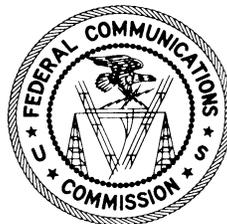


# **Internet Access Services: Status as of December 31, 2017**

Industry Analysis Division  
Office of Economics & Analytics  
August 2019



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## TABLE OF CONTENTS

<b>SECTION 1: OVERVIEW &amp; HIGHLIGHTS</b> .....	<b>1</b>
<b>Introduction</b> .....	<b>1</b>
<b>Total Connections</b> .....	<b>2</b>
Figure 1    Fixed and Mobile Connections by Speed 2014-2017 .....	2
<b>Connections by Speed</b> .....	<b>3</b>
Figure 2(a) Distribution of Fixed Connections by Downstream Speed.....	3
Figure 2(b) Distribution of Fixed Connections by Upstream Speed .....	4
Figure 3    Fixed Connections by Speed 2014-2017 .....	5
<b>Number of Providers by Census Block</b> .....	<b>6</b>
Figure 4    Percentages of Developed Census Blocks in which Providers Report Deployment of Residential Fixed Broadband.....	6
<b>Internet Access Subscribership</b> .....	<b>7</b>
Figure 5    Fixed Connections 2002-2017 .....	7
<b>Other Report Highlights</b> .....	<b>8</b>
<b>SECTION 2: SUMMARY STATISTICS - THE NATION</b> .....	<b>10</b>
<b>SECTION 3: SUMMARY STATISTICS - THE STATES</b> .....	<b>28</b>
<b>SECTION 4: SUMMARY STATISTICS - COUNTIES AND CENSUS TRACTS</b> .....	<b>38</b>
<b>SECTION 5: CORRELATION RESULTS - DEMOGRAPHIC MEASURES</b> .....	<b>48</b>
<b>Technical Notes</b> .....	<b>55</b>
<b>Glossary</b> .....	<b>58</b>

## SECTION 1: OVERVIEW & HIGHLIGHTS

### Introduction

This report summarizes information about Internet access connections in the United States as of December 31, 2017 as collected by FCC Form 477. For purposes of this report, Internet access *connections* are those in service, over 200 kilobits per second (kbps) in at least one direction, and reported to the FCC through Form 477.<sup>1</sup>

The report includes data on total and residential Internet access connections by downstream and upstream speed, by technology, by geography, and over time. Section 2 of the report presents nationwide statistics, Section 3 provides state-level data, and Section 4 includes data on the subscribership differences among counties and census tracts.<sup>2</sup> In addition, Section 5 of the report includes an analysis of the correlations between subscribership ratios and various demographic measures.<sup>3</sup> Maps depicting the number of fixed connections per 1,000 households by census tract are available online at <https://www.fcc.gov/reports-research/reports/internet-access-services-reports/internet-access-services-reports>.

<sup>1</sup> See the Technical Notes and Glossary at the end of this report for more-detailed information about the Form 477 data collection and the meaning of terms used in this report. Note that the Form 477 data for the June 30, 2014 filing period were not subject to typical quality checks. See *Internet Access Services: Status as of December 31, 2014* (March 2016) at 2, available at [https://apps.fcc.gov/edocs\\_public/attachmatch/DOC-338630A1.pdf](https://apps.fcc.gov/edocs_public/attachmatch/DOC-338630A1.pdf). In addition, the figures on mobile broadband subscribership by speed tier (formerly Figures 4(a), 4(b), and 12) have been removed to maintain firm confidentiality.

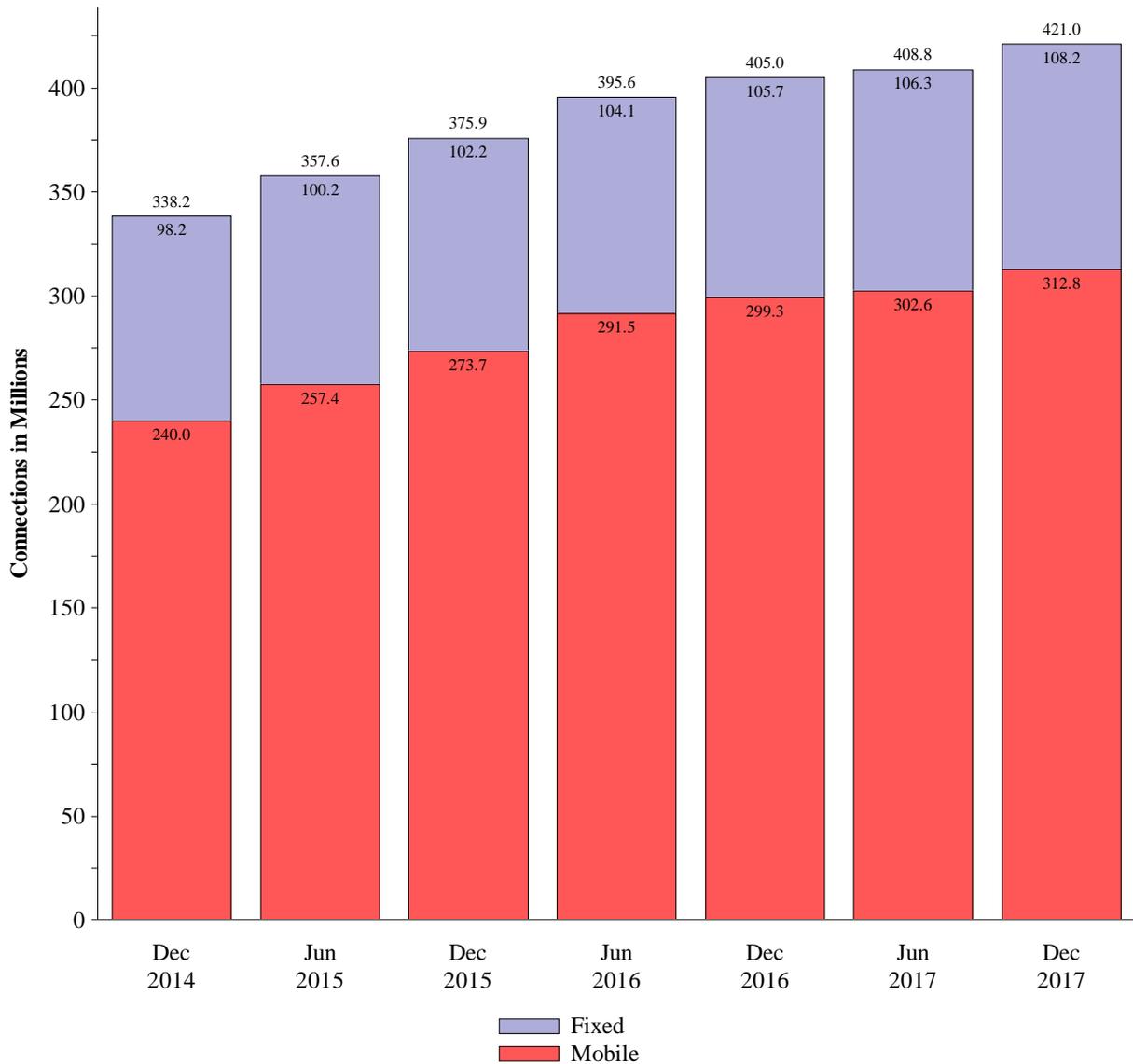
<sup>2</sup> The Commission began collecting census tract-level data for data as of December 31, 2008. See *High-Speed Services for Internet Access: Status as of December 31, 2008* (February 2010) at 1-4, available at <http://www.fcc.gov/encyclopedia/high-speed-services-internet-access-reports> (*December 2008 High-Speed Report*).

<sup>3</sup> Publicly-available data that are too voluminous to include in this report are available online at <https://www.fcc.gov/general/fcc-form-477-additional-data>.

## Total Connections

- As shown in Figure 1, total Internet connections increased by about 4% between December 2016 and December 2017 to 421 million. Mobile Internet connections increased 4.5% year-over-year to 313 million in December 2017, while fixed connections grew to 108 million – up about 2% from December 2016.
- Although Mobile Internet connections were revised upward for our last report, we believe this number remains underreported by as much as 5% through December 2017.

**Figure 1**  
**Fixed and Mobile Connections 2014-2017**

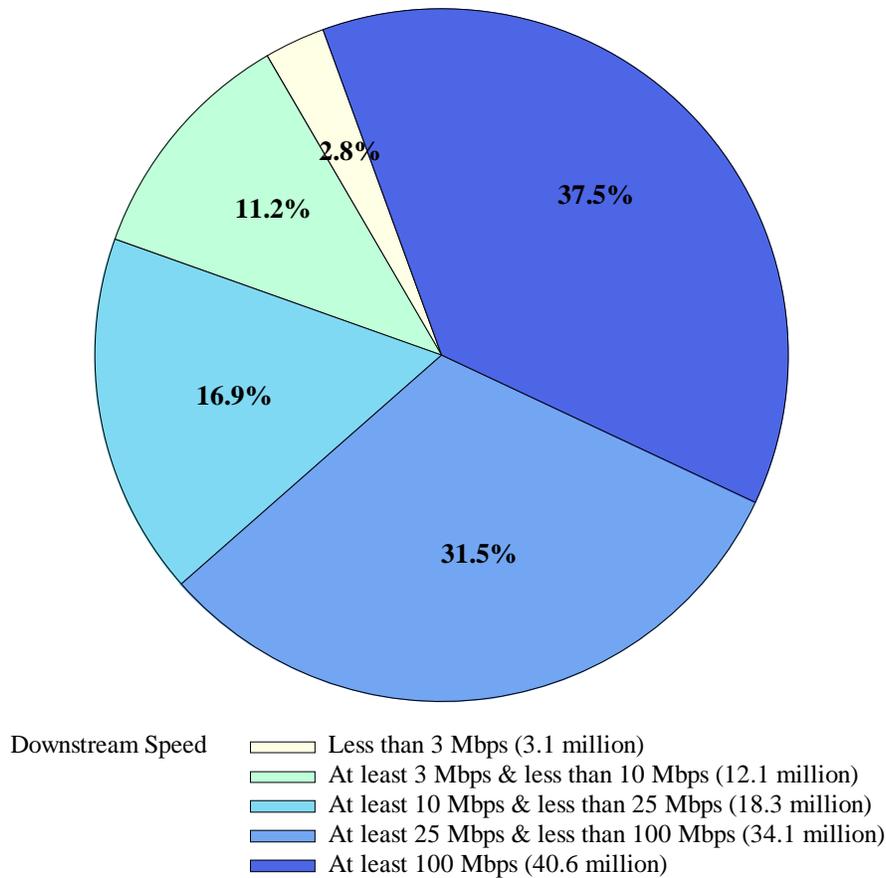


The Commission approved changes to the Form 477 in June 2013 that affect the data beginning in June 2014 (see Technical Notes). Some previously-published data may have been revised. Figures may not sum to totals elsewhere in this report due to rounding. Connections include both residential and business connections.

## Connections by Speed

*Fixed connections – downstream speeds.* Figure 2(a) illustrates how the 108 million fixed connections reported for December 2017 were distributed across the five groups of *downstream speeds* defined by breakpoints at 3 Mbps, 10 Mbps, 25 Mbps, and 100 Mbps.

**Figure 2(a)**  
**Distribution of Fixed Connections (108.2 million) by Downstream Speed**  
**as of December 31, 2017**

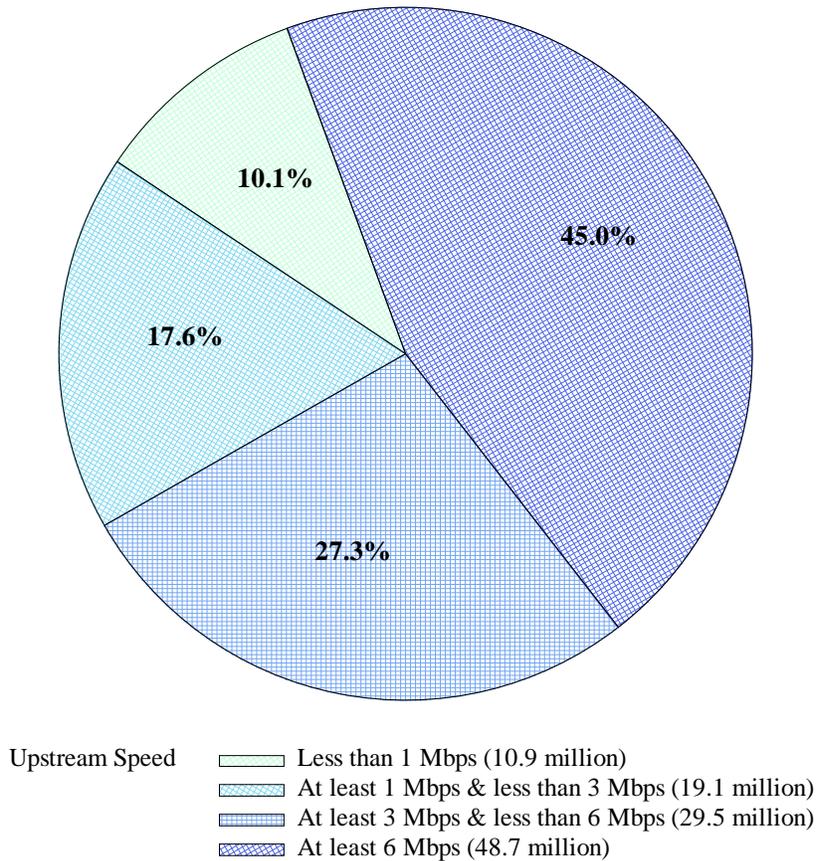


- In December 2017, 3% of fixed connections (or 3 million connections) were slower than 3 Mbps downstream, 11% (or 12 million connections) were at least 3 Mbps downstream but slower than 10 Mbps, 17% (or 18 million connections) were at least 10 Mbps downstream but slower than 25 Mbps, 32% (or 34 million connections) were at least 25 Mbps downstream but slower than 100 Mbps, and 38% (or 41 million connections) were at least 100 Mbps.<sup>4</sup>

<sup>4</sup> See Figure 9.

*Fixed connections – upstream speeds.* Figure 2(b) illustrates how the 108 million fixed connections reported for December 2017 were distributed across the four groups of *upstream speeds* defined by breakpoints at 1 Mbps, 3 Mbps, and 6 Mbps.

**Figure 2(b)**  
**Distribution of Fixed Connections (108.2 million) by Upstream Speed**  
**as of December 31, 2017**

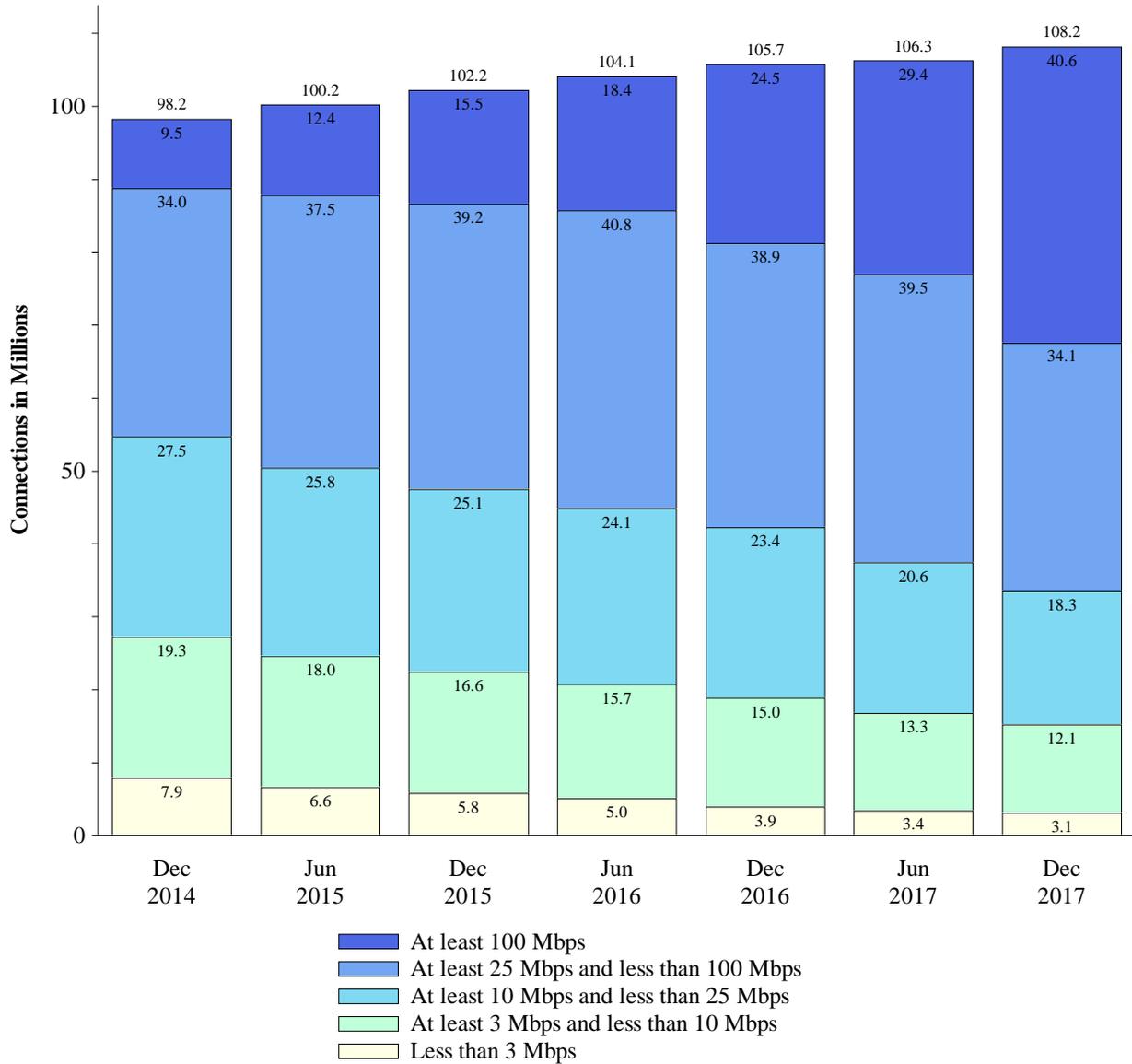


- In December 2017, 10% of fixed connections (or 11 million connections) were slower than 1 Mbps upstream, 18% (or 19 million connections) were at least 1 Mbps upstream but slower than 3 Mbps, 27% (or 30 million connections) were at least 3 Mbps upstream but slower than 6 Mbps, and 45% (or 49 million connections) were at least 6 Mbps upstream.<sup>5</sup>

*Fixed connections by downstream speed over time.* Figure 3 illustrates how the composition of total fixed Internet connections by different speed groups has changed from 2014 to 2017.

<sup>5</sup> *Ibid.*

**Figure 3**  
**Fixed Connections by Downstream Speed 2014-2017**



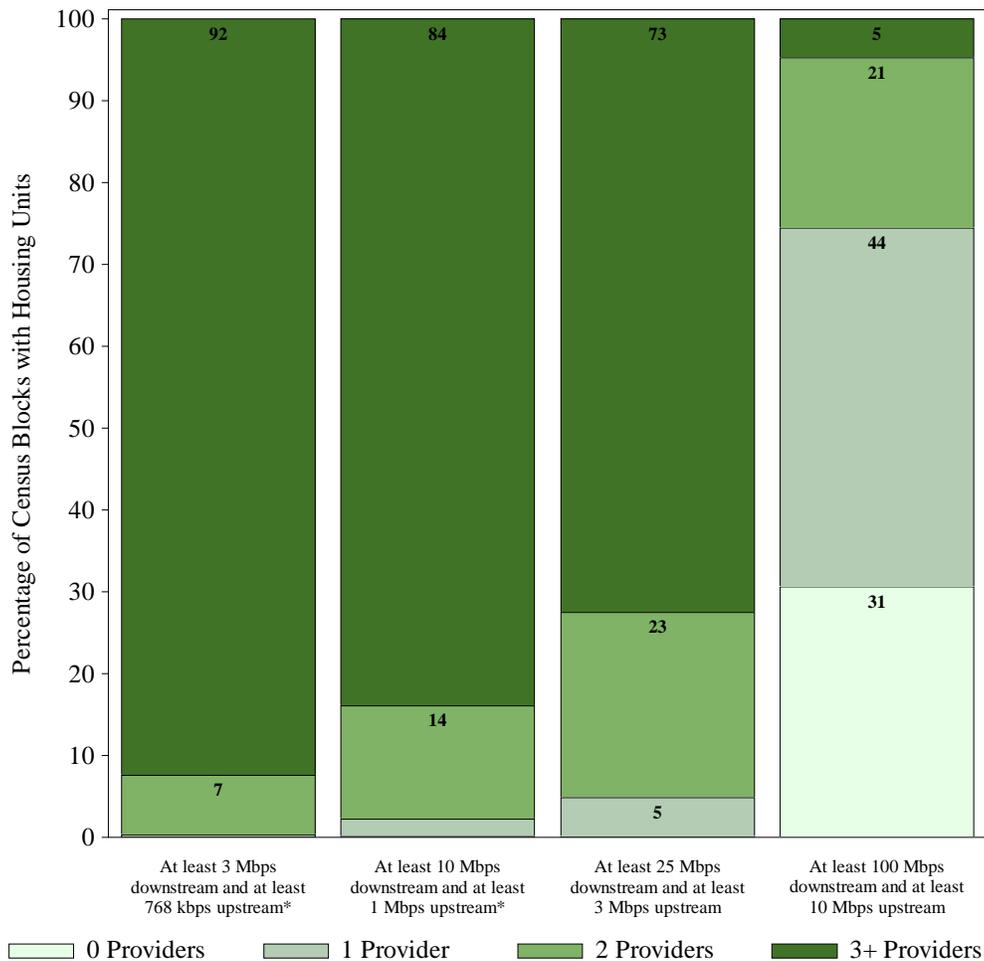
The Commission approved changes to the Form 477 in June 2013 that affect the data beginning in June 2014 (see Technical Notes). Some previously-published data may have been revised. Figures may not sum to totals elsewhere in this report due to rounding. Connections include both residential and business connections.

- The percentage of fixed connections with a downstream speed of at least 25 Mbps has grown from 44% (or 44 million connections) in December 2014 to 69% (or 75 million connections) in December 2017. Over the same period, the percentage of fixed connections with slower downstream speeds of less than 3 Mbps has decreased from 8% (or 8 million connections) in December 2014 to 3% (or 3 million connections) in December 2017.

## Number of Providers by Census Block

In Figure 4, we show the percentage of “developed” census blocks – blocks that contain housing units – with zero, one, two, or three or more fixed broadband providers offering residential Internet access service at different speeds in December 2017. This information is taken from the block-level Form 477 fixed broadband deployment data that the Commission began collecting in 2014.<sup>6</sup> A provider that reports offering service in a particular census block may not offer service, or service at that speed, to all locations in the census block. Accordingly, the number of providers shown in Figure 4 does not necessarily reflect the number of choices available to a particular household and does not purport to measure competition.

**Figure 4**  
**Percentages of Developed Census Blocks in which Providers Reported the Deployment of Residential Fixed Broadband as of December 31, 2017**



\* Satellite service providers are included in this analysis. Satellite service providers report offering Internet access at bandwidths of at least 25 Mbps downstream and 3 Mbps upstream in 99.8% of developed census blocks

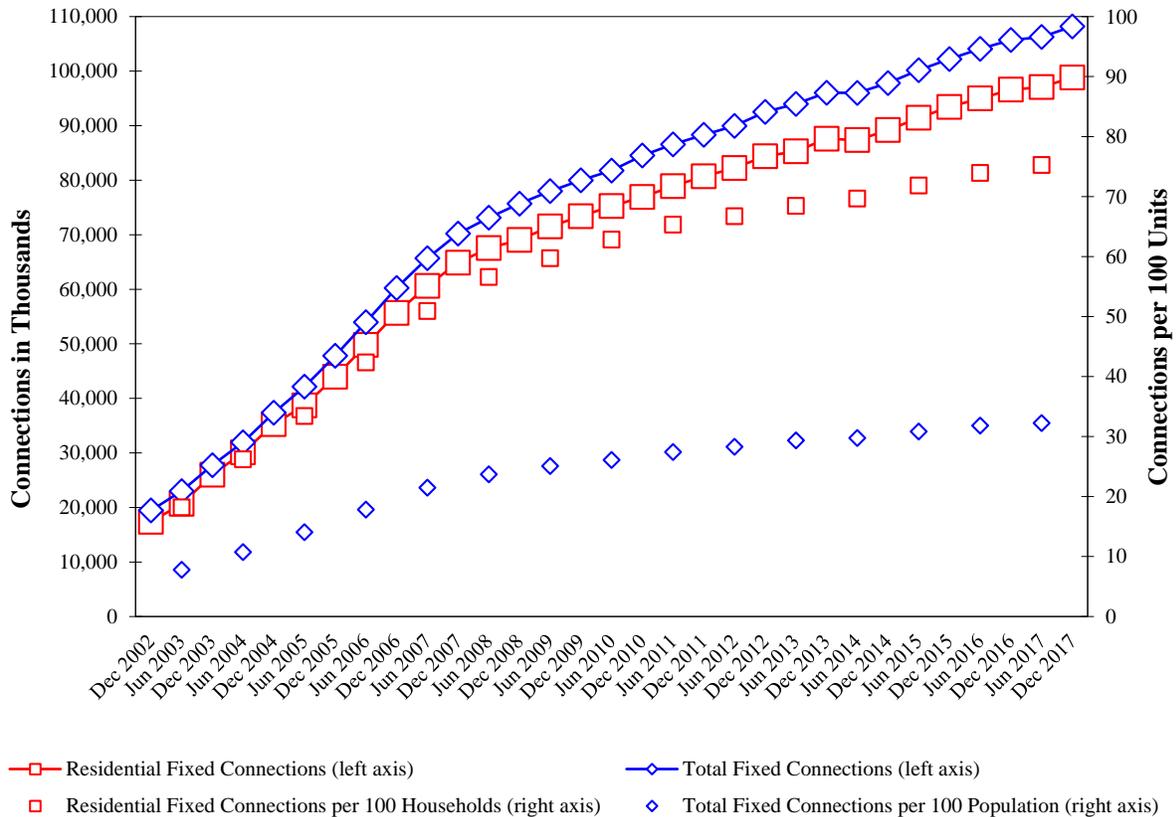
Column figures may not sum to 100% due to rounding. Developed census blocks are those with housing units based on the 2010 census.

<sup>6</sup> Download these data and explore the interactive map at <https://broadbandmap.fcc.gov/#/>.

## Internet Access Subscribership

Figure 5 illustrates the number of total and residential fixed Internet access connections (connections over 200 kbps in at least one direction except mobile wireless connections), as well as the number of total fixed connections per 100 persons and the number of residential fixed connections per 100 households, since 2002.<sup>7</sup>

**Figure 5**  
**Fixed Connections 2002-2017**  
**(Connections over 200 kbps in at least one direction)**



- Between December 2007 and December 2017, total (business and residential) fixed connections grew from 70 million connections to 108 million connections – at a compound annual growth rate of 4% per year.<sup>8</sup>

<sup>7</sup> For data through December 2004, only those providers with at least 250 connections in a state were required to report. Historical fixed-location connection counts not included in this report may be found in *June 2008 High-Speed Report* at Tables 1 and 3, available in Excel format at <https://www.fcc.gov/general/reports-high-speed-services-internet-access>.

<sup>8</sup> The compound annual growth rate (CAGR) is a smoothed rate of growth calculated in three steps: divide the ending value by the beginning value; raise the result of that division to a power equal to one divided by the number of years in the period (in this case, 10 years, so the power is 1/10); subtract the number one from the result of the second step.

- Over the same ten-year period, residential fixed connections grew from 65 million connections to 99 million connections – also at a compound annual growth rate of 4% per year.
- From June 2007 to June 2017, the number of residential fixed connections per 100 U.S. households increased from 51 to 75.<sup>9</sup>

## Other Report Highlights

### Typical speeds

- The median downstream speed of all reported fixed connections was 60 Mbps and the median upstream speed was 5 Mbps. For residential fixed connections, the median downstream speed was 60 Mbps and the median upstream speed was 5 Mbps.

### Residential connections

- Residential fixed Internet access connections increased by about 2% between December 2016 and December 2017, to 99 million. *See* Figure 7.
- Residential (non-business) mobile wireless Internet access connections on mobile devices with data plans for full Internet access increased by 5%, to 266 million, between December 2016 and December 2017. *See* Figure 7.
- Approximately 85% of residential fixed connections had a speed of at least 10 Mbps downstream and 1 Mbps upstream in December 2017, while 70% had a speed of at least 25 Mbps downstream and 3 Mbps upstream. About 39% percent of all residential fixed connections had a downstream speed of at least 100 Mbps. *See* Figures 10 and 27.
- As a national average in December 2017, there were 71 residential fixed connections with speeds of at least 10 Mbps downstream and 1 Mbps upstream per 100 households; 58 residential fixed connections with speeds of at least 25 Mbps downstream and 3 Mbps upstream per 100 households; and 27 residential fixed connections with speeds of at least 100 Mbps downstream and 10 Mbps upstream per 100 households.<sup>10</sup> *See* Figure 32.

<sup>9</sup> We calculate residential fixed connections per 100 *households* using, in the denominator, U.S. household estimates from the Census Bureau’s Current Population Survey (CPS) for July of each year and, for Puerto Rico and the other inhabited island areas, Census 2010 households for 2010 and later years and Census 2000 households for the earlier years. (The CPS also estimates U.S. households for March and November of each year.) Figure 5 also shows total (business and residential) fixed connections per 100 *population*, which we calculate using U.S. Census Bureau population estimates for the United States and Puerto Rico – which are as of July 1 each year – and, for the remaining inhabited island areas, Census 2010 population for 2010 and later years and Census 2000 population for the earlier years. This statistic incorporates connections to business locations into a comparison to persons. (We note that the ratio of accurately-measured residential fixed connections to population has a maximum value for any given country and point in time – the value when every household is connected – if we assume that no household would have more than one fixed connection to its premises. For the United States in June, for example, the maximum value would be 39 because there were about 129 million households in the United States and inhabited insular areas and a population of about 329 million according to the sources used for Figure 5.)

<sup>10</sup> Increases over time in the ratio of residential fixed connections to households indicate that increasing shares of households are connected at home. The ratio is somewhat different from the “take rate” of offered service (which may also be called an “adoption rate”) because some households may be located in areas where no fixed-location service is offered. These methodological differences are discussed in greater detail in *Inquiry Concerning the*

Census tract and county shares of households with reportable connections

- We estimate the share of households with fixed Internet access connections in individual census tracts and counties as of December 31, 2017.<sup>11</sup> We continue to observe substantial variation among these estimates. *See* Figures 37 and 39.

Household subscribership rates and demographics

- The report includes charts that illustrate correlations between household subscribership rates and demographic measures. We update charts based on income, household density, education and age. The data indicate that some demographic variables are correlated with Internet access subscribership rates. *See* Figures 44-49.

*Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, Amended by the Broadband Data Improvement Act*, GN Docket No.11-121, Eighth Broadband Progress Report, 27 FCC Rcd 10342, 10386, para. 94 (2012).

<sup>11</sup> For both census tracts and counties, we continue to find estimates above 100% for the share of households with fixed Internet access connections. *See* p. 57 for more information.

**SECTION 2**  
**SUMMARY STATISTICS: THE NATION**

**Table of Contents**

Figure 6	Connections over 200 kbps in at Least One Direction 2013-2017 .....	12
Figure 7	Residential Connections over 200 kbps in at Least One Direction 2013-2017 .....	12
Figure 8	Residential Fixed Connections by Speed 2013-2017 .....	13
Figure 9	Distribution of Fixed Connections over 200 kbps in at Least One Direction as of December 31, 2017 .....	14
Figure 10	Distribution of Residential Fixed Connections over 200 kbps in at Least One Direction as of December 31, 2017 .....	15
Figure 11	Connections over 200 kbps in at Least One Direction by Technology 2013-2017 .....	16
Figure 12	Connections by Technology as of December 31, 2017 .....	16
Figure 13	Residential Connections over 200 kbps in at Least One Direction by Technology 2013-2017 .....	17
Figure 14	Residential Connections by Technology as of December 31, 2017 .....	17
Figure 15	Fixed Connections at Least 3 Mbps Downstream and 768 kbps Upstream by Technology 2013-2017 .....	18
Figure 16	Residential Fixed Connections at Least 3 Mbps Downstream and 768 kbps Upstream by Technology 2013-2017 .....	18
Figure 17	Fixed Connections at Least 10 Mbps Downstream and 1 Mbps Upstream by Technology 2014-2017 .....	19
Figure 18	Fixed Connections at Least 10 Mbps Downstream and 1 Mbps Upstream by Technology as of December 31, 2017 .....	19
Figure 19	Residential Fixed Connections at Least 10 Mbps Downstream and 1 Mbps Upstream by Technology 2014-2017 .....	20
Figure 20	Residential Fixed Connections at Least 10 Mbps Downstream and 1 Mbps Upstream by Technology as of December 31, 2017 .....	20
Figure 21	Fixed Connections at Least 25 Mbps Downstream and 3 Mbps Upstream by Technology 2014-2017 .....	21
Figure 22	Fixed Connections at Least 25 Mbps Downstream and 3 Mbps Upstream by Technology as of December 31, 2017 .....	21
Figure 23	Residential Fixed Connections at Least 25 Mbps Downstream and 3 Mbps Upstream by Technology 2014-2017 .....	22
Figure 24	Residential Fixed Connections at Least 25 Mbps Downstream and 3 Mbps Upstream by Technology as of December 31, 2017 .....	22
Figure 25	Residential Fixed Connections over 200 kbps in at Least One Direction by Technology 2013-2017 (Shares of Selected Technologies) .....	23

Figure 26	Residential Fixed Connections over 200 kbps in at Least One Direction by Technology 2013-2017 (Net Adds for Selected Technologies) .....	23
Figure 27	Residential Fixed Connections by Technology as of December 31, 2017 (Shares of Selected Technologies for Selected Speeds) .....	24
Figure 28	Fixed Connections by Downstream Speed Tier and Technology as of December 31, 2017 .....	25
Figure 29	Residential Fixed Connections by Downstream Speed Tier and Technology as of December 31, 2017 .....	26
Figure 30	Nationwide Number of Providers of Connections over 200 kbps in at Least One Direction by Technology 2013-2017 .....	27
Figure 31	Nationwide Number of Providers of Connections over 200 kbps in at Least One Direction - Selected Technologies 2013-2017 .....	27

**Figure 6**  
**Connections over 200 kbps in at Least One Direction 2013-2017**  
(In thousands)

<i>Technology</i>	2013		2014		2015		2016		2017	
	<i>Dec</i>	<i>Jun*</i>	<i>Dec</i>	<i>Jun</i>	<i>Dec</i>	<i>Jun</i>	<i>Dec</i>	<i>Jun</i>	<i>Dec</i>	
Total	293,397	<b>324,471</b>	<b>338,202</b>	<b>357,613</b>	<b>375,895</b>	<b>395,603</b>	<b>404,971</b>	<b>408,816</b>	<b>420,966</b>	
Total Fixed	96,032	<b>95,982</b>	<b>98,245</b>	<b>100,179</b>	<b>102,216</b>	<b>104,087</b>	<b>105,715</b>	<b>106,254</b>	<b>108,188</b>	
Mobile Wireless	197,365	<b>228,489</b>	<b>239,957</b>	<b>257,434</b>	<b>273,679</b>	<b>291,516</b>	<b>299,256</b>	<b>302,562</b>	<b>312,778</b>	

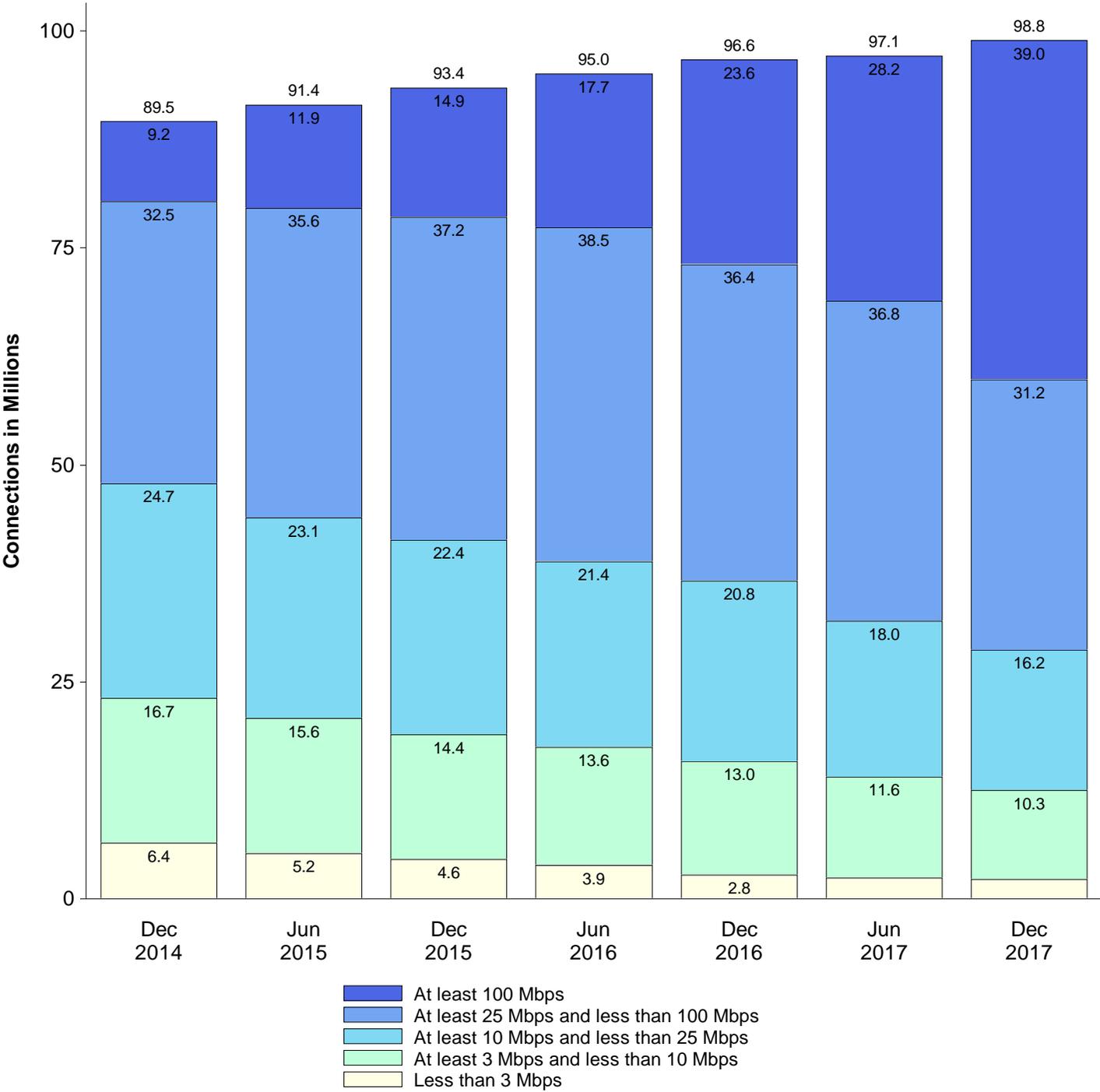
**Figure 7**  
**Residential Connections over 200 kbps in at Least One Direction 2013-2017**  
(In thousands)

<i>Technology</i>	2013		2014		2015		2016		2017	
	<i>Dec</i>	<i>Jun*</i>	<i>Dec</i>	<i>Jun</i>	<i>Dec</i>	<i>Jun</i>	<i>Dec</i>	<i>Jun</i>	<i>Dec</i>	
Total	246,797	<b>277,551</b>	<b>290,696</b>	<b>306,292</b>	<b>322,557</b>	<b>341,537</b>	<b>349,607</b>	<b>353,057</b>	<b>365,040</b>	
Total Fixed	87,599	<b>87,345</b>	<b>89,530</b>	<b>91,439</b>	<b>93,434</b>	<b>95,001</b>	<b>96,607</b>	<b>97,071</b>	<b>98,832</b>	
Mobile Wireless	159,197	<b>190,205</b>	<b>201,166</b>	<b>214,853</b>	<b>229,122</b>	<b>246,537</b>	<b>253,000</b>	<b>255,986</b>	<b>266,208</b>	

\* The June 2014 data have not been subjected to the typical quality checks (see Technical Notes).

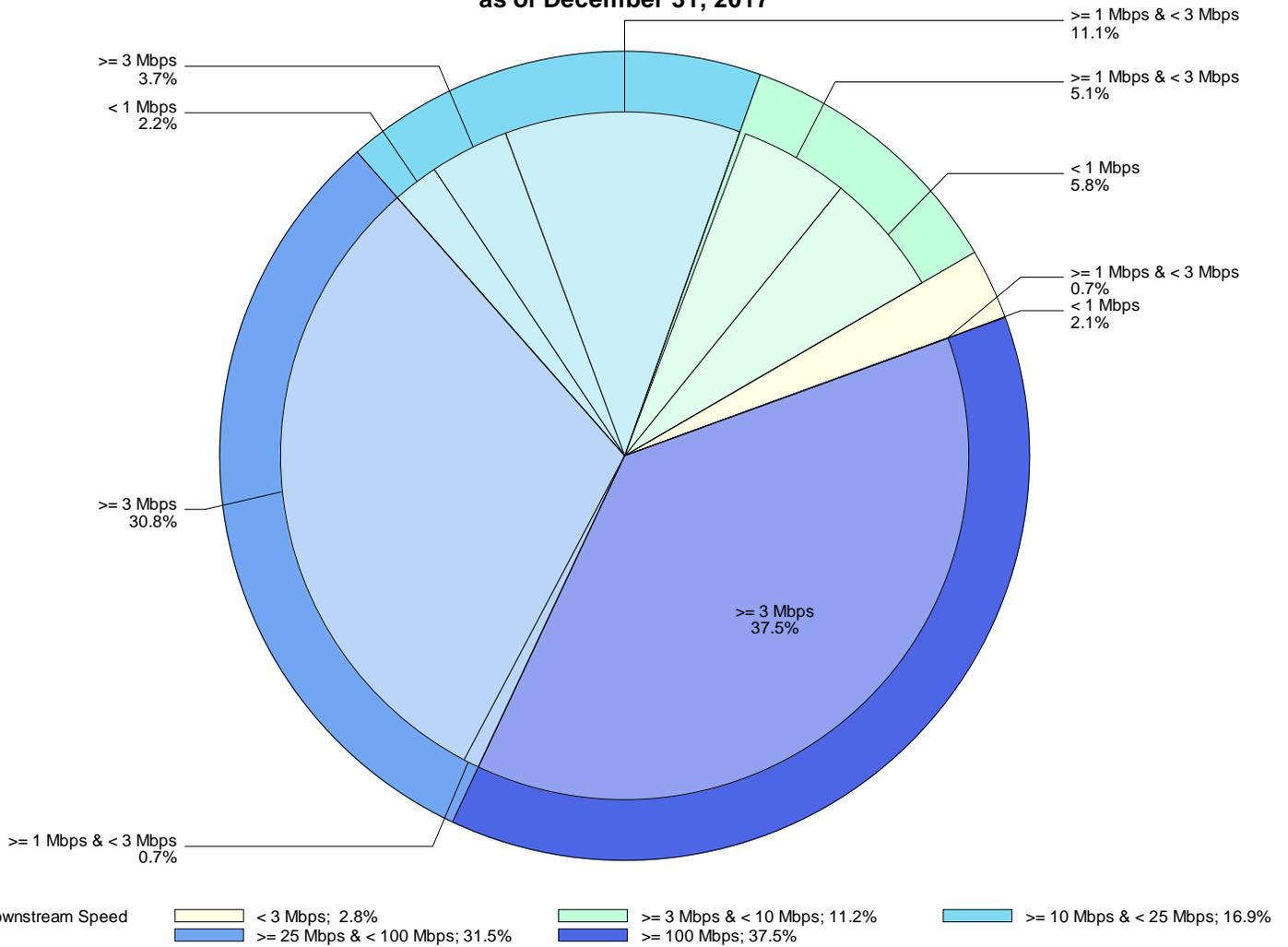
The Commission approved changes to the Form 477 in June 2013 that affect the data beginning in June 2014 (see Technical Notes). Some previously-published data may have been revised. Figures may not sum to totals elsewhere in this report due to rounding.

**Figure 8**  
**Residential Fixed Connections by Downstream Speed 2014-2017**



The Commission approved changes to the Form 477 in June 2013 that affect the data beginning in June 2014 (see Technical Notes). Some previously-published data may have been revised. Figures may not sum to totals elsewhere in this report due to rounding.

**Figure 9**  
**Distribution of Fixed Connections over 200 kbps in at Least One Direction**  
**as of December 31, 2017**



Note: Inner circle (light shading) represents upstream speeds.

Fixed Connections over 200 kbps in at Least One Direction (in thousands)

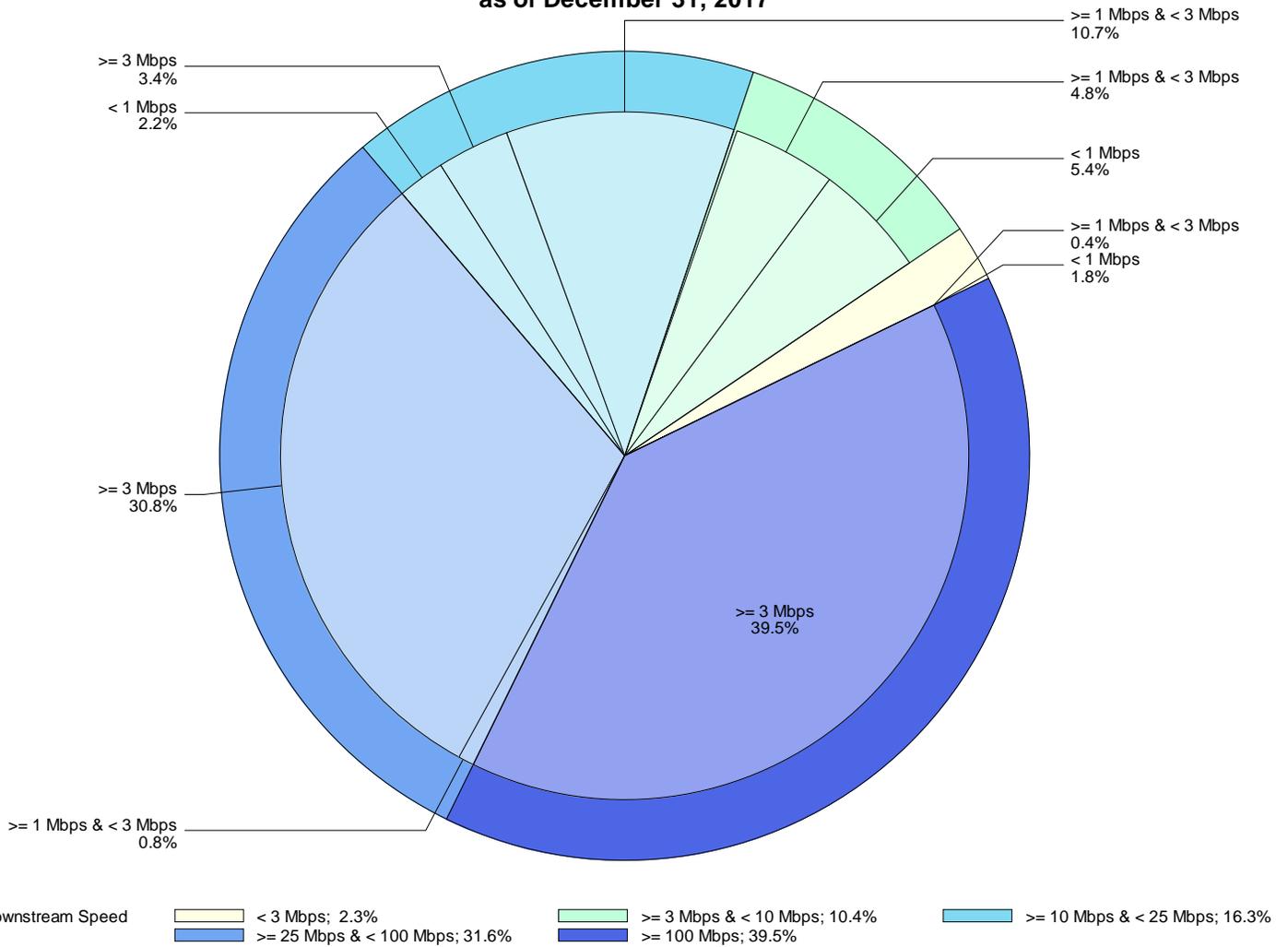
Upstream Speed	Downstream Speed					Total
	Less than 3 Mbps	At least 3 Mbps and less than 10 Mbps	At least 10 Mbps and less than 25 Mbps	At least 25 Mbps and less than 100 Mbps	At least 100 Mbps	
Less than 1 Mbps	2,298	6,278	2,334	#	#	10,910
At least 1 Mbps & Less than 3 Mbps	762	5,517	11,969	798	6	19,052
At least 3 Mbps	4	301	4,003	33,305	40,612	78,226
<b>Total</b>	<b>3,064</b>	<b>12,096</b>	<b>18,306</b>	<b>34,104</b>	<b>40,618</b>	<b>108,188</b>

Percentages						
Less than 1 Mbps	2.1	5.8	2.2	0.0	0.0	10.1
At least 1 Mbps & Less than 3 Mbps	0.7	5.1	11.1	0.7	0.0	17.6
At least 3 Mbps	0.0	0.3	3.7	30.8	37.5	72.3
<b>Total</b>	<b>2.8</b>	<b>11.2</b>	<b>16.9</b>	<b>31.5</b>	<b>37.5</b>	<b>100.0</b>

Note: Figures may not sum to totals due to rounding. # = Rounds to zero.  
 Source: FCC Form 477.

**Figure 10**  
**Distribution of Residential Fixed Connections over 200 kbps in at Least One Direction**  
**as of December 31, 2017**



Note: Inner circle (light shading) represents upstream speeds.

Residential Fixed Connections over 200 kbps in at Least One Direction (in thousands)

Upstream Speed	Downstream Speed					Total
	Less than 3 Mbps	At least 3 Mbps and less than 10 Mbps	At least 10 Mbps and less than 25 Mbps	At least 25 Mbps and less than 100 Mbps	At least 100 Mbps	
Less than 1 Mbps	1,809	5,315	2,194	#	0	9,318
At least 1 Mbps & Less than 3 Mbps	417	4,789	10,600	742	5	16,554
At least 3 Mbps	4	148	3,361	30,445	39,002	72,960
<b>Total</b>	<b>2,230</b>	<b>10,253</b>	<b>16,155</b>	<b>31,187</b>	<b>39,007</b>	<b>98,832</b>

Percentages						
Less than 1 Mbps	1.8	5.4	2.2	0.0	0.0	9.4
At least 1 Mbps & Less than 3 Mbps	0.4	4.8	10.7	0.8	0.0	16.7
At least 3 Mbps	0.0	0.1	3.4	30.8	39.5	73.8
<b>Total</b>	<b>2.3</b>	<b>10.4</b>	<b>16.3</b>	<b>31.6</b>	<b>39.5</b>	<b>100.0</b>

Note: Figures may not sum to totals due to rounding. # = Rounds to zero.  
 Source: FCC Form 477.

**Figure 11**  
**Connections over 200 kbps in at Least One Direction by Technology 2013-2017**  
(In thousands)

Technology	2013	2014		2015		2016		2017	
	Dec	Jun*	Dec	Jun	Dec	Jun	Dec	Jun	Dec
Total	293,397	<b>324,471</b>	<b>338,202</b>	<b>357,613</b>	<b>375,895</b>	<b>395,603</b>	<b>404,971</b>	<b>408,816</b>	<b>420,966</b>
Total Fixed	96,032	<b>95,982</b>	<b>98,245</b>	<b>100,179</b>	<b>102,216</b>	<b>104,087</b>	<b>105,715</b>	<b>106,254</b>	<b>108,188</b>
aDSL	30,690	<b>29,870</b>	<b>29,533</b>	<b>29,351</b>	<b>28,134</b>	<b>27,488</b>	<b>26,527</b>	<b>25,506</b>	<b>24,193</b>
sDSL	108	<b>96</b>	<b>72</b>	<b>77</b>	<b>60</b>	<b>55</b>	<b>42</b>	<b>44</b>	<b>28</b>
Other Wireline <sup>1</sup>	772	<b>792</b>	<b>773</b>	<b>706</b>	<b>694</b>	<b>674</b>	<b>655</b>	<b>668</b>	<b>631</b>
Cable Modem	54,009	<b>54,011</b>	<b>55,785</b>	<b>57,244</b>	<b>59,706</b>	<b>61,456</b>	<b>63,325</b>	<b>64,059</b>	<b>66,195</b>
FTTP <sup>2</sup>	7,745	<b>8,312</b>	<b>9,077</b>	<b>9,688</b>	<b>10,498</b>	<b>11,143</b>	<b>12,053</b>	<b>12,906</b>	<b>13,978</b>
Satellite	1,849	<b>1,964</b>	<b>2,006</b>	<b>2,058</b>	<b>2,071</b>	<b>2,079</b>	<b>1,864</b>	<b>1,826</b>	<b>1,872</b>
Fixed Wireless	858	<b>935</b>	<b>999</b>	<b>1,056</b>	<b>1,054</b>	<b>1,192</b>	<b>1,250</b>	<b>1,245</b>	<b>1,292</b>
Mobile Wireless	197,365	<b>228,489</b>	<b>239,957</b>	<b>257,434</b>	<b>273,679</b>	<b>291,516</b>	<b>299,256</b>	<b>302,562</b>	<b>312,778</b>

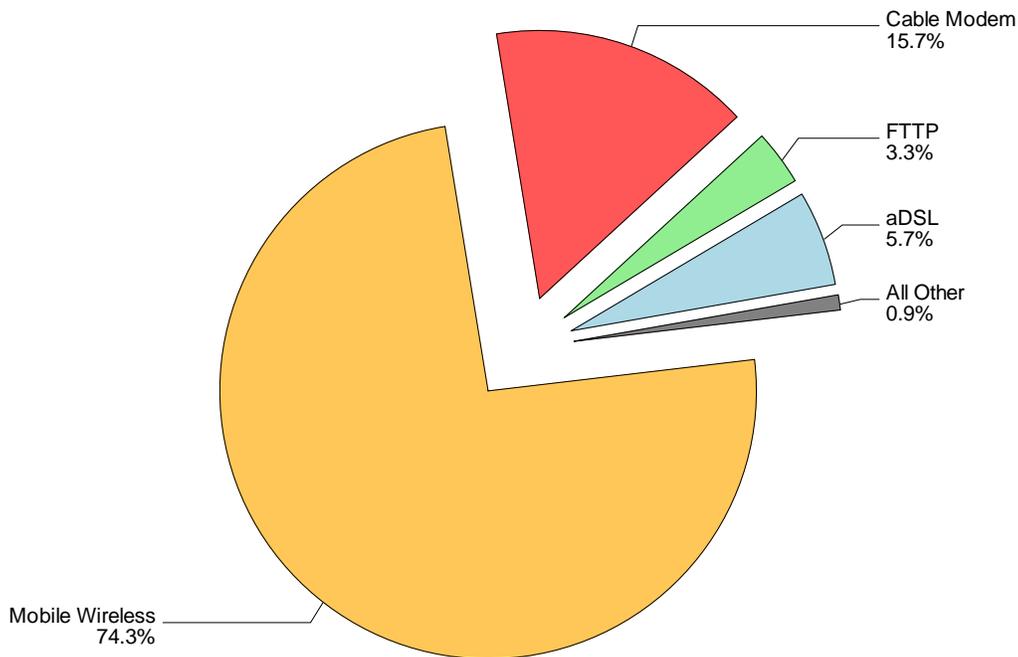
<sup>1</sup> Power Line and Other are summarized with Other Wireline to maintain firm confidentiality. See Technical Notes at the end of the report for a description of Form 477 technology categories and other reporting requirements.

<sup>2</sup> Fiber to the premises.

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**Figure 12**  
**Connections by Technology as of December 31, 2017**



**Figure 13**  
**Residential Connections over 200 kbps in at Least One Direction by Technology 2013-2017**  
(In thousands)

Technology	2013	2014		2015		2016		2017	
	Dec	Jun*	Dec	Jun	Dec	Jun	Dec	Jun	Dec
Total	246,797	<b>277,551</b>	<b>290,696</b>	<b>306,292</b>	<b>322,557</b>	<b>341,537</b>	<b>349,607</b>	<b>353,057</b>	<b>365,040</b>
Total Fixed	87,599	<b>87,345</b>	<b>89,530</b>	<b>91,439</b>	<b>93,434</b>	<b>95,001</b>	<b>96,607</b>	<b>97,071</b>	<b>98,832</b>
aDSL	27,248	<b>26,675</b>	<b>26,442</b>	<b>26,157</b>	<b>25,139</b>	<b>24,486</b>	<b>23,691</b>	<b>22,775</b>	<b>21,653</b>
sDSL	39	<b>30</b>	<b>19</b>	<b>18</b>	<b>16</b>	<b>10</b>	<b>8</b>	<b>12</b>	<b>9</b>
Other Wireline <sup>1</sup>	22	<b>57</b>	<b>59</b>	<b>59</b>	<b>54</b>	<b>51</b>	<b>32</b>	<b>74</b>	<b>68</b>
Cable Modem	50,709	<b>50,389</b>	<b>52,061</b>	<b>53,544</b>	<b>55,799</b>	<b>57,358</b>	<b>59,145</b>	<b>59,687</b>	<b>61,567</b>
FTTP <sup>2</sup>	7,176	<b>7,605</b>	<b>8,262</b>	<b>8,842</b>	<b>9,592</b>	<b>10,140</b>	<b>10,956</b>	<b>11,776</b>	<b>12,702</b>
Satellite	1,643	<b>1,760</b>	<b>1,803</b>	<b>1,875</b>	<b>1,891</b>	<b>1,897</b>	<b>1,676</b>	<b>1,637</b>	<b>1,688</b>
Fixed Wireless	763	<b>829</b>	<b>884</b>	<b>944</b>	<b>943</b>	<b>1,059</b>	<b>1,099</b>	<b>1,111</b>	<b>1,146</b>
Mobile Wireless	159,197	<b>190,205</b>	<b>201,166</b>	<b>214,853</b>	<b>229,122</b>	<b>246,537</b>	<b>253,000</b>	<b>255,986</b>	<b>266,208</b>

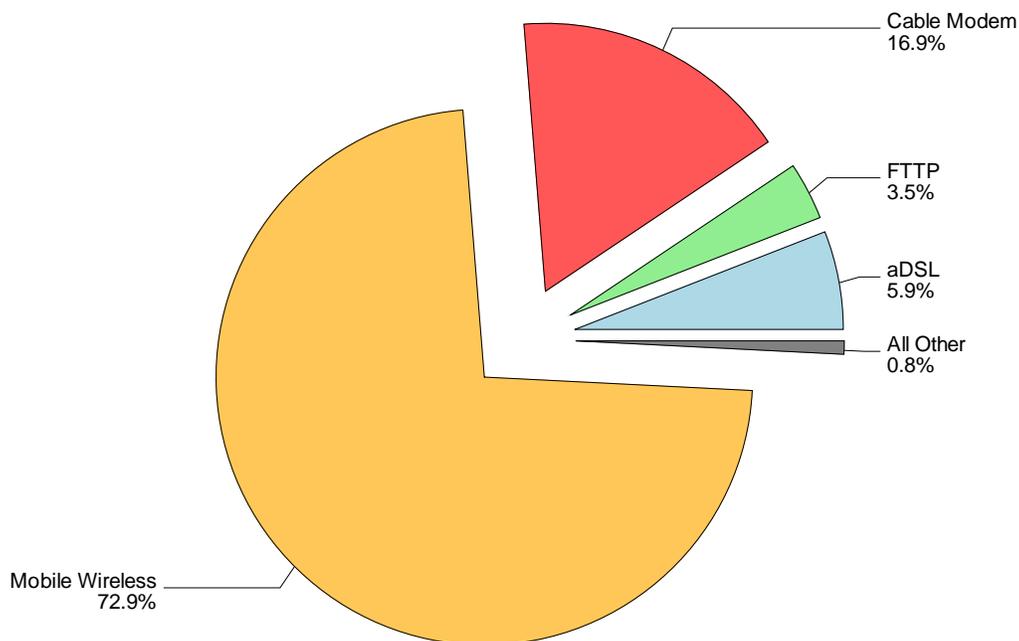
<sup>1</sup> Power Line and Other are summarized with Other Wireline to maintain firm confidentiality. See Technical Notes at the end of the report for a description of Form 477 technology categories and other reporting requirements.

<sup>2</sup> Fiber to the premises.

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**Figure 14**  
**Residential Connections by Technology as of December 31, 2017**



**Figure 15**  
**Fixed Connections at Least 3 Mbps Downstream and 768 kbps Upstream by Technology 2013-2017**  
(In thousands)

<i>Technology</i>	2013		2014		2015		2016		2017	
	<i>Dec</i>	<i>Jun*</i>	<i>Dec</i>	<i>Jun</i>	<i>Dec</i>	<i>Jun</i>	<i>Dec</i>	<i>Jun</i>	<i>Dec</i>	
Total	78,175	<b>78,981</b>	<b>83,872</b>	<b>89,011</b>	<b>92,356</b>	<b>95,516</b>	<b>98,761</b>	<b>100,098</b>	<b>102,035</b>	
aDSL	18,540	<b>17,246</b>	<b>18,557</b>	<b>20,947</b>	<b>20,744</b>	<b>21,147</b>	<b>21,042</b>	<b>20,621</b>	<b>19,257</b>	
sDSL	36	<b>33</b>	<b>28</b>	<b>24</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>24</b>	<b>17</b>	
Other Wireline <sup>1</sup>	308	<b>310</b>	<b>308</b>	<b>297</b>	<b>330</b>	<b>336</b>	<b>328</b>	<b>355</b>	<b>370</b>	
Cable Modem	50,236	<b>51,304</b>	<b>53,853</b>	<b>55,819</b>	<b>58,423</b>	<b>60,343</b>	<b>62,855</b>	<b>63,719</b>	<b>65,905</b>	
FTTP <sup>2</sup>	7,486	<b>8,111</b>	<b>8,974</b>	<b>9,552</b>	<b>10,383</b>	<b>11,030</b>	<b>11,953</b>	<b>12,813</b>	<b>13,870</b>	
Satellite	1,181	<b>1,424</b>	<b>1,558</b>	<b>1,690</b>	<b>1,744</b>	<b>1,775</b>	<b>1,609</b>	<b>1,586</b>	<b>1,563</b>	
Fixed Wireless	388	<b>553</b>	<b>594</b>	<b>681</b>	<b>712</b>	<b>865</b>	<b>954</b>	<b>981</b>	<b>1,054</b>	

<sup>1</sup> Power Line and Other are summarized with Other Wireline to maintain firm confidentiality. See Technical Notes at the end of the report for a description of Form 477 technology categories and other reporting requirements.

<sup>2</sup> Fiber to the premises.

\* The June 2014 data have not been subjected to the typical quality checks (see Technical Notes).

# = Rounds to zero.

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**Figure 16**  
**Residential Fixed Connections at Least 3 Mbps Downstream and 768 kbps Upstream by Technology 2013-2017**  
(In thousands)

<i>Technology</i>	2013		2014		2015		2016		2017	
	<i>Dec</i>	<i>Jun*</i>	<i>Dec</i>	<i>Jun</i>	<i>Dec</i>	<i>Jun</i>	<i>Dec</i>	<i>Jun</i>	<i>Dec</i>	
Total	72,476	<b>73,042</b>	<b>77,540</b>	<b>82,320</b>	<b>85,439</b>	<b>88,197</b>	<b>91,258</b>	<b>92,354</b>	<b>93,977</b>	
aDSL	16,715	<b>15,673</b>	<b>16,867</b>	<b>18,988</b>	<b>18,866</b>	<b>19,207</b>	<b>19,133</b>	<b>18,719</b>	<b>17,480</b>	
sDSL	13	<b>7</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>7</b>	<b>6</b>	
Other Wireline <sup>1</sup>	20	<b>45</b>	<b>50</b>	<b>45</b>	<b>47</b>	<b>49</b>	<b>31</b>	<b>73</b>	<b>67</b>	
Cable Modem	47,258	<b>47,924</b>	<b>50,308</b>	<b>52,254</b>	<b>54,650</b>	<b>56,353</b>	<b>58,784</b>	<b>59,410</b>	<b>61,334</b>	
FTTP <sup>2</sup>	6,958	<b>7,491</b>	<b>8,246</b>	<b>8,750</b>	<b>9,512</b>	<b>10,063</b>	<b>10,883</b>	<b>11,704</b>	<b>12,616</b>	
Satellite	1,177	<b>1,419</b>	<b>1,552</b>	<b>1,682</b>	<b>1,734</b>	<b>1,764</b>	<b>1,596</b>	<b>1,571</b>	<b>1,545</b>	
Fixed Wireless	335	<b>483</b>	<b>516</b>	<b>599</b>	<b>628</b>	<b>759</b>	<b>829</b>	<b>870</b>	<b>929</b>	

<sup>1</sup> Power Line and Other are summarized with Other Wireline to maintain firm confidentiality. See Technical Notes at the end of the report for a description of Form 477 technology categories and other reporting requirements.

<sup>2</sup> Fiber to the premises.

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**Figure 17**  
**Fixed Connections at Least 10 Mbps Downstream and 1 Mbps Upstream by Technology 2014-2017**  
(In thousands)

Technology	2014		2015		2016		2017	
	Jun*	Dec	Jun	Dec	Jun	Dec	Jun	Dec
Total	63,823	68,238	72,713	76,939	80,458	84,112	86,967	90,694
aDSL	7,561	8,560	9,471	9,799	10,349	10,810	11,321	11,596
sDSL	9	6	9	8	8	10	14	9
Other Wireline <sup>1</sup>	169	186	182	203	210	217	253	273
Cable Modem	47,296	49,837	52,658	55,710	57,951	60,349	61,704	63,977
FTTP <sup>2</sup>	7,601	8,320	8,874	9,575	10,142	11,000	11,884	12,954
Satellite	1,016	1,136	1,298	1,393	1,467	1,342	1,373	1,402
Fixed Wireless	170	193	221	252	330	383	418	484

<sup>1</sup> Power Line and Other are summarized with Other Wireline to maintain firm confidentiality. See Technical Notes at the end of the report for a description of Form 477 technology categories and other reporting requirements.

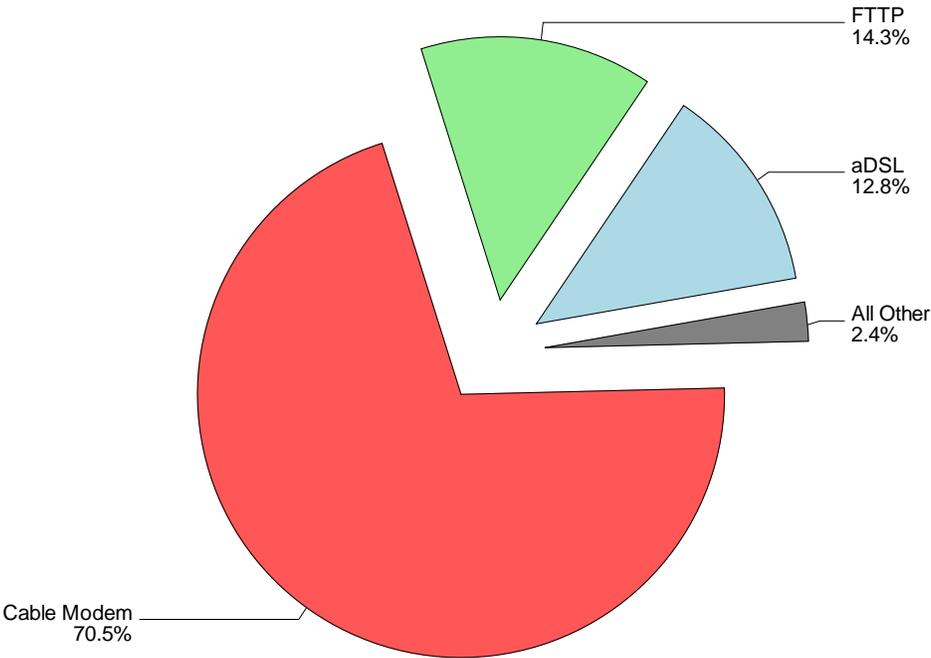
<sup>2</sup> Fiber to the premises.

\* The June 2014 data have not been subjected to the typical quality checks (see Technical Notes).

# = Rounds to zero.

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Figures may not sum to totals due to rounding.

**Figure 18**  
**Fixed Connections at Least 10 Mbps Downstream and 1 Mbps Upstream**  
**by Technology as of December 31, 2017**



**Figure 19**  
**Residential Fixed Connections at Least 10 Mbps Downstream and 1 Mbps Upstream**  
**by Technology 2014-2017**  
(In thousands)

Technology	2014		2015		2016		2017	
	Jun*	Dec	Jun	Dec	Jun	Dec	Jun	Dec
Total	59,729	63,732	67,898	71,784	74,840	78,202	80,671	84,156
aDSL	7,025	7,970	8,743	9,069	9,526	9,963	10,415	10,657
sDSL	3	#	#	1	2	2	6	5
Other Wireline <sup>1</sup>	33	36	38	43	47	30	71	64
Cable Modem	44,480	46,772	49,487	52,294	54,274	56,538	57,617	59,863
FTTP <sup>2</sup>	7,032	7,653	8,144	8,776	9,248	10,004	10,835	11,762
Satellite	1,014	1,133	1,293	1,386	1,460	1,333	1,362	1,387
Fixed Wireless	142	167	191	213	283	332	365	418

<sup>1</sup> Power Line and Other are summarized with Other Wireline to maintain firm confidentiality. See Technical Notes at the end of the report for a description of Form 477 technology categories and other reporting requirements.

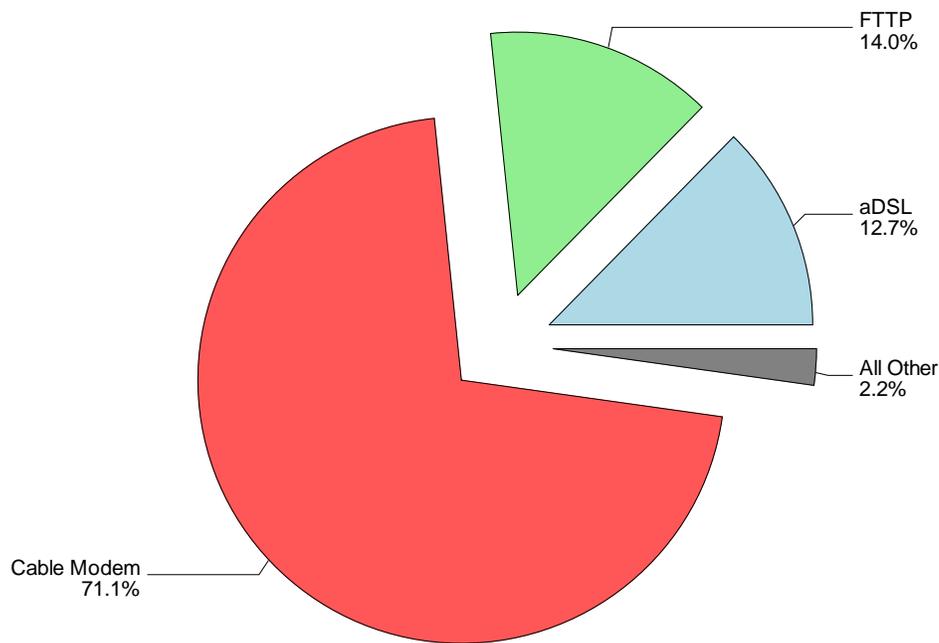
<sup>2</sup> Fiber to the premises.

\* The June 2014 data have not been subjected to the typical quality checks (see Technical Notes).

# = Rounds to zero.

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Figures may not sum to totals due to rounding.

**Figure 20**  
**Residential Fixed Connections at Least 10 Mbps Downstream and 1 Mbps Upstream**  
**by Technology as of December 31, 2017**



**Figure 21**  
**Fixed Connections at Least 25 Mbps Downstream and 3 Mbps Upstream by Technology 2014-2017**  
(In thousands)

Technology	2014		2015		2016		2017	
	Jun+	Dec	Jun	Dec	Jun	Dec	Jun	Dec
Total	35,924	42,713	48,784	54,335	58,753	62,907	68,041	73,329
aDSL	421	587	762	938	1,239	1,476	2,530	3,586
sDSL	2	1	1	*	*	*	*	*
Other Wireline <sup>1</sup>	114	125	125	141	158	170	207	224
Cable Modem	30,769	36,383	40,979	45,530	48,696	51,740	54,829	57,869
FTTP <sup>2</sup>	4,600	5,589	6,871	7,691	8,608	9,449	10,374	11,525
Satellite	#	#	#	*	*	*	*	*
Fixed Wireless	19	28	47	55	72	92	120	145

<sup>1</sup> Power Line and Other are summarized with Other Wireline to maintain firm confidentiality. See Technical Notes at the end of the report for a description of Form 477 technology categories and other reporting requirements.

<sup>2</sup> Fiber to the premises.

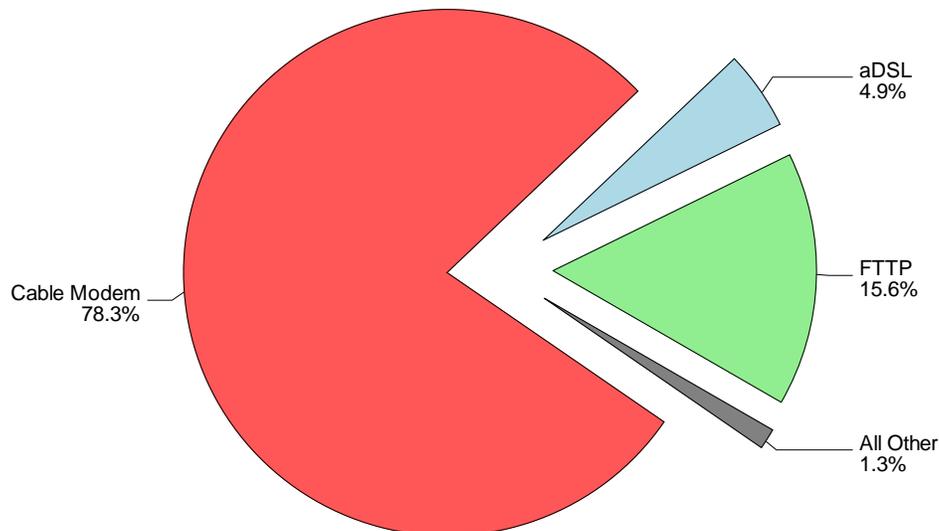
+ The June 2014 data have not been subjected to the typical quality checks (see Technical Notes).

\* = Data withheld to maintain firm confidentiality.

# = Rounds to zero.

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Figures may not sum to totals due to rounding.

**Figure 22**  
**Fixed Connections at Least 25 Mbps Downstream and 3 Mbps Upstream**  
**by Technology as of December 31, 2017**



**Figure 23**  
**Residential Fixed Connections at Least 25 Mbps Downstream and 3 Mbps Upstream**  
**by Technology 2014-2017**  
(In thousands)

Technology	2014		2015		2016		2017	
	Jun+	Dec	Jun	Dec	Jun	Dec	Jun	Dec
Total	34,437	40,916	46,532	51,788	55,694	59,463	64,253	68,869
aDSL	397	556	727	897	1,173	1,408	2,418	3,410
sDSL	#	#	#	*	*	*	*	*
Other Wireline <sup>1</sup>	22	26	26	31	41	27	67	59
Cable Modem	29,806	35,202	39,416	43,746	46,527	49,300	52,154	54,747
FTTP <sup>2</sup>	4,198	5,111	6,323	7,089	7,916	8,674	9,532	10,553
Satellite	0	0	0	*	*	*	*	*
Fixed Wireless	14	22	40	46	57	75	101	120

<sup>1</sup> Power Line and Other are summarized with Other Wireline to maintain firm confidentiality. See Technical Notes at the end of the report for a description of Form 477 technology categories and other reporting requirements.

<sup>2</sup> Fiber to the premises.

+ The June 2014 data have not been subjected to the typical quality checks (see Technical Notes).

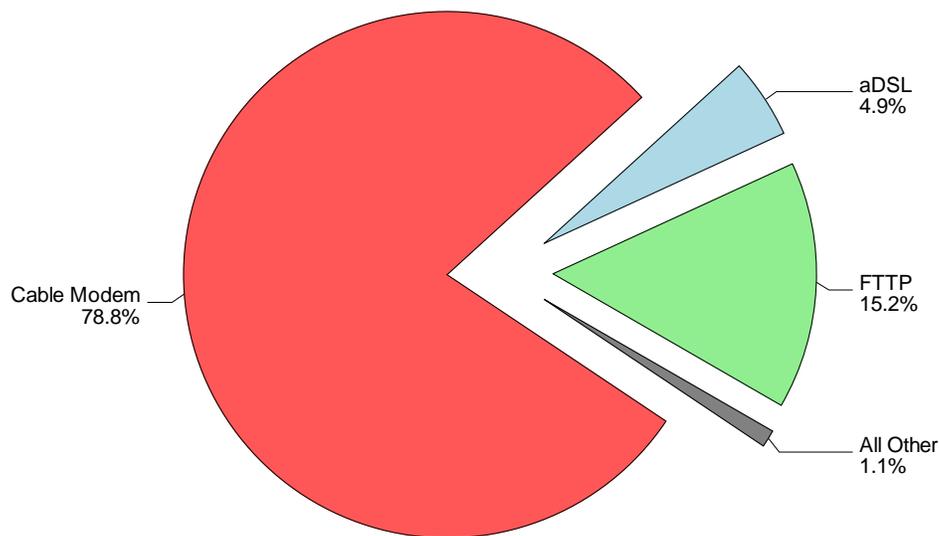
\* = Data withheld to maintain firm confidentiality.

# = Rounds to zero.

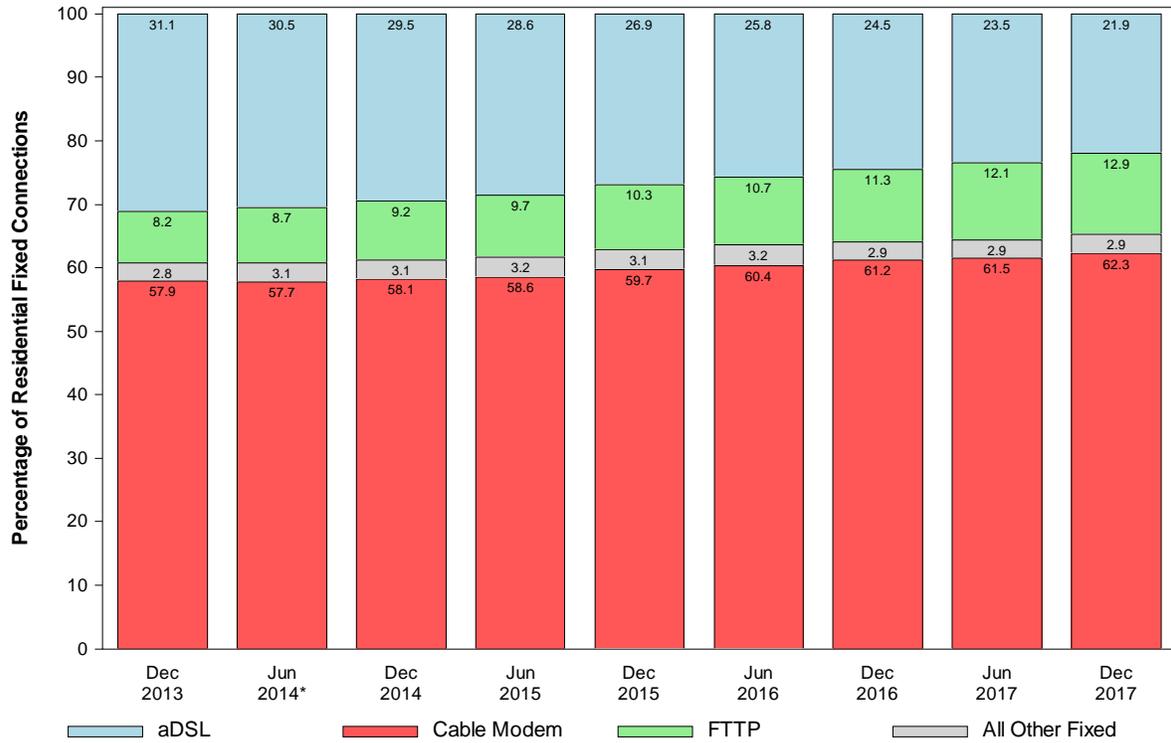
The Commission approved changes to the Form 477 in June 2013 that affect the data beginning in June 2014 (see Technical Notes).

Figures may not sum to totals due to rounding.

**Figure 24**  
**Residential Fixed Connections at Least 25 Mbps Downstream and 3 Mbps Upstream**  
**by Technology as of December 31, 2017**



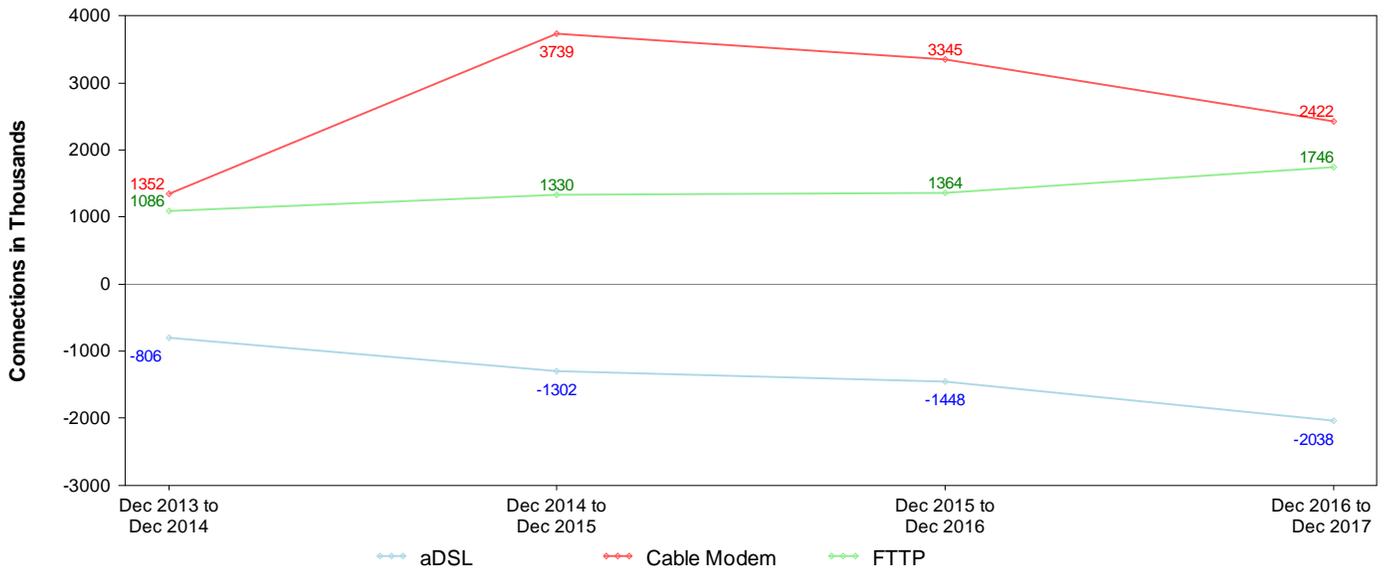
**Figure 25**  
**Residential Fixed Connections over 200 kbps in at Least One Direction 2013-2017**  
 (Shares of selected technologies)



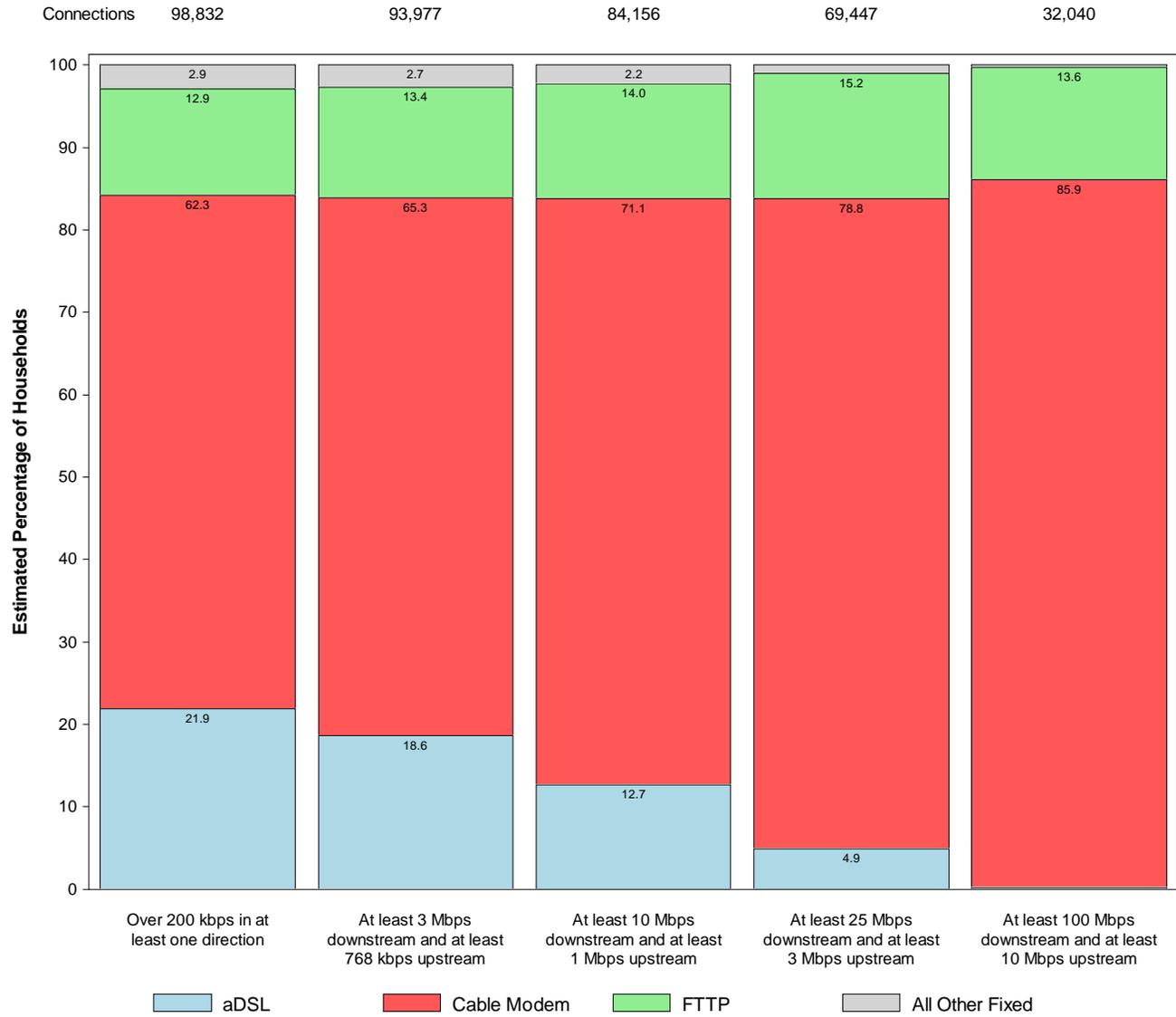
\* The June 2014 data have not been subjected to the typical quality checks (see Technical Notes).

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**Figure 26**  
**Residential Fixed Connections over 200 kbps in at Least One Direction 2013-2017**  
 (Net adds for selected technologies)



**Figure 27**  
**Residential Fixed Connections by Technology as of December 31, 2017**  
**(Shares of selected technologies for selected speeds, connections in thousands)**



**Figure 28**  
**Fixed Connections by Downstream Speed Tier and Technology as of December 31, 2017**  
(In thousands)

Technology	Downstream Speed						Total
	Less than 1.5 Mbps	At least 1.5 Mbps and less than 3 Mbps	At least 3 Mbps and less than 10 Mbps	At least 10 Mbps and less than 25 Mbps	At least 25 Mbps and less than 100 Mbps	At least 100 Mbps	
aDSL	717	1,376	8,557	9,513	3,958	72	24,193
sDSL	6	6	7	6	*	*	28
Other Wireline <sup>1</sup>	30	228	100	48	29	195	631
Cable Modem	60	64	2,051	5,834	22,688	35,499	66,195
FTTP	45	35	602	1,736	6,746	4,814	13,978
Satellite	282	23	165	837	*	*	1,872
Fixed Wireless	62	130	615	332	115	37	1,292
<b>Total</b>	<b>1,202</b>	<b>1,862</b>	<b>12,096</b>	<b>18,306</b>	<b>34,104</b>	<b>40,618</b>	<b>108,188</b>

Percentages							
aDSL	0.7	1.3	7.9	8.8	3.7	0.1	22.4
sDSL	0.0	0.0	0.0	0.0	*	*	0.0
Other Wireline <sup>1</sup>	0.0	0.2	0.1	0.0	0.0	0.2	0.6
Cable Modem	0.1	0.1	1.9	5.4	21.0	32.8	61.2
FTTP	0.0	0.0	0.6	1.6	6.2	4.4	12.9
Satellite	0.3	0.0	0.2	0.8	*	*	1.7
Fixed Wireless	0.1	0.1	0.6	0.3	0.1	0.0	1.2
<b>Total</b>	<b>1.1</b>	<b>1.7</b>	<b>11.2</b>	<b>16.9</b>	<b>31.5</b>	<b>37.5</b>	<b>100.0</b>

<sup>1</sup> Power Line and Other are summarized with Other Wireline to maintain firm confidentiality. See Technical Notes at the end of the report for a description of Form 477 technology categories and other reporting requirements.

# = Rounds to Zero.

\* = Data withheld to maintain firm confidentiality.

Note: Figures may not sum to totals due to rounding.

Source: FCC Form 477.

**Figure 29**  
**Residential Fixed Connections by Downstream Speed Tier and Technology as of December 31, 2017**  
(In thousands)

Technology	Downstream Speed						Total
	Less than 1.5 Mbps	At least 1.5 Mbps and less than 3 Mbps	At least 3 Mbps and less than 10 Mbps	At least 10 Mbps and less than 25 Mbps	At least 25 Mbps and less than 100 Mbps	At least 100 Mbps	
aDSL	640	1,124	7,418	8,653	3,755	64	21,653
sDSL	2	1	1	4	*	*	9
Other Wireline <sup>1</sup>	#	1	3	5	6	53	68
Cable Modem	54	35	1,573	4,856	20,561	34,488	61,567
FTTP	34	26	543	1,515	6,207	4,376	12,702
Satellite	133	8	160	830	*	*	1,688
Fixed Wireless	54	118	554	291	101	27	1,146
<b>Total</b>	<b>917</b>	<b>1,313</b>	<b>10,253</b>	<b>16,155</b>	<b>31,187</b>	<b>39,007</b>	<b>98,832</b>

Percentages							
aDSL	0.6	1.1	7.5	8.8	3.8	0.1	21.9
sDSL	0.0	0.0	0.0	0.0	*	*	0.0
Other Wireline <sup>1</sup>	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Cable Modem	0.1	0.0	1.6	4.9	20.8	34.9	62.3
FTTP	0.0	0.0	0.5	1.5	6.3	4.4	12.9
Satellite	0.1	0.0	0.2	0.8	*	*	1.7
Fixed Wireless	0.1	0.1	0.6	0.3	0.1	0.0	1.2
<b>Total</b>	<b>0.9</b>	<b>1.3</b>	<b>10.4</b>	<b>16.3</b>	<b>31.6</b>	<b>39.5</b>	<b>100.0</b>

<sup>1</sup> Power Line and Other are summarized with Other Wireline to maintain firm confidentiality. See Technical Notes at the end of the report for a description of Form 477 technology categories and other reporting requirements.

# = Rounds to Zero.

\* = Data withheld to maintain firm confidentiality.

Note: Figures may not sum to totals due to rounding.

Source: FCC Form 477.

**Figure 30**  
**Nationwide Number of Providers of Connections over 200 kbps in at Least One Direction**  
**by Technology 2013-2017**

Technology	2013		2014		2015		2016		2017	
	Dec	Jun+	Dec	Jun	Dec	Jun	Dec	Jun	Dec	
aDSL	851	793	793	792	778	769	774	769	742	
sDSL	239	192	187	177	180	171	161	161	151	
Other Wireline <sup>1</sup>	245	270	245	240	250	244	236	243	236	
Cable Modem	407	394	402	393	392	388	385	383	382	
FTTP	744	879	910	931	990	1,016	1,067	1,103	1,148	
Satellite	5	16	14	10	10	6	6	5	6	
Fixed Wireless	825	872	922	948	982	1,025	1,068	1,093	1,153	
Mobile Wireless	77	91	98	100	96	99	97	97	83	
Power Line and Other <sup>1</sup>	*	-	-	-	-	-	-	-	-	
<b>Total</b>	<b>1,773</b>	<b>1,816</b>	<b>1,872</b>	<b>1,881</b>	<b>1,917</b>	<b>1,955</b>	<b>1,999</b>	<b>2,028</b>	<b>2,083</b>	

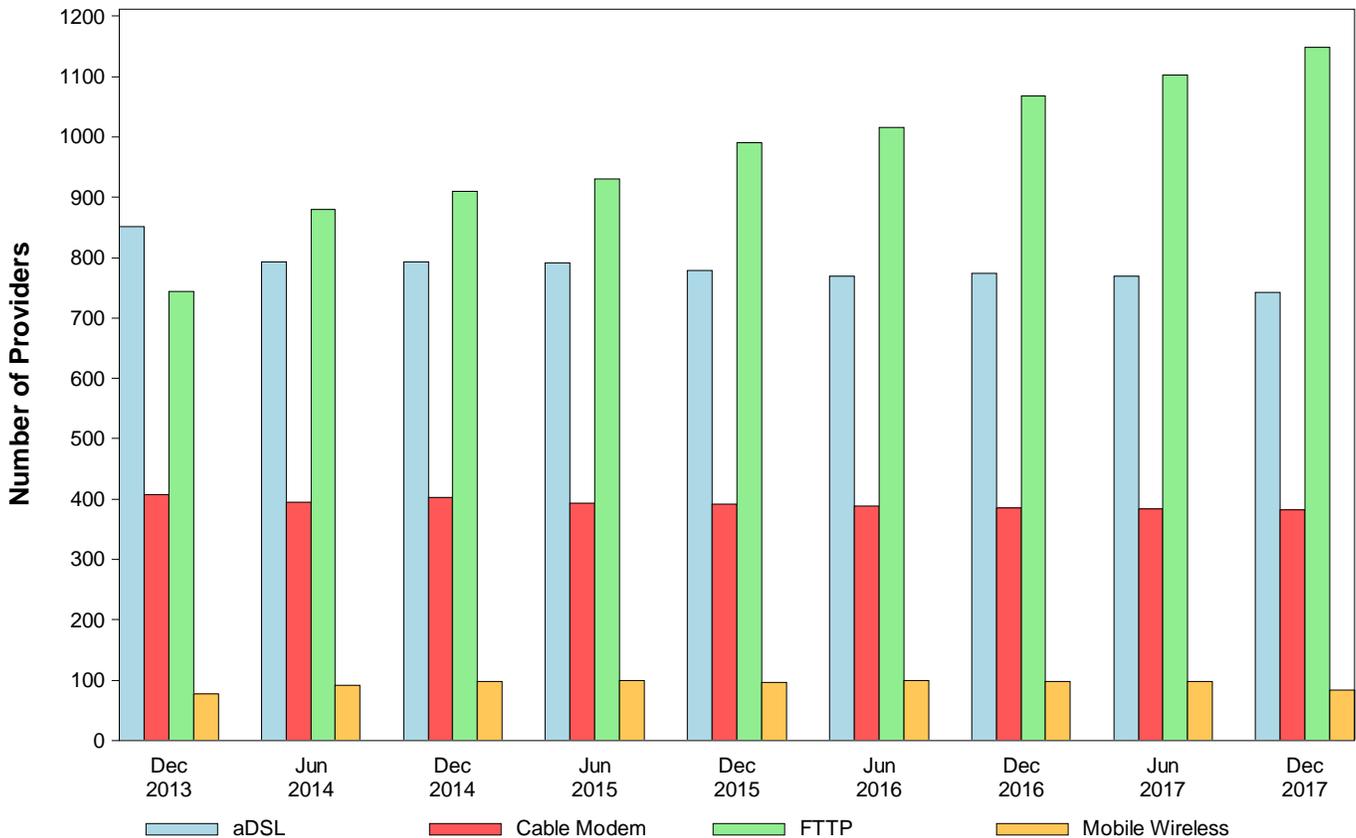
<sup>1</sup> For this Figure, the categories Power Line and All Other were combined with Other Wireline from June 2014 forward.

+ The June 2014 data have not been subjected to the typical quality checks (see Technical Notes).

Multiple Form 477 filers within a holding company structure count as one provider. \* = 1-3 providers.

The Commission approved changes to the Form 477 in June 2013 that affect the data beginning in June 2014 (see Technical Notes). Some previously-published data may have been revised.

**Figure 31**  
**Nationwide Number of Providers of Connections over 200 kbps in at Least One Direction**  
**Selected Technologies 2013-2017**



**SECTION 3**  
**SUMMARY STATISTICS: THE STATES**

**Table of Contents**

Figure 32	Residential Fixed Connections and Households by State as of December 31, 2017 .....	29
Figure 33	Connections by Type of End User by State as of December 31, 2017 .....	31
Figure 34	Connections by Technology by State as of December 31, 2017 .....	32
Figure 35	Percentage of Fixed Connections by Downstream Speed by State as of December 31, 2017 .....	34
Figure 36	Providers of Connections by Technology by State as of December 31, 2017 .....	36

**Figure 32**  
**Residential Fixed Connections and Households by State as of December 31, 2017**  
(Connections and households, in thousands)

State	Households	At least 200 kbps in at least One Direction		At least 10 Mbps Down and 1 Mbps Up		At least 25 Mbps Down and 3 Mbps Up		At least 100 Mbps Down and 10 Mbps Up	
		Connections	Subscribership Ratio	Connections	Subscribership Ratio	Connections	Subscribership Ratio	Connections	Subscribership Ratio
Alabama	1,857	1,331	0.72	1,050	0.57	791	0.43	266	0.14
Alaska	253	201	0.79	158	0.63	*	*	*	*
American Samoa	10	*	*	0	0.00	0	0.00	0	0.00
Arizona	2,482	2,116	0.85	1,667	0.67	1,361	0.55	655	0.26
Arkansas	1,147	770	0.67	562	0.49	362	0.32	112	0.10
California	12,888	11,251	0.87	9,977	0.77	8,215	0.64	4,175	0.32
Colorado	2,083	1,864	0.90	1,487	0.71	1,362	0.65	534	0.26
Connecticut	1,362	1,201	0.88	1,080	0.79	882	0.65	423	0.31
Delaware	352	327	0.93	311	0.88	300	0.85	116	0.33
District of Columbia	278	242	0.87	224	0.81	213	0.77	*	*
Florida	7,511	7,134	0.95	6,395	0.85	5,319	0.71	2,654	0.35
Georgia	3,663	2,983	0.81	2,493	0.68	1,942	0.53	733	0.20
Guam	42	*	*	*	*	*	*	0	0.00
Hawaii	456	423	0.93	418	0.92	*	*	*	*
Idaho	609	495	0.81	302	0.50	236	0.39	48	0.08
Illinois	4,818	3,834	0.80	3,328	0.69	2,630	0.55	904	0.19
Indiana	2,537	1,934	0.76	1,572	0.62	1,195	0.47	525	0.21
Iowa	1,252	935	0.75	658	0.53	544	0.43	181	0.14
Kansas	1,122	883	0.79	696	0.62	489	0.44	255	0.23
Kentucky	1,725	1,272	0.74	958	0.56	673	0.39	449	0.26
Louisiana	1,738	1,256	0.72	1,031	0.59	742	0.43	266	0.15
Maine	554	484	0.87	367	0.66	243	0.44	138	0.25
Maryland	2,181	1,897	0.87	1,787	0.82	1,678	0.77	659	0.30
Massachusetts	2,586	2,334	0.90	2,195	0.85	2,113	0.82	857	0.33
Michigan	3,889	3,021	0.78	2,610	0.67	2,108	0.54	602	0.15
Minnesota	2,153	1,740	0.81	1,344	0.62	1,177	0.55	318	0.15
Mississippi	1,104	675	0.61	500	0.45	310	0.28	78	0.07
Missouri	2,386	1,801	0.75	1,388	0.58	1,042	0.44	415	0.17
Montana	420	337	0.80	239	0.57	204	0.49	50	0.12
Nebraska	748	579	0.77	445	0.59	342	0.46	173	0.23

**Figure 32 - Continued**  
**Residential Fixed Connections and Households by State as of December 31, 2017**  
(Connections and households, in thousands)

State	Households	At least 200 kbps in at least One Direction		At least 10 Mbps Down and 1 Mbps Up		At least 25 Mbps Down and 3 Mbps Up		At least 100 Mbps Down and 10 Mbps Up	
		Connections	Subscribership Ratio	Connections	Subscribership Ratio	Connections	Subscribership Ratio	Connections	Subscribership Ratio
Nevada	1,052	909	0.86	778	0.74	612	0.58	*	*
New Hampshire	527	471	0.90	409	0.78	369	0.70	166	0.31
New Jersey	3,199	2,942	0.92	2,805	0.88	2,712	0.85	1,394	0.44
New Mexico	770	557	0.72	358	0.46	305	0.40	81	0.11
New York	7,303	6,244	0.85	5,842	0.80	5,282	0.72	3,287	0.45
North Carolina	3,874	3,248	0.84	2,629	0.68	2,273	0.59	1,456	0.38
North Dakota	312	250	0.80	223	0.72	194	0.62	51	0.16
Northern Mariana Isl	16	*	*	*	*	*	*	0	0.00
Ohio	4,633	3,673	0.79	3,066	0.66	2,153	0.46	1,224	0.26
Oklahoma	1,469	1,025	0.70	770	0.52	519	0.35	211	0.14
Oregon	1,572	1,320	0.84	1,087	0.69	965	0.61	351	0.22
Pennsylvania	5,007	4,073	0.81	3,552	0.71	3,155	0.63	1,331	0.27
Puerto Rico	1,223	*	*	293	0.24	*	*	*	*
Rhode Island	412	358	0.87	345	0.84	311	0.76	*	*
South Carolina	1,871	1,511	0.81	1,278	0.68	892	0.48	276	0.15
South Dakota	339	261	0.77	230	0.68	204	0.60	26	0.08
Tennessee	2,547	1,911	0.75	1,643	0.65	1,303	0.51	541	0.21
Texas	9,430	7,513	0.80	6,460	0.68	4,959	0.53	2,698	0.29
Utah	938	822	0.88	653	0.70	573	0.61	221	0.24
Vermont	259	232	0.90	176	0.68	141	0.55	56	0.22
Virgin Islands	43	*	*	*	*	*	*	*	*
Virginia	3,106	2,568	0.83	2,261	0.73	2,036	0.66	887	0.29
Washington	2,756	2,415	0.88	2,025	0.73	1,848	0.67	802	0.29
West Virginia	738	537	0.73	390	0.53	312	0.42	142	0.19
Wisconsin	2,329	1,808	0.78	1,459	0.63	1,061	0.46	371	0.16
Wyoming	230	179	0.78	135	0.58	111	0.48	17	0.07
<b>Total</b>	<b>120,159</b>	<b>98,832</b>	<b>0.82</b>	<b>84,156</b>	<b>0.70</b>	<b>69,447</b>	<b>0.58</b>	<b>32,040</b>	<b>0.27</b>

# = Rounds to Zero; \* = Data withheld to maintain firm confidentiality.

Note: Figures may not sum to totals due to rounding.

Sources: FCC Form 477 (Connections); 2013-2017 ACS 5-year estimates; Census 2010.

**Figure 33**  
**Connections by Type of End User by State as of December 31, 2017**  
**(Connections over 200 kbps in at least one direction, in thousands)**

State	Connections		Percentages		Total
	Residential	Business	Residential	Business	
Alabama	5,466	642	89.5	10.5	6,108
Alaska	839	120	87.4	12.6	959
American Samoa	*	*	*	*	*
Arizona	7,195	1,017	87.6	12.4	8,211
Arkansas	3,134	425	88.1	11.9	3,559
California	44,440	8,113	84.6	15.4	52,552
Colorado	6,252	919	87.2	12.8	7,171
Connecticut	4,114	732	84.9	15.1	4,847
Delaware	1,089	140	88.6	11.4	1,229
District of Columbia	989	444	69.0	31.0	1,433
Florida	23,940	3,900	86.0	14.0	27,840
Georgia	11,605	1,633	87.7	12.3	13,238
Guam	180	55	76.7	23.3	235
Hawaii	1,716	207	89.2	10.8	1,923
Idaho	1,766	237	88.2	11.8	2,003
Illinois	14,323	2,324	86.0	14.0	16,647
Indiana	7,015	908	88.5	11.5	7,923
Iowa	3,302	520	86.4	13.6	3,822
Kansas	4,420	483	90.1	9.9	4,903
Kentucky	4,938	590	89.3	10.7	5,529
Louisiana	5,147	671	88.5	11.5	5,818
Maine	1,542	213	87.9	12.1	1,754
Maryland	6,970	998	87.5	12.5	7,968
Massachusetts	8,282	1,258	86.8	13.2	9,540
Michigan	10,863	1,698	86.5	13.5	12,561
Minnesota	6,116	968	86.3	13.7	7,084
Mississippi	3,138	327	90.6	9.4	3,465
Missouri	6,494	1,003	86.6	13.4	7,497
Montana	1,165	135	89.6	10.4	1,300
Nebraska	1,978	354	84.8	15.2	2,332
Nevada	3,321	402	89.2	10.8	3,723
New Hampshire	1,545	215	87.8	12.2	1,760
New Jersey	10,441	1,714	85.9	14.1	12,154
New Mexico	2,126	244	89.7	10.3	2,370
New York	23,781	3,733	86.4	13.6	27,513
North Carolina	11,025	1,569	87.5	12.5	12,594
North Dakota	858	129	87.0	13.0	986
Northern Mariana Isl	*	*	*	*	*
Ohio	12,941	1,805	87.8	12.2	14,747
Oklahoma	3,997	584	87.2	12.8	4,581
Oregon	4,597	679	87.1	12.9	5,276
Pennsylvania	14,337	2,007	87.7	12.3	16,344
Puerto Rico	3,510	269	92.9	7.1	3,778
Rhode Island	1,125	178	86.3	13.7	1,303
South Carolina	5,309	652	89.1	10.9	5,961
South Dakota	949	111	89.5	10.5	1,060
Tennessee	7,328	993	88.1	11.9	8,321
Texas	29,795	5,024	85.6	14.4	34,819
Utah	3,047	474	86.5	13.5	3,521
Vermont	715	110	86.7	13.3	824
Virgin Islands	127	12	91.5	8.5	139
Virginia	8,908	1,516	85.5	14.5	10,423
Washington	8,438	1,241	87.2	12.8	9,679
West Virginia	1,689	195	89.7	10.3	1,884
Wisconsin	5,975	956	86.2	13.8	6,931
Wyoming	683	74	90.2	9.8	757
<b>Total</b>	<b>365,040</b>	<b>55,926</b>	<b>86.7</b>	<b>13.3</b>	<b>420,966</b>

# = Rounds to Zero.

\* = Data withheld to maintain firm confidentiality.

Figures may not sum to totals due to rounding.

Source: FCC Form 477.

**Figure 34**  
**Connections by Technology by State as of December 31, 2017**  
(Connections over 200 kbps in at least one direction, in thousands)

<i>State</i>	<i>ADSL</i>	<i>SDSL</i>	<i>Other Wireline<sup>1</sup></i>	<i>Cable Modem</i>	<i>Fiber</i>	<i>Satellite</i>	<i>Fixed Wireless</i>	<i>Mobile Wireless</i>	<i>Total</i>
Alabama	506	#	*	784	100	*	6	4,647	6,108
Alaska	77	#	2	*	5	*	8	727	959
American Samoa	*	*	0	*	*	0	*	*	*
Arizona	541	#	*	1,509	150	*	37	5,931	8,211
Arkansas	346	#	*	410	33	*	7	2,712	3,559
California	3,127	3	*	7,831	1,049	*	99	40,211	52,552
Colorado	*	#	19	1,256	227	*	62	5,134	7,171
Connecticut	*	#	4	979	12	*	#	3,528	4,847
Delaware	*	*	3	220	*	*	#	874	1,229
District of Columbia	*	*	5	*	*	*	2	1,156	1,433
Florida	1,611	#	*	5,190	834	*	13	20,071	27,840
Georgia	990	#	*	1,853	350	*	4	9,956	13,238
Guam	*	0	*	*	*	0	0	190	235
Hawaii	*	2	1	*	*	*	2	1,463	1,923
Idaho	167	#	*	219	87	*	48	1,463	2,003
Illinois	1,176	1	*	2,700	183	*	74	12,438	16,647
Indiana	645	#	*	1,138	221	*	40	5,823	7,923
Iowa	283	1	*	477	189	*	42	2,798	3,822
Kansas	248	#	*	472	181	*	40	3,940	4,903
Kentucky	424	#	*	764	138	*	16	4,144	5,529
Louisiana	410	*	6	808	101	*	6	4,431	5,818
Maine	125	1	*	382	12	*	4	1,217	1,754
Maryland	*	#	16	1,089	*	*	6	5,905	7,968
Massachusetts	*	#	21	1,880	*	*	5	6,981	9,540
Michigan	841	2	*	2,229	68	*	46	9,273	12,561
Minnesota	484	2	*	1,118	220	*	30	5,190	7,084
Mississippi	340	#	*	322	32	*	2	2,712	3,465
Missouri	679	#	*	917	241	*	43	5,536	7,497
Montana	100	#	*	204	32	*	26	922	1,300
Nebraska	146	#	*	394	60	*	26	1,695	2,332

**Figure 34 - Continued**  
**Connections by Technology by State as of December 31, 2017**  
(Connections over 200 kbps in at least one direction, in thousands)

<i>State</i>	<i>ADSL</i>	<i>SDSL</i>	<i>Other Wireline<sup>1</sup></i>	<i>Cable Modem</i>	<i>Fiber</i>	<i>Satellite</i>	<i>Fixed Wireless</i>	<i>Mobile Wireless</i>	<i>Total</i>
Nevada	219	#	6	*	24	*	18	2,730	3,723
New Hampshire	74	#	*	412	29	*	1	1,235	1,760
New Jersey	160	#	27	2,076	*	*	1	8,907	12,154
New Mexico	234	#	*	294	43	*	23	1,759	2,370
New York	410	#	38	4,798	*	*	8	20,624	27,513
North Carolina	842	#	*	2,278	329	*	7	9,060	12,594
North Dakota	42	#	*	149	84	*	4	704	986
Northern Mariana Isl	*	*	0	*	*	0	*	*	*
Ohio	1,062	#	*	2,565	242	*	44	10,772	14,747
Oklahoma	375	#	*	582	74	*	48	3,449	4,581
Oregon	247	#	*	940	192	*	25	3,831	5,276
Pennsylvania	569	#	28	2,832	*	*	7	11,905	16,344
Puerto Rico	*	0	*	*	7	*	8	3,100	3,778
Rhode Island	*	*	2	*	*	*	*	912	1,303
South Carolina	453	#	*	998	144	*	4	4,319	5,961
South Dakota	45	*	#	169	58	*	10	772	1,060
Tennessee	542	#	*	1,176	302	*	11	6,223	8,321
Texas	2,291	1	*	4,272	1,224	*	205	26,592	34,819
Utah	168	#	*	492	175	*	48	2,627	3,521
Vermont	88	#	*	144	25	*	1	559	824
Virgin Islands	*	0	*	*	*	*	*	*	139
Virginia	300	#	*	1,480	908	*	19	7,607	10,423
Washington	432	#	*	1,839	246	*	35	7,050	9,679
West Virginia	*	*	1	362	11	*	2	1,296	1,884
Wisconsin	617	8	5	*	109	*	40	4,960	6,931
Wyoming	50	#	*	110	12	*	22	555	757
<b>Total</b>	<b>24,193</b>	<b>28</b>	<b>631</b>	<b>66,195</b>	<b>13,978</b>	<b>1,872</b>	<b>1,292</b>	<b>312,778</b>	<b>420,966</b>

<sup>1</sup> PowerLine and Other are summarized with Other Wireline to maintain firm confidentiality. See Technical Notes at the end of the report for a description of Form 477 technology categories and other reporting requirements.

# = Rounds to Zero.

\* = Data withheld to maintain firm confidentiality.

Figures may not sum to totals due to rounding.

Source: FCC Form 477.

**Figure 35**  
**Percentage of Fixed Connections by Downstream Speed by State as of December 31, 2017**

State	Over 200 kbps Upstream and				
	% over 200 kbps Downstream	% at least 3 Mbps Downstream	% at least 10 Mbps Downstream	% at least 25 Mbps Downstream	% at least 100 Mbps Downstream
Alabama	99.5	94.9	80.6	59.3	21.6
Alaska	98.4	92.0	78.3	58.6	41.9
American Samoa	*	*	*	*	*
Arizona	99.8	97.4	87.5	64.1	34.2
Arkansas	99.5	94.2	76.2	48.7	16.9
California	99.7	97.8	87.0	70.8	44.2
Colorado	99.8	96.4	88.7	71.6	45.4
Connecticut	99.5	99.2	88.2	71.5	45.3
Delaware	99.9	98.7	93.3	88.9	53.4
District of Columbia	99.9	98.0	89.7	84.1	57.1
Florida	99.7	98.1	91.2	74.0	35.8
Georgia	99.3	96.5	83.5	64.2	26.2
Guam	*	*	*	*	*
Hawaii	100.0	99.7	97.8	88.8	54.3
Idaho	99.6	95.3	75.0	48.1	32.5
Illinois	99.8	97.7	85.7	66.9	25.6
Indiana	99.5	97.2	81.9	60.7	26.0
Iowa	99.7	94.4	77.8	56.8	20.8
Kansas	99.7	95.8	79.6	53.6	28.5
Kentucky	99.2	95.1	75.9	52.8	33.6
Louisiana	99.4	95.4	82.1	58.8	23.0
Maine	99.1	95.4	74.6	49.2	28.8
Maryland	99.9	98.5	92.3	86.1	48.8
Massachusetts	99.9	98.6	92.1	87.4	54.9
Michigan	99.5	97.3	85.3	68.4	20.5
Minnesota	99.8	96.2	84.3	66.8	31.1
Mississippi	99.2	93.0	74.3	47.1	20.1
Missouri	99.6	95.4	80.8	58.1	40.4
Montana	99.7	93.1	76.6	60.7	14.9
Nebraska	99.7	96.7	80.3	58.5	29.5

**Figure 35 - Continued**  
**Percentage of Fixed Connections by Downstream Speed by State as of December 31, 2017**

State	Over 200 kbps Upstream and				
	% over 200 kbps Downstream	% at least 3 Mbps Downstream	% at least 10 Mbps Downstream	% at least 25 Mbps Downstream	% at least 100 Mbps Downstream
Nevada	99.9	98.4	89.6	68.8	30.8
New Hampshire	99.2	96.6	84.5	75.0	51.7
New Jersey	99.8	98.7	94.3	90.1	56.1
New Mexico	99.8	93.9	77.6	54.5	30.7
New York	99.7	98.7	92.2	82.9	50.0
North Carolina	99.4	96.8	84.0	68.7	43.4
North Dakota	99.9	97.6	90.2	77.6	25.3
Northern Mariana Isl	*	*	*	*	*
Ohio	99.8	97.3	83.3	57.9	32.5
Oklahoma	99.7	96.6	75.6	50.1	23.2
Oregon	99.8	96.6	87.0	72.2	40.4
Pennsylvania	99.8	97.3	87.0	76.2	46.1
Puerto Rico	99.9	84.7	51.8	30.5	3.8
Rhode Island	99.6	98.8	95.3	85.5	40.9
South Carolina	99.6	96.8	84.8	60.0	22.2
South Dakota	99.7	97.5	89.6	77.8	10.7
Tennessee	99.5	96.8	85.8	67.4	28.9
Texas	99.8	97.6	85.5	64.7	39.4
Utah	99.9	97.6	86.9	69.1	43.3
Vermont	98.8	93.9	73.3	58.3	39.1
Virgin Islands	99.8	85.7	53.8	*	*
Virginia	99.5	97.2	87.8	77.0	42.0
Washington	99.6	96.9	88.1	74.9	52.6
West Virginia	99.1	97.4	71.4	56.9	34.3
Wisconsin	99.2	95.9	82.8	58.3	22.5
Wyoming	99.7	94.0	80.5	61.3	9.5
Total	99.7	97.2	86.0	69.1	37.5

**Figure 36**  
**Providers of Connections by Technology by State as of December 31, 2017**  
(Connections over 200 kbps in at least one direction, in thousands)

<i>State</i>	<i>ADSL</i>	<i>SDSL</i>	<i>Other Wireline<sup>1</sup></i>	<i>Cable Modem</i>	<i>Fiber</i>	<i>Satellite</i>	<i>Fixed Wireless</i>	<i>Mobile Wireless</i>	<i>Total</i>
Alabama	26	6	*	19	42	*	29	6	93
Alaska	13	4	12	*	9	*	17	7	40
American Samoa	*	*	0	*	*	0	*	*	*
Arizona	24	4	*	16	39	*	44	7	109
Arkansas	26	5	*	20	38	*	23	5	83
California	35	16	*	33	82	*	110	6	203
Colorado	*	7	28	17	59	*	63	9	137
Connecticut	*	5	16	10	23	*	7	4	44
Delaware	*	*	11	6	*	*	4	4	28
District of Columbia	*	*	12	*	*	*	7	4	39
Florida	23	9	*	24	69	*	36	5	118
Georgia	26	5	*	31	85	*	28	4	130
Guam	*	0	*	*	*	0	0	4	4
Hawaii	*	4	7	*	*	*	5	5	24
Idaho	23	5	*	18	34	*	40	10	77
Illinois	52	8	*	20	96	*	90	7	196
Indiana	37	6	*	13	61	*	59	5	118
Iowa	98	17	*	42	150	*	94	22	240
Kansas	27	8	*	28	62	*	50	9	111
Kentucky	19	4	*	28	44	*	33	8	102
Louisiana	17	*	22	19	37	*	16	5	70
Maine	13	6	*	9	20	*	12	5	41
Maryland	*	5	18	19	*	*	25	5	78
Massachusetts	*	4	21	11	*	*	24	5	69
Michigan	35	10	*	25	63	*	46	6	129
Minnesota	45	8	*	22	77	*	47	5	124
Mississippi	17	4	*	14	26	*	11	5	57
Missouri	39	10	*	18	62	*	70	8	146
Montana	21	5	*	7	30	*	31	7	67
Nebraska	31	4	*	20	54	*	44	8	101

**Figure 36 - Continued**  
**Providers of Connections by Technology by State as of December 31, 2017**  
(Connections over 200 kbps in at least one direction, in thousands)

<i>State</i>	<i>ADSL</i>	<i>SDSL</i>	<i>Other Wireline<sup>1</sup></i>	<i>Cable Modem</i>	<i>Fiber</i>	<i>Satellite</i>	<i>Fixed Wireless</i>	<i>Mobile Wireless</i>	<i>Total</i>
Nevada	17	7	21	*	34	*	24	5	74
New Hampshire	9	6	*	5	20	*	7	6	37
New Jersey	13	4	32	12	*	*	15	4	72
New Mexico	19	5	*	10	30	*	31	8	73
New York	35	6	31	21	*	*	35	7	121
North Carolina	22	7	*	26	55	*	22	6	99
North Dakota	24	7	*	9	31	*	15	6	48
Northern Mariana Isl	*	*	0	*	*	0	*	*	*
Ohio	35	5	*	33	66	*	59	4	145
Oklahoma	39	8	*	15	50	*	47	12	112
Oregon	40	10	*	16	55	*	45	6	103
Pennsylvania	25	6	29	26	*	*	31	8	114
Puerto Rico	*	0	*	*	7	*	6	5	17
Rhode Island	*	*	9	*	*	*	*	4	22
South Carolina	19	4	*	17	32	*	14	6	57
South Dakota	23	*	13	8	31	*	19	8	72
Tennessee	22	5	*	22	54	*	29	7	103
Texas	63	19	*	35	121	*	150	9	259
Utah	20	4	*	12	30	*	32	9	73
Vermont	12	4	*	6	20	*	6	6	36
Virgin Islands	*	0	*	*	*	*	*	*	7
Virginia	23	7	*	17	64	*	39	6	111
Washington	26	7	*	23	62	*	55	6	123
West Virginia	*	*	11	16	21	*	15	6	56
Wisconsin	47	7	25	*	66	*	49	6	127
Wyoming	16	5	*	5	17	*	26	8	49
<b>Total</b>	<b>742</b>	<b>151</b>	<b>236</b>	<b>382</b>	<b>1,148</b>	<b>6</b>	<b>1,153</b>	<b>83</b>	<b>2,083</b>

<sup>1</sup> Power Line and Other are summarized with Other Wireline. See Technical Notes at the end of the report for a description of Form 477 technology categories and other reporting requirements.

# = Rounds to Zero.

\* = Data withheld to maintain firm confidentiality.

Figures may not sum to totals due to rounding.

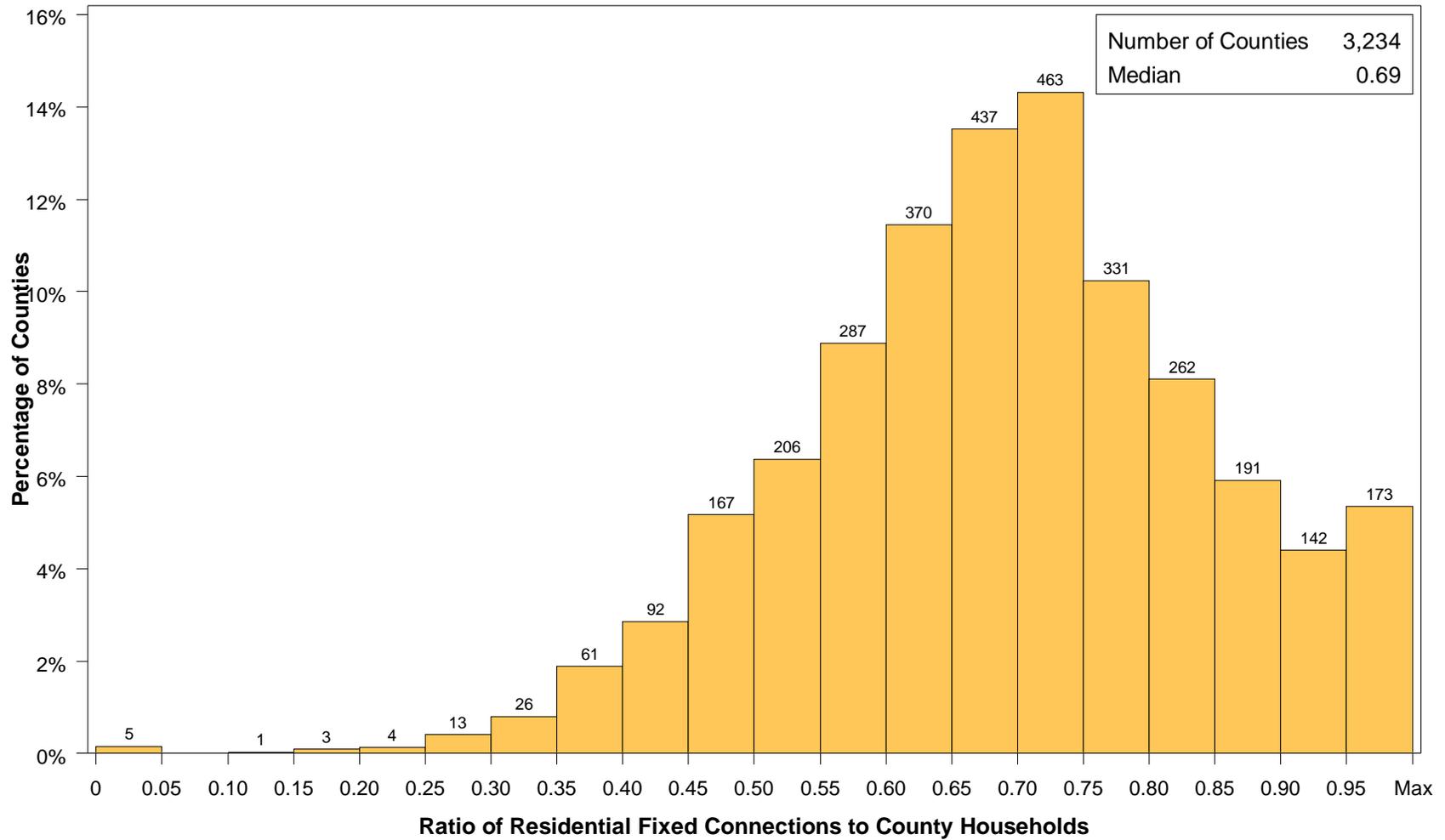
Source: FCC Form 477.

**SECTION 4**  
**SUMMARY STATISTICS: COUNTIES AND CENSUS TRACTS**

**Table of Contents**

Figure 37	Distribution of Counties by Ratio of Residential Fixed Connections over 200 kbps in at Least One Direction to County Households as of December 31, 2017 .....	39
Figure 38	Distribution of Counties by Ratio of Residential Fixed Connections over 200 kbps in at Least One Direction to County Households by Technology as of December 31, 2017 .....	40
Figure 39	Distribution of Census Tracts by Ratio of Residential Fixed Connections over 200 kbps in at Least One Direction to Tract Households as of December 31, 2017 .....	41
Figure 40	Distribution of Census Tracts by Ratio of Residential Fixed Connections over 200 kbps in at Least One Direction to Tract Households by Technology as of December 31, 2017 .....	42
Figure 41	Percentage of Developed Census Blocks with Residential Fixed Connections by Technology as of December 31, 2017 .....	43
Figure 42	Distribution of Counties by Ratio of Residential Fixed Connections to County Households by State as of December 31, 2017 .....	44
Figure 43	Distribution of Census Tracts by Ratio of Residential Fixed Connections to Tract Households by State as of December 31, 2017 .....	46

**Figure 37**  
**Distribution of Counties by Ratio of Residential Fixed Connections over 200 kbps in at Least One Direction to County Households as of December 31, 2017**



Note: Ratios over 1 were set to 1. See Technical Notes at the end of the report.  
 Sources: FCC Form 477; 2013-2017 ACS 5-year estimates; and Census 2010.

**Figure 38**  
**Distribution of Counties by Ratio of Residential Fixed Connections over 200 kbps in at Least One Direction to County Households by Technology as of December 31, 2017**

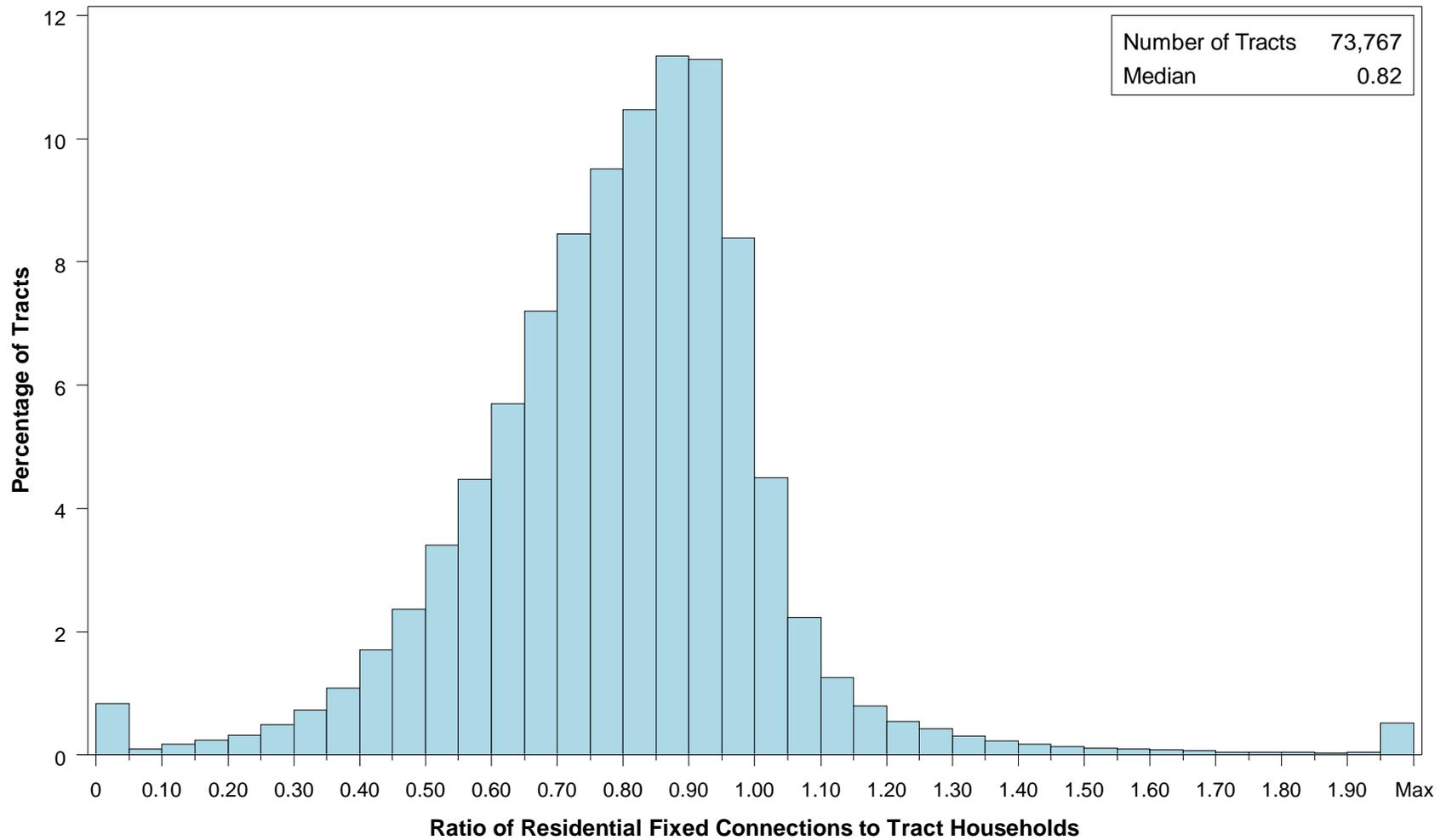
<i>Technology</i>	<i>Ratio of Residential Fixed Connections to County Households</i>										<i>100% or more</i>
	<i>Zero</i>	<i>Greater than 0 and no more than 5%</i>	<i>Greater than 5 and no more than 10%</i>	<i>Greater than 10 and no more than 20%</i>	<i>Greater than 20 and no more than 30%</i>	<i>Greater than 30 and no more than 40%</i>	<i>Greater than 40 and no more than 50%</i>	<i>Greater than 50 and no more than 60%</i>	<i>Greater than 60 and no more than 80%</i>	<i>Greater than 80 and no more than 100%</i>	
aDSL	1.2	5.9	7.6	27.4	29.9	16.0	7.6	2.6	1.4	0.2	0.2
sDSL	93.2	6.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Wireline	92.0	7.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cable Modem	11.3	7.1	6.1	14.5	14.2	13.4	12.0	11.4	8.4	1.3	0.3
FTTP	24.9	43.4	9.2	9.0	4.7	3.0	2.1	1.9	1.6	0.2	0.1
Satellite	1.4	66.0	22.3	9.2	0.8	0.2	0.0	0.0	0.0	0.1	0.0
Fixed Wireless	24.8	54.3	10.9	7.1	1.8	0.8	0.2	0.1	0.0	0.0	0.1
<b>Total</b>	<b>0.1</b>	<b>0.0</b>	<b>0.0</b>	<b>0.1</b>	<b>0.5</b>	<b>2.7</b>	<b>8.0</b>	<b>15.3</b>	<b>49.5</b>	<b>20.6</b>	<b>3.1</b>

<sup>1</sup> Power Line and Other are summarized with Other Wireline. See Technical Notes at the end of the report for a description of Form 477 technology categories and other reporting requirements.

Note: Figures may not sum to totals due to rounding.

Sources: FCC Form 477; 2013-2017 ACS 5-year estimates; and Census 2010.

**Figure 39**  
**Distribution of Census Tracts by Ratio of Residential Fixed Connections over 200 kbps in at Least One Direction to Tract Households as of December 31, 2017**



Note: Ratios over 2 were set to 2. See Technical Notes at the end of the report.  
 Sources: FCC Form 477; 2013-2017 ACS 5-year estimates; and Census 2010.

**Figure 40**  
**Distribution of Census Tracts by Ratio of Residential Fixed Connections over 200 kbps in at Least One Direction to Tract Households by Technology as of December 31, 2017**

<i>Technology</i>	<i>Ratio of Residential Fixed Connections to Tract Households</i>										<i>100% or more</i>
	<i>Zero</i>	<i>Greater than 0 and no more than 5%</i>	<i>Greater than 5 and no more than 10%</i>	<i>Greater than 10 and no more than 20%</i>	<i>Greater than 20 and no more than 30%</i>	<i>Greater than 30 and no more than 40%</i>	<i>Greater than 40 and no more than 50%</i>	<i>Greater than 50 and no more than 60%</i>	<i>Greater than 60 and no more than 80%</i>	<i>Greater than 80 and no more than 100%</i>	
aDSL	2.5	20.9	13.5	25.2	19.0	11.1	4.7	1.9	1.0	0.2	0.2
sDSL	99.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Wireline	98.4	1.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cable Modem	4.7	2.8	1.7	4.0	6.6	12.0	17.0	18.9	23.8	6.6	1.9
FTTP	44.8	19.7	6.5	9.2	6.0	4.9	3.8	2.5	2.2	0.3	0.1
Satellite	35.4	55.2	5.0	3.1	0.8	0.2	0.1	0.0	0.0	0.0	0.0
Fixed Wireless	74.2	19.9	2.6	2.1	0.7	0.3	0.1	0.0	0.0	0.0	0.0
<b>Total</b>	<b>0.8</b>	<b>0.1</b>	<b>0.1</b>	<b>0.4</b>	<b>0.8</b>	<b>1.8</b>	<b>4.1</b>	<b>7.9</b>	<b>30.9</b>	<b>41.5</b>	<b>11.6</b>

<sup>1</sup> Power Line and Other are summarized with Other Wireline. See Technical Notes at the end of the report for a description of Form 477 technology categories and other reporting requirements.

Note: Figures may not sum to totals due to rounding.

Sources: FCC Form 477; 2013-2017 ACS 5-year estimates; and Census 2010.

**Figure 41**  
**Percentage of Developed Census Blocks with Residential Fixed Service by Technology as of December 31, 2017**  
*(Internet Access Service over 200 kbps in at least one direction)*

<i>Technology</i>	<i>Number of Providers</i>							
	<i>Zero</i>	<i>One</i>	<i>Two</i>	<i>Three</i>	<i>Four</i>	<i>Five</i>	<i>Six</i>	<i>Seven or More</i>
aDSL	24.4	72.8	2.7	0.1	0.0	0.0	0.0	0.0
sDSL	99.3	0.7	0.0	0.0	0.0	0.0	0.0	0.0
Other Wireline <sup>1</sup>	98.8	1.1	0.0	0.0	0.0	0.0	0.0	0.0
Cable Modem	54.6	42.7	2.4	0.3	0.0	0.0	0.0	0.0
FTTP	78.1	19.8	2.0	0.1	0.0	0.0	0.0	0.0
Satellite	0.0	0.1	1.0	98.8	0.0	0.0	0.0	0.0
Fixed Wireless	56.7	27.6	11.2	3.7	0.7	0.1	0.0	0.0
aDSL and/or Cable Modem and/or FTTP	13.3	42.6	37.2	6.3	0.5	0.0	0.0	0.0
Any Technology	0.0	0.1	0.2	5.6	18.1	40.7	23.3	12.0

<sup>1</sup> Power Line and Other are summarized with Other Wireline. See Technical Notes at the end of the report for a description of Form 477 technology categories and other reporting requirements.  
 Note: Figures may not sum to totals due to rounding. The number of providers in a census block does not necessarily reflect the number of choices available to a particular household, and does not purport to measure competition. Providers may list a census block on Form 477 if service can be provided to at least one location in the block. Developed census blocks are those with housing units based on the 2010 census.

Sources: FCC Form 477 and Census 2010.

**Figure 42**  
**Distribution of Counties by Ratio of Residential Fixed Connections to County Households by State as of December 31, 2017**  
**(Connections over 200 kbps in at least one direction)**

State	Counties	Ratio of Residential Fixed Connections over 200 kbps in at Least One Direction to County Households										
		Zero	Greater than 0 and no more than 5%	Greater than 5 and no more than 10%	Greater than 10 and no more than 20%	Greater than 20 and no more than 30%	Greater than 30 and no more than 40%	Greater than 40 and no more than 50%	Greater than 50 and no more than 60%	Greater than 60 and no more than 80%	Greater than 80 and no more than 100%	100% or more
Alabama	67	0	0	0	0	0	2	16	19	23	7	0
Alaska	29	0	0	0	0	1	2	3	2	9	9	3
American Samoa	5	2	0	0	0	2	1	0	0	0	0	0
Arizona	15	0	0	0	0	0	0	1	1	7	6	0
Arkansas	75	0	0	0	0	0	5	20	28	20	2	0
California	58	0	0	0	0	0	0	0	0	20	35	3
Colorado	64	0	0	0	0	0	1	3	7	21	22	10
Connecticut	8	0	0	0	0	0	0	0	0	0	8	0
Delaware	3	0	0	0	0	0	0	0	0	0	2	1
District of Columbia	1	0	0	0	0	0	0	0	0	0	1	0
Florida	67	0	0	0	0	0	0	0	7	17	28	15
Georgia	159	0	0	0	1	2	10	20	29	59	31	7
Guam	1	0	0	0	0	0	0	0	0	0	1	0
Hawaii	5	1	0	0	0	0	0	0	0	1	1	2
Idaho	44	0	0	0	0	0	0	0	4	27	10	3
Illinois	102	0	0	0	0	0	1	2	18	68	13	0
Indiana	92	0	0	0	0	0	0	1	20	59	12	0
Iowa	99	0	0	0	0	0	0	1	9	83	5	1
Kansas	105	0	0	0	0	0	1	4	12	72	16	0
Kentucky	120	0	0	0	0	1	1	10	22	74	12	0
Louisiana	64	0	0	0	0	0	5	12	11	29	7	0
Maine	16	0	0	0	0	0	0	0	0	7	7	2
Maryland	24	0	0	0	0	0	0	0	1	8	14	1
Massachusetts	14	0	0	0	0	0	0	0	0	2	9	3
Michigan	83	0	0	0	0	0	0	4	7	53	18	1
Minnesota	87	0	0	0	0	0	1	0	2	63	20	1
Mississippi	82	0	0	0	1	1	14	28	22	13	3	0
Missouri	115	0	0	0	0	3	6	11	20	63	10	2
Montana	56	0	0	0	0	0	0	0	7	32	16	1
Nebraska	93	0	0	0	0	0	2	9	22	57	3	0

**Figure 42 - Continued**  
**Distribution of Counties by Ratio of Residential Fixed Connections to County Households by State as of December 31, 2017**  
**(Connections over 200 kbps in at least one direction)**

State	Counties	Ratio of Residential Fixed Connections over 200 kbps in at Least One Direction to County Households										
		Zero	Greater than 0 and no more than 5%	Greater than 5 and no more than 10%	Greater than 10 and no more than 20%	Greater than 20 and no more than 30%	Greater than 30 and no more than 40%	Greater than 40 and no more than 50%	Greater than 50 and no more than 60%	Greater than 60 and no more than 80%	Greater than 80 and no more than 100%	100% or more
Nevada	17	0	0	0	0	1	1	0	3	7	5	0
New Hampshire	10	0	0	0	0	0	0	0	1	1	6	2
New Jersey	21	0	0	0	0	0	0	0	0	1	19	1
New Mexico	33	0	0	0	1	1	2	2	6	17	3	1
New York	62	0	0	0	0	0	0	0	0	36	24	2
North Carolina	100	0	0	0	0	0	0	1	15	46	31	7
North Dakota	53	0	0	0	0	0	0	1	7	31	13	1
Northern Mariana Isl	4	1	0	0	0	0	0	3	0	0	0	0
Ohio	88	0	0	0	0	0	0	2	8	60	18	0
Oklahoma	77	0	0	0	0	1	4	13	24	33	2	0
Oregon	36	0	0	0	0	0	0	1	1	19	14	1
Pennsylvania	67	0	0	0	0	0	0	1	1	38	23	4
Puerto Rico	78	0	0	0	0	3	14	25	30	6	0	0
Rhode Island	5	0	0	0	0	0	0	0	0	0	5	0
South Carolina	46	0	0	0	0	0	0	7	11	17	9	2
South Dakota	66	0	0	0	0	0	1	5	5	45	9	1
Tennessee	95	0	0	0	0	0	1	8	23	53	10	0
Texas	254	0	1	0	0	0	5	28	62	112	37	9
Utah	29	0	0	0	0	0	0	0	1	10	12	6
Vermont	14	0	0	0	0	0	0	0	0	3	10	1
Virgin Islands	3	0	0	0	0	0	0	0	2	0	0	1
Virginia	134	0	0	0	1	0	7	14	16	60	34	2
Washington	39	0	0	0	0	0	0	1	2	14	21	1
West Virginia	55	0	0	0	0	1	0	1	3	42	8	0
Wisconsin	72	0	0	0	0	0	0	0	1	49	20	2
Wyoming	23	0	0	0	0	0	0	1	2	13	6	1
Total	3,234	4	1	0	4	17	87	259	494	1600	667	101

Note: Figures may not sum to totals due to rounding. See Technical Notes at the end of the report.

Sources: FCC Form 477; 2013-2017 ACS 5-year estimates (Households for U.S. and District of Columbia); Census 2010 (Households for Puerto Rico, American Samoa, Guam, Northern Mariana Islands and U.S. Virgin Islands).

**Figure 43**  
**Distribution of Census Tracts by Ratio of Residential Fixed Connections to Tract Households by State as of December 31, 2017**  
**(Connections over 200 kbps in at least one direction)**

State	Tracts	Ratio of Residential Fixed Connections over 200 kbps in at Least One Direction to Tract Households										
		Zero	Greater than 0 and no more than 5%	Greater than 5 and no more than 10%	Greater than 10 and no more than 20%	Greater than 20 and no more than 30%	Greater than 30 and no more than 40%	Greater than 40 and no more than 50%	Greater than 50 and no more than 60%	Greater than 60 and no more than 80%	Greater than 80 and no more than 100%	100% or more
Alabama	1,179	4	0	1	5	17	78	137	204	413	252	68
Alaska	167	2	0	0	3	6	2	5	12	51	69	17
American Samoa	18	2	0	0	1	8	5	0	0	0	1	1
Arizona	1,526	14	7	8	9	17	22	42	120	375	589	323
Arkansas	686	1	0	1	5	12	62	106	124	226	122	27
California	8,036	54	3	5	9	22	46	96	313	1,943	4,589	956
Colorado	1,249	14	1	0	0	4	9	20	38	299	648	216
Connecticut	829	2	0	0	0	2	1	8	34	154	509	119
Delaware	215	1	0	0	0	1	0	2	11	53	97	50
District of Columbia	179	1	0	0	0	1	0	4	11	57	74	31
Florida	4,199	38	0	1	4	3	19	70	161	768	1,835	1,300
Georgia	1,964	11	2	0	3	13	63	132	202	594	687	257
Guam	56	8	0	2	4	1	3	3	3	11	6	15
Hawaii	326	14	0	0	3	0	6	6	12	59	131	95
Idaho	298	0	0	0	1	2	2	5	23	136	102	27
Illinois	3,121	6	0	1	3	10	34	142	298	1,176	1,289	162
Indiana	1,508	4	1	1	3	8	19	82	198	656	457	79
Iowa	825	3	0	0	1	2	4	20	84	510	184	17
Kansas	770	11	0	0	0	1	11	37	92	323	226	69
Kentucky	1,115	10	2	0	11	11	30	61	161	446	340	43
Louisiana	1,136	12	1	0	3	17	67	91	169	416	306	54
Maine	351	0	0	0	0	0	0	0	8	113	173	57
Maryland	1,394	9	0	0	0	1	15	39	74	308	748	200
Massachusetts	1,471	11	1	0	0	2	1	9	34	303	897	213
Michigan	2,767	28	1	1	10	24	98	185	273	839	1,145	163
Minnesota	1,335	4	0	1	1	3	5	33	57	564	594	73
Mississippi	661	4	0	0	4	23	87	126	130	184	90	13
Missouri	1,393	4	0	1	7	15	39	111	197	463	481	75
Montana	271	2	0	0	1	0	2	7	20	109	110	20
Nebraska	532	4	0	0	0	0	5	23	49	246	172	33

**Figure 43 - Continued**  
**Distribution of Census Tracts by Ratio of Residential Fixed Connections to Tract Households by State as of December 31, 2017**  
**(Connections over 200 kbps in at least one direction)**

State	Tracts	Ratio of Residential Fixed Connections over 200 kbps in at Least One Direction to Tract Households										
		Zero	Greater than 0 and no more than 5%	Greater than 5 and no more than 10%	Greater than 10 and no more than 20%	Greater than 20 and no more than 30%	Greater than 30 and no more than 40%	Greater than 40 and no more than 50%	Greater than 50 and no more than 60%	Greater than 60 and no more than 80%	Greater than 80 and no more than 100%	100% or more
Nevada	683	5	0	2	2	4	5	18	40	179	313	115
New Hampshire	294	2	0	0	0	0	4	9	5	43	170	61
New Jersey	2,004	11	0	0	0	1	3	9	33	397	1,145	405
New Mexico	499	2	3	2	9	13	17	25	78	194	128	28
New York	4,900	74	1	3	11	17	15	45	170	1,574	2,389	601
North Carolina	2,183	21	1	0	1	4	16	59	168	763	818	332
North Dakota	205	0	0	0	0	0	0	9	20	104	54	18
Northern Mariana Isl	22	2	0	0	0	1	6	6	2	5	0	0
Ohio	2,946	7	0	0	1	10	31	113	299	1,157	1,173	155
Oklahoma	1,046	2	2	2	12	34	41	130	177	357	220	69
Oregon	827	2	0	0	0	0	6	17	30	261	446	65
Pennsylvania	3,217	21	0	1	4	10	13	56	189	1,295	1,374	254
Puerto Rico	903	21	31	34	124	149	142	138	63	73	32	96
Rhode Island	241	1	0	0	0	0	0	2	2	62	142	32
South Carolina	1,097	12	0	0	1	9	23	88	132	366	318	148
South Dakota	222	0	0	0	2	0	4	11	13	118	62	12
Tennessee	1,497	21	1	0	6	14	54	105	210	557	433	96
Texas	5,253	40	1	1	19	61	158	390	695	1,595	1,656	637
Utah	588	4	2	3	0	0	1	3	7	146	349	73
Vermont	184	1	0	0	0	0	1	0	0	51	98	33
Virgin Islands	29	0	0	0	2	1	2	7	5	8	2	2
Virginia	1,895	23	0	0	5	18	42	85	166	458	816	282
Washington	1,446	2	1	0	0	4	8	19	32	304	885	191
West Virginia	484	0	1	1	2	6	12	32	50	221	129	30
Wisconsin	1,393	3	1	3	16	13	8	30	91	640	523	65
Wyoming	132	1	0	0	1	0	1	6	9	60	47	7
Total	73,767	556	64	75	309	595	1,348	3,014	5,798	22,783	30,645	8,580

Note: Figures may not sum to totals due to rounding. See Technical Notes at the end of the report.

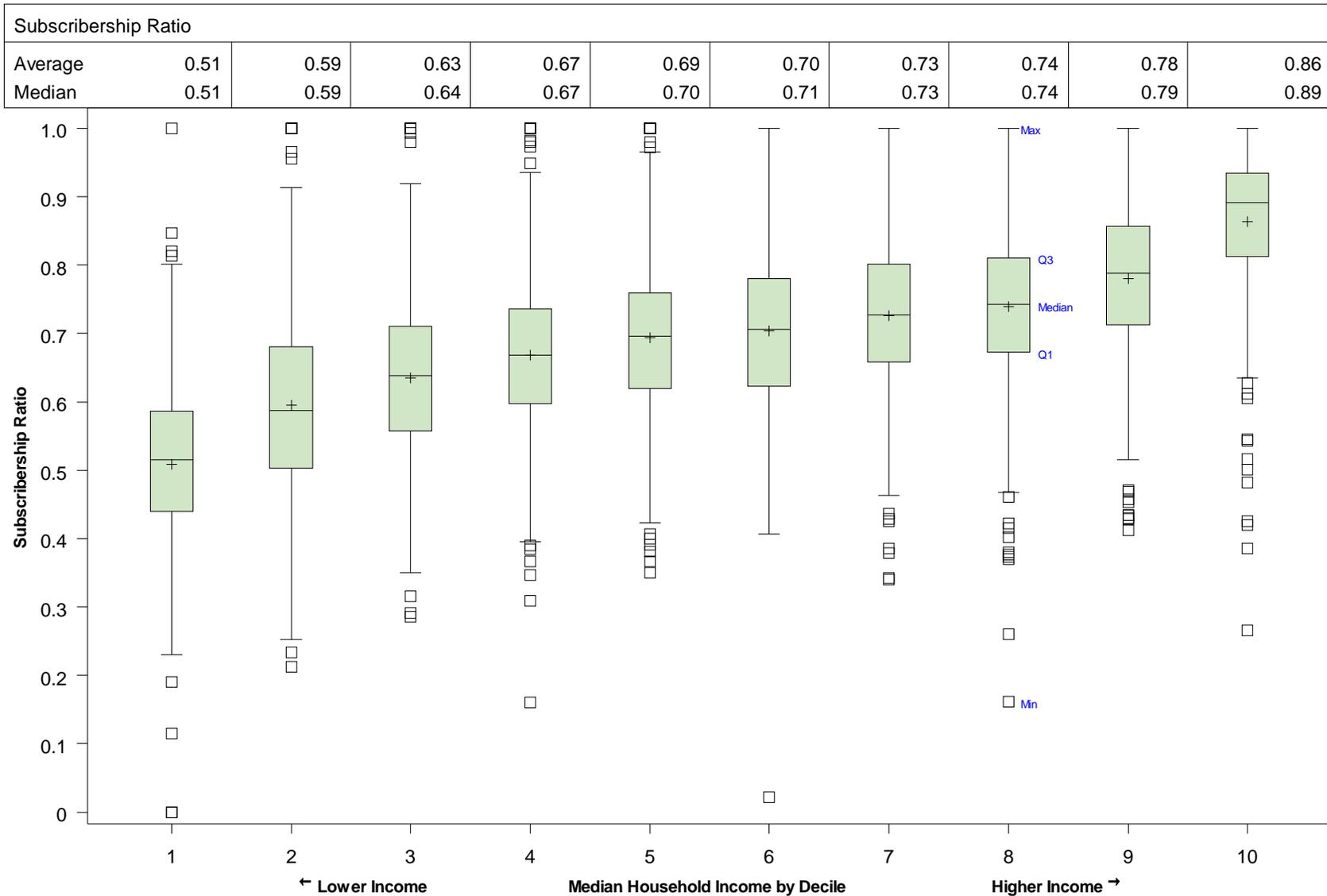
Sources: FCC Form 477; 2013-2017 ACS 5-year estimates (Households for U.S. and District of Columbia); Census 2010 (Households for Puerto Rico, American Samoa, Guam, Northern Mariana Islands and U.S. Virgin Islands).

**SECTION 5**  
**CORRELATED RESULTS: DEMOGRAPHIC MEASURES**

**Table of Contents**

Figure 44	Subscribership Ratio Distributions by Income Deciles as of December 31, 2017 ..	49
Figure 45	Subscribership Ratio Distributions by Density Deciles as of December 31, 2017..	50
Figure 46	Subscribership Ratio Distributions by Share of Population with a College Degree (in Deciles) as of December 31, 2017 .....	51
Figure 47	Subscribership Ratio Distributions by Average Age of County Population (in Deciles) as of December 31, 2017 .....	52
Figure 48	Subscribership Ratios by Technology and Tract Household Density as of December 31, 2017.....	53
Figure 49	Average Subscribership Ratios by Income and Household Density as of December 31, 2017.....	54

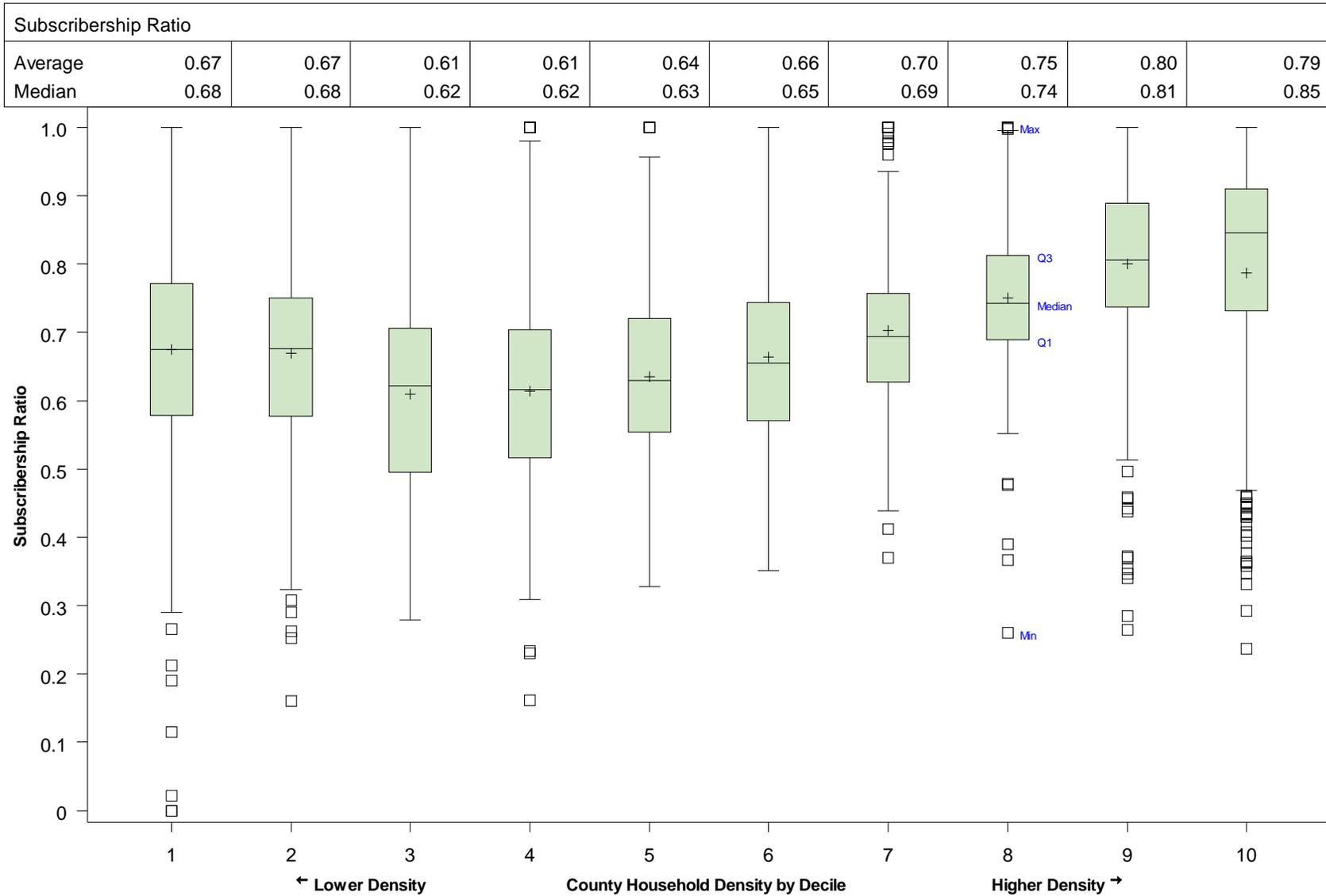
**Figure 44**  
**Subscribership Ratio Distributions by Income Deciles as of December 31, 2017**



Note: Each box plot shows the distribution of residential subscribership to connections over 200 kbps in at least one direction for counties in the income decile. Some of the features are labeled, but note also that + denotes the position of the average residential subscribership ratio taken across all counties in the decile; ⊥ is the minimum observation above Q1-1.5(Q3-Q1); T is the maximum observation below Q3+1.5(Q3-Q1); and □ is any data point beyond Q1-1.5(Q3-Q1) or Q3+1.5(Q3-Q1). Ratios greater than 1 were set to 1.

Sources: FCC Form 477; 2013-2017 ACS 5-year Estimates; Census 2010.

**Figure 45**  
**Subscribership Ratio Distributions by Density Deciles as of December 31, 2017**



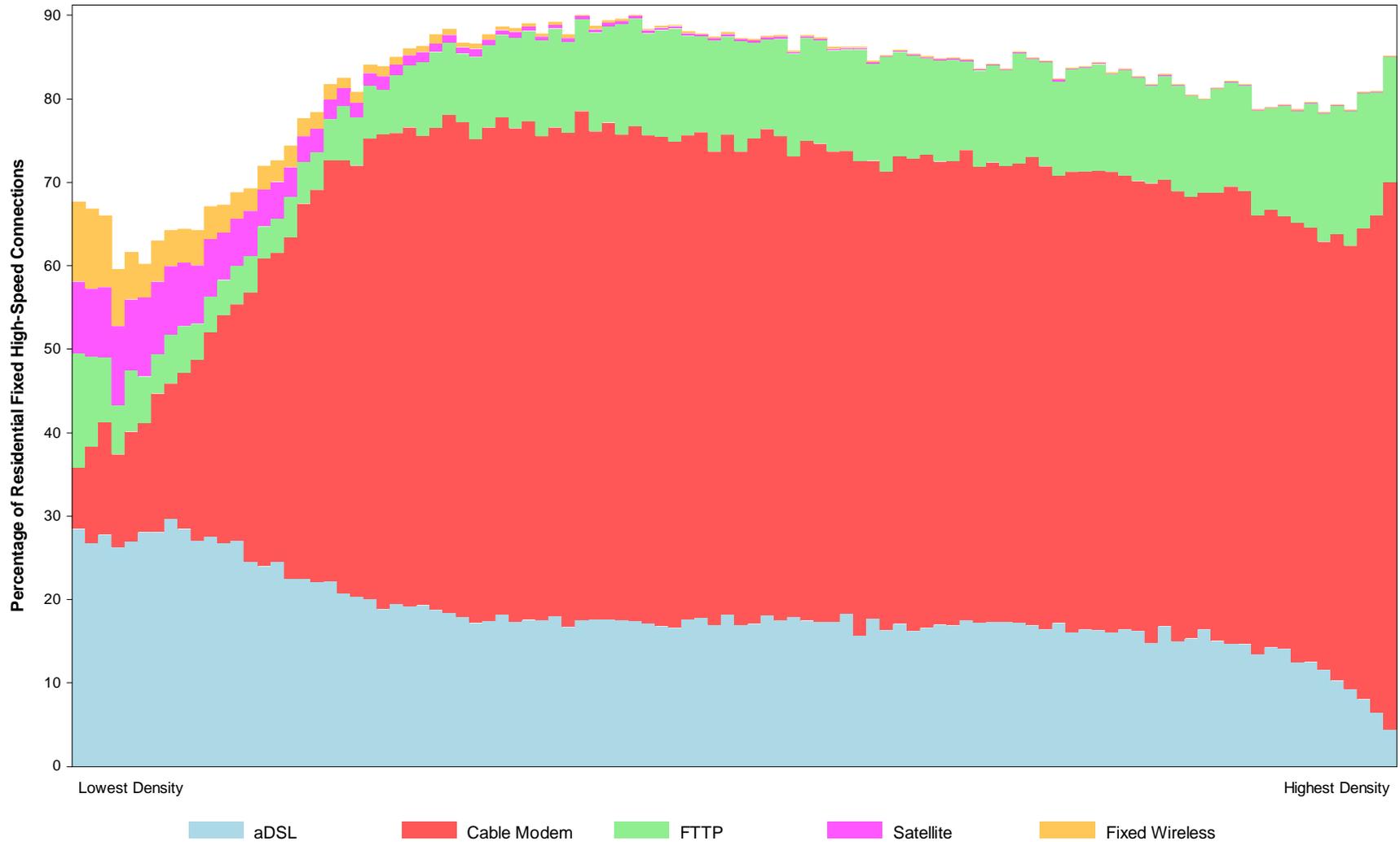
Note: Each box plot shows the distribution of residential subscribership to connections over 200 kbps in at least one direction for counties in the density decile. Some of the features are labeled, but note also that + denotes the position of the average residential subscribership ratio taken across all counties in the decile; ⊥ is the minimum observation above  $Q1-1.5(Q3-Q1)$ ; T is the maximum observation below  $Q3+1.5(Q3-Q1)$ ; and □ is any data point beyond  $Q1-1.5(Q3-Q1)$  or  $Q3+1.5(Q3-Q1)$ . Ratios greater than 1 were set to 1.

Sources: FCC Form 477; 2013-2017 ACS 5-year Estimates; Census 2010.





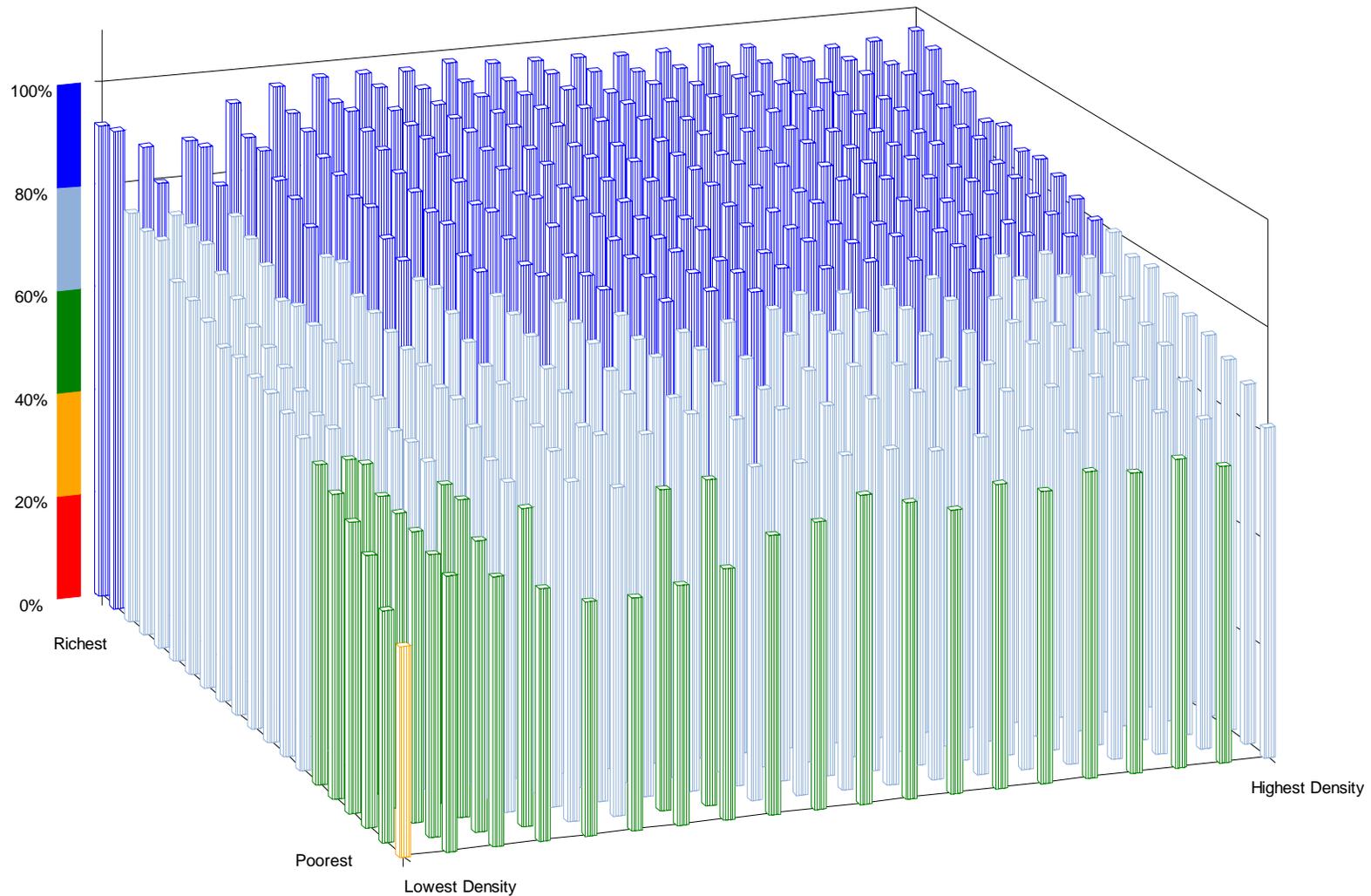
**Figure 48**  
**Subscribership Ratios by Technology and Tract Household Density as of December 31, 2017**  
**(Residential fixed connections over 200 kbps in at least one direction)**



This chart shows subscribership ratios by technology and household density. Tracts were grouped into 100 density percentiles based on households per square mile, calculated as the ratio of estimated tract households to tract land area from the Census Bureau. For each percentile, the height of the bar represents the household-weighted average ratio of residential fixed connections to households across tracts in the percentile.

Sources: FCC Form 477; 2013-2017 ACS 5-year estimates; and Census 2010.

**Figure 49**  
**Average Subscribership Ratios by Income and Household Density as of December 31, 2017**  
**(Residential fixed connections over 200 kbps in at least one direction by Tract)**



This chart shows subscribership ratios by household density and income quantiles. Tracts were grouped into 400 density/income quantiles based on households per square mile, calculated as the ratio of estimated tract households to tract land area, and median household income. For each quantile, the height of the grid represents the household-weighted average ratio of residential fixed connections to households across tracts in the decile.

Sources: FCC Form 477; 2013-2017 ACS 5-year estimates; and Census 2010.

## Technical Notes

### General

The information presented in this report is based on data from FCC Form 477. Through Form 477, facilities-based broadband providers submit information to the FCC about where they offer and have subscribers to Internet access services over 200 kilobits per second (kbps) in at least one direction. In June 2013, the Commission adopted several changes to Form 477.<sup>1</sup> Detailed information about those changes and about the Form 477 reporting requirements in general is available at [www.fcc.gov/form477](http://www.fcc.gov/form477). Due to technical difficulties in 2014 with the redesigned Form 477 filing interface, the filing deadline for Form 477 data as of June 30, 2014 was moved to December 11, 2014. Because of that delay, the Commission staff were not able to perform their typical process of identifying anomalies or errors in the data, following up with filers, and requesting updates to the data where appropriate – a process which usually generates a significant number of corrections and hence a more accurate Form 477 data set.

Form 477 collects information about *Internet access connections in service* to end-user locations that are advertised to deliver information to and/or from the end user – that is, in at least one direction – at transfer rates (speeds) above 200 kilobits per second (kbps). Information is collected about the number of connections by the advertised speeds associated with each product subscribed to in the relevant geographic area, census tracts for fixed and states for mobile. Fixed providers report connections by the maximum advertised upload and download speeds, while mobile providers report connections by minimum advertised upload and download speeds. Fixed connections are further categorized by the technology employed by the part of the connection that terminates at the end-user location. Wherever a *number of providers* is cited in this report, multiple Form 477 filers within a holding company structure count as one provider.

“End users” are residential, business, institutional, or government entities who use services for their own purposes and who do not resell such services to other entities. *Facilities-based providers* report information about connections they provide directly to their own end-user customers and also connections that they provide to Internet Service Providers for resale to end users. For Form 477 purposes, the facilities-based provider of a connection is the entity that owns the portion of the physical facility that terminates at the end-user location, obtains an unbundled network element (UNE), special access line, or other leased facility that terminates at the end-user location and provisions/equips it as a connection that transfers information at rates over 200 kbps in at least one direction, or provisions/equips a wireless channel that transfers information at rates over 200 kbps in at least one direction to the end-user location over licensed spectrum or over spectrum that the provider uses on an unlicensed basis.

The mutually exclusive Form 477 *technology categories* are: asymmetric Digital Subscriber Line (aDSL in this report); symmetric Digital Subscriber Line (sDSL); other copper wireline; cable modem; optical carrier / fiber to the end user; satellite; terrestrial fixed wireless (using licensed or unlicensed spectrum); mobile wireless; and all other (which is included to capture deployment of additional technologies over time). In the Form 477 data collection, aDSL-based services delivered over fiber-to-the-node architecture are reported in the aDSL category. The other wireline category comprises T1/DS1, T3/DS3, and other copper-based connections, not elsewhere categorized, that deliver *Internet access* service at the end-user

<sup>1</sup> *Modernizing the FCC Form 477 Data Program*, WC Docket No. 11-10, Report and Order, 28 FCC Rcd 9887 (2013). See also *High-Speed Services for Internet Access: Status as of December 31, 2014* (March 2016) at 1-2, available at <https://www.fcc.gov/reports-research/reports/internet-access-services-reports/internet-access-services-reports>.

location. Ethernet connections delivering Internet access service are reported in the other wireline category if the connection terminates over copper and in the FTTP category if the connection terminates over fiber. Connections deployed over hybrid fiber-coax (HFC) architecture are reported in the cable modem category. Wireless ISPs (WISPs) report in the fixed wireless category if providing service to dispersed, fixed end-user locations and report in the mobile wireless category if providing a commercial service that can be received at any location within a service footprint. Wireless local area networks (such as Wi-Fi hotspots) that only enable local distribution and sharing of a premises connection are not included, although the shared premises connection is included.

Numbers of connections presented in this report are not adjusted for the number of persons at a single end-user location who have access to, or who use, the Internet access services delivered over the connection to that location.

Numbers of residential connections are estimated based on the total connections and percentage-residential connections information reported on Form 477.

### **Census tracts**

Since the collection of data as of December 31, 2008, facilities-based providers of reportable fixed-location Internet access connections have been reporting connection counts at the census tract level of detail. Facilities-based mobile wireless providers report connection counts by state rather than census tract.

The census tract-level data summarized in this report were collected for tracts in the 2010 decennial census. For the purposes of this report, there are 73,767 census tracts because we exclude census tracts delineated specifically to cover large bodies of water.

About 110 of the census tracts have population but no households because the population resides in group living quarters. For the purpose of estimating residential subscribership rates by census tract, we assume these census tracts have no reportable *residential* Internet access service because persons residing in group quarters would have Internet access over a business connection provided to the operator of the group quarters. Therefore, these census tracts are included in the “zero” column.

### **Ratios of residential fixed-location connections to households that exceed 100%**

We estimate the share of households with fixed-location connections in individual census tracts by taking the ratio of the reported number of fixed-location residential service connections to the estimated number of households. We continue to find “outlier” estimates at or above 100% and to find that the number of outliers is substantially reduced when estimates are made for individual counties rather than for individual census tracts.

Possible explanations of ratios at or above 100% include: (1) geocoding misallocations of service locations to census tracts; (2) proper allocation of connections to the county level by some filers, but improper allocation of all connections to a single tract in the county; (3) possible overestimation of residential connections in service plans for which the customer base is primarily residential; and (4) connections at seasonally or occasionally occupied housing units, such as vacation homes, while the household is counted elsewhere. The numbers of households in census tracts that were used to generate the estimated ratios are themselves estimates (from Census 2011-2015 ACS 5-year estimates), which could have an independent effect.

**Maps showing residential subscribership rates by census tract**

The two maps based on estimated Internet access connections over 200 kbps in at least one direction per 1,000 households (that is, estimated household subscribership rates) exclude all connections identified as business connections and necessarily exclude residential mobile wireless connections (which are reported for the state but not for individual census tracts).

## Glossary

<b>Term</b>	<b>Definition</b>
aDSL	Asymmetric Digital Subscriber Line: A digital local loop typically using copper facilities and providing greater bandwidth in one direction than the other.
Cable modem service	A service which offers customers access to the Internet over a cable system.
Downstream speed	Speed of transmission from the Internet to the end user.
End users	Residential, business, institutional, or government entities who use services for their own purposes and who do not resell such services to other entities.
Facilities-based provider	Entity that owns the portion of the physical facility that terminates at the end-user location, obtains an unbundled network element (UNE), special access line, or other leased facility that terminates at the end-user location and provisions/equips it as a connection that transfers information at rates over 200 kbps in at least one direction, or provisions/equips a wireless channel that transfers information at rates over 200 kbps in at least one direction to the end-user location over licensed spectrum or over spectrum that the provider uses on an unlicensed basis.
Fixed wireless	A radio communication service between specified fixed points.
Fixed technologies	All technologies other than terrestrial mobile wireless.
FTTH or FTTP	Fiber to the Home (Premises): A network access architecture in which optical fiber is deployed all the way to the customer's home (premises).
Internet access service	Service that provides end users access to the Internet.
ISPs	Internet Service Providers: Companies or organizations that provide Internet access service (see above).
Mobile wireless service	A radio communication service between mobile and fixed stations, or between mobile stations.
Mobile wireless provider	Provider of mobile wireless service (see above).
Other wireline	All copper-wire based technologies other than DSL technologies; Ethernet over copper and T-1 are examples.
Power line	Internet access service delivered over electric power transmission lines.
Satellite communications	A telecommunications service provided via one or more satellite relays and their associated uplinks and downlinks.
sDSL	Symmetric Digital Subscriber Line: DSL technology that provides equal bandwidth for both uploads and downloads.
Speed tiers	Sub-groupings defined by ranges of upstream speeds and downstream speeds.
Upstream speed	Speed of transmission from the end user to the Internet.
Wi-Fi hotspot	Wireless Fidelity: Generic term referring to any type of IEEE 802.11 wireless network. A hotspot is a small geographic area in which users

	can gain access to a Wi-Fi network which in turn connects to the Internet.
Wireless service	Telephone, Internet, data, and other services provided to customers through the transmission of signals over networks of radio towers.
Wireless service provider	Provider of wireless service (see above).
WISP	Wireless ISP: A company that provides end users with wireless access to the Internet, most commonly by using radio spectrum designated for unlicensed use.

# Customer Response

Publication: *Internet Access Services: Status as of December 31, 2017*

You can help us provide the best possible information to the public by completing this form and returning it to the Industry Analysis Division of the FCC's Office of Economics and Analytics.

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