

Internet Access Services: Status as of December 31, 2019

Industry Analysis Division
Office of Economics & Analytics
August 2023



This report is available for reference in the FCC's Reference Information Center, 45 L Street NE, Washington, DC 20554. Copies may be purchased by contacting Best Copy and Printing, Inc., 45 L Street NE, Washington, DC 20554, telephone (800) 378-3160, or via their website at www.bcpweb.com. The report can also be downloaded from the Internet Access Services Reports webpage at www.fcc.gov/internet-access-services-reports. To discuss the information in this report, please call (202) 418-0940 or send an e-mail to OEA-IAReports@fcc.gov.

TABLE OF CONTENTS

SECTION 1: OVERVIEW & HIGHLIGHTS	1
Introduction.....	1
Total Connections	2
Figure 1 Fixed and Mobile Connections by Speed 2016-2019	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 2016-2019	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 2004-2019	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	 55
Glossary	58

SECTION 1: OVERVIEW & HIGHLIGHTS

Introduction

This report summarizes information about Internet access connections in the United States as of December 31, 2019 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 are available online at <https://www.fcc.gov/internet-access-services-reports>.

¹ See the Technical Notes and Glossary at the end of this report for more-detailed information about the FCC Form 477 data collection and the meaning of terms used in this report.

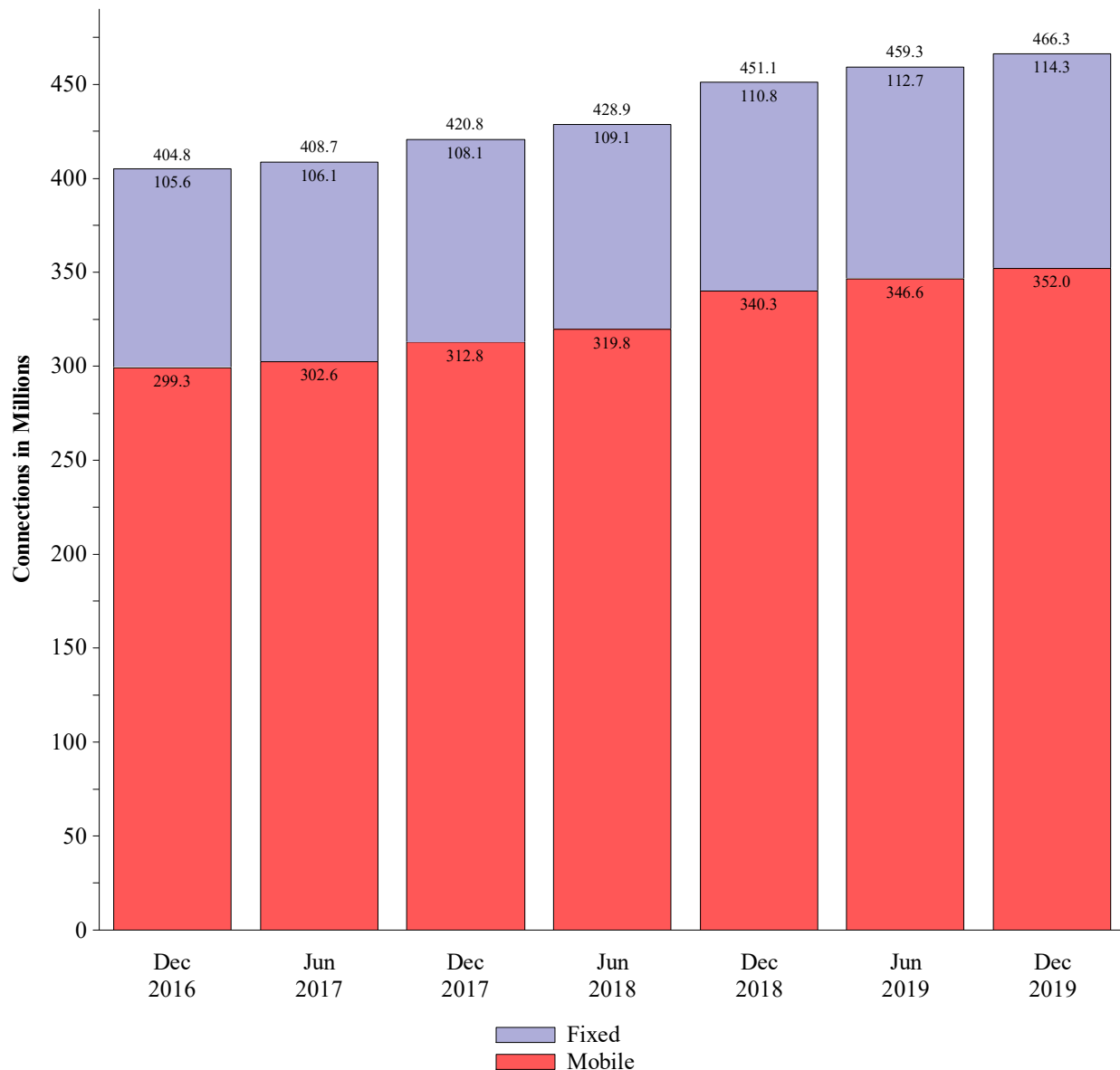
² The Commission began collecting census tract-level data for data as of December 31, 2008. *See High-Speed Services for Internet Access: Status as of December 31, 2008* (February 2010) at 1-4, available at <http://www.fcc.gov/encyclopedia/high-speed-services-internet-access-reports> (December 2008 High-Speed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

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, total Internet connections increased by about 3.4% between December 2018 and December 2019 to 466 million. Mobile Internet connections increased 3.4% year-over-year to 352 million in December 2019, while fixed connections grew to 114 million – up about 3.2% from December 2018.

Figure 1
Fixed and Mobile Connections 2016-2019



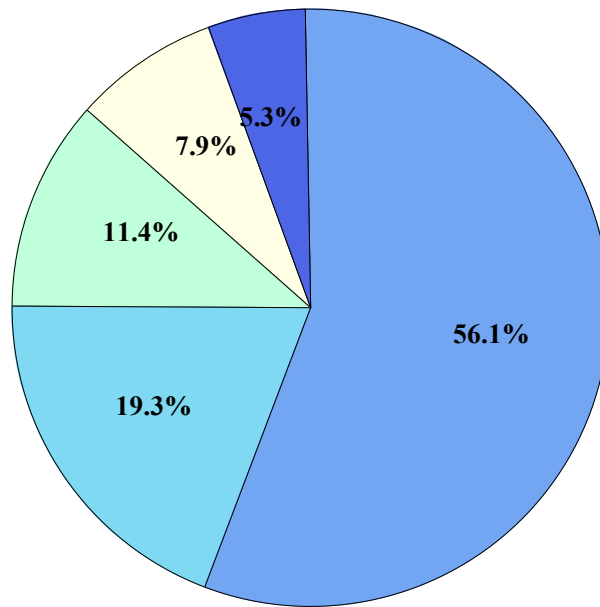
Note: Some previously-published data may have been revised. Numbers may not sum to totals due to rounding. Connections include both residential and business connections. We believe mobile Internet connections remain underreported by as much as 2% through June 2018 due to inadequate accounting of connections sold by downstream mobile virtual network operators (MVNOs).

Source: FCC Form 477.

Connections by Speed

Fixed connections – downstream speeds. Figure 2(a) illustrates how the 114 million fixed connections reported for December 2019 were distributed across the five groups of *downstream speeds* defined by breakpoints at 10 Mbps, 25 Mbps, 100 Mbps, and 940 Mbps. See Figure 9 for more detail.

Figure 2(a)
Distribution of Fixed Connections (114.3 million) by Downstream Speed
as of December 31, 2019

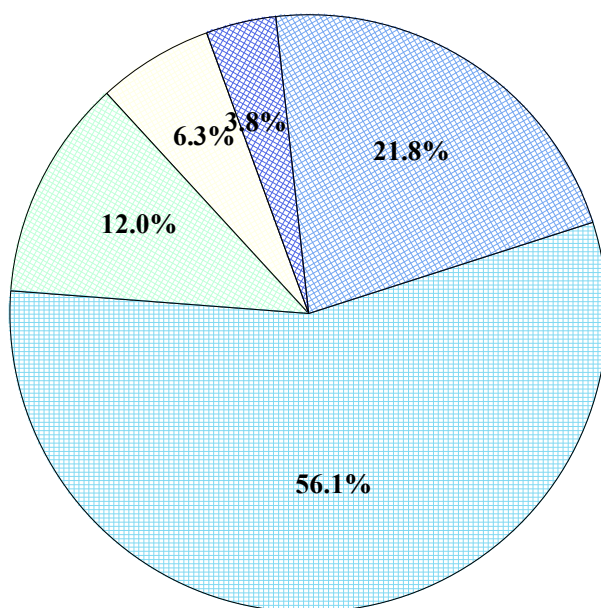


Downstream Speed	Less than 10 Mbps (9.0 million)
	At least 10 Mbps & less than 25 Mbps (13.1 million)
	At least 25 Mbps & less than 100 Mbps (22.1 million)
	At least 100 Mbps & less than 940 Mbps (64.1 million)
	At least 940 Mbps (6.0 million)

Note: Numbers may not sum to total due to rounding.
Source: FCC Form 477.

Fixed connections – upstream speeds. Figure 2(b) illustrates how the 114 million fixed connections reported for December 2019 were distributed across the five groups of *upstream speeds* defined by breakpoints at 1 Mbps, 3 Mbps, 20 Mbps, and 500 Mbps. See Figure 9 for more detail.

Figure 2(b)
Distribution of Fixed Connections (114.3 million) by Upstream Speed
as of December 31, 2019

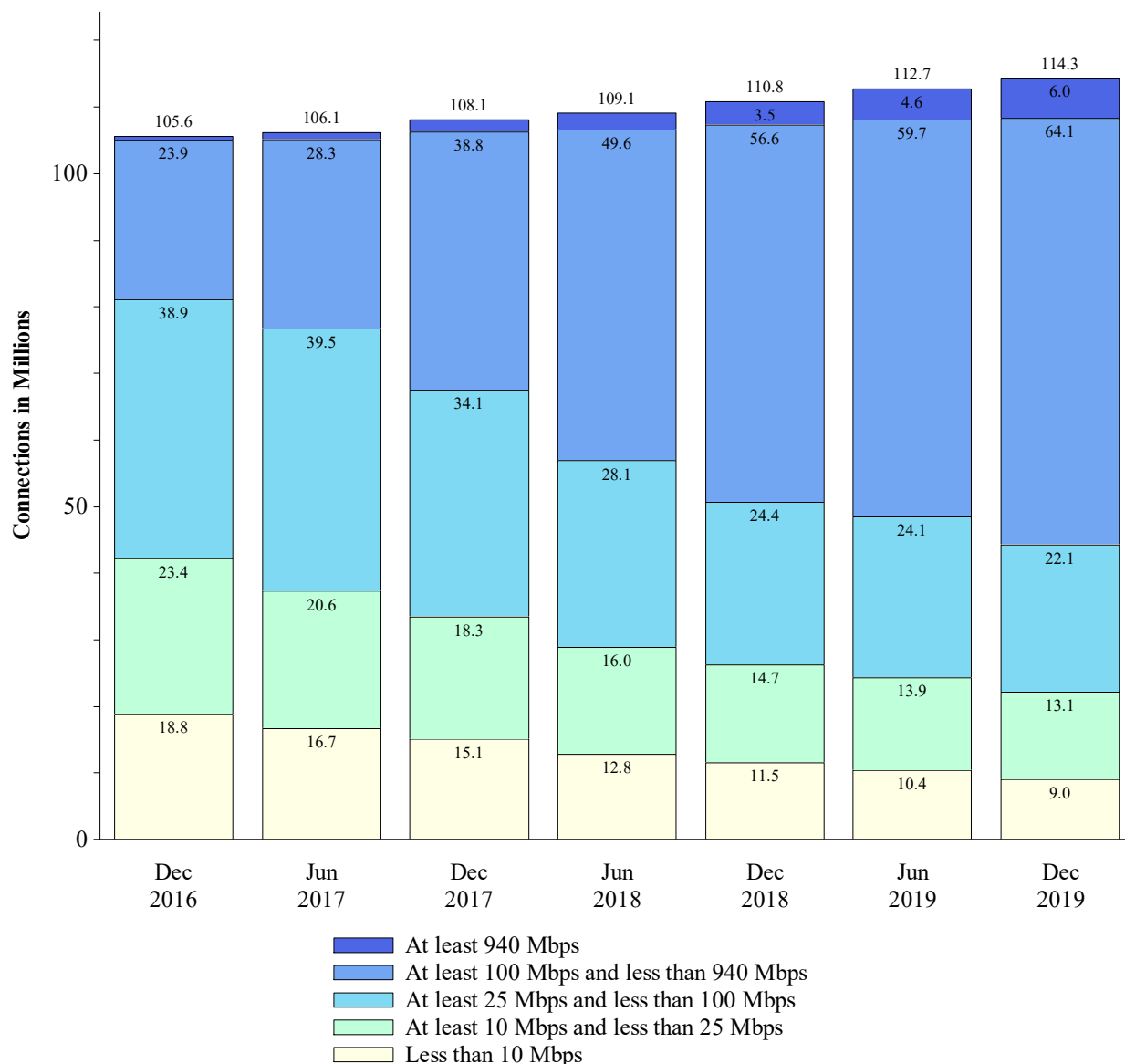


Upstream Speed		Less than 1 Mbps (7.2 million)
		At least 1 Mbps & less than 3 Mbps (13.7 million)
		At least 3 Mbps & less than 20 Mbps (64.2 million)
		At least 20 Mbps & less than 500 Mbps (25.0 million)
		At least 500 Mbps (4.3 million)

Note: Numbers may not sum to total due to rounding.
Source: FCC Form 477.

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 2016 to 2019.

Figure 3
Fixed Connections by Downstream Speed 2016-2019



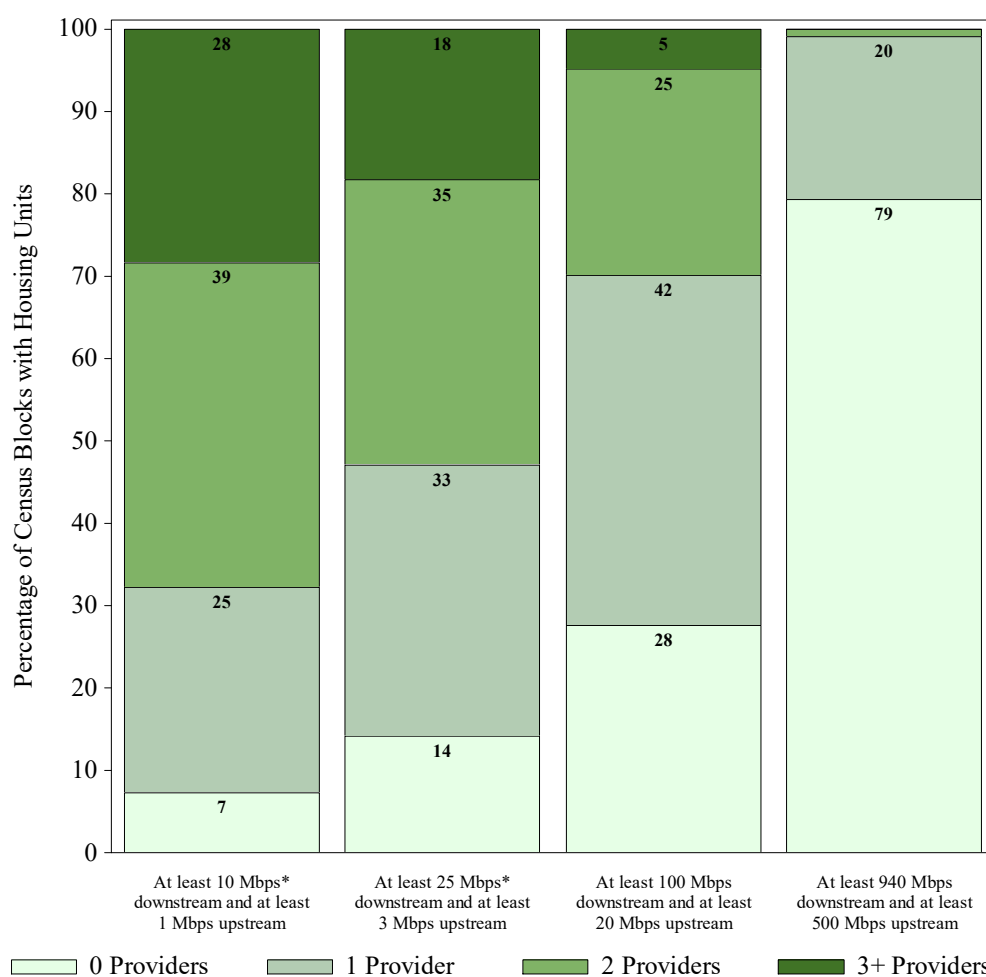
Note: Some previously-published data may have been revised. Numbers may not sum to totals due to rounding. Connections include both residential and business connections.
Source: FCC Form 477.

- The percentage of fixed connections with a downstream speed of at least 100 Mbps has grown from 23% (or 24 million connections) in December 2016 to 61% (or 70 million connections) in December 2019. Over the same period, the percentage of fixed connections with downstream speeds of less than 10 Mbps has decreased from 18% (or 19 million connections) in December 2016 to about 8% (or about 9 million connections) in December 2019.

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 2019. This information is taken from the block-level FCC Form 477 fixed broadband deployment data that the Commission began collecting in 2014.⁴ 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, 2019



* Satellite service providers are excluded from 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.

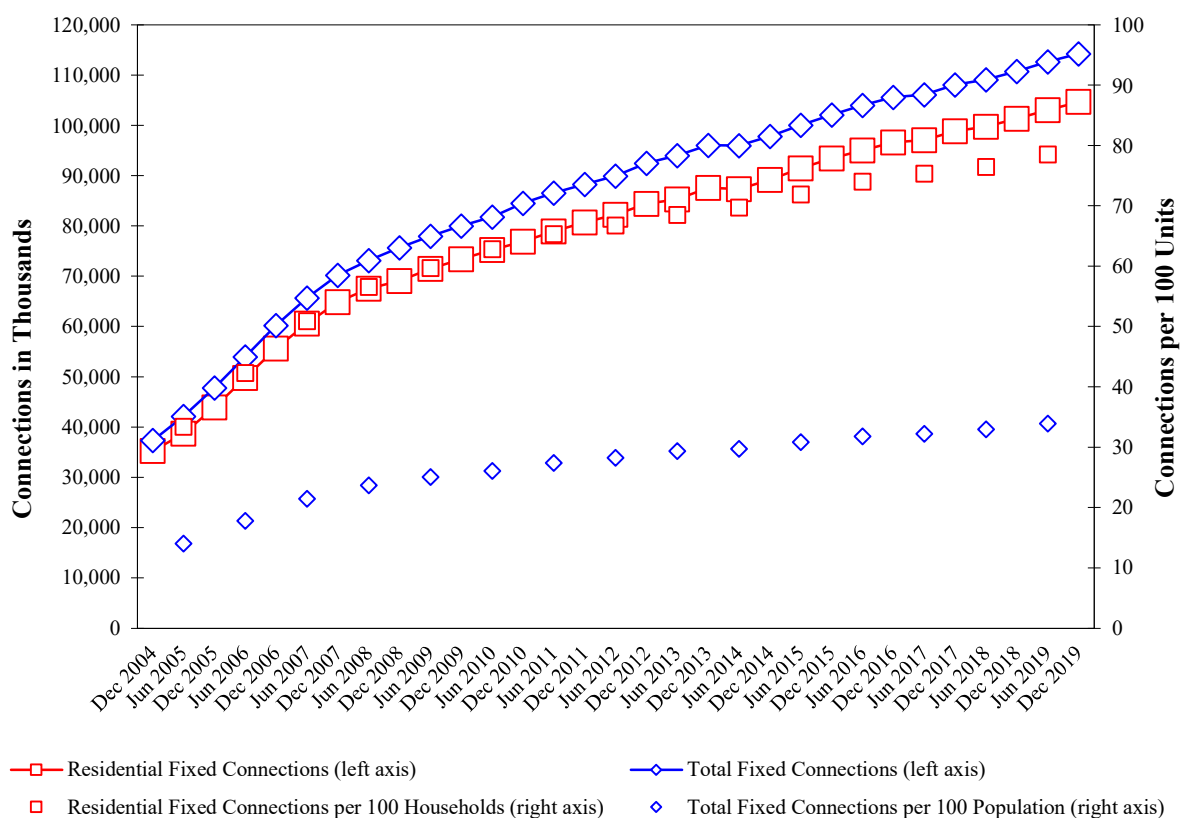
Note: Numbers may sum to totals due to rounding. Developed census blocks are those with housing units based on the 2010 census. Source: FCC Form 477.

⁴ Download these data and explore the interactive map at <https://broadband477map.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 2004.⁵

Figure 5
Fixed Connections 2004-2019
(Connections over 200 kbps in at least one direction)



- Between December 2009 and December 2019, total (business and residential) fixed connections grew from 80 million connections to 114 million connections – at a compound annual growth rate of 4% per year.⁶

⁵ 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>.

⁶ The compound annual growth rate (CAGR) is a smoothed rate of growth calculated in three steps: (1) divide the ending value by the beginning value; (2) 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); (3) subtract the number one from the result of the second step.

- Over the same ten-year period, residential fixed connections grew from 73 million connections to 105 million connections – also at a compound annual growth rate of 4% per year.
- From June 2009 to June 2019, the number of residential fixed connections per 100 U.S. households increased from 60 to 80.⁷

Other Report Highlights

Typical speeds

- The median downstream speed of all reported fixed connections was 100 Mbps and the median upstream speed was 10 Mbps. For residential fixed connections, the median downstream speed was 100 Mbps and the median upstream speed was 10 Mbps.

Residential connections

- Residential fixed Internet access connections increased by about 3.3% between December 2018 and December 2019, to about 105 million. *See Figure 7.*
- Residential (non-business) mobile wireless Internet access connections on mobile devices with data plans for full Internet access increased by about 2.4%, to 270 million, between December 2018 and December 2019. *See Figure 7.*
- Approximately 91% of residential fixed connections had a speed of at least 10 Mbps downstream and 1 Mbps upstream in December 2019, while 80% had a speed of at least 25 Mbps downstream and 3 Mbps upstream. About 63% percent of all residential fixed connections had a downstream speed of at least 100 Mbps. *See Figures 10 and 29.*
- As a national average in December 2019, there were about 79 residential fixed connections with speeds of at least 10 Mbps downstream and 1 Mbps upstream per 100 households; 69 residential fixed connections with speeds of at least 25 Mbps downstream and 3 Mbps upstream per 100 households; and 19 residential fixed connections with speeds of at least 100 Mbps downstream and 20 Mbps upstream per 100 households.⁸ *See Figure 34.*

⁷ 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 40 because there were about 131 million households in the United States and inhabited insular areas and a population of about 332 million according to the sources used for Figure 5.)

⁸ 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*,

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, 2019.⁹ We continue to observe substantial variation among these estimates. *See* Figures 39 and 41.

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 46-51.

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).

⁹ 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 2015-2019	12
Figure 7	Residential Connections over 200 kbps in at Least One Direction 2015-2019	12
Figure 8	Residential Fixed Connections by Downstream Speed 2016-2019	13
Figure 9	Distribution of Fixed Connections over 200 kbps in at Least One Direction as of December 31, 2019	14
Figure 10	Distribution of Residential Fixed Connections over 200 kbps in at Least One Direction as of December 31, 2019	15
Figure 11	Connections over 200 kbps in at Least One Direction by Technology 2015-2019	16
Figure 12	Connections by Technology as of December 31, 2019	16
Figure 13	Residential Connections over 200 kbps in at Least One Direction by Technology 2015-2019	17
Figure 14	Residential Connections by Technology as of December 31, 2019	17
Figure 15	Fixed Connections at Least 10 Mbps Downstream and 1 Mbps Upstream by Technology 2015-2019	18
Figure 16	Fixed Connections at Least 10 Mbps Downstream and 1 Mbps Upstream by Technology as of December 31, 2019	18
Figure 17	Residential Fixed Connections at Least 10 Mbps Downstream and 1 Mbps Upstream by Technology 2015-2019	19
Figure 18	Residential Fixed Connections at Least 10 Mbps Downstream and 1 Mbps by Technology as of December 31, 2019	19
Figure 19	Fixed Connections at Least 25 Mbps Downstream and 3 Mbps Upstream by Technology 2015-2019	20
Figure 20	Fixed Connections at Least 25 Mbps Downstream and 3 Mbps Upstream by Technology as of December 31, 2019	20
Figure 21	Residential Fixed Connections at Least 25 Mbps Downstream and 3 Mbps Upstream by Technology 2015-2019	21
Figure 22	Residential Fixed Connections at Least 25 Mbps Downstream and 3 Mbps Upstream by Technology as of December 31, 2019	21
Figure 23	Fixed Connections at Least 100 Mbps Downstream and 20 Mbps Upstream by Technology 2015-2019	22
Figure 24	Fixed Connections at Least 100 Mbps Downstream and 20 Mbps Upstream by Technology as of December 31, 2019	22
Figure 25	Residential Fixed Connections at Least 100 Mbps Downstream and 20 Mbps Upstream by Technology 2015-2019	23

Figure 26	Residential Fixed Connections at Least 25 Mbps Downstream and 3 Mbps Upstream by Technology as of December 31, 2019.....	23
Figure 27	Residential Fixed Connections over 200 kbps in at Least One Direction by Technology 2015-2019 (Shares of Selected Technologies)	24
Figure 28	Residential Fixed Connections over 200 kbps in at Least One Direction by Technology 2015-2019 (Net Adds for Selected Technologies)	24
Figure 29	Residential Fixed Connections by Technology as of December 31, 2019 (Shares of Selected Technologies for Selected Speeds)	25
Figure 30	Fixed Connections by Downstream Speed Tier and Technology as of December 31, 2019.....	26
Figure 31	Residential Fixed Connections by Downstream Speed Tier and Technology as of December 31, 2019	27
Figure 32	Nationwide Number of Providers of Connections over 200 kbps in at Least One Direction by Technology 2015-2019	28
Figure 33	Nationwide Number of Providers of Connections over 200 kbps in at Least One Direction - Selected Technologies 2015-2019	28

Figure 6
Connections over 200 kbps in at Least One Direction 2015-2019
(In thousands)

<i>Technology</i>	2015	2016		2017		2018		2019	
	<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	375,790	395,496	404,849	408,692	420,838	428,864	451,062	459,327	466,302
Total Fixed	102,111	103,980	105,593	106,130	108,065	109,087	110,784	112,725	114,291
Mobile Wireless	273,679	291,516	299,256	302,562	312,773	319,776	340,278	346,603	352,012

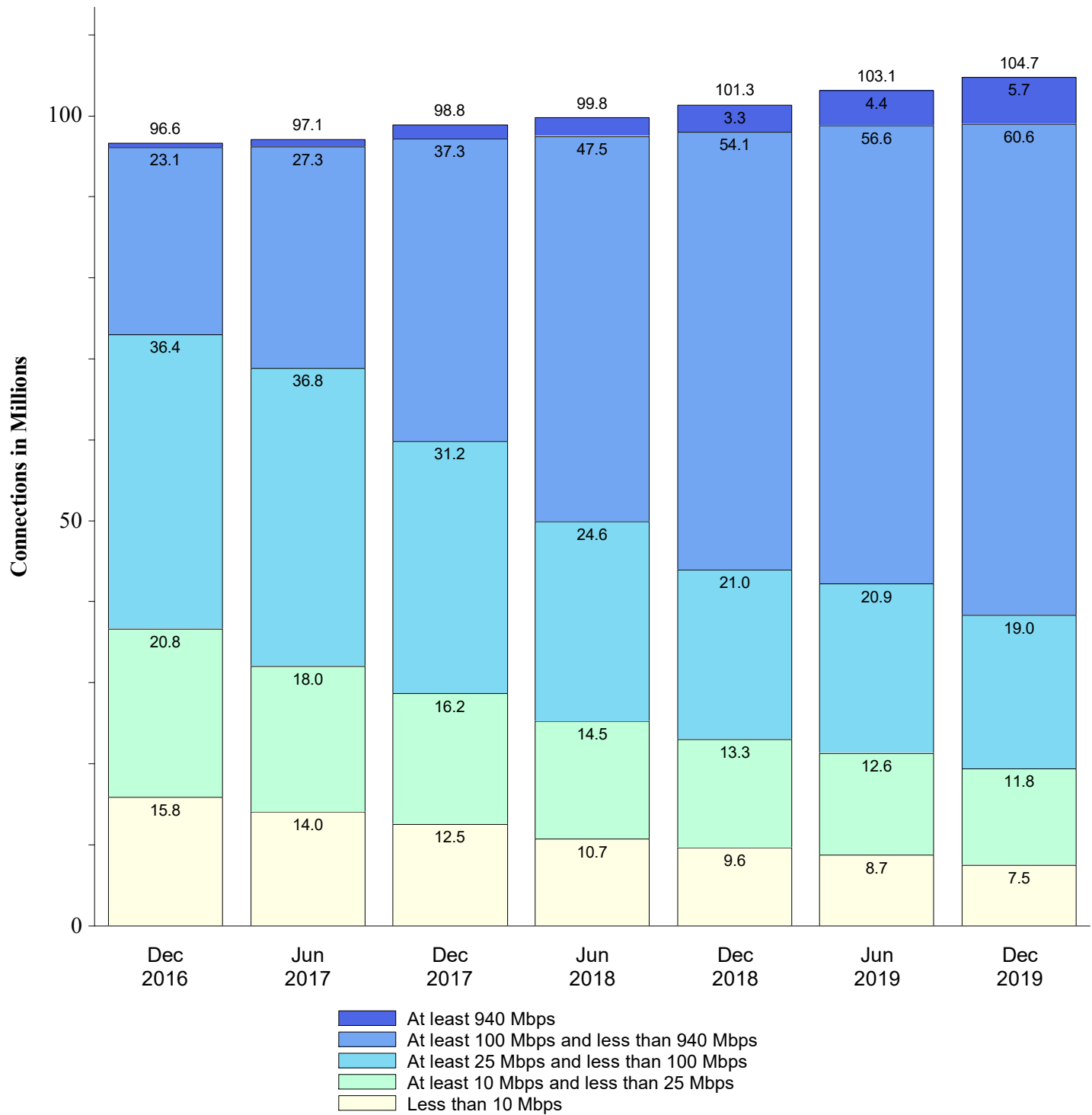
Some previously-published data may have been revised. Numbers may not sum to totals due to rounding.
Source: FCC Form 477.

Figure 7
Residential Connections over 200 kbps in at Least One Direction 2015-2019
(In thousands)

<i>Technology</i>	2015	2016		2017		2018		2019	
	<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	322,557	330,987	337,978	341,094	351,966	358,867	378,286	383,605	388,344
Total Fixed	93,434	95,001	96,607	97,071	98,845	99,758	101,348	103,118	104,703
Mobile Wireless	229,122	235,985	241,371	244,022	253,121	259,109	276,938	280,486	283,641

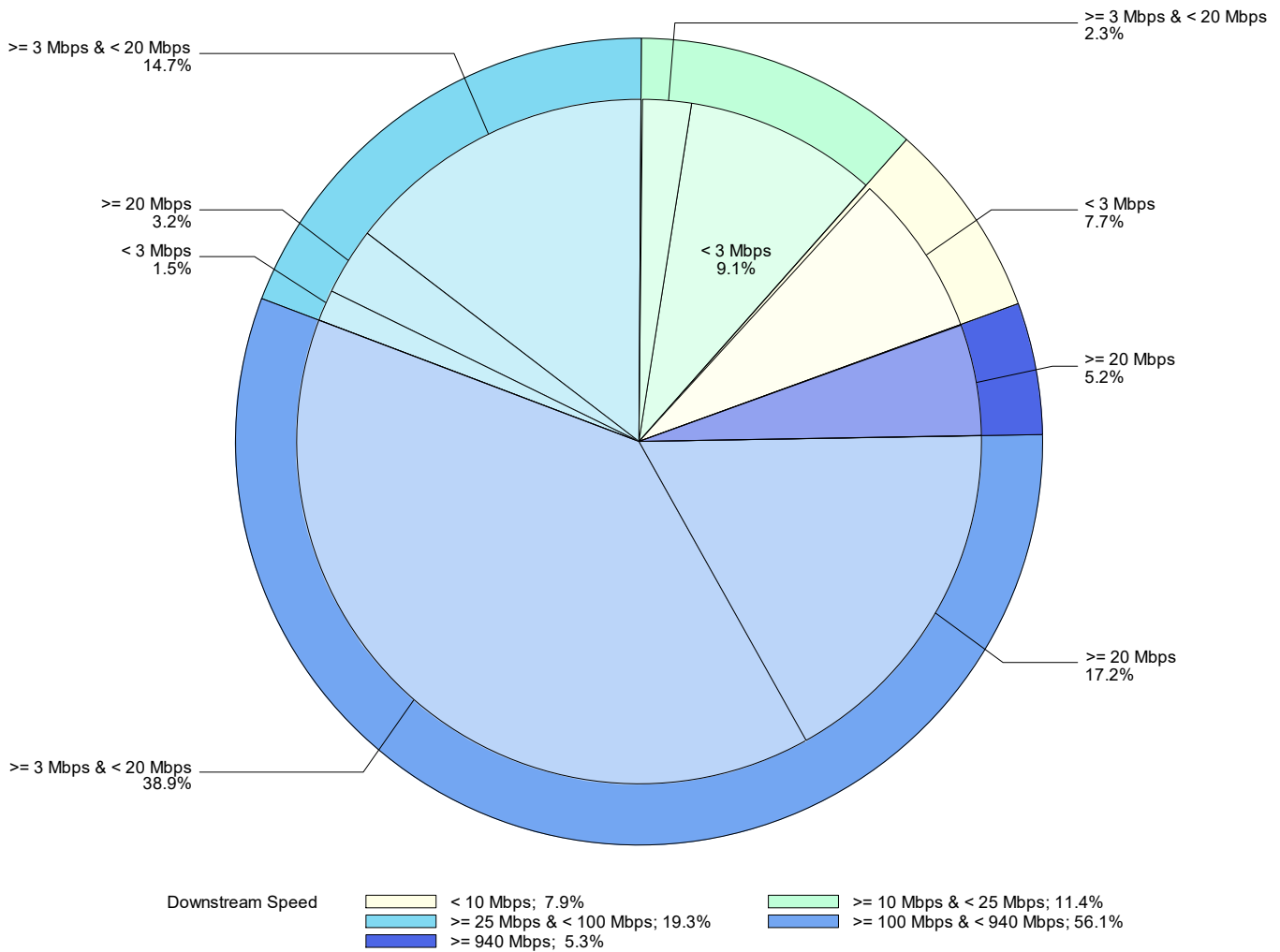
Some previously-published data may have been revised. Numbers may not sum to totals due to rounding.
Source: FCC Form 477.

Figure 8
Residential Fixed Connections by Downstream Speed 2016-2019



Note: Numbers may not sum to totals due to rounding.
Source: FCC Form 477.

Figure 9
Distribution of Fixed Connections over 200 kbps in at Least One Direction
as of December 31, 2019



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 10 Mbps	At least 10 Mbps and less than 25 Mbps	At least 25 Mbps and less than 100 Mbps	At least 100 Mbps and less than 940 Mbps	At least 940 Mbps	
Less than 3 Mbps	8,777	10,370	1,687	10	#	20,845
At least 3 Mbps & Less than 20 Mbps	270	2,628	16,779	44,437	39	64,153
At least 20 Mbps	#	77	3,614	19,614	5,989	29,293
Total	9,047	13,075	22,080	64,061	6,028	114,291

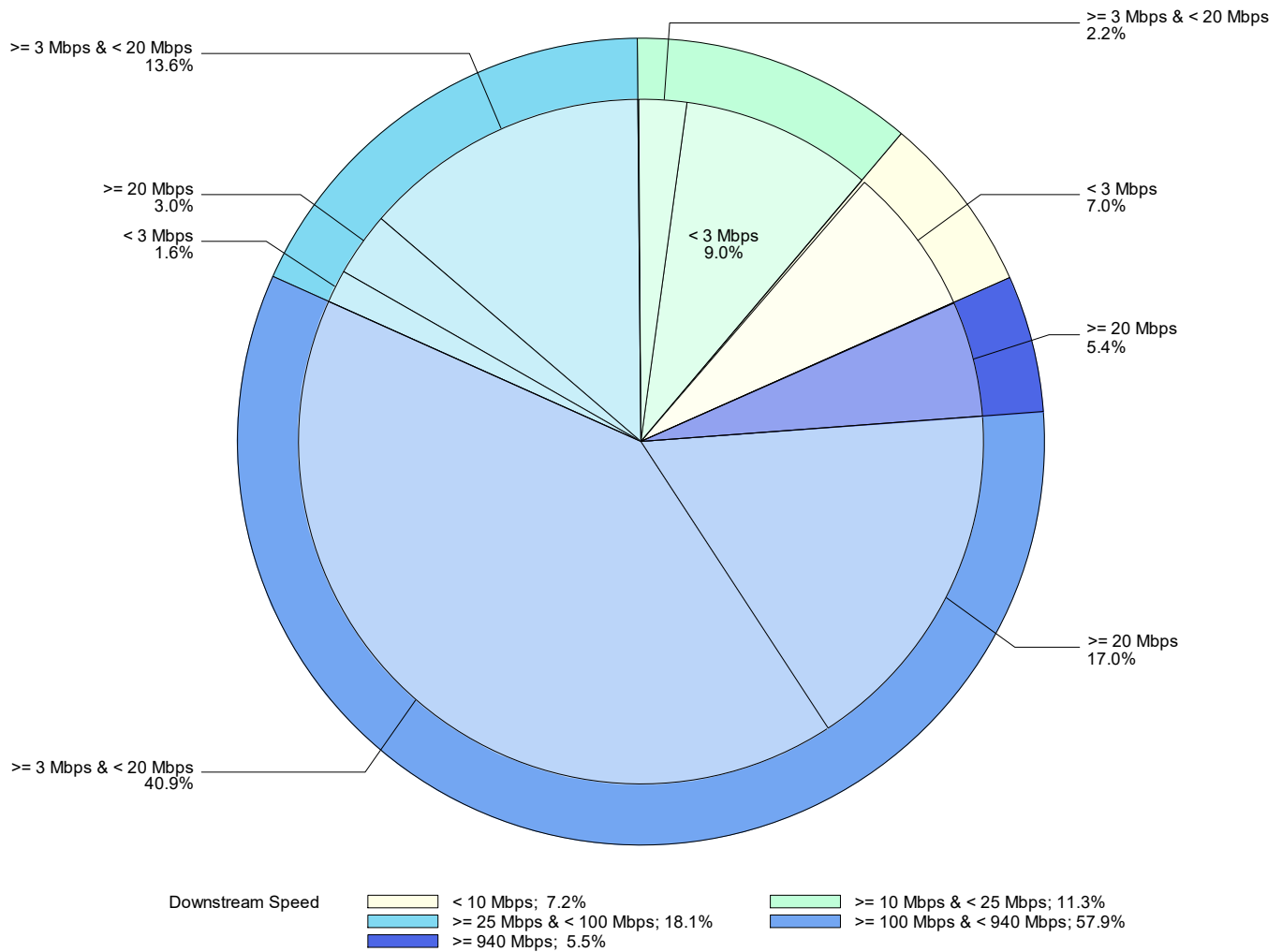
Percentages

Less than 3 Mbps	7.7	9.1	1.5	0.0	0.0	18.2
At least 3 Mbps & Less than 20 Mbps	0.2	2.3	14.7	38.9	0.0	56.1
At least 20 Mbps	0.0	0.1	3.2	17.2	5.2	25.6
Total	7.9	11.4	19.3	56.1	5.3	100.0

Note: Numbers 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, 2019



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 10 Mbps	At least 10 Mbps and less than 25 Mbps	At least 25 Mbps and less than 100 Mbps	At least 100 Mbps and less than 940 Mbps	At least 940 Mbps	
Less than 3 Mbps	7,346	9,446	1,625	10	0	18,428
At least 3 Mbps & Less than 20 Mbps	160	2,355	14,208	42,845	38	59,606
At least 20 Mbps	#	36	3,164	17,772	5,697	26,669
Total	7,506	11,837	18,997	60,627	5,736	104,703

Percentages

Less than 3 Mbps	7.0	9.0	1.6	0.0	0.0	17.6
At least 3 Mbps & Less than 20 Mbps	0.2	2.2	13.6	40.9	0.0	56.9
At least 20 Mbps	0.0	0.0	3.0	17.0	5.4	25.5
Total	7.2	11.3	18.1	57.9	5.5	100.0

Note: Numbers 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 2015-2019
(in thousands)

Technology	2015	2016		2017		2018		2019	
	Dec	Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec
Total	375,790	395,496	404,849	408,692	420,838	428,864	451,062	459,327	466,302
Total Fixed	102,111	103,980	105,593	106,130	108,065	109,087	110,784	112,725	114,291
aDSL	28,134	27,488	26,527	25,505	24,193	23,074	22,377	21,163	20,214
sDSL	60	55	42	44	28	28	20	17	16
Other Wireline ¹	637	622	599	619	581	558	557	501	525
Cable Modem	59,706	61,456	63,325	64,060	66,196	67,165	68,882	70,750	72,516
FTTP ²	10,450	11,087	11,986	12,831	13,890	14,889	15,492	16,748	17,376
Satellite	2,071	2,079	1,864	1,826	1,872	1,939	1,971	1,984	1,975
Fixed Wireless	1,054	1,193	1,250	1,245	1,306	1,434	1,485	1,561	1,669
Mobile Wireless	273,679	291,516	299,256	302,562	312,773	319,776	340,278	346,603	352,012

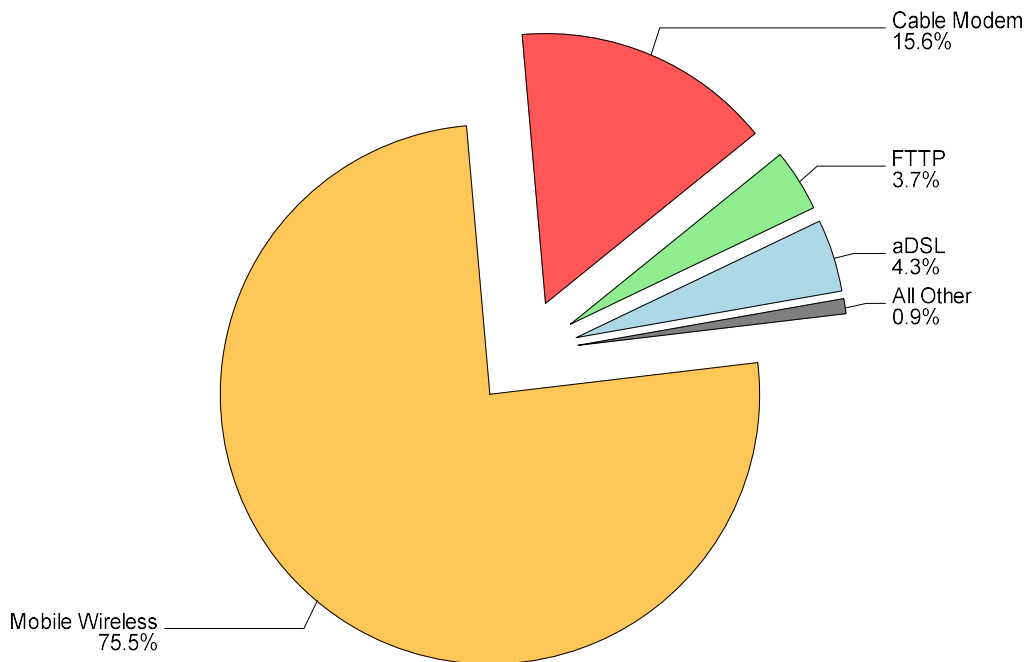
¹ Power Line and Other are summarized with Other Wireline for confidentiality reasons. See Technical Notes at the end of the report for a description of FCC Form 477 technology categories and other reporting requirements.

² Fiber to the premises.

Note: Some previously-published data may have been revised. Numbers may not sum to totals due to rounding.

Source: FCC Form 477.

Figure 12
Connections by Technology as of December 31, 2019



Source: FCC Form 477.

Figure 13
Residential Connections over 200 kbps in at Least One Direction by Technology 2015-2019
(in thousands)

Technology	2015	2016		2017		2018		2019	
	Dec	Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec
Total	322,557	330,987	337,978	341,094	351,966	358,867	378,286	383,605	388,344
Total Fixed	93,434	95,001	96,607	97,071	98,845	99,758	101,348	103,118	104,703
aDSL	25,139	24,486	23,691	22,774	21,653	20,671	20,126	18,976	18,159
sDSL	16	10	8	12	9	9	4	4	5
Other Wireline ¹	54	51	32	74	67	74	76	62	74
Cable Modem	55,799	57,358	59,145	59,687	61,567	62,320	63,813	65,457	67,141
FTTP ²	9,592	10,140	10,956	11,776	12,702	13,663	14,205	15,410	16,011
Satellite	1,891	1,897	1,676	1,637	1,688	1,751	1,787	1,805	1,795
Fixed Wireless	943	1,059	1,100	1,112	1,158	1,270	1,338	1,405	1,520
Mobile Wireless	229,122	235,985	241,371	244,022	253,121	259,109	276,938	280,486	283,641

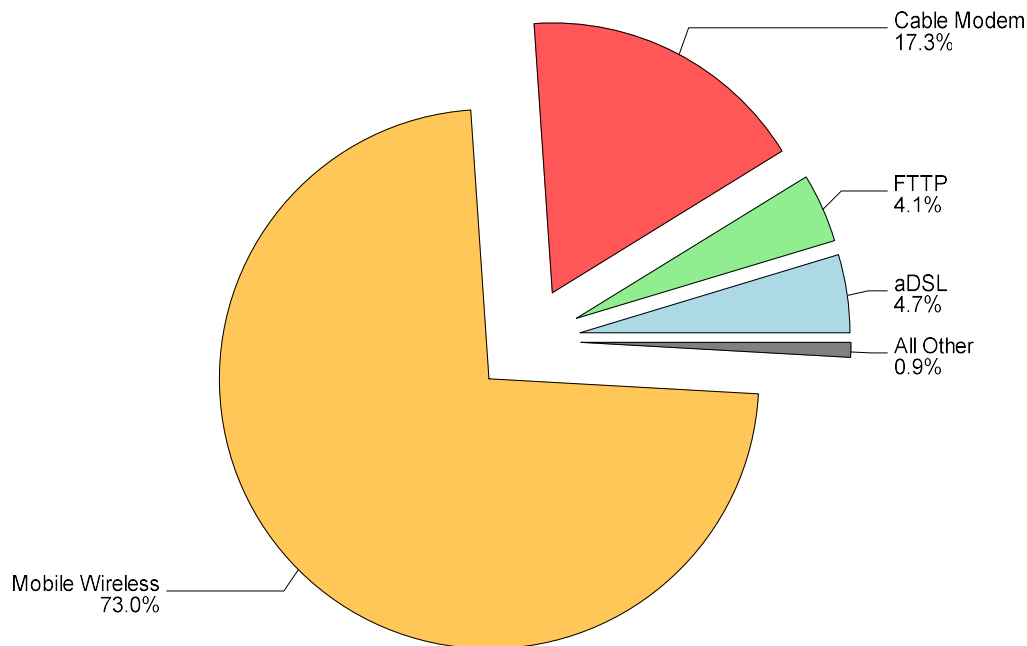
¹ Power Line and Other are summarized with Other Wireline for confidentiality reasons. See Technical Notes at the end of the report for a description of FCC Form 477 technology categories and other reporting requirements.

² Fiber to the premises.

Note: Some previously-published data may have been revised. Numbers may not sum to totals due to rounding.

Source: FCC Form 477.

Figure 14
Residential Connections by Technology as of December 31, 2019



Source: FCC Form 477.

Figure 15
Fixed Connections at Least 10 Mbps Downstream and 1 Mbps Upstream by Technology 2015-2019
(in thousands)

Technology	2015	2016		2017		2018		2019	
	Dec	Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec
Total	76,886	80,397	84,038	86,886	90,609	94,071	97,302	100,464	103,595
aDSL	9,799	10,349	10,810	11,321	11,598	11,822	12,038	11,829	11,704
sDSL	8	8	10	14	9	11	6	5	5
Other Wireline ¹	197	203	209	246	262	271	292	261	301
Cable Modem	55,710	57,951	60,349	61,704	63,978	65,808	67,716	69,704	71,934
FTTP ²	9,528	10,088	10,935	11,811	12,869	13,898	14,815	16,078	16,854
Satellite	1,393	1,467	1,342	1,373	1,402	1,595	1,677	1,726	1,737
Fixed Wireless	252	330	383	418	491	666	759	861	1,059

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

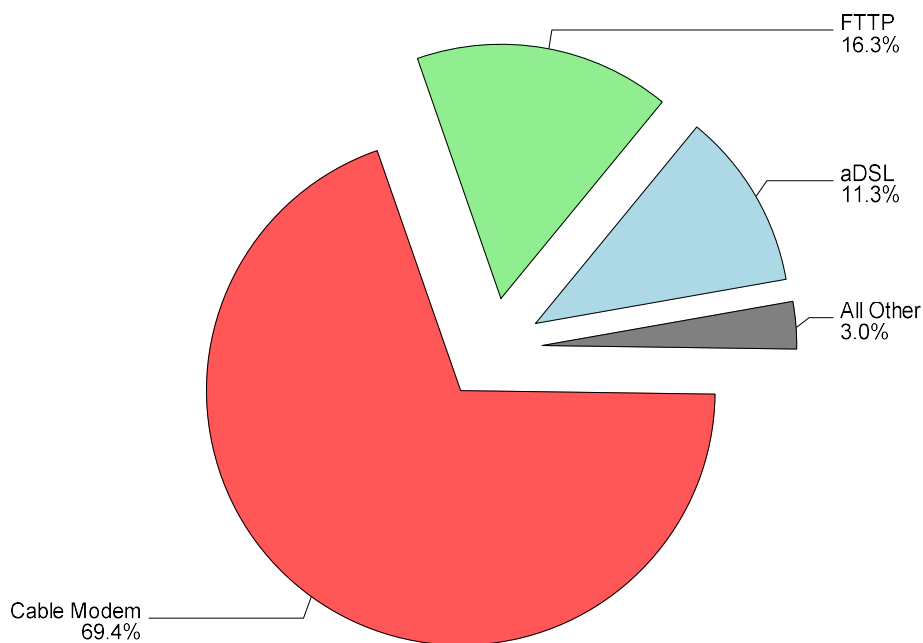
² Fiber to the premises.

= Rounds to zero.

Note: Some previously-published data may have been revised. Numbers may not sum to totals due to rounding.

Source: FCC Form 477.

Figure 16
Fixed Connections at Least 10 Mbps Downstream and 1 Mbps Upstream
by Technology as of December 31, 2019



Source: FCC Form 477.

Figure 17
Residential Fixed Connections at Least 10 Mbps Downstream and 1 Mbps Upstream by Technology 2015-2019
(in thousands)

Technology	2015	2016	2017	2018	2019
	Dec	Jun	Dec	Jun	Dec
Total	71,784	74,841	78,201	80,671	84,163
aDSL	9,069	9,526	9,963	10,415	10,657
sDSL	1	2	2	6	5
Other Wireline ¹	43	47	30	71	64
Cable Modem	52,294	54,274	56,538	57,617	59,864
FTTP ²	8,776	9,248	10,004	10,835	11,762
Satellite	1,386	1,460	1,333	1,362	1,387
Fixed Wireless	213	283	332	365	425

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

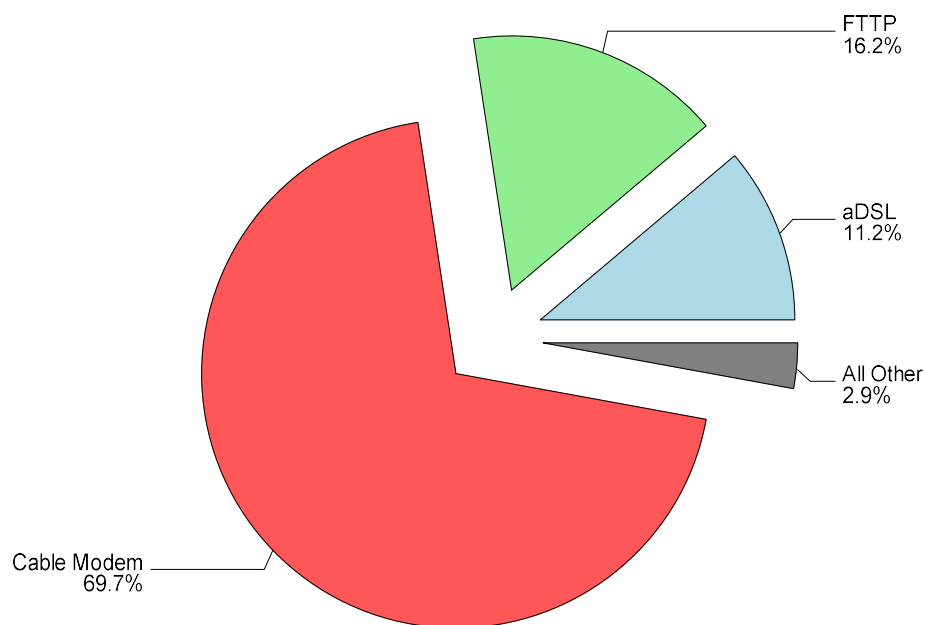
² Fiber to the premises.

= Rounds to zero.

Note: Some previously-published data may have been revised. Numbers may not sum to totals due to rounding.

Source: FCC Form 477.

Figure 18
Residential Fixed Connections at Least 10 Mbps Downstream and 1 Mbps Upstream
by Technology as of December 31, 2019



Source: FCC Form 477.

Figure 19
Fixed Connections at Least 25 Mbps Downstream and 3 Mbps Upstream by Technology 2015-2019
(in thousands)

	2015	2016		2017		2018		2019	
Technology	Dec	Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec
Total	54,338	58,765	62,933	68,280	73,875	78,952	82,965	86,744	90,471
aDSL	938	1,239	1,476	2,530	3,586	4,298	4,988	5,233	5,523
sDSL	*	*	*	*	*	*	*	*	*
Other Wireline ¹	138	155	166	203	219	203	228	220	263
Cable Modem	45,530	48,696	51,740	54,829	57,870	60,859	62,880	64,938	67,171
FTTP ²	7,673	8,587	9,422	10,344	11,489	12,568	13,605	14,902	15,866
Satellite	*	*	*	*	*	*	*	*	*
Fixed Wireless	55	72	92	120	143	224	267	325	449

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

² Fiber to the premises.

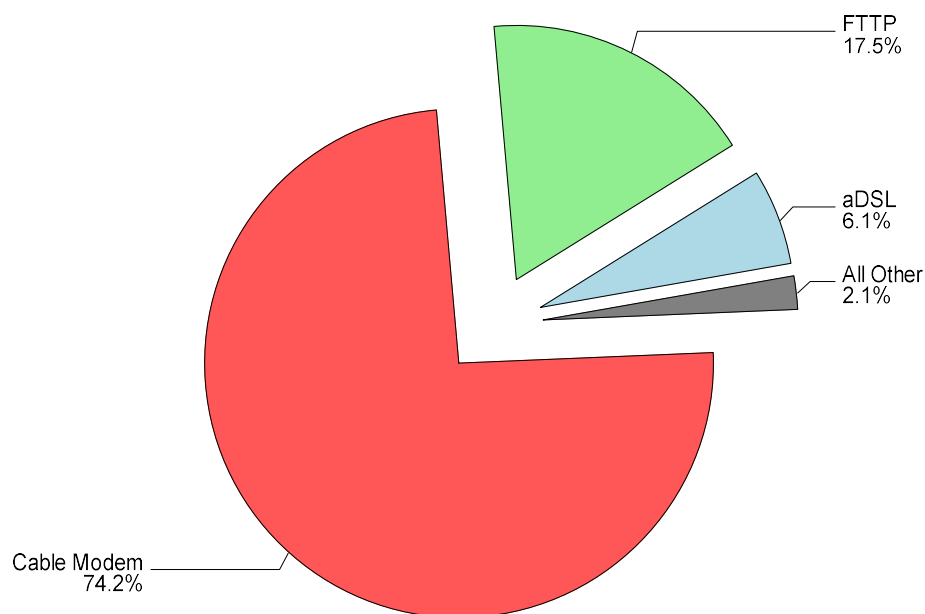
* = Data withheld for confidentiality reasons.

= Rounds to zero.

Note: Some previously-published data may have been revised. Numbers may not sum to totals due to rounding.

Source: FCC Form 477.

Figure 20
Fixed Connections at Least 25 Mbps Downstream and 3 Mbps Upstream
by Technology as of December 31, 2019



Source: FCC Form 477.

Figure 21
Residential Fixed Connections at Least 25 Mbps Downstream and 3 Mbps Upstream by Technology 2015-2019
(in thousands)

	2015	2016	2017	2018	2019				
Technology	Dec	Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec
Total	51,812	55,729	59,518	64,520	69,447	73,288	76,873	80,256	83,725
aDSL	897	1,173	1,408	2,418	3,410	4,068	4,712	4,911	5,168
sDSL	*	*	*	*	*	*	*	*	*
Other Wireline ¹	31	41	27	67	59	54	61	53	64
Cable Modem	43,746	46,527	49,300	52,154	54,748	56,620	58,342	60,125	62,231
FTTP ²	7,089	7,916	8,674	9,532	10,553	11,570	12,546	13,780	14,690
Satellite	*	*	*	*	*	*	*	*	*
Fixed Wireless	46	57	75	101	119	193	234	283	400

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

² Fiber to the premises.

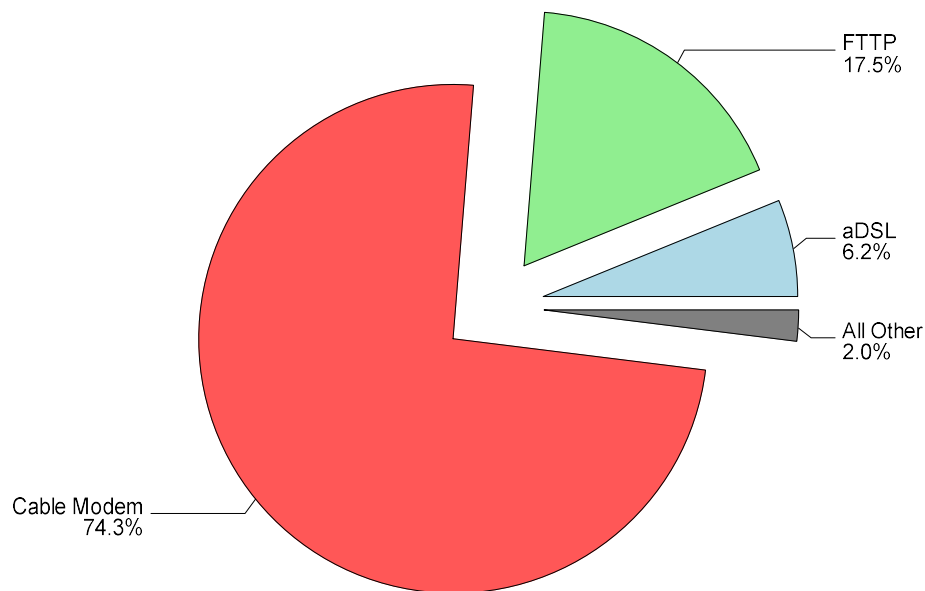
* = Data withheld for confidentiality reasons.

= Rounds to zero.

Note: Some previously-published data may have been revised. Numbers may not sum to totals due to rounding.

Source: FCC Form 477.

Figure 22
Residential Fixed Connections at Least 25 Mbps Downstream and 3 Mbps Upstream
by Technology as of December 31, 2019



Source: FCC Form 477.

Figure 23
Fixed Connections at Least 100 Mbps Downstream and 20 Mbps Upstream by Technology 2015-2019
(in thousands)

Technology	2015	2016		2017		2018		2019	
	Dec	Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec
Total	5,317	6,866	7,968	9,676	12,148	14,619	18,750	22,217	25,603
aDSL	1	1	2	16	47	59	207	387	569
sDSL	#	#	1	1	1	1	1	#	*
Other Wireline ¹	113	117	140	174	192	174	196	178	211
Cable Modem	4,329	5,259	5,356	6,055	7,149	8,352	9,466	11,426	13,088
FTTP ²	856	1,470	2,438	3,403	4,729	5,976	8,815	10,146	11,634
Satellite	0	0	0	0	0	0	0	0	*
Fixed Wireless	17	20	31	28	30	56	65	79	101

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

² Fiber to the premises.

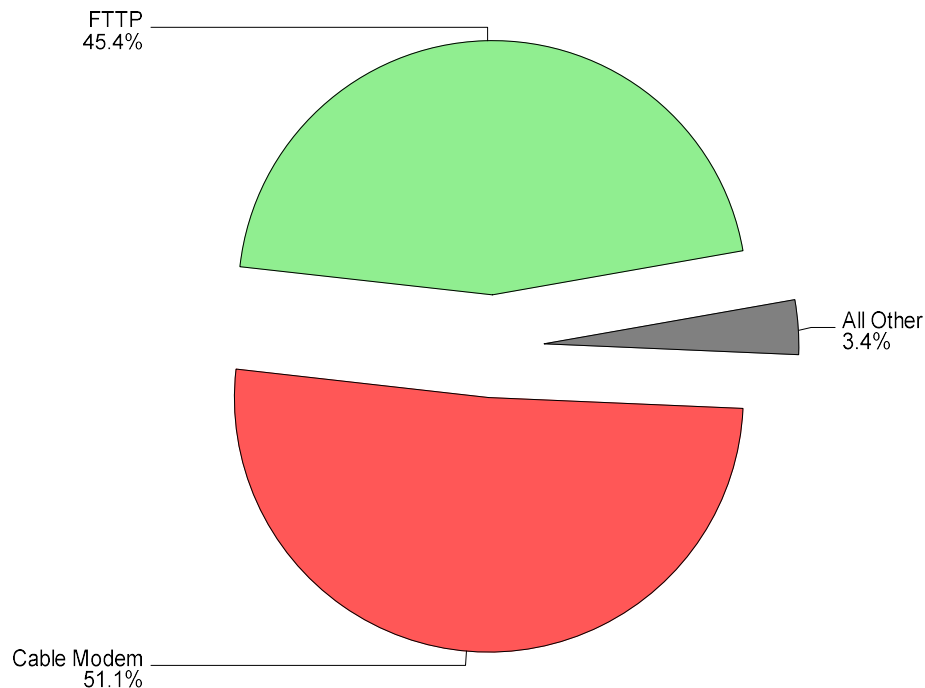
* = Data withheld for confidentiality reasons.

= Rounds to zero.

Note: Some previously-published data may have been revised. Numbers may not sum to totals due to rounding.

Source: FCC Form 477.

Figure 24
Fixed Connections at Least 100 Mbps Downstream and 20 Mbps Upstream
by Technology as of December 31, 2019



Source: FCC Form 477.

Figure 25
Residential Fixed Connections at Least 100 Mbps Downstream and 20 Mbps Upstream by Technology 2015-2019
(in thousands)

	2015		2016		2017		2018		2019	
Technology	Dec	Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec	
Total	4,854	6,316	7,291	8,879	11,030	13,171	17,101	20,322	23,469	
aDSL	1	1	2	15	42	53	194	344	512	
sDSL	#	#	#	#	#	#	#	#	*	
Other Wireline ¹	23	28	24	61	53	46	47	27	36	
Cable Modem	4,135	5,020	5,071	5,695	6,591	7,491	8,512	10,312	11,883	
FTTP ²	683	1,253	2,170	3,089	4,324	5,534	8,292	9,574	10,952	
Satellite	0	0	0	0	0	0	0	0	*	
Fixed Wireless	12	14	24	20	20	47	56	65	86	

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

² Fiber to the premises.

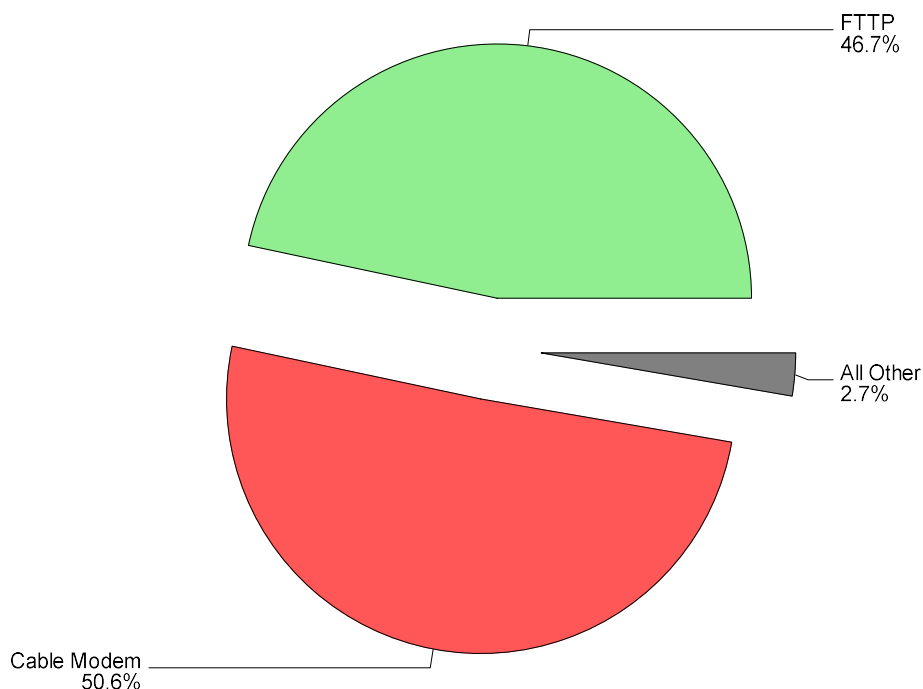
* = Data withheld for confidentiality reasons.

= Rounds to zero.

Note: Some previously-published data may have been revised. Numbers may not sum to totals due to rounding.

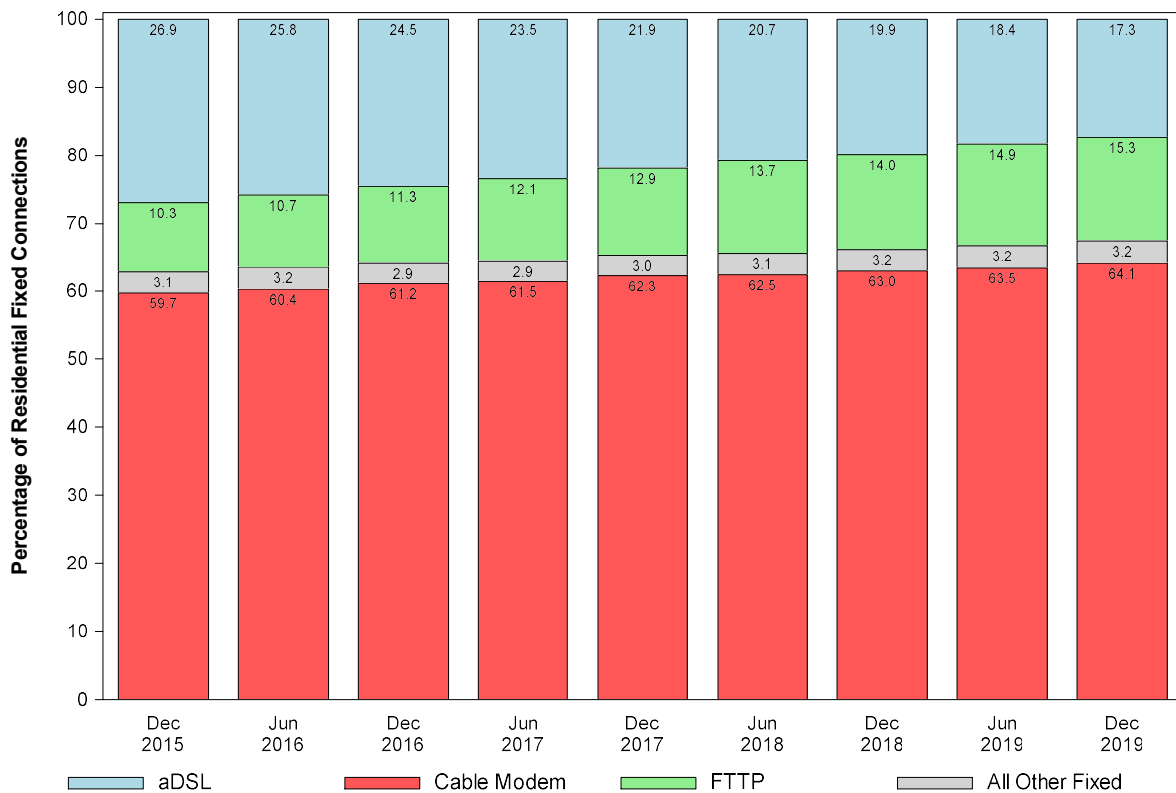
Source: FCC Form 477.

Figure 26
Residential Fixed Connections at Least 100 Mbps Downstream and 20 Mbps Upstream
by Technology as of December 31, 2019



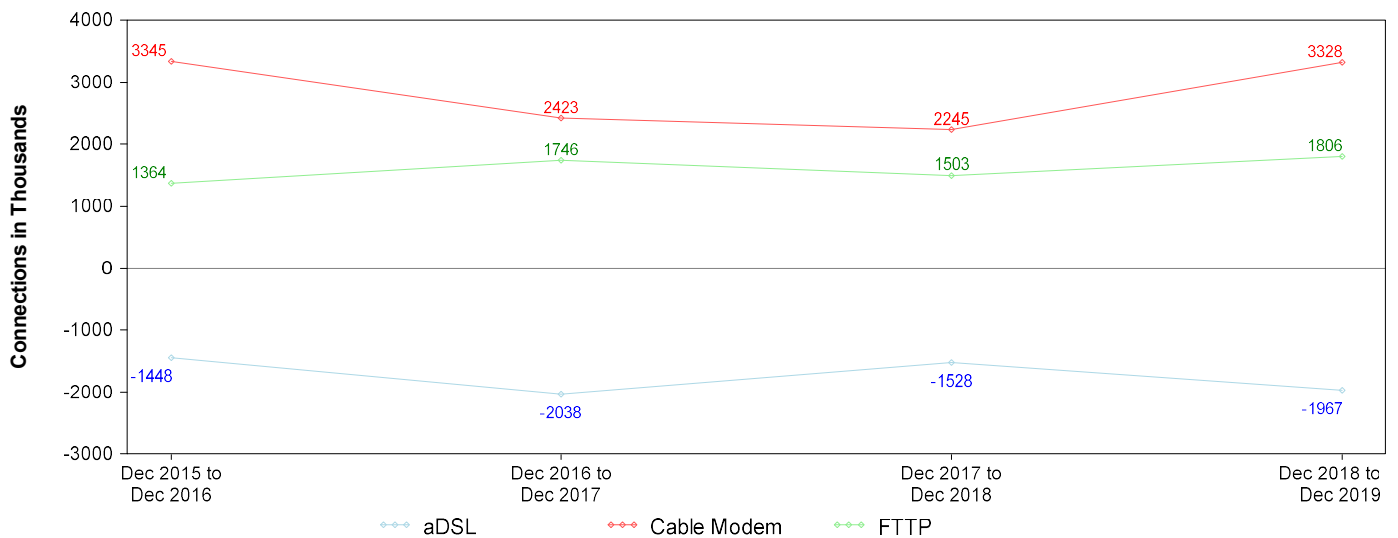
Source: FCC Form 477.

Figure 27
Residential Fixed Connections over 200 kbps in at Least One Direction 2015-2019
 (Shares of selected technologies)



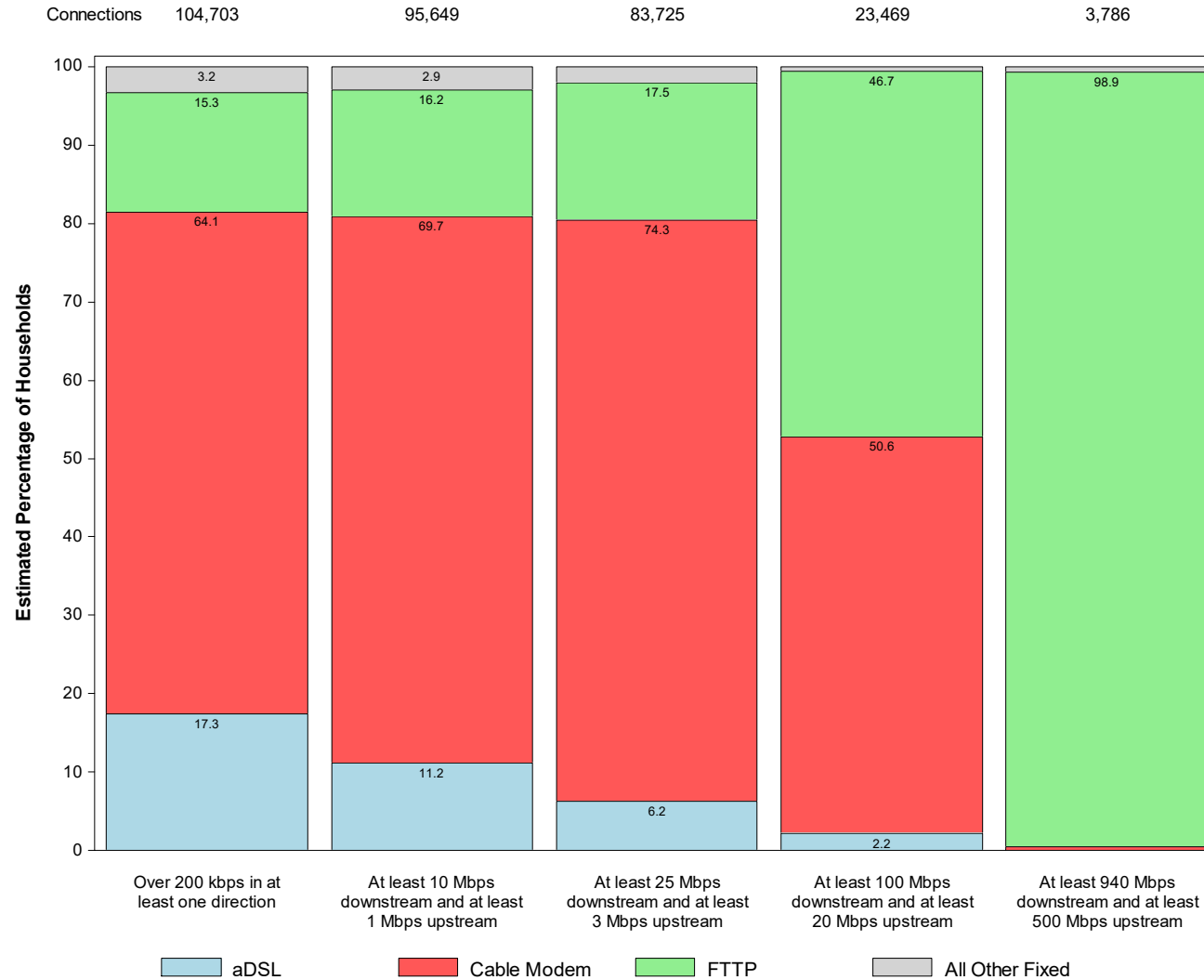
Note: Some previously-published data may have been revised. Numbers may not sum to totals due to rounding.
 Source: FCC Form 477.

Figure 28
Residential Fixed Connections over 200 kbps in at Least One Direction 2015-2019
 (Net adds for selected technologies)



Source: FCC Form 477.

Figure 29
Residential Fixed Connections by Technology as of December 31, 2019
(Shares of selected technologies for selected speeds, connections in thousands)



Note: Numbers may not sum to totals due to rounding.
Source: FCC Form 477.

Figure 30
Fixed Connections by Downstream Speed Tier and Technology as of December 31, 2019
(in thousands)

Technology	Downstream Speed						Total
	Less than 4 Mbps	At least 4 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 and less than 940 Mbps	At least 940 Mbps	
aDSL	3,006	3,908	7,115	5,480	705	#	20,214
sDSL	*	*	*	*	*	#	16
Other Wireline ¹	188	35	38	32	224	7	525
Cable Modem	311	258	3,802	10,988	55,205	1,953	72,516
FTTP	152	332	980	4,035	7,837	4,040	17,376
Satellite	*	*	*	*	*	0	1,975
Fixed Wireless	231	378	596	355	81	27	1,669
Total	4,074	4,973	13,075	22,080	64,061	6,028	114,291

Percentages							
aDSL	2.6	3.4	6.2	4.8	0.6	0.0	17.7
sDSL	*	*	*	*	*	0.0	0.0
Other Wireline ¹	0.2	0.0	0.0	0.0	0.2	0.0	0.5
Cable Modem	0.3	0.2	3.3	9.6	48.3	1.7	63.4
FTTP	0.1	0.3	0.9	3.5	6.9	3.5	15.2
Satellite	*	*	*	*	*	0.0	1.7
Fixed Wireless	0.2	0.3	0.5	0.3	0.1	0.0	1.5
Total	3.6	4.4	11.4	19.3	56.1	5.3	100.0

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

= Rounds to Zero.

* = Data withheld for confidentiality reasons.

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

Source: FCC Form 477.

Figure 31
Residential Fixed Connections by Downstream Speed Tier and Technology as of December 31, 2019
(in thousands)

Technology	Downstream Speed						Total
	Less than 4 Mbps	At least 4 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 and less than 940 Mbps	At least 940 Mbps	
aDSL	2,536	3,442	6,395	5,148	638	#	18,159
sDSL	*	*	*	*	*	*	5
Other Wireline ¹	2	2	6	8	53	3	74
Cable Modem	259	180	3,508	8,780	52,565	1,849	67,141
FTTP	130	307	843	3,576	7,294	3,861	16,011
Satellite	*	*	*	*	*	0	1,795
Fixed Wireless	208	351	547	321	69	23	1,520
Total	3,164	4,342	11,837	18,997	60,627	5,736	104,703

Percentages							
aDSL	2.4	3.3	6.1	4.9	0.6	0.0	17.3
sDSL	*	*	*	*	*	*	0.0
Other Wireline ¹	0.0	0.0	0.0	0.0	0.1	0.0	0.1
Cable Modem	0.2	0.2	3.4	8.4	50.2	1.8	64.1
FTTP	0.1	0.3	0.8	3.4	7.0	3.7	15.3
Satellite	*	*	*	*	*	0.0	1.7
Fixed Wireless	0.2	0.3	0.5	0.3	0.1	0.0	1.5
Total	3.0	4.1	11.3	18.1	57.9	5.5	100.0

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

= Rounds to Zero.

* = Data withheld for confidentiality reasons.

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

Source: FCC Form 477.

Figure 32
Nationwide Number of Providers of Connections over 200 kbps in at Least One Direction
by Technology 2015-2019

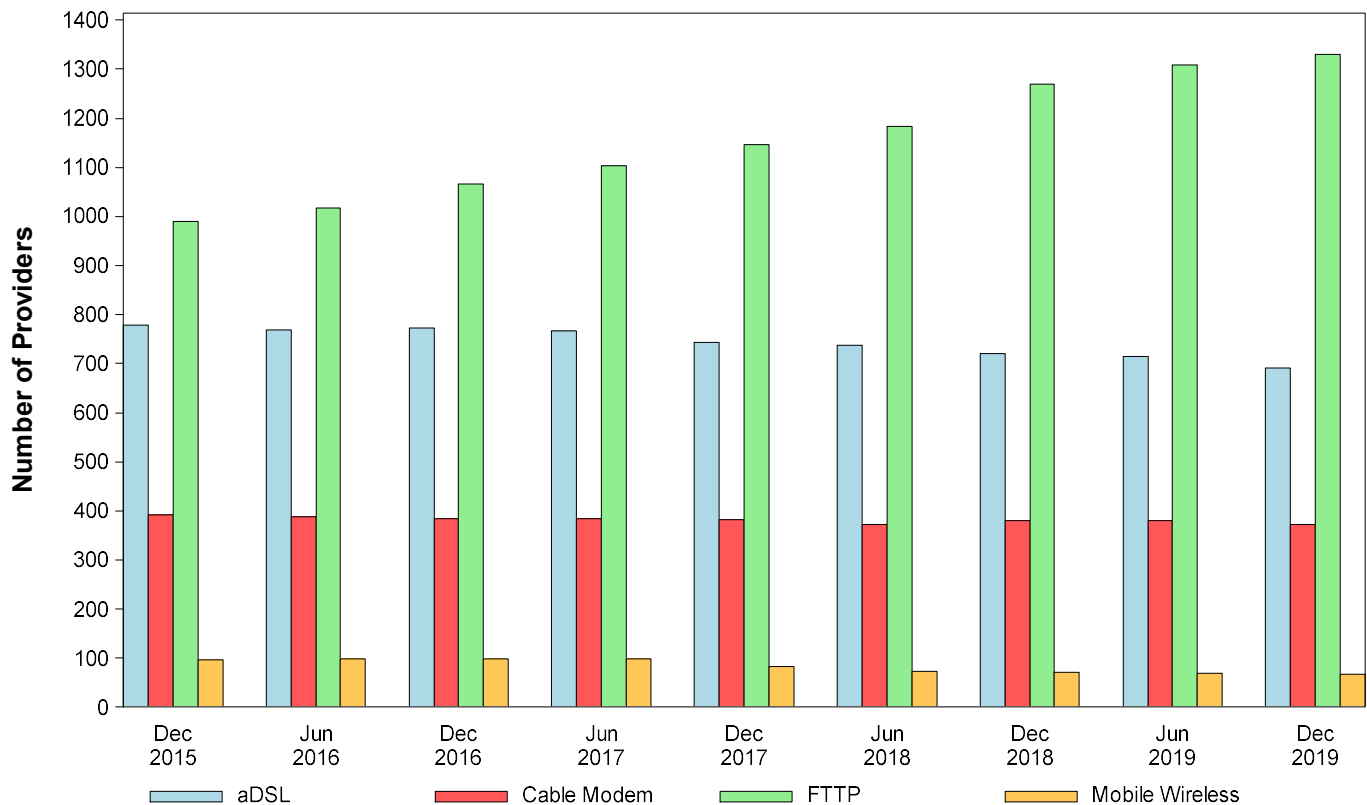
Technology	2015	2016	2017	2018	2019
	Dec	Jun	Dec	Jun	Dec
aDSL	778	769	774	768	743
sDSL	179	171	160	161	150
Other Wireline ¹	250	244	236	243	235
Cable Modem	392	388	385	384	383
FTTP	990	1,017	1,066	1,103	1,147
Satellite	10	6	6	5	6
Fixed Wireless	983	1,027	1,071	1,095	1,160
Mobile Wireless	96	99	98	98	83
Total	1,917	1,957	2,000	2,030	2,090

¹ Power Line and Other are summarized with Other Wireline for confidentiality reasons.

Note: Multiple Form 477 filers within a holding company structure count as one provider. Some previously-published data may have been revised.

Source: FCC Form 477.

Figure 33
Nationwide Number of Providers of Connections over 200 kbps in at Least One Direction
Selected Technologies 2015-2019



Source: FCC Form 477.

SECTION 3
SUMMARY STATISTICS: THE STATES

Table of Contents

Figure 34	Residential Fixed Connections and Households by State as of December 31, 2019	30
Figure 35	Connections by Type of End User by State as of December 31, 2019.....	32
Figure 36	Connections by Technology by State as of December 31, 2019	33
Figure 37	Percentage of Fixed Connections by Downstream Speed by State as of December 31, 2019.....	35
Figure 38	Providers of Connections by Technology by State as of December 31, 2019.....	37

Figure 34
Residential Fixed Connections and Households by State as of December 31, 2019
(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 20 Mbps Up		At least 940 Mbps Down and 500 Mbps Up	
		Connections	Subscribership Ratio	Connections	Subscribership Ratio	Connections	Subscribership Ratio	Connections	Subscribership Ratio	Connections	Subscribership Ratio
Alabama	1,868	1,429	0.77	1,235	0.66	1,020	0.55	250	0.13	34	0.02
Alaska	253	207	0.82	183	0.72	133	0.52	42	0.16	0	0.00
American Samoa	10	*	*	*	*	*	*	0	0.00	0	0.00
Arizona	2,571	2,275	0.88	1,993	0.78	1,797	0.70	400	0.16	*	*
Arkansas	1,158	815	0.70	672	0.58	513	0.44	149	0.13	10	0.01
California	13,044	11,720	0.90	11,013	0.84	9,735	0.75	2,005	0.15	179	0.01
Colorado	2,149	1,992	0.93	1,749	0.81	1,594	0.74	194	0.09	59	0.03
Connecticut	1,371	1,244	0.91	1,174	0.86	995	0.73	295	0.22	2	0.00
Delaware	363	356	0.98	345	0.95	333	0.92	96	0.26	*	*
District of Columbia	284	262	0.92	252	0.89	238	0.84	92	0.32	*	*
Florida	7,736	7,651	0.99	7,215	0.93	6,304	0.81	1,751	0.23	119	0.02
Georgia	3,759	3,207	0.85	2,920	0.78	2,413	0.64	811	0.22	129	0.03
Guam	42	*	*	*	*	*	*	0	0.00	0	0.00
Hawaii	459	465	1.01	447	0.97	*	*	*	*	*	*
Idaho	630	527	0.84	396	0.63	315	0.50	70	0.11	8	0.01
Illinois	4,846	3,979	0.82	3,651	0.75	2,941	0.61	788	0.16	36	0.01
Indiana	2,570	2,053	0.80	1,813	0.71	1,454	0.57	421	0.16	32	0.01
Iowa	1,265	990	0.78	803	0.63	688	0.54	169	0.13	10	0.01
Kansas	1,129	925	0.82	820	0.73	665	0.59	223	0.20	63	0.06
Kentucky	1,735	1,376	0.79	1,199	0.69	1,011	0.58	249	0.14	20	0.01
Louisiana	1,739	1,323	0.76	1,186	0.68	978	0.56	286	0.16	22	0.01
Maine	560	518	0.93	450	0.80	358	0.64	17	0.03	*	*
Maryland	2,205	2,058	0.93	1,973	0.89	1,851	0.84	704	0.32	*	*
Massachusetts	2,617	2,438	0.93	2,347	0.90	2,274	0.87	510	0.19	*	*
Michigan	3,935	3,186	0.81	2,900	0.74	2,426	0.62	438	0.11	19	0.00
Minnesota	2,186	1,843	0.84	1,578	0.72	1,401	0.64	171	0.08	26	0.01
Mississippi	1,104	729	0.66	602	0.55	418	0.38	100	0.09	13	0.01
Missouri	2,415	1,913	0.79	1,631	0.68	1,359	0.56	422	0.17	84	0.03
Montana	428	353	0.83	289	0.68	243	0.57	27	0.06	*	*
Nebraska	759	627	0.83	557	0.73	467	0.62	129	0.17	19	0.03

Figure 34 - Continued
Residential Fixed Connections and Households by State as of December 31, 2019
(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 20 Mbps Up		At least 940 Mbps Down and 500 Mbps Up	
		Connections	Subscribership Ratio	Connections	Subscribership Ratio	Connections	Subscribership Ratio	Connections	Subscribership Ratio	Connections	Subscribership Ratio
Nevada	1,099	984	0.90	920	0.84	814	0.74	201	0.18	*	*
New Hampshire	532	520	0.98	484	0.91	443	0.83	48	0.09	*	*
New Jersey	3,232	3,005	0.93	2,920	0.90	2,838	0.88	1,543	0.48	*	*
New Mexico	780	609	0.78	461	0.59	380	0.49	35	0.04	3	0.00
New York	7,343	6,367	0.87	6,193	0.84	5,817	0.79	3,077	0.42	*	*
North Carolina	3,965	3,519	0.89	3,130	0.79	2,848	0.72	778	0.20	112	0.03
North Dakota	318	277	0.87	262	0.82	243	0.76	48	0.15	1	0.00
Northern Mariana Isl	16	*	*	*	*	*	*	0	0.00	0	0.00
Ohio	4,676	3,858	0.82	3,498	0.75	2,919	0.62	503	0.11	16	0.00
Oklahoma	1,480	1,094	0.74	926	0.63	755	0.51	218	0.15	27	0.02
Oregon	1,612	1,407	0.87	1,236	0.77	1,113	0.69	134	0.08	20	0.01
Pennsylvania	5,053	4,300	0.85	3,951	0.78	3,642	0.72	981	0.19	*	*
Puerto Rico	1,193	471	0.39	358	0.30	206	0.17	25	0.02	*	*
Rhode Island	410	373	0.91	369	0.90	358	0.87	*	*	*	*
South Carolina	1,922	1,658	0.86	1,519	0.79	1,284	0.67	308	0.16	26	0.01
South Dakota	344	282	0.82	267	0.77	245	0.71	26	0.08	#	0.00
Tennessee	2,597	2,083	0.80	1,905	0.73	1,593	0.61	541	0.21	83	0.03
Texas	9,692	8,259	0.85	7,687	0.79	6,619	0.68	2,277	0.23	303	0.03
Utah	977	884	0.90	781	0.80	688	0.70	138	0.14	31	0.03
Vermont	260	248	0.95	204	0.79	165	0.63	24	0.09	*	*
Virgin Islands	43	*	*	17	0.39	*	*	0	0.00	0	0.00
Virginia	3,151	2,709	0.86	2,507	0.80	2,339	0.74	892	0.28	*	*
Washington	2,848	2,583	0.91	2,303	0.81	2,107	0.74	231	0.08	55	0.02
West Virginia	733	516	0.70	405	0.55	335	0.46	92	0.12	2	0.00
Wisconsin	2,358	1,969	0.83	1,749	0.74	1,454	0.62	177	0.08	12	0.01
Wyoming	230	194	0.84	163	0.71	147	0.64	9	0.04	#	0.00
Total	122,060	104,703	0.86	95,649	0.78	83,725	0.69	23,469	0.19	3,786	0.03

= Rounds to Zero; * = Data withheld for confidentiality reasons.

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

Sources: FCC Form 477 (Connections); 2015-2019 ACS 5-year estimates; Census 2010.

Figure 35
Connections by Type of End User by State as of December 31, 2019
 (Connections over 200 kbps in at least one direction, in thousands)

State	Connections		Percentages		Total
	Residential	Business	Residential	Business	
Alabama	5,404	1,286	80.8	19.2	6,690
Alaska	842	130	86.6	13.4	972
American Samoa	*	*	*	*	*
Arizona	8,113	1,445	84.9	15.1	9,558
Arkansas	3,112	818	79.2	20.8	3,930
California	48,994	8,262	85.6	14.4	57,256
Colorado	6,722	1,359	83.2	16.8	8,082
Connecticut	4,207	947	81.6	18.4	5,154
Delaware	1,135	228	83.3	16.7	1,363
District of Columbia	1,049	564	65.0	35.0	1,614
Florida	26,184	4,855	84.4	15.6	31,038
Georgia	12,108	2,769	81.4	18.6	14,877
Guam	193	41	82.4	17.6	234
Hawaii	1,795	317	85.0	15.0	2,112
Idaho	1,904	384	83.2	16.8	2,288
Illinois	14,908	3,163	82.5	17.5	18,071
Indiana	7,176	1,570	82.0	18.0	8,746
Iowa	3,406	784	81.3	18.7	4,190
Kansas	5,079	728	87.5	12.5	5,808
Kentucky	5,030	924	84.5	15.5	5,954
Louisiana	5,382	979	84.6	15.4	6,362
Maine	1,452	430	77.1	22.9	1,882
Maryland	7,550	1,284	85.5	14.5	8,834
Massachusetts	8,600	1,757	83.0	17.0	10,357
Michigan	11,210	2,542	81.5	18.5	13,751
Minnesota	6,354	1,432	81.6	18.4	7,786
Mississippi	3,130	593	84.1	15.9	3,723
Missouri	6,819	1,464	82.3	17.7	8,283
Montana	1,114	302	78.7	21.3	1,415
Nebraska	2,029	563	78.3	21.7	2,592
Nevada	3,631	625	85.3	14.7	4,257
New Hampshire	1,526	394	79.5	20.5	1,920
New Jersey	10,862	2,153	83.5	16.5	13,015
New Mexico	2,302	412	84.8	15.2	2,714
New York	25,231	4,694	84.3	15.7	29,925
North Carolina	11,349	2,635	81.2	18.8	13,984
North Dakota	857	229	78.9	21.1	1,086
Northern Mariana Isl	*	*	*	*	*
Ohio	13,428	3,063	81.4	18.6	16,491
Oklahoma	4,377	849	83.7	16.3	5,226
Oregon	4,825	1,045	82.2	17.8	5,869
Pennsylvania	14,850	3,207	82.2	17.8	18,057
Puerto Rico	3,493	409	89.5	10.5	3,902
Rhode Island	1,176	241	83.0	17.0	1,417
South Carolina	5,522	1,236	81.7	18.3	6,759
South Dakota	911	245	78.8	21.2	1,156
Tennessee	7,531	1,784	80.8	19.2	9,316
Texas	34,612	5,914	85.4	14.6	40,526
Utah	3,302	712	82.3	17.7	4,014
Vermont	695	218	76.2	23.8	913
Virgin Islands	126	15	89.1	10.9	141
Virginia	9,069	2,238	80.2	19.8	11,307
Washington	8,930	1,789	83.3	16.7	10,719
West Virginia	1,644	325	83.5	16.5	1,969
Wisconsin	6,341	1,428	81.6	18.4	7,770
Wyoming	655	163	80.0	20.0	818
Total	388,344	77,958	83.3	16.7	466,302

= Rounds to Zero.

* = Data withheld for confidentiality reasons.

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

Source: FCC Form 477.

Figure 36
Connections by Technology by State as of December 31, 2019
(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	414	*	4	858	210	*	9	5,132	6,690
Alaska	77	*	2	*	10	*	10	729	972
American Samoa	0	0	0	*	*	0	*	*	*
Arizona	590	*	12	1,626	135	*	45	7,112	9,558
Arkansas	320	#	*	421	89	*	10	3,035	3,930
California	2,457	3	*	8,636	1,384	*	161	44,404	57,256
Colorado	*	#	18	1,421	153	*	85	5,914	8,082
Connecticut	*	*	2	1,067	32	*	#	3,792	5,154
Delaware	*	*	2	249	*	*	*	977	1,363
District of Columbia	*	*	6	*	*	*	*	1,315	1,614
Florida	1,277	*	34	5,778	1,126	*	23	22,715	31,038
Georgia	816	*	10	2,010	590	*	8	11,370	14,877
Guam	*	0	0	*	*	0	0	193	234
Hawaii	*	*	1	*	68	*	2	1,599	2,112
Idaho	216	*	3	246	41	*	52	1,713	2,288
Illinois	978	#	*	2,936	284	*	82	13,730	18,071
Indiana	521	*	3	1,260	335	*	53	6,523	8,746
Iowa	288	1	*	494	210	*	55	3,110	4,190
Kansas	207	#	*	505	228	*	46	4,800	5,808
Kentucky	358	*	2	840	233	*	22	4,459	5,954
Louisiana	352	*	3	852	175	*	11	4,909	6,362
Maine	108	1	*	426	12	*	8	1,315	1,882
Maryland	*	#	16	1,209	*	*	5	6,657	8,834
Massachusetts	*	*	18	2,000	*	*	14	7,692	10,357
Michigan	691	1	*	2,466	150	*	46	10,305	13,751
Minnesota	479	2	*	1,225	226	*	38	5,782	7,786
Mississippi	311	*	1	352	65	*	9	2,919	3,723
Missouri	572	*	7	1,032	343	*	48	6,206	8,283
Montana	95	*	2	226	32	*	26	1,019	1,415
Nebraska	139	#	*	389	109	*	38	1,906	2,592

Figure 36 - Continued
Connections by Technology by State as of December 31, 2019
(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	180	#	5	*	72	*	28	3,187	4,257
New Hampshire	64	*	4	467	32	*	2	1,346	1,920
New Jersey	104	*	25	2,118	*	*	#	9,712	13,015
New Mexico	233	*	4	350	37	*	25	2,049	2,714
New York	266	*	36	4,931	1,713	*	9	22,918	29,925
North Carolina	683	*	7	2,540	493	*	14	10,172	13,984
North Dakota	32	#	*	175	96	*	4	775	1,086
Northern Mariana Isl	*	0	0	*	*	0	0	*	*
Ohio	866	*	11	2,807	368	*	55	12,333	16,491
Oklahoma	334	#	*	612	153	*	50	4,021	5,226
Oregon	236	#	*	1,044	185	*	34	4,330	5,869
Pennsylvania	456	#	24	3,113	*	*	9	13,383	18,057
Puerto Rico	*	0	*	*	21	*	23	3,268	3,902
Rhode Island	*	*	2	*	*	*	*	1,011	1,417
South Carolina	376	*	3	1,128	244	*	5	4,965	6,759
South Dakota	39	*	#	187	69	*	10	845	1,156
Tennessee	429	#	*	1,288	464	*	18	7,048	9,316
Texas	1,762	#	*	4,976	1,778	*	253	31,509	40,526
Utah	185	*	6	554	151	*	57	3,054	4,014
Vermont	80	*	2	159	29	*	4	634	913
Virgin Islands	*	0	*	*	*	*	*	*	141
Virginia	240	#	*	1,606	978	*	27	8,348	11,307
Washington	420	#	*	2,021	217	*	42	7,932	10,719
West Virginia	*	*	1	351	17	*	4	1,400	1,969
Wisconsin	526	*	3	*	176	*	47	5,630	7,770
Wyoming	47	#	*	120	12	*	30	600	818
Total	20,214	16	525	72,516	17,376	1,975	1,669	352,012	466,302

¹ PowerLine and Other are summarized with Other Wireline for confidentiality reasons. See Technical Notes at the end of the report for a description of FCC Form 477 technology categories and other reporting requirements.

= Rounds to Zero.

* = Data withheld for confidentiality reasons.

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

Source: FCC Form 477.

Figure 37
Percentage of Fixed Connections by Downstream Speed by State as of December 31, 2019

State	% over 200 kbps Downstream	% at least 10 Mbps Downstream	Over 200 kbps Upstream and		
			% at least 25 Mbps Downstream	% at least 100 Mbps Downstream	% at least 940 Mbps Downstream
Alabama	99.7	87.7	73.3	53.5	2.8
Alaska	99.0	85.9	62.3	*	*
American Samoa	*	*	*	*	*
Arizona	99.8	93.5	79.5	54.1	4.9
Arkansas	99.8	85.1	64.9	35.2	2.5
California	99.8	93.0	81.8	60.5	3.7
Colorado	99.8	93.8	80.3	52.3	6.6
Connecticut	99.7	93.5	80.6	70.0	2.6
Delaware	99.9	96.1	92.8	76.2	13.7
District of Columbia	99.9	94.2	88.7	80.5	15.0
Florida	99.8	95.3	86.2	66.5	2.6
Georgia	99.5	91.0	78.6	58.6	5.1
Guam	*	*	*	*	*
Hawaii	100.0	95.0	*	*	1.6
Idaho	99.7	85.9	61.3	41.7	2.0
Illinois	99.8	91.4	78.2	58.9	2.5
Indiana	99.5	89.0	74.6	53.8	2.6
Iowa	99.7	86.9	70.8	36.1	3.0
Kansas	99.8	89.4	70.9	47.6	7.8
Kentucky	99.5	87.4	74.4	53.2	1.9
Louisiana	99.7	89.8	74.7	50.7	3.1
Maine	99.2	85.1	69.1	57.4	0.5
Maryland	99.9	95.6	90.0	74.7	15.3
Massachusetts	100.0	95.5	92.5	81.2	10.7
Michigan	99.5	90.7	79.4	60.4	1.4
Minnesota	99.9	90.7	76.8	50.5	3.3
Mississippi	99.5	82.9	60.9	36.5	2.2
Missouri	99.7	87.9	72.3	54.0	5.1
Montana	99.8	86.7	69.8	52.9	4.6
Nebraska	99.6	91.1	75.0	55.5	4.6

Figure 37 - Continued
Percentage of Fixed Connections by Downstream Speed by State as of December 31, 2019

State	% over 200 kbps Downstream	% at least 10 Mbps Downstream	Over 200 kbps Upstream and		
			% at least 25 Mbps Downstream	% at least 100 Mbps Downstream	% at least 940 Mbps Downstream
Nevada	99.9	95.2	84.5	62.3	5.0
New Hampshire	99.4	91.4	84.4	74.5	4.6
New Jersey	99.8	96.6	93.6	82.3	14.7
New Mexico	99.9	86.0	64.2	36.2	2.0
New York	99.7	96.3	90.4	79.1	9.0
North Carolina	99.4	91.0	81.0	65.4	3.5
North Dakota	99.9	95.3	86.8	67.7	3.3
Northern Mariana Isl	*	*	*	*	*
Ohio	99.8	90.9	75.8	56.6	1.0
Oklahoma	99.8	84.8	67.9	44.5	4.5
Oregon	99.7	91.4	79.4	54.6	4.0
Pennsylvania	99.8	92.2	84.9	68.8	10.2
Puerto Rico	100.0	77.1	48.0	*	*
Rhode Island	99.7	98.2	94.7	*	*
South Carolina	99.8	92.0	79.0	61.4	2.1
South Dakota	99.8	95.8	86.4	60.5	2.1
Tennessee	99.7	91.5	79.2	62.2	5.0
Texas	99.9	93.0	79.8	58.0	5.3
Utah	100.0	93.3	78.8	49.4	6.3
Vermont	98.1	80.9	67.7	56.1	6.0
Virgin Islands	*	*	*	*	*
Virginia	99.6	92.6	85.5	69.2	13.8
Washington	99.6	92.6	81.6	58.4	5.5
West Virginia	97.8	77.7	64.3	47.7	2.6
Wisconsin	99.3	90.0	74.3	57.7	1.2
Wyoming	99.9	87.9	76.6	49.1	0.5
Total	99.7	92.1	80.6	61.3	5.3

Source: FCC Form 477.

Figure 38
Providers of Connections by Technology by State as of December 31, 2019
(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	22	*	14	16	38	*	22	7	72
Alaska	16	*	8	*	16	*	19	9	39
American Samoa	0	0	0	*	*	0	*	*	*
Arizona	21	*	21	15	39	*	52	6	102
Arkansas	22	5	*	16	44	*	29	5	85
California	33	12	*	30	87	*	125	5	206
Colorado	*	5	24	16	75	*	65	9	136
Connecticut	*	*	9	8	22	*	6	4	34
Delaware	*	*	7	4	*	*	*	4	26
District of Columbia	*	*	12	*	*	*	*	4	40
Florida	20	*	28	19	71	*	38	6	111
Georgia	24	*	24	25	87	*	25	5	116
Guam	*	0	0	*	*	0	0	4	4
Hawaii	*	*	8	*	11	*	5	5	22
Idaho	20	*	12	16	40	*	41	9	75
Illinois	49	4	*	19	96	*	90	6	177
Indiana	37	*	24	11	79	*	66	4	124
Iowa	78	15	*	40	168	*	85	8	233
Kansas	25	5	*	23	69	*	66	9	125
Kentucky	15	*	12	27	53	*	28	7	98
Louisiana	16	*	16	16	38	*	24	6	71
Maine	12	5	*	7	19	*	14	5	40
Maryland	*	4	19	16	*	*	25	5	75
Massachusetts	*	*	15	10	*	*	17	6	61
Michigan	32	5	*	25	76	*	58	7	132
Minnesota	40	9	*	20	86	*	58	5	136
Mississippi	18	*	9	12	25	*	15	6	55
Missouri	35	*	27	18	74	*	71	7	141
Montana	20	*	10	7	34	*	36	6	62
Nebraska	31	5	*	17	59	*	51	7	104

Figure 38 - Continued
Providers of Connections by Technology by State as of December 31, 2019
(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	17	5	13	*	34	*	28	5	68
New Hampshire	8	*	8	5	19	*	8	6	33
New Jersey	10	*	24	9	*	*	10	4	60
New Mexico	19	*	16	10	34	*	38	6	71
New York	31	*	26	21	75	*	29	7	115
North Carolina	18	*	20	26	61	*	26	6	98
North Dakota	20	4	*	9	32	*	12	6	50
Northern Mariana Isl	*	0	0	*	*	0	0	*	*
Ohio	33	*	25	32	79	*	71	4	157
Oklahoma	34	5	*	13	59	*	46	11	108
Oregon	35	6	*	18	60	*	47	6	101
Pennsylvania	22	4	18	25	*	*	27	8	105
Puerto Rico	*	0	*	*	11	*	13	5	24
Rhode Island	*	*	6	*	*	*	*	4	22
South Carolina	18	*	11	14	37	*	12	6	54
South Dakota	20	*	10	9	39	*	21	8	73
Tennessee	22	4	*	20	71	*	37	6	111
Texas	68	13	*	31	128	*	160	11	254
Utah	19	*	14	11	34	*	36	8	73
Vermont	8	*	7	5	19	*	10	6	37
Virgin Islands	*	0	*	*	*	*	*	*	7
Virginia	23	4	*	20	73	*	44	6	115
Washington	26	5	*	26	66	*	56	6	118
West Virginia	*	*	11	16	27	*	19	6	65
Wisconsin	41	*	20	*	75	*	48	6	113
Wyoming	13	4	*	7	23	*	22	8	46
Total	691	121	211	373	1,330	5	1,280	67	2,247

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

= Rounds to Zero.

* = Data withheld for confidentiality reasons.

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

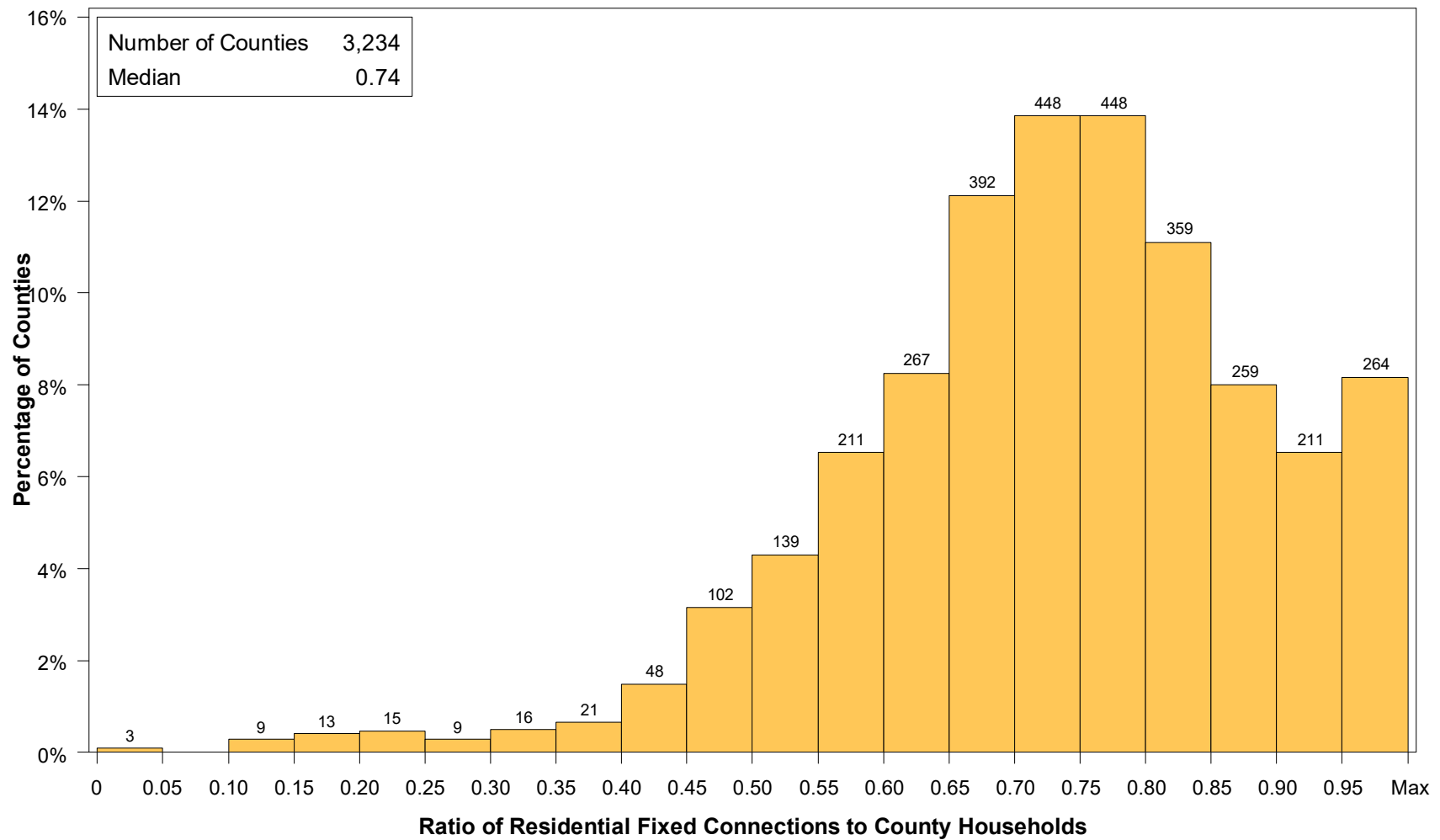
Source: FCC Form 477.

SECTION 4
SUMMARY STATISTICS: COUNTIES AND CENSUS TRACTS

Table of Contents

Figure 39	Distribution of Counties by Ratio of Residential Fixed Connections over 200 kbps in at Least One Direction to County Households as of December 31, 2019	40
Figure 40	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, 2019	41
Figure 41	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, 2019	42
Figure 42	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, 2019	43
Figure 43	Percentage of Developed Census Blocks with Residential Fixed Connections by Technology as of December 31, 2019	44
Figure 44	Distribution of Counties by Ratio of Residential Fixed Connections to County Households by State as of December 31, 2019	45
Figure 45	Distribution of Census Tracts by Ratio of Residential Fixed Connections to Tract Households by State as of December 31, 2019	47

Figure 39
Distribution of Counties by Ratio of Residential Fixed Connections over 200 kbps in at Least One Direction to County Households as of December 31, 2019



Note: Ratios over 1 were set to 1. See Technical Notes at the end of the report.
 Sources: FCC Form 477; 2015-2019 ACS 5-year estimates; and Census 2010.

Figure 40
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, 2019

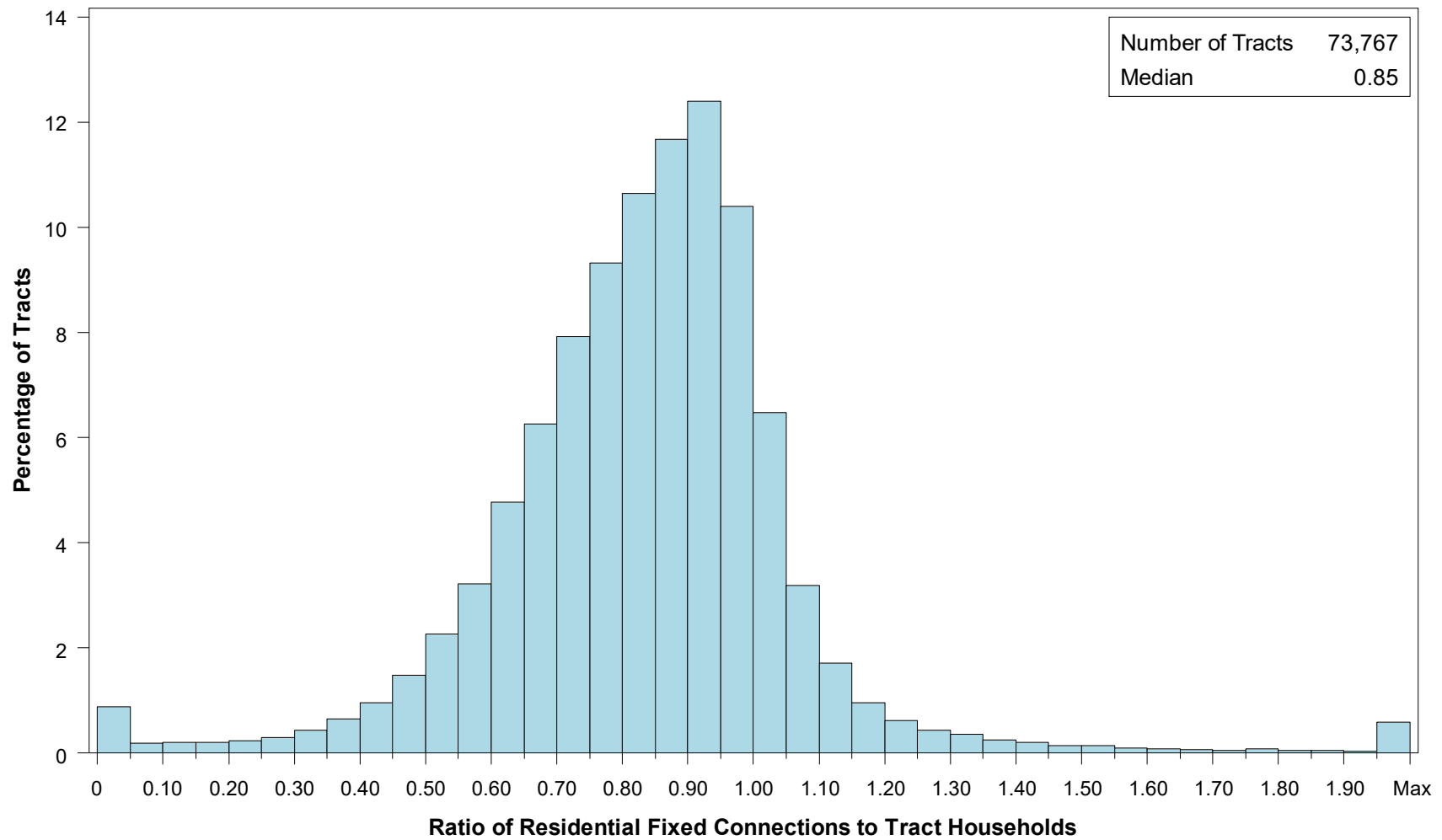
<i>Technology</i>	<i>Ratio of Residential Fixed Connections to County Households</i>										<i>100% or more</i>
	<i>Zero</i>	<i>Greater than 0 and no more than 5%</i>	<i>Greater than 5 and no more than 10%</i>	<i>Greater than 10 and no more than 20%</i>	<i>Greater than 20 and no more than 30%</i>	<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	1.7	8.2	10.8	31.0	24.7	13.5	6.1	2.2	1.6	0.2	0.2
sDSL	94.9	5.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Wireline	93.8	6.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cable Modem	10.9	8.0	5.6	12.4	13.4	11.5	11.7	11.2	13.0	1.7	0.6
FTTP	14.9	42.8	11.8	12.0	6.2	4.1	2.9	2.0	2.9	0.3	0.1
Satellite	0.4	64.6	22.4	11.0	1.2	0.2	0.1	0.0	0.0	0.0	0.0
Fixed Wireless	13.6	60.7	12.2	8.8	3.0	1.1	0.4	0.1	0.1	0.0	0.0
Total	0.1	0.0	0.0	0.7	0.7	1.1	4.7	10.8	48.1	28.9	4.9

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: Numbers may not sum to totals due to rounding.

Sources: FCC Form 477; 2015-2019 ACS 5-year estimates; and Census 2010.

Figure 41
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, 2019



Note: Ratios over 2 were set to 2. See Technical Notes at the end of the report.
 Sources: FCC Form 477; 2015-2019 ACS 5-year estimates; and Census 2010.

Figure 42
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, 2019

<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	4.1	25.5	15.8	25.4	16.7	7.0	2.9	1.4	0.8	0.2	0.2
sDSL	99.3	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Wireline	99.1	0.7	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cable Modem	4.7	2.8	1.5	3.4	4.9	9.2	14.7	18.5	28.5	9.5	2.3
FTTP	34.5	21.7	8.2	11.1	7.8	6.0	4.3	2.9	2.8	0.5	0.2
Satellite	24.8	64.9	5.6	3.7	0.8	0.2	0.1	0.0	0.0	0.0	0.0
Fixed Wireless	67.6	25.1	3.1	2.5	0.9	0.4	0.2	0.1	0.1	0.0	0.0
Total	0.8	0.1	0.2	0.4	0.5	1.1	2.5	5.5	28.3	45.2	15.5

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

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

Sources: FCC Form 477; 2015-2019 ACS 5-year estimates; and Census 2010.

Figure 43
Percentage of Developed Census Blocks with Residential Fixed Service by Technology as of December 31, 2019
 (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	22.8	75.2	1.9	0.1	0.0	0.0	0.0	0.0
sDSL	99.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Other Wireline ¹	99.2	0.8	0.0	0.0	0.0	0.0	0.0	0.0
Cable Modem	32.0	64.0	3.9	0.0	0.0	0.0	0.0	0.0
FTTP	71.6	27.0	1.3	0.1	0.0	0.0	0.0	0.0
Satellite	0.0	0.1	0.9	98.9	0.0	0.0	0.0	0.0
Fixed Wireless	47.9	27.9	15.5	6.4	1.9	0.3	0.0	0.0
aDSL and/or Cable Modem and/or FTTP	10.7	24.2	55.9	8.6	0.6	0.0	0.0	0.0
Any Technology	0.0	0.1	0.0	3.7	14.2	39.7	24.5	17.8

¹ Power Line and Other are summarized with Other Wireline. See Technical Notes at the end of the report for a description of FCC Form 477 technology categories and other reporting requirements. Note: Numbers 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 FCC 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 44
Distribution of Counties by Ratio of Residential Fixed Connections to County Households by State as of December 31, 2019
(Connections over 200 kbps in at least one direction)

Ratio of Residential Fixed Connections over 200 kbps in at Least One Direction to County Households												
State	Counties	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	0	11	14	32	10	0
Alaska	29	0	0	0	1	0	1	2	2	12	8	3
American Samoa	5	2	0	0	0	1	1	1	0	0	0	0
Arizona	15	0	0	0	0	0	0	0	2	6	7	0
Arkansas	75	0	0	0	0	0	2	9	30	30	4	0
California	58	0	0	0	0	0	0	0	0	11	44	3
Colorado	64	0	0	0	0	0	0	1	5	19	23	16
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	4	18	26	19
Georgia	159	0	0	0	0	3	5	13	25	63	42	8
Guam	1	0	0	0	0	0	0	0	0	1	0	0
Hawaii	5	0	0	0	0	0	0	0	0	0	2	3
Idaho	44	0	0	0	0	0	1	0	6	20	12	5
Illinois	102	0	0	0	1	0	0	3	16	61	21	0
Indiana	92	0	0	0	0	0	0	0	11	60	21	0
Iowa	99	0	0	0	0	0	0	0	2	84	12	1
Kansas	105	0	0	0	0	0	0	2	5	75	23	0
Kentucky	120	0	0	0	0	0	0	6	13	75	26	0
Louisiana	64	0	0	0	0	0	1	12	11	29	11	0
Maine	16	0	0	0	0	0	0	0	0	1	10	5
Maryland	24	0	0	0	0	0	0	0	0	7	15	2
Massachusetts	14	0	0	0	0	0	0	0	0	0	11	3
Michigan	83	0	0	0	0	0	0	2	3	49	25	4
Minnesota	87	0	0	0	0	0	0	1	1	51	32	2
Mississippi	82	0	0	0	0	1	4	25	29	19	3	1
Missouri	115	0	0	0	0	0	2	11	18	62	20	2
Montana	56	0	0	0	0	0	0	0	3	32	18	3
Nebraska	93	0	0	0	0	0	0	2	12	66	13	0

Figure 44 - Continued
Distribution of Counties by Ratio of Residential Fixed Connections to County Households by State as of December 31, 2019
(Connections over 200 kbps in at least one direction)

Ratio of Residential Fixed Connections over 200 kbps in at Least One Direction to County Households												
State	Counties	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	0	1	1	1	7	7	0
New Hampshire	10	0	0	0	0	0	0	0	0	0	7	3
New Jersey	21	0	0	0	0	0	0	0	0	0	18	3
New Mexico	33	0	0	0	0	0	0	2	1	18	9	3
New York	62	0	0	0	0	0	1	0	0	25	31	5
North Carolina	100	0	0	0	0	0	0	0	3	42	47	8
North Dakota	53	0	0	0	0	0	0	0	3	29	16	5
Northern Mariana Isl	4	1	0	0	0	0	1	1	1	0	0	0
Ohio	88	0	0	0	0	0	0	1	6	50	31	0
Oklahoma	77	0	0	0	0	0	2	10	23	36	5	1
Oregon	36	0	0	0	0	0	0	1	1	14	16	4
Pennsylvania	67	0	0	0	0	0	0	0	0	31	33	3
Puerto Rico	78	0	0	0	20	18	8	13	15	3	1	0
Rhode Island	5	0	0	0	0	0	0	0	0	0	4	1
South Carolina	46	0	0	0	0	0	0	2	9	18	15	2
South Dakota	66	0	0	0	0	0	0	0	5	41	18	2
Tennessee	95	0	0	0	0	0	0	0	11	66	16	2
Texas	254	0	0	0	0	0	2	11	32	139	58	12
Utah	29	0	0	0	0	0	0	0	0	5	17	7
Vermont	14	0	0	0	0	0	0	0	0	0	10	4
Virgin Islands	3	0	0	0	0	0	0	0	1	1	1	0
Virginia	134	0	0	0	0	1	4	5	15	59	47	3
Washington	39	0	0	0	0	0	0	1	1	11	22	4
West Virginia	55	0	0	0	0	0	1	1	8	37	8	0
Wisconsin	72	0	0	0	0	0	0	0	1	31	35	5
Wyoming	23	0	0	0	0	0	0	1	0	9	12	1
Total	3,234	3	0	0	22	24	37	151	349	1555	934	159

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

Sources: FCC Form 477; 2015-2019 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 45
Distribution of Census Tracts by Ratio of Residential Fixed Connections to Tract Households by State as of December 31, 2019
(Connections over 200 kbps in at least one direction)

Ratio of Residential Fixed Connections over 200 kbps in at Least One Direction to Tract Households												
State	Tracts	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	5	0	0	0	9	49	85	168	443	337	83
Alaska	167	2	0	0	4	1	6	1	9	56	67	21
American Samoa	18	2	0	0	0	5	6	3	0	0	1	1
Arizona	1,526	12	3	4	13	14	17	39	89	349	598	388
Arkansas	686	1	0	0	1	5	40	85	122	259	148	25
California	8,036	56	2	4	9	12	38	55	195	1,596	4,772	1,297
Colorado	1,249	14	1	0	0	2	3	10	19	231	694	275
Connecticut	829	4	0	0	1	0	1	2	14	128	536	143
Delaware	215	1	0	0	0	1	0	0	3	45	97	68
District of Columbia	179	1	0	0	0	0	0	1	4	54	69	50
Florida	4,199	39	0	1	2	1	11	40	98	656	1,778	1,573
Georgia	1,964	11	1	0	1	10	32	95	138	567	797	312
Guam	56	7	0	0	4	5	2	5	4	10	4	15
Hawaii	326	13	0	0	0	1	0	1	3	42	137	129
Idaho	298	0	0	0	2	2	4	7	16	117	120	30
Illinois	3,121	6	1	1	4	6	23	75	217	1,146	1,407	235
Indiana	1,508	4	1	0	4	1	11	48	126	646	563	104
Iowa	825	4	0	0	0	0	3	12	52	475	246	33
Kansas	770	10	0	0	1	2	1	16	60	316	305	59
Kentucky	1,115	10	0	1	0	7	17	36	85	443	456	60
Louisiana	1,136	12	1	1	3	9	29	93	139	414	354	81
Maine	351	0	0	0	0	0	0	0	2	79	187	83
Maryland	1,394	9	0	0	0	0	7	14	45	222	680	417
Massachusetts	1,471	12	0	0	1	1	3	1	20	220	934	279
Michigan	2,767	29	1	3	7	17	40	127	221	824	1,261	237
Minnesota	1,335	4	0	0	0	2	5	11	35	461	719	98
Mississippi	661	4	0	0	0	9	35	121	136	230	105	21
Missouri	1,393	4	0	0	2	8	25	68	162	456	546	122
Montana	271	2	0	0	1	0	3	6	7	114	116	22
Nebraska	532	3	0	1	0	0	0	5	24	218	242	39

Figure 45 - Continued
Distribution of Census Tracts by Ratio of Residential Fixed Connections to Tract Households by State as of December 31, 2019
(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	0	1	0	9	14	22	165	320	147
New Hampshire	294	2	0	0	0	0	0	0	2	23	179	88
New Jersey	2,004	10	1	0	1	5	7	4	19	350	1,097	510
New Mexico	499	2	3	2	4	8	13	14	54	176	179	44
New York	4,900	81	8	5	15	15	21	39	116	1,427	2,361	812
North Carolina	2,183	18	1	0	1	0	7	17	105	652	919	463
North Dakota	205	0	0	0	0	0	0	1	11	96	72	25
Northern Mariana Isl	22	2	0	0	0	1	6	6	0	7	0	0
Ohio	2,946	8	0	1	2	4	20	61	193	1,101	1,350	206
Oklahoma	1,046	0	0	2	6	17	37	78	176	368	272	90
Oregon	827	2	0	0	0	0	2	6	17	204	509	87
Pennsylvania	3,217	27	1	1	8	5	7	37	104	1,069	1,608	350
Puerto Rico	903	18	59	104	183	137	118	80	51	49	31	73
Rhode Island	241	1	0	0	0	0	0	2	0	38	153	47
South Carolina	1,097	12	0	0	0	11	13	53	94	350	373	191
South Dakota	222	0	0	0	1	0	0	6	12	109	75	19
Tennessee	1,497	21	1	0	1	6	13	58	144	586	522	145
Texas	5,253	40	1	0	2	21	63	180	452	1,721	1,932	841
Utah	588	4	2	0	2	1	2	0	12	111	335	119
Vermont	184	1	0	0	0	0	0	1	0	24	104	54
Virgin Islands	29	0	0	0	1	2	1	2	5	14	3	1
Virginia	1,895	23	0	0	3	13	28	49	110	448	816	405
Washington	1,446	2	1	1	0	4	4	6	15	212	940	261
West Virginia	484	0	0	3	8	10	15	25	68	201	128	26
Wisconsin	1,393	3	1	0	1	4	1	8	42	520	716	97
Wyoming	132	1	0	1	0	0	1	1	1	48	70	9
Total	73,767	564	90	136	300	394	799	1,810	4,038	20,886	33,340	11,410

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

Sources: FCC Form 477; 2015-2019 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).

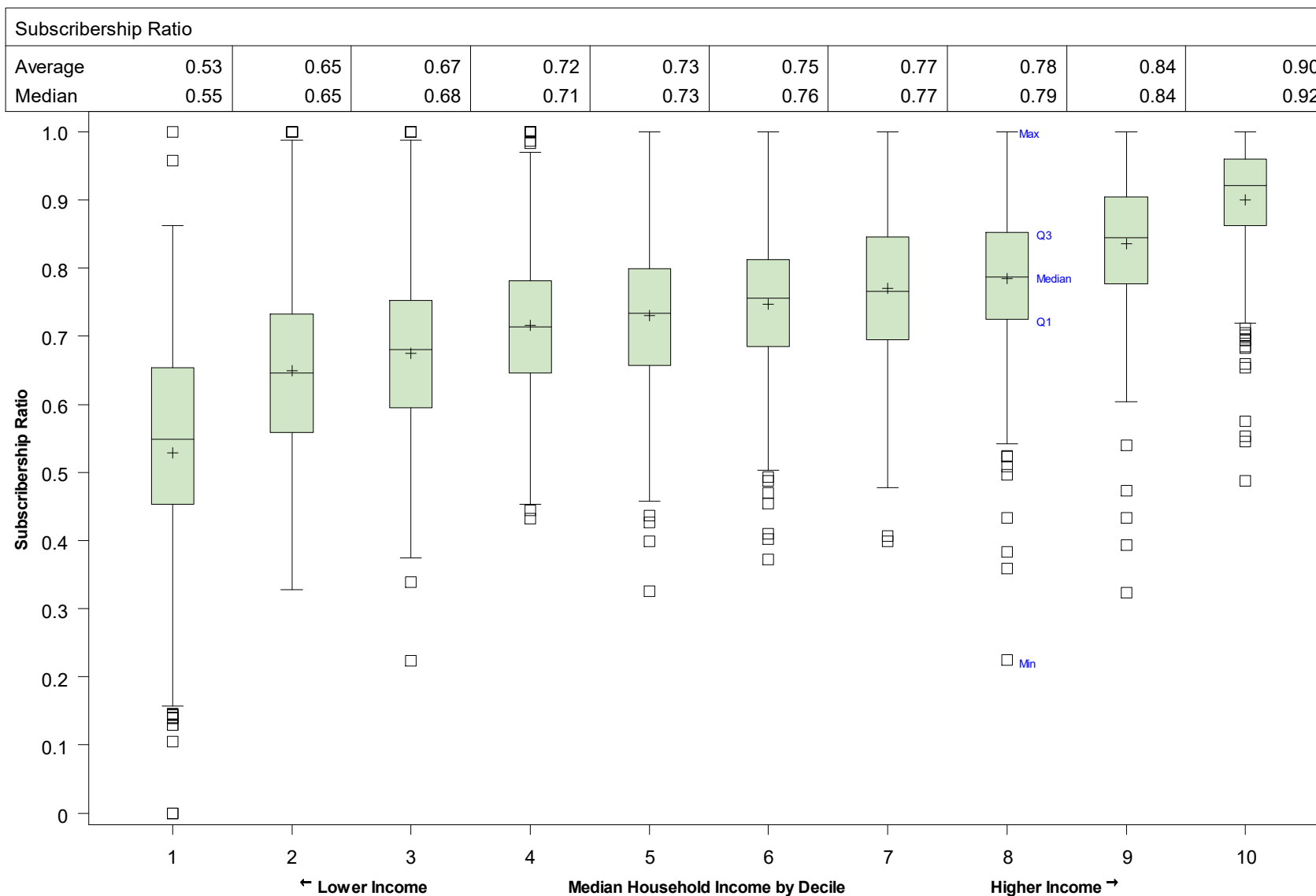
SECTION 5

CORRELATED RESULTS: DEMOGRAPHIC MEASURES

Table of Contents

Figure 46	Subscribership Ratio Distributions by Income Deciles as of December 31, 2019 ..	50
Figure 47	Subscribership Ratio Distributions by Density Deciles as of December 31, 2019..	51
Figure 48	Subscribership Ratio Distributions by Share of Population with a College Degree (in Deciles) as of December 31, 2019	52
Figure 49	Subscribership Ratio Distributions by Average Age of County Population (in Deciles) as of December 31, 2019	53
Figure 50	Subscribership Ratios by Technology and Tract Household Density as of December 31, 2019.....	54
Figure 51	Average Subscribership Ratios by Income and Household Density as of December 31, 2019.....	55

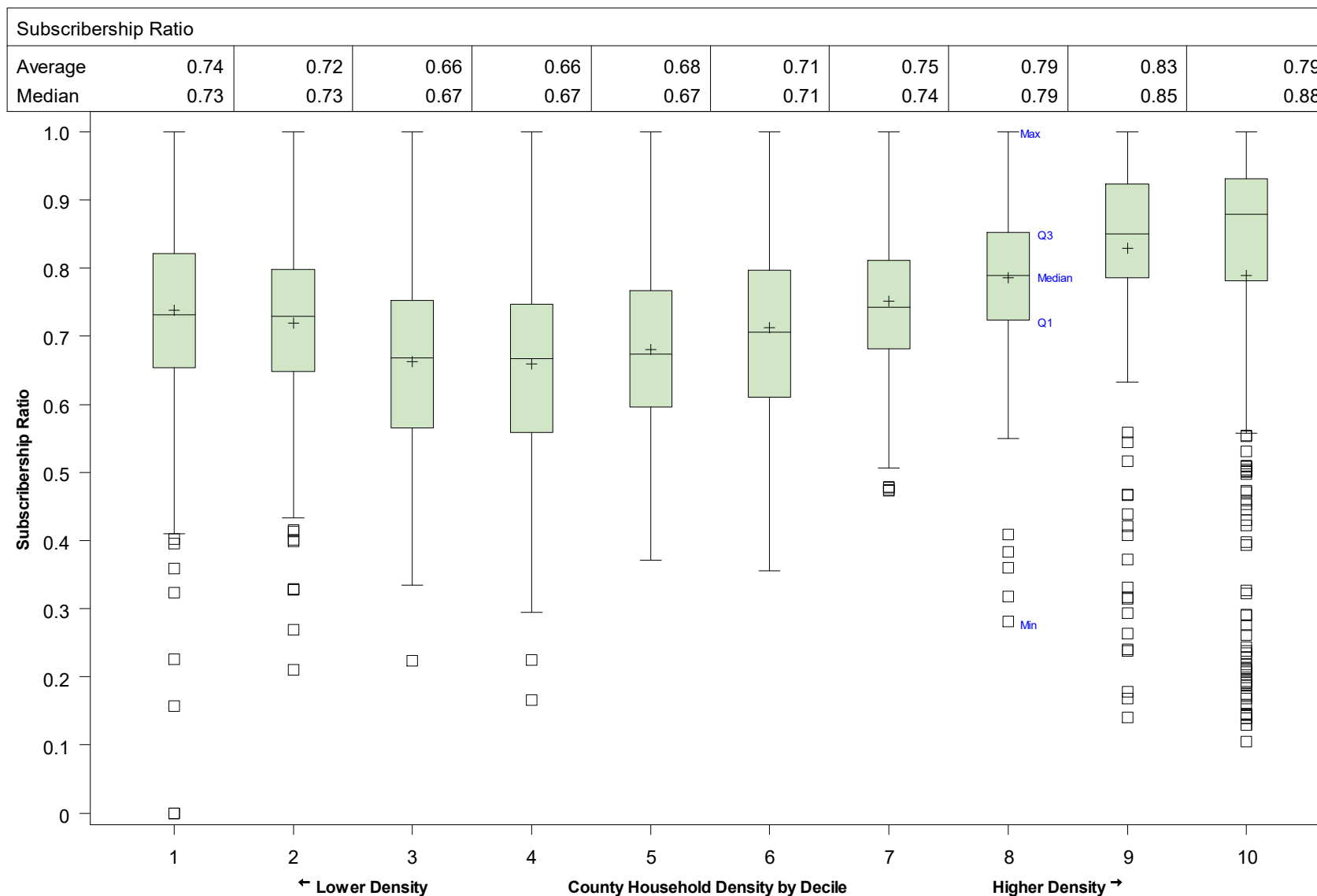
Figure 46
Subscribership Ratio Distributions by Income Deciles as of December 31, 2019



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; 2015-2019 ACS 5-year Estimates; Census 2010.

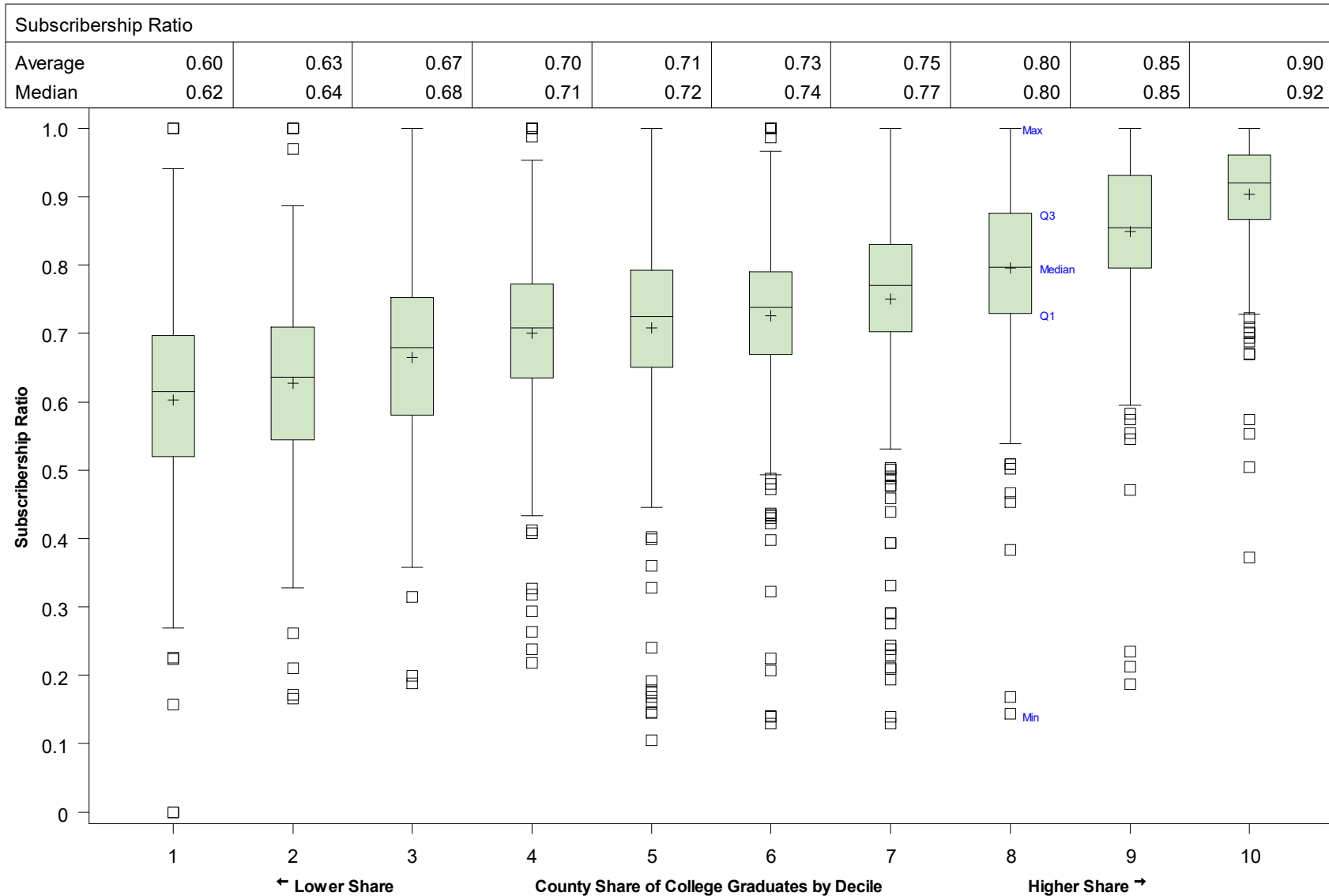
Figure 47
Subscribership Ratio Distributions by Density Deciles as of December 31, 2019



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; 2015-2019 ACS 5-year Estimates; Census 2010.

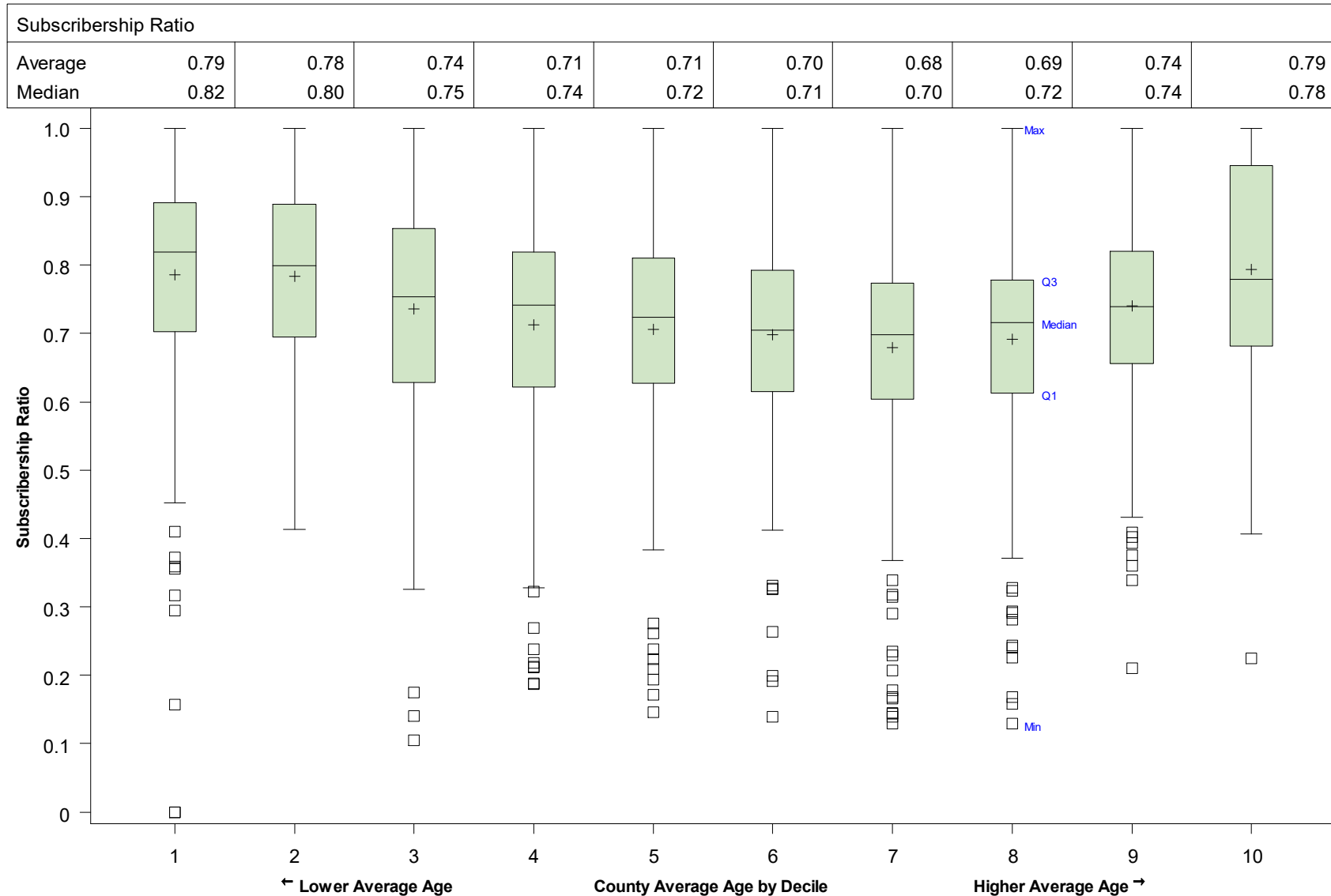
Figure 48
Subscribership Ratio Distributions by Share of Population with a College Degree (in Deciles) as of December 31, 2019



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; 2015-2019 ACS 5-year Estimates; Census 2010.

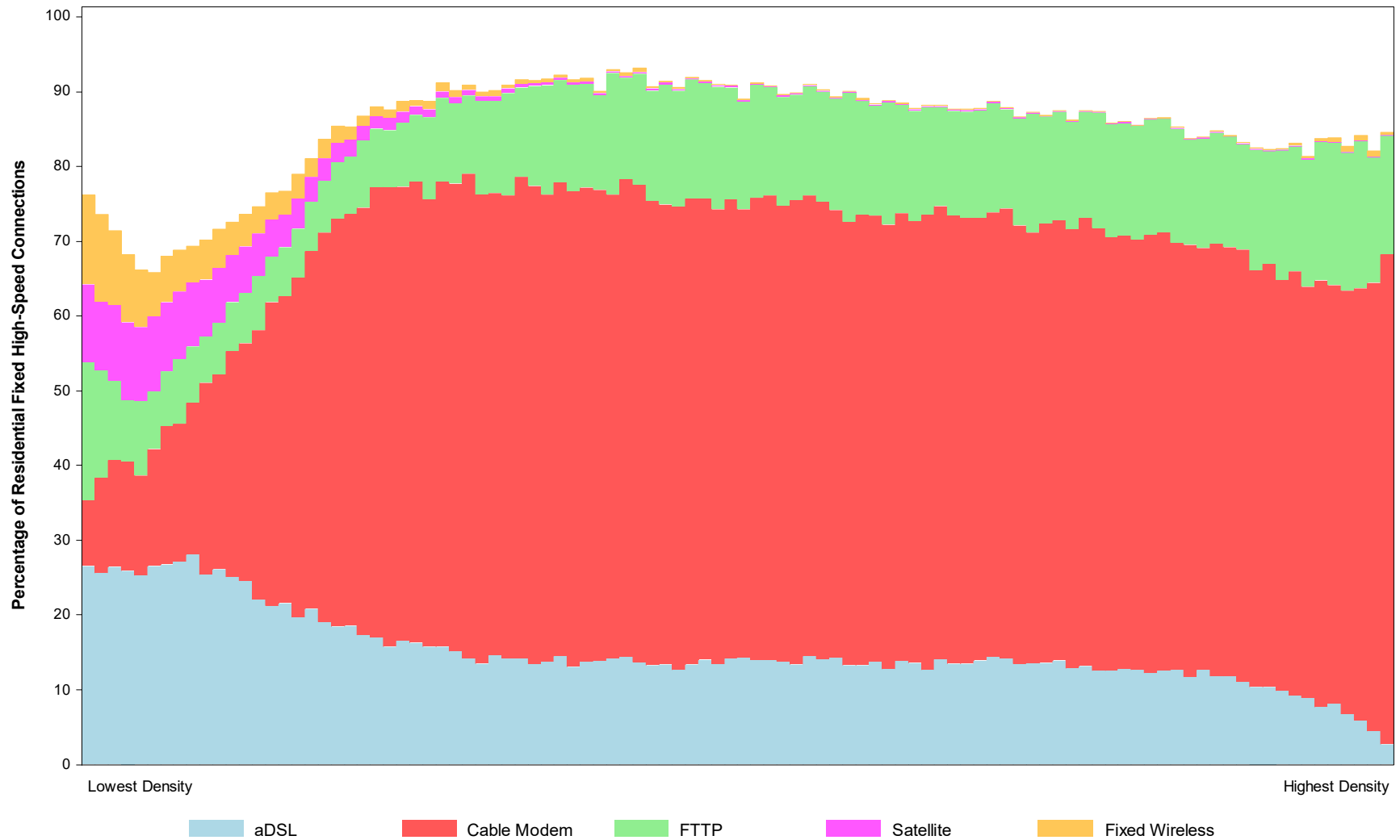
Figure 49
Subscribership Ratio Distributions by Average Age of County Population (in Deciles) as of December 31, 2019



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; 2015-2019 ACS 5-year Estimates; Census 2010.

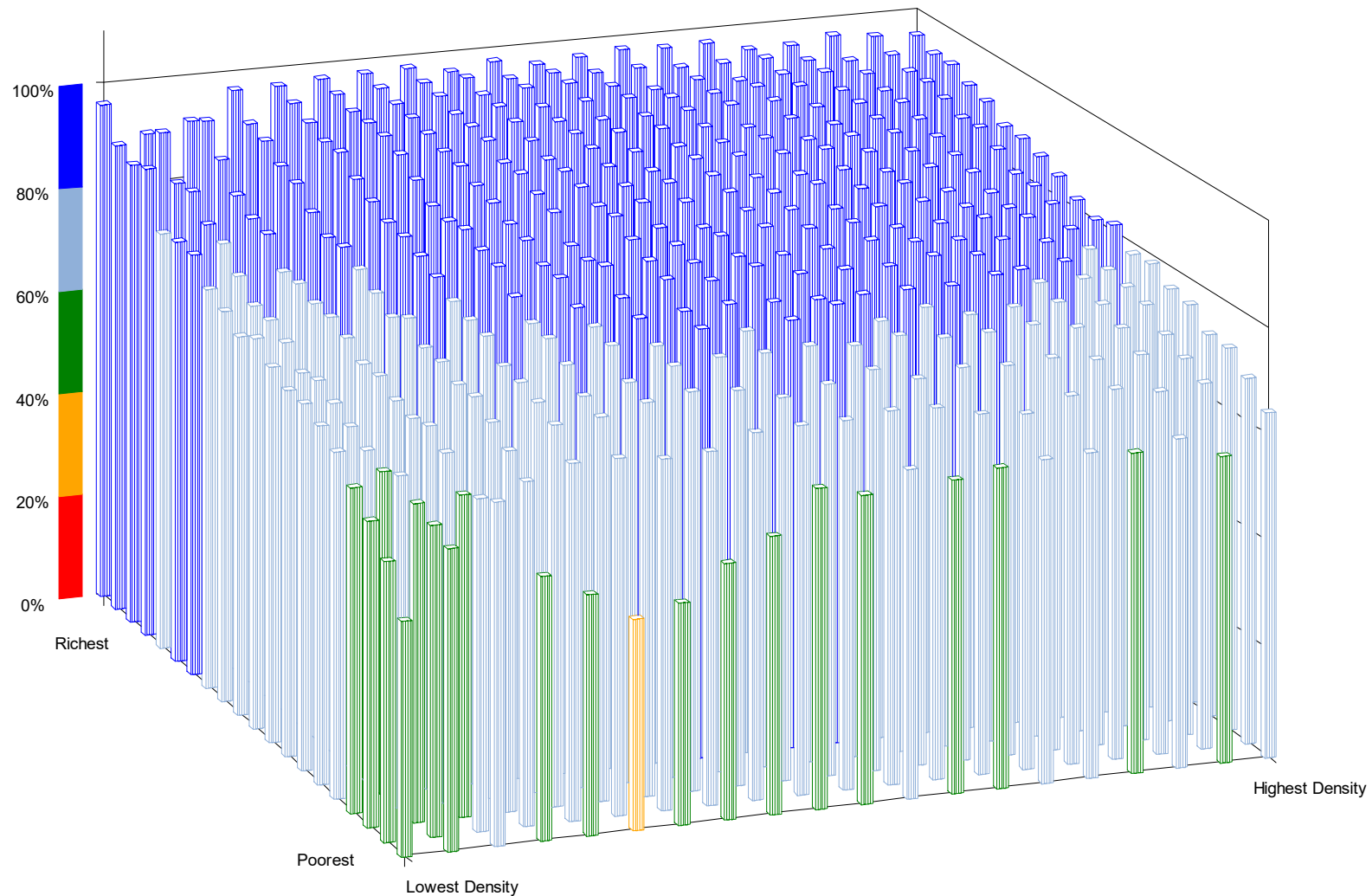
Figure 50
Subscribership Ratios by Technology and Tract Household Density as of December 31, 2019
(Residential fixed connections over 200 kbps in at least one direction)



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; 2015-2019 ACS 5-year estimates; and Census 2010.

Figure 51
Average Subscriberhip Ratios by Income and Household Density as of December 31, 2019
(Residential fixed connections over 200 kbps in at least one direction by Tract)



This chart shows subscriberhip 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; 2015-2019 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 FCC 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 FCC Form 477.¹⁰ Detailed information about those changes and about the FCC Form 477 reporting requirements in general is available at www.fcc.gov/form477.

In March 2020, Congress passed the Broadband Data Act which required the Commission to collect broadband availability data at a more granular level than what was historically reported through FCC Form 477.¹¹ As a result, starting in June 2022, broadband availability data have been collected through the Broadband Data Collection (BDC) while subscription data continues to be reported through FCC Form 477. To ensure consistency across the two data collections, several minor changes were made to the FCC Form 477 reporting requirements beginning with filings as of June 30, 2022. Complete reporting requirements for both, the BDC and FCC Form 477, can be found here: www.fcc.gov/BroadbandData/filers. The inaugural BDC filing window for data as of June 30, 2022 was closed on September 1, 2022. Subscription data collected as part of the BDC will be incorporated into this report beginning with the June 30, 2022 edition.

FCC 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 FCC 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 FCC 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

¹⁰ *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>.

¹¹ Broadband Deployment Accuracy and Technological Availability Act, Pub. L. No. 116-130, 134 Stat. 228 (2020) (codified at 47 U.S.C. §§ 641-646) (Broadband DATA Act or Act).

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 FCC 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 FCC 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 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 FCC 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 2015-2019 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.