

AT&T's Digital Divide in California

An Analysis of AT&T Fiber Deployment and Wireline Broadband Speeds in California

Garrett Strain

Eli Moore

Samir Gambhir

About the Authors

Garrett Strain

Strain is a Ph.D. student in Sociology at the University of California, Berkeley. His research focuses on labor, finance, and political economy. He holds a MPA and B.S. in Economics from the University of Washington.

Eli Moore

Moore is the California Community Partnerships Program Manager at the Haas Institute for a Fair and Inclusive Society. His research focuses on a broad range of equity and inclusion issues and policy areas. Eli holds a Bachelor's degree from University of California, Santa Cruz and dual Master's degrees from Syracuse University.

Samir Gambhir

Gambhir is a Geographic Information Systems (GIS) researcher and manager of the Equity Metrics program at the Haas Institute for a Fair and Inclusive Society. He has research experience in the areas of social justice, racial equity, planning, health, and business, with a focus on human geography. He graduated from The Ohio State University in 2003 with a Master's degree in City and Regional Planning.

Special Thanks

Thank you to Communications Workers of America District 9 for supporting this research

Report URL

<http://haasinstitute.berkeley.edu/digitaldividecalifornia>

Contents

Executive Summary	04
Introduction	07
Broadband Data Analysis	08
Policy Implications	18
Recommendations	19
Appendix	20

Executive Summary

Californians need high-speed broadband—it is an essential conduit for opportunity, shaping access to education, employment, health services, and other spheres of life. Internet speed matters. More than half of all Internet traffic is now data-rich video, requiring higher capacity networks. All-fiber networks capable of delivering gigabit speeds have become the global standard for Internet connectivity.

With great fanfare, AT&T launched an initiative to build “GigaPower,” fiber-to-the-home networks to 12.5 million customer locations across its 21-state wireline footprint. This report provides the first analysis of the income distribution of AT&T’s initial fiber-to-the-home deployment in California. The analysis uses the most recent data (which presents data as of June 30, 2016) from the Federal Communications Commission (FCC) and correlates the FCC data with statistics on household income from the Census Bureau’s American Community Survey.

The report also examines more generally AT&T’s advertised wireline broadband services in California. The analysis covers households located within AT&T’s California wireline footprint (i.e. households where AT&T California is an incumbent local exchange carrier). AT&T is the largest telecommunications carrier in California, with a landline network serving 70.8 percent of California households across 56 counties. AT&T is the largest telecommunications company in the United States, with revenue of \$163.8 billion and profits of \$13 billion in 2016.

The data reveals disturbing trends that will exacerbate the digital divide in California. First, AT&T’s initial fiber-to-the-home deployment is disproportionately focused

on high-income communities. Second, AT&T has left too many Californians stuck in the slow lane on the information highway, unable to participate fully in the expanding digital economy. Despite its large size and profitability, AT&T has fallen short of providing equitable access to high-speed broadband in California. The major findings from the June 2016 data are as follows:

AT&T’s Initial Fiber-to-the-Home Network Deployment is Concentrated in High-Income Communities

- + The median household income of California communities with access to AT&T’s fiber-to-the-home (FTTH) network is \$94,208. This exceeds by \$32,297 the \$61,911 median household income for all California households in the AT&T wireline footprint.
- + In contrast, the median household income of California communities for whom the most advanced broadband technology available from AT&T is its slower U-verse fiber-to-the-neighborhood (FTTN) network is \$67,021, which is \$27,187 (28.9 percent) lower than the median household income of fiber-to-the-home households.

+ Approximately one-quarter (27.6 percent) of households— about 2.7 million households—in AT&T’s California footprint are stuck with slow DSL. The median household income for California households for whom DSL is the most advanced broadband technology available from AT&T is \$53,186, which is \$41,022 (43.5 percent) lower than the median household income of fiber-to-the-home households.

Millions of Californians are Underserved by AT&T Broadband

+ **1.7 million households are underserved by AT&T.**

The California Public Utilities Commission (CPUC) defines communities without access to broadband at a speed of at least 6 Megabits per second (Mbps) download/1.5 Mbps upload as underserved. A full 18.1 percent of California households in AT&T’s wireline footprint—approximately 1.7 million households—lack access to AT&T broadband according to this definition.

+ **4.1 million households are without access to AT&T high-speed broadband.** The Federal Communications Commission (FCC) defines high-speed broadband as digital transmission at 25/3 Mbps download/upload. Based on this definition, 42.8 percent of California households in AT&T’s wireline footprint, or approximately 4.1 million households, do not have access to AT&T broadband that meets the FCC’s high-speed definition of 25/3 Mbps.

+ **Rural California is left behind by AT&T.** In 14 largely rural counties, virtually no household has access to AT&T broadband at the FCC’s 25/3 Mbps speed and one-third or more households are underserved without access to AT&T broadband at 6/1.5 Mbps.

+ **Many urban and suburban Californians are stuck in AT&T’s slow lane.** AT&T’s slow speeds are not limited to rural areas. In Los Angeles county, for example, approximately 443,000 households (20.4 percent) in AT&T’s wireline footprint lack access to AT&T broadband at 6/1 Mbps and approximately 1.1 million households (51.5 percent) lack access to AT&T broadband at 25/3 Mbps. In Santa Clara County, the heart of Silicon Valley, approximately 98,000 households (17.5 percent) are underserved by AT&T and approximately 176,000 lack access to AT&T broadband at 25/3 Mbps.

See Chart 1 page 12, Table 1 page 11, and Table 5 page 22 for this data.

Recommendations

Access to high-speed broadband is not a luxury, it is a necessity. Yet too many Californians are trapped on the wrong side of the digital divide. To remain a leader in high-tech innovation, California must do better. Public oversight and intervention is needed to ensure universal and affordable access to high-speed communications services. Policymakers must hold network carriers accountable to meet deployment benchmarks to ensure that essential services like high-speed broadband are provided in an affordable and equitable way.

Therefore, our recommendations are:

- + Policymakers and community leaders** should call on AT&T to accelerate investment in its wireline broadband network in California, expanding deployment of its all-fiber network to more communities on an equitable basis, and ensuring that everyone in its wireline footprint has access to a high-speed broadband connection.
- + Policymakers and community leaders** should call on AT&T to make available to the public its fiber deployment plans: where it plans to deploy fiber, the timeline for the deployment, the number of households that will be served by fiber, internal measures to ensure equitable access to diverse, low-income communities, and network investment plans in rural and other areas.
- + The California legislature** should reassert public authority over broadband network deployment by repealing SB1161, which places some limits on such public oversight, and should adopt legislation that establishes enforceable fiber deployment benchmarks that apply to all providers.
- + The California Public Utilities Commission** should convene public hearings in 2017 across the state on the availability of high-speed broadband in order to inform its 2018 report on the state of broadband in California. It should also continue to require broadband carriers to provide accurate information on broadband deployment by speed, technology, and customer types at a granular Census Block level and audit such data for accuracy; Lastly, it should publish and make available to the public statutorily-mandated reports in a timely manner.

Introduction

CALIFORNIA IS A LEADER in digital innovation and technology, yet too many California residents are stuck in the slow lane on the information highway, with few competitive options for high-speed broadband. In this report, we focus on broadband availability from AT&T California because it is the largest legacy telephone company in the state, reaching 70.8 percent of California households—approximately 9.7 million households—across its wireline network in 56 counties. AT&T is also the largest telecommunications company in the nation, with revenue of \$163.8 billion and profits of \$13 billion in 2016.¹

How AT&T invests in upgrading its wireline network to meet California consumers' demand for high-capacity broadband will have far-reaching consequences for access to opportunity for individual Californians and the state as a whole. It will also have a significant impact on economic growth, job creation, and job quality. Network investment drives job growth at AT&T, which employs more than 17,000 union-represented technicians and customer service workers in California who earn family-supporting wages and benefits. Moreover, high-capacity broadband networks create a “virtuous cycle” of innovation leading to the development of new online applications and services, driving economic growth and job creation throughout the California economy. Academic studies have found that broadband expansion drives local economic growth and households that use the Internet have better employment outcomes than those who do not.²

The Digital Divide in California

Rural Broadband Gap

Only 43 percent of rural households have access to reliable broadband service.

Competition/Speed Gap

Only 36.2 percent of California households have more than one choice for a high-speed broadband provider (at 25/3 Mbps).

Adoption/Affordability Gap

Only 43 percent of low-income households subscribe to wireline broadband at home compared to 94 percent of high-income.

Only 56 percent of Latinos, 68 percent of Asian Americans, and 66 percent of African Americans subscribe to wireline broadband at home compared to 83 percent of non-Hispanic whites.

1 AT&T Press Release, “AT&T Reports 4th Quarter and Full-Year Results,” Jan. 25, 2017 (available at http://about.att.com/story/att_fourth_quarter_earnings_2016.html).

2 Council of Economic Advisors, “The Digital Divide and Economic Benefits of Broadband Access,” March 2016 (available at https://obamawhitehouse.archives.gov/sites/default/files/page/files/20160308_broadband_cea_issue_brief.pdf).

Sources: California Emerging Technology Fund, “Internet Connectivity and the ‘Digital Divide’ in California Households: 2016,” July 2016; Testimony of Trevor R. Roycroft on Behalf of TURN, CPUC Competition Investigation I.15-11-007, filed 11/5/2015, public version 6/1/ 2016; CPUC Competition Report, Dec. 2016.

Broadband Data Analysis

The AT&T Footprint

AT&T's total California wireline broadband footprint encompasses 9,683,239 households, or 70.8 percent of total California households.³ The analysis in this report focuses on this footprint—the households located in areas where AT&T California is the Incumbent Local Exchange Carrier (ILEC). The data was compiled from two sources. The AT&T California broadband figures were compiled using the FCC Form 477 data. We used the most recent dataset, which presents data as of June 2016. The FCC Form 477 data is self-reported by each company and contains the maximum speed that companies advertise by census block.⁴ The income data was derived from the American Community Survey (ACS) five-year estimates, which provides demographic data at the block group level.⁵ The methodology is explained in more detail in the Appendix.

The FCC requires companies to report data separately for wireline, fixed wireless, and mobile broadband, as well as for residential consumer and business broadband availability. This study analyzes only wireline broadband advertised by AT&T to residential customers; all other broadband data is excluded. This methodology is consistent with the FCC 2016 Broadband Progress Report and the CPUC 2016 Competition Report, both of which explain that wireless is not a substitute for a home wireline connection because wireless is

less reliable, more expensive, and it is difficult to do important activities such as homework or apply for a job on a smartphone or small mobile device.⁶

Because the FCC Form 477 data does not report the number of households with no broadband availability, this report focuses only on characteristics of California households with access to AT&T wireline broadband. However, the approximate number of California households in AT&T's footprint with no broadband available from AT&T as of December 2015 was 252,075, comprising 2.5 percent of California households.⁷ This data is reported in Appendix Table 7.

This report analyzes AT&T residential wireline broadband deployment in California in two ways: technology and speed.

In AT&T service areas there are 252,075 households with no broadband available.

3 This figure does not include the small number of households where AT&T is an incumbent local exchange carrier but offers no broadband services. In total, AT&T's California wireline network spans 280,964 census blocks.

4 FCC, Form 477 Data, June 30, 2016 (available at <https://www.fcc.gov/general/broadband-deployment-data-fcc-form-477>).

5 U.S. Census Bureau, American Community Survey (ACS) 2011-2015 (5-Year Estimates). Prepared by Social Explorer (available online at <http://www.socialexplorer.com/explore/tables>).

6 FCC, 2016 Broadband Progress Report, Jan. 29, 2016 (available at https://apps.fcc.gov/edocs_public/attachmatch/FCC-16-6A1.pdf); California Public Utilities Commission, Decision Analyzing the California Telecommunications Market, Investigation 15-11-007, Dec. 8, 2016, pp 11,47-8 (available at <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M171/K031/171031953.pdf>).

7 Author's calculation from FCC ArcGIS File of AT&T ILEC territory and FCC Form 477 database, Dec. 15, 2015.

AT&T uses three wireline broadband technologies:

- + **DSL** is the oldest and slowest wireline broadband technology. DSL delivers data traffic over the traditional copper network at download speeds typically in the range between 0.768 Mbps and 6 Mbps, depending on the customer's distance from the switch. This is the only wireline broadband technology available to 2,677,141 California households (27.6 percent) in AT&T's wireline footprint.
- + **VDSL, which AT&T markets as U-verse**, is a fiber-to-the-node (FTTN) network that delivers data over fiber to a neighborhood cabinet and then over the traditional copper network to the customer location. This technology typically delivers Internet download speeds between 12 and 18 Mbps over a single copper pair (again depending on the distance from the switch), but the speed can go up to 75 Mbps with pair bonding (two copper pairs) and boosts in digital frequency. AT&T U-verse deployment began in 2006 and continued through 2015. Almost three-quarters (71.6 percent) of California households in the AT&T wireline footprint—6,937,319 households—have access to U-verse Internet, almost all in urban or suburban communities. AT&T has largely bypassed rural communities in deploying U-verse.
- + **Fiber-to-the-Home (FTTH)**. In the past year, AT&T began to deploy all-fiber networks in communities across its 21-state wireline footprint, including California. All-fiber networks are capable of delivering “Gigapower” speeds of up to 1,000 Mbps download and upload. To win regulatory approval of its DirecTV acquisition, AT&T committed to deploy all-fiber networks to 12.5 million customer locations by 2019. As of April 20, 2017 AT&T reported that it had deployed all-fiber networks to 4.6 million customer locations across its 21-state footprint.⁸

⁸ FCC, AT&T/DirecTV Order, MB Docket No. 14-90, July 28, 2015 (rel) (available at <https://www.fcc.gov/transaction/att-directv>). AT&T Press Release, April 20, 2017.

AT&T's Initial Fiber-to-the-Home Deployment Targets High-Income Households

This analysis of the June 2016 FCC Form 477 data provides a first look at the income characteristics of the California communities that AT&T has chosen as pioneers in its fiber-to-the-home deployment. The June 2016 data reports AT&T fiber-to-the-home deployment in 2,886 census blocks reaching 68,029 households. Because there is no regulatory oversight of AT&T's fiber-to-the-home deployment, AT&T is free to choose the communities in which it builds its all-fiber GigaPower network. Our analysis finds that AT&T has built its all-fiber network disproportionately in higher income communities. If this pattern continues, it has troubling consequences for low- and moderate-income Californians, leaving many without access to AT&T's gold standard all-fiber network and exacerbating the digital divide.

Table 1 and Charts 1 through 8 detail the median household income for the most advanced technology available to households across California and in seven counties where AT&T has deployed fiber-to-the-home. A clear pattern emerges: those with access to AT&T's fiber-to-the-home network have the highest median household income and those with only DSL availability have the lowest median income.

- + The median household income of California communities with access to AT&T's fiber-to-the-home (FTTH) network is \$94,208, to U-verse is \$67,021, and to the DSL network is \$53,186.
- + The median household income for fiber-to-the-home households exceeds those with only U-verse availability by \$27,187 (28.9 percent) and those with only DSL availability by \$41,022 (43.5 percent).
- + This pattern is replicated in each of the seven counties where AT&T has early fiber deployment. For example, in Los Angeles County, the median income of households with fiber-to-the-home access is \$110,474, compared with \$60,534 for those with U-verse availability, and \$47,894 for those with only DSL availability. This amounts to differences of \$49,940 (45.2 percent) for U-verse and \$62,580 (56.6 percent) for DSL.
- + Our analysis did not find a correlation between the areas where AT&T has deployed its fiber-to-the-home technology and racial/ethnic characteristics, but policymakers should continue to monitor this aspect of AT&T's fiber deployment going forward.

Table 1: Median Household Income by AT&T Broadband Technology Speed

County	Technology	Total Households	% of Household by Tech	Median Household Income	Difference from Fiber to the Home (Median Household Income)	% Difference from Fiber to the Home (Median HH Income)
Los Angeles	DSL	736,230	34.0%	\$47,894	\$(62,580)	-56.6%
	U-Verse	1,425,810	65.8%	\$60,534	\$(49,940)	-45.2%
	Fiber to the Home	4,881	0.2%	\$110,474		
	All Technologies	2,166,921		\$54,195	\$(56,279)	-50.9%
San Diego	DSL	113,251	10.1%	\$63,007	\$(67,183)	-51.6%
	U-Verse	996,576	89.1%	\$69,247	\$(60,943)	-46.8%
	Fiber to the Home	8,178	0.7%	\$130,190		
	All Technologies	1,118,005		\$68,704	\$(61,486)	-47.2%
Orange	DSL	214,511	26.4%	\$89,374	\$(14,189)	-13.7%
	U-Verse	591,542	72.7%	\$75,400	\$(28,163)	-27.2%
	Fiber to the Home	7,115	0.9%	\$103,563		
	All Technologies	813,168		\$80,196	\$(23,367)	-22.6%
Alameda	DSL	46,754	8.2%	\$84,160	\$(26,984)	-24.3%
	U-Verse	525,210	91.7%	\$76,416	\$(34,728)	-31.2%
	Fiber to the Home	966	0.2%	\$111,144		
	All Technologies	572,930		\$77,421	\$(33,723)	-30.3%
Sacramento	DSL	57,828	13.6%	\$50,513	\$(27,523)	-35.3%
	U-Verse	362,938	85.5%	\$53,499	\$(24,537)	-31.4%
	Fiber to the Home	3,672	0.9%	\$78,036		
	All Technologies	424,438		\$52,262	\$(25,774)	-33.0%
Contra Costa	DSL	74,511	18.9%	\$83,707	\$(14,061)	-14.4%
	U-Verse	314,099	79.6%	\$80,792	\$(16,976)	-17.4%
	Fiber to the Home	6,061	1.5%	\$97,768		
	All Technologies	394,671		\$82,273	\$(15,495)	-15.8%
Fresno	DSL	59,614	23.0%	\$39,003	\$(39,394)	-50.2%
	U-Verse	195,142	75.2%	\$50,361	\$(28,036)	-35.8%
	Fiber to the Home	4,639	1.8%	\$78,397		
	All Technologies	259,395		\$44,270	\$(34,127)	-43.5%
Ca State-Wide Total	DSL	2,677,141	27.6%	\$53,186	\$(41,022)	-43.5%
	U-Verse	6,937,319	71.6%	\$67,021	\$(27,187)	-28.9%
	Fiber to the Home	68,029	0.7%	\$94,208		
	All Technologies	9,682,489		\$61,911	\$(32,297)	-34.3%

Sources: FCC Form 477, June 30, 2016 and American Community Survey 2011-2015 (five-year estimates)

Charts 1-8. AT&T Fiber to the Home Deployment in California Median Household Income by Technology

Chart 1. California State

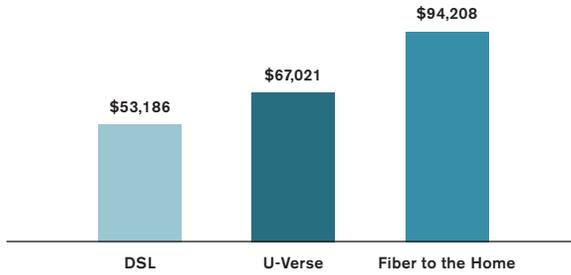


Chart 5. Alameda County

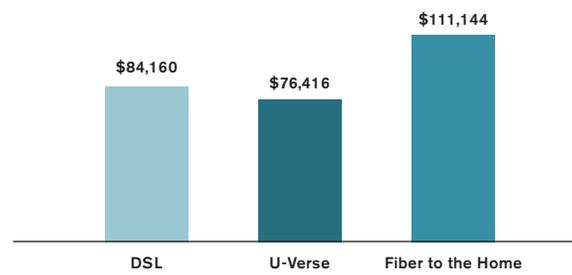


Chart 2. Los Angeles County

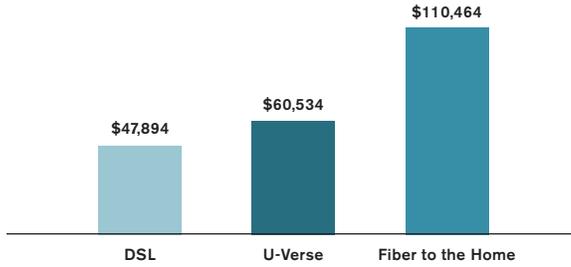


Chart 6. Sacramento County

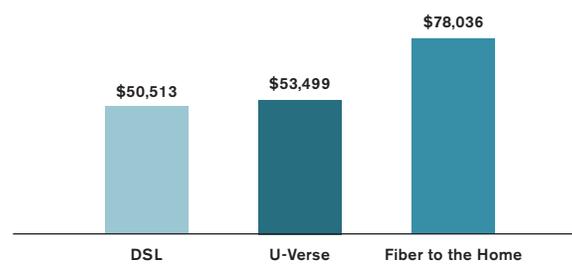


Chart 3. San Diego County

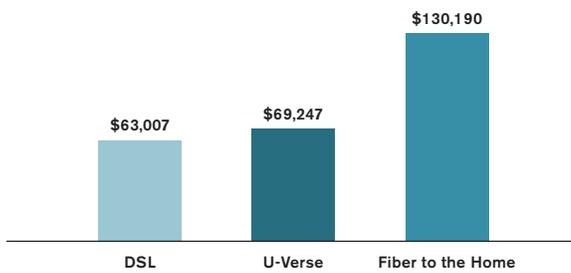


Chart 7. Contra Costa County

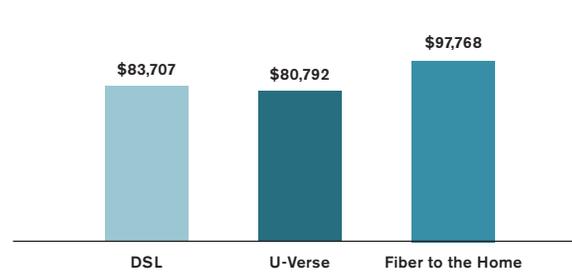


Chart 4. Orange County

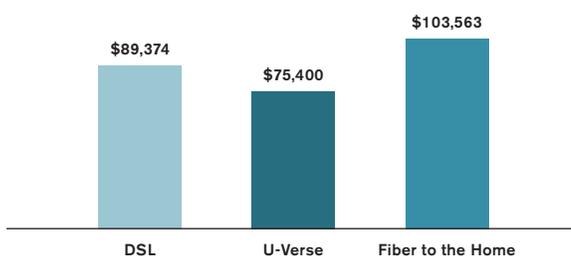
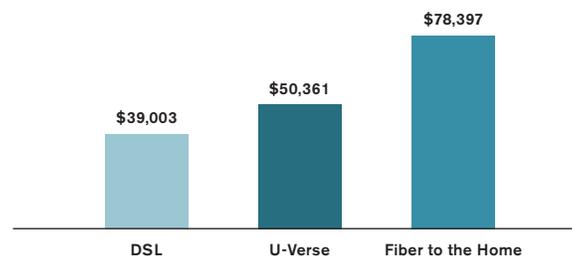


Chart 8. Fresno County



Source: FCC form 477, June 2016 (most recent data)

AT&T Leaves Many California Communities Stuck in the Slow Lane

AT&T's advertised broadband speeds leave many Californians underserved, below the official CPUC standard of 6/1 Mbps, and without high-speed broadband meeting the federal standard of 25/3 Mbps. The following figures drawn from our analysis present a stark picture of the inadequacy of AT&T's wired broadband network in California. A complete list of AT&T broadband speeds by county is available in Table 5 in the Appendix.

- + 18.1 percent of California households in AT&T's wireline footprint, or approximately 1.7 million households, are underserved by AT&T broadband, without access to the CPUC benchmark of 6 Mbps broadband download.
- + 42.8 percent of California households in AT&T's wireline footprint—approximately 4.1 million households—cannot get AT&T broadband at the FCC broadband speed standard of 25/3 Mbps.
- + AT&T does not advertise any broadband, at any speed, to more than one-quarter million (252,075) California households in its wireline footprint. (This figure is based on data from December 2015).⁹
- + More than one-quarter (27.6 percent) of California households in AT&T's wireline footprint—approximately 2.7 million households—can only get DSL from AT&T.
- + AT&T's higher-speed U-verse broadband technology is not available to virtually any household in 14 largely rural counties.

- + Many urban and suburban counties have a significant number of households that are underserved by AT&T broadband. In Los Angeles County, approximately 443,000 households (20.4 percent) in AT&T's wireline footprint lack access to AT&T broadband at 6/1 Mbps and approximately 1.1 million households (51.5 percent) lack access to AT&T broadband at 25/3 Mbps. In Santa Clara County, the heart of Silicon Valley, approximately 98,000 households (17.5 percent) are underserved by AT&T and approximately 176,000 lack access to AT&T broadband at 25/3 Mbps.

Table 5 in the Appendix breaks these statewide figures down by county. In 14 largely rural counties, virtually no household has access to AT&T broadband at the FCC's 25/3 Mbps speed and between one-third and two-thirds or more households are underserved without access to AT&T broadband at the 6 Mbps download CPUC benchmark.

Table 6 in the Appendix provides a complete list of AT&T broadband technology deployment by county. In 14 largely rural counties—Amador, Butte, Calaveras, Glenn, Humboldt, Imperial, Tehama, Lake, Mendocino, Nevada, San Luis Obispo, Shasta, Siskiyou, and Tuolumne—AT&T has not deployed its more advanced U-verse fiber-to-the-node (FTTN) or fiber-to-the-home technology to virtually any household.

AT&T's lack of high-speed Internet is not limited to rural areas: the company also falls short in populous urban and suburban counties throughout California. Table 3 shows the number of households without access to AT&T broadband at CPUC and FCC standard speeds for the 10 counties where AT&T has the largest footprint.

⁹ Over the next six years, AT&T has made a commitment to the FCC to use federal Connect America Fund subsidies to deploy broadband at a minimum of 10/1 Mbps to 141,000 underserved customer locations, but this will still leave more than half of AT&T's wireline footprint without broadband access.

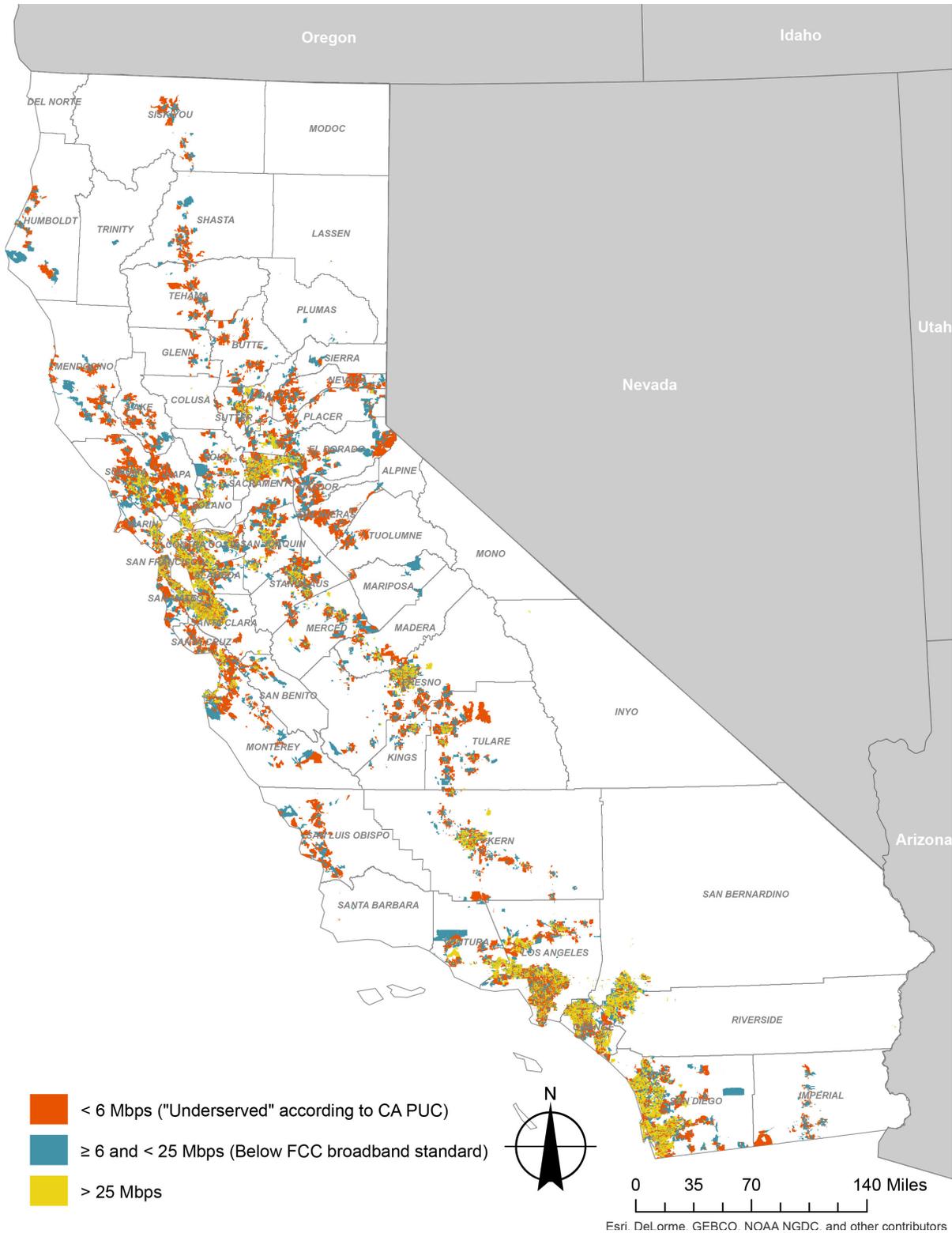
Table 2. Counties with Slowest AT&T Broadband in AT&T Wireline Footprint

County	Underserved Households without access to 6 Mbps Download or Above (CPUC Standard)	Households without access to 25/3 Mbps or Above (FCC Standard)
Butte	41,938 (61.2%)	68,516 (100%)
Calaveras	8,076 (58.1%)	13,906 (100%)
Tuolumne	8,098 (55.9%)	14,482 (100%)
Shasta	24,319 (52.2%)	46,625 (100%)
Nevada	18,480 (46.5%)	39,520 (99.4%)
San Luis Obispo	42,851 (45.6%)	93,897 (100%)
Humboldt	18,049 (43.4%)	41,561 (100%)
Lake	10,589 (41.1%)	25,763 (100%)
Mendocino	9,637 (38.8%)	24,833 (100%)
Tehama	6,515 (38.5%)	16,927 (100%)
El Dorado	24,308 (37%)	50,359 (76.8%)
Santa Cruz	31,845 (34.6%)	69,393 (75.4%)
Amador	2,837 (33.1%)	8,569 (100%)

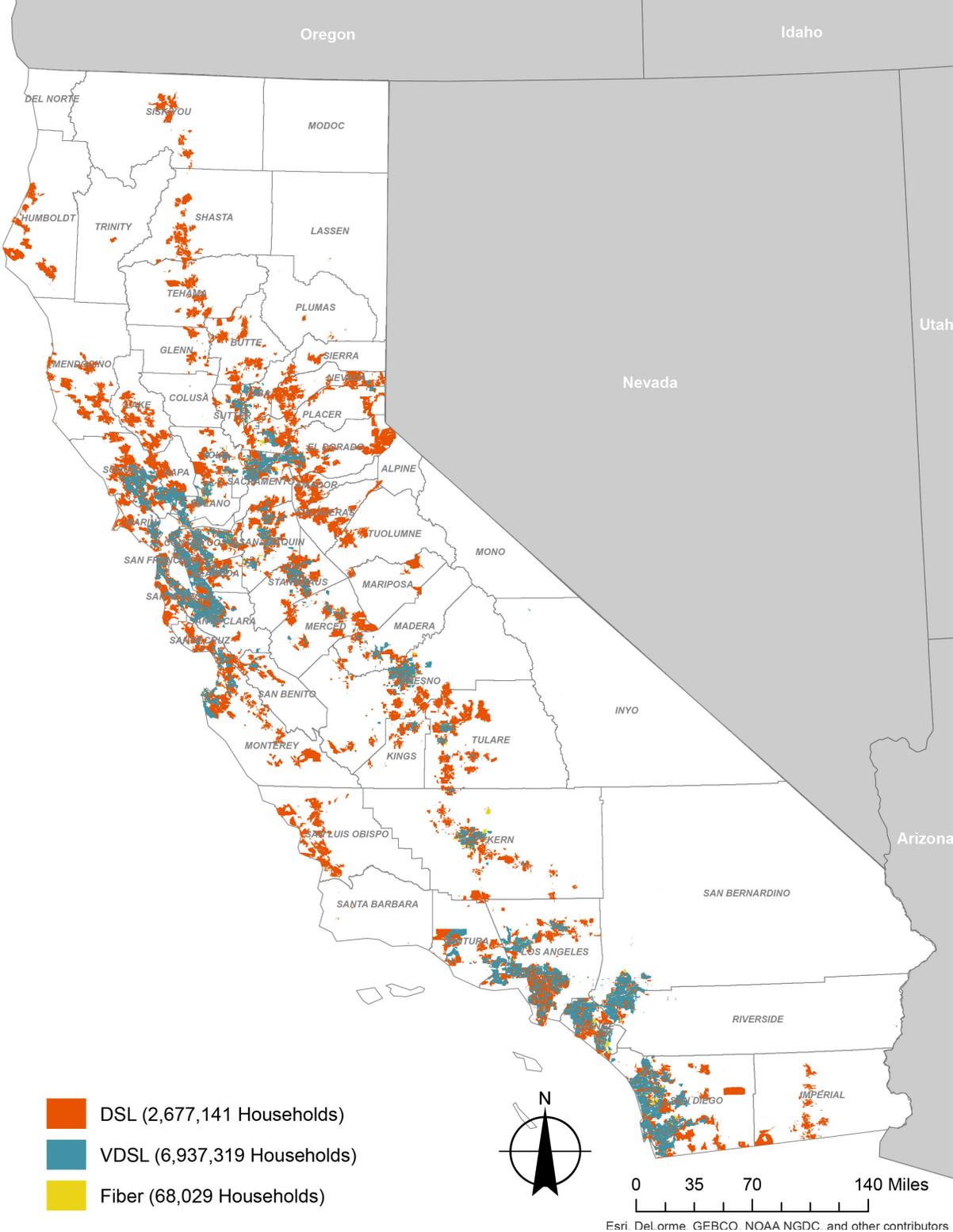
Table 3. Households without Access to Broadband at CPUC and FCC Standards for 10 Largest Urban/Suburban Counties in AT&T Wireline Footprint

County	Underserved Households without access to 6 Mbps download or Above (CPUC Standard)	Households without access to 25/3 Mbps or Above (FCC Standard)	Total Number of Households in AT&T's Footprint
Los Angeles	443,007 (20.4%)	1,116,461 (51.5%)	2,167,671
San Diego	135,692 (12.1%)	277,253 (24.8%)	1,118,005
Orange	167,512 (20.6%)	325,993 (40.1%)	813,168
Alameda	62,211 (10.9%)	142,099 (24.8%)	572,930
Santa Clara	98,860 (17.5%)	176,271 (31.1%)	566,222
Sacramento	62,106 (14.6%)	129,262 (30.5%)	424,438
Contra Costa	49,647 (12.6%)	131,794 (33.4%)	394,671
San Francisco	49,375 (13.2%)	258,020 (68.7%)	375,473
San Mateo	53,025 (20.0%)	98,862 (37.3%)	264,782
Fresno	36,683 (14.1%)	97,646 (37.6%)	259,395

**Map 1: Fastest AT&T Broadband Speed
Available by Census Block as of June 30, 2016**



Map 2: Most Advanced AT&T Broadband Technology Available by Census Block as of June 30, 2016



Policy Implications

This report provides a troubling view of AT&T's wireline broadband deployment in California. It shows that AT&T's initial fiber-to-the-home deployment reaches predominately higher-income communities, leaving low- and moderate-income Californians behind. It also shows that AT&T has left rural, and even many urban and suburban, Californians stuck in the slow lane.

In 2006, in response to a request from AT&T, the legislature established rules for statewide video franchising with passage of the Digital Infrastructure and Video Competition Act of 2006 (DIVCA, AB2897). The statute required AT&T to upgrade its network for video capability to at least 50 percent of California households, at least 30 percent of whom must be low-income.¹⁰ As a result, AT&T was required to build its U-verse network to households at all income levels. However, as this report demonstrates, AT&T focused its Uverse investment in more densely-populated urban and suburban areas, leaving rural areas behind.

But today, as AT&T embarks on a new wave of wired infrastructure investment in California, the legislature has taken away substantial public oversight over its fiber deployment. In 2012, the legislature, with AT&T support, passed the "IP Deregulation Bill" (SB 1161) which prohibits regulatory authority over Voice-over-Internet-Protocol (VoIP) and all IP-enabled broadband services. The bill sunsets in 2020. Until that date, or unless the statute is repealed, the legislature has effectively taken away CPUC authority to adopt policies to close the high-speed digital divide and to promote equitable fiber deployment in California.

This report demonstrates that deregulation is not working to drive AT&T investment to ensure that all California communities have access to the essential infrastructure of the 21st century – high-speed broadband. It is critical that policymakers take proactive steps to get AT&T to accelerate its wireline network investment and fiber deployment to bring high-speed broadband to all California communities.

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

Recommendations

Access to high-speed broadband is not a luxury, it is a necessity. Yet too many Californians are trapped on the wrong side of the digital divide. To remain a leader in high-tech innovation, California must do better. Public oversight and intervention is needed to ensure universal and affordable access to high-speed communications services. Policymakers must hold network carriers accountable to meet deployment benchmarks to ensure that essential services like high-speed broadband are provided in an affordable and equitable way.

Therefore, our recommendations are:

- + Policymakers and community leaders** should call on AT&T to accelerate investment in its wireline broadband network in California, expanding deployment of its all-fiber network to more communities on an equitable basis, and ensuring that everyone in its wireline footprint has access to a high-speed broadband connection.
- + Policymakers and community leaders** should call on AT&T to make available to the public its fiber deployment plans: where it plans to deploy fiber, the timeline for the deployment, the number of households that will be served by fiber, internal measures to ensure equitable access to diverse, low-income communities, and network investment plans in rural and other areas.
- + The California legislature** should reassert public authority over broadband network deployment by repealing SB1161, which places some limits on such public oversight, and should adopt legislation that establishes enforceable fiber deployment benchmarks that apply to all providers.
- + The California Public Utilities Commission** should convene public hearings in 2017 across the state on the availability of high-speed broadband in order to inform its 2018 report on the state of broadband in California. It should also continue to require broadband carriers to provide accurate information on broadband deployment by speed, technology, and customer types at a granular Census Block level and audit such data for accuracy; Lastly, it should publish and make available to the public statutorily-mandated reports in a timely manner.

Appendix

Methodology

Data Sources

The AT&T California broadband statistics referenced in this report were compiled using FCC Form 477 data available on the FCC website.¹¹ We used the most recent publicly available dataset which presents data as of June 30, 2016. The FCC Form 477 data is self-reported by each company.

The FCC requires companies to report their data separately for wireline, fixed wireless and mobile broadband. The FCC also requires companies to report data separately for consumer and business broadband availability. Because this study analyzes fixed wireline broadband availability to residential customers, we eliminated from the data all places where AT&T does not provide residential (termed “consumer” in the FCC data) broadband.

The dataset contains the download and upload speeds advertised by each broadband company at the Census Block level. In an urban area, a Census Block is roughly equivalent to the size of a city block, while in rural areas Census Blocks can be larger due to low population density. The FCC notes that it is possible for broadband to be advertised to one household in a Census Block while not being available to another household in that same Block. However, for the purposes of this report, we assume that if a company advertises broadband with a particular speed and technology in a Census Block, every household in the Block has access to that speed and technology. This is a conservative assumption because it may overstate the true availability of broadband to all households in the Census Block. Because the Form 477 data concerns the speeds advertised by companies in various Census Block, this report does not examine consumer adoption of AT&T broadband in California, nor does this report examine whether the speeds advertised by AT&T are the actual speeds delivered by AT&T.

The FCC dataset contains information on four wireline broadband technologies offered by AT&T in California, summarized in the table below. This report classifies the technologies into three categories: DSL, U-verse, and fiber.

Table 4: AT&T Technologies in FCC Data¹²

FCC Technology Code	FCC Description of Technology	Classification of Technology in Report
10	Asymmetric xDSL	DSL
11	ADSL2, ADSL2+	DSL
12	VDSL	U-verse
50	Optical Carrier / Fiber to the end user (Fiber to the home or business end user, does not include “fiber to the curb”)	Fiber

The FCC Form 477 data was cleaned and combined with other datasets to conduct the analysis in this report. The most important steps in this process were the following:

- + We found AT&T’s fastest advertised download speed in each Census Block. AT&T reports maximum advertised speeds in 10 speed tiers: 0.768 Mbps, 1.5 Mbps, 3 Mbps, 6 Mbps, 12 Mbps, 18 Mbps, 24 Mbps, 45 Mbps, 75 Mbps, 1000 Mbps.
- + We found AT&T’s most advanced technology available in each Census Block, with Fiber (Tech Code 50) being the most advanced and DSL (Tech Codes 10 and 11) being the least advanced.

¹¹ FCC, Form 477 Data, June 30, 2016 (available at <https://www.fcc.gov/general/broadband-deployment-data-fcc-form-477>)

¹² <https://www.fcc.gov/general/technology-codes-used-fixed-broadband-deployment-data>

+ We merged the FCC data with 2010 Census data to determine the number of housing units (referred to as “households” in this report) by Census Block.¹³ Each Census Block is identified by a 12-digit FIPs Code. The third through fifth digit of this code identifies the county in which the Census Block is located. These digits were used to assign a county name to each Census Block.

+ We merged the FCC data with American Community Survey (ACS) 5-Year Estimates of median household income from 2011-2015.¹⁴ The smallest geographical unit at which the ACS provides data on median household income is the Census Block Group, which typically has a population of 600 to 3,000 people. Each Census Block is located within a Census Block Group. We merged the FCC and ACS data by assigning to each Census Block the median household income of the Block Group containing that Block. Given the small number of households in each Block Group, we assume any variation in median household income across the Blocks located in a Block group would be minimal. Therefore, this procedure gives us reasonably accurate estimates of the median income of households with access to each AT&T broadband technology and speed.

+ We identified in the December 2015 FCC data those Census Blocks where AT&T is an Incumbent Local Exchange Carrier but does not provide broadband. The Form 477 only requires reporting where a company provides broadband, but does not require reporting of “no broadband” Census Blocks. These Census Blocks were found through a three-stage process. First, we mapped a Shapefile of the FCC’s March 2016 report of the all Incumbent Local Exchange Carrier (ILEC) study areas in the U.S. using ArcGIS, an industry-standard geographic information

system software program.¹⁵ Second, we extracted AT&T California’s ILEC area and ran an intersect command in ArcGIS with a Shapefile of all California Census Blocks downloaded from the Census Bureau’s TIGER website. This intersect command allowed us to determine which Census Blocks are located in AT&T California’s ILEC areas. Third, we ran an erase command in ArcGIS to remove from the ILEC area all Census Blocks where AT&T advertises broadband, leaving just the Census Blocks where AT&T is an ILEC but provides no broadband.

Lastly, it is important to note that while some reports include upload speeds in their analysis, this report focuses on download speeds. Therefore, we assume that any household with download speeds of 25 Mbps or above will also have upload speeds of 3 Mbps or above.

Statewide Broadband Maps

The maps in this report were created using ArcGIS, an industry-standard geographic information system software program. AT&T advertises 10 different broadband speeds in California (0.768, 1.5, 3, 6, 12, 18, 24, 45, 75, and 1000 Mbps). However, in order to increase the legibility of the county-level maps, these speeds were grouped into three colors corresponding to the following value ranges:

- + **Red:** Less than 6 Mbps
- + **Blue:** Greater than or equal to 6 Mbps and less than 25 Mbps
- + **Green:** Greater than or equal to 25

13 2010 was the most recent year in which the Census Bureau collected housing unit counts at the Census Block level. The statewide proportion of housing units by county has changed relatively little since 2010.

14 U.S. Census Bureau, American Community Survey (ACS) 2011-2015 (5-Year Estimates). Prepared by Social Explorer (available online at <http://www.socialexplorer.com/explore/tables>)

15 The FCC’s March 2016 study areas Shapefile is available at https://github.com/FCC/SABdata/blob/master/study_areas_10mar16.zip

Table 5. Number of Households Without Access to AT&T Wireline Broadband at Benchmark Speeds in AT&T Wireline Footprint

County	6 Mbps or greater (CA benchmark)		25 Mbps or greater (FCC benchmark)		Total # of Households in County Located within AT&T Incumbent Carrier Area
	HH Count	% of Cnty HH	HH Count	% of Cnty HH	HH Count
Alameda	62,211	10.9%	142,099	24.8%	572,930
Alpine	0	0.0%	529	100.0%	529 *
Amador	2,837	33.1%	8,569	100.0%	8,569
Butte	41,938	61.2%	68,516	100.0%	68,516
Calaveras	8,076	58.1%	13,906	100.0%	13,906
Colusa	9	2.0%	112	25.3%	443 *
Contra Costa	49,647	12.6%	131,794	33.4%	394,671
Del Norte	23	20.2%	114	100.0%	114 *
El Dorado	24,308	37.0%	50,359	76.8%	65,613
Fresno	36,683	14.1%	97,646	37.6%	259,395
Glenn	1,583	19.1%	8,186	98.9%	8,278
Humboldt	18,049	43.4%	41,561	100.0%	41,565
Imperial	9,296	20.0%	46,399	100.0%	46,399
Inyo	0	0.0%	25	7.4%	340 *
Kern	35,473	16.0%	95,895	43.3%	221,386
Kings	4,242	11.9%	20,240	56.9%	35,588
Lake	10,589	41.1%	25,763	100.0%	25,763
Lassen	0	0.0%	40	100.0%	40 *
Los Angeles	443,007	20.4%	1,116,461	51.5%	2,167,671
Madera	4,857	16.9%	11,359	39.6%	28,718

Sources: FCC Form 477, June 30, 2016 (broadband speeds); 2010 Census (household numbers)

Table 5. Number of Households Without Access to AT&T Wireline Broadband at Benchmark Speeds in AT&T Wireline Footprint (con't.)

County	6 Mbps or greater (CA benchmark)		25 Mbps or greater (FCC benchmark)		Total # of Households in County Located within AT&T Incumbent Carrier Area
	HH Count	% of Cnty HH	HH Count	% of Cnty HH	HH Count
Marin	20,058	21.4%	47,785	51.0%	93,727
Mariposa	305	24.6%	1,240	100.0%	1,240 *
Mendocino	9,637	38.8%	24,833	100.0%	24,833
Merced	18,692	28.8%	39,804	61.3%	64,920
Monterey	27,922	21.6%	59,604	46.2%	129,096
Napa	7,229	14.0%	17,480	33.9%	51,621
Nevada	18,480	46.5%	39,520	99.4%	39,745
Orange	167,512	20.6%	325,993	40.1%	813,168
Placer	19,475	24.2%	47,338	58.7%	80,612
Plumas	33	12.6%	262	100.0%	262 *
Riverside	14,076	6.7%	38,281	18.1%	211,328
Sacramento	62,106	14.6%	129,262	30.5%	424,438
San Benito	2,606	16.7%	5,648	36.1%	15,633
San Bernardino	12,859	9.6%	34,414	25.8%	133,567
San Diego	135,692	12.1%	277,253	24.8%	1,118,005
San Francisco	49,375	13.2%	258,020	68.7%	375,473
San Joaquin	20,637	11.0%	57,887	30.9%	187,610
San Luis Obispo	42,851	45.6%	93,897	100.0%	93,897
San Mateo	53,025	20.0%	98,862	37.3%	264,782
Santa Barbara	739	55.5%	1,331	100.0%	1,331 *

Table 5. Number of Households Without Access to AT&T Wireline Broadband at Benchmark Speeds in AT&T Wireline Footprint (con't.)

County	6 Mbps or greater (CA benchmark)		25 Mbps or greater (FCC benchmark)		Total # of Households in County Located within AT&T Incumbent Carrier Area	
	HH Count	% of Cnty HH	HH Count	% of Cnty HH	HH Count	
Santa Clara	98,860	17.5%	176,271	31.1%	566,222	
Santa Cruz	31,845	34.6%	69,393	75.4%	91,993	
Shasta	24,319	52.2%	46,625	100.0%	46,625	
Sierra	21	7.3%	287	100.0%	287	*
Siskiyou	2,983	25.6%	11,634	100.0%	11,634	
Solano	17,173	12.1%	36,256	25.5%	142,182	
Sonoma	36,661	19.1%	79,959	41.7%	191,579	
Stanislaus	19,883	12.2%	56,172	34.5%	162,774	
Sutter	4,529	14.3%	12,219	38.5%	31,765	
Tehama	6,515	38.5%	16,927	100.0%	16,927	
Trinity	0	0.0%	75	100.0%	75	*
Tulare	21,208	19.6%	56,277	52.0%	108,196	
Tuolumne	8,098	55.9%	14,482	100.0%	14,482	
Ventura	25,607	21.2%	59,213	49.0%	120,934	
Yolo	11,461	16.3%	26,131	37.1%	70,384	
Yuba	2,533	11.8%	7,441	34.7%	21,458	
California State-wide	1,747,833	18.1%	4,147,649	42.8%	9,683,239	

Sources: FCC Form 477, June 30, 2016 (broadband speeds); 2010 Census (household numbers)

Table 6: No. of Households & Census Blocks With Each AT&T Broadband Technology By County

County	DSL		U-Verse		Fiber-to-the-Home		Total AT&T Footprint	
	# of Households	# of Census Blocks	# of Households	# of Census Blocks	# of Households	# of Census Blocks	# of Households	# of Census Blocks
Alameda	46,754	3,358	525,210	13,350	966	46	572,930	16,754
Alpine	529	23	0	0	0	0	529	23
Amador	8,569	446	0	0	0	0	8,569	446
Butte	68,457	2,341	59	1	0	0	68,516	2,342
Calaveras	13,906	565	0	0	0	0	13,906	565
Colusa	79	14	364	33	0	0	443	47
Contra Costa	74,511	3,201	314,099	8,814	6,061	297	394,671	12,312
Del Norte	114	15	0	0	0	0	114	15
El Dorado	43,019	1,846	22,416	612	178	17	65,613	2,475
Fresno	59,614	3,750	195,142	6,161	4,639	241	259,395	10,152
Glenn	8,186	777	92	2	0	0	8,278	779
Humboldt	41,399	2,477	166	4	0	0	41,565	2,481
Imperial	46,158	2,214	241	2	0	0	46,399	2,216
Inyo	15	2	325	16	0	0	340	18
Kern	65,368	3,987	151,237	4,591	4,781	170	221,386	8,748
Kings	16,639	1,208	18,892	797	57	2	35,588	2,007
Lake	25,694	1,607	69	3	0	0	25,763	1,610
Lassen	40	5	0	0	0	0	40	5
Los Angeles	736,230	20,600	1,425,810	27,326	4,881	151	2,166,921	48,077
Madera	6,787	516	21,358	1,006	573	35	28,718	1,557

Sources: FCC Form 477, June 30, 2016 and American Community Survey 2011-2015 (five-year estimates)

Table 6: No. of Households & Census Blocks With Each AT&T Broadband Technology By County (con't.)

County	DSL		U-Verse		Fiber-to-the-Home		Total AT&T Footprint	
	# of Households	# of Census Blocks	# of Households	# of Census Blocks	# of Households	# of Census Blocks	# of Households	# of Census Blocks
Marin	30,005	1,206	63,652	1,339	70	1	93,727	2,546
Mariposa	1,129	86	111	2	0	0	1,240	88
Mendocino	24,830	1,543	3	1	0	0	24,833	1,544
Merced	25,547	1,473	37,719	1,130	1,654	78	64,920	2,681
Monterey	37,708	1,835	90,335	2,445	1,053	114	129,096	4,394
Napa	11,272	509	40,313	1,228	36	1	51,621	1,738
Nevada	38,933	1,465	812	8	0	0	39,745	1,473
Orange	214,511	6,867	591,542	12,851	7,115	134	813,168	19,852
Placer	42,489	1,993	37,241	1,049	882	67	80,612	3,109
Plumas	262	15	0	0	0	0	262	15
Riverside	7,750	667	197,978	5,153	5,600	179	211,328	5,999
Sacramento	57,828	3,201	362,938	9,835	3,672	218	424,438	13,254
San Benito	2,826	286	12,668	516	139	5	15,633	807
San Bernardino	8,870	489	123,731	3,178	966	57	133,567	3,724
San Diego	113,251	6,144	996,576	22,302	8,178	255	1,118,005	28,701
San Francisco	215,471	3,176	159,112	2,757	890	4	375,473	5,937
San Joaquin	32,294	2,142	151,042	4,824	4,274	224	187,610	7,190
San Luis Obispo	93,598	3,808	299	2	0	0	93,897	3,810
San Mateo	45,181	2,032	219,600	5,163	1	1	264,782	7,196

Table 6: No. of Households & Census Blocks With Each AT&T Broadband Technology By County (con't.)

County	DSL		U-Verse		Fiber-to-the-Home		Total AT&T Footprint	
	# of Households	# of Census Blocks	# of Households	# of Census Blocks	# of Households	# of Census Blocks	# of Households	# of Census Blocks
Santa Barbara	1,331	48	0	0	0	0	1,331	48
Santa Clara	61,121	2,917	500,791	11,235	4,310	185	566,222	14,337
Santa Cruz	59,240	2,123	32,753	919	0	0	91,993	3,042
Shasta	46,620	2,081	5	1	0	0	46,625	2,082
Sierra	287	33	0	0	0	0	287	33
Siskiyou	11,634	965	0	0	0	0	11,634	965
Solano	15,282	1,155	125,214	3,793	1,686	108	142,182	5,056
Sonoma	41,294	2,082	149,603	3,986	682	17	191,579	6,085
Stanislaus	29,368	1,942	131,995	4,031	1,411	74	162,774	6,047
Sutter	6,741	536	24,516	809	508	21	31,765	1,366
Tehama	16,917	1,278	10	1	0	0	16,927	1,279
Trinity	75	1	0	0	0	0	75	1
Tulare	46,378	3,666	60,083	2,421	1,735	129	108,196	6,216
Tuolumne	14,373	728	109	2	0	0	14,482	730
Ventura	45,691	1,955	74,994	1,824	249	12	120,934	3,791
Yolo	10,337	675	59,571	1,452	476	28	70,384	2,155
Yuba	4,629	340	16,523	689	306	15	21,458	1,044
Total	2,677,141	110,414	6,937,319	167,664	68,029	2,886	9,682,489	280,964

Sources: FCC Form 477, June 30, 2016 and American Community Survey 2011-2015 (five-year estimates)

Table 7. Households with No AT&T Broadband (as of Dec. 15, 2015)

County	HH Count	% of Cnty HH
Colusa	435	100.0%
Inyo	577	100.0%
Lassen	72	100.0%
Santa Barbara	26	100.0%
Trinity	905	100.0%
Mariposa	1,856	57.8%
Sierra	1,219	52.7%
Plumas	4,807	52.5%
Mendocino	8,238	24.3%
Siskiyou	3,472	21.5%
Tuolumne	5,617	21.0%
Glenn	2,111	20.0%
Calaveras	3,176	18.4%
Tehama	3,578	14.5%
Yuba	3,395	13.0%
Amador	1,242	13.0%
Lake	3,815	11.6%
Madera	3,452	10.6%
Nevada	5,140	10.1%
El Dorado	8,266	9.7%

Source: Author's calculation from FCC shapefile of AT&T ILEC territory and FCC Form 477 broadband database, Dec. 15, 2015

Table 7. Households with No AT&T Broadband (as of Dec. 15, 2015) (con't.)

County	HH Count	% of Cnty HH
Kings	3,589	9.3%
San Benito	1,604	9.2%
Tulare	10,969	8.9%
Humboldt	4,159	8.4%
Butte	7,453	7.9%
Merced	5,265	7.5%
Alpine	42	7.4%
Monterey	8,887	6.6%
Placer	5,739	6.6%
Napa	2,827	5.2%
Shasta	3,176	5.2%
Imperial	2,378	4.9%
San Joaquin	8,518	4.4%
Kern	9,557	4.2%
Fresno	10,115	3.8%
San Luis Obispo	4,160	3.8%
Yolo	2,740	3.8%
Sutter	1,189	3.6%
Solano	4,770	3.2%
Stanislaus	4,514	2.7%

Table 7. Households with No AT&T Broadband (as of Dec. 15, 2015) (con't.)

County	HH Count	% of Cnty HH
Sonoma	5,033	2.6%
San Diego	29,152	2.6%
Santa Clara	13,424	2.4%
Santa Cruz	2,132	2.2%
Orange	12,702	1.6%
Marin	1,340	1.4%
Contra Costa	4,766	1.2%
Ventura	1,219	1.0%
Sacramento	4,304	1.0%
Alameda	5,405	0.9%
Riverside	1,974	0.9%
San Mateo	1,669	0.6%
San Bernardino	763	0.6%
Los Angeles	4,997	0.2%
San Francisco	145	0.0%
California State-wide	252,075	2.5%

Source: Author's calculation from FCC shapefile of AT&T ILEC territory and FCC Form 477 broadband database, Dec. 15, 2015

The Haas Institute for a Fair and Inclusive Society brings together researchers, community stakeholders, and policymakers to identify and challenge the barriers to an inclusive, just, and sustainable society in order to create transformative change.

Contact

460 Stephens Hall
Berkeley, CA 94720-2330
Tel 510-642-3342
haasinstitute.berkeley.edu

