

Internet Access Services: Status as of June 30, 2016

Industry Analysis and Technology Division
Wireline Competition Bureau
April 2017



This report is available for reference in the FCC's Reference Information Center, Courtyard Level, 445 12th Street, SW, Washington, DC. Copies may be purchased by contacting Best Copy and Printing, Inc., 445 12th Street, SW, Room CY-B402, Washington, DC 20554, telephone (800) 378-3160, or via their website at www.bcpiweb.com. The report can also be downloaded from the Internet Access Services Reports webpage at <https://www.fcc.gov/general/iatd-data-statistical-reports>.

Table of Contents

SECTION 1: OVERVIEW & HIGHLIGHTS	1
Introduction	1
Total Connections	2
Figure 1 Fixed and Mobile Connections by Speed 2013-2016	2
Connections by Speed	3
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 2013-2016	5
Number of Providers by Census Block	6
Figure 4 Percentages of Developed Census Blocks in which Providers Report Deployment of Residential Fixed Broadband	6
Internet Access Subscribership	7
Figure 5 Fixed Connections 2001-2016	7
Other Report Highlights	8
SECTION 2: SUMMARY STATISTICS - THE NATION	10
SECTION 3: SUMMARY STATISTICS - THE STATES	28
SECTION 4: SUMMARY STATISTICS - COUNTIES AND CENSUS TRACTS	38
SECTION 5: CORRELATION RESULTS - DEMOGRAPHIC MEASURES	48
Technical Notes	56
Glossary	59

SECTION 1: OVERVIEW & HIGHLIGHTS

Introduction

This report summarizes information about Internet access connections in the United States as of June 30, 2016 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 477.¹

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.² In addition, Section 5 of the report includes an analysis of the correlations between subscribership ratios and various demographic measures.³ Maps depicting the number of fixed connections per 1,000 households by census tract and the number of fixed providers by census block are available online at <https://www.fcc.gov/reports-research/reports/internet-access-services-reports/internet-access-services-reports>.

¹ 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. 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.

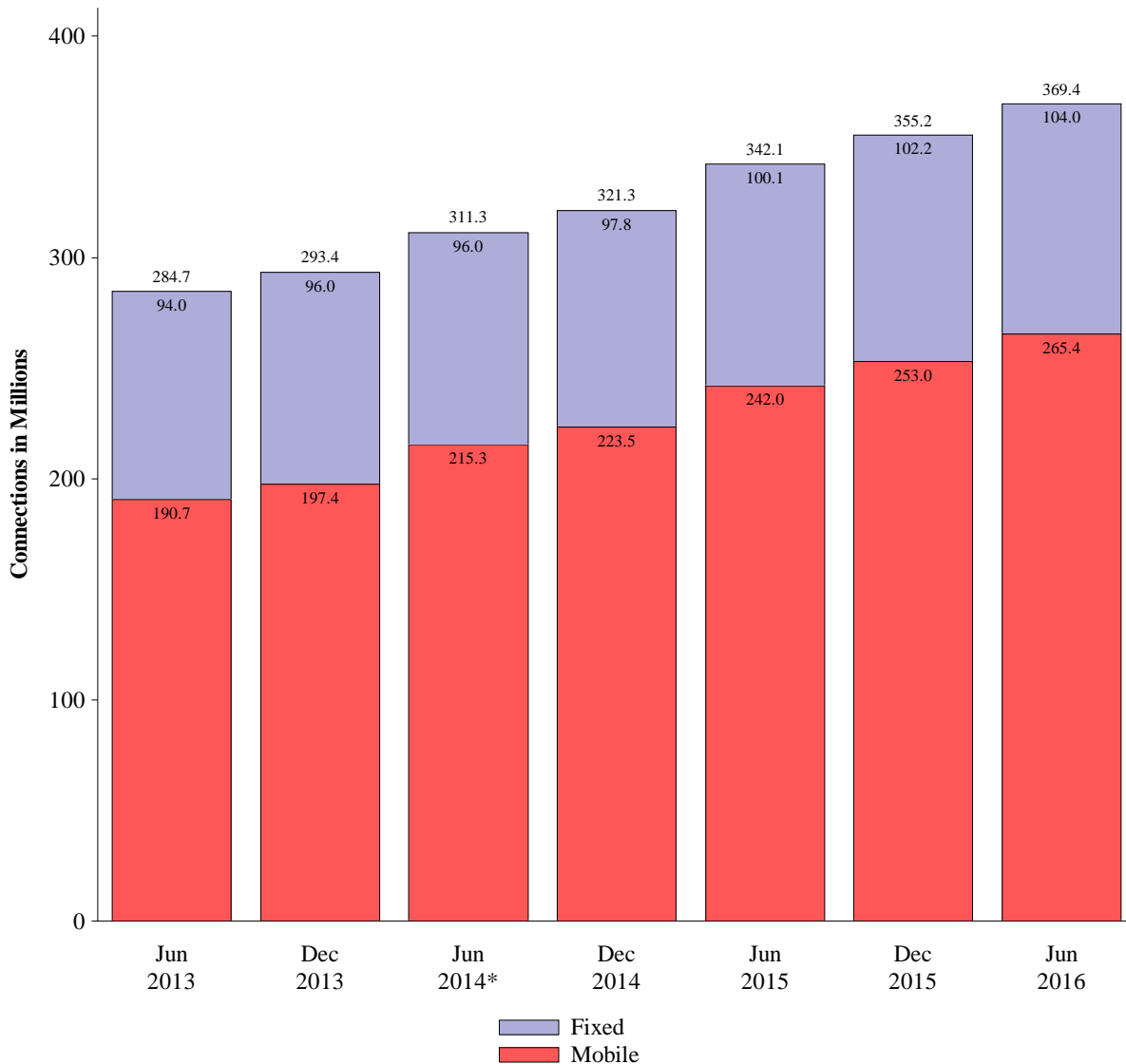
² The Commission began collecting census tract-level data for data as of December 31, 2008. See *High-Speed Services for Internet Access: Status as of December 31, 2008* (February 2010) (*December 2008 High-Speed Report*) at 1-4, available at <http://www.fcc.gov/encyclopedia/high-speed-services-internet-access-reports>.

³ 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, the total number of Internet connections increased by about 8% between June 2015 and June 2016 to 369 million.
- Most of the growth in total Internet connections is attributable to increased mobile Internet access subscribership. The number of mobile Internet connections increased 10% year-over-year to 265 million in June 2016, while the number of fixed connections grew to 104 million – up 4% from June 2015.

Figure 1
Fixed and Mobile Connections 2013-2016



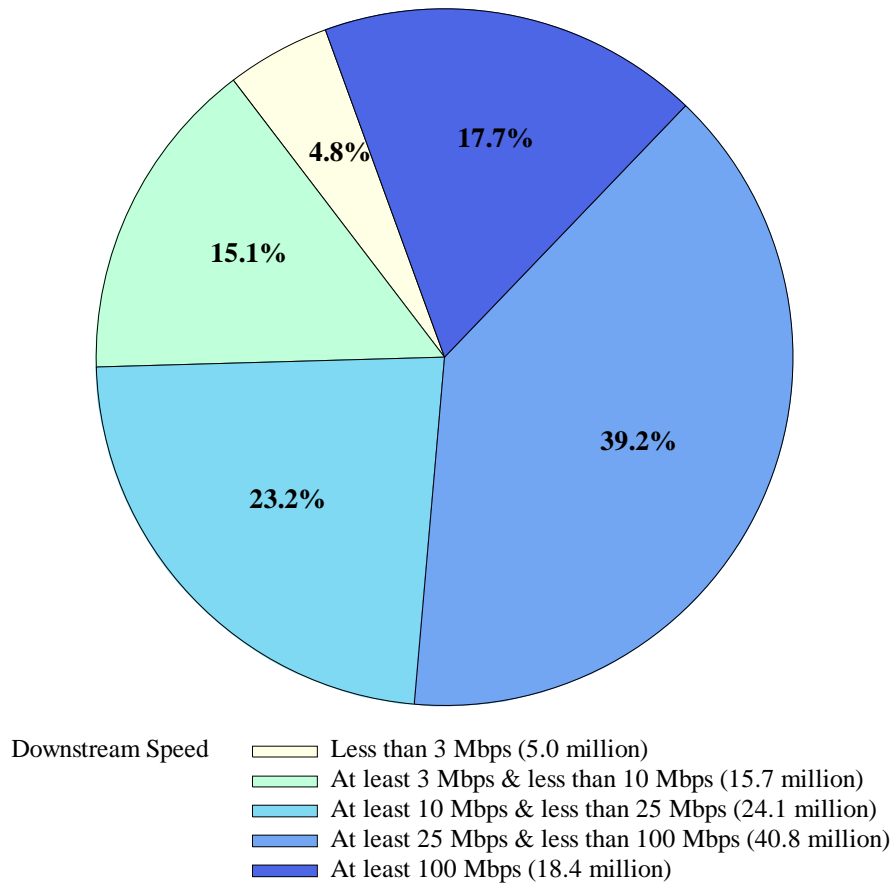
* The June 2014 data have not been subjected to the typical quality checks (see Technical Notes).

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. Connections include both residential and business connections.

Connections by Speed

Fixed connections – downstream speeds. Figure 2(a) illustrates how the 104 million fixed connections reported for June 2016 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 (104.0 million) by Downstream Speed
as of June 30, 2016

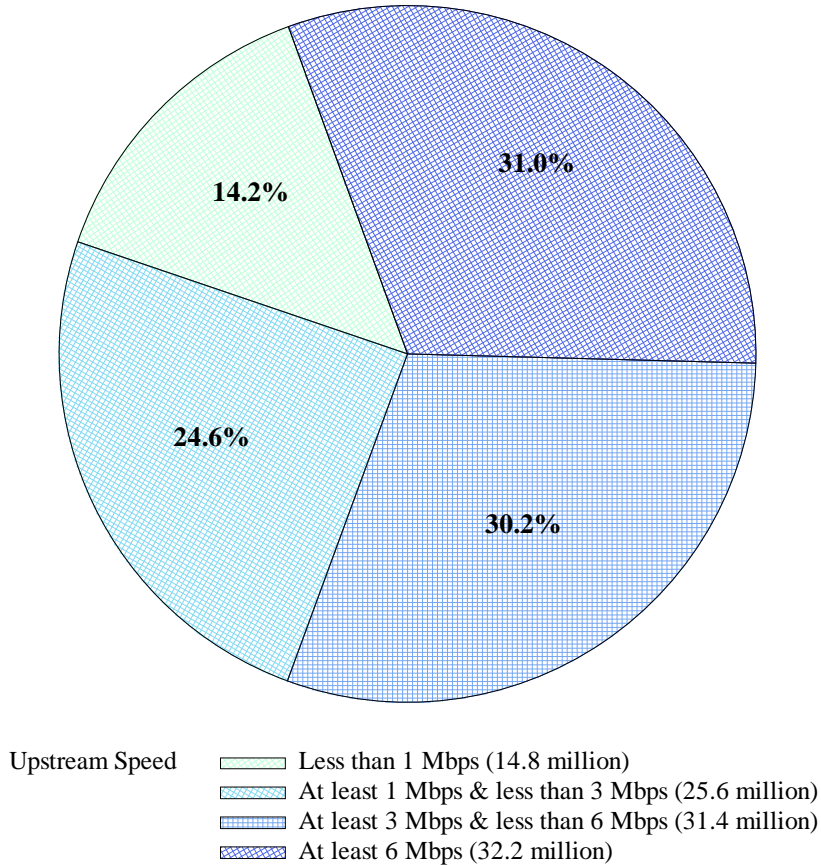


- In June 2016, 5% of fixed connections (or 5 million connections) were slower than 3 Mbps downstream, 15% (or 16 million connections) were at least 3 Mbps downstream but slower than 10 Mbps, 23% (or 24 million connections) were at least 10 Mbps downstream but slower than 25 Mbps, 39% (or 41 million connections) were at least 25 Mbps downstream but slower than 100 Mbps, and 18% (or 18 million connections) were at least 100 Mbps.⁴

⁴ See Figure 9.

Fixed connections – upstream speeds. Figure 2(b) illustrates how the 104 million fixed connections reported for June 2016 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 (104.0 million) by Upstream Speed
as of June 30, 2016

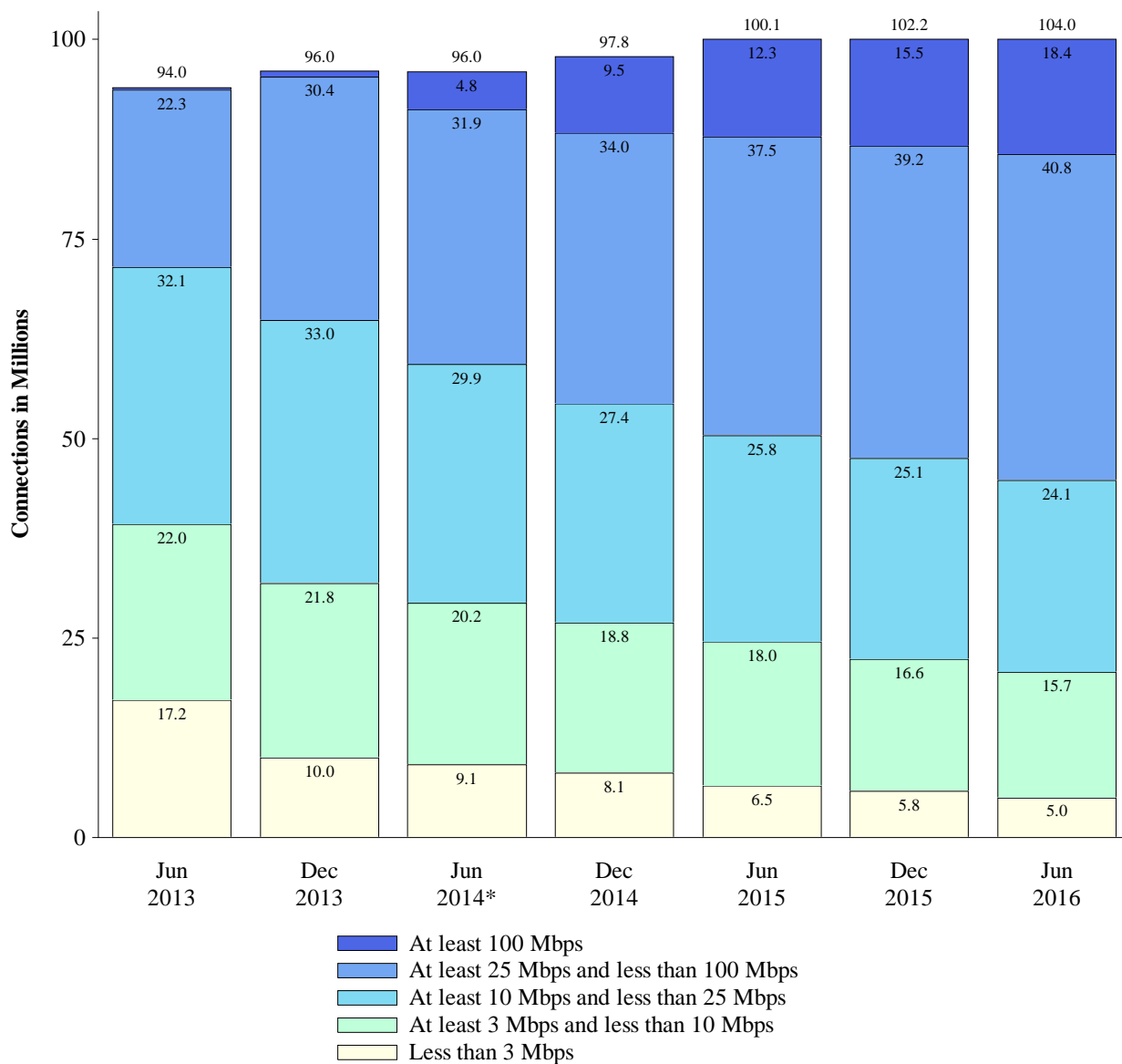


- In June 2016, 14% of fixed connections (or 15 million connections) were slower than 1 Mbps upstream, 25% (or 26 million connections) were at least 1 Mbps upstream but slower than 3 Mbps, 30% (or 31 million connections) were at least 3 Mbps upstream but slower than 6 Mbps, and 31% (or 32 million connections) were at least 6 Mbps upstream.⁵

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 2013 to 2016.

⁵ *Ibid.*

Figure 3
Fixed Connections by Downstream Speed 2013-2016



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

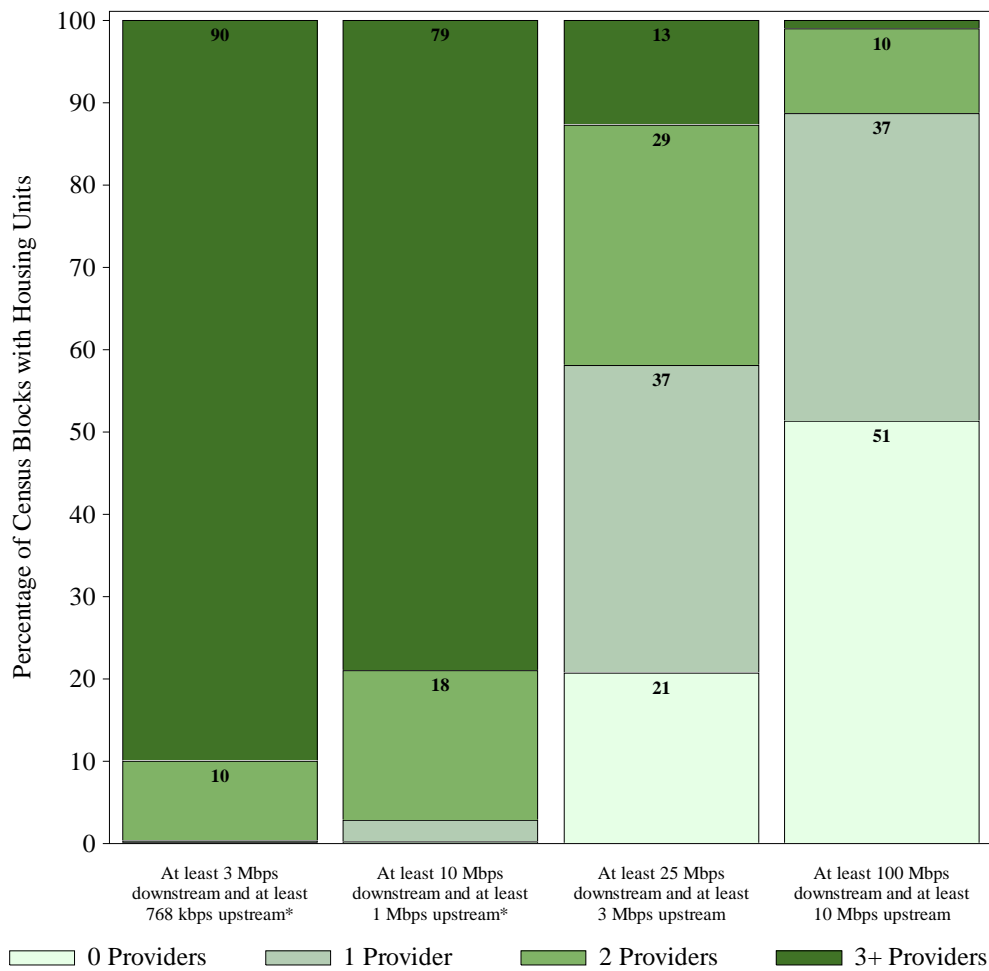
The Commission approved changes to the Form 477 in June 2013 that affect the data beginning in June 2014 (see Technical Notes). Some previously-published data may have been revised. Figures may not sum to totals elsewhere in this report due to rounding. Connections include both residential and business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

- The percentage of fixed connections with a downstream speed of at least 25 Mbps has grown from 24% (or 23 million connections) in June 2013 to 57% (or 59 million connections) in June 2016. Over the same period, the percentage of fixed connections with slower downstream speeds of less than 3 Mbps has decreased from 18% (or 17 million connections) in June 2013 to 5% (or 5 million connections) in June 2016.

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 June 2016. This information is taken from the block-level Form 477 fixed broadband deployment data that the Commission began collecting in 2014. 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 June 30, 2016



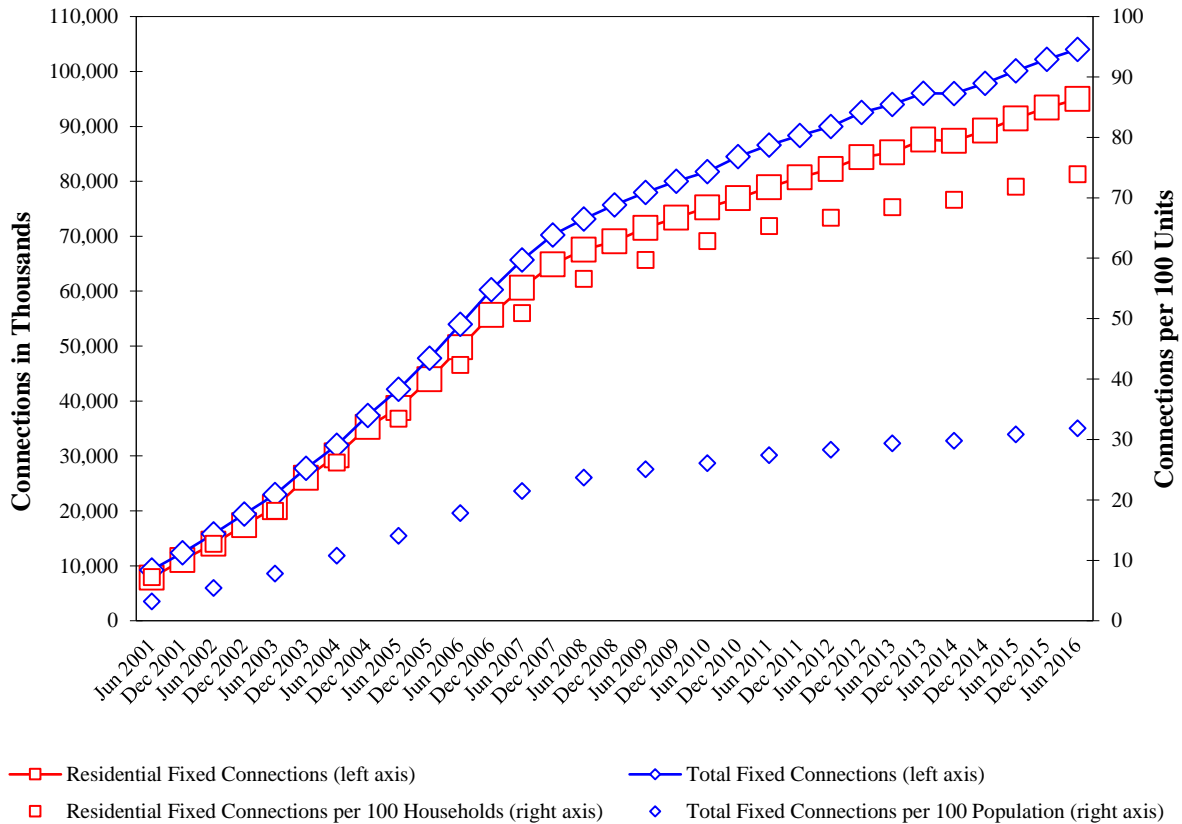
* Satellite service providers report offering Internet access at bandwidths of at least 10 Mbps downstream and 1 Mbps upstream in 99.1% of developed census blocks

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

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 2001.⁶

Figure 5
Fixed Connections 2001-2016
(Connections over 200 kbps in at least one direction)



- Between June 2006 and June 2016, total (business and residential) fixed connections grew from 54 million connections to 104 million connections – at a compound annual growth rate of 7% per year.⁷

⁶ 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>.

⁷ The compound annual growth rate (CAGR) is a smoothed rate of growth calculated in three steps. First, divide the ending value by the beginning value. Second, 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). Third, subtract the number one from the result of the second step.

- Over the same ten-year period, residential fixed connections grew from 50 million connections to 95 million connections – also at a compound annual growth rate of 7% per year.
- From June 2006 to June 2016, the number of residential fixed connections per 100 U.S. households increased from 42 to 74.⁸

Other Report Highlights

Average speeds

- The median downstream speed of all reported fixed connections was 28 Mbps and the median upstream speed was 5 Mbps. For residential fixed connections, the median downstream speed was 30 Mbps and the median upstream speed was 5 Mbps.

Residential connections

- Residential fixed Internet access connections increased by about 4% between June 2015 and June 2016, to 95 million. See Figure 7.
- Residential (non-business) mobile wireless Internet access connections on mobile devices with data plans for full Internet access increased by 10%, to 221 million, between June 2015 and June 2016. See Figure 7.
- Approximately 79% of residential fixed connections had a speed of at least 10 Mbps downstream and 1 Mbps upstream in June 2016, while 59% had a speed of at least 25 Mbps downstream and 3 Mbps upstream. About 19% 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 June 2016, there were 63 residential fixed connections with speeds of at least 10 Mbps downstream and 1 Mbps upstream per 100 households.⁹ See Figure 32.

⁸ 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 128 million households in the United States and inhabited insular areas and a population of about 327 million according to the sources used for Figure 5.)

⁹ 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 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*,

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 June 30, 2016.¹⁰ 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, age, and race. The data indicate that some demographic variables are correlated with Internet access subscribership rates. See Figures 44-50.

Amended by the Broadband Data Improvement Act, GN Docket No.11-121, Eighth Broadband Progress Report, 27 FCC Rcd 10342, 10386, para. 94 (2012).

¹⁰ 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 2012-2016.....	12
Figure 7	Residential Connections over 200 kbps in at Least One Direction 2012-2016.....	12
Figure 8	Residential Fixed Connections by Speed 2013-2016.....	13
Figure 9	Distribution of Fixed Connections over 200 kbps in at Least One Direction as of June 30, 2016.....	14
Figure 10	Distribution of Residential Fixed Connections over 200 kbps in at Least One Direction as of June 30, 2016.....	15
Figure 11	Connections over 200 kbps in at Least One Direction by Technology 2012-2016.....	16
Figure 12	Connections by Technology as of June 30, 2016.....	16
Figure 13	Residential Connections over 200 kbps in at Least One Direction by Technology 2012-2016.....	17
Figure 14	Residential Connections by Technology as of June 30, 2016.....	17
Figure 15	Fixed Connections at Least 3 Mbps Downstream and 768 kbps Upstream by Technology 2012-2016.....	18
Figure 16	Residential Fixed Connections at Least 3 Mbps Downstream and 768 kbps Upstream by Technology 2012-2016.....	18
Figure 17	Fixed Connections at Least 10 Mbps Downstream and 1 Mbps Upstream by Technology 2014-2016.....	19
Figure 18	Fixed Connections at Least 10 Mbps Downstream and 1 Mbps Upstream by Technology as of June 30, 2016.....	19
Figure 19	Residential Fixed Connections at Least 10 Mbps Downstream and 1 Mbps Upstream by Technology 2014-2016.....	20
Figure 20	Residential Fixed Connections at Least 10 Mbps Downstream and 1 Mbps Upstream by Technology as of June 30, 2016.....	20
Figure 21	Fixed Connections at Least 25 Mbps Downstream and 3 Mbps Upstream by Technology 2014-2016.....	21
Figure 22	Fixed Connections at Least 25 Mbps Downstream and 3 Mbps Upstream by Technology as of June 30, 2016.....	21
Figure 23	Residential Fixed Connections at Least 25 Mbps Downstream and 3 Mbps Upstream by Technology 2014-2016.....	22
Figure 24	Residential Fixed Connections at Least 25 Mbps Downstream and 3 Mbps Upstream by Technology as of June 30, 2016.....	22
Figure 25	Residential Fixed Connections over 200 kbps in at Least One Direction by Technology 2012-2016 (Shares of Selected Technologies).....	23

Figure 26	Residential Fixed Connections over 200 kbps in at Least One Direction by Technology 2012-2016 (Net Adds for Selected Technologies)	23
Figure 27	Residential Fixed Connections by Technology as of June 30, 2016 (Shares of Selected Technologies for Selected Speeds)	24
Figure 28	Fixed Connections by Downstream Speed Tier and Technology as of June 30, 2016	25
Figure 29	Residential Fixed Connections by Downstream Speed Tier and Technology as of June 30, 2016	26
Figure 30	Nationwide Number of Providers of Connections over 200 kbps in at Least One Direction by Technology 2012-2016	27
Figure 31	Nationwide Number of Providers of Connections over 200 kbps in at Least One Direction - Selected Technologies 2012-2016	27

Figure 6
Connections over 200 kbps in at Least One Direction 2012-2016
(In thousands)

<i>Technology</i>	2012		2013		2014		2015		2016
	<i>Jun</i>	<i>Dec</i>	<i>Jun</i>	<i>Dec</i>	<i>Jun*</i>	<i>Dec</i>	<i>Jun</i>	<i>Dec</i>	<i>Jun</i>
Total	243,359	262,564	284,692	293,397	311,284	321,305	342,096	355,229	369,416
Total Fixed	89,945	92,511	93,986	96,032	95,998	97,810	100,134	102,212	104,042
Mobile Wireless	153,414	170,053	190,706	197,365	215,286	223,495	241,962	253,017	265,374

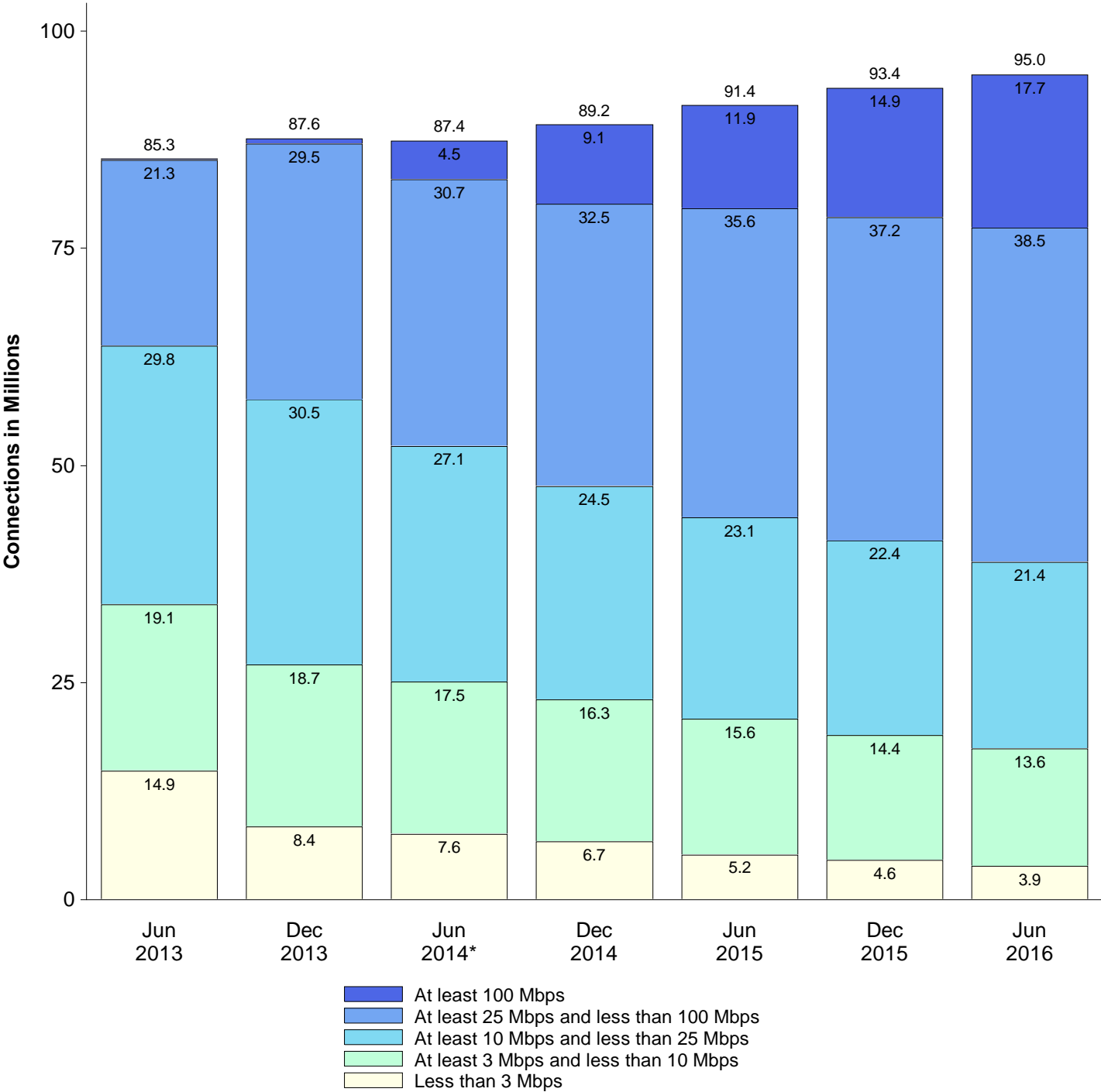
Figure 7
Residential Connections over 200 kbps in at Least One Direction 2012-2016
(In thousands)

<i>Technology</i>	2012		2013		2014		2015		2016
	<i>Jun</i>	<i>Dec</i>	<i>Jun</i>	<i>Dec</i>	<i>Jun*</i>	<i>Dec</i>	<i>Jun</i>	<i>Dec</i>	<i>Jun</i>
Total	196,665	215,817	235,273	246,797	264,343	273,950	292,279	303,655	316,454
Total Fixed	82,217	84,392	85,277	87,599	87,360	89,196	91,419	93,430	94,966
Mobile Wireless	114,448	131,425	149,996	159,197	176,983	184,754	200,859	210,224	221,488

* 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.

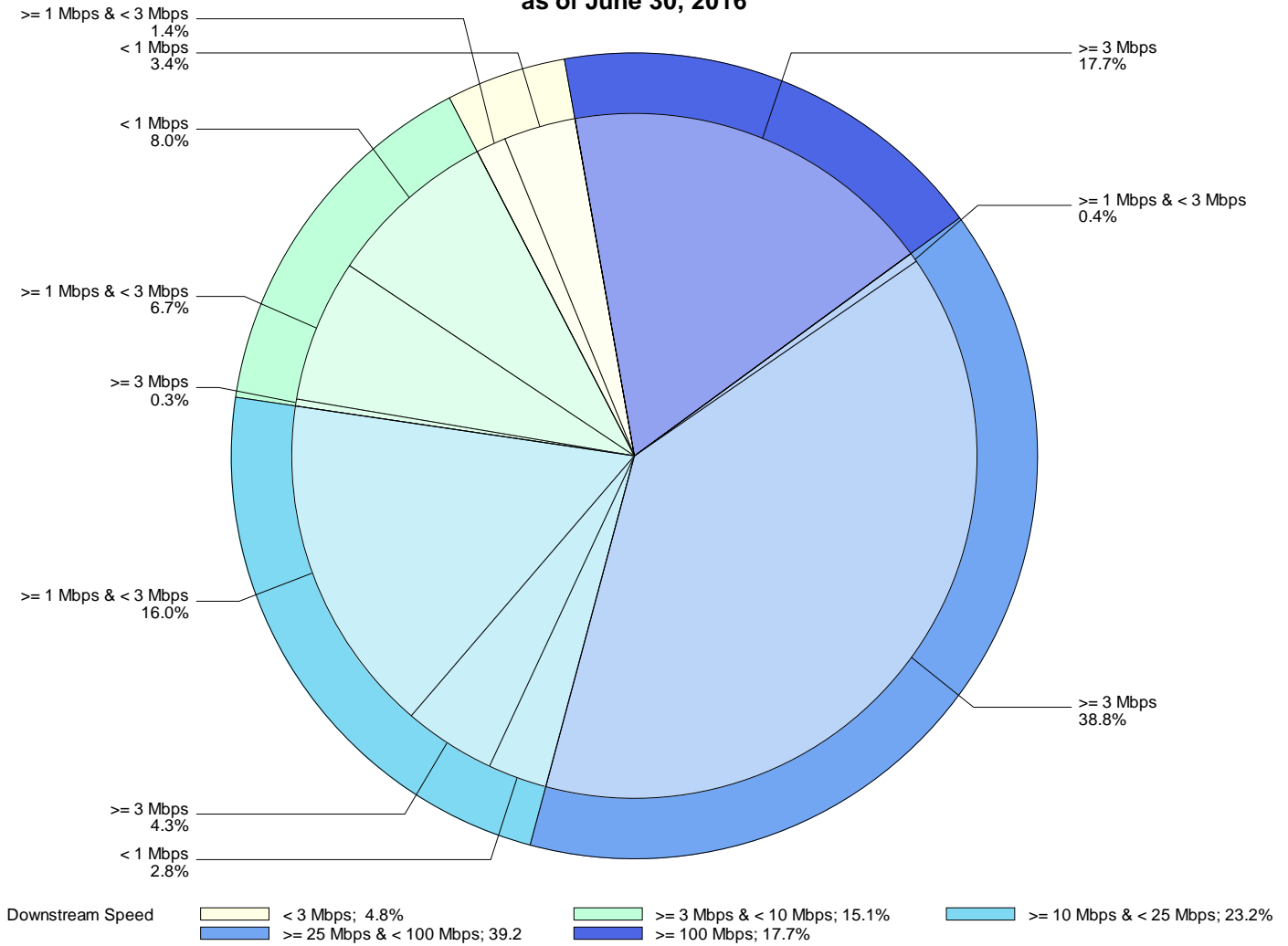
Figure 8
Residential Fixed Connections by Downstream Speed 2013-2016



* 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 9
Distribution of Fixed Connections over 200 kbps in at Least One Direction
as of June 30, 2016



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

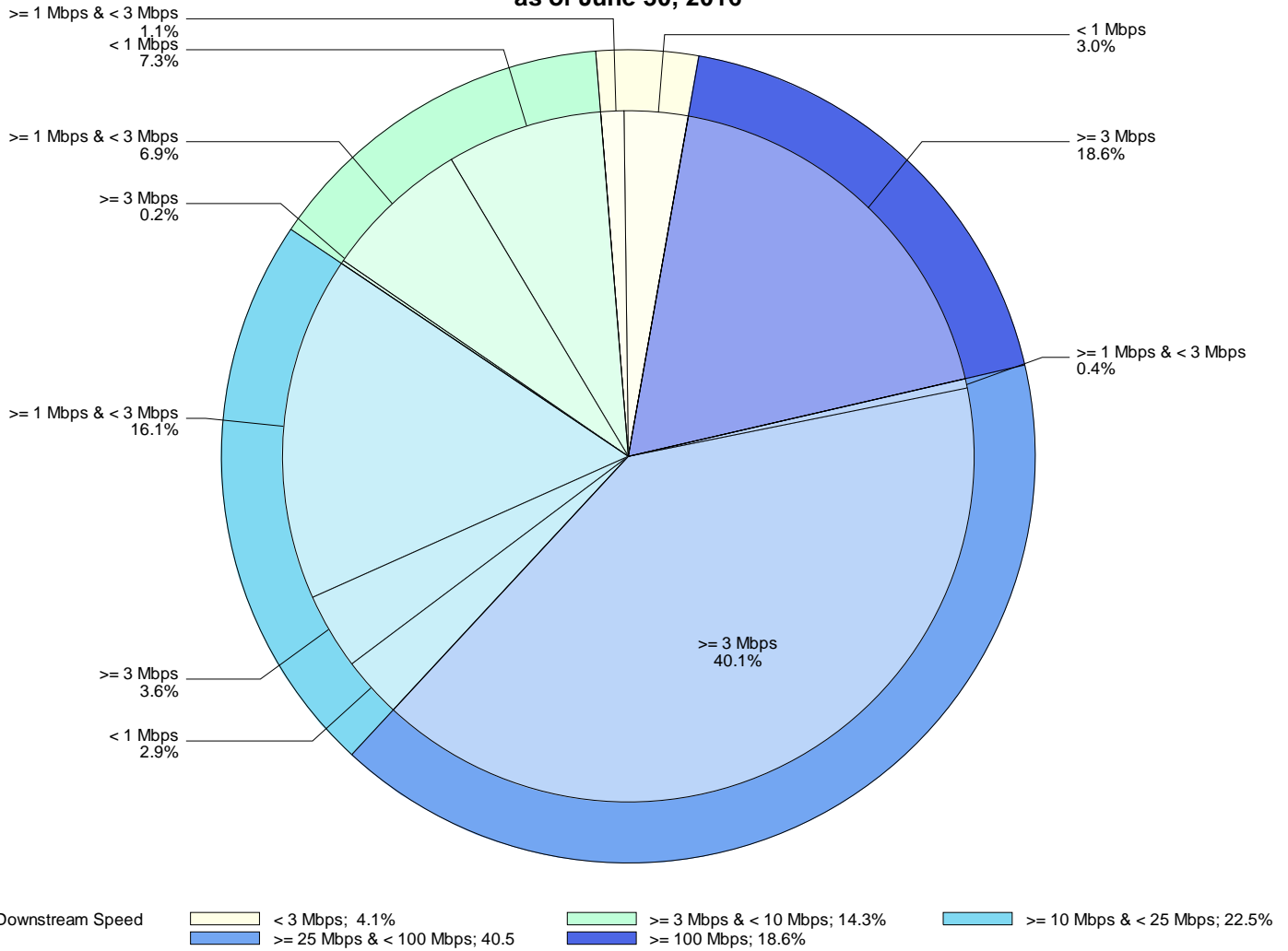
Fixed Connections over 200 kbps in at Least One Direction (in thousands)

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	3,533	8,363	2,898	7	1	14,802
At least 1 Mbps & Less than 3 Mbps	1,474	6,984	16,691	449	10	25,608
At least 3 Mbps	1	346	4,512	40,350	18,425	63,633
Total	5,008	15,692	24,101	40,806	18,435	104,042

Percentages						
Less than 1 Mbps	3.4	8.0	2.8	0.0	0.0	14.2
At least 1 Mbps & Less than 3 Mbps	1.4	6.7	16.0	0.4	0.0	24.6
At least 3 Mbps	0.0	0.3	4.3	38.8	17.7	61.2
Total	4.8	15.1	23.2	39.2	17.7	100.0

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 June 30, 2016



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	2,827	6,906	2,710	7	#	12,450
At least 1 Mbps & Less than 3 Mbps	1,028	6,519	15,307	411	5	23,269
At least 3 Mbps	#	146	3,383	38,049	17,669	59,248
Total	3,854	13,571	21,401	38,466	17,674	94,966

Percentages						
Less than 1 Mbps	3.0	7.3	2.9	0.0	0.0	13.1
At least 1 Mbps & Less than 3 Mbps	1.1	6.9	16.1	0.4	0.0	24.5
At least 3 Mbps	0.0	0.2	3.6	40.1	18.6	62.4
Total	4.1	14.3	22.5	40.5	18.6	100.0

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 2012-2016
(In thousands)

Technology	2012		2013		2014		2015		2016
	Jun	Dec	Jun	Dec	Jun*	Dec	Jun	Dec	Jun
Total	243,359	262,564	284,692	293,397	311,284	321,305	342,096	355,229	369,416
Total Fixed	89,945	92,511	93,986	96,032	95,998	97,810	100,134	102,212	104,042
aDSL	31,173	30,974	30,657	30,690	29,873	28,527	29,341	28,131	27,484
sDSL	139	132	117	108	96	85	75	60	56
Other Wireline ¹	770	796	769	772	792	723	682	693	673
Cable Modem	49,664	51,646	52,760	54,009	54,011	56,301	57,243	59,706	61,453
FTTP ²	6,300	6,733	7,250	7,745	8,326	9,180	9,687	10,499	11,129
Satellite	1,217	1,454	1,623	1,849	1,964	2,006	2,058	2,071	2,079
Fixed Wireless	682	777	810	858	935	988	1,049	1,052	1,169
Mobile Wireless	153,414	170,053	190,706	197,365	215,286	223,495	241,962	253,017	265,374

¹ 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.

² Fiber to the premises.

* 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 due to rounding.

Figure 12
Connections by Technology as of June 30, 2016

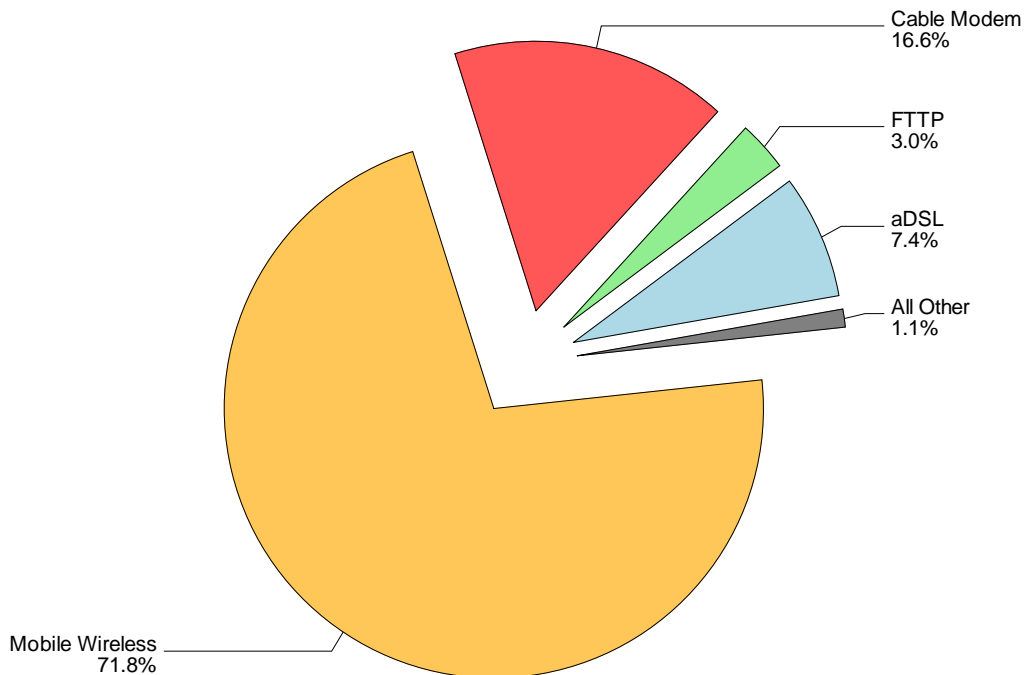


Figure 13
Residential Connections over 200 kbps in at Least One Direction by Technology 2012-2016
(In thousands)

Technology	2012		2013		2014		2015		2016
	Jun	Dec	Jun	Dec	Jun*	Dec	Jun	Dec	Jun
Total	196,665	215,817	235,273	246,797	264,343	273,950	292,279	303,655	316,454
Total Fixed	82,217	84,392	85,277	87,599	87,360	89,196	91,419	93,430	94,966
aDSL	27,632	27,391	26,869	27,248	26,678	25,603	26,154	25,137	24,483
sDSL	49	50	43	39	30	22	17	16	11
Other Wireline ¹	14	34	22	22	57	59	52	54	51
Cable Modem	47,033	48,716	49,494	50,709	50,389	52,467	53,543	55,799	57,354
FTTP ²	5,892	6,270	6,732	7,176	7,617	8,368	8,841	9,592	10,131
Satellite	998	1,242	1,407	1,643	1,760	1,803	1,875	1,891	1,897
Fixed Wireless	600	689	710	763	829	874	937	942	1,039
Mobile Wireless	114,448	131,425	149,996	159,197	176,983	184,754	200,859	210,224	221,488

¹ 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.

² Fiber to the premises.

* 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 due to rounding.

Figure 14
Residential Connections by Technology as of June 30, 2016

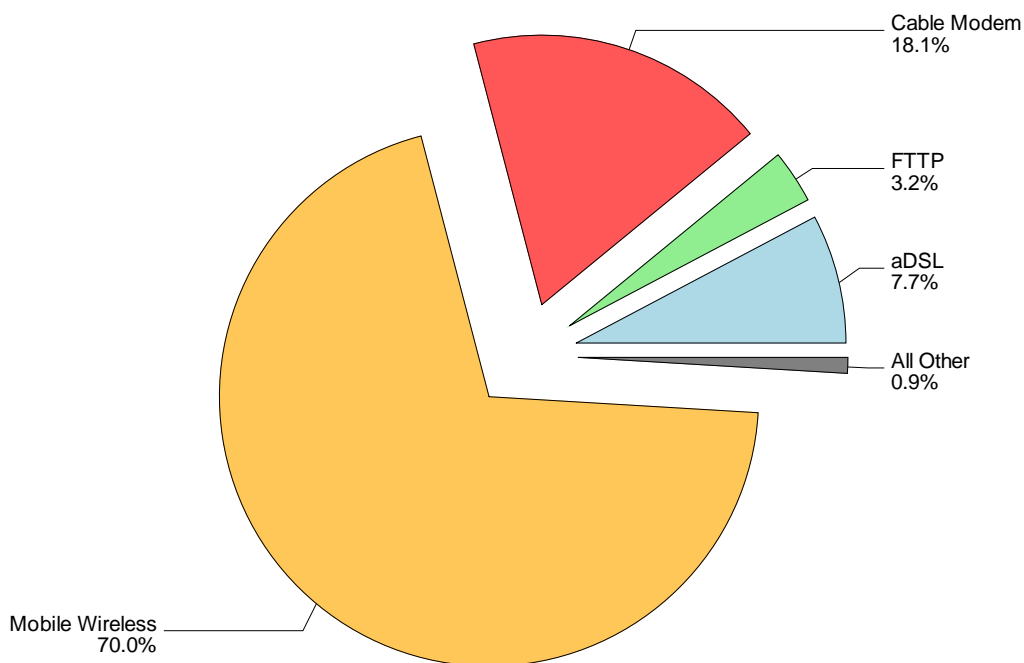


Figure 15
Fixed Connections at Least 3 Mbps Downstream and 768 kbps Upstream by Technology 2012-2016
(In thousands)

<i>Technology</i>	2012		2013		2014		2015		2016
	<i>Jun</i>	<i>Dec</i>	<i>Jun</i>	<i>Dec</i>	<i>Jun*</i>	<i>Dec</i>	<i>Jun</i>	<i>Dec</i>	<i>Jun</i>
Total	57,243	64,657	68,673	78,175	78,981	83,872	88,985	92,352	95,481
aDSL	12,875	13,108	14,233	18,540	17,246	18,557	20,939	20,741	21,144
sDSL	30	33	34	36	33	28	24	20	20
Other Wireline ¹	239	276	284	308	310	308	296	330	336
Cable Modem	37,798	44,133	46,014	50,236	51,304	53,853	55,807	58,423	60,341
FTTP ²	6,001	6,430	6,981	7,486	8,111	8,974	9,551	10,384	11,017
Satellite	87	394	791	1,181	1,424	1,558	1,690	1,744	1,775
Fixed Wireless	214	284	337	388	553	594	677	710	849

¹ 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.

² Fiber to the premises.

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

= 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). Some previously-published data may have been revised. Figures may not sum to totals due to rounding.

Figure 16
Residential Fixed Connections at Least 3 Mbps Downstream and 768 kbps Upstream by Technology 2012-2016
(In thousands)

<i>Technology</i>	2012		2013		2014		2015		2016
	<i>Jun</i>	<i>Dec</i>	<i>Jun</i>	<i>Dec</i>	<i>Jun*</i>	<i>Dec</i>	<i>Jun</i>	<i>Dec</i>	<i>Jun</i>
Total	53,070	59,914	63,342	72,476	73,042	77,540	82,300	85,435	88,170
aDSL	11,563	11,669	12,666	16,715	15,673	16,867	18,985	18,863	19,205
sDSL	12	13	13	13	7	2	1	2	2
Other Wireline ¹	7	20	21	20	45	50	45	47	49
Cable Modem	35,583	41,561	43,061	47,258	47,924	50,308	52,241	54,650	56,350
FTTP ²	5,632	6,012	6,504	6,958	7,491	8,246	8,750	9,513	10,054
Satellite	86	393	788	1,177	1,419	1,552	1,682	1,734	1,764
Fixed Wireless	185	245	289	335	483	516	596	626	745

¹ 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.

² Fiber to the premises.

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

= 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). Some previously-published data may have been revised. Figures may not sum to totals due to rounding.

Figure 17
Fixed Connections at Least 10 Mbps Downstream and 1 Mbps Upstream by Technology 2014-2016
(In thousands)

Technology	2014		2015		2016
	Jun*	Dec	Jun	Dec	Jun
Total	63,849	68,009	72,691	76,939	80,436
aDSL	7,573	8,310	9,463	9,799	10,348
sDSL	9	6	8	8	8
Other Wireline ¹	169	183	182	203	210
Cable Modem	47,296	49,839	52,646	55,710	57,950
FTTP ²	7,615	8,341	8,873	9,575	10,130
Satellite	1,016	1,137	1,298	1,393	1,467
Fixed Wireless	170	192	220	252	323

¹ 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.

² Fiber to the premises.

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

= 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 18
Fixed Connections at Least 10 Mbps Downstream and 1 Mbps Upstream
by Technology as of June 30, 2016

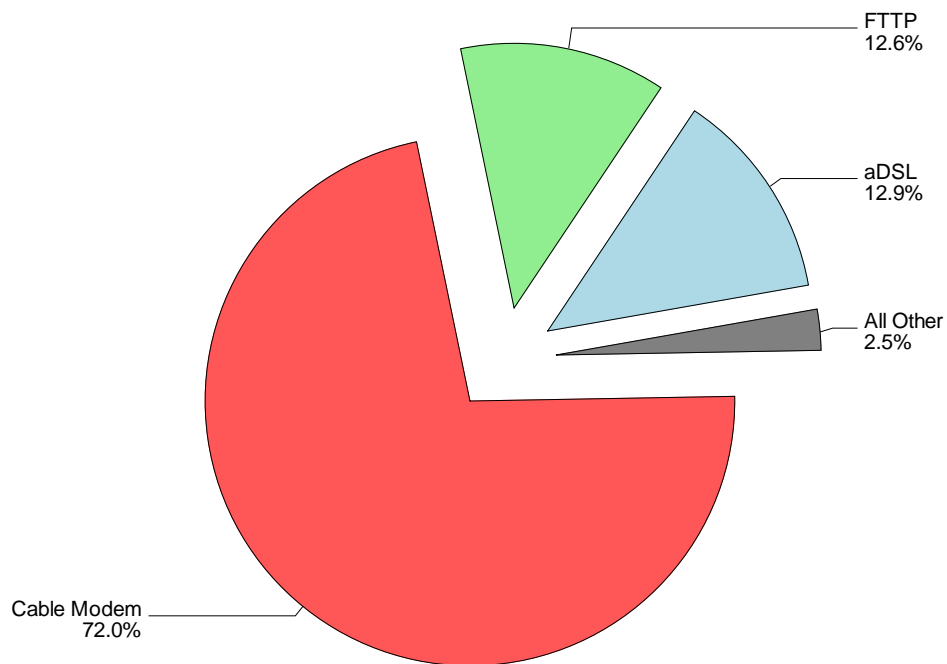


Figure 19
Residential Fixed Connections at Least 10 Mbps Downstream and 1 Mbps Upstream
by Technology 2014-2016
(In thousands)

Technology	2014		2015		2016
	Jun*	Dec	Jun	Dec	Jun
Total	59,751	63,522	67,881	71,784	74,824
aDSL	7,035	7,741	8,740	9,069	9,525
sDSL	3	#	#	1	2
Other Wireline ¹	33	36	38	43	47
Cable Modem	44,480	46,767	49,475	52,294	54,273
FTTP ²	7,044	7,679	8,144	8,776	9,239
Satellite	1,014	1,133	1,293	1,386	1,460
Fixed Wireless	142	166	190	213	278

¹ 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.

² Fiber to the premises.

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

= 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 20
Residential Fixed Connections at Least 10 Mbps Downstream and 1 Mbps Upstream
by Technology as of June 30, 2016

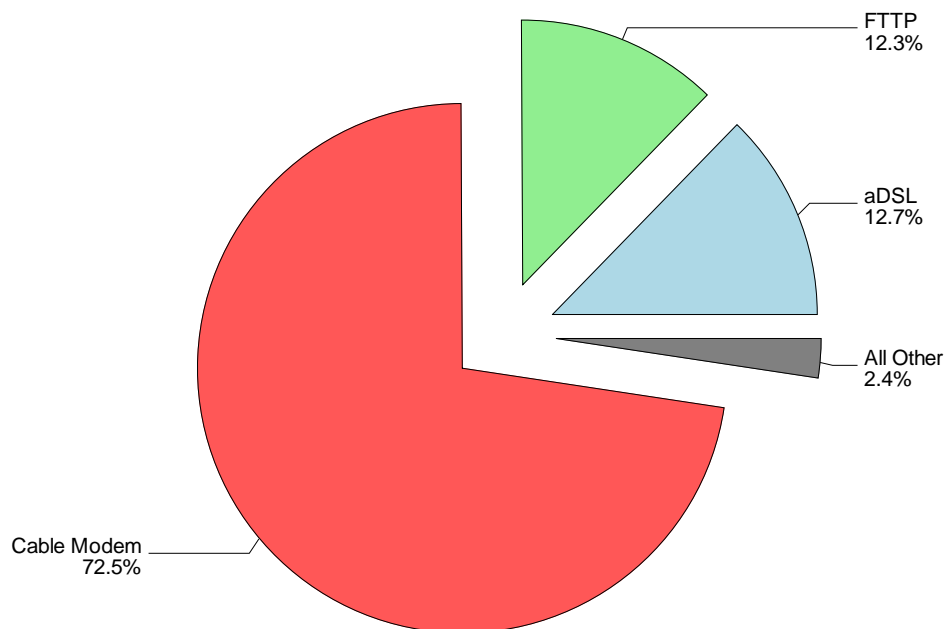


Figure 21
Fixed Connections at Least 25 Mbps Downstream and 3 Mbps Upstream by Technology 2014-2016
(In thousands)

Technology	2014		2015		2016
	Jun+	Dec	Jun	Dec	Jun
Total Fixed	35,927	42,390	48,449	54,360	58,774
aDSL	420	598	761	938	1,239
sDSL	2	2	1	*	*
Other Wireline ¹	114	125	125	141	158
Cable Modem	30,769	36,095	40,646	45,530	48,694
FTTP ²	4,603	5,542	6,870	7,691	8,599
Satellite	#	#	#	*	*
Fixed Wireless	19	28	47	55	68

¹ 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.

² 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. Revised May 2, 2017.

Figure 22
Fixed Connections at Least 25 Mbps Downstream and 3 Mbps Upstream
by Technology as of June 30, 2016

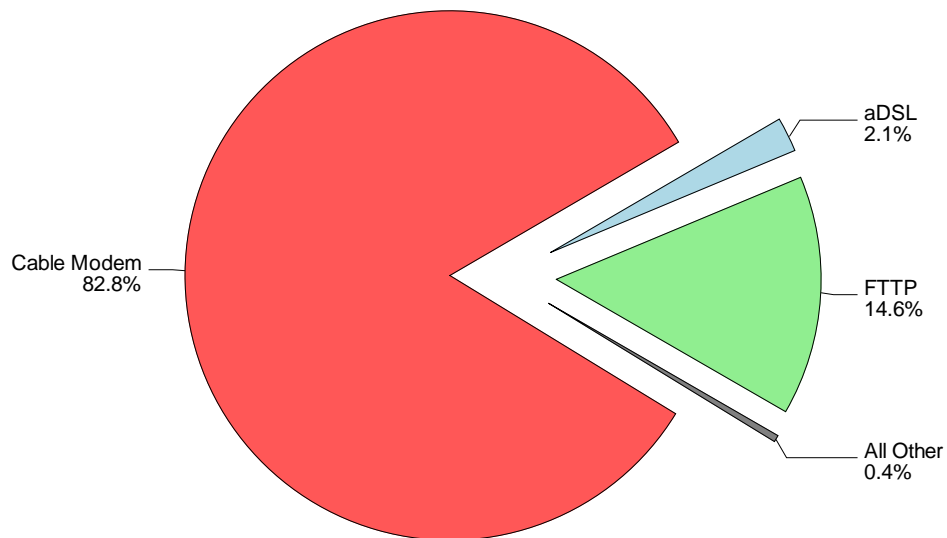


Figure 23
Residential Fixed Connections at Least 25 Mbps Downstream and 3 Mbps Upstream
by Technology 2014-2016
(In thousands)

Technology	2014		2015		2016
	Jun+	Dec	Jun	Dec	Jun
Total Fixed	34,439	40,595	46,198	51,811	55,718
aDSL	397	566	727	897	1,173
sDSL	#	#	#	*	*
Other Wireline ¹	22	26	26	31	41
Cable Modem	29,806	34,914	39,083	43,746	46,526
FTTP ²	4,201	5,068	6,323	7,089	7,909
Satellite	0	0	0	*	*
Fixed Wireless	14	22	40	46	54

¹ 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.

² 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. Revised May 2, 2017.

Figure 24
Residential Fixed Connections at Least 25 Mbps Downstream and 3 Mbps Upstream
by Technology as of June 30, 2016

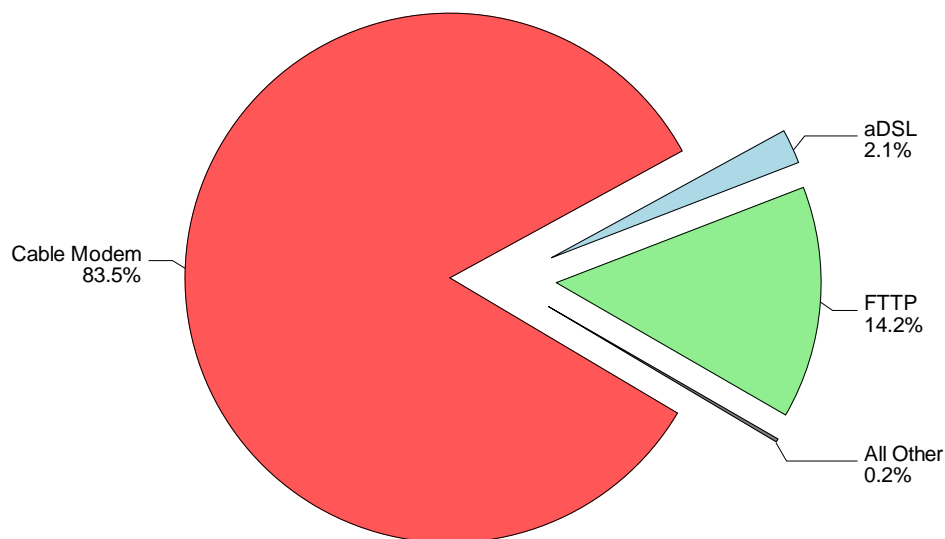
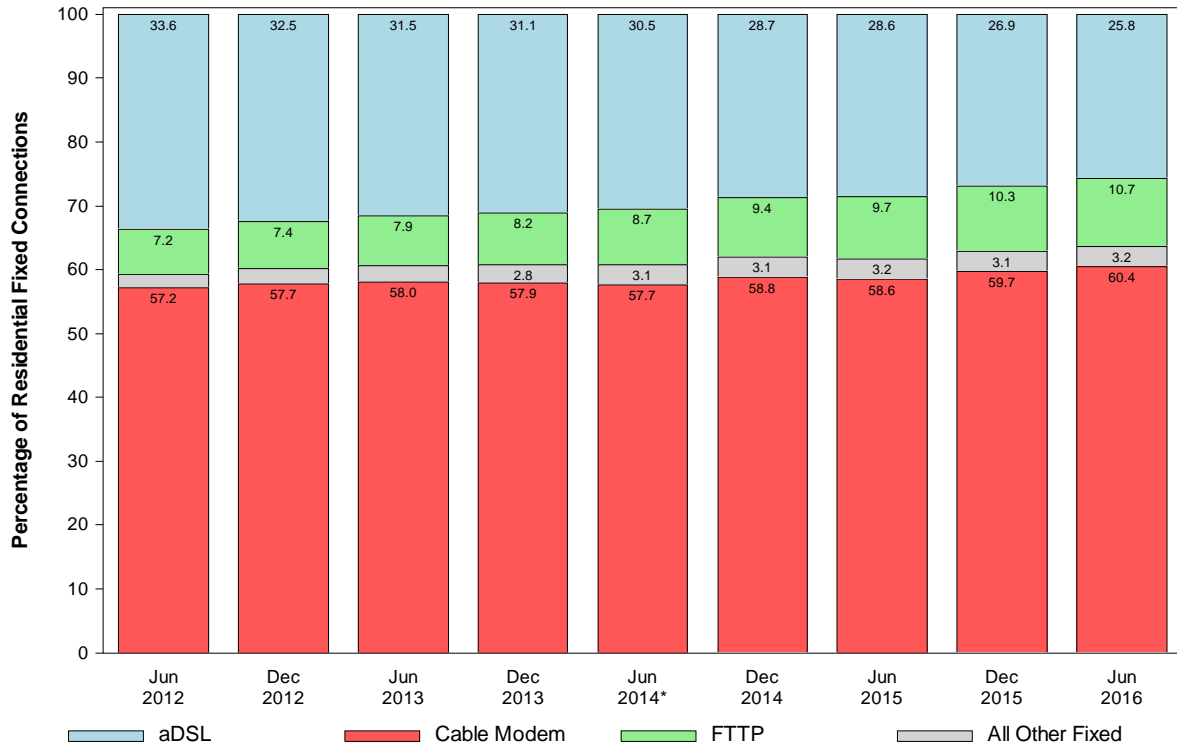


Figure 25
Residential Fixed Connections over 200 kbps in at Least One Direction 2012-2016
 (Shares of selected technologies)



* 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 due to rounding.

Figure 26
Residential Fixed Connections over 200 kbps in at Least One Direction 2012-2016
 (Net adds for selected technologies)

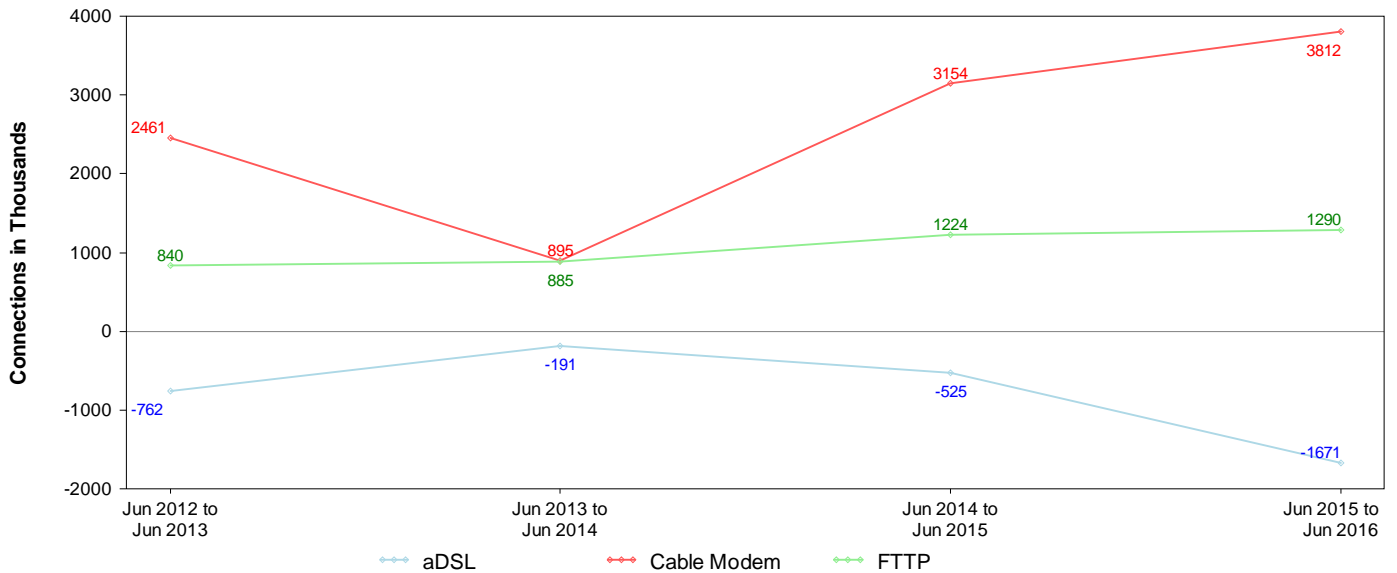


Figure 27
Residential Fixed Connections by Technology as of June 30, 2016
(Shares of selected technologies for selected speeds, connections in thousands)

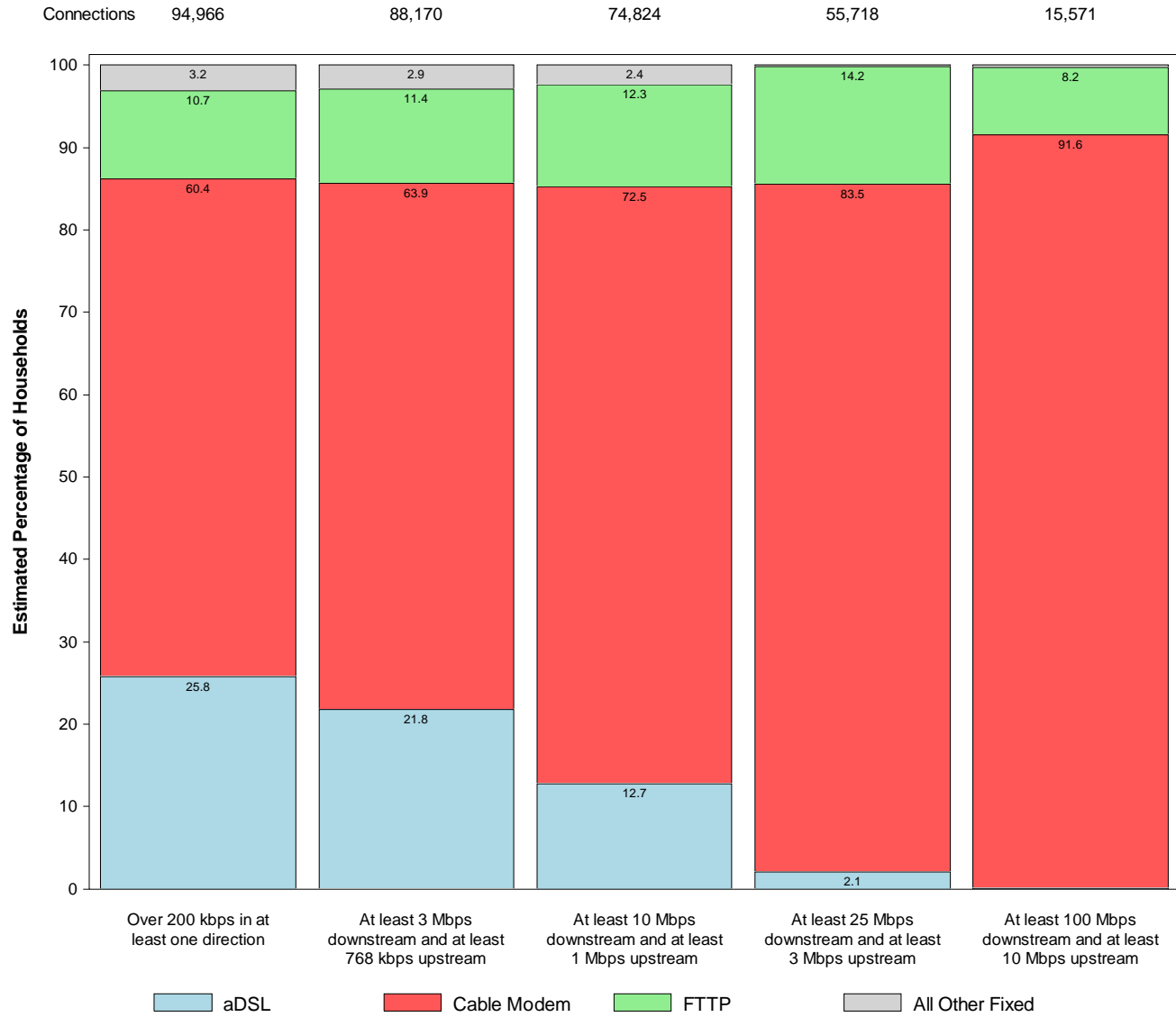


Figure 28
Fixed Connections by Downstream Speed Tier and Technology as of June 30, 2016
(In thousands)

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	1,147	2,114	11,446	11,359	1,408	10	27,484
sDSL	21	15	12	6	*	*	56
Other Wireline ¹	66	269	128	51	40	119	673
Cable Modem	86	661	2,611	9,153	32,157	16,785	61,453
FTTP	36	45	585	1,825	7,134	1,504	11,129
Satellite	234	39	338	1,454	*	*	2,079
Fixed Wireless	109	165	572	255	51	18	1,169
Total	1,699	3,309	15,692	24,101	40,806	18,435	104,042

Percentages							
aDSL	1.1	2.0	11.0	10.9	1.4	0.0	26.4
sDSL	0.0	0.0	0.0	0.0	*	*	0.1
Other Wireline ¹	0.1	0.3	0.1	0.0	0.0	0.1	0.6
Cable Modem	0.1	0.6	2.5	8.8	30.9	16.1	59.1
FTTP	0.0	0.0	0.6	1.8	6.9	1.4	10.7
Satellite	0.2	0.0	0.3	1.4	*	*	2.0
Fixed Wireless	0.1	0.2	0.5	0.2	0.0	0.0	1.1
Total	1.6	3.2	15.1	23.2	39.2	17.7	100.0

¹ 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 June 30, 2016
(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	1,017	1,725	9,944	10,465	1,328	5	24,483
sDSL	8	1	1	1	*	*	11
Other Wireline ¹	#	1	2	6	13	28	51
Cable Modem	81	618	2,266	7,636	30,399	16,354	57,354
FTTP	19	30	515	1,624	6,670	1,273	10,131
Satellite	88	16	333	1,446	*	*	1,897
Fixed Wireless	99	151	511	223	42	13	1,039
Total	1,312	2,542	13,571	21,401	38,466	17,674	94,966

Percentages							
aDSL	1.1	1.8	10.5	11.0	1.4	0.0	25.8
sDSL	0.0	0.0	0.0	0.0	*	*	0.0
Other Wireline ¹	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Cable Modem	0.1	0.7	2.4	8.0	32.0	17.2	60.4
FTTP	0.0	0.0	0.5	1.7	7.0	1.3	10.7
Satellite	0.1	0.0	0.4	1.5	*	*	2.0
Fixed Wireless	0.1	0.2	0.5	0.2	0.0	0.0	1.1
Total	1.4	2.7	14.3	22.5	40.5	18.6	100.0

¹ 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 2012-2016

Technology	2012		2013		2014		2015		2016
	Jun	Dec	Jun	Dec	Jun+	Dec	Jun	Dec	Jun
aDSL	860	865	852	851	794	792	790	775	762
sDSL	251	255	246	239	195	191	177	181	170
Other Wireline ¹	258	262	246	245	270	245	239	250	241
Cable Modem	401	404	403	407	394	402	391	392	384
FTTP	642	666	692	744	878	906	929	990	1,010
Satellite	5	6	5	5	18	16	11	11	9
Fixed Wireless	713	765	771	825	870	916	943	977	996
Mobile Wireless	67	70	79	77	91	98	100	97	99
Power Line and Other ¹	*	*	0	*	-	-	-	-	-
Total	1,673	1,722	1,714	1,773	1,813	1,865	1,874	1,911	1,919

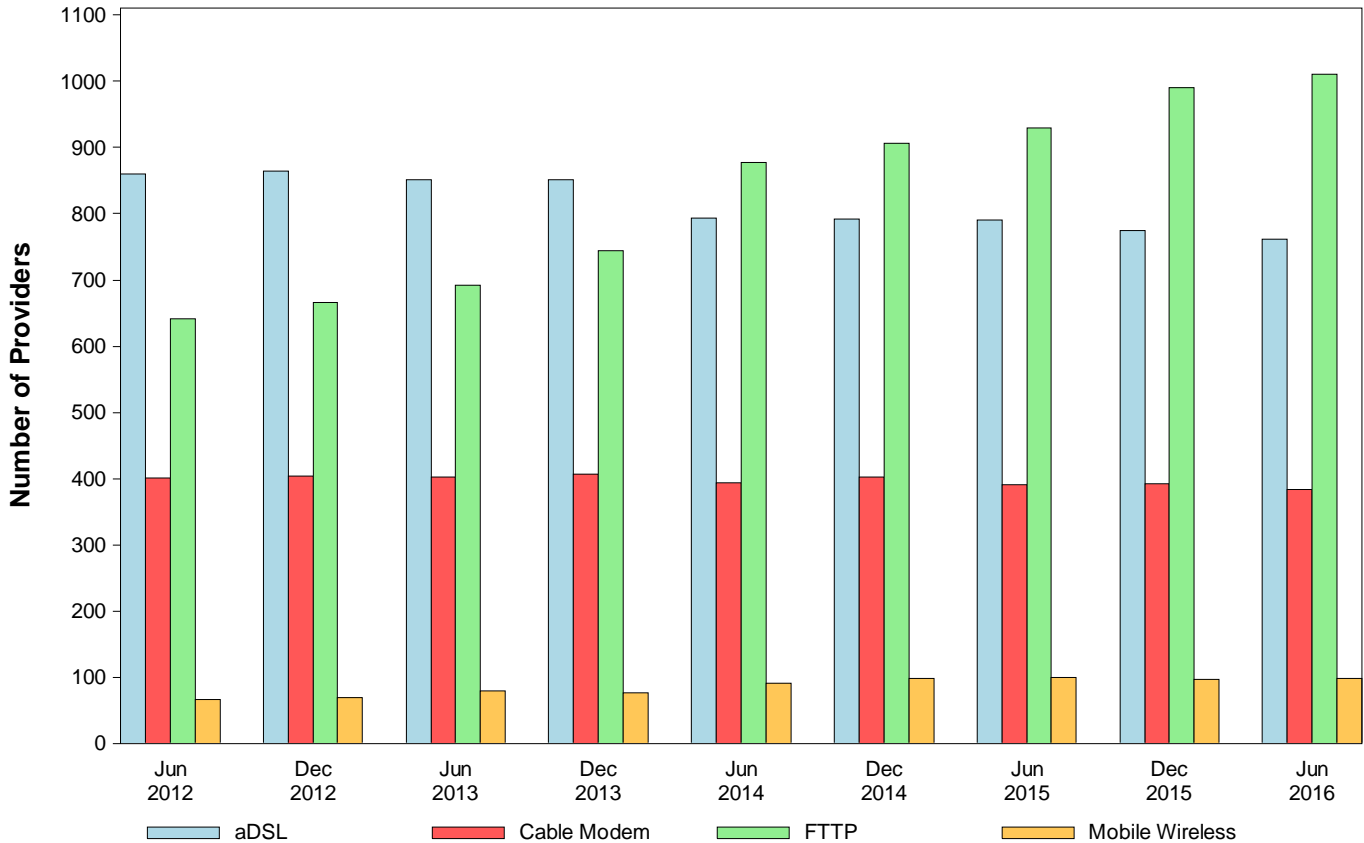
¹ For this Figure, the categories Power Line and All Other were combined with Other Wireline from June 2014 forward.

+ 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 2012-2016



SECTION 3
SUMMARY STATISTICS: THE STATES

Table of Contents

Figure 32	Residential Fixed Connections and Households by State as of June 30, 2016	29
Figure 33	Connections by Type of End User by State as of June 30, 2016.....	31
Figure 34	Connections by Technology by State as of June 30, 2016	32
Figure 35	Percentage of Fixed Connections by Downstream Speed by State as of June 30, 2016.....	34
Figure 36	Providers of Connections by Technology by State as of June 30, 2016.....	36

Figure 32
Residential Fixed Connections and Households by State as of June 30, 2016
(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	1,848	1,261	0.68	905	0.49	579	0.31	50	0.03
Alaska	251	204	0.81	141	0.56	*	*	*	*
American Samoa	10	*	*	0	0.00	0	0.00	0	0.00
Arizona	2,412	1,975	0.82	1,390	0.58	1,121	0.46	329	0.14
Arkansas	1,138	728	0.64	479	0.42	249	0.22	75	0.07
California	12,718	10,832	0.85	8,987	0.71	6,650	0.52	2,433	0.19
Colorado	2,024	1,795	0.89	1,254	0.62	1,156	0.57	*	*
Connecticut	1,353	1,174	0.87	1,008	0.75	811	0.60	222	0.16
Delaware	344	318	0.92	292	0.85	269	0.78	85	0.25
District of Columbia	273	231	0.84	204	0.74	193	0.71	*	*
Florida	7,300	6,525	0.89	5,473	0.75	4,093	0.56	976	0.13
Georgia	3,574	2,821	0.79	2,144	0.60	1,506	0.42	243	0.07
Guam	42	*	*	*	*	*	*	0	0.00
Hawaii	451	398	0.88	390	0.86	*	*	*	*
Idaho	589	468	0.79	234	0.40	173	0.29	13	0.02
Illinois	4,786	3,720	0.78	2,982	0.62	2,174	0.45	402	0.08
Indiana	2,502	1,867	0.75	1,380	0.55	924	0.37	207	0.08
Iowa	1,236	919	0.74	536	0.43	295	0.24	67	0.05
Kansas	1,113	867	0.78	630	0.57	381	0.34	153	0.14
Kentucky	1,708	1,261	0.74	835	0.49	438	0.26	232	0.14
Louisiana	1,728	1,201	0.70	924	0.53	593	0.34	154	0.09
Maine	553	489	0.88	345	0.62	138	0.25	*	*
Maryland	2,166	1,840	0.85	1,680	0.78	1,545	0.71	440	0.20
Massachusetts	2,550	2,273	0.89	2,069	0.81	1,960	0.77	654	0.26
Michigan	3,841	2,897	0.75	2,350	0.61	1,739	0.45	190	0.05
Minnesota	2,125	1,694	0.80	1,153	0.54	987	0.46	250	0.12
Mississippi	1,097	633	0.58	430	0.39	232	0.21	36	0.03
Missouri	2,365	1,745	0.74	1,230	0.52	785	0.33	210	0.09
Montana	409	319	0.78	186	0.45	169	0.41	*	*
Nebraska	737	567	0.77	379	0.52	255	0.35	41	0.06

Figure 32 - Continued
Residential Fixed Connections and Households by State as of June 30, 2016
(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	1,017	851	0.84	667	0.66	504	0.50	*	*
New Hampshire	520	476	0.91	393	0.76	348	0.67	133	0.26
New Jersey	3,189	2,889	0.91	2,681	0.84	2,594	0.81	660	0.21
New Mexico	764	544	0.71	283	0.37	251	0.33	77	0.10
New York	7,262	6,182	0.85	5,589	0.77	4,594	0.63	1,023	0.14
North Carolina	3,776	3,067	0.81	2,272	0.60	1,708	0.45	870	0.23
North Dakota	300	232	0.77	188	0.63	140	0.47	22	0.07
Northern Mariana Isl	16	*	*	0	0.00	0	0.00	0	0.00
Ohio	4,585	3,687	0.80	2,744	0.60	1,230	0.27	50	0.01
Oklahoma	1,455	995	0.68	694	0.48	408	0.28	102	0.07
Oregon	1,533	1,278	0.83	965	0.63	861	0.56	*	*
Pennsylvania	4,959	3,952	0.80	3,098	0.62	2,740	0.55	857	0.17
Puerto Rico	1,244	*	*	*	*	*	*	*	*
Rhode Island	411	348	0.85	333	0.81	*	*	*	*
South Carolina	1,815	1,397	0.77	1,093	0.60	548	0.30	28	0.02
South Dakota	331	249	0.75	208	0.63	154	0.47	17	0.05
Tennessee	2,505	1,781	0.71	1,428	0.57	1,065	0.43	195	0.08
Texas	9,149	7,015	0.77	5,522	0.60	3,394	0.37	1,500	0.16
Utah	906	784	0.87	527	0.58	457	0.50	181	0.20
Vermont	257	234	0.91	157	0.61	126	0.49	49	0.19
Virgin Islands	43	*	*	*	*	*	*	0	0.00
Virginia	3,063	2,480	0.81	2,106	0.69	1,821	0.59	463	0.15
Washington	2,669	2,329	0.87	1,806	0.68	1,645	0.62	657	0.25
West Virginia	741	506	0.68	337	0.46	272	0.37	*	*
Wisconsin	2,299	1,809	0.79	1,344	0.58	738	0.32	16	0.01
Wyoming	227	177	0.78	116	0.51	97	0.43	#	0.00
Total	118,281	94,966	0.80	74,824	0.63	55,718	0.47	15,571	0.13

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

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

Sources: FCC Form 477 (Connections); 2011-2015 ACS 5-year estimates; Census 2010.

Figure 33
Connections by Type of End User by State as of June 30, 2016
(Connections over 200 kbps in at least one direction, in thousands)

State	Connections		Percentages		Total
	Residential	Business	Residential	Business	
Alabama	4,515	586	88.5	11.5	5,101
Alaska	792	136	85.4	14.6	928
American Samoa	*	*	*	*	*
Arizona	6,205	960	86.6	13.4	7,165
Arkansas	2,711	389	87.5	12.5	3,100
California	38,975	7,237	84.3	15.7	46,212
Colorado	5,519	888	86.1	13.9	6,408
Connecticut	3,798	675	84.9	15.1	4,473
Delaware	980	152	86.6	13.4	1,132
District of Columbia	869	479	64.5	35.5	1,348
Florida	18,858	3,377	84.8	15.2	22,234
Georgia	9,531	1,550	86.0	14.0	11,080
Guam	102	41	71.2	28.8	144
Hawaii	1,546	202	88.4	11.6	1,748
Idaho	1,529	233	86.8	13.2	1,762
Illinois	12,880	2,183	85.5	14.5	15,063
Indiana	6,201	866	87.8	12.2	7,066
Iowa	2,932	495	85.6	14.4	3,427
Kansas	3,500	460	88.4	11.6	3,960
Kentucky	5,201	576	90.0	10.0	5,777
Louisiana	4,645	640	87.9	12.1	5,285
Maine	1,280	201	86.4	13.6	1,480
Maryland	6,053	1,023	85.5	14.5	7,076
Massachusetts	7,019	1,227	85.1	14.9	8,246
Michigan	8,986	1,677	84.3	15.7	10,663
Minnesota	5,399	939	85.2	14.8	6,338
Mississippi	2,800	300	90.3	9.7	3,100
Missouri	5,794	972	85.6	14.4	6,765
Montana	968	130	88.1	11.9	1,099
Nebraska	1,689	336	83.4	16.6	2,026
Nevada	2,822	387	87.9	12.1	3,209
New Hampshire	1,360	208	86.7	13.3	1,568
New Jersey	9,707	1,786	84.5	15.5	11,493
New Mexico	1,815	249	87.9	12.1	2,064
New York	20,074	3,496	85.2	14.8	23,570
North Carolina	9,742	1,538	86.4	13.6	11,280
North Dakota	741	125	85.6	14.4	866
Northern Mariana Isl	*	*	*	*	*
Ohio	11,407	1,772	86.6	13.4	13,179
Oklahoma	3,650	565	86.6	13.4	4,215
Oregon	4,003	654	86.0	14.0	4,657
Pennsylvania	12,460	1,959	86.4	13.6	14,419
Puerto Rico	3,260	265	92.5	7.5	3,525
Rhode Island	1,033	173	85.6	14.4	1,207
South Carolina	4,462	623	87.7	12.3	5,086
South Dakota	793	106	88.2	11.8	899
Tennessee	6,116	982	86.2	13.8	7,099
Texas	25,512	4,659	84.6	15.4	30,171
Utah	2,698	468	85.2	14.8	3,166
Vermont	626	124	83.4	16.6	751
Virgin Islands	99	16	86.2	13.8	115
Virginia	7,747	1,448	84.2	15.8	9,195
Washington	7,446	1,224	85.9	14.1	8,670
West Virginia	1,529	176	89.7	10.3	1,705
Wisconsin	5,420	927	85.4	14.6	6,347
Wyoming	590	80	88.0	12.0	671
Total	316,454	52,962	85.7	14.3	369,416

= 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 June 30, 2016
(Connections over 200 kbps in at least one direction, in thousands)

<i>State</i>	<i>ADSL</i>	<i>SDSL</i>	<i>Other Wireline¹</i>	<i>Cable Modem</i>	<i>Fiber</i>	<i>Satellite</i>	<i>Fixed Wireless</i>	<i>Mobile Wireless</i>	<i>Total</i>
Alabama	526	3	*	738	38	*	5	3,715	5,101
Alaska	78	#	3	*	4	*	7	687	928
American Samoa	0	0	0	*	*	0	*	*	*
Arizona	602	#	*	1,326	127	*	30	5,036	7,165
Arkansas	345	#	*	364	18	*	7	2,307	3,100
California	3,611	9	*	7,033	920	*	75	34,320	46,212
Colorado	553	1	*	1,119	177	*	60	4,442	6,408
Connecticut	*	#	4	919	8	*	*	3,182	4,473
Delaware	*	#	4	207	*	*	*	786	1,132
District of Columbia	39	1	7	*	*	*	*	1,080	1,348
Florida	1,763	1	*	4,599	633	*	11	15,085	22,234
Georgia	1,108	1	*	1,755	140	*	2	7,972	11,080
Guam	*	0	*	*	*	0	0	104	144
Hawaii	*	2	1	*	29	*	4	1,317	1,748
Idaho	195	#	*	192	61	*	49	1,250	1,762
Illinois	1,303	2	*	2,534	73	*	76	10,997	15,063
Indiana	714	1	*	1,051	157	*	42	5,035	7,066
Iowa	334	1	*	459	145	*	34	2,420	3,427
Kansas	261	#	*	492	130	*	38	3,012	3,960
Kentucky	480	#	*	746	77	*	15	4,402	5,777
Louisiana	427	#	*	752	64	*	5	3,967	5,285
Maine	133	2	*	379	8	*	4	942	1,480
Maryland	171	1	16	1,026	*	*	4	5,071	7,076
Massachusetts	*	1	19	1,780	*	*	2	5,751	8,246
Michigan	897	4	*	2,070	21	*	46	7,507	10,663
Minnesota	562	3	*	1,033	173	*	28	4,494	6,338
Mississippi	328	#	*	301	17	*	2	2,388	3,100
Missouri	765	#	*	856	151	*	36	4,867	6,765
Montana	112	1	*	187	22	*	23	740	1,099
Nebraska	171	#	*	372	46	*	23	1,402	2,026

Figure 34 - Continued
Connections by Technology by State as of June 30, 2016
(Connections over 200 kbps in at least one direction, in thousands)

<i>State</i>	<i>ADSL</i>	<i>SDSL</i>	<i>Other Wireline¹</i>	<i>Cable Modem</i>	<i>Fiber</i>	<i>Satellite</i>	<i>Fixed Wireless</i>	<i>Mobile Wireless</i>	<i>Total</i>
Nevada	243	#	6	*	11	*	12	2,277	3,209
New Hampshire	84	#	4	412	24	*	*	1,037	1,568
New Jersey	222	1	26	2,009	*	*	#	8,301	11,493
New Mexico	270	#	*	258	33	*	19	1,467	2,064
New York	543	3	36	4,681	*	*	4	16,757	23,570
North Carolina	982	#	*	2,144	137	*	4	7,936	11,280
North Dakota	55	#	*	129	69	*	5	604	866
Northern Mariana Isl	*	0	*	*	*	0	0	*	*
Ohio	1,175	1	*	2,562	153	*	41	9,180	13,179
Oklahoma	388	#	*	560	33	*	46	3,124	4,215
Oregon	305	1	*	865	165	*	21	3,259	4,657
Pennsylvania	740	1	25	2,637	*	*	6	10,085	14,419
Puerto Rico	*	*	*	*	5	*	2	2,839	3,525
Rhode Island	*	#	2	*	*	*	*	827	1,207
South Carolina	477	#	*	915	77	*	3	3,566	5,086
South Dakota	53	*	#	158	50	*	10	623	899
Tennessee	579	#	*	1,124	186	*	8	5,123	7,099
Texas	2,718	1	*	3,650	813	*	191	22,522	30,171
Utah	210	#	*	435	141	*	58	2,312	3,166
Vermont	122	*	3	134	20	*	1	464	751
Virgin Islands	*	0	*	*	*	*	*	90	115
Virginia	355	1	*	1,399	833	*	15	6,478	9,195
Washington	518	1	*	1,702	208	*	25	6,142	8,670
West Virginia	*	*	1	317	9	*	2	1,156	1,705
Wisconsin	657	6	5	*	69	*	38	4,379	6,347
Wyoming	56	1	*	104	9	*	21	470	671
Total	27,484	56	673	61,453	11,129	2,079	1,169	265,374	369,416

¹ 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 June 30, 2016

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	99.2	92.6	73.8	45.9	5.6
Alaska	97.2	84.7	67.5	35.5	14.0
American Samoa	*	*	*	*	*
Arizona	99.6	95.7	82.2	55.1	20.3
Arkansas	99.2	91.7	69.0	37.0	15.2
California	99.6	96.5	80.7	58.5	28.4
Colorado	99.7	94.1	83.2	61.8	25.2
Connecticut	99.3	98.7	84.4	66.9	18.0
Delaware	99.8	97.9	90.7	81.7	25.5
District of Columbia	99.8	96.5	84.9	78.5	28.3
Florida	99.5	96.2	86.1	61.3	14.6
Georgia	99.0	94.6	76.5	52.2	8.6
Guam	*	*	*	*	*
Hawaii	100.0	98.7	96.5	39.8	13.3
Idaho	99.4	92.1	66.2	36.3	24.8
Illinois	99.6	96.8	79.4	56.2	13.4
Indiana	99.2	95.3	74.8	47.6	10.6
Iowa	99.5	91.4	67.3	31.8	8.7
Kansas	99.6	94.6	73.2	42.0	17.7
Kentucky	98.9	90.5	66.8	33.9	17.2
Louisiana	99.1	93.5	76.4	48.4	14.3
Maine	98.7	90.8	69.0	26.9	1.8
Maryland	99.7	97.5	89.4	81.3	23.0
Massachusetts	99.8	97.6	89.7	83.2	27.4
Michigan	99.3	96.5	80.4	58.0	6.6
Minnesota	99.6	94.1	78.2	57.0	14.4
Mississippi	98.7	91.0	68.3	37.3	14.6
Missouri	99.3	93.1	74.6	44.9	33.3
Montana	99.4	87.8	63.8	52.1	1.8
Nebraska	99.6	94.1	71.3	44.0	8.3

Figure 35 - Continued
Percentage of Fixed Connections by Downstream Speed by State as of June 30, 2016

<i>State</i>	<i>Over 200 kbps Upstream and</i>				
	<i>% over 200 kbps Downstream</i>	<i>% at least 3 Mbps Downstream</i>	<i>% at least 10 Mbps Downstream</i>	<i>% at least 25 Mbps Downstream</i>	<i>% at least 100 Mbps Downstream</i>
Nevada	99.8	97.3	84.8	59.0	13.0
New Hampshire	98.9	95.0	81.0	68.7	25.6
New Jersey	99.7	97.9	92.0	87.4	21.8
New Mexico	99.6	90.6	68.8	44.2	15.5
New York	99.6	96.9	88.5	72.1	15.9
North Carolina	99.4	93.0	77.9	53.2	26.9
North Dakota	99.8	95.4	81.9	61.0	15.6
Northern Mariana Isl	*	*	*	*	*
Ohio	99.7	93.3	74.7	32.3	1.8
Oklahoma	99.5	95.4	69.5	40.5	14.8
Oregon	99.7	94.8	82.1	65.4	20.2
Pennsylvania	99.6	95.4	79.7	67.9	21.1
Puerto Rico	99.9	76.8	45.1	13.1	0.5
Rhode Island	99.6	98.4	93.7	81.7	14.4
South Carolina	99.3	93.7	78.4	39.2	2.6
South Dakota	99.6	95.8	84.9	61.4	7.8
Tennessee	99.2	95.2	80.2	57.9	11.1
Texas	99.7	95.6	78.0	46.9	21.8
Utah	99.8	95.6	79.0	56.3	22.1
Vermont	98.4	84.3	62.9	46.9	17.8
Virgin Islands	99.9	83.1	25.0	*	*
Virginia	99.5	96.2	84.4	70.5	18.0
Washington	99.4	95.3	83.6	68.3	27.3
West Virginia	98.7	96.8	64.3	51.7	34.2
Wisconsin	99.4	92.4	76.8	40.3	1.4
Wyoming	99.5	89.9	72.1	53.3	0.8
Total	99.5	95.2	80.1	56.9	17.7

Figure 36
Providers of Connections by Technology by State as of June 30, 2016
(Connections over 200 kbps in at least one direction, in thousands)

<i>State</i>	<i>ADSL</i>	<i>SDSL</i>	<i>Other Wireline¹</i>	<i>Cable Modem</i>	<i>Fiber</i>	<i>Satellite</i>	<i>Fixed Wireless</i>	<i>Mobile Wireless</i>	<i>Total</i>
Alabama	26	11	*	23	36	*	20	6	87
Alaska	14	4	14	*	7	*	12	7	38
American Samoa	0	0	0	*	*	0	*	*	*
Arizona	27	6	*	17	35	*	38	7	101
Arkansas	24	6	*	20	30	*	19	4	76
California	37	13	*	27	57	*	86	6	171
Colorado	35	7	*	18	50	*	56	10	128
Connecticut	*	8	19	10	21	*	*	4	44
Delaware	*	4	17	6	*	*	*	4	32
District of Columbia	10	6	20	*	*	*	*	4	45
Florida	30	12	*	26	52	*	27	5	104
Georgia	32	9	*	36	69	*	16	4	118
Guam	*	0	*	*	*	0	0	4	4
Hawaii	*	5	10	*	9	*	5	5	25
Idaho	27	5	*	17	30	*	34	9	81
Illinois	54	11	*	22	84	*	71	8	177
Indiana	40	9	*	15	53	*	51	5	112
Iowa	111	25	*	45	126	*	80	36	227
Kansas	32	13	*	29	58	*	47	9	116
Kentucky	24	8	*	30	43	*	29	6	100
Louisiana	16	5	*	23	28	*	12	5	68
Maine	17	8	*	9	18	*	10	5	43
Maryland	19	10	27	17	*	*	18	5	75
Massachusetts	*	7	30	11	*	*	16	4	67
Michigan	35	12	*	24	50	*	39	6	115
Minnesota	51	13	*	24	73	*	46	5	129
Mississippi	18	4	*	19	20	*	12	5	64
Missouri	39	13	*	21	54	*	60	8	141
Montana	26	8	*	10	27	*	25	5	62
Nebraska	34	5	*	23	44	*	37	8	89

Figure 36 - Continued
Providers of Connections by Technology by State as of June 30, 2016
(Connections over 200 kbps in at least one direction, in thousands)

<i>State</i>	<i>ADSL</i>	<i>SDSL</i>	<i>Other Wireline¹</i>	<i>Cable Modem</i>	<i>Fiber</i>	<i>Satellite</i>	<i>Fixed Wireless</i>	<i>Mobile Wireless</i>	<i>Total</i>
Nevada	20	8	29	*	27	*	17	6	64
New Hampshire	15	8	20	6	22	*	*	6	43
New Jersey	21	8	35	13	*	*	5	4	64
New Mexico	26	7	*	12	24	*	24	9	68
New York	43	8	35	22	*	*	25	5	106
North Carolina	26	9	*	27	46	*	14	6	90
North Dakota	28	7	*	8	28	*	16	7	54
Northern Mariana Isl	*	0	*	*	*	0	0	*	*
Ohio	41	9	*	31	67	*	45	4	134
Oklahoma	37	10	*	15	37	*	41	11	99
Oregon	44	12	*	18	48	*	40	6	102
Pennsylvania	34	9	39	30	*	*	24	7	118
Puerto Rico	*	*	*	*	6	*	5	5	17
Rhode Island	*	6	11	*	*	*	*	4	27
South Carolina	21	4	*	18	25	*	8	6	54
South Dakota	26	*	13	8	30	*	24	9	73
Tennessee	26	9	*	24	42	*	26	7	99
Texas	67	19	*	41	95	*	115	10	227
Utah	23	7	*	14	26	*	27	9	76
Vermont	13	*	11	7	18	*	4	6	36
Virgin Islands	*	0	*	*	*	*	*	4	7
Virginia	31	11	*	20	52	*	30	6	105
Washington	31	9	*	25	50	*	52	6	118
West Virginia	*	*	17	16	17	*	10	6	54
Wisconsin	49	9	27	*	60	*	47	7	130
Wyoming	19	6	*	8	17	*	21	8	53
Total	762	170	241	384	1,010	9	996	99	1,919

¹ 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.

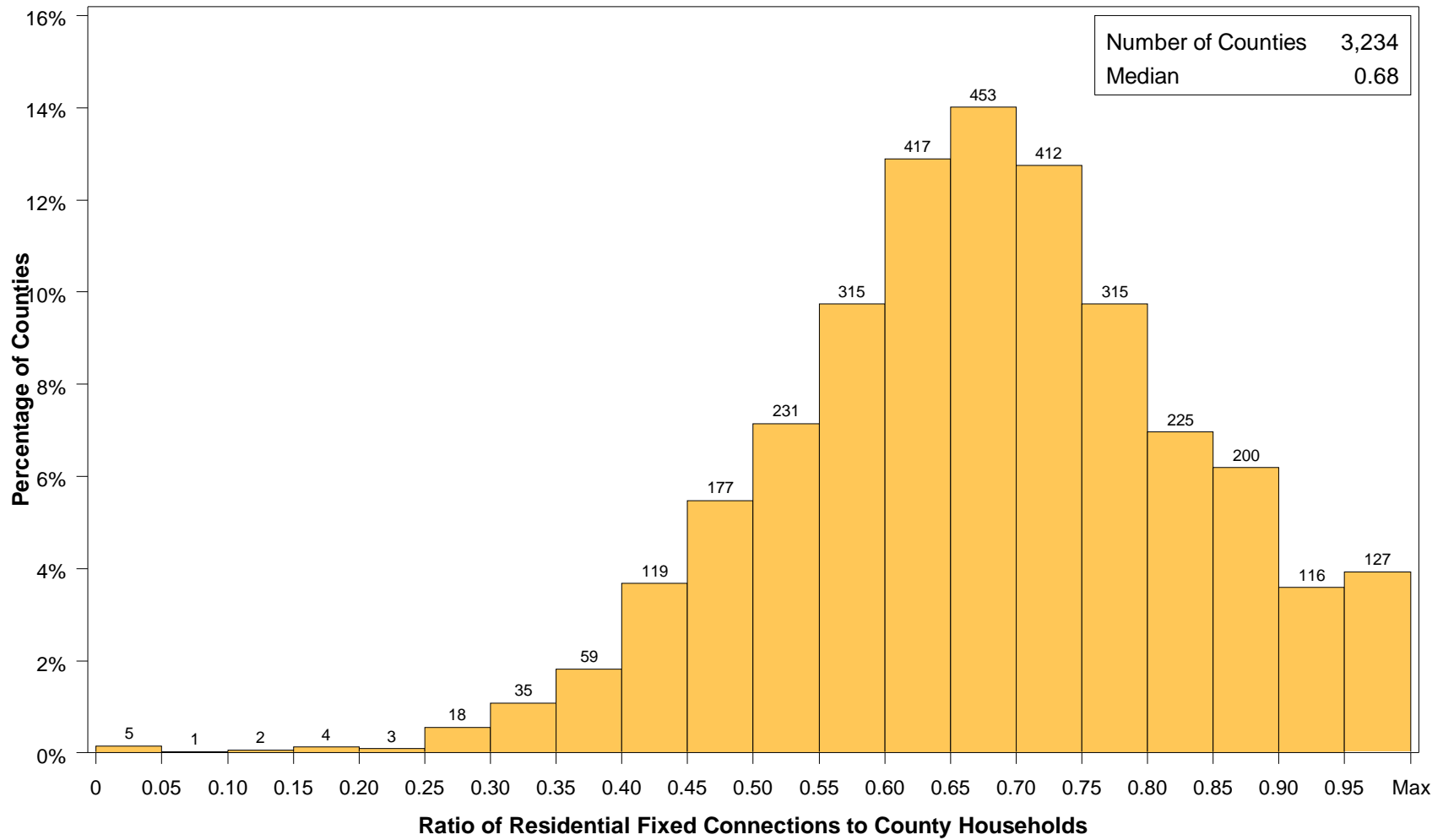
Source: FCC Form 477.

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 June 30, 2016	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 June 30, 2016	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 June 30, 2016	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 June 30, 2016	42
Figure 41	Percentage of Developed Census Blocks with Residential Fixed Connections by Technology as of June 30, 2016	43
Figure 42	Distribution of Counties by Ratio of Residential Fixed Connections to County Households by State as of June 30, 2016	44
Figure 43	Distribution of Census Tracts by Ratio of Residential Fixed Connections to Tract Households by State as of June 30, 2016	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 June 30, 2016



Note: Ratios over 1 were set to 1. See Technical Notes at the end of the report.
 Sources: FCC Form 477; 2011-2015 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 June 30, 2016

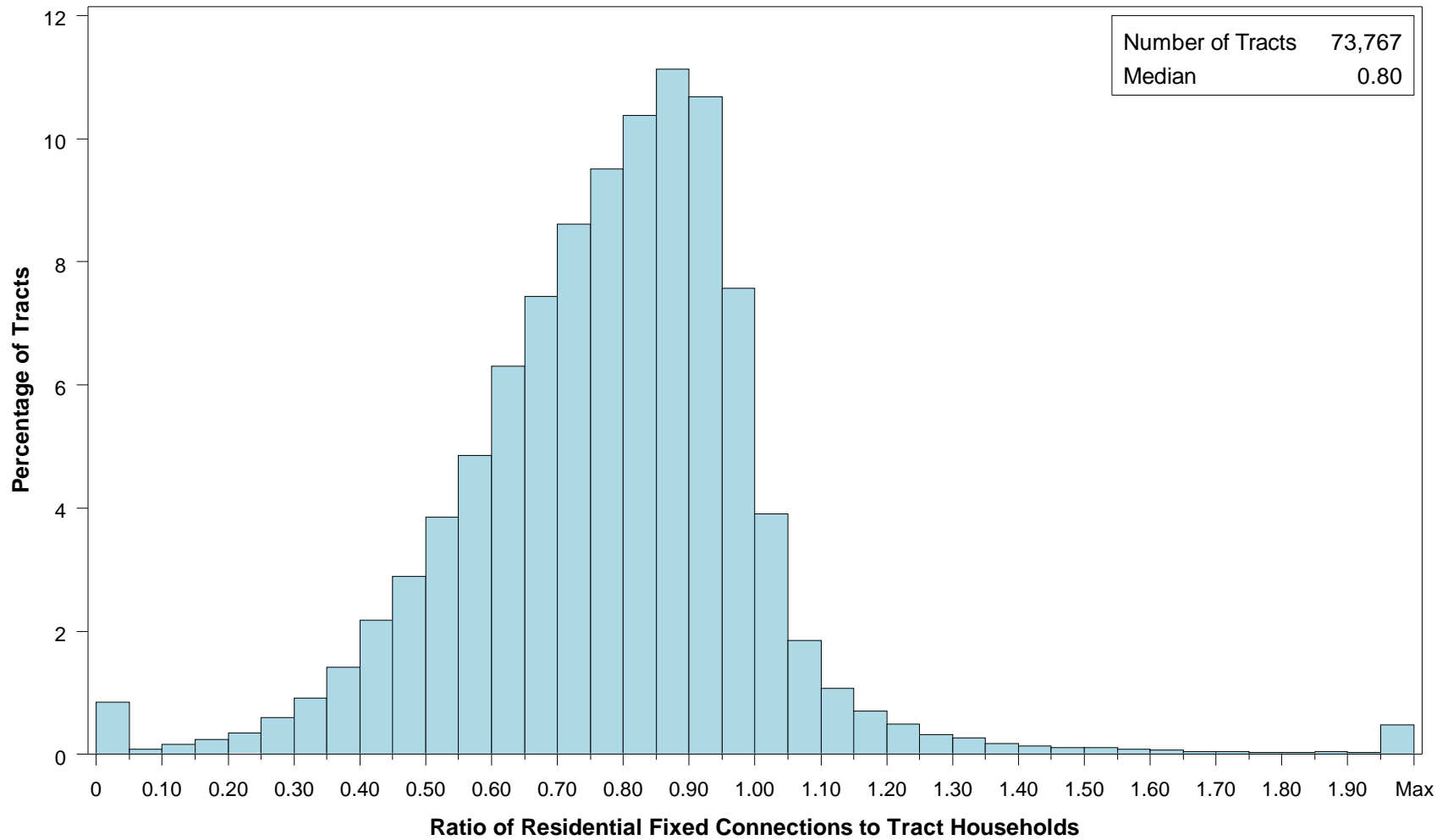
<i>Technology</i>	<i>Ratio of Residential Fixed Connections to County Households</i>										<i>100% or more</i>
	<i>Zero</i>	<i>Greater than 0 and no more than 5%</i>	<i>Greater than 5 and no more than 10%</i>	<i>Greater than 10 and no more than 20%</i>	<i>Greater than 20 and no more than 30%</i>	<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	0.8	5.0	5.7	24.9	30.5	19.3	8.5	3.4	1.5	0.3	0.2
sDSL	88.5	11.3	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Other Wireline	91.9	7.9	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cable Modem	12.1	7.1	6.8	16.0	14.6	14.0	11.5	10.4	6.5	0.7	0.3
FTTP	29.0	45.4	7.4	7.4	3.9	2.7	1.6	1.3	1.4	0.0	0.0
Satellite	1.0	62.4	24.7	10.4	1.3	0.2	0.0	0.0	0.0	0.0	0.0
Fixed Wireless	30.4	49.8	10.6	6.6	1.7	0.5	0.2	0.1	0.0	0.0	0.0
Total	0.2	0.0	0.0	0.2	0.6	2.9	9.2	16.9	49.4	18.2	2.4

¹ 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; 2011-2015 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 June 30, 2016



Note: Ratios over 2 were set to 2. See Technical Notes at the end of the report.
 Sources: FCC Form 477; 2011-2015 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 June 30, 2016

<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	1.6	16.6	11.5	24.7	21.1	13.8	6.3	2.5	1.2	0.3	0.2
sDSL	98.3	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Wireline	99.0	0.8	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cable Modem	5.0	3.0	1.9	4.6	8.3	14.0	17.8	17.9	20.9	5.1	1.5
FTTP	56.9	16.7	3.9	5.9	4.1	4.1	3.6	2.5	1.9	0.2	0.1
Satellite	26.1	63.4	5.6	3.6	0.9	0.3	0.1	0.0	0.0	0.0	0.0
Fixed Wireless	76.1	18.4	2.5	1.9	0.6	0.3	0.1	0.0	0.0	0.0	0.0
Total	0.7	0.1	0.1	0.4	0.9	2.3	5.1	8.7	31.9	39.8	9.9

¹ 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; 2011-2015 ACS 5-year estimates; and Census 2010.

Figure 41
Percentage of Developed Census Blocks with Residential Fixed Service by Technology as of June 30, 2016
(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	25.9	69.6	4.3	0.2	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 ¹	98.4	1.6	0.0	0.0	0.0	0.0	0.0	0.0
Cable Modem	34.1	62.0	3.6	0.3	0.0	0.0	0.0	0.0
FTTP	83.3	16.3	0.4	0.0	0.0	0.0	0.0	0.0
Satellite	0.1	0.9	0.2	98.8	0.0	0.0	0.0	0.0
Fixed Wireless	59.4	24.9	10.8	3.9	1.0	0.1	0.0	0.0
aDSL and/or Cable Modem and/or FTTP	13.5	25.7	51.9	8.1	0.8	0.0	0.0	0.0
Any Technology	0.0	0.2	0.1	7.4	19.2	40.9	20.0	12.2

¹ 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 June 30, 2016
(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	1	3	17	21	21	4	0
Alaska	29	0	0	0	0	2	1	4	2	10	8	2
American Samoa	5	3	0	1	1	0	0	0	0	0	0	0
Arizona	15	0	0	0	0	0	0	2	1	9	3	0
Arkansas	75	0	0	0	1	0	5	28	24	16	1	0
California	58	0	0	0	0	0	0	1	0	24	32	1
Colorado	64	0	0	0	0	0	0	2	4	25	20	13
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	11	14	33	9
Georgia	159	0	0	0	1	2	9	24	34	53	31	5
Guam	1	0	0	0	0	0	0	0	0	0	1	0
Hawaii	5	1	0	0	0	0	0	0	0	1	3	0
Idaho	44	0	0	0	0	0	0	1	5	27	9	2
Illinois	102	0	0	0	0	1	1	4	20	65	11	0
Indiana	92	0	0	0	0	0	0	2	17	63	10	0
Iowa	99	0	0	0	0	0	0	1	10	82	5	1
Kansas	105	0	0	0	0	0	0	4	19	69	13	0
Kentucky	120	0	0	0	0	1	2	10	30	68	9	0
Louisiana	64	0	0	0	0	1	4	15	13	29	2	0
Maine	16	0	0	0	0	0	0	0	0	6	7	3
Maryland	24	0	0	0	0	0	0	0	3	9	11	1
Massachusetts	14	0	0	0	0	0	0	0	0	2	9	3
Michigan	83	0	0	0	0	0	0	3	11	54	13	2
Minnesota	87	0	0	0	0	1	0	0	4	66	16	0
Mississippi	82	0	0	0	2	4	17	33	14	11	1	0
Missouri	115	0	0	0	0	1	5	14	26	60	8	1
Montana	56	0	0	0	0	0	0	0	4	34	17	1
Nebraska	93	0	0	0	0	0	2	9	23	54	5	0

Figure 42 - Continued
Distribution of Counties by Ratio of Residential Fixed Connections to County Households by State as of June 30, 2016
(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	2	0	2	5	5	3	0
New Hampshire	10	0	0	0	0	0	0	0	0	1	7	2
New Jersey	21	0	0	0	0	0	0	0	0	2	18	1
New Mexico	33	0	0	0	0	0	2	2	8	16	5	0
New York	62	0	0	0	0	0	0	0	0	34	25	3
North Carolina	100	0	0	0	0	0	0	2	15	55	23	5
North Dakota	53	0	0	0	0	0	0	0	7	33	13	0
Northern Mariana Isl	4	1	0	0	0	0	2	1	0	0	0	0
Ohio	88	0	0	0	0	0	0	3	6	55	24	0
Oklahoma	77	0	0	0	0	1	5	14	23	32	2	0
Oregon	36	0	0	0	0	0	0	0	3	18	14	1
Pennsylvania	67	0	0	0	0	0	0	0	3	44	18	2
Puerto Rico	78	0	0	0	0	2	14	29	28	5	0	0
Rhode Island	5	0	0	0	0	0	0	0	0	0	5	0
South Carolina	46	0	0	0	0	0	1	9	10	18	6	2
South Dakota	66	0	0	0	0	0	1	2	12	45	5	1
Tennessee	95	0	0	0	0	0	3	12	34	38	8	0
Texas	254	0	0	0	0	0	7	29	59	130	27	2
Utah	29	0	0	0	0	0	0	0	1	14	9	5
Vermont	14	0	0	0	0	0	0	0	0	3	8	3
Virgin Islands	3	0	0	0	0	0	1	1	0	0	1	0
Virginia	134	0	0	0	1	1	9	12	19	62	28	2
Washington	39	0	0	0	0	0	0	1	2	16	19	1
West Virginia	55	0	0	0	0	1	0	3	10	35	6	0
Wisconsin	72	0	0	0	0	0	0	0	2	49	20	1
Wyoming	23	0	0	0	0	0	0	0	3	15	3	2
Total	3,234	5	0	1	6	21	94	296	546	1597	590	78

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

Sources: FCC Form 477; 2011-2015 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 June 30, 2016
(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	2	32	96	183	209	378	218	56
Alaska	167	2	0	0	1	9	1	7	7	51	75	14
American Samoa	18	4	6	2	3	1	0	0	0	2	0	0
Arizona	1,526	13	9	8	14	13	35	61	118	406	614	235
Arkansas	686	1	1	0	8	21	59	133	138	212	91	22
California	8,036	53	3	6	8	27	53	120	397	2,197	4,432	740
Colorado	1,249	14	0	0	1	1	7	17	45	323	631	210
Connecticut	829	2	0	0	0	1	1	7	41	172	497	108
Delaware	215	1	0	0	0	0	1	3	10	52	106	42
District of Columbia	179	1	0	0	0	0	1	7	13	60	69	28
Florida	4,199	38	0	0	4	3	32	95	214	1,042	1,841	930
Georgia	1,964	10	1	1	6	14	77	137	246	605	668	199
Guam	56	4	1	1	5	2	2	5	7	5	7	17
Hawaii	326	14	0	0	4	4	4	7	9	69	155	60
Idaho	298	0	0	0	2	4	5	3	15	137	113	19
Illinois	3,121	7	0	0	5	13	59	194	336	1,173	1,211	123
Indiana	1,508	5	2	0	2	5	27	95	235	668	402	67
Iowa	825	3	1	0	2	1	6	31	86	498	174	23
Kansas	770	10	0	0	0	5	5	36	106	329	221	58
Kentucky	1,115	9	2	1	9	12	35	71	175	437	284	80
Louisiana	1,136	11	2	0	4	19	68	141	176	433	247	35
Maine	351	0	0	0	0	3	2	1	11	117	150	67
Maryland	1,394	8	0	0	0	2	29	51	80	323	762	139
Massachusetts	1,471	12	1	0	0	2	2	11	40	328	887	188
Michigan	2,767	29	0	0	17	49	140	215	256	866	1,076	119
Minnesota	1,335	4	0	0	3	4	7	36	59	583	572	67
Mississippi	661	4	0	2	9	33	117	135	110	166	70	15
Missouri	1,393	5	0	0	4	12	53	127	202	500	402	88
Montana	271	2	1	0	1	1	1	8	22	117	100	18
Nebraska	532	4	0	0	0	0	4	26	59	247	151	41

Figure 43 - Continued
Distribution of Census Tracts by Ratio of Residential Fixed Connections to Tract Households by State as of June 30, 2016
(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	1	2	7	13	22	59	167	298	109
New Hampshire	294	2	0	0	0	0	1	0	2	47	189	53
New Jersey	2,004	11	0	0	1	2	5	7	40	434	1,204	300
New Mexico	499	1	5	2	6	13	13	42	75	190	128	24
New York	4,900	73	1	3	16	16	22	84	209	1,503	2,356	617
North Carolina	2,183	19	3	1	1	6	14	91	228	779	718	323
North Dakota	205	0	0	0	0	0	0	7	16	120	48	14
Northern Mariana Isl	22	2	0	0	1	1	7	7	2	2	0	0
Ohio	2,946	6	0	0	4	17	54	162	268	1,067	1,086	282
Oklahoma	1,046	2	2	1	13	30	64	132	183	347	198	74
Oregon	827	2	0	0	0	3	4	17	30	277	430	64
Pennsylvania	3,217	22	0	0	4	6	19	67	236	1,374	1,299	190
Puerto Rico	903	24	26	24	107	131	149	144	90	90	42	76
Rhode Island	241	1	0	0	0	0	0	1	5	70	146	18
South Carolina	1,097	11	0	0	0	14	44	103	145	342	313	125
South Dakota	222	0	0	1	0	1	7	20	30	120	37	6
Tennessee	1,497	22	1	1	6	26	85	147	221	552	356	80
Texas	5,253	40	0	0	20	80	201	524	715	1,639	1,523	511
Utah	588	4	2	2	1	0	1	2	14	156	336	70
Vermont	184	1	0	0	0	0	2	0	1	43	92	45
Virgin Islands	29	0	0	1	2	5	5	5	6	3	2	0
Virginia	1,895	24	0	0	4	20	52	98	178	468	838	213
Washington	1,446	3	0	0	1	5	9	24	35	326	855	188
West Virginia	484	0	1	1	4	11	19	43	84	202	91	28
Wisconsin	1,393	3	1	0	2	3	5	42	113	639	507	78
Wyoming	132	1	0	0	0	1	1	5	10	62	45	7
Total	73,767	553	72	60	309	691	1,725	3,759	6,417	23,515	29,363	7,303

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

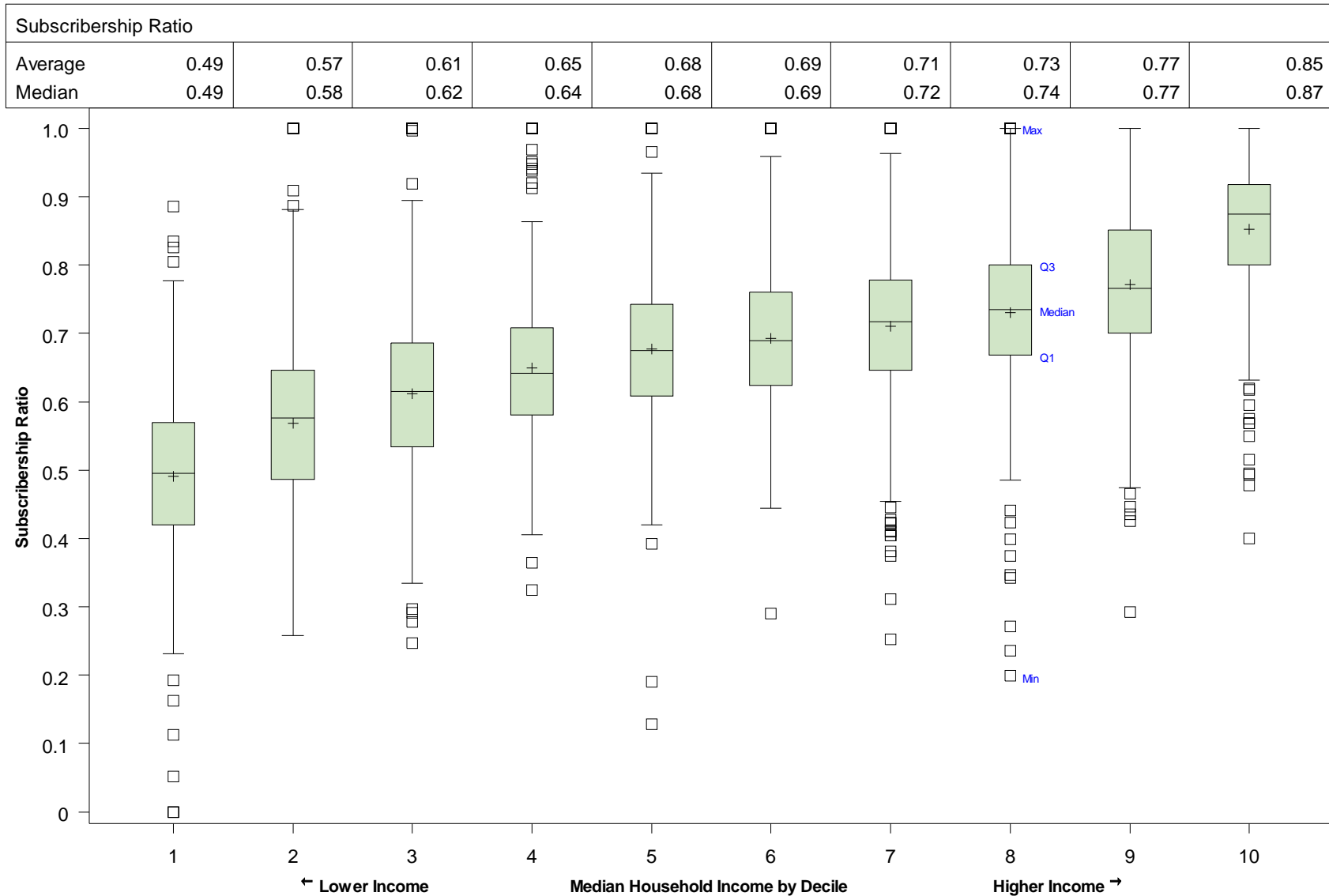
Sources: FCC Form 477; 2011-2015 ACS 5-year estimates (Households for U.S. and District of Columbia); Census 2010 (Households for Puerto Rico, American Samoa, Guam, Northern Mariana Islands and U.S. Virgin Islands).

SECTION 5
CORRELATED RESULTS: DEMOGRAPHIC MEASURES

Table of Contents

Figure 44	Subscribership Ratio Distributions by Income Deciles as of June 30, 2016	49
Figure 45	Subscribership Ratio Distributions by Density Deciles as of June 30, 2016.....	50
Figure 46	Subscribership Ratio Distributions by Share of Population with a College Degree (in Deciles) as of June 30, 2016.....	51
Figure 47	Subscribership Ratio Distributions by Average Age of County Population (in Deciles) as of June 30, 2016.....	52
Figure 48	Subscribership Ratio Distributions by Share of White Alone (in Deciles) as of June 30, 2016.....	53
Figure 49	Subscribership Ratios by Technology and Tract Household Density as of June 30, 2016.....	54
Figure 50	Average Subscribership Ratios by Income and Household Density as of June 30, 2016.....	55

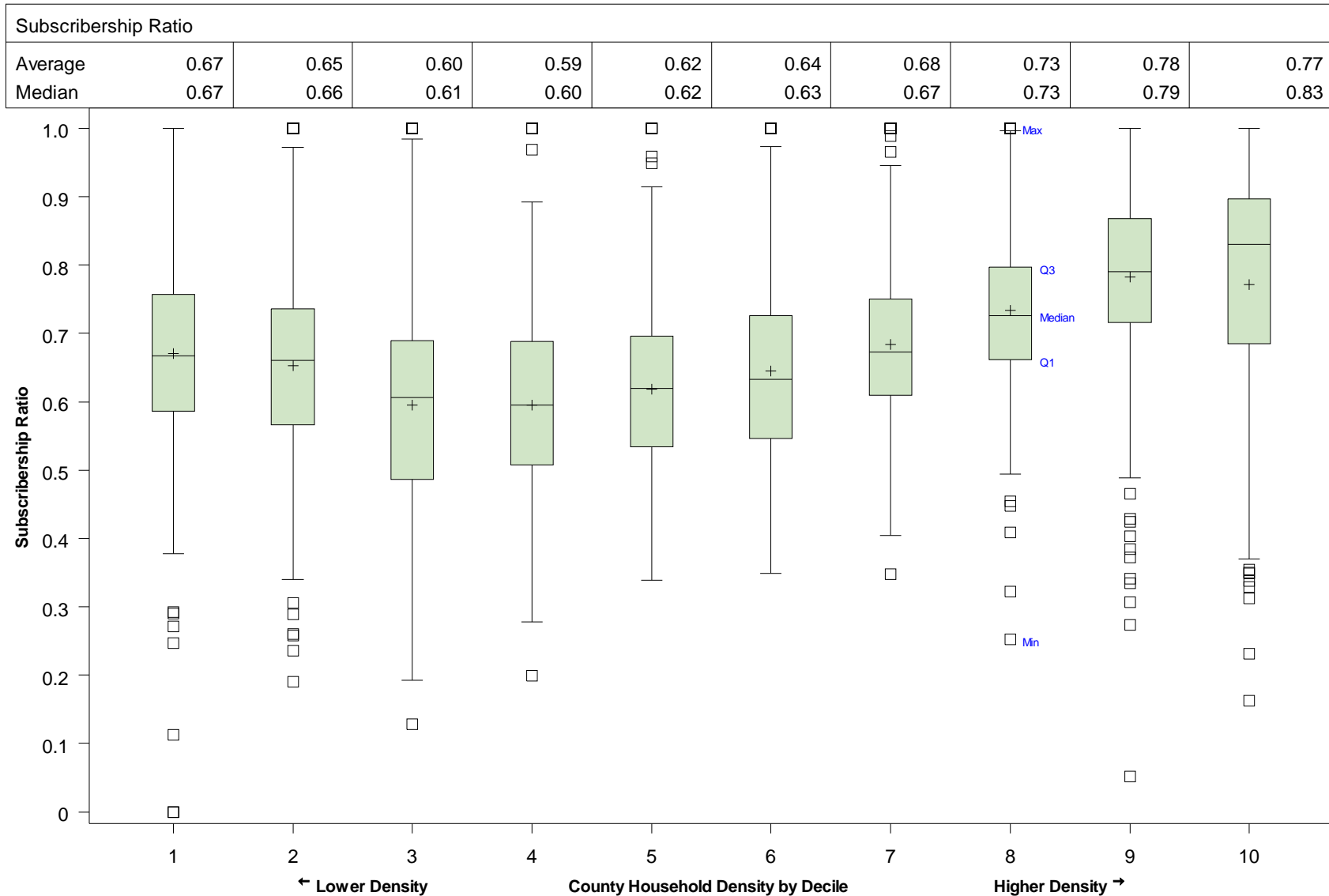
Figure 44
Subscribership Ratio Distributions by Income Deciles as of June 30, 2016



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; 2011-2015 ACS 5-year Estimates; Census 2010.

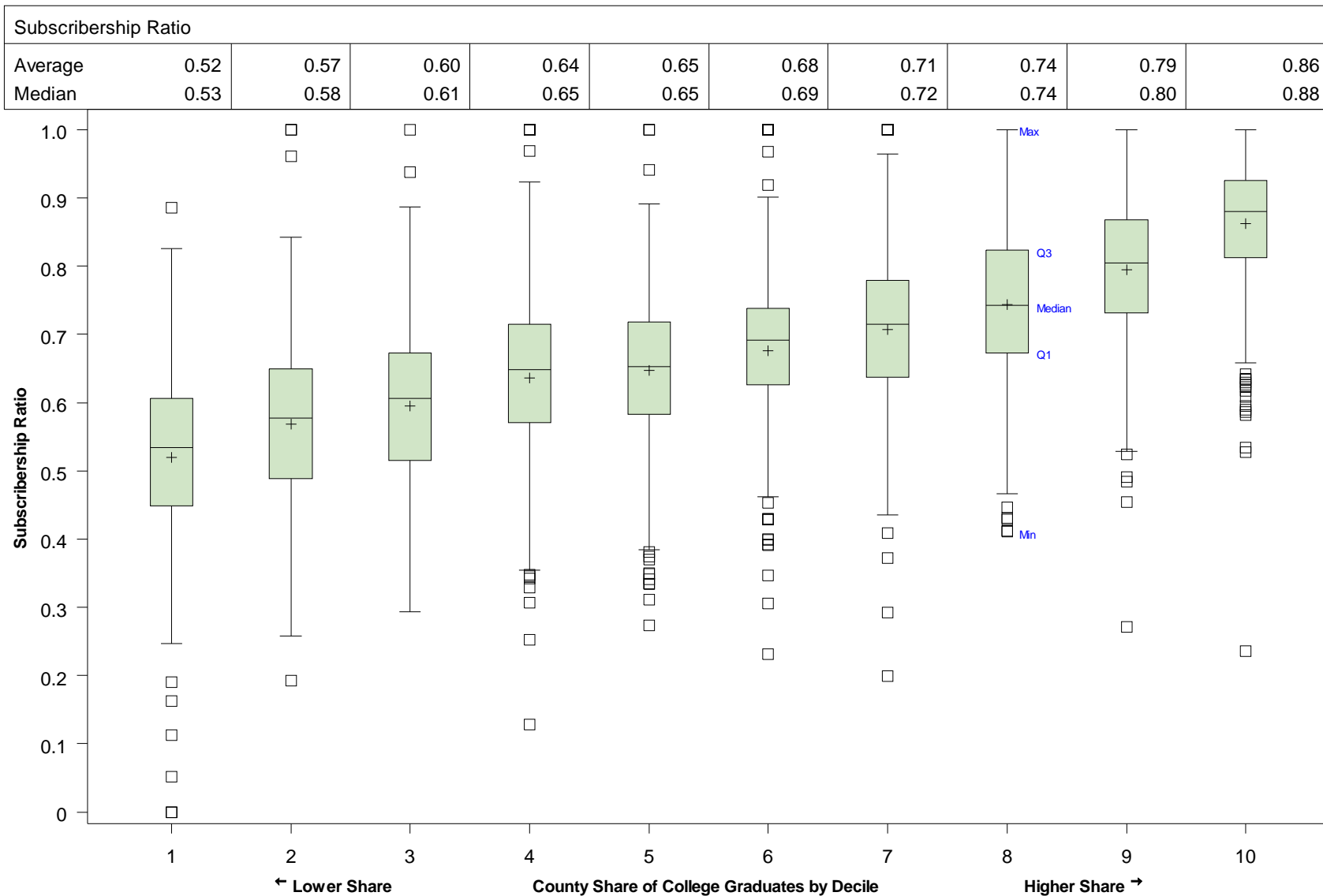
Figure 45
Subscribership Ratio Distributions by Density Deciles as of June 30, 2016



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; 2011-2015 ACS 5-year Estimates; Census 2010.

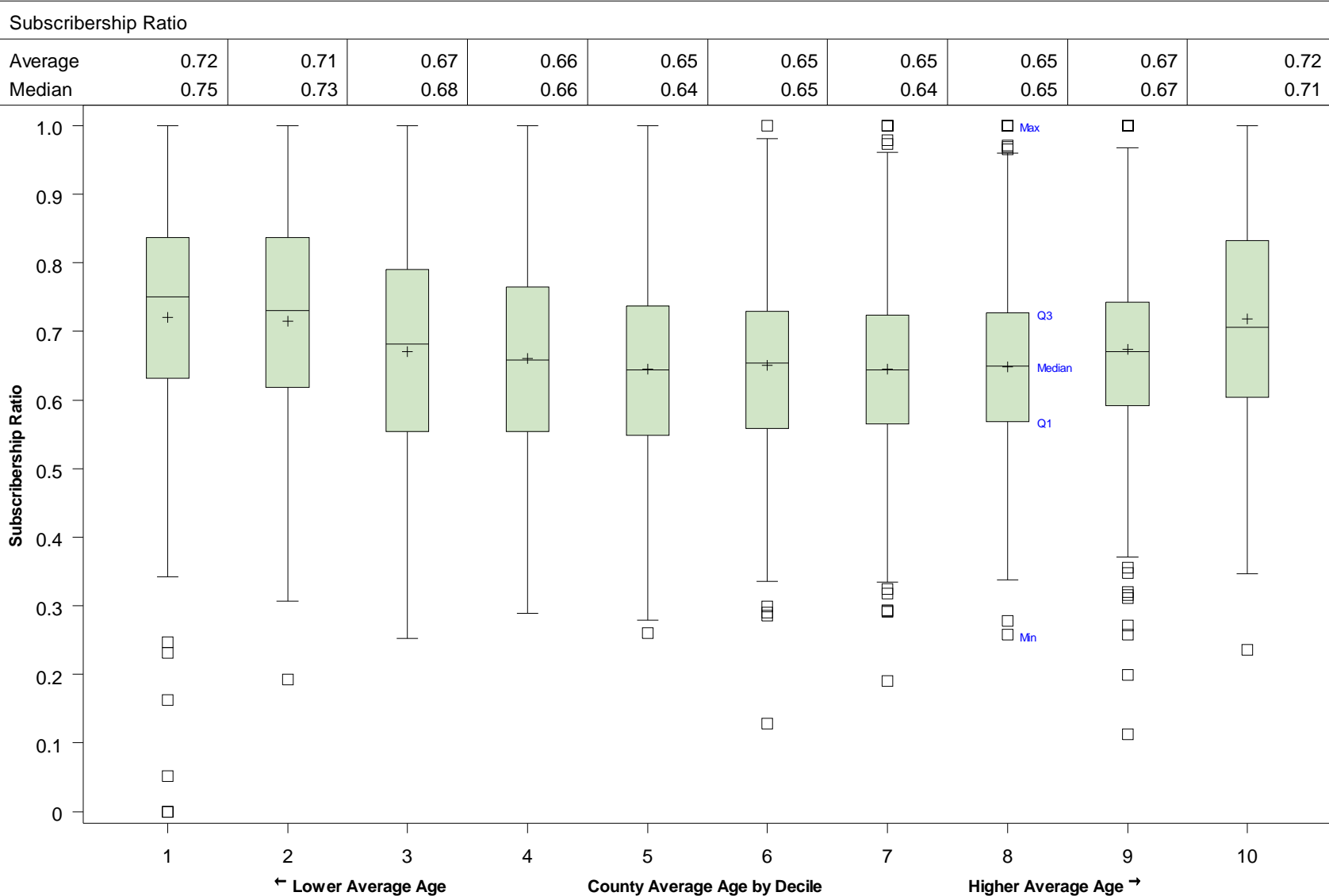
Figure 46
Subscribership Ratio Distributions by Share of Population with a College Degree (in Deciles) as of June 30, 2016



Note: Each box plot shows the distribution of residential subscribership to connections over 200 kbps in at least one direction for counties in the share 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 a 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; 2011-2015 ACS 5-year Estimates; Census 2010.

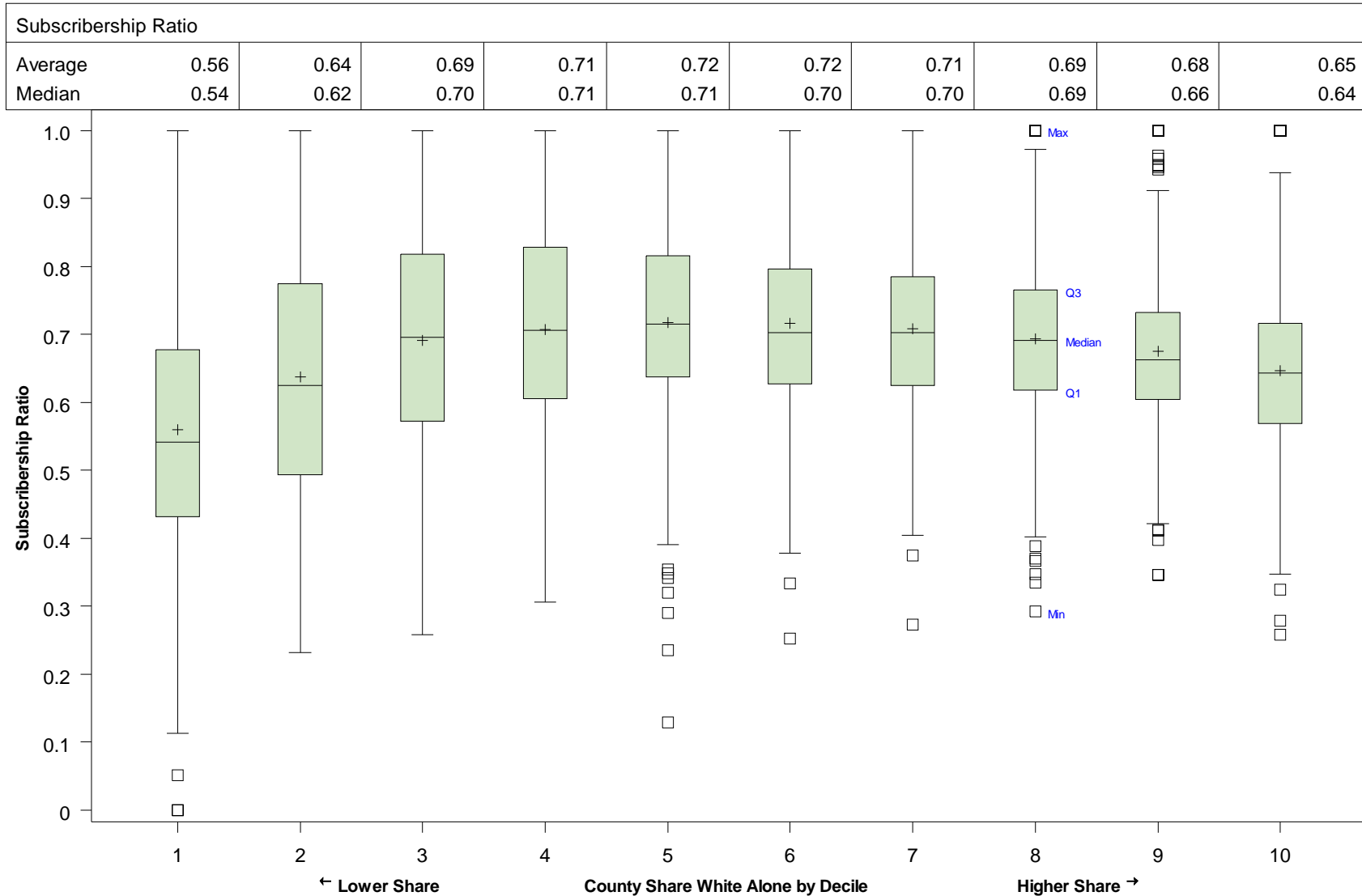
Figure 47
Subscribership Ratio Distributions by Average Age of County Population (in Deciles) as of June 30, 2016



Note: Each box plot shows the distribution of residential subscribership to connections over 200 kbps in at least one direction for counties in the average age 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 a data point beyond $Q1-1.5(Q3-Q1)$ or $Q3+1.5(Q3-Q1)$. Ratios greater than 1 were set to 1.

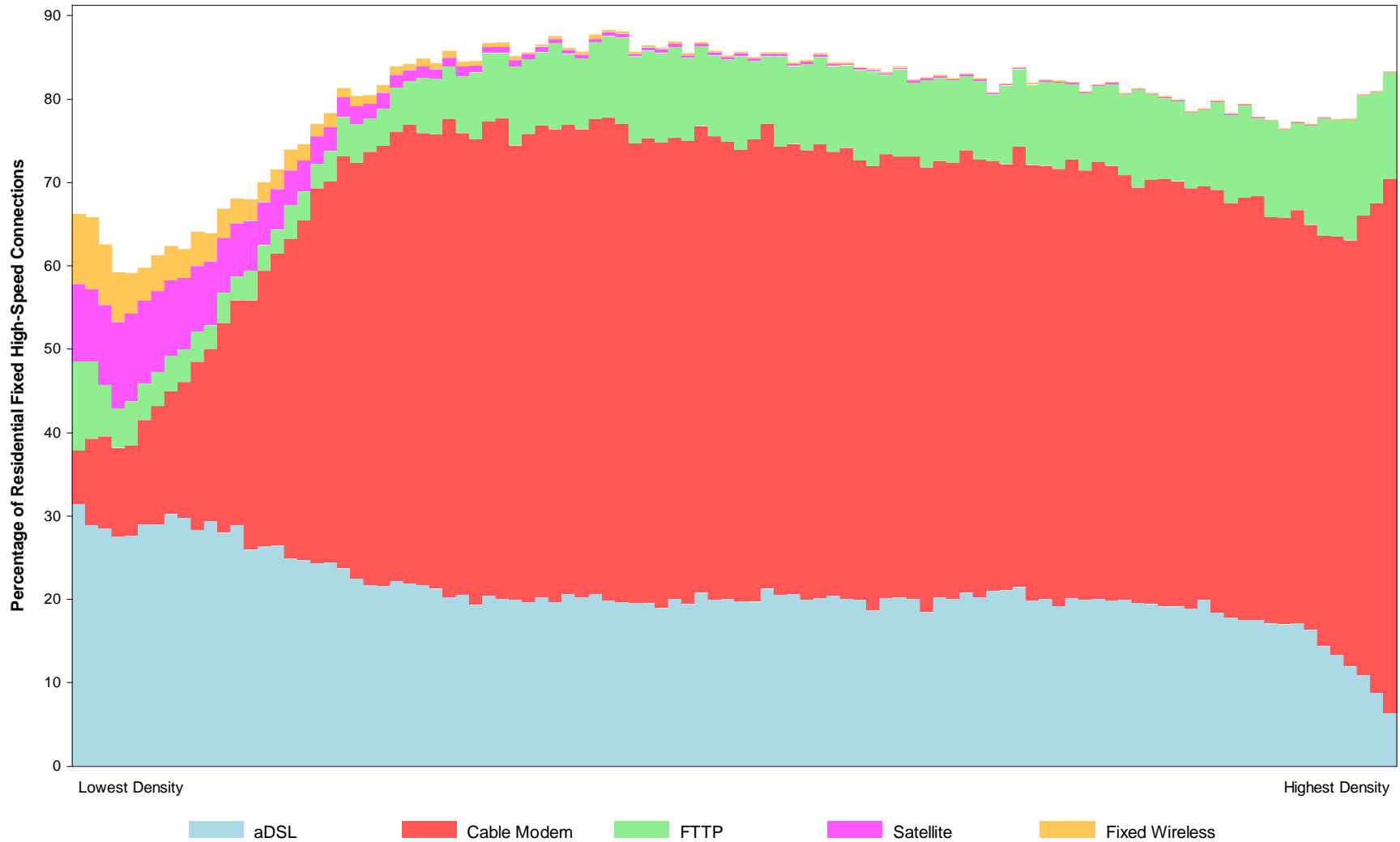
Sources: FCC Form 477; 2011-2015 ACS 5-year Estimates; Census 2010.

Figure 48
Subscribership Ratio Distributions by Share White Alone (in Deciles) as of June 30, 2016



Note: Each box plot shows the distribution of residential subscribership to connections over 200 kbps in at least one direction for counties in each race decile. Counties were grouped into deciles based on the share of the county population that reported their race as white alone. 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; \perp is the minimum observation above $Q1-1.5(Q3-Q1)$; \top is the maximum observation below $Q3+1.5(Q3-Q1)$; and \square is a 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; 2011-2015 ACS 5-year Estimates; Census 2010.

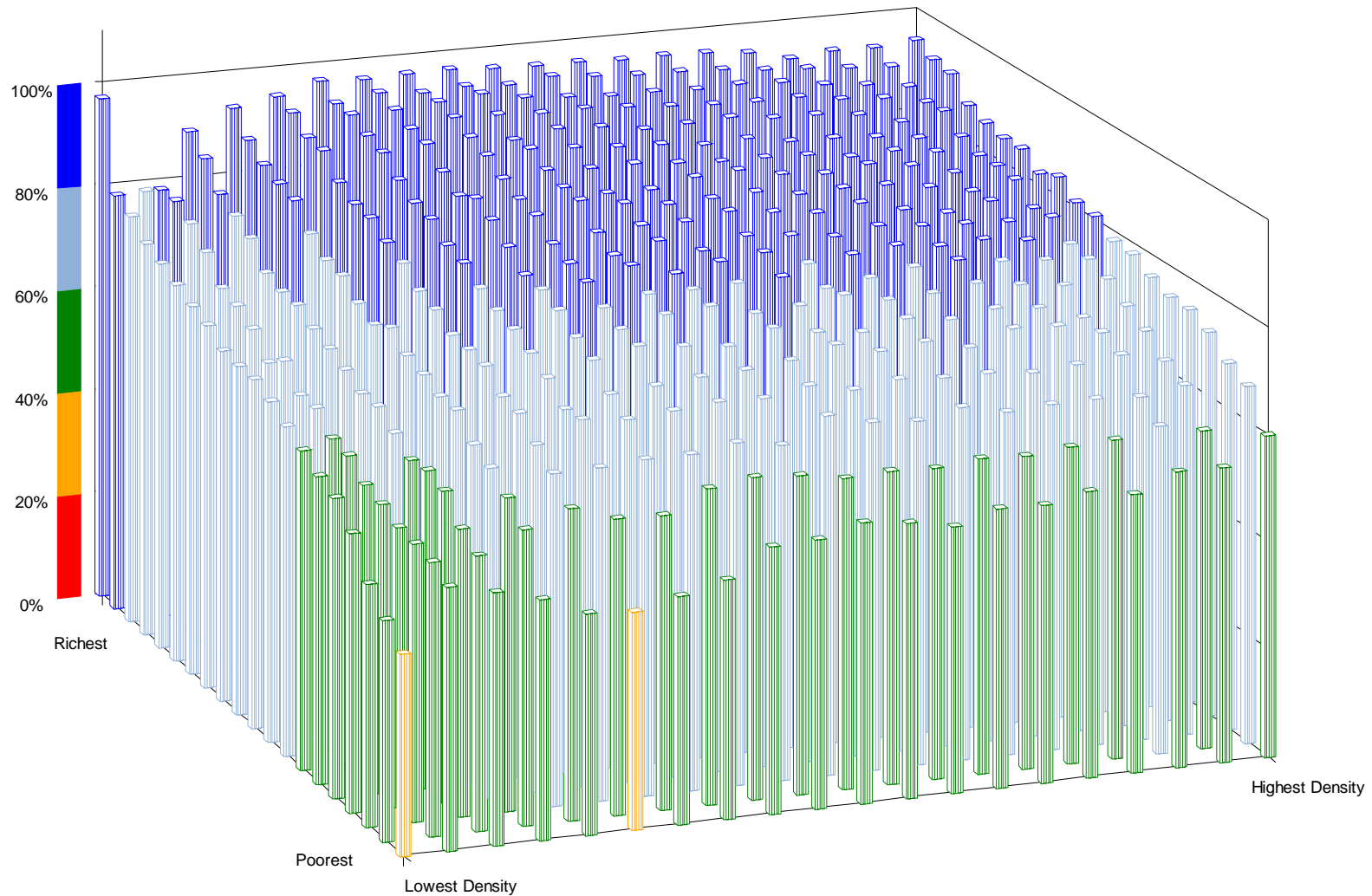
Figure 49
Subscribership Ratios by Technology and Tract Household Density as of June 30, 2016
(Residential fixed connections over 200 kbps in at least one direction)



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; 2011-2015 ACS 5-year estimates; and Census 2010.

Figure 50
Average Subscribership Ratios by Income and Household Density as of June 30, 2016
(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; 2011-2015 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 477.¹ Detailed information about those changes and about the Form 477 reporting requirements in general is available at 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

¹ *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>.

copper-based connections, not elsewhere categorized, that deliver *Internet access* service at the end-user 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

Term	Definition
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 June 30, 2016*

You can help us provide the best possible information to the public by completing this form and returning it to the Industry Analysis and Technology Division of the FCC's Wireline Competition Bureau.

1. Please check the category that best describes you:

- press
- current telecommunications carrier
- potential telecommunications carrier
- business customer evaluating vendors/service options
- consultant, law firm, lobbyist
- other business customer
- academic/student
- residential customer
- FCC employee
- other federal government employee
- state or local government employee
- Other (please specify)

2. Please rate the report: Excellent Good Satisfactory Poor No opinion

Data accuracy	(<input type="checkbox"/>)	(<input type="checkbox"/>)	(<input type="checkbox"/>)	(<input type="checkbox"/>)	(<input type="checkbox"/>)
Data presentation	(<input type="checkbox"/>)	(<input type="checkbox"/>)	(<input type="checkbox"/>)	(<input type="checkbox"/>)	(<input type="checkbox"/>)
Timeliness of data	(<input type="checkbox"/>)	(<input type="checkbox"/>)	(<input type="checkbox"/>)	(<input type="checkbox"/>)	(<input type="checkbox"/>)
Completeness of data	(<input type="checkbox"/>)	(<input type="checkbox"/>)	(<input type="checkbox"/>)	(<input type="checkbox"/>)	(<input type="checkbox"/>)
Text clarity	(<input type="checkbox"/>)	(<input type="checkbox"/>)	(<input type="checkbox"/>)	(<input type="checkbox"/>)	(<input type="checkbox"/>)
Completeness of text	(<input type="checkbox"/>)	(<input type="checkbox"/>)	(<input type="checkbox"/>)	(<input type="checkbox"/>)	(<input type="checkbox"/>)

3. Overall, how do you rate this report? Excellent Good Satisfactory Poor No opinion

	(<input type="checkbox"/>)	(<input type="checkbox"/>)	(<input type="checkbox"/>)	(<input type="checkbox"/>)	(<input type="checkbox"/>)
--	------------------------------	------------------------------	------------------------------	------------------------------	------------------------------

4. How can this report be improved?

5. May we contact you to discuss possible improvements?

Name:
Telephone #:

To discuss the information in this report, contact: 202-418-0940 or for users of TTY equipment, call 202-418-0484		
Fax this response to 202-418-0520	or	Mail this response to
Scan and email to IATDreports@fcc.gov		FCC/WCB/IATD, Mail Stop 1600 F Washington, DC 20554