

Internet Access Services: Status as of December 31, 2021

Industry Analysis Division
Office of Economics & Analytics
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SECTION 1: OVERVIEW & HIGHLIGHTS

Introduction

This report summarizes information about Internet access connections in the United States as of December 31, 2021 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.

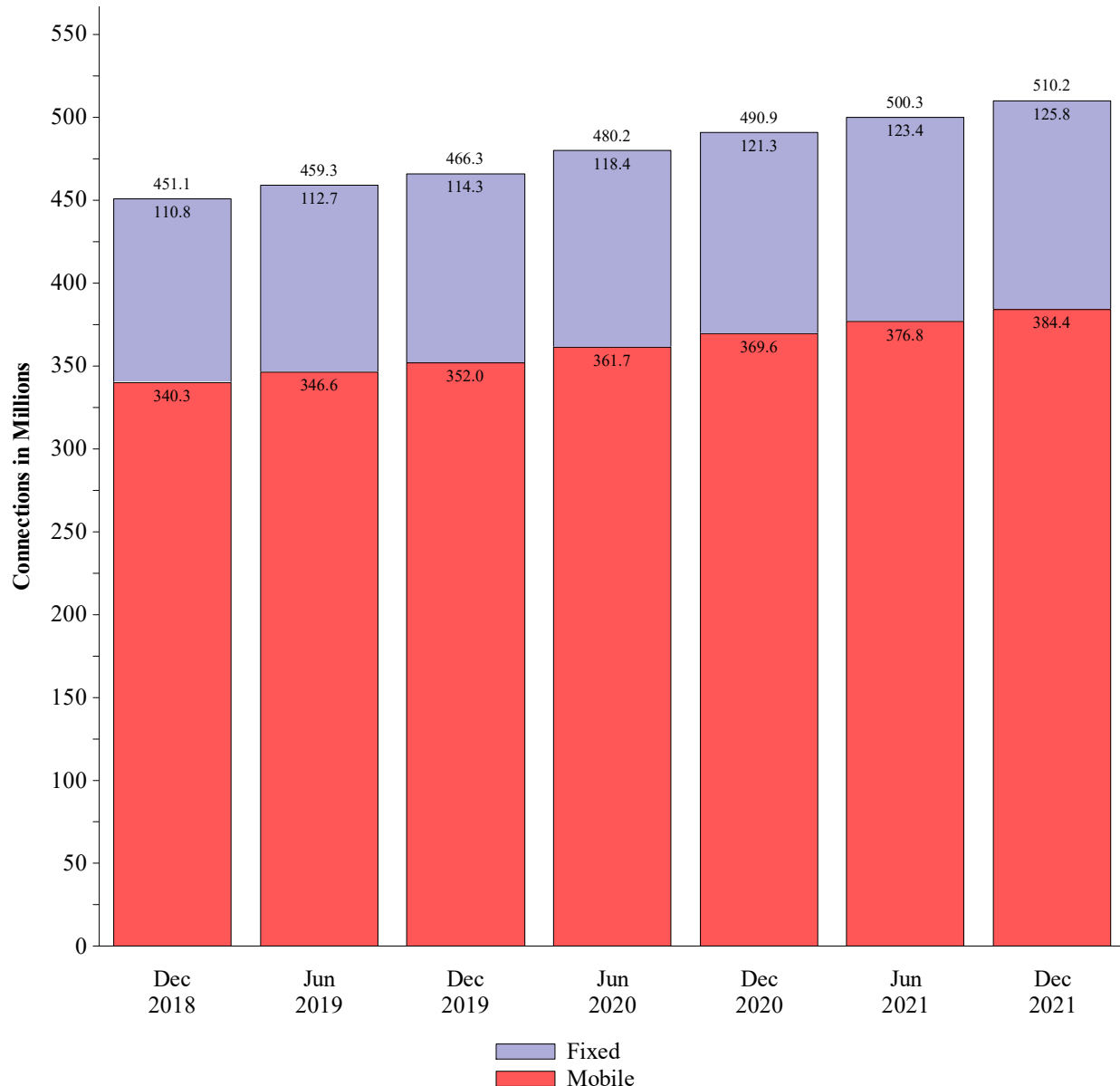
² The Commission began collecting census tract-level data for data as of December 31, 2008. *See High-Speed Services for Internet Access: Status as of December 31, 2008* (February 2010) at 1-4, available at <http://www.fcc.gov/encyclopedia/high-speed-services-internet-access-reports> (December 2008 High-Speed 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 3.9% between December 2020 and December 2021 to 510 million. Mobile Internet connections increased 4.0% year-over-year to 384 million in December 2021, while fixed connections grew to 126 million – up about 3.7% from December 2020.

Figure 1
Fixed and Mobile Connections 2018-2021



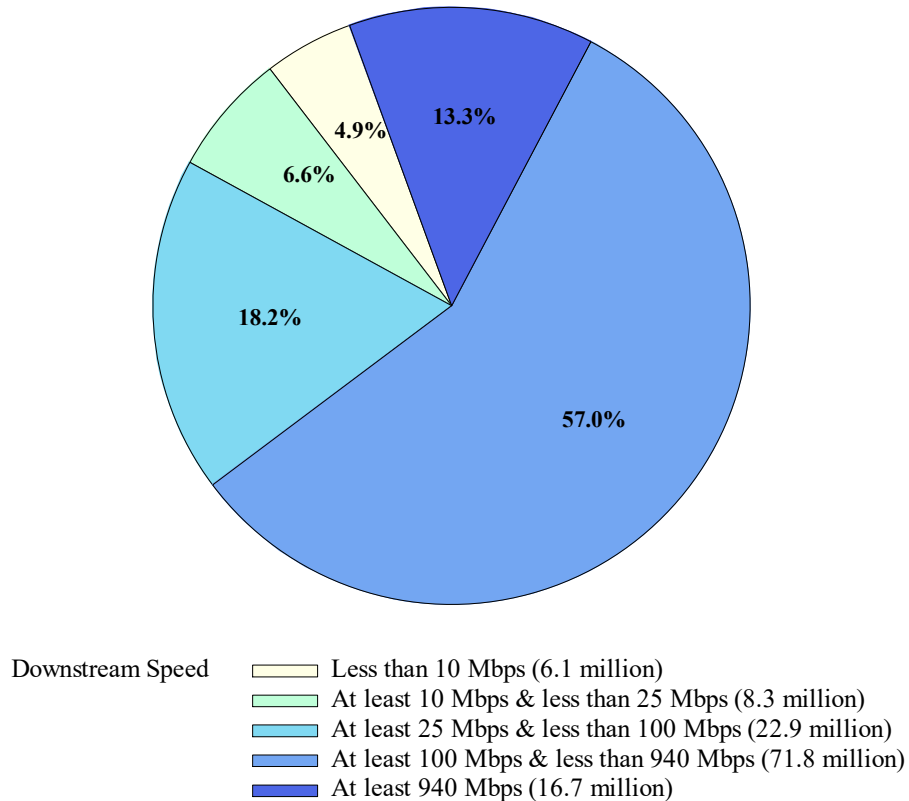
Note: Some previously-published data may have been revised. Numbers may not sum to totals due to rounding. Connections include both residential and business connections.

Source: FCC Form 477.

Connections by Speed

Fixed connections – downstream speeds. Figure 2(a) illustrates how the 126 million fixed connections reported for December 2021 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.

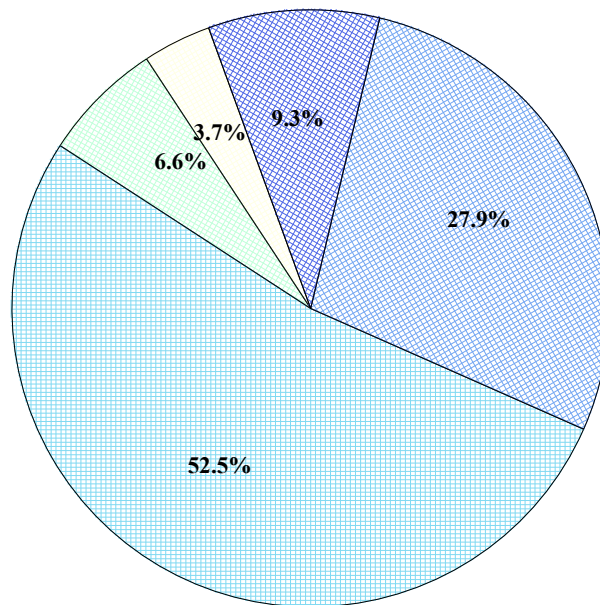
Figure 2(a)
Distribution of Fixed Connections (125.8 million) by Downstream Speed
as of December 31, 2021



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

Fixed connections – upstream speeds. Figure 2(b) illustrates how the 126 million fixed connections reported for December 2021 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 (125.8 million) by Upstream Speed
as of December 31, 2021

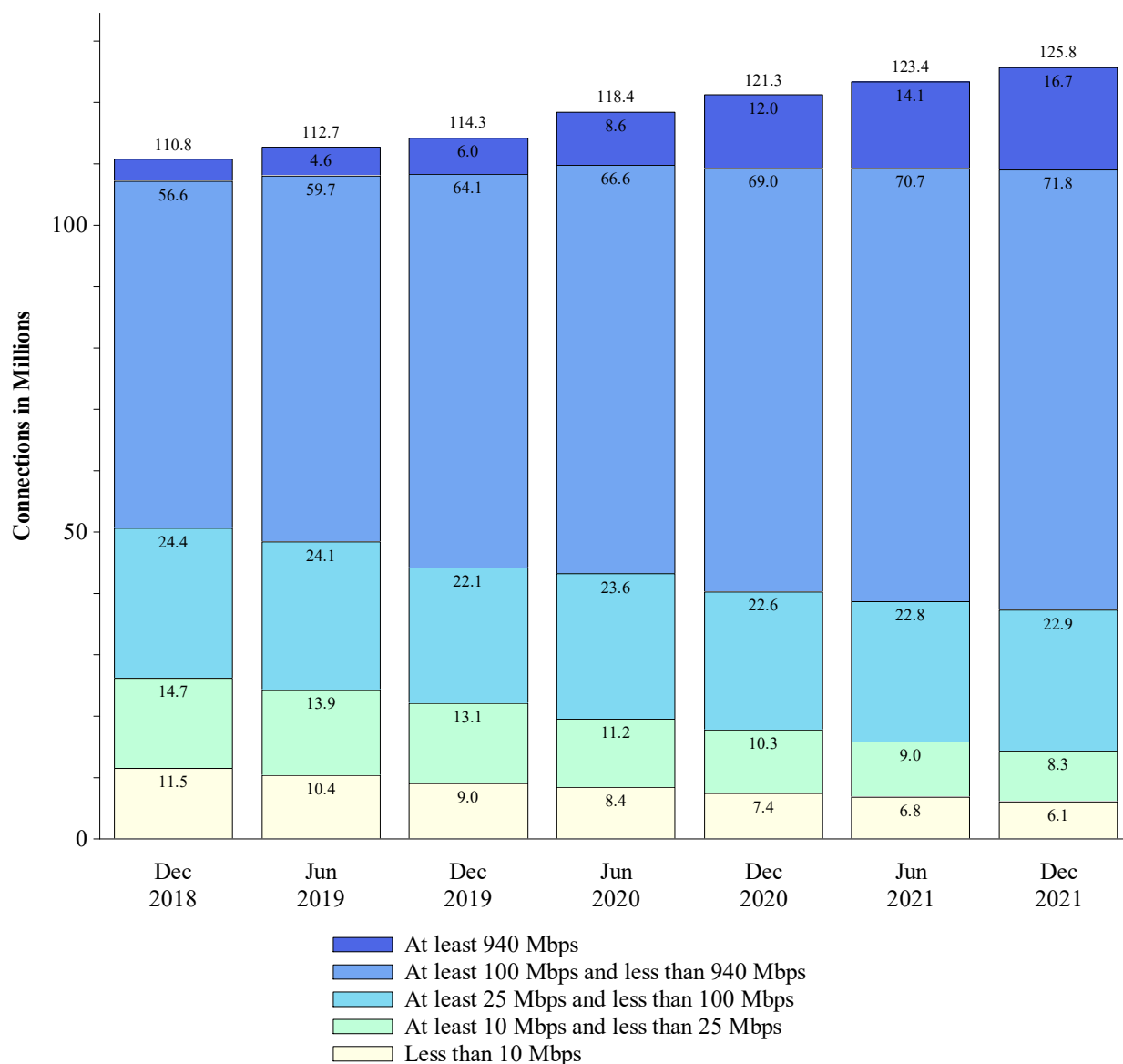


Upstream Speed		Less than 1 Mbps (4.7 million)
		At least 1 Mbps & less than 3 Mbps (8.3 million)
		At least 3 Mbps & less than 20 Mbps (66.1 million)
		At least 20 Mbps & less than 500 Mbps (35.1 million)
		At least 500 Mbps (11.7 million)

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 2018 to 2021.

Figure 3
Fixed Connections by Downstream Speed 2018-2021



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.

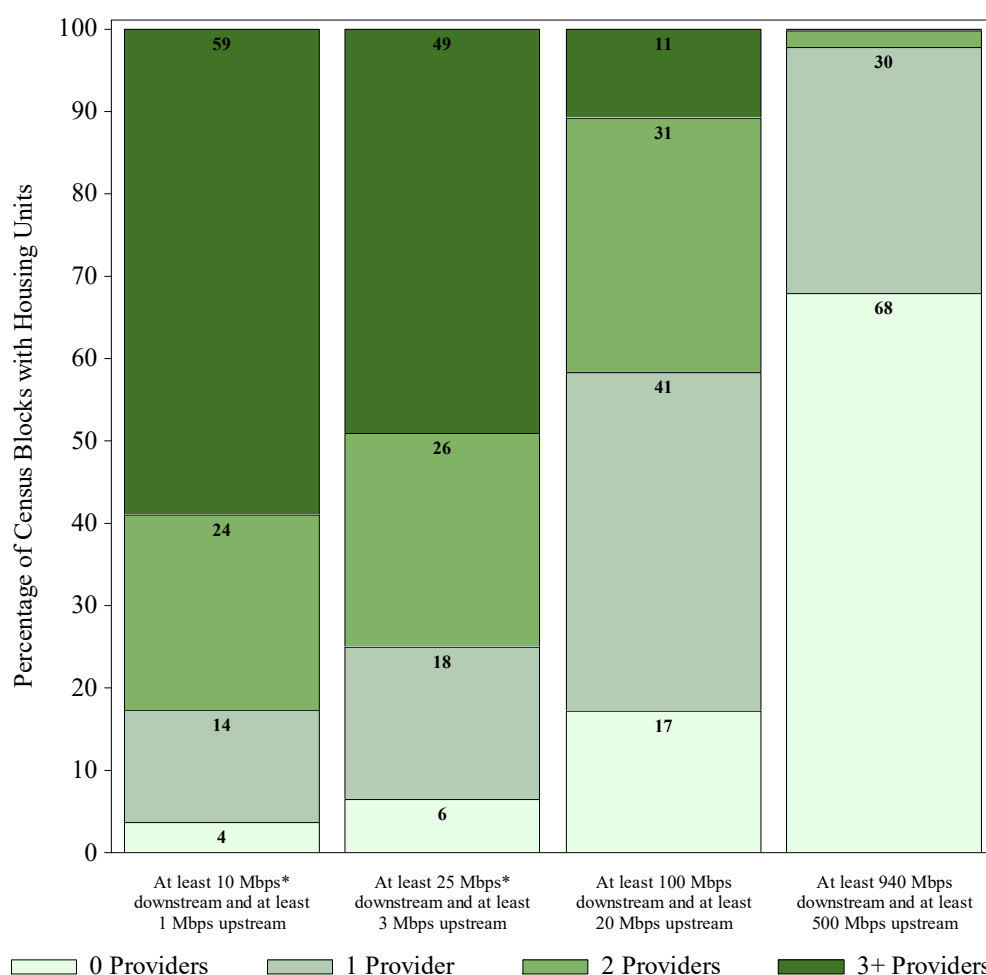
Source: FCC Form 477.

- The percentage of fixed connections with a downstream speed of at least 100 Mbps has grown from 54% (or 60 million connections) in December 2018 to 70% (or 89 million connections) in December 2021. Over the same period, the percentage of fixed connections with downstream speeds of less than 10 Mbps has decreased from 10% (or 12 million connections) in December 2018 to about 5% (or about 6 million connections) in December 2021.

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 2021. 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, 2021



* 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.

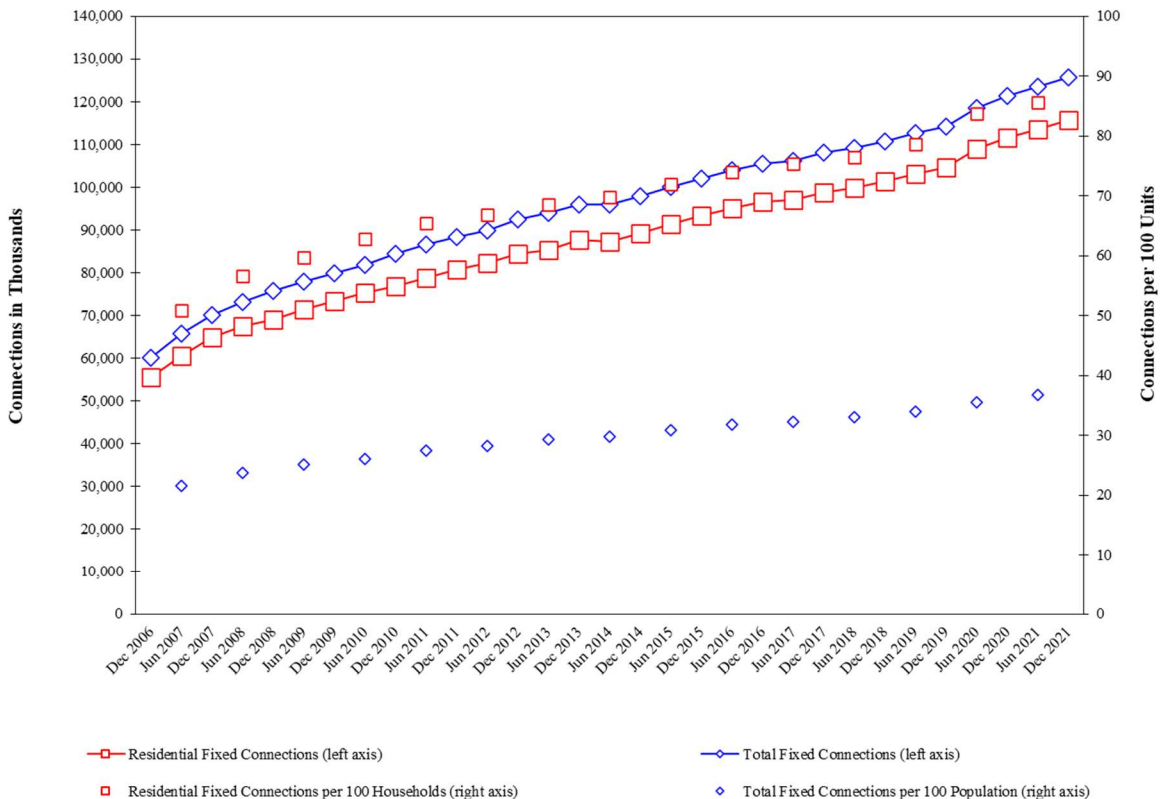
Note: Numbers may not sum to totals due to rounding. Developed census blocks are those with housing units based on the 2020 census. Source: FCC Form 477.

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 2006.

Figure 5
Fixed Connections 2006-2021
(Connections over 200 kbps in at least one direction)



- Between December 2011 and December 2021, total (business and residential) fixed connections grew from 88 million connections to 126 million connections – at a compound annual growth rate of 4% per year.⁵
- Over the same ten-year period, residential fixed connections grew from 81 million connections to 116 million connections – also at a compound annual growth rate of 4% per year.

⁵ 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.

- From June 2011 to June 2021, the number of residential fixed connections per 100 U.S. households increased from 65 to 86.⁶

Other Report Highlights

Typical speeds

- The median downstream speed of all reported fixed connections was 200 Mbps and the median upstream speed was 10 Mbps. For residential fixed connections, the median downstream speed was 200 Mbps and the median upstream speed was 10 Mbps.

Residential connections

- Residential fixed Internet access connections increased by about 3.7% between December 2020 and December 2021, to about 116 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 8.4%, to 321 million, between December 2020 and December 2021. *See Figure 7.*
- Approximately 95% of residential fixed connections had a speed of at least 10 Mbps downstream and 1 Mbps upstream in December 2021, while 89% had a speed of at least 25 Mbps downstream and 3 Mbps upstream. About 72% 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 2021, there were about 88 residential fixed connections with speeds of at least 10 Mbps downstream and 1 Mbps upstream per 100 households; 82 residential fixed connections with speeds of at least 25 Mbps downstream and 3 Mbps upstream per 100 households; and 32 residential fixed connections with speeds of at least 100 Mbps downstream and 20 Mbps upstream per 100 households.⁷ *See Figure 34.*

⁶ 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 133 million households in the United States and inhabited insular areas and a population of about 336 million according to the sources used for Figure 5.)

⁷ 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 December 31, 2021.⁸ 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.

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

⁸ 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

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Figure 6
Connections over 200 kbps in at Least One Direction 2017-2021
(in thousands)

<i>Technology</i>	<i>2017</i>	<i>2018</i>		<i>2019</i>		<i>2020</i>		<i>2021</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>	<i>Dec</i>
Total	420,838	428,864	451,062	459,327	466,302	480,185	490,888	500,261	510,198
Total Fixed	108,065	109,087	110,784	112,725	114,291	118,449	121,250	123,425	125,777
Mobile Wireless	312,773	319,776	340,278	346,603	352,012	361,737	369,638	376,835	384,420

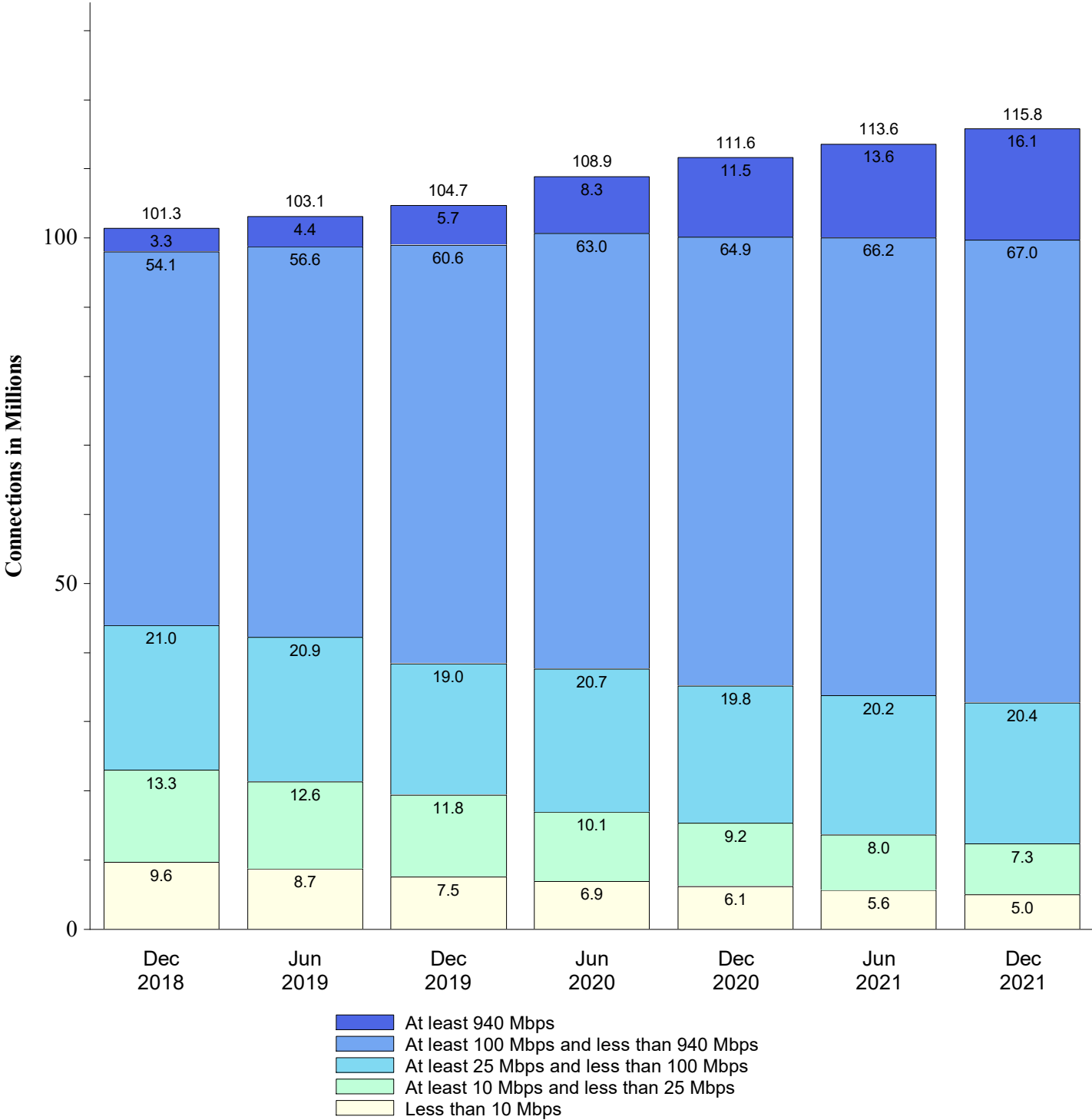
Some previously-published data may have been revised. Numbers may not sum to totals due to rounding.
Source: FCC Form 477.

Figure 7
Residential Connections over 200 kbps in at Least One Direction 2017-2021
(in thousands)

<i>Technology</i>	<i>2017</i>	<i>2018</i>		<i>2019</i>		<i>2020</i>		<i>2021</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>	<i>Dec</i>
Total	351,966	358,867	378,286	383,605	388,344	403,212	407,652	415,260	436,576
Total Fixed	98,845	99,758	101,348	103,118	104,703	108,909	111,621	113,581	115,792
Mobile Wireless	253,121	259,109	276,938	280,486	283,641	294,303	296,031	301,679	320,785

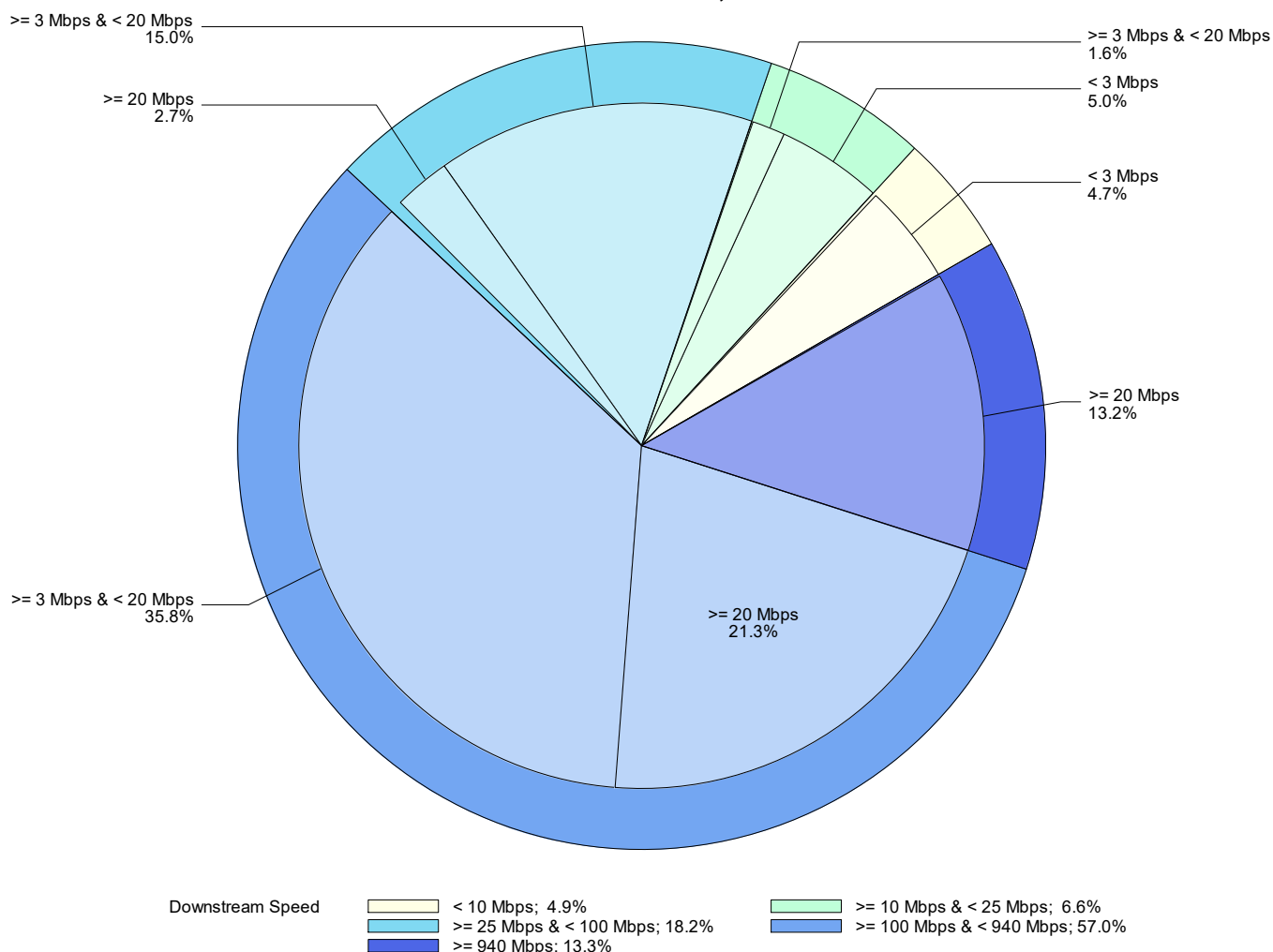
Some previously-published data may have been revised. Numbers may not sum to totals due to rounding.
Source: FCC Form 477.

Figure 8
Residential Fixed Connections by Downstream Speed 2018-2021



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, 2021



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

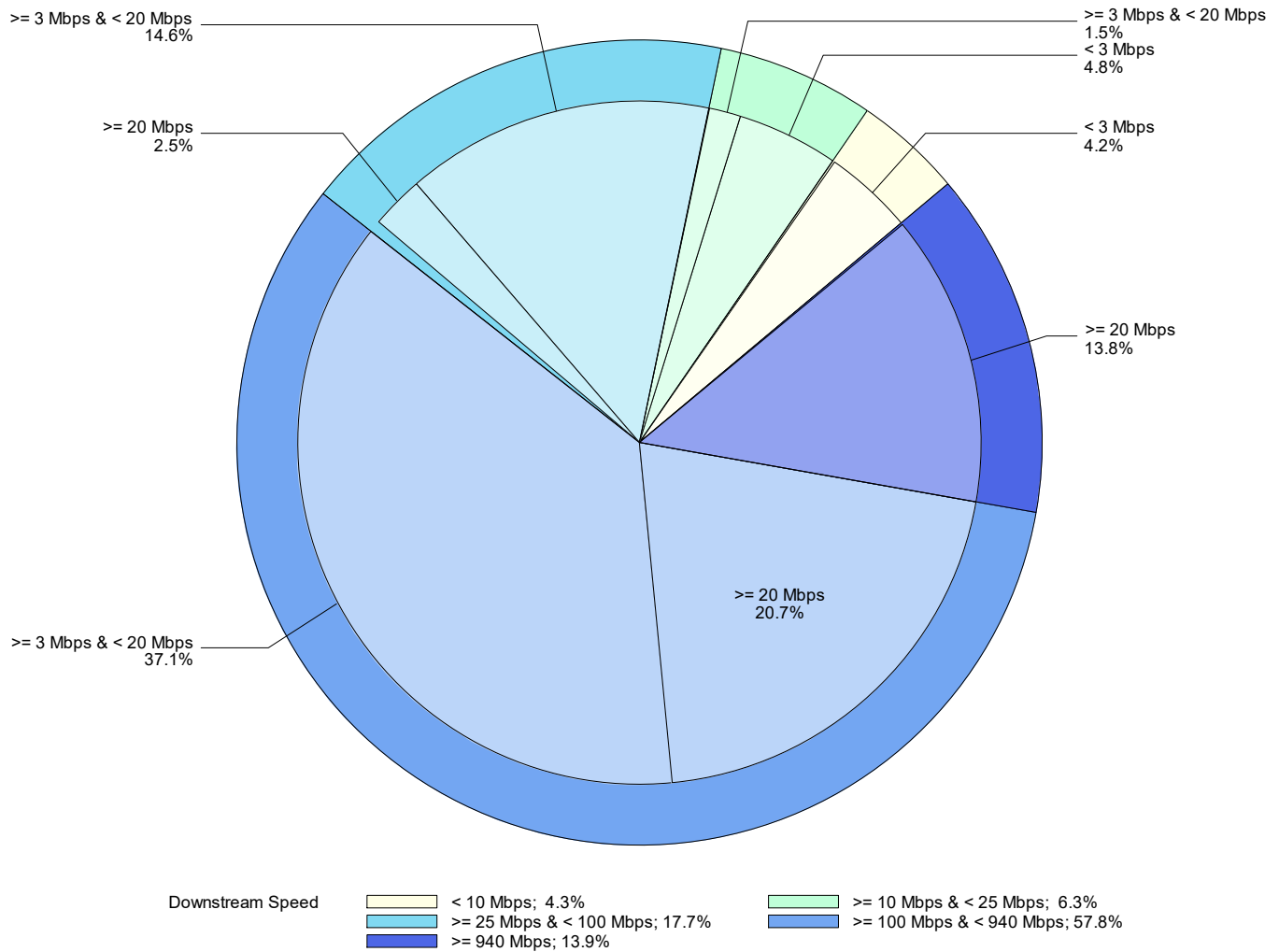
Fixed Connections over 200 kbps in at Least One Direction (in thousands)

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	5,908	6,272	728	11	#	12,920
At least 3 Mbps & Less than 20 Mbps	204	1,950	18,852	44,966	118	66,090
At least 20 Mbps	2	75	3,339	26,775	16,577	46,767
Total	6,114	8,297	22,919	71,752	16,695	125,777

Percentages						
Less than 3 Mbps	4.7	5.0	0.6	0.0	0.0	10.3
At least 3 Mbps & Less than 20 Mbps	0.2	1.6	15.0	35.8	0.1	52.5
At least 20 Mbps	0.0	0.1	2.7	21.3	13.2	37.2
Total	4.9	6.6	18.2	57.0	13.3	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, 2021



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	4,878	5,550	669	10	#	11,108
At least 3 Mbps & Less than 20 Mbps	121	1,724	16,890	42,998	114	61,848
At least 20 Mbps	2	33	2,880	23,959	15,962	42,836
Total	5,001	7,307	20,440	66,967	16,077	115,792

Percentages

Less than 3 Mbps	4.2	4.8	0.6	0.0	0.0	9.6
At least 3 Mbps & Less than 20 Mbps	0.1	1.5	14.6	37.1	0.1	53.4
At least 20 Mbps	0.0	0.0	2.5	20.7	13.8	37.0
Total	4.3	6.3	17.7	57.8	13.9	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 2017-2021
(in thousands)

	2017	2018	2019	2020	2021				
Technology	Dec	Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec
Total	420,838	428,864	451,062	459,327	466,302	480,185	490,888	500,261	510,198
Total Fixed	108,065	109,087	110,784	112,725	114,291	118,449	121,250	123,425	125,777
aDSL	24,193	23,074	22,377	21,163	20,214	19,639	18,786	18,085	16,868
sDSL	28	28	20	17	16	19	13	18	14
Other Wireline ¹	581	558	557	501	525	516	527	517	530
Cable Modem	66,196	67,165	68,882	70,750	72,516	75,986	77,909	79,330	80,232
FTTP ²	13,890	14,889	15,492	16,748	17,376	18,443	19,945	21,120	23,338
Satellite	1,872	1,939	1,971	1,984	1,975	1,993	1,931	1,910	1,873
Fixed Wireless	1,306	1,434	1,485	1,561	1,669	1,853	2,140	2,445	2,923
Mobile Wireless	312,773	319,776	340,278	346,603	352,012	361,737	369,638	376,835	384,420

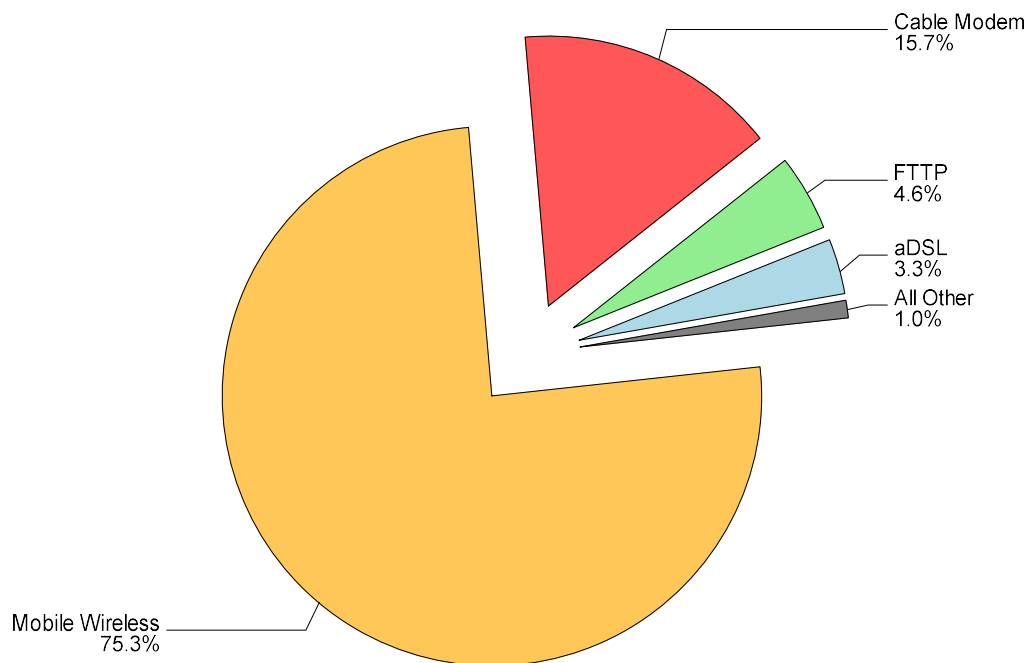
¹ Power Line and Other are summarized with Other Wireline for confidentiality reasons. See Technical Notes at the end of the report for a description of FCC Form 477 technology categories and other reporting requirements.

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, 2021



Source: FCC Form 477.

Figure 13
Residential Connections over 200 kbps in at Least One Direction by Technology 2017-2021
(in thousands)

Technology	2017	2018		2019		2020		2021	
	Dec	Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec
Total	351,966	358,867	378,286	383,605	388,344	403,212	407,652	415,260	436,576
Total Fixed	98,845	99,758	101,348	103,118	104,703	108,909	111,621	113,581	115,792
aDSL	21,653	20,671	20,126	18,976	18,159	17,647	16,920	16,278	15,186
sDSL	9	9	4	4	5	7	3	4	3
Other Wireline ¹	67	74	76	62	74	64	59	63	80
Cable Modem	61,567	62,320	63,813	65,457	67,141	70,710	72,543	73,844	74,599
FTTP ²	12,702	13,663	14,205	15,410	16,011	16,971	18,384	19,414	21,531
Satellite	1,688	1,751	1,787	1,805	1,795	1,815	1,752	1,728	1,692
Fixed Wireless	1,158	1,270	1,338	1,405	1,520	1,694	1,958	2,251	2,701
Mobile Wireless	253,121	259,109	276,938	280,486	283,641	294,303	296,031	301,679	320,785

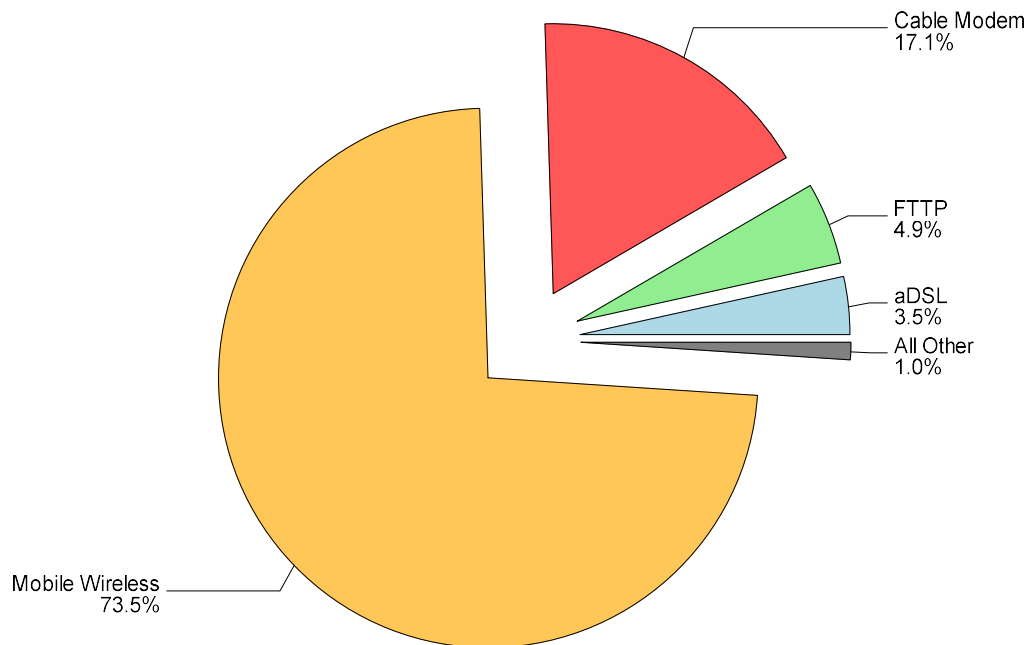
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² Fiber to the premises.

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, 2021



Source: FCC Form 477.

Figure 15
Fixed Connections at Least 10 Mbps Downstream and 1 Mbps Upstream by Technology 2017-2021
(in thousands)

Technology	2017	2018	2019	2020	2021
	Dec	Jun	Dec	Jun	Dec
Total	90,609	94,071	97,302	100,464	103,595
aDSL	11,598	11,822	12,038	11,829	11,704
sDSL	9	11	6	5	5
Other Wireline ¹	262	271	292	261	301
Cable Modem	63,978	65,808	67,716	69,704	71,934
FTTP ²	12,869	13,898	14,815	16,078	16,854
Satellite	1,402	1,595	1,677	1,726	1,737
Fixed Wireless	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.

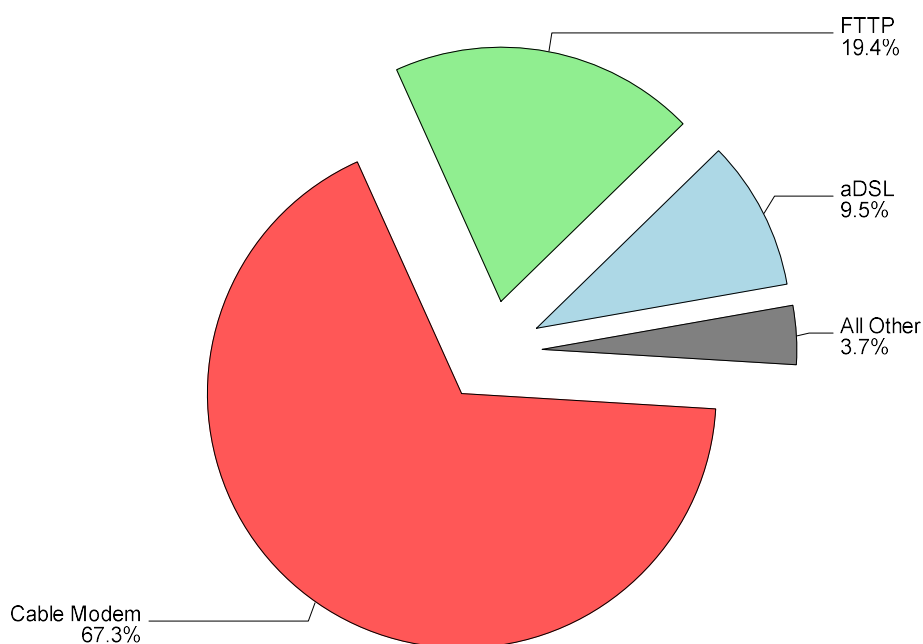
² Fiber to the premises.

= 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, 2021



Source: FCC Form 477.

Figure 17**Residential Fixed Connections at Least 10 Mbps Downstream and 1 Mbps Upstream by Technology 2017-2021**
(in thousands)

Technology	2017	2018	2019	2020	2021
	Dec	Jun	Dec	Jun	Dec
Total	84,163	86,973	89,873	92,698	95,649
aDSL	10,657	10,862	11,073	10,812	10,682
sDSL	5	6	2	1	2
Other Wireline ¹	64	65	68	58	70
Cable Modem	59,864	61,142	62,810	64,556	66,691
FTTP ²	11,762	12,741	13,589	14,800	15,536
Satellite	1,387	1,575	1,655	1,702	1,708
Fixed Wireless	425	582	676	768	960

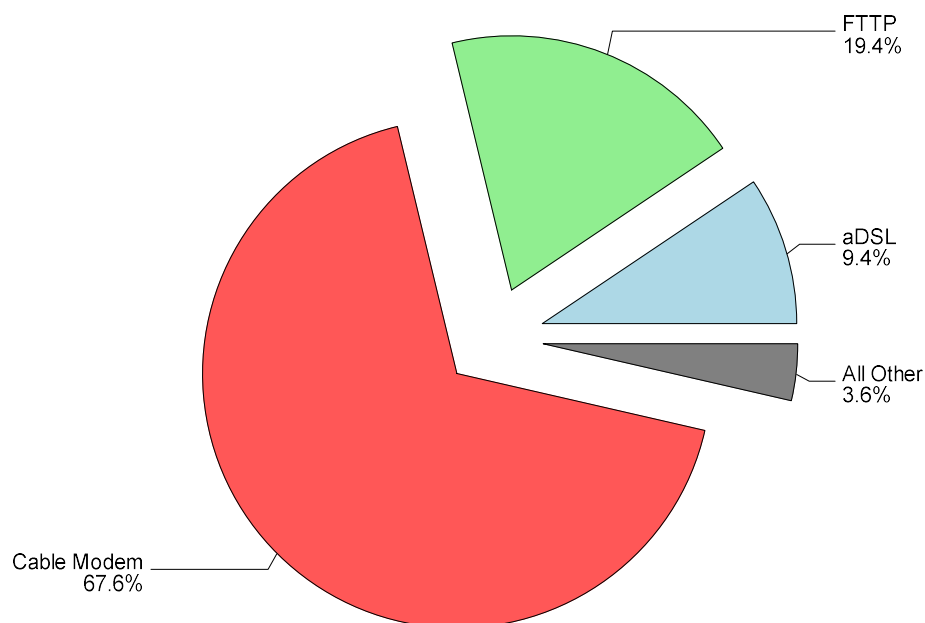
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= Rounds to zero.

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, 2021**

Source: FCC Form 477.

Figure 19
Fixed Connections at Least 25 Mbps Downstream and 3 Mbps Upstream by Technology 2017-2021
(in thousands)

Technology	2017	2018	2019	2020	2021
	Dec	Jun	Dec	Jun	Dec
Total	73,875	78,952	82,965	86,744	90,471
aDSL	3,586	4,298	4,988	5,233	5,523
sDSL	*	*	*	*	*
Other Wireline ¹	219	203	228	220	263
Cable Modem	57,870	60,859	62,880	64,938	67,171
FTTP ²	11,489	12,568	13,605	14,902	15,866
Satellite	*	*	*	*	*
Fixed Wireless	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.

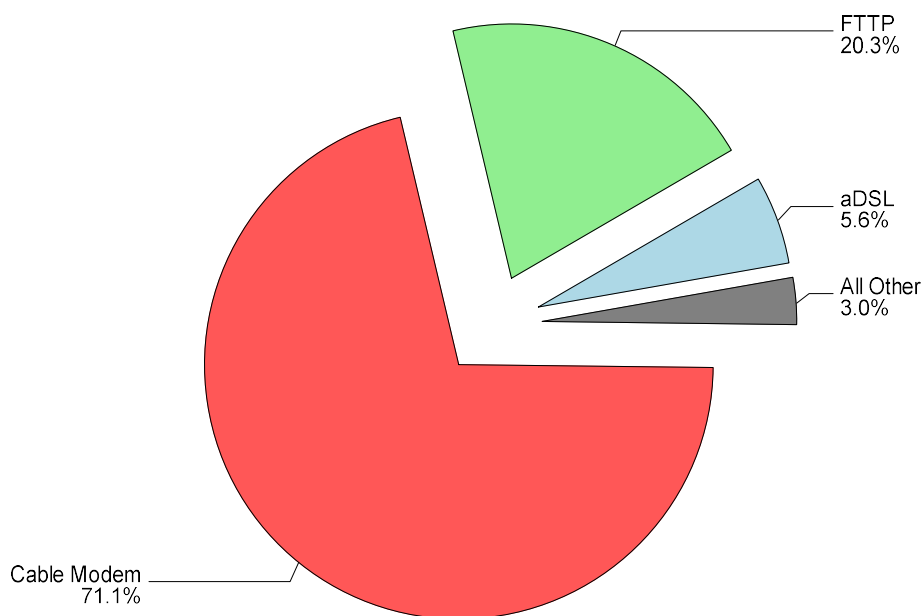
* = Data withheld for confidentiality reasons.

= 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, 2021



Source: FCC Form 477.

Figure 21
Residential Fixed Connections at Least 25 Mbps Downstream and 3 Mbps Upstream by Technology 2017-2021
(in thousands)

Technology	2017	2018	2019	2020	2021
	Dec	Jun	Dec	Jun	Dec
Total	69,447	73,288	76,873	80,256	83,725
aDSL	3,410	4,068	4,712	4,911	5,168
sDSL	*	*	*	*	*
Other Wireline ¹	59	54	61	53	64
Cable Modem	54,748	56,620	58,342	60,125	62,231
FTTP ²	10,553	11,570	12,546	13,780	14,690
Satellite	*	*	*	*	*
Fixed Wireless	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.

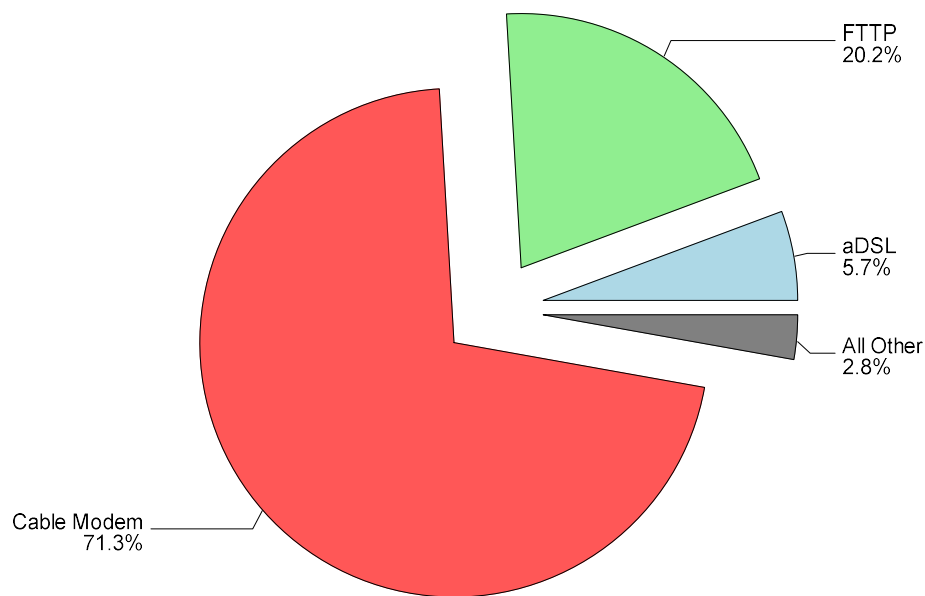
* = Data withheld for confidentiality reasons.

= 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, 2021



Source: FCC Form 477.

Figure 23
Fixed Connections at Least 100 Mbps Downstream and 20 Mbps Upstream by Technology 2017-2021
(in thousands)

Technology	2017	2018	2019	2020	2021
	Dec	Jun	Dec	Jun	Dec
Total	12,148	14,619	18,750	22,217	25,603
aDSL	47	59	207	387	569
sDSL	1	1	#	*	*
Other Wireline ¹	192	174	196	178	211
Cable Modem	7,149	8,352	9,466	11,426	13,088
FTTP ²	4,729	5,976	8,815	10,146	11,634
Satellite	0	0	0	*	*
Fixed Wireless	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.

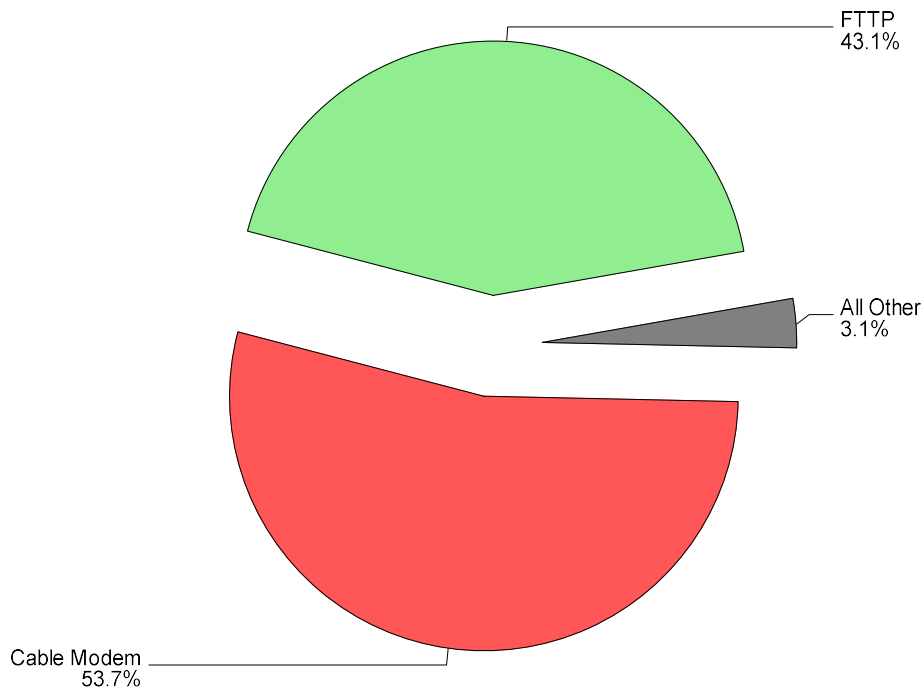
* = Data withheld for confidentiality reasons.

= 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, 2021



Source: FCC Form 477.

Figure 25
Residential Fixed Connections at Least 100 Mbps Downstream and 20 Mbps Upstream by Technology 2017-2021
(in thousands)

Technology	2017	2018		2019		2020		2021	
	Dec	Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec
Total	11,030	13,171	17,101	20,322	23,469	27,164	31,773	35,456	39,921
aDSL	42	53	194	344	512	594	733	820	835
sDSL	#	#	#	#	*	*	*	*	*
Other Wireline ¹	53	46	47	27	36	27	20	21	35
Cable Modem	6,591	7,491	8,512	10,312	11,883	14,157	16,843	19,128	21,298
FTTP ²	4,324	5,534	8,292	9,574	10,952	12,288	14,055	15,329	17,537
Satellite	0	0	0	0	*	*	*	*	*
Fixed Wireless	20	47	56	65	86	98	118	158	215

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.

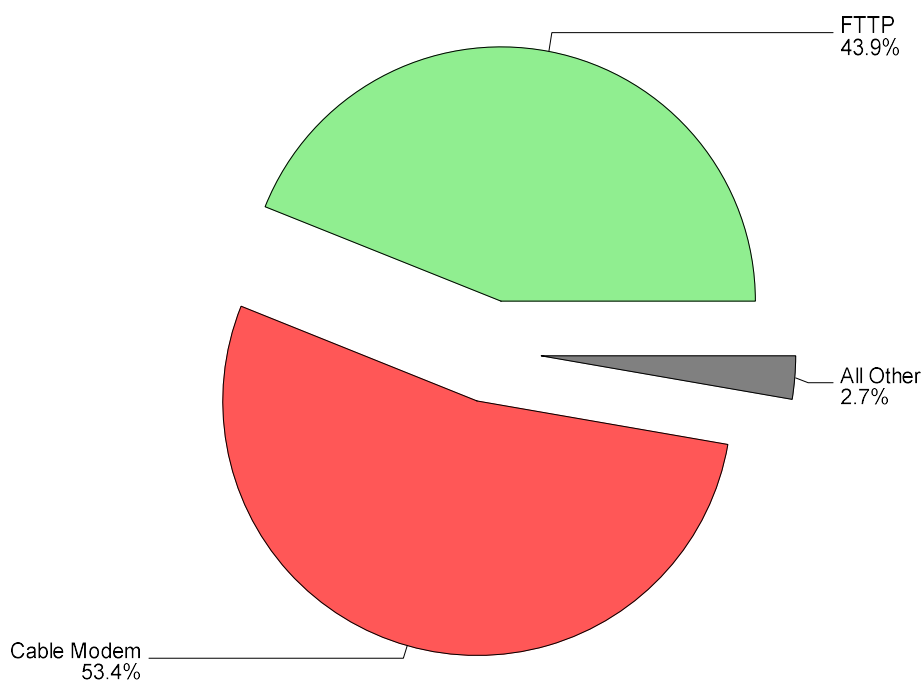
* = Data withheld for confidentiality reasons.

= Rounds to zero.

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

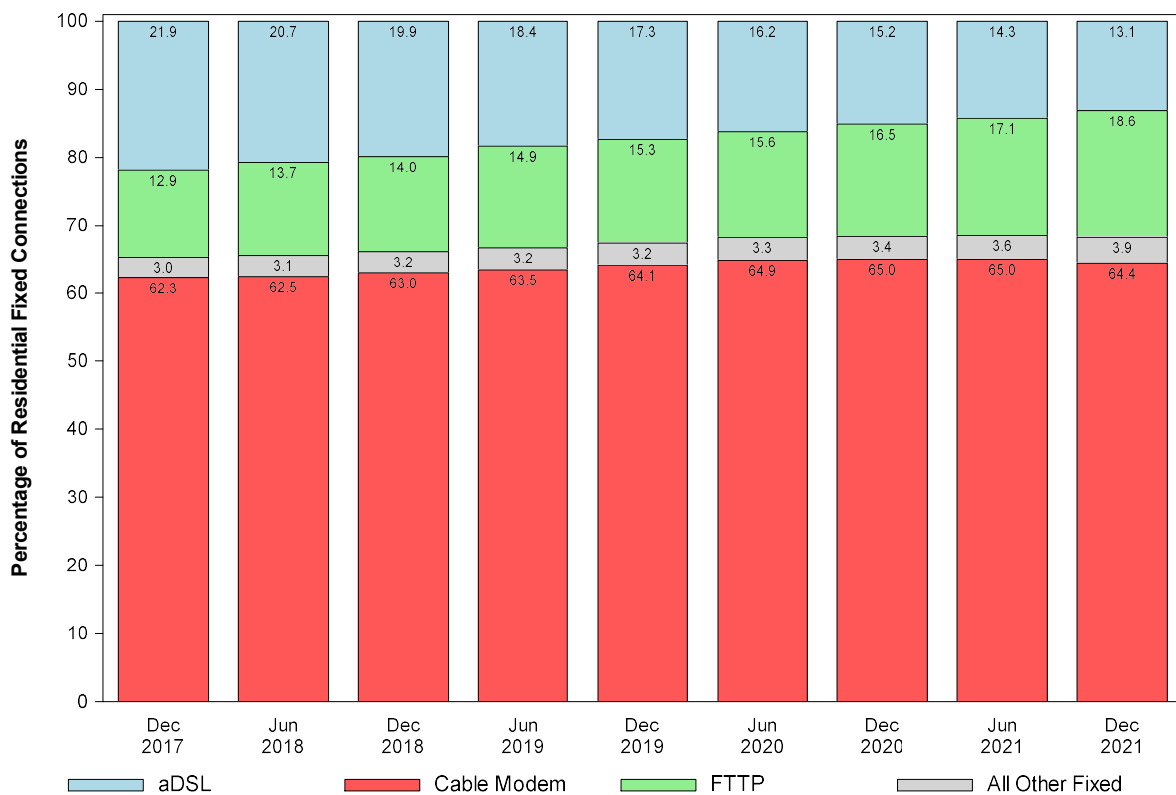
Source: FCC Form 477.

Figure 26
Residential Fixed Connections at Least 100 Mbps Downstream and 20 Mbps Upstream
by Technology as of December 31, 2021



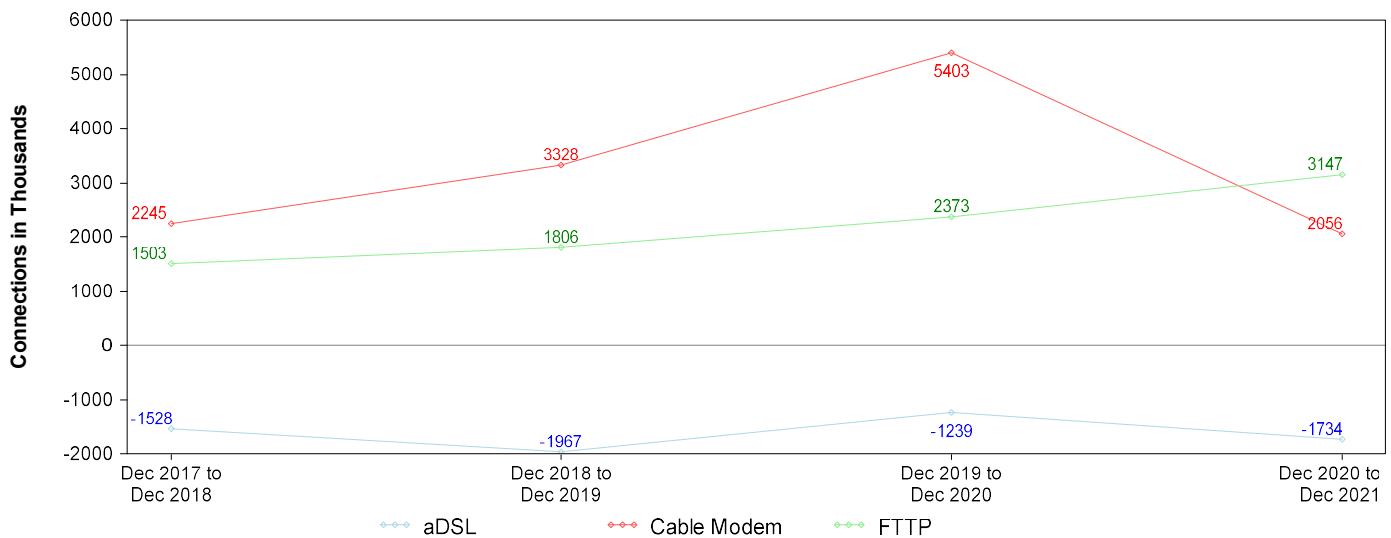
Source: FCC Form 477.

Figure 27
Residential Fixed Connections over 200 kbps in at Least One Direction 2017-2021
 (Shares of selected technologies)



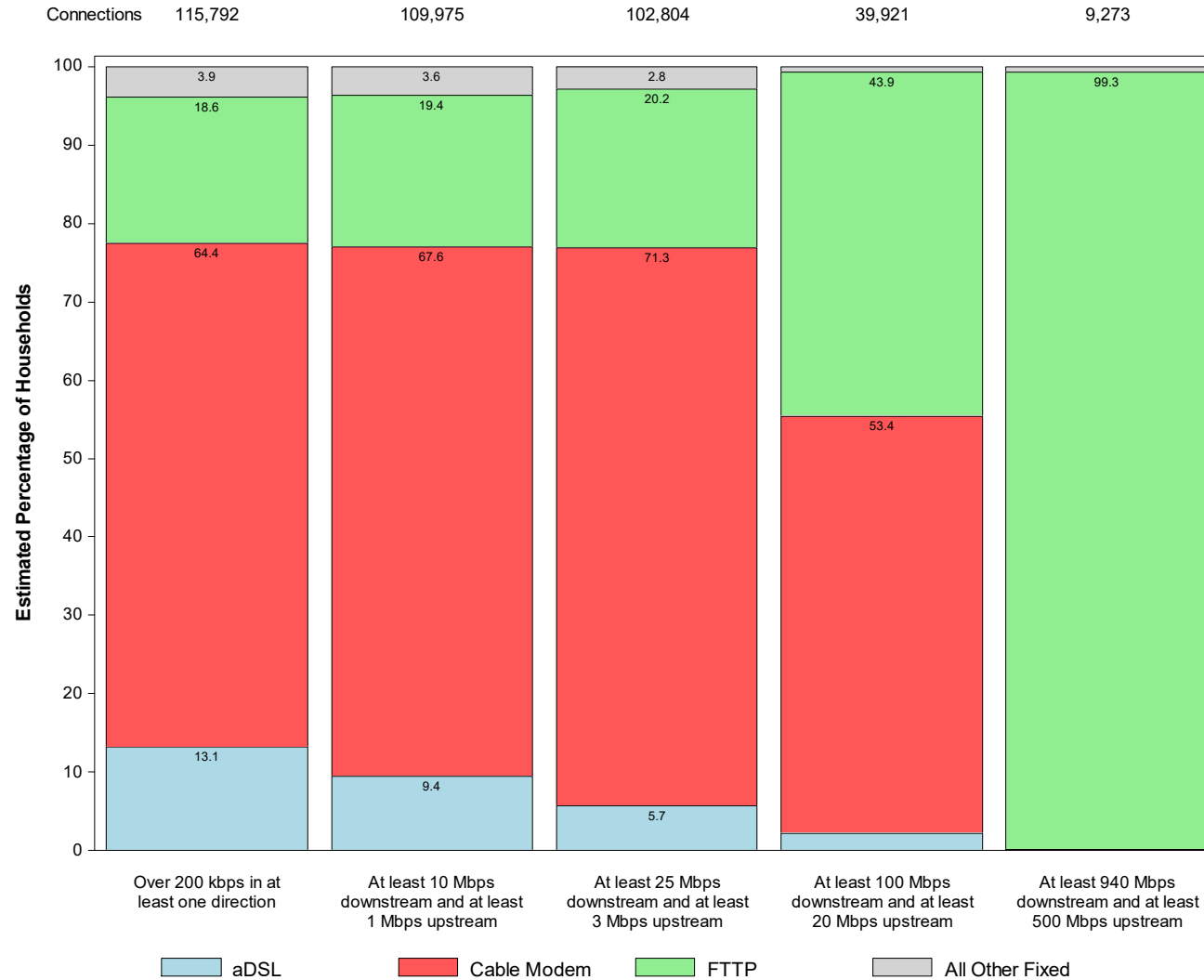
Note: Some previously-published data may have been revised. Numbers may not sum to totals due to rounding.
 Source: FCC Form 477.

Figure 28
Residential Fixed Connections over 200 kbps in at Least One Direction 2017-2021
 (Net adds for selected technologies)



Source: FCC Form 477.

Figure 29
Residential Fixed Connections by Technology as of December 31, 2021
(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, 2021
(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	2,065	2,598	5,425	5,684	1,096	#	16,868
sDSL	*	*	*	*	*	*	14
Other Wireline ¹	159	30	38	45	224	35	530
Cable Modem	177	90	1,159	11,179	60,751	6,875	80,232
FTTP	86	185	577	3,400	9,365	9,725	23,338
Satellite	*	*	*	*	*	0	1,873
Fixed Wireless	217	327	748	1,372	199	60	2,923
Total	2,858	3,257	8,297	22,919	71,752	16,695	125,777

Percentages							
aDSL	1.6	2.1	4.3	4.5	0.9	0.0	13.4
sDSL	*	*	*	*	*	*	0.0
Other Wireline ¹	0.1	0.0	0.0	0.0	0.2	0.0	0.4
Cable Modem	0.1	0.1	0.9	8.9	48.3	5.5	63.8
FTTP	0.1	0.1	0.5	2.7	7.4	7.7	18.6
Satellite	*	*	*	*	*	0.0	1.5
Fixed Wireless	0.2	0.3	0.6	1.1	0.2	0.0	2.3
Total	2.3	2.6	6.6	18.2	57.0	13.3	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, 2021
(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	1,740	2,284	4,810	5,321	1,032	#	15,186
sDSL	*	*	*	*	*	*	3
Other Wireline ¹	1	1	3	6	38	30	80
Cable Modem	147	59	988	9,696	57,075	6,634	74,599
FTTP	71	166	471	2,937	8,527	9,358	21,531
Satellite	*	*	*	*	*	0	1,692
Fixed Wireless	195	299	690	1,282	181	54	2,701
Total	2,167	2,834	7,307	20,440	66,967	16,077	115,792

Percentages							
aDSL	1.5	2.0	4.2	4.6	0.9	0.0	13.1
sDSL	*	*	*	*	*	*	0.0
Other Wireline ¹	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Cable Modem	0.1	0.1	0.9	8.4	49.3	5.7	64.4
FTTP	0.1	0.1	0.4	2.5	7.4	8.1	18.6
Satellite	*	*	*	*	*	0.0	1.5
Fixed Wireless	0.2	0.3	0.6	1.1	0.2	0.0	2.3
Total	1.9	2.4	6.3	17.7	57.8	13.9	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 2017-2021

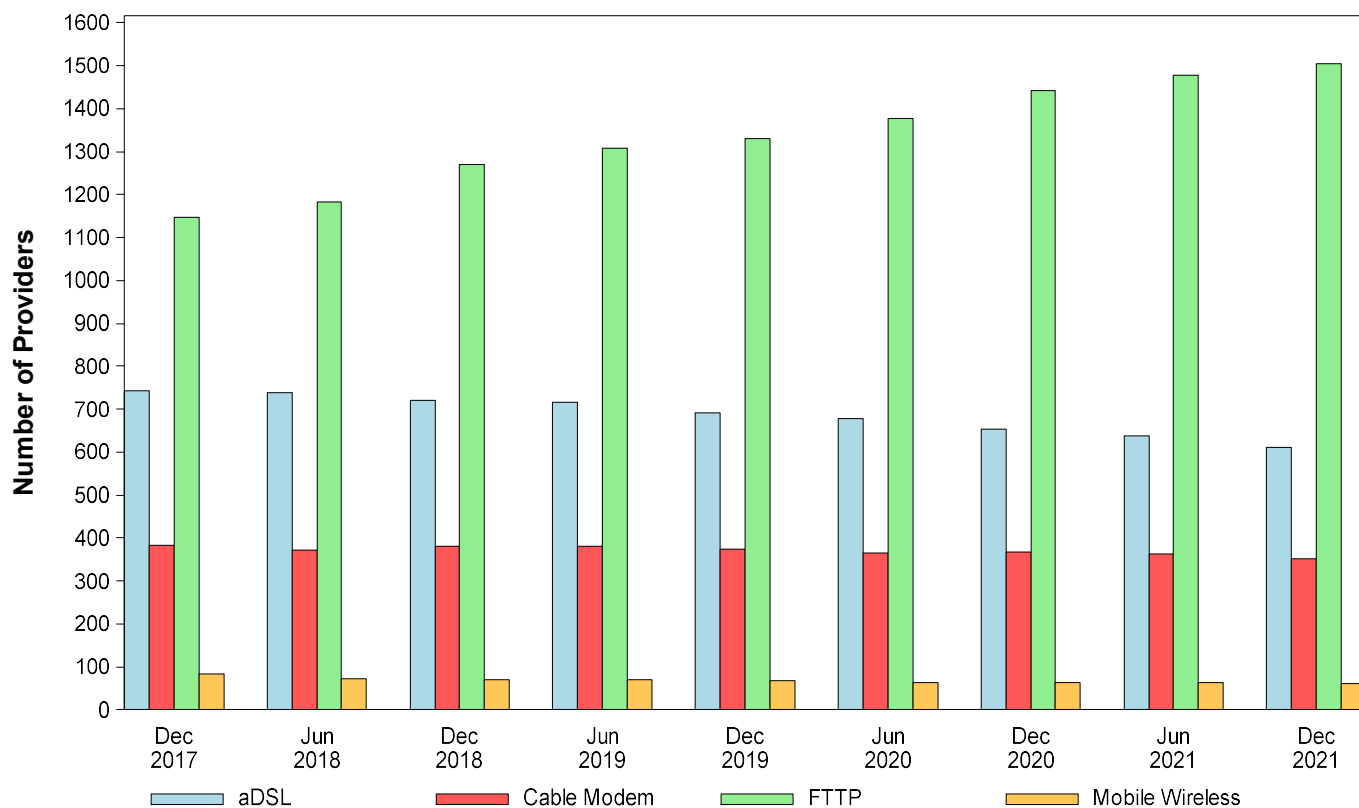
Technology	2017	2018		2019		2020		2021	
	Dec	Jun	Dec	Jun	Dec	Jun	Dec	Jun	Dec
aDSL	743	738	721	715	691	677	653	638	610
sDSL	150	136	127	123	121	118	106	102	87
Other Wireline ¹	235	249	243	222	211	215	209	203	213
Cable Modem	383	372	381	381	373	365	368	362	352
FTTP	1,147	1,183	1,269	1,309	1,330	1,377	1,441	1,477	1,505
Satellite	6	6	6	6	5	5	6	6	5
Fixed Wireless	1,160	1,188	1,239	1,248	1,280	1,312	1,396	1,383	1,359
Mobile Wireless	83	73	71	70	67	64	64	63	62
Total	2,090	2,129	2,215	2,223	2,247	2,279	2,381	2,392	2,384

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

Note: Multiple FCC 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 2017-2021



Source: FCC Form 477.

SECTION 3
SUMMARY STATISTICS: THE STATES

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Figure 34
Residential Fixed Connections and Households by State as of December 31, 2021
(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	1,903	1,645	0.86	1,508	0.79	1,356	0.71	520	0.27	153	0.08
Alaska	261	231	0.89	215	0.83	168	0.64	*	*	*	*
American Samoa	10	*	*	*	*	*	*	0	0.00	0	0.00
Arizona	2,684	2,540	0.95	2,416	0.90	2,235	0.83	526	0.20	90	0.03
Arkansas	1,158	955	0.82	842	0.73	726	0.63	294	0.25	59	0.05
California	13,218	12,667	0.96	12,207	0.92	11,493	0.87	3,765	0.28	641	0.05
Colorado	2,228	2,186	0.98	2,086	0.94	1,947	0.87	530	0.24	136	0.06
Connecticut	1,397	1,321	0.95	1,277	0.91	1,161	0.83	397	0.28	19	0.01
Delaware	381	395	1.04	388	1.02	386	1.01	141	0.37	*	*
District of Columbia	310	280	0.90	274	0.88	271	0.88	117	0.38	*	*
Florida	8,157	8,387	1.03	8,090	0.99	7,756	0.95	3,127	0.38	468	0.06
Georgia	3,885	3,635	0.94	3,434	0.88	3,193	0.82	1,529	0.39	411	0.11
Guam	42	*	*	*	*	*	*	*	*	0	0.00
Hawaii	478	499	1.04	489	1.02	*	*	*	*	*	*
Idaho	657	617	0.94	551	0.84	444	0.68	211	0.32	34	0.05
Illinois	4,930	4,283	0.87	4,081	0.83	3,788	0.77	1,565	0.32	155	0.03
Indiana	2,623	2,275	0.87	2,111	0.81	1,938	0.74	812	0.31	152	0.06
Iowa	1,276	1,081	0.85	980	0.77	866	0.68	361	0.28	43	0.03
Kansas	1,140	1,008	0.88	944	0.83	857	0.75	336	0.30	127	0.11
Kentucky	1,748	1,544	0.88	1,424	0.81	1,277	0.73	501	0.29	87	0.05
Louisiana	1,749	1,470	0.84	1,362	0.78	1,219	0.70	429	0.25	95	0.05
Maine	571	587	1.03	541	0.95	468	0.82	68	0.12	2	0.00
Maryland	2,294	2,171	0.95	2,126	0.93	2,094	0.91	933	0.41	*	*
Massachusetts	2,714	2,584	0.95	2,527	0.93	2,508	0.92	794	0.29	*	*
Michigan	3,977	3,533	0.89	3,348	0.84	3,132	0.79	989	0.25	77	0.02
Minnesota	2,229	2,020	0.91	1,895	0.85	1,734	0.78	458	0.21	69	0.03
Mississippi	1,109	869	0.78	771	0.70	631	0.57	283	0.26	104	0.09
Missouri	2,434	2,118	0.87	1,916	0.79	1,705	0.70	759	0.31	207	0.09
Montana	436	404	0.93	364	0.83	313	0.72	57	0.13	8	0.02
Nebraska	767	674	0.88	634	0.83	578	0.75	199	0.26	36	0.05

Figure 34 - Continued
Residential Fixed Connections and Households by State as of December 31, 2021
(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	1,142	1,093	0.96	1,047	0.92	990	0.87	257	0.22	44	0.04
New Hampshire	540	562	1.04	540	1.00	511	0.95	135	0.25	6	0.01
New Jersey	3,397	3,199	0.94	3,143	0.93	3,116	0.92	1,851	0.55	*	*
New Mexico	798	703	0.88	629	0.79	547	0.69	109	0.14	10	0.01
New York	7,530	6,859	0.91	6,763	0.90	6,529	0.87	3,762	0.50	*	*
North Carolina	4,035	3,981	0.99	3,681	0.91	3,482	0.86	1,372	0.34	329	0.08
North Dakota	317	283	0.89	276	0.87	267	0.84	151	0.48	7	0.02
Northern Mariana Isl	16	*	*	*	*	*	*	0	0.00	0	0.00
Ohio	4,754	4,266	0.90	4,034	0.85	3,714	0.78	1,029	0.22	101	0.02
Oklahoma	1,504	1,258	0.84	1,150	0.76	1,022	0.68	369	0.25	104	0.07
Oregon	1,658	1,560	0.94	1,464	0.88	1,374	0.83	358	0.22	79	0.05
Pennsylvania	5,148	4,649	0.90	4,397	0.85	4,287	0.83	1,478	0.29	*	*
Puerto Rico	1,197	662	0.55	579	0.48	380	0.32	125	0.10	*	*
Rhode Island	427	403	0.95	401	0.94	399	0.94	206	0.48	*	*
South Carolina	1,976	1,919	0.97	1,825	0.92	1,681	0.85	697	0.35	104	0.05
South Dakota	346	311	0.90	303	0.88	291	0.84	114	0.33	2	0.01
Tennessee	2,665	2,404	0.90	2,287	0.86	2,155	0.81	1,042	0.39	302	0.11
Texas	10,239	9,605	0.94	9,235	0.90	8,558	0.84	4,063	0.40	1,160	0.11
Utah	1,034	989	0.96	948	0.92	887	0.86	314	0.30	91	0.09
Vermont	263	269	1.02	237	0.90	200	0.76	42	0.16	13	0.05
Virgin Islands	43	*	*	*	*	*	*	*	*	0	0.00
Virginia	3,249	2,953	0.91	2,802	0.86	2,734	0.84	1,135	0.35	*	*
Washington	2,932	2,852	0.97	2,677	0.91	2,524	0.86	648	0.22	151	0.05
West Virginia	711	568	0.80	491	0.69	428	0.60	145	0.20	4	0.01
Wisconsin	2,402	2,166	0.90	1,997	0.83	1,781	0.74	448	0.19	56	0.02
Wyoming	231	214	0.93	198	0.86	181	0.78	39	0.17	1	0.01
Total	125,319	115,792	0.92	109,975	0.88	102,804	0.82	39,921	0.32	9,273	0.07

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

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

Sources: FCC Form 477 (Connections); 2017-2021 ACS 5-year estimates; Census 2010.

Figure 35
Connections by Type of End User by State as of December 31, 2021
 (Connections over 200 kbps in at least one direction, in thousands)

State	Connections		Percentages		Total
	Residential	Business	Residential	Business	
Alabama	6,379	990	86.6	13.4	7,369
Alaska	892	143	86.2	13.8	1,034
American Samoa	*	*	*	*	*
Arizona	9,304	1,378	87.1	12.9	10,682
Arkansas	3,771	527	87.7	12.3	4,298
California	52,547	9,514	84.7	15.3	62,061
Colorado	7,431	1,428	83.9	16.1	8,859
Connecticut	4,903	853	85.2	14.8	5,756
Delaware	1,354	228	85.6	14.4	1,581
District of Columbia	1,118	654	63.1	36.9	1,773
Florida	30,113	4,557	86.9	13.1	34,670
Georgia	14,220	2,319	86.0	14.0	16,539
Guam	*	*	*	*	*
Hawaii	1,913	329	85.3	14.7	2,242
Idaho	2,240	329	87.2	12.8	2,569
Illinois	16,612	3,075	84.4	15.6	19,687
Indiana	8,338	1,269	86.8	13.2	9,607
Iowa	3,889	623	86.2	13.8	4,512
Kansas	3,674	549	87.0	13.0	4,223
Kentucky	5,590	803	87.4	12.6	6,392
Louisiana	6,113	846	87.8	12.2	6,959
Maine	1,738	308	84.9	15.1	2,046
Maryland	8,250	1,339	86.0	14.0	9,589
Massachusetts	9,139	1,712	84.2	15.8	10,851
Michigan	12,735	2,213	85.2	14.8	14,948
Minnesota	7,135	1,262	85.0	15.0	8,397
Mississippi	3,800	471	89.0	11.0	4,270
Missouri	7,768	1,229	86.3	13.7	8,997
Montana	1,342	226	85.6	14.4	1,568
Nebraska	2,389	467	83.6	16.4	2,856
Nevada	4,205	550	88.4	11.6	4,756
New Hampshire	1,771	337	84.0	16.0	2,107
New Jersey	12,436	2,178	85.1	14.9	14,614
New Mexico	2,695	390	87.4	12.6	3,085
New York	26,941	5,346	83.4	16.6	32,287
North Carolina	13,467	2,284	85.5	14.5	15,751
North Dakota	975	161	85.9	14.1	1,136
Northern Mariana Isl	*	*	*	*	*
Ohio	15,127	2,618	85.2	14.8	17,745
Oklahoma	4,992	728	87.3	12.7	5,720
Oregon	5,394	979	84.6	15.4	6,373
Pennsylvania	16,576	2,882	85.2	14.8	19,458
Puerto Rico	3,953	291	93.1	6.9	4,244
Rhode Island	1,441	273	84.1	15.9	1,713
South Carolina	6,588	953	87.4	12.6	7,540
South Dakota	1,096	162	87.1	12.9	1,259
Tennessee	8,964	1,379	86.7	13.3	10,343
Texas	39,453	5,979	86.8	13.2	45,432
Utah	3,744	734	83.6	16.4	4,478
Vermont	781	176	81.6	18.4	957
Virgin Islands	105	12	89.6	10.4	117
Virginia	11,053	2,048	84.4	15.6	13,101
Washington	9,946	1,755	85.0	15.0	11,701
West Virginia	2,064	259	88.8	11.2	2,323
Wisconsin	7,125	1,230	85.3	14.7	8,355
Wyoming	755	121	86.2	13.8	875
Total	436,576	73,621	85.6	14.4	510,198

= 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, 2021
(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	363	*	5	1,011	328	*	22	5,580	7,369
Alaska	63	*	8	*	15	6	14	766	1,034
American Samoa	0	0	0	*	*	0	*	*	*
Arizona	520	#	*	1,823	225	*	93	7,969	10,682
Arkansas	300	*	4	477	192	*	20	3,259	4,298
California	1,969	3	*	9,621	1,731	*	287	48,243	62,061
Colorado	*	#	17	1,600	238	*	115	6,491	8,859
Connecticut	*	*	2	1,165	74	*	7	4,316	5,756
Delaware	*	*	*	279	*	*	2	*	1,581
District of Columbia	*	*	6	*	*	*	9	1,458	1,773
Florida	1,050	#	*	6,344	1,516	*	71	25,581	34,670
Georgia	731	*	8	2,273	838	*	35	12,584	16,539
Guam	*	0	0	*	*	0	*	*	*
Hawaii	*	*	1	*	*	*	2	1,688	2,242
Idaho	195	#	*	294	83	*	76	1,900	2,569
Illinois	803	1	*	3,222	403	*	144	15,061	19,687
Indiana	434	#	*	1,428	467	*	76	7,155	9,607
Iowa	248	#	*	507	321	*	67	3,333	4,512
Kansas	170	#	*	544	297	*	63	3,129	4,223
Kentucky	318	*	2	924	360	*	33	4,719	6,392
Louisiana	324	*	4	938	251	*	28	5,358	6,959
Maine	98	#	*	496	31	*	10	1,395	2,046
Maryland	*	*	14	1,323	*	*	21	7,248	9,589
Massachusetts	62	#	*	2,108	598	*	28	8,034	10,851
Michigan	606	1	*	2,794	243	*	83	11,131	14,948
Minnesota	405	1	*	1,359	322	*	68	6,211	8,397
Mississippi	301	*	11	394	180	*	19	3,304	4,270
Missouri	491	#	*	1,152	486	*	86	6,706	8,997
Montana	86	*	2	255	51	*	37	1,118	1,568
Nebraska	118	#	*	400	163	*	44	2,120	2,856

Figure 36 - Continued
Connections by Technology by State as of December 31, 2021
(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	144	*	5	*	123	*	43	3,574	4,756
New Hampshire	48	#	*	513	53	*	4	1,480	2,107
New Jersey	71	*	23	2,165	*	*	16	11,113	14,614
New Mexico	207	#	*	436	57	*	40	2,323	3,085
New York	172	1	*	5,066	2,164	*	45	24,767	32,287
North Carolina	574	#	*	2,855	736	*	47	11,455	15,751
North Dakota	22	*	#	174	118	*	4	815	1,136
Northern Mariana Isl	*	0	*	*	*	0	*	*	*
Ohio	709	*	8	3,207	516	*	101	13,159	17,745
Oklahoma	297	*	2	674	274	*	80	4,345	5,720
Oregon	195	#	*	1,155	256	*	46	4,674	6,373
Pennsylvania	360	*	23	3,433	1,134	*	45	14,423	19,458
Puerto Rico	*	0	2	*	95	*	76	3,518	4,244
Rhode Island	*	*	*	*	*	*	*	*	1,713
South Carolina	313	*	4	1,296	400	*	22	5,470	7,540
South Dakota	31	*	1	201	91	*	11	917	1,259
Tennessee	348	#	*	1,459	713	*	34	7,731	10,343
Texas	1,441	#	*	5,744	2,591	*	412	35,023	45,432
Utah	138	*	7	620	227	*	70	3,410	4,478
Vermont	77	*	3	177	43	*	4	647	957
Virgin Islands	0	0	0	*	*	*	*	82	117
Virginia	193	#	*	1,760	1,104	*	54	9,892	13,101
Washington	368	#	*	2,218	302	*	79	8,636	11,701
West Virginia	*	*	1	425	19	*	12	1,707	2,323
Wisconsin	468	*	3	*	276	*	70	6,008	8,355
Wyoming	39	*	1	134	18	*	39	636	875
Total	16,868	14	530	80,232	23,338	1,873	2,923	384,420	510,198

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, 2021

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	99.8	92.7	83.4	64.7	11.3
Alaska	99.8	91.9	72.7	*	*
American Samoa	*	*	*	*	*
Arizona	99.9	95.9	88.4	61.8	12.9
Arkansas	99.8	90.2	76.4	47.0	10.8
California	99.8	95.7	89.6	72.2	11.6
Colorado	99.9	96.4	89.1	68.3	16.9
Connecticut	99.8	96.0	88.5	77.0	10.8
Delaware	99.9	97.5	96.9	82.2	24.2
District of Columbia	100.0	96.1	94.8	78.2	23.4
Florida	99.8	97.1	92.5	72.7	9.4
Georgia	99.6	94.2	87.6	67.0	16.1
Guam	*	*	*	*	*
Hawaii	100.0	96.6	*	*	*
Idaho	99.8	91.2	73.2	52.3	8.9
Illinois	99.8	95.0	88.0	64.9	10.2
Indiana	99.6	93.4	85.0	61.3	10.6
Iowa	99.3	91.9	80.6	55.5	10.6
Kansas	99.8	94.2	84.3	58.3	15.9
Kentucky	99.7	92.3	83.4	64.4	6.9
Louisiana	99.8	93.0	83.2	58.0	11.9
Maine	99.3	90.9	80.7	68.4	3.0
Maryland	99.9	97.2	95.6	80.2	27.4
Massachusetts	100.0	97.2	96.3	85.2	20.2
Michigan	99.5	94.5	88.2	67.4	7.2
Minnesota	99.8	95.1	86.5	63.9	9.2
Mississippi	99.7	88.8	73.4	47.5	15.7
Missouri	99.6	92.5	81.3	63.3	12.2
Montana	99.9	92.4	78.4	57.3	2.7
Nebraska	99.6	94.6	85.7	63.4	9.0

Figure 37 - Continued
Percentage of Fixed Connections by Downstream Speed by State as of December 31, 2021

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	100.0	96.7	91.3	67.6	13.9
New Hampshire	99.6	94.7	90.8	81.0	12.5
New Jersey	99.8	97.8	96.6	87.3	25.8
New Mexico	99.9	91.8	78.9	51.3	7.1
New York	99.8	97.9	94.4	86.0	16.1
North Carolina	99.5	94.0	87.4	74.6	9.5
North Dakota	99.9	97.7	93.2	76.4	7.4
Northern Mariana Isl	*	*	*	*	*
Ohio	99.8	94.8	86.7	68.3	4.2
Oklahoma	99.6	91.3	80.2	55.8	13.7
Oregon	99.8	94.9	88.0	68.9	13.1
Pennsylvania	99.8	94.9	92.3	75.2	18.4
Puerto Rico	100.0	86.0	59.5	26.3	1.2
Rhode Island	99.6	98.9	97.9	82.6	29.5
South Carolina	99.8	95.3	87.6	72.5	7.5
South Dakota	99.8	97.9	93.8	67.1	6.9
Tennessee	99.7	95.1	89.1	69.9	15.8
Texas	99.9	96.2	88.8	69.8	16.7
Utah	100.0	96.5	89.7	68.8	18.9
Vermont	99.1	86.0	75.6	61.4	11.3
Virgin Islands	*	*	*	*	*
Virginia	99.5	95.0	91.6	74.6	24.7
Washington	99.7	94.9	88.4	71.6	16.4
West Virginia	98.1	85.9	75.7	59.2	9.2
Wisconsin	99.2	93.5	82.5	66.5	3.3
Wyoming	99.9	93.8	84.7	62.2	1.6
Total	99.7	95.1	88.5	70.3	13.3

Source: FCC Form 477.

Figure 38
Providers of Connections by Technology by State as of December 31, 2021
(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	23	*	13	17	50	*	30	6	86
Alaska	16	*	6	*	21	4	18	10	41
American Samoa	0	0	0	*	*	0	*	*	*
Arizona	19	4	*	18	58	*	54	6	106
Arkansas	23	*	12	17	60	*	38	5	100
California	32	9	*	35	95	*	138	5	222
Colorado	*	6	20	17	84	*	74	9	142
Connecticut	*	*	9	10	24	*	11	4	41
Delaware	*	*	*	5	*	*	5	*	36
District of Columbia	*	*	14	*	*	*	10	4	45
Florida	15	4	*	21	82	*	51	6	125
Georgia	25	*	18	28	93	*	33	5	128
Guam	*	0	0	*	*	0	*	*	*
Hawaii	*	*	8	*	*	*	6	5	24
Idaho	24	4	*	18	47	*	46	8	80
Illinois	49	7	*	22	100	*	95	6	179
Indiana	33	6	*	15	89	*	67	4	134
Iowa	61	9	*	38	182	*	85	6	232
Kansas	28	4	*	24	75	*	69	8	126
Kentucky	18	*	16	31	69	*	36	7	117
Louisiana	16	*	15	18	42	*	30	6	80
Maine	12	5	*	8	22	*	15	5	41
Maryland	*	*	18	16	*	*	31	5	84
Massachusetts	8	4	*	10	41	*	23	4	63
Michigan	27	5	*	28	86	*	64	7	137
Minnesota	36	8	*	22	97	*	61	5	140
Mississippi	14	*	10	12	45	*	20	5	72
Missouri	31	5	*	19	88	*	86	7	158
Montana	19	*	9	8	38	*	43	6	71
Nebraska	28	4	*	21	58	*	48	6	93

Figure 38 - Continued
Providers of Connections by Technology by State as of December 31, 2021
(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	*	13	*	43	*	33	5	76
New Hampshire	9	4	*	7	25	*	9	5	38
New Jersey	11	*	20	11	*	*	15	4	69
New Mexico	20	4	*	11	40	*	45	6	75
New York	32	4	*	24	84	*	38	4	127
North Carolina	24	4	*	25	68	*	34	6	106
North Dakota	18	*	8	9	35	*	12	6	52
Northern Mariana Isl	*	0	*	*	*	0	*	*	*
Ohio	33	*	23	32	91	*	85	4	173
Oklahoma	33	*	15	13	66	*	55	9	116
Oregon	33	6	*	18	73	*	50	6	112
Pennsylvania	21	*	20	28	81	*	45	7	133
Puerto Rico	*	0	5	*	18	*	34	4	42
Rhode Island	*	*	*	*	*	*	*	*	24
South Carolina	17	*	15	15	49	*	22	6	71
South Dakota	17	*	10	9	44	*	30	8	76
Tennessee	22	4	*	20	90	*	42	7	130
Texas	63	5	*	33	148	*	186	9	287
Utah	18	*	17	13	47	*	41	8	78
Vermont	8	*	8	6	26	*	12	5	42
Virgin Islands	0	0	0	*	*	*	*	4	5
Virginia	21	5	*	20	83	*	47	6	123
Washington	25	5	*	26	79	*	57	6	120
West Virginia	*	*	8	17	32	*	27	6	70
Wisconsin	41	*	16	*	82	*	54	6	121
Wyoming	15	*	8	7	28	*	25	8	51
Total	610	87	213	352	1,505	5	1,359	62	2,384

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.

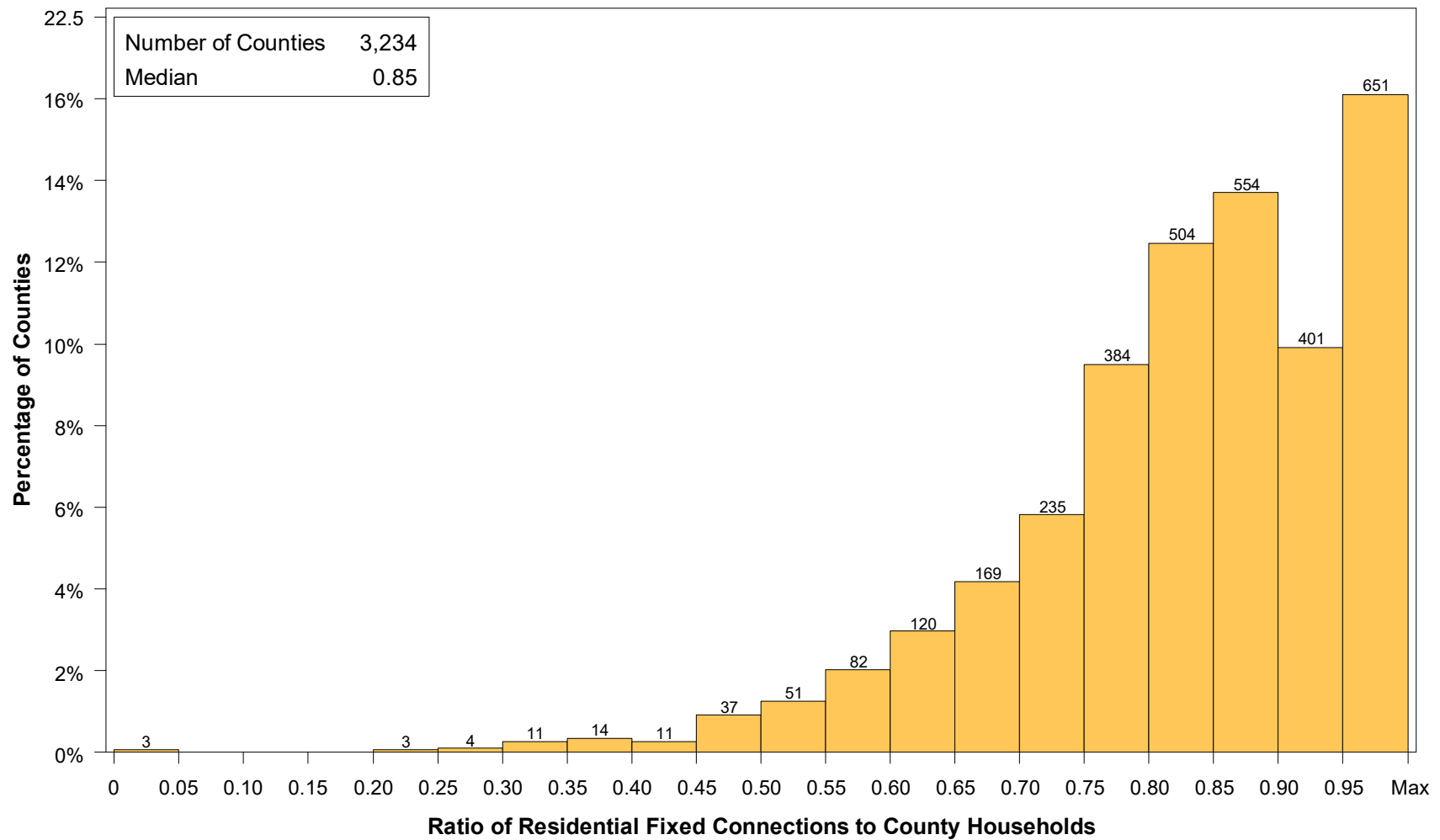
Source: FCC Form 477.

SECTION 4
SUMMARY STATISTICS: COUNTIES AND CENSUS TRACTS

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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, 2021



Note: Ratios over 1 were set to 1. See Technical Notes at the end of the report.
 Sources: FCC Form 477; 2017-2021 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, 2021

<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	2.2	11.4	14.7	30.7	19.5	10.8	5.4	2.7	2.0	0.3	0.2
sDSL	96.1	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Wireline ¹	93.8	6.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cable Modem	11.4	5.2	4.7	10.5	12.1	11.2	11.1	11.4	17.3	4.0	1.0
FTTP	7.4	34.8	13.4	15.6	9.3	6.1	3.9	2.9	3.8	2.4	0.4
Satellite	0.4	65.8	21.0	10.8	1.5	0.3	0.2	0.0	0.0	0.0	0.0
Fixed Wireless	1.8	63.4	16.2	11.3	4.1	2.0	0.5	0.4	0.2	0.0	0.1
Total	0.1	0.0	0.0	0.0	0.2	0.8	1.5	4.1	28.1	54.0	11.2

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; 2017-2021 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, 2021

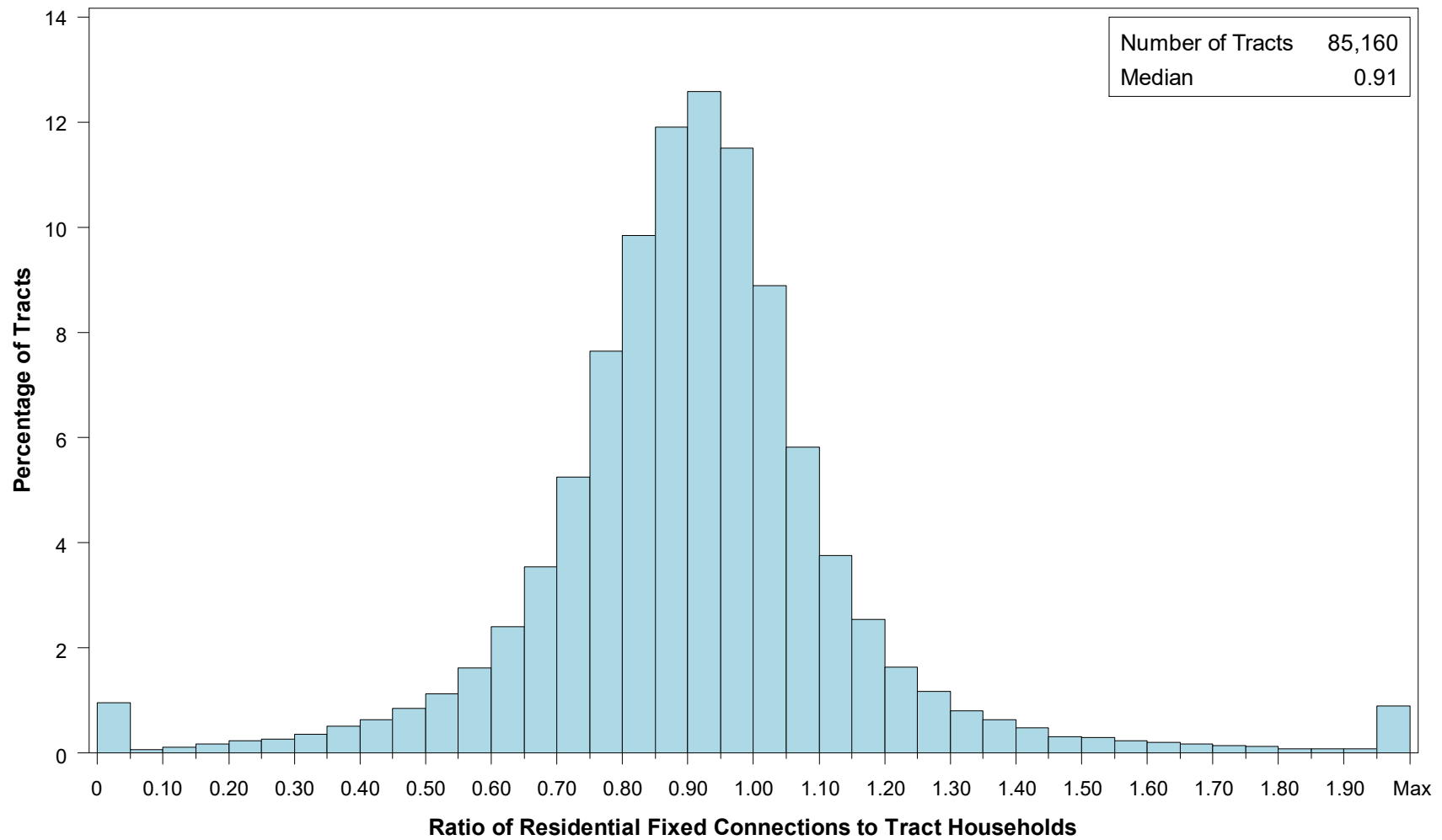


Figure 42
Distribution of Census Tracts by Ratio of Residential Fixed Connections over 200 kbps in at Least One Direction to Tract Households by Technology as of December 31, 2021

<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	9.5	27.7	16.7	24.4	12.2	4.6	2.2	1.2	1.0	0.3	0.2
sDSL	99.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Wireline ¹	98.9	0.8	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Cable Modem	4.9	2.4	1.4	3.0	4.2	7.0	11.3	15.0	31.7	15.0	4.2
FTTP	28.3	20.5	9.0	12.5	9.2	6.6	4.7	3.1	3.4	1.5	1.2
Satellite	31.3	58.7	5.3	3.5	0.9	0.2	0.1	0.0	0.0	0.0	0.0
Fixed Wireless	5.4	84.5	4.1	3.3	1.3	0.7	0.4	0.2	0.2	0.0	0.0
Total	0.9	0.0	0.1	0.3	0.5	0.9	1.5	2.7	18.9	46.0	28.2

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; 2017-2021 ACS 5-year estimates; and Census 2010.

Figure 43
Percentage of Developed Census Blocks with Residential Fixed Service by Technology as of December 31, 2021
 (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	25.3	72.9	1.7	0.0	0.0	0.0	0.0	0.0
sDSL	99.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Other Wireline ¹	99.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Cable Modem	31.8	63.9	4.3	0.1	0.0	0.0	0.0	0.0
FTTP	64.1	32.2	3.6	0.2	0.0	0.0	0.0	0.0
Satellite	0.0	1.2	65.1	33.7	0.0	0.0	0.0	0.0
Fixed Wireless	21.7	32.6	23.3	13.4	6.0	2.0	0.7	0.2
aDSL and/or Cable Modem and/or FTTP	8.2	24.0	56.9	10.2	0.6	0.1	0.0	0.0
Any Technology	0.0	0.0	1.8	7.5	16.9	24.8	21.6	27.4

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 2020 census. Sources: FCC Form 477 and Census 2020.

Figure 44
Distribution of Counties by Ratio of Residential Fixed Connections to County Households by State as of December 31, 2021
(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	1	5	30	29	2
Alaska	30	0	0	0	0	1	0	1	3	4	15	6
American Samoa	5	2	0	0	0	0	0	2	1	0	0	0
Arizona	15	0	0	0	0	0	0	1	0	1	13	0
Arkansas	75	0	0	0	0	0	0	1	7	40	26	1
California	58	0	0	0	0	0	0	0	0	1	49	8
Colorado	64	0	0	0	0	1	0	0	0	15	27	21
Connecticut	8	0	0	0	0	0	0	0	0	0	8	0
Delaware	3	0	0	0	0	0	0	0	0	0	1	2
District of Columbia	1	0	0	0	0	0	0	0	0	0	1	0
Florida	67	0	0	0	0	0	0	0	1	10	29	27
Georgia	159	0	0	0	0	0	2	5	7	59	63	23
Guam	1	0	0	0	0	0	0	0	0	0	1	0
Hawaii	5	0	0	0	0	0	0	0	0	0	1	4
Idaho	44	0	0	0	0	0	0	0	0	11	22	11
Illinois	102	0	0	0	0	0	0	2	8	53	38	1
Indiana	92	0	0	0	0	0	0	1	1	43	46	1
Iowa	99	0	0	0	0	0	0	1	0	31	66	1
Kansas	105	0	0	0	0	1	1	0	2	39	57	5
Kentucky	120	0	0	0	0	0	0	1	5	36	73	5
Louisiana	64	0	0	0	0	0	1	1	7	32	22	1
Maine	16	0	0	0	0	0	0	0	0	0	7	9
Maryland	24	0	0	0	0	0	0	0	0	4	17	3
Massachusetts	14	0	0	0	0	0	0	0	0	0	9	5
Michigan	83	0	0	0	0	0	0	1	1	15	52	14
Minnesota	87	0	0	0	0	0	0	0	0	8	72	7
Mississippi	82	0	0	0	0	0	1	3	15	48	14	1
Missouri	115	0	0	0	0	0	0	3	5	44	57	6
Montana	56	0	0	0	0	0	0	0	0	8	39	9
Nebraska	93	0	0	0	0	0	0	1	1	32	56	3

Figure 44 - Continued
Distribution of Counties by Ratio of Residential Fixed Connections to County Households by State as of December 31, 2021
(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	0	1	1	2	2	10	1
New Hampshire	10	0	0	0	0	0	0	0	0	0	5	5
New Jersey	21	0	0	0	0	0	0	0	0	1	16	4
New Mexico	33	0	0	0	0	0	0	0	1	8	17	7
New York	62	0	0	0	0	0	0	0	0	6	45	11
North Carolina	100	0	0	0	0	0	0	0	1	14	58	27
North Dakota	53	0	0	0	0	0	0	0	0	4	44	5
Northern Mariana Isl	4	1	0	0	0	0	1	0	1	1	0	0
Ohio	88	0	0	0	0	0	0	1	0	24	61	2
Oklahoma	77	0	0	0	0	0	0	3	4	40	30	0
Oregon	36	0	0	0	0	0	0	0	2	6	23	5
Pennsylvania	67	0	0	0	0	0	0	0	0	6	54	7
Puerto Rico	78	0	0	0	0	4	15	13	28	18	0	0
Rhode Island	5	0	0	0	0	0	0	0	0	0	3	2
South Carolina	46	0	0	0	0	0	0	0	1	16	22	7
South Dakota	66	0	0	0	0	0	1	0	0	9	52	4
Tennessee	95	0	0	0	0	0	0	0	1	28	60	6
Texas	254	0	0	0	0	0	1	0	10	82	126	35
Utah	29	0	0	0	0	0	0	0	1	1	14	13
Vermont	14	0	0	0	0	0	0	0	0	0	8	6
Virgin Islands	3	0	0	0	0	0	0	0	0	2	1	0
Virginia	133	0	0	0	0	0	1	4	7	41	69	11
Washington	39	0	0	0	0	0	0	0	1	2	26	10
West Virginia	55	0	0	0	0	0	0	1	3	27	21	3
Wisconsin	72	0	0	0	0	0	0	0	0	6	53	13
Wyoming	23	0	0	0	0	0	0	0	1	0	19	3
Total	3,234	3	0	0	0	7	25	48	133	908	1747	363

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

Sources: FCC Form 477; 2017-2021 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, 2021
(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	1,435	5	0	0	0	5	15	41	89	387	616	277
Alaska	177	3	0	0	2	2	4	2	9	31	91	33
American Samoa	18	2	0	0	0	3	7	2	1	1	1	1
Arizona	1,765	30	0	4	13	12	19	20	32	304	697	634
Arkansas	823	2	0	0	0	2	7	32	78	285	311	106
California	9,107	61	4	2	4	9	17	37	79	872	5,024	2,998
Colorado	1,447	17	0	0	1	0	4	5	12	146	723	539
Connecticut	879	7	0	0	1	0	0	0	3	84	511	273
Delaware	259	3	0	6	5	7	9	6	6	30	61	126
District of Columbia	206	2	0	0	0	0	5	3	8	55	73	60
Florida	5,114	44	2	2	3	5	11	17	77	535	1,891	2,527
Georgia	2,791	10	0	2	1	2	16	34	89	539	1,102	996
Guam	56	1	0	0	0	1	2	2	1	16	12	21
Hawaii	436	13	0	0	0	1	1	3	1	46	172	199
Idaho	456	0	0	0	1	2	1	4	7	73	215	153
Illinois	3,263	6	0	1	4	3	16	48	93	821	1,781	490
Indiana	1,693	9	0	0	5	2	13	26	58	440	842	298
Iowa	896	4	0	0	0	0	3	9	14	309	477	80
Kansas	829	14	0	0	1	7	2	1	13	211	431	149
Kentucky	1,306	9	0	1	3	4	7	24	42	313	649	254
Louisiana	1,376	11	1	1	3	9	13	50	96	412	546	234
Maine	400	0	0	0	0	0	0	0	0	24	195	181
Maryland	1,463	8	1	1	19	29	34	34	35	277	511	514
Massachusetts	1,613	20	0	2	0	7	16	38	54	264	727	485
Michigan	2,971	79	1	0	5	6	24	37	87	587	1,535	610
Minnesota	1,502	4	0	0	1	2	2	3	11	278	897	304
Mississippi	875	4	0	0	2	3	13	39	110	319	262	123
Missouri	1,654	4	0	0	4	8	10	46	68	426	772	316
Montana	319	2	0	0	0	0	0	2	3	63	168	81
Nebraska	553	2	0	0	2	0	0	6	10	130	316	87

Figure 45 - Continued
Distribution of Census Tracts by Ratio of Residential Fixed Connections to Tract Households by State as of December 31, 2021
(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
Nevada	775	5	0	0	1	1	3	11	11	104	377	262
New Hampshire	349	2	0	0	0	0	0	0	0	12	177	158
New Jersey	2,175	13	2	2	8	19	49	63	105	421	807	686
New Mexico	612	13	1	2	7	8	6	11	17	148	253	146
New York	5,393	136	0	3	13	29	69	117	179	1,262	2,200	1,385
North Carolina	2,660	19	1	1	0	1	4	7	30	362	1,198	1,037
North Dakota	228	0	0	0	0	0	0	0	1	53	131	43
Northern Mariana Isl	23	2	1	0	0	0	2	3	5	7	2	1
Ohio	3,162	12	0	0	1	6	8	19	52	592	1,907	565
Oklahoma	1,205	11	1	0	1	10	20	30	70	387	476	199
Oregon	994	2	0	0	1	1	1	7	11	124	555	292
Pennsylvania	3,445	48	1	0	2	7	23	51	88	797	1,677	751
Puerto Rico	939	19	2	20	103	162	155	153	95	88	42	100
Rhode Island	247	1	0	0	0	0	5	6	1	46	103	85
South Carolina	1,317	11	0	1	0	0	3	9	50	286	508	449
South Dakota	242	0	0	0	1	0	0	0	2	51	150	38
Tennessee	1,701	23	0	0	0	2	9	19	47	395	811	395
Texas	6,883	54	3	0	2	7	30	78	213	1,480	2,840	2,176
Utah	716	7	2	1	4	2	2	8	8	84	325	273
Vermont	193	1	0	0	0	0	0	1	1	4	109	77
Virgin Islands	29	0	0	0	0	0	2	4	2	14	6	1
Virginia	2,186	26	7	4	24	31	63	88	110	414	738	681
Washington	1,772	3	2	0	0	3	5	4	7	119	963	666
West Virginia	546	1	0	0	0	0	8	13	34	214	224	52
Wisconsin	1,526	3	1	0	0	2	5	3	13	300	881	318
Wyoming	160	1	0	1	0	0	0	1	2	22	94	39
Total	85,160	789	33	57	248	422	743	1,277	2,340	16,064	39,163	24,024

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

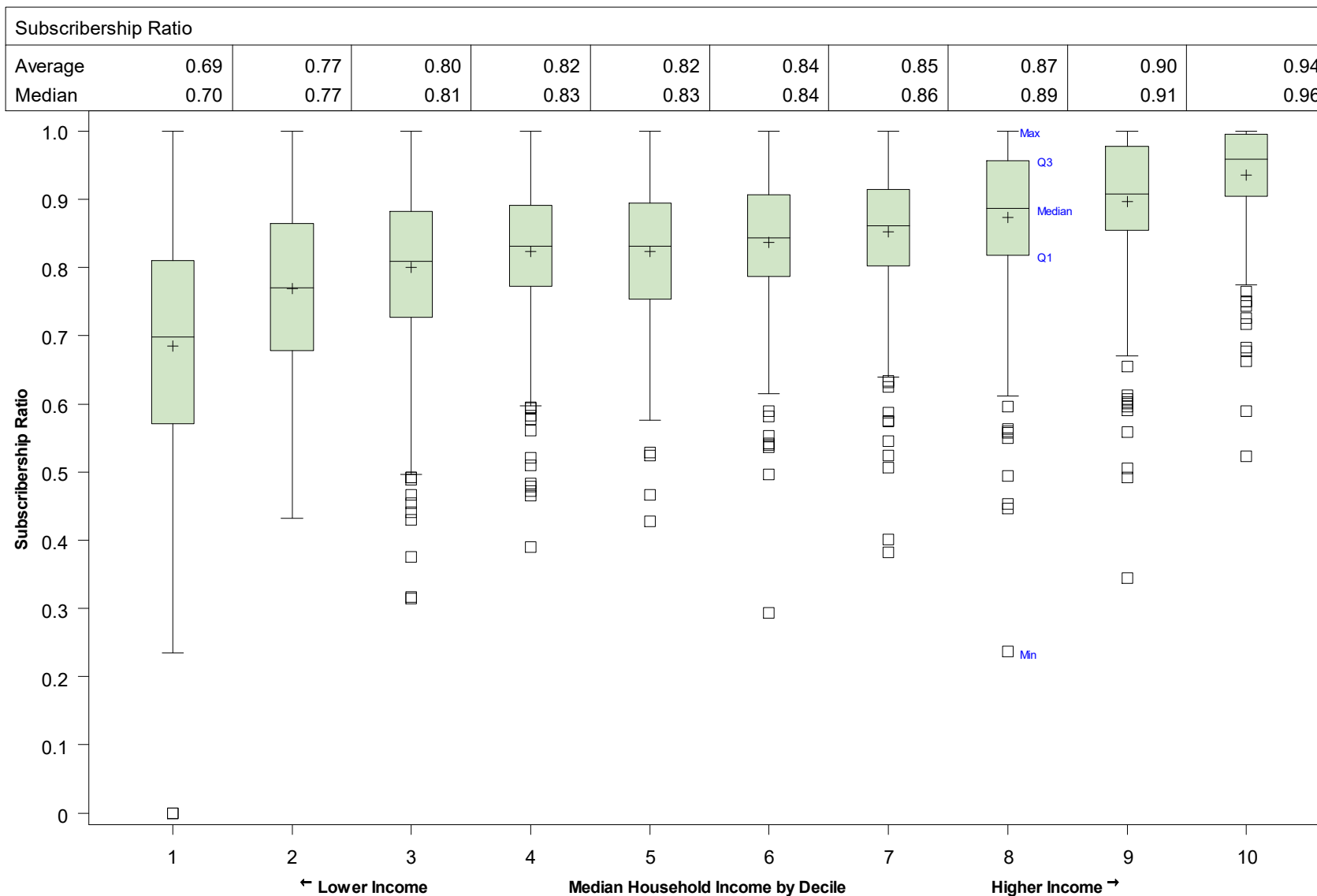
Sources: FCC Form 477; 2017-2021 ACS 5-year estimates (Households for U.S. and District of Columbia); Census 2010 (Households for Puerto Rico, American Samoa, Guam, Northern Mariana Islands and U.S. Virgin Islands).

SECTION 5
CORRELATED RESULTS: DEMOGRAPHIC MEASURES

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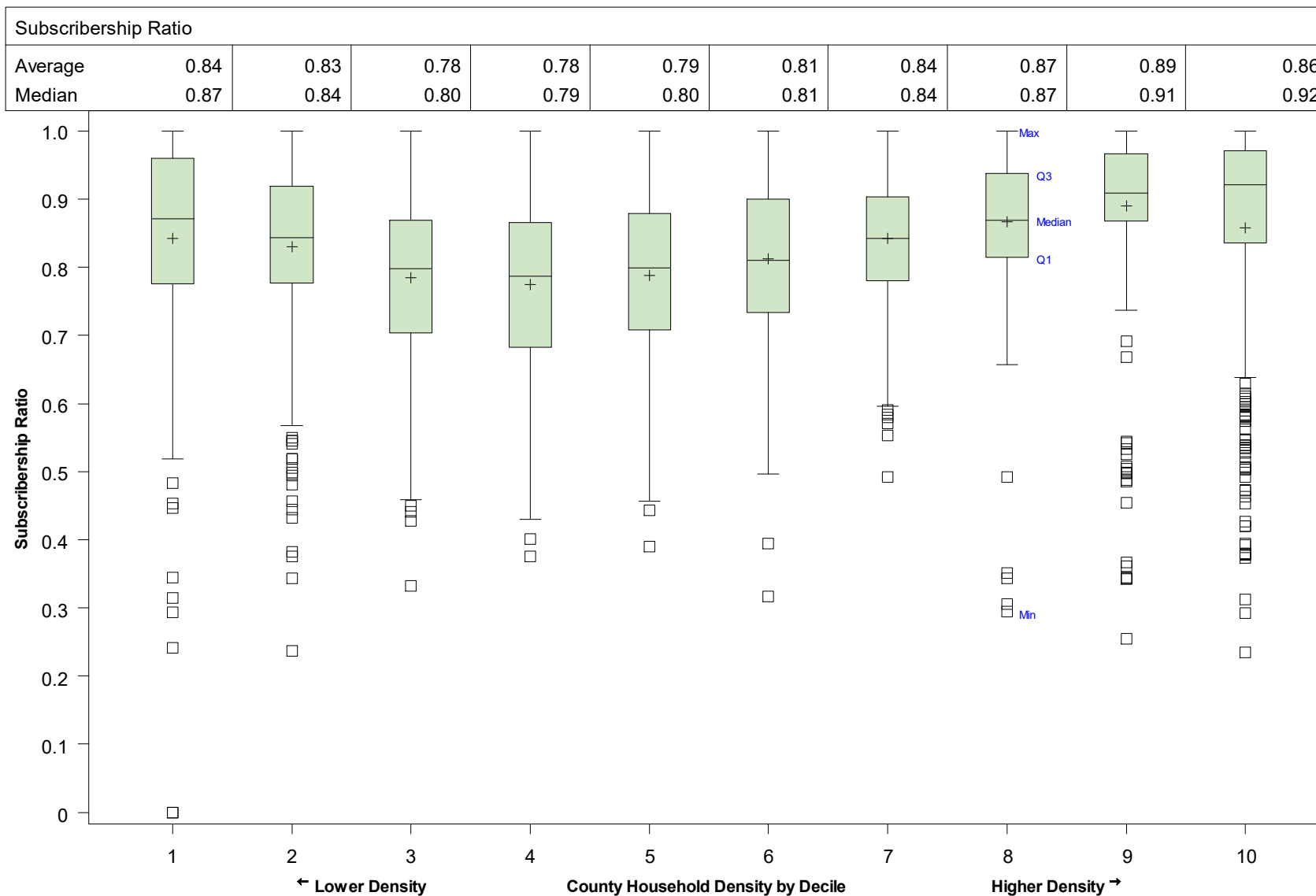
Figure 46
Subscribership Ratio Distributions by Income Deciles as of December 31, 2021



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.

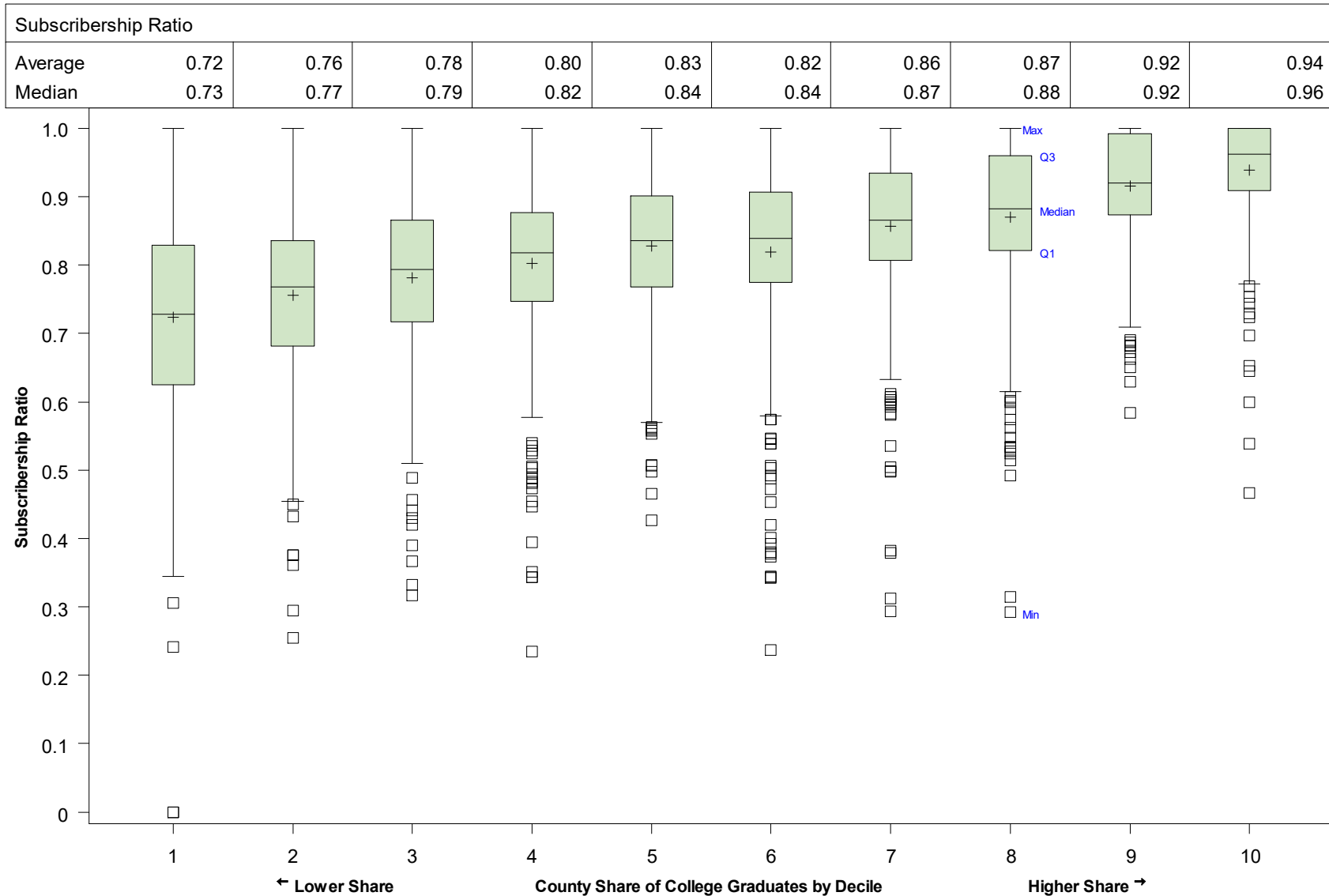
Sources: FCC Form 477; 2017-2021 ACS 5-year Estimates; Census 2010.

Figure 47
Subscribership Ratio Distributions by Density Deciles as of December 31, 2021



Sources: FCC Form 477; 2017-2021 ACS 5-year Estimates; Census 2010.

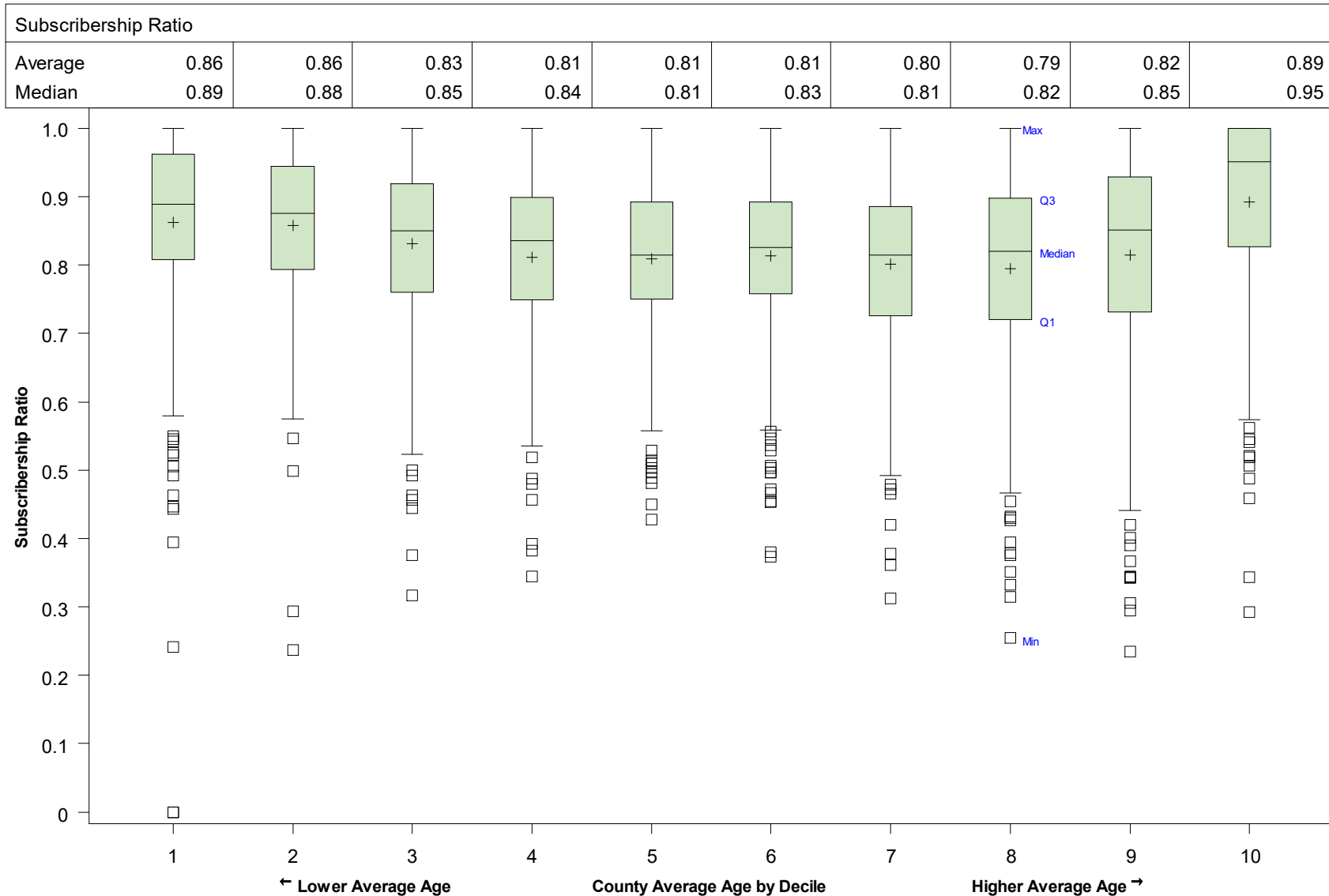
Figure 48
Subscribership Ratio Distributions by Share of Population with a College Degree (in Deciles) as of December 31, 2021



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; 2017-2021 ACS 5-year Estimates; Census 2010.

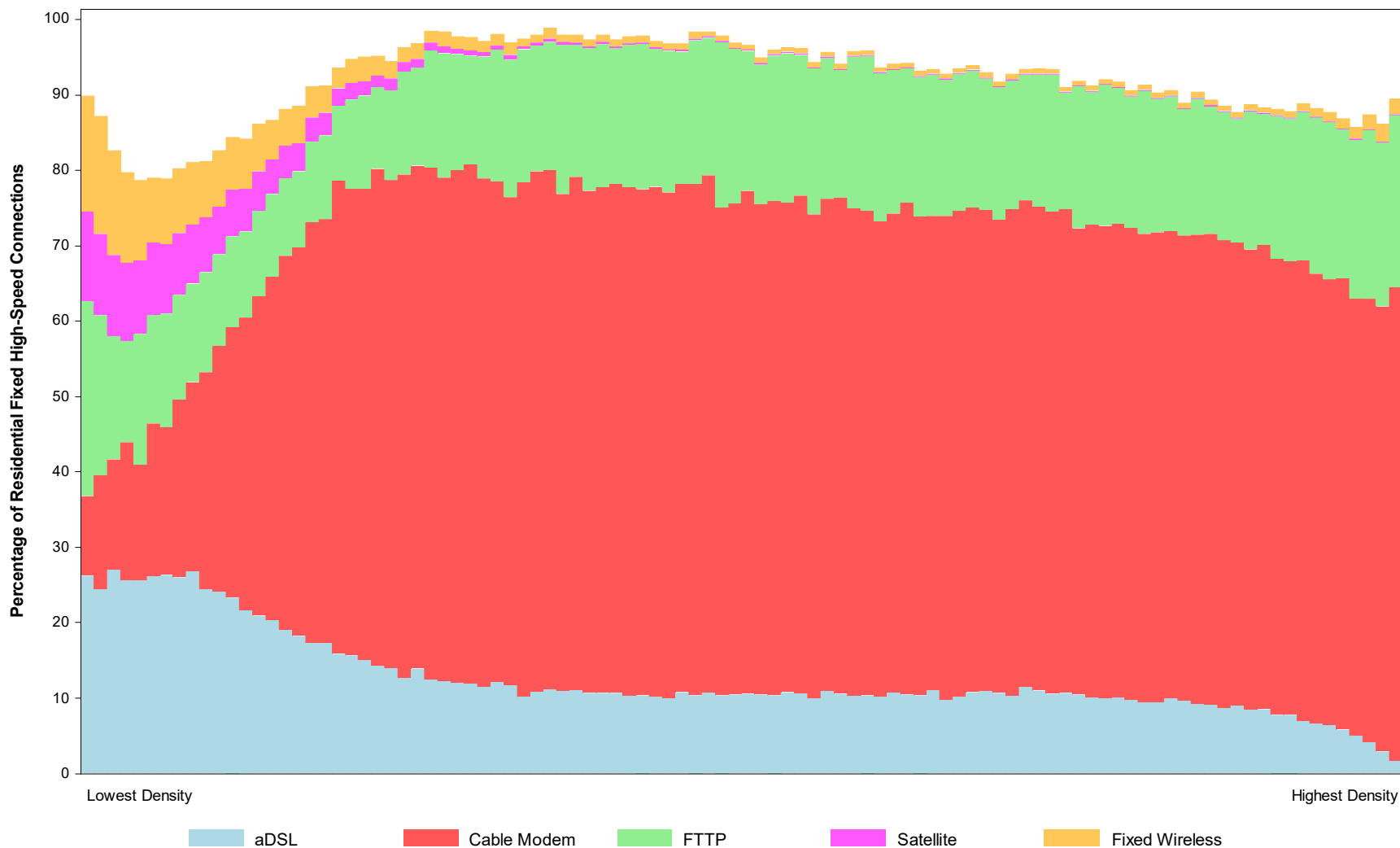
Figure 49
Subscribership Ratio Distributions by Average Age of County Population (in Deciles) as of December 31, 2021



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; 2017-2021 ACS 5-year Estimates; Census 2010.

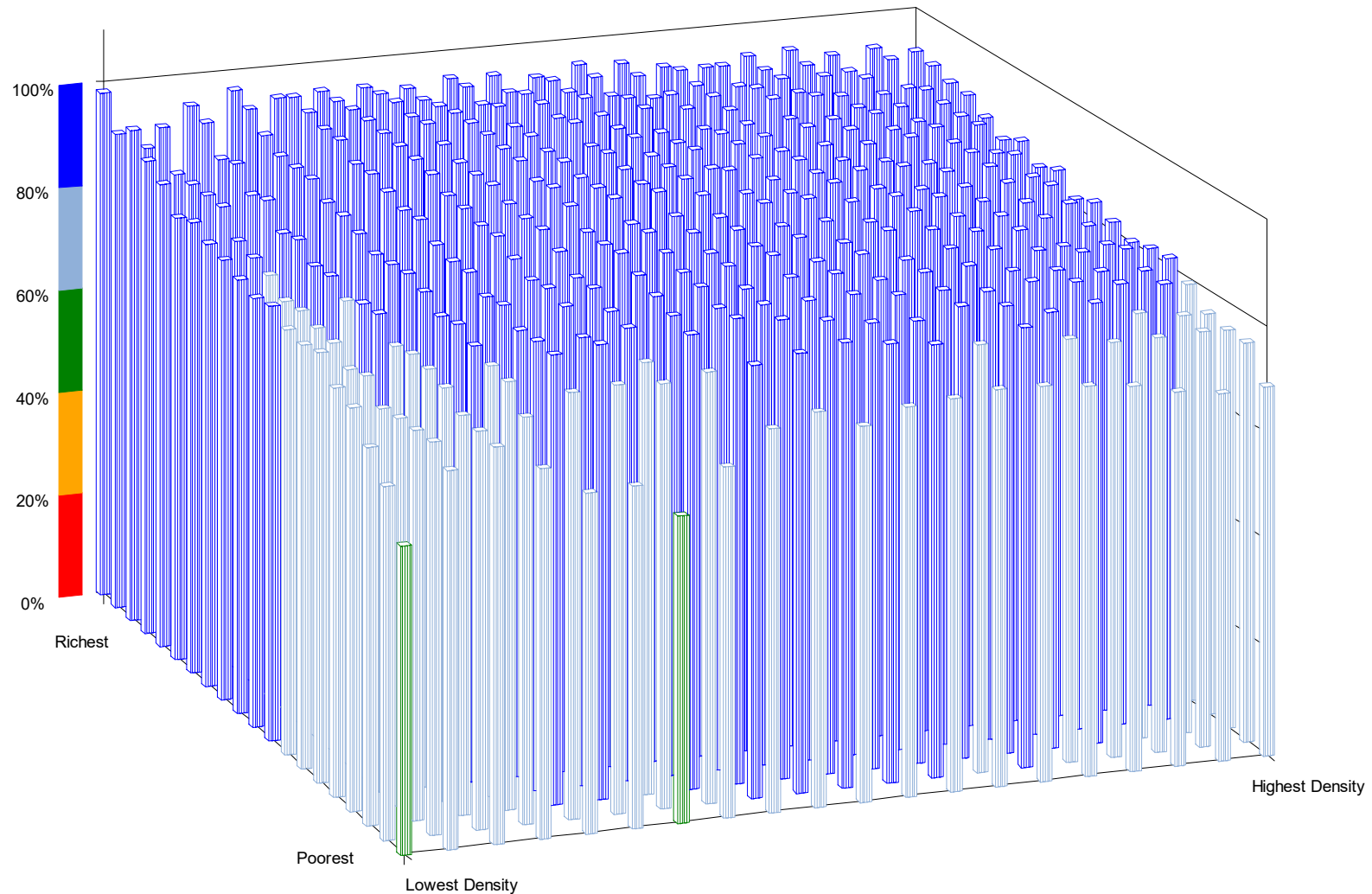
Figure 50
Subscribership Ratios by Technology and Tract Household Density as of December 31, 2021
(Residential fixed connections over 200 kbps in at least one direction)



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; 2017-2021 ACS 5-year estimates; and Census 2010.

Figure 51
Average Subscribership Ratios by Income and Household Density as of December 31, 2021
(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; 2017-2021 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 477.⁹ 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 477.¹⁰ 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

⁹ *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>.

¹⁰ 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 2020 decennial census. For the purposes of this report, there are 85,160 census tracts because we exclude census tracts delineated specifically to cover large bodies of water.

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 2017-2021 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.