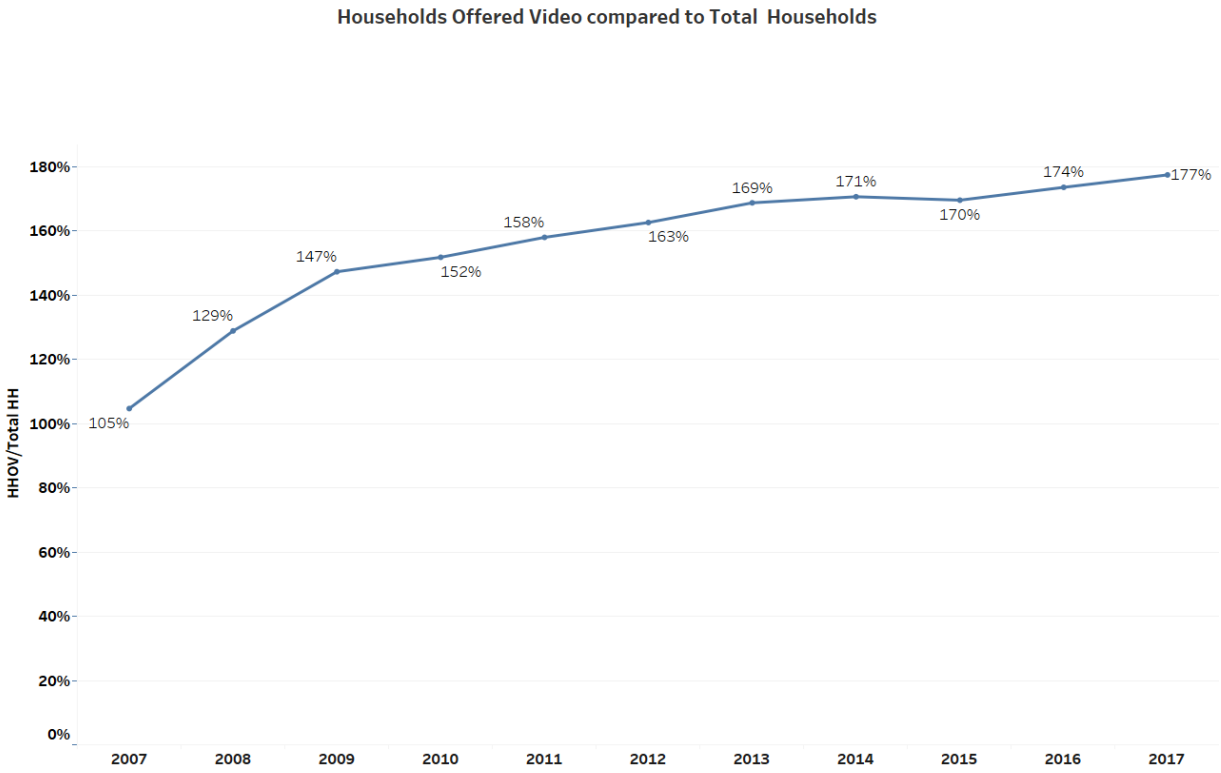
Because DIVCA provides for video data to be reported at the census tract level, it isn't possible to know precisely which households within a census tract are offered video and thus how many households have a choice of multiple providers. However, the following table and graph illustrate an index that is useful as a proxy for the increase in video competition under DIVCA over time. The table below shows the total number of households offered video each year divided by the total number of households in the state, resulting in a ratio of video offerings per

household. In 2007, this ratio (105%) indicates that very few California households were offered video by more than one company. By 2017, the ratio increased to 177%, indicating that on average, substantially more California household now have a greater choice of video providers than in 2007. While some households still lack video service entirely, other households have a choice of three (or in some cases four) video providers.

Most of the growth in this ratio occurred in the first five years after implementation of state video franchising. During the first five years after the passage of DIVCA, Verizon (now Frontier) was required to deploy video service to a minimum of 40% of the households in its telephone service territory. AT&T was required to deploy video service to a minimum of 50% of the the households in their telephone service territory. During 2017 the number of households offered video increased by 3.0%.

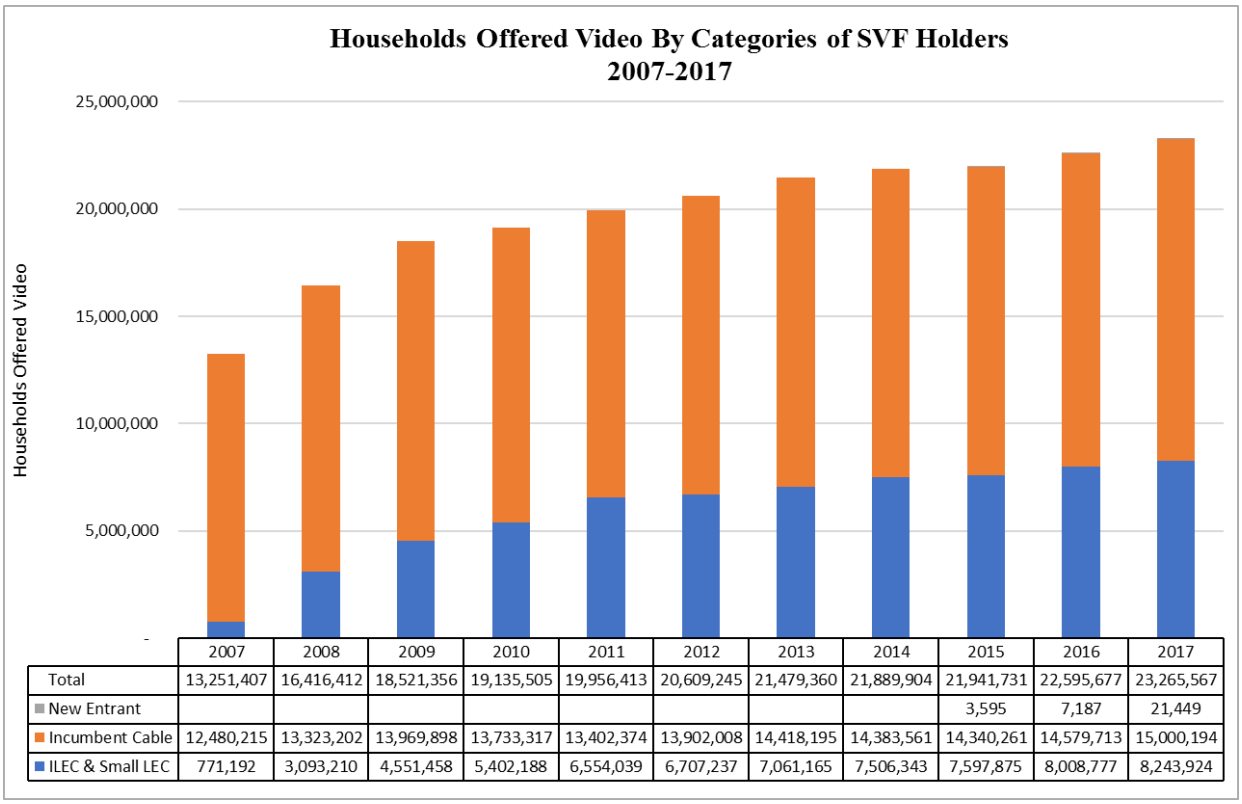
Households Offered Video Compared to Total Households

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
HHOV	13,251,407	16,416,412	18,521,356	19,135,840	19,956,413	20,609,245	21,479,360	21,889,904	21,941,731	22,595,677	23,265,567
Total Households	12,661,670	12,741,883	12,577,498	12,609,150	12,633,403	12,675,876	12,731,223	12,830,035	12,941,948	13,020,413	13,113,840
Ratio (HHOV/HH)	105%	129%	147%	152%	158%	163%	169%	171%	170%	174%	177%



The graphic below breaks down households offered video by the type of entity providing the service, i.e., incumbent telephone companies, incumbent cable companies, and other providers of video service with an SVF since DIVCA was enacted. The table shows the rapid ramp up of households offered video from the first activity in 2007, through the initial 5-year buildout followed by slower growth since that time. In 2017, ILEC/small LECs' portion of the total households offered video (HHOV) in the state was 35.5%. In 2007, their portion was only 5.8%.

At the same time, incumbent cable operators increased their offered households modestly from 12.5 million to 15 million between 2007 and 2017. Beginning in 2015, a new group of SVF Holders (New Entrants) began to offer video service, generally through newly-constructed fiber to the home projects. Because of the small number of households offered video service by these new entrants, however, their presence is barely visible in the bar chart.



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total	13,251,407	16,416,412	18,521,356	19,135,505	19,956,413	20,609,245	21,479,360	21,889,904	21,941,731	22,595,677	23,265,567
New Entrant									3,595	7,187	21,449
Incumbent Cable	12,480,215	13,323,202	13,969,898	13,733,317	13,402,374	13,902,008	14,418,195	14,383,561	14,340,261	14,579,713	15,000,194
ILEC & Small LEC	771,192	3,093,210	4,551,458	5,402,188	6,554,039	6,707,237	7,061,165	7,506,343	7,597,875	8,008,777	8,243,924

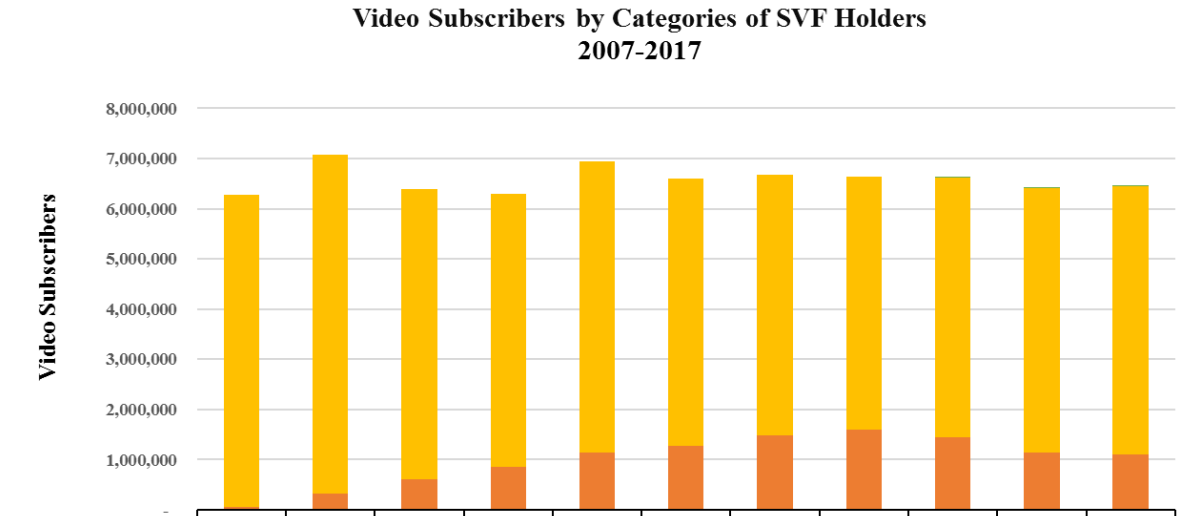
C. Households Subscribing to Video Services by Industry Segment

In addition to households offered video, franchise holders also report their video subscribership by census tract. The graphic below aggregates video subscribership since DIVCA was implemented. It shows that during 2017, traditional wireline bundled linear video[15] subscribership in California increased by 0.5% (33,671) to 6.45 million subscribers. Since the peak of video subscribership in 2008 (7.1 million), video subscribership has decreased by 8.9% (628,695).

Aggregation of video subscriber data by industry segment shows that incumbent cable companies' customer base stabilized in 2012, after seemingly losing customers to the phone companies beginning in 2007, as the phone companies built out their video networks following the implementation of state video franchising. After 2011, the video subscriber base for phone

[15] Linear video is a television service where the viewer must watch a scheduled program at the time it is offered, and on the "channel" it is presented, or recorded for later viewing. Alternatives to this are Over-The-Top (OTT) streaming services, digital video recorders (DVRs) and video-on-demand services. Broadband providers are not required to have an SVF in order to provide video service on an OTT basis.

companies continued to grow through 2014, followed by significant declines from 2014 through 2017.



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total	6,284,297	7,077,445	6,391,733	6,302,133	6,948,011	6,592,036	6,672,145	6,638,498	6,623,509	6,415,079	6,446,723
New Entrant									190	240	1,131
Incumbent Cable	6,221,443	6,754,623	5,786,130	5,441,727	5,807,055	5,317,519	5,179,966	5,034,117	5,184,080	5,263,289	5,337,420
ILEC & Small LEC	62,854	322,822	605,603	860,406	1,140,956	1,274,517	1,492,179	1,604,381	1,439,239	1,151,550	1,108,172

D. Pricing and Income Aspects of Video Deployment and Subscribership

DIVCA does not provide for the collection of pricing information relating to video services, so we are unable to analyze such data here.[16] Staff has attempted to shed light on pricing issues, and issues related to income distribution of video services in two ways. First, we have calculated the average revenue per video subscriber (ARPU) over time using the reported number of video subscribers (discussed above) and total gross video revenue data (discussed below). ARPU does not equate to the price of basic video service, since gross video revenues include additional revenue streams, including subscriptions to premium video services (such as HBO, Showtime, etc.) and advertising revenue. Nevertheless, ARPU as calculated shows the average revenue stream attributable to each video subscriber. The table below indicates that on average, customers of SVF Holders are spending about $90/month for their video service.

[16] This year the CPUC opened a proceeding to examine issues related to the affordability of utility and communications services. See, Order Instituting Rulemaking to Establish a Framework and Processes for Assessing the Affordabilty of Utility Service, R.18-07-006 (July 12, 2018).

Increasingly, however, SVF Holders' customers are reported to be purchasing over-the-top (OTT) services in addition to those reflected here. OTT revenues are not included in reported gross video revenues.[17]

Average Monthly Revenue Per Video Subscriber (ARPU)

Provider Type	2012	2013	2014	2015	2016	2017
ILEC & Small LEC	$83	$80	$85	$103	$107	$86
Incumbent Cable	$87	$84	$90	$88	$90	$93

Below is an analysis that shows the household-weighted average of the median household income levels where video service is offered. SVF Holders report their video data by census tract. The census bureau also publishes the median family income by tract.[18] A state-wide average of the median household income in each census tract, weighted by households in each census tract is also shown, in order to illustrate whether each category of provider offers service in higher- or lower-income areas compared to the state average median household income.

[17] Discontinuous results for ILEC and Small LEC ARPU in 2015 and 2016 are the result of data anomalies.
[18] Median Household Income by Census Tract in 2009-2016 was obtained from the U.S. Census Bureau: https://factfinder.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t.
2017 income estimates were obtained from the California Dept. of Finance: http://www.dof.ca.gov/Forecasting/Demographics/Estimates/documents/Price-Population_2016.pdf.

Median Household Income of Households Offered Video

Provider Type	2009	2010	2011	2012	2013	2014	2015	2016	2017
Small LEC	45,013	46,328	42,783	42,103	-	50,216	50,096	51,048	55,572
Incumbent Cable	67,048	50,258	68,416	67,461	67,489	68,392	68,926	71,285	74,909
ILEC	71,027	52,901	69,178	68,788	68,858	69,868	70,701	72,703	76,757
New Entrant	N/A	N/A	N/A	N/A	N/A	N/A	69,607	62,185	77,225
Statewide Weighted Average MHI	66,655	67,102	67,990	67,814	67,733	68,471	69,195	71,433	75,193

Similarly, the table below shows the average median household income associated with the subscribers to the video service offered by these categories of provider.[19]

Median Household Income of Households Subscribing to Video

Provider Type	2009	2010	2011	2012	2013	2014	2015	2016	2017
Small LEC	46,425	47,704	45,008	43,574	-	49,211	47,260	49,570	54,701
Incumbent Cable	71,261	54,580	72,016	71,632	71,735	72,695	73,197	75,845	79,532
ILEC	78,804	55,651	77,691	76,955	76,095	76,503	77,259	80,852	83,888
New Entrant	N/A	N/A	N/A	N/A	N/A	N/A	72,100	67,885	63,494
Statewide Weighted Average MHI	66,655	67,102	67,990	67,814	67,733	68,471	69,195	71,433	75,193

This analysis indicates that small LECs offer video service in areas with the lowest median household income, followed by the incumbent cable companies. The average income level in census tracts where ILECs provide service is above that of small LECs and incumbent cable companies, and the new entrants are shown to be offering video in census tracts with the highest median family income.

The results shown in the tables above track the regulatory history of each category of provider. Small LECs have historically offered telephone service in the most rural, high-cost areas of the state, areas that are typically lower income. Incumbent cable companies traditionally operated under local franchises which required all areas of a city or county to be built out, without regard to income.

[19] These two tables show no entry for Small LECs in 2013 due to data anomalies.

Under DIVCA, ILECs had more freedom to choose where in their telephone service territories they would deploy their video service, and they were only required to serve 40% or 50% of their telephone service territory with video. Thus, it makes sense that the average median household income associated with incumbent cable companies' video deployment is between those of the ILECs and small LECs, and closest to the statewide median household income averages.

New entrants have the most freedom to choose where they deploy their video service. They typically construct the most expensive technology—fiber to the home—and the table shows these companies offer video in areas with the highest median family income of any of the other categories of providers.

E. Gross Video Revenue

State video franchisees report "gross video revenue" annually.[20] Gross video revenues include all revenue related to the sale of video services, such as video advertising revenue. Gross video revenues form the basis upon which the CPUC's Annual Fee is allocated among all franchise Holders.[21] Gross video revenues form the basis upon which local entities can collect both franchise fees and Public Educational and Governmental Access fees (PEG fees). Franchise fees may not exceed 5% of gross video revenues, and PEG fees may not exceed 1% of gross video revenues.

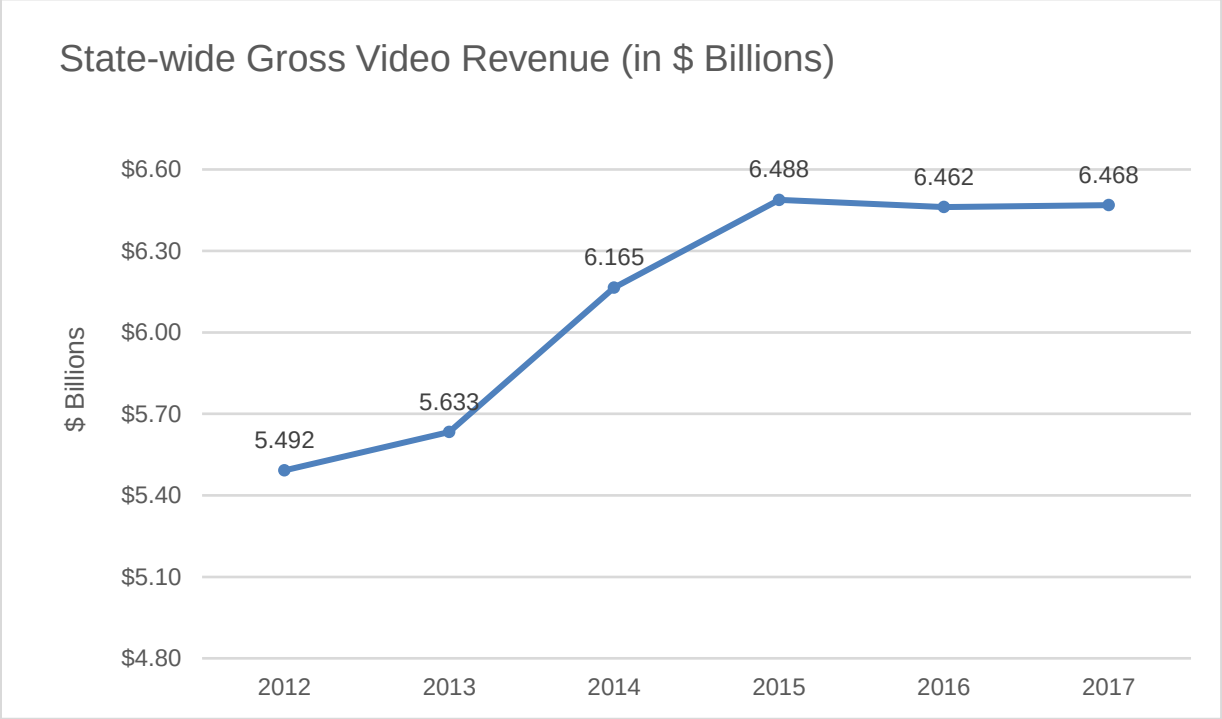
Gross video revenues peaked in 2015 at $6.5 billion and have remained at that level through 2017. Reasons for the lack of video revenue growth since 2015 include: (1) increased cord cutting, where customers purchase broadband service, but subscribe to over-the-top video services, rather than traditional video service from their cable provider; (2) while keeping video service, subscribers are reducing the amount of traditional video services purchased from the

[20] DIVCA defines gross video revenue as "all revenue actually received by the holder of a state franchise, as determined in accordance with generally accepted accounting principles, that is derived from the operation of the holder's network to provide cable or video service within the jurisdiction of the local entity." Cal. Pub. Util. Code § 5860 (d).

[21] Because the CPUC only began to use gross video revenues to determine our Annual Fee on video franchise holders in 2012, we did not track this metric in prior years.

provider (e.g., dropping premium services), and (3) the trend to lower-priced, smaller bundles of video services being offered and purchased. If these trends continue and lead to an actual decline in video revenue, the amount of franchise fees and PEG fees that cities and counties collect could begin to see actual declines in the future.

The graph below shows that in 2017 gross video revenue in California increased by only 0.1% ($6.2 million) to $6.47 billion from the prior year. At the total allowable 6% rate, cities and counties could collect $388 million in franchise and access fees in 2017.



3. Broadband Information Submitted by SVF Holders for the Year Ending December 31, 2017

As with our presentation and discussion of video data above, this section of the Report will provide information received from SVF Holders regarding broadband deployment and broadband connections[22] at year-end 2017, as well as annual comparisons of such data since DIVCA's implementation.[23] Aggregation is done by provider type (LEC/cable/new entrant) as above, as well as by technology type.

A. Methods Used to Validate Broadband Deployment Data

The method of estimating the availability of SVF-provided broadband services begins with SVF Holders providing data at specified granularities i.e., by "census block" for providers of fixed broadband services.[24] This data is validated by CPUC staff using other available commercial and government data. To validate reported availability data, staff also uses subscriber data to invalidate inaccurate availability data provided by SVF Holders. For example, if an SVF Holder reports that it offers broadband service in a census block, but they report no customers in that block, staff notifies the SVF Holder and removes that census block from the served category. Similarly, consumer feedback to the CPUC detailing where service is not available from a provider invalidates the availability information received from SVF Holders.

We describe below the limitations of collecting broadband data at the census block level. Note that these limitations do not apply to the subscription analyses presented in subsequent sections of this Report, as those analyses use actual subscriber numbers as opposed to relying on deployment data, which assumes that service is available to all housholds in a census block.

Despite improvements in the detail of data collected over time, e.g. census block and tracts, rather than prior zip-code and state-based data, there are still analytical limitations inherent in collecting

[22] The terms "connection" and "subscription" are used interchangeably in this Report.
[23] Changes in the format used for data collection limits the number of years of historic data that can be presented.
[24] Mobile service is reported using geographic information system "shapefiles," which designate a polygon within which service is provided, rather than by individual census blocks.

data at anything beyond street address level. Further, because census blocks are a much more granular mapping unit than census tracts, they provide a much better picture of broadband availability than census tracts. However, aggregation away from address level data introduces a level of imprecision into the availability analysis.[25]

Since it is impossible to know precisely where within each census block service is being offered, we can only classify census blocks as being served if at least one broadband provider offers service to any part of the block. This naturally can result in an overstatement of the number of served households, as it is quite possible that there are households located in areas of a served census block that no provider serves.

When drawing conclusions from this Report, in addition to the data limitations described above, it is important to keep in mind that only services offered by SVF Holders and their locally-franchised affiliates are reflected. Broadband and video services offered by local independent wireline providers and wireless and satellite ISPs are, by definition, excluded.

[25] The FCC has also wrestled with the appropriate level of granularity to measure competition, most recently in its *Special Access/Business Data Services* decision. *In re Business Data Services, et al.*, 31 FCC Rec 4723 (May 2, 2016) at ¶ 63 and Figure 5, and ¶ 192 (distinguishing between census block and building-level data).

B. Broadband Deployment and Connections / Subscribers by Industry Segment

The table below shows the number of households offered broadband at speeds faster than 200kbps in at least one direction as well as the number of subscribers for each industry segment at year-end 2017. The second table below shows the number of households offered broadband for 2014 through 2017.

2017 Aggregated Broadband Deployment / Subscribers

Provider Type	HH offered Broadband	Subscribers
ILEC & Small ILEC	12,197,308	3,544,490
Incumbent Cable	12,276,202	7,368,797
New Entrant	1,242,897	77,843
Grand Total	**25,716,407**	**10,991,130**

The table below shows that during 2017, broadband deployment by ILECs & small LECs increased by 1.1% (129,226), while broadband deployment by incumbent cable providers increased by 0.5% (56,698). Between 2014 and 2017 broadband deployment by ILECs & small LECs increased by 0.3% (31,182), while broadband deployment by incumbent cable providers decreased by 0.7% (90,567), as shown in the table below.

Broadband Deployment by Provider Type

Provider Type	2014	2015	2016	2017
ILEC & Small ILEC	12,166,126	12,242,571	12,068,082	12,197,308
Incumbent Cable	12,366,769	12,389,148	12,219,504	12,276,202
New Entrant	1,256,624	1,444,520	1,290,652	1,242,897

C. Broadband Deployment and Connections by Technology

The table below breaks out overall broadband deployment by technology between 2014 and 2017.

Broadband Deployment by Technology

Tech Description	2014	2015	2016	2017
ADSL2, ADSL2+	100,889	3,387,983	4,804,712	11,631,941
Asymmetric xDSL	11,230,699	10,710,163	11,370,312	11,429,981
Cable Modem - DOCSIS 1, 1.1 or 2.0	68,454	52,223	24,047	18,707
Cable Modem - DOCSIS 3.0	12,302,130	12,362,477	12,191,385	8,058,618
Cable Modem - DOCSIS 3.1				4,437,257
Optical Carrier/Fiber to the end user	1,843,021	1,892,533	2,031,613	2,919,952
Other Copper Wireline	1,255,857	1,439,793	21,201	10,013
Symmetric xDSL	1,255,850			18,434
VDSL		6,642,904	6,729,245	7,598,677

Several technology-related developments are noteworthy. First is the large increase in the deployment by ILECs of aDSL2 and aDSL2+ that was reported in 2017, as well as a significant increase in the deployment of vDSL technology. Each of these technologies support substantial potential increases in broadband speeds compared to asymmetric DSL (aDSL), which was the telephone industry standard as recently as 2014. Asymmetric DSL technology cannot support the "served" speed definition adopted by the Legislature for the CPUC's infrastructure grant program (6 Mbps down/1 Mbps up) for homes far from the telephone central office that they are served from. aDSL 2 technology, however, enables broadband speeds of up to 12 Mbps. aDSL 2+ technology enables broadband speeds of up to 24 Mbps and vDSL enables broadband speeds of up to 50 Mbps, and in some cases up to 100 Mbps. These technologies enable LECs to provide broadband at "served" speeds to these more-distant homes.

Second is the reported shift by incumbent cable companies from Docsis 3.0 to Docsis 3.1, amounting to 35.5% (4.4 million) of its embedded base during the 2017. Docsis 3.1 is capable of supporting multi-gigabit broadband speeds by incumbent cable companies in the future at very low

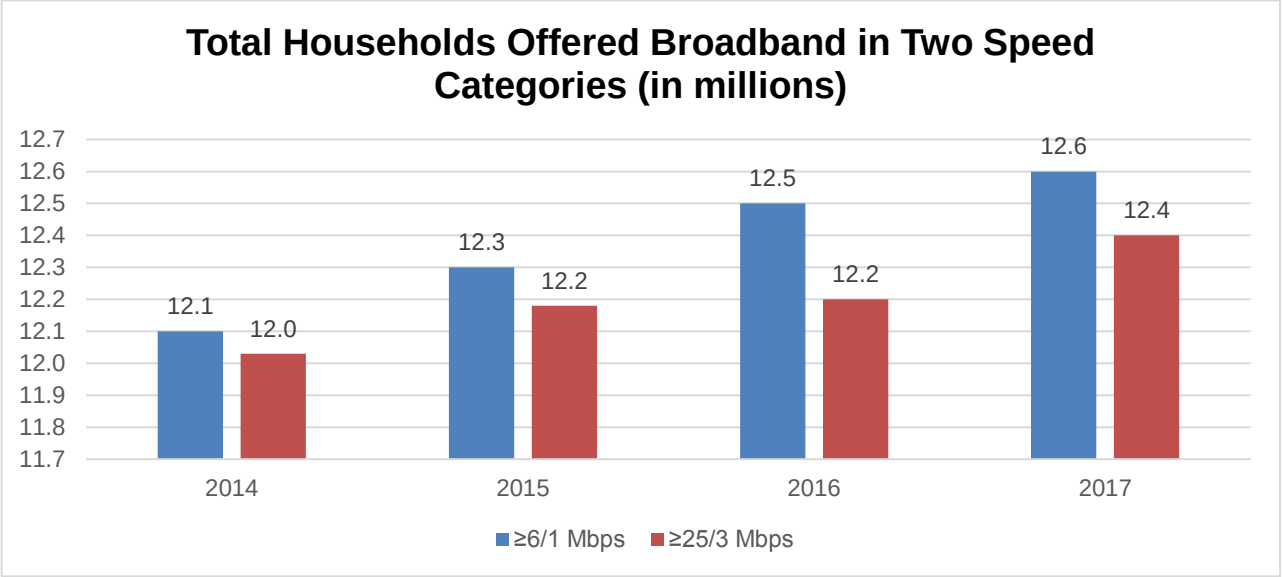
incremental cost, compared to other broadband platforms (e.g., fiber). Third, is the 44% increase in deployment of Fiber to the end user (or FTTH) which was reported in 2017, which will also support the introduction of multi-gigabit broadband speeds as needed in the future. FTTH is being deployed by each industry segment.

D. Broadband Deployment by Two Speed Categories

The bar chart below shows the change in the total number of households having access to broadband in two key speed categories, ≥ 6/1 Mbps and ≥ 25/3 Mbps. The >=6/1 category is important because it defines areas that are considered "served," and thus ineligible, for the Commission's California Advanced Services Fund (CASF) broadband infrastructure grant program. The >=25/3 category is important as that is the current level considered by the FCC to qualify as supporting advanced services. During 2017, the total number of households offered broadband at ≥ 6/1 Mbps increased by 0.8% to 12.6 million, while the number of households offered broadband at ≥ 25/3 Mbps increased by 1.6% to 12.4 million.

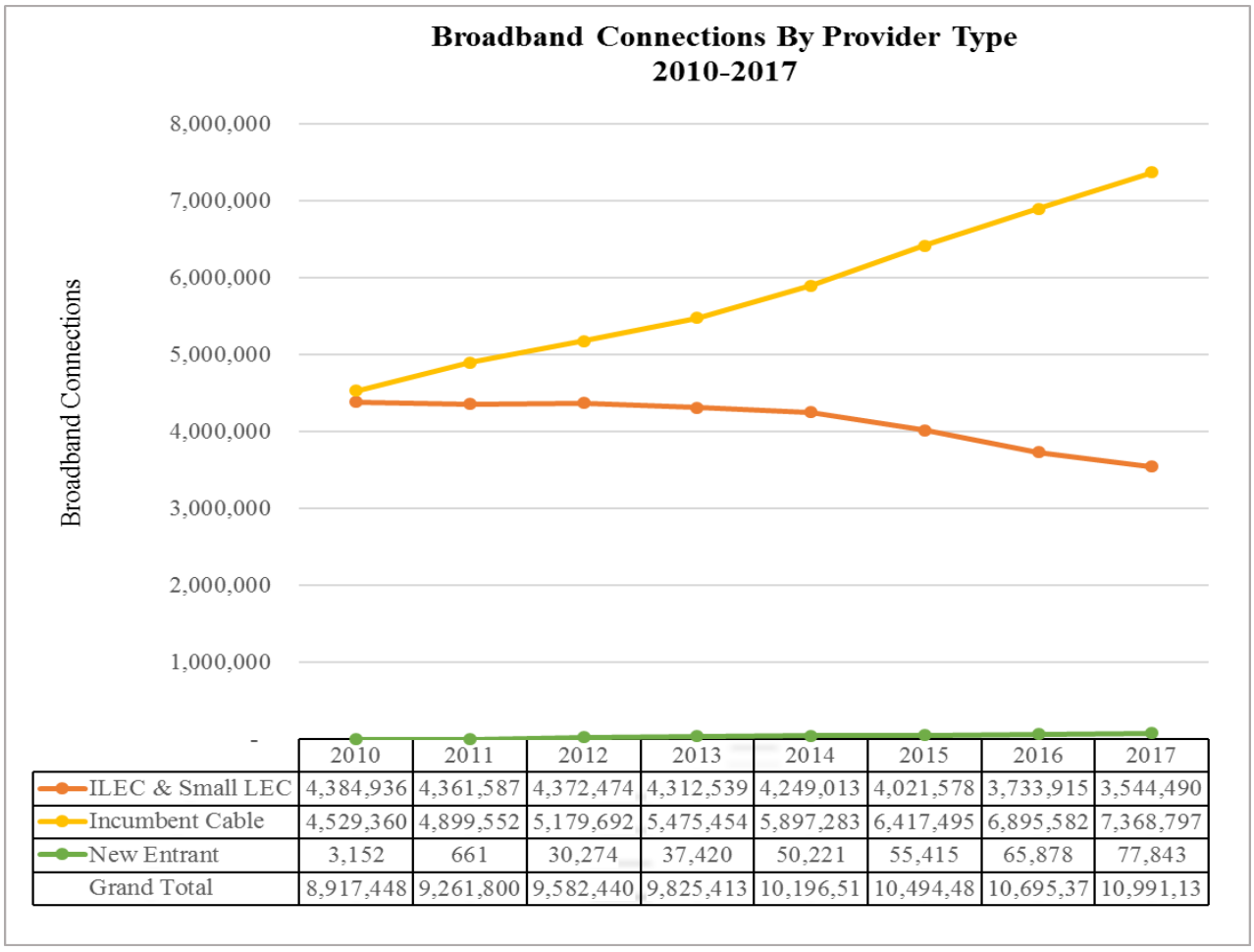
Ninety six percent (96.2%) of the households in the state were offered broadband at ≥ 6/1 Mbps in 2017, and 94.7% were offered broadband at ≥ 25/3 Mbps.[26] Readers should note that as described in section 3A above, these data are based on census block data, which presumes that all households in a census block are offered service, which may or not be the case. As a result, these data may overstate the number of households that are actually offered service at these speeds.

[26] Subject to the overstatement resulting from the collection of broadband availability at the census block level, as discussed herein.


Total Households Offered Broadband in Two Speed Categories (in millions)
12.7
12.6
12.5
12.4
12.3
12.2
12.1
12.0
11.9
11.8
11.7
12.1
12.0
12.3
12.2
12.5
12.2
12.6
12.4
2014
2015
2016
2017
≥6/1 Mbps
≥25/3 Mbps

E. Broadband Connections

The table below breaks out broadband connections by provider category between 2008 and 2017.[27] During 2017, broadband connections increased by 2.8% (296,000) to 11 million. Between 2010 and 2017 overall, broadband connections increased by 23.3% (2.1 million) to 11 million. During this time period, ILEC & small ILEC broadband connections declined by 19.2% (840,446), while incumbent cable subscribers increased by 62.7% (2.8 million).

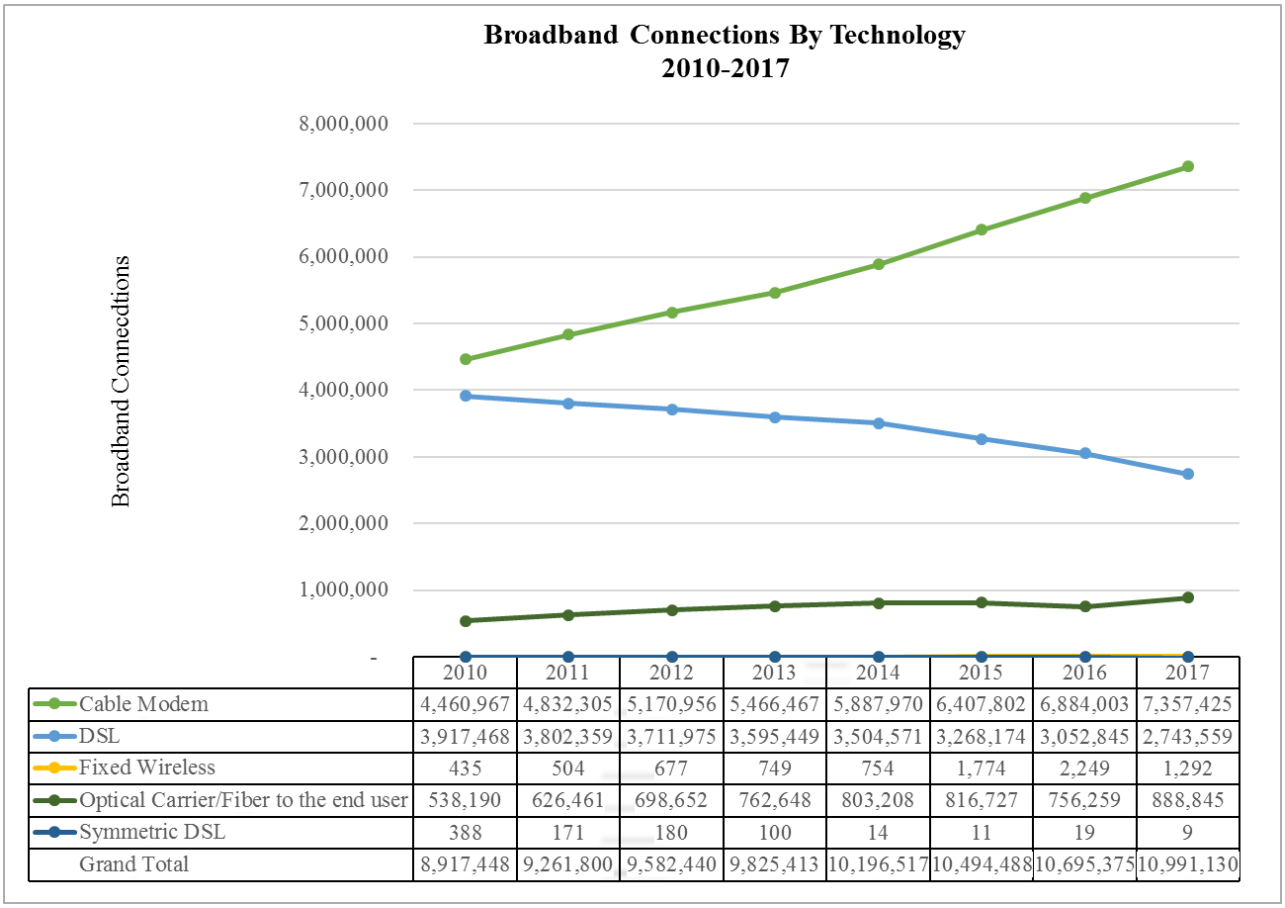


	2010	2011	2012	2013	2014	2015	2016	2017
ILEC & Small LEC	4,384,936	4,361,587	4,372,474	4,312,539	4,249,013	4,021,578	3,733,915	3,544,490
Incumbent Cable	4,529,360	4,899,552	5,179,692	5,475,454	5,897,283	6,417,495	6,895,582	7,368,797
New Entrant	3,152	661	30,274	37,420	50,221	55,415	65,878	77,843
Grand Total	8,917,448	9,261,800	9,582,440	9,825,413	10,196,51	10,494,48	10,695,37	10,991,13

[27] Connections and subscribers are synonymous. This analysis is based on the actual number of households subscribing to broadband, while deployment described in earlier sections describe services that are offered.

F. Broadband Connections by Technology Type

The line graph below shows the aggregate statewide number of connections/subscribers broken out by technology type between 2010 and 2017. This line graph shows that despite the fact that ILECs & small LECs have increased their deployment of faster ADSL 2 and ADSL2+, they continue to lose subscribers / connections. At the end of 2017, the number of cable modem connections, which are deployed by incumbent cable companies, was almost three times the number of DSL connections, which are deployed by the ILECs and small LECs. The number of fiber-optic connections to households increased by 17.5% to 888,845.[28]



	2010	2011	2012	2013	2014	2015	2016	2017
Cable Modem	4,460,967	4,832,305	5,170,956	5,466,467	5,887,970	6,407,802	6,884,003	7,357,425
DSL	3,917,468	3,802,359	3,711,975	3,595,449	3,504,571	3,268,174	3,052,845	2,743,559
Fixed Wireless	435	504	677	749	754	1,774	2,249	1,292
Optical Carrier/Fiber to the end user	538,190	626,461	698,652	762,648	803,208	816,727	756,259	888,845
Symmetric DSL	388	171	180	100	14	11	19	9
Grand Total	8,917,448	9,261,800	9,582,440	9,825,413	10,196,517	10,494,488	10,695,375	10,991,130

[28] Except for 2008, synchronous DSL, other copper wireline, and fixed wireless subscribers have never accounted for more than 0.5% of total consumer subscribers and are therefore not visible on the graph above.

Cable modems continued to be the broadband wireline technology most frequently chosen by residential customers at the end of 2017. Cable modems were used by 67% (7.4 million) of the residential households to subscribe to broadband, up from 64% (6.9 million) in 2016, 61% (6.4 million) in 2015, 58% in 2014, 56% in 2013 and 52% (4.8 million) in 2011. Between 2008 and 2016, cable modem usage increased by 81.6% from 3.8 to 6.9 million.

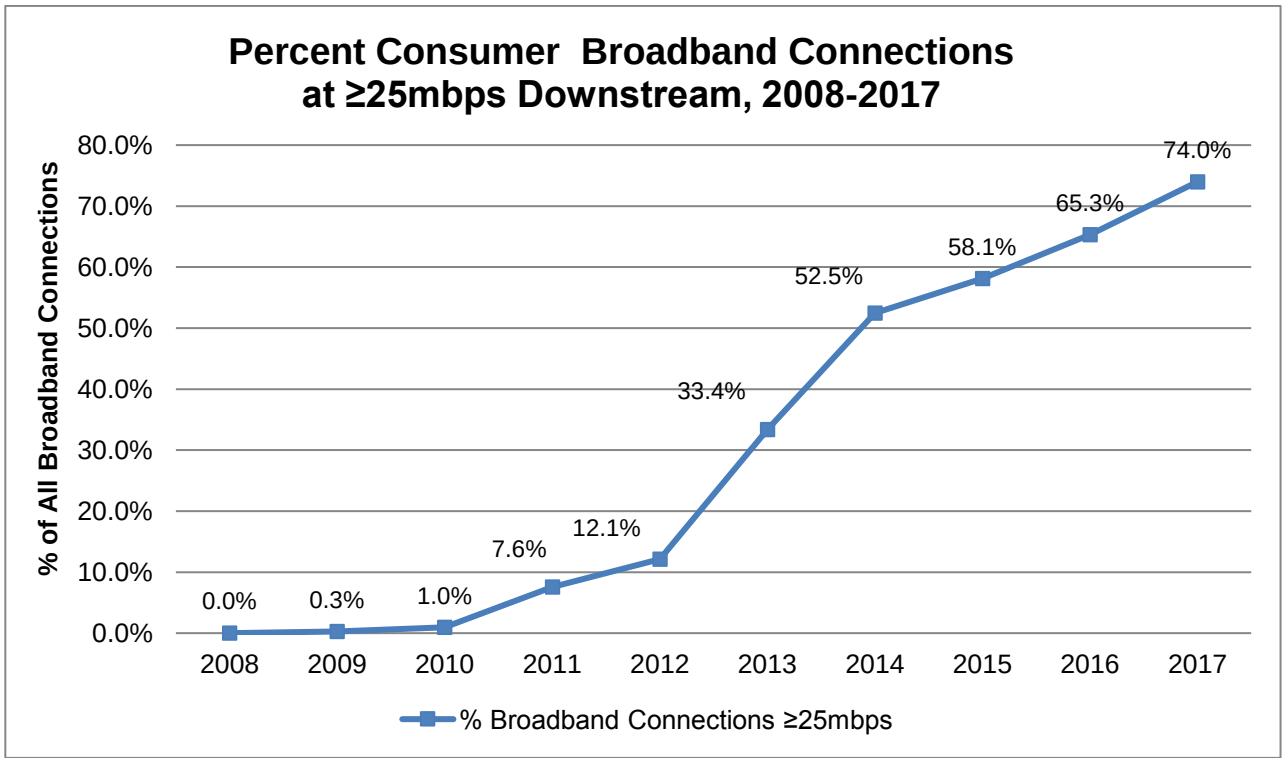
Digital Subscriber Line (DSL) subscriptions have declined since 2010, from 3.9 million subscribers to 2.7 million in 2017. DSL technology typically is used by telephone companies to deploy broadband over their existing copper plant. U-Verse uses a version of DSL (VDSL) in some areas to provide data at speeds over 25 Mbps.

Fiber-to-the-home (FTTH) technology provided broadband to 8.1 percent of residential subscribers (888,845) in California in 2017 compared with 7.1% in 2016, 7.8% in 2015, 7.3% in 2012, 6% in 2010 and 4% in 2008.

Fixed wireless technology provided broadband to 1,292 subscribers in California in 2017, down from 2,249 in 2016.

G. Broadband Connections at >=25 Mbps

The line graph below shows the changes in the speed of broadband services to which consumers are subscribing.[29] At year-end 2017, 74% of all SVF Holder broadband connections were at downstream speeds >= 25 Mbps. As recently as 2010, only 1% of connections were at that speed.



[29] This analysis is based on the actual number of households subscribing to broadband.

4. DIVCA Video Build-Out Requirements[30]

DIVCA requires SVF Holders or their affiliates, with more than 1 million telephone customers (AT&T and Frontier[31]), to build out facilities sufficient to provide specified percentages of customers within their telephone service areas access to their video service within five years of the passage of DIVCA.[32] DIVCA requires the CPUC to monitor compliance.[33] If the Commission finds a SVF Holder to be out of compliance with the build out, low-income, or other provisions of DIVCA, DIVCA gives the Commission authority to impose fines up to one percent of SVF Holders' total monthly gross video revenue, and/or suspend or revoke a state video franchise.[34] Because cable television companies offer video to all of their voice customers, they meet the DIVCA video deployment requirement.

Each of the video franchise holders have met or exceeded the video deployment / build-out requirements that were set forth in the DIVCA statute.

A. AT&T and Frontier Met Their Build-out Requirements

As part of ongoing enforcement duties, CD staff has analyzed the deployment records of both AT&T and Frontier to determine whether both organizations have complied with the requirements of DIVCA. These analyses determined that Frontier and AT&T exceeded their two and five-year build-out obligation, as defined in Public Utilities Code § 5890(e), by offering video services to at least 40% or 50% of the households in their respective telephone

[30] SVF Holders must annually submit the number of low-income households in the census tracts they serve, and low-income households offered video. Cal. Pub. Util. Code § 5960(b)(3). This information is used to determine compliance with DIVCA's buildout requirements. Because of the way DIVCA instructs holders to calculate this information, it is not well suited to shed light on the relationship between household income and the availability of and subscription to video services.

[31] In April 2016, Verizon California sold its wireline business, including its video franchise to Frontier California (Frontier). Consequently, we are using "Frontier" to refer to the video franchise facilities that were previously owned by Verizon.

[32] Cal. Pub. Util. Code § 5890(b). Because the incumbent cable companies offer video service to any household that is also offered voice service, the Commission did not impose DIVCA's low-income / build-out requirements on those cable companies. See D.07-03-014, at p.163 and D.07-10-013, at p. 3.

[33] Cal. Pub. Util. Code § 5890 (g)-(i).

[34] Cal. Pub. Util. Code § 5890 (h).

service areas.

The build-out requirements for SVF Holders with over one million telephone customers (AT&T and Frontier) are shown in the table below:

DIVCA Build-out Requirements

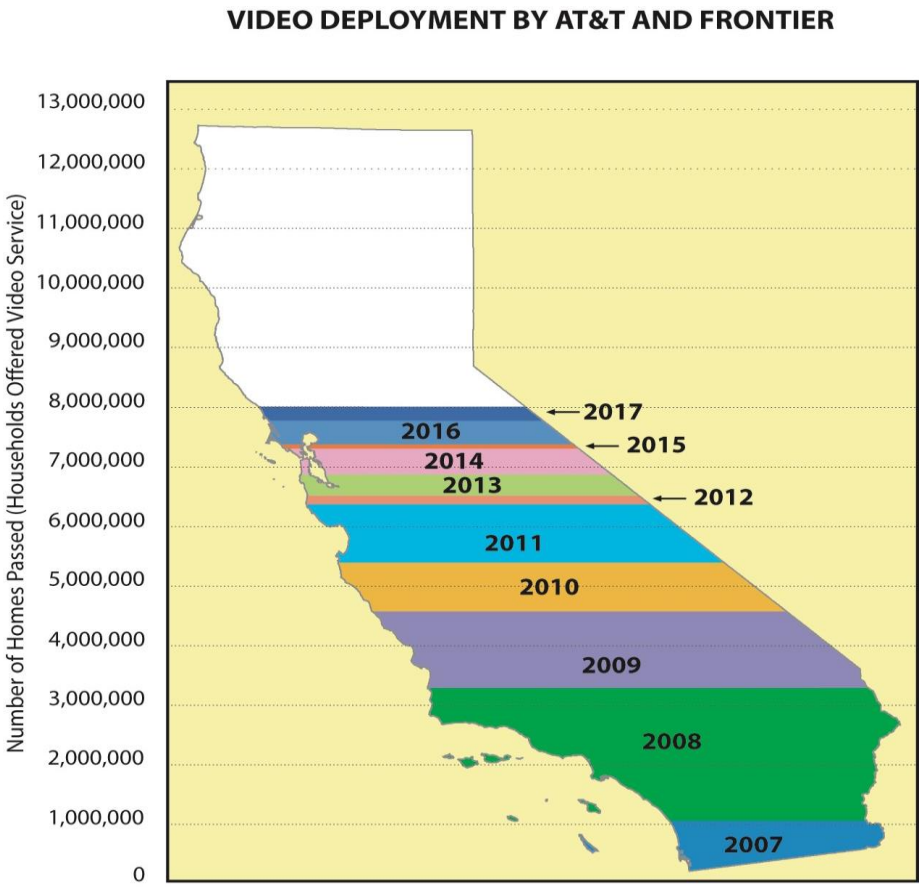
Time Frame	SVF Holders with more than One Million Telephone Customers in CA	
	Frontier - Predominantly Fiber Optic to Premises	**AT&T - Predominantly Non-fiber Optic to Premises**
Within 2 years	25% of customer households in a telephone service area must have access to video service	N/A
Within 3 years	N/A	35% of households in telephone service area must have access to video service
Within 5 years*	40% of customer households in a telephone area must have access to video service	50% of households in telephone service area must have access to video service

* Not required to meet these requirements until 2 years after at least 30% of households with access become subscribers for 6 consecutive months.

B. In 2017, AT&T and Frontier Continued to Deploy Video Facilities

To measure video deployment, we count the number of reported households offered video services.[35] The chart below shows that during 2017, AT&T and Frontier increased their combined deployment of video services by 3% (approximately 230,000 Households) to 8.01 million households, 61.5% of the 13.02 million households in the state. This compares with a 5.4% increase in 2016, a 0.1% increase in 2015, a 6.2% increase during 2014, a 5.5% increase during 2013, a 2.3% increase in 2012, and an 18% increase in 2011.

At the end of 2017, AT&T and Frontier exceeded their combined statutorily required deployment levels by 19.7% or approximately 1.3 million households.



[35] By statute, service providers submit DIVCA video availability data to the CPUC on a Census tract basis. Cal. Pub. Util. Code § 5960(b)(2). For a discussion of the staff's method of collecting, validating and analyzing DIVCA data, and the limitations of Census block and tract granularity, see DIVCA Report, year ending December 31st, 2016, Appendix B; http://www.cpuc.ca.gov/General.aspx?id=2241. Generally, AT&T and Frontier do not have overlapping telephone service areas. As a result, Census tract granularity does not cause the over-counting described in this Report, which says that over-counting can sometimes occur when multiple companies operate within the same Census tract.

C. All State Video Franchise Holders Have Met Their Anti-Discrimination Build-Out Requirements

Incumbent Cable Operators: DIVCA states: "A cable operator or video service provider that has been granted a state franchise under this division may not discriminate against or deny access to service to any group of potential residential subscribers because of the income of the residents in the local area in which the group resides."[36] Because cable television companies offer video to all of their voice customers, they meet the DIVCA anti-discrimination build-out requirement.

AT&T & Frontier**:** To operationalize the anti-discrimination requirement for SVF Holders with more than 1 million telephone customers, DIVCA requires that beginning five years after being granted a state video franchise, at least 30% of households with access to that SVF Holder's video service must be low-income households.

Both Frontier and AT&T have had state video franchises for over five years and have more than 1 million telephone customers. Both are obligated to ensure that at least 30% of the households with access to video service in their respective video service territories are low-income households.[37] They both meet or exceed that anti-discrimination requirement.

D. AT&T & Frontier Have Continued to Meet the Community Center Build-Out Requirements

DIVCA requires SVF Holders with more than 1 million telephone customers in California to provide free video and broadband service to community centers in underserved areas, as determined by the telephone corporation. These SVF Holders must provide this service at a ratio of one community center for every 10,000 video customers. For each year, including 2017, both AT&T and Frontier met this requirement.

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[36] Cal. Pub. Util. Code § 5890 (a).

[37] Cal. Pub. Util. Code § 5890 (j)(4); "Low-income household" means those residential households located within the holder's existing telephone service area where the average annual household income is less than thirty-five thousand dollars ($35,000), based on the 2000 United States Census Bureau estimates adjusted annually, to reflect rates of change and distribution through January 1, 2007. The low-income household percentages derived from these 2007 estimates are the basis for calculating low-income compliance thereafter.

5. Employment Reporting Required Under DIVCA

DIVCA requires the CPUC to collect employment information from state-issued video franchises employing more than 750 full-time employees in California. The CPUC is required to post the information on its website and report it to the Assembly Committee on Utilities and Commerce and the Senate Committee on Energy, Utilities and Communications annually.[38]

This is the seventh report on SVF employment data.[39] The data in this Report reflects data as of December 31, 2017. Five state-issued video franchise holders reported that they employed more than 750 full-time employees in the State of California. The franchise holders were AT&T California (AT&T), Frontier, Comcast, Cox and Charter.[40]

The following information is required to be reported to the CPUC by the qualifying SVFs:

- Number of California residents employed on a full-time basis
- Percentage of the state-issued video franchise holder's total domestic workforce that resides in California
- Employees categorized by occupation
- Average wages and salaries (including benefits) categorized by occupation
- Number of out-of-state residents employed by independent contractors, which personally provide services to the franchise holder, unless the holder is contractually prohibited from disclosing this information to the public
- Forecast of the number of net new positions expected to be created during the next year (2017).

As in the past, of the 54 state-issued video franchise holders, the following five had more than 750 full-time employees in California and were therefore required to report employment data for 2017:

- AT&T California (AT&T)
- Frontier
- Comcast
- Charter Communications
- Cox Communications

[38] Cal. Pub. Util. Code §§ 914.4, 5920.

[39] This Report and previous DIVCA Employment Reports, which were published as stand-alone documents can be found at this link on the CPUC website: http://www.cpuc.ca.gov/General.aspx?id=2241.

[40] In prior years, six companies reported. In 2016, Charter merged with Time Warner. As a result, five companies reported for 2017.

The employees of state-issued video franchise holders that are described in this Report may be involved in wireline telephone, video, and/or data services. DIVCA does not require franchise holders to categorize their employees by the type of technology they work on. Video programming operations may include existing local affiliates of state-issued video franchise holders. AT&T and Frontier's employment numbers exclude data from some of their related operations, as detailed below.

- Frontier's employment submission **includes** the total number of employees in its wireline telephone, DSL and FiOS data and video operations.
- AT&T California's employment submission **includes** their wireline telephone, U-verse video, and DSL operations, but **excludes** AT&T's wireless operations.

A. Total Employees

The tables below show the change in the number of employees of SVF Holders between 2007 and 2017.

The tables below show that the five reporting SVF Holders reported a total of 35,132 employees in California, as of December 31, 2017. In aggregate, the total number of people employed by all the SVF Holders declined by 4.6% (-1,683) to 35,132 during 2017. Between 2007 and 2017, the total number of employees declined by 28.9% (-14,295).

Total Number of Employees by SVF Holder

SVF Holder	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	% Change 2016-2017
AT&T	29,509	25,881	24,751	21,447	20,481	19,360	19,595	18,728	17,642	16,615	15,547	-6.4%
Frontier	8,110	7,070	6,242	5,804	5,409	4,951	4,399	4,133	3,623	3,936	3,729	-5.3%
Comcast	7,167	7,290	6,608	6,221	5,943	4,332	4,166	4,461	4,490	4,572	4,335	-5.2%
Cox	3,243	3,321	3,121	3,065	2,751	2,800	2,486	1,842	1,886	1,724	1,657	-3.9%
Charter	1,398	1,341	1,240	1,312	1,175	1,456	1,527	1,492	1,504	9,968	9,864	-1.0%
Total	**49,427**	**44,903**	**41,962**	**37,849**	**35,759**	**32,899**	**32,173**	**30,656**	**29,145**	**36,815**	**35,132**	**-4.6%**

During 2017, all five SVF Holders decreased the number of their California-based employees. The table below shows the percentage decreases for each of the five SVF Holders.

Percentage Change of Total Employees by SVF Holder Between 2007 and 2017

SVF Holder	% Change 2013-2014	% Change 2014- 2015	% Change 2015-2016	% Change 2016-2017	% Change 2007-2017
AT&T	-4.4%	-5.8%	-5.8%	-6.4%	-47.3%
Frontier	-6.0%	-12.3%	8.6%	-5.3%	-54.0%
Comcast	7.1%	0.7%	1.8%	-5.2%	-39.5%
Cox	-25.9%	2.4%	-8.6%	-3.9%	-48.9%
Charter	-2.3%	0.8%	N/A*	-1.0%	N/A*
Total	-3.0%	-3.3%	-0.8%	-4.6%	-28.9%

* In 2016, Charter acquired Time Warner. Consequently, Charter's 2016 and 2017 employment submittals included Time Warner's employees. Therefore, we do not compare the number of employees Charter reported in 2015 on its own with 2016, which included Time Warner. Similarly, we do not compare the 2017 combined number of employees with the Charter number from 2007.

B. Total Employees by Occupation

The table below categorizes the 35,132 employees who were employed by the five reporting holders at the end of 2017into eight different occupational categories. Skilled craft workers made up the largest category of workersfor all of the franchise holders.

Most SVF Holders that are required to report employee information under DIVCAprovide the CPUC with copies of their U.S Equal Opportunity Commission EEO-1 filings. The CPUC uses the same categories listed in these filings to show the statistics below. However, some similar categories have been grouped together for the purposes of this report.

Total CA Employees by Occupation - 2017

Occupational Categories	AT&T	Frontier	Comcast	Cox	Charter	Total
Exec / Sr. Leaders	0	6	13	0	2	**21**
Officials / Managers	232	29	611	281	1,195	**2,348**
Professionals	1,518	91	194	127	558	**2,488**
Technicians	4,851	113	507	212	236	**5,919**
Sales / Associates	283	360	507	308	2,146	**3,604**
Office / Clerical	2,683	0	658	212	2,296	**5,849**
Skilled Crafts	5,980	3,130	1,730	482	3,428	**14,750**
Oper/Labor/Serv	0	0	115	35	3	**153**
Total	**15,547**	**3,729**	**4,335**	**1,657**	**9,864**	**35,132**

C. Number of Out-of-State Residents Employed by IndependentContractors

None of the five companies reported out-of-state residents employed by independent contractors, companies, and consultants hired by the holder.

D. Forecasts of Job Creation

AT&T and Charter were the two SVF Holders that provided forecasts for job creation in 2018. AT&T forecasts an increase of 38 employes in 2018. Charter forecasts an increase of 326 employees in 2018.

E. Map Showing Areas of the State Where the Incumbent Cable Companies and the Telephone Corporations (AT&T and Frontier) Offer Video Services

The map on the next page represents both incumbent and new entrant video service providers in California. A map representing each video franchise is available on the CPUC website.[41]

The green area represents the entire video franchise service areas of AT&T and Frontier. This does NOT represent the areas where they have actually deployed video services. AT&T offers video in approximately 50% of their telephone service area and Frontier offers video in approximately 40% of their telephone service area.

The completely white areas show areas where no telephone companies offered video. The white areas with red diagonal hatching represent the service areas of incumbent cable TV franchise holders.

The areas with red diagonal hatching in green areas indicate areas where both the incumbent Cable TV franchise holders and the telephone companies (AT&T and Frontier) have overlapping video franchise territories.

[41] See http://www.cpuc.ca.gov/General.aspx?id=2134.


STATE OF CALIFORNIA VIDEO FRANCHISING
State-Issued Video Franchise Territory
Video Franchise Territory
Incumbents
New Entrants (Telephone Companies)
The colored areas represent approximately 13,001,332 households; 99.1% of all households in the State.
Data Source:
State video franchise holder applications as of 12/31/17.
Prepared by the CPUC, Communications Division, Video Franchising and Broadband Deployment Group, Sept 2018.
N
W
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60
120 Miles
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100
200 Km
OREGON
NEVADA
UTAH
ARIZONA
MÉXICO
Pacific Ocean
DEL NORTE
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MODOC
TRINITY
SHASTA
LASSEN
HUMBOLDT
TEHAMA
PLUMAS
MENDOCINO
GLENN
BUTTE
SIERRA
NEVADA
COLUSA
YUBA
PLACER
LAKE
SUTTER
EL DORADO
YOLO
SONOMA
NAPA
ALPINE
SACRAMENTO
AMADOR
SOLANO
CALAVERAS
MARIN
SAN JOAQUIN
TUOLUMNE
CONTRA COSTA
MONO
SAN FRANCISCO
ALAMEDA
STANISLAUS
MARIPOSA
SAN MATEO
SANTA CLARA
MERCED
MADERA
SANTA CRUZ
SAN BENITO
FRESNO
INYO
MONTEREY
TULARE
KINGS
SAN LUIS OBISPO
KERN
SAN BERNARDINO
SANTA BARBARA
VENTURA
LOS ANGELES
ORANGE
RIVERSIDE
SAN DIEGO
IMPERIAL
NAPA
SONOMA
SOLANO
MARIN
CONTRA COSTA
SAN FRANCISCO
ALAMEDA
SAN MATEO
SANTA CLARA
SANTA CRUZ
VENTURA
LOS ANGELES
SAN BERNARDINO
RIVERSIDE
ORANGE

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Michael Pierce, Public Utility Research Analyst
Dion Good, Research Analyst, Geographic Information Systems
Ling Mu, Public Utility Research Analyst
Michael Morris, Program Supervisor
Robert Wullenjohn, Program Manager
Cynthia Walker, Director

End of DIVCA Video, Broadband and Employment Report

For the Year Ended December 31, 2017