Broadband/Internet Availability Survey Report

NTCA–THE RURAL BROADBAND ASSOCIATION

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To gauge the deployment rates of advanced services by its member companies, for nearly two decades NTCA–The Rural Broadband Association (NTCA) has conducted its Broadband/Internet Availability Survey. NTCA is a national association representing nearly 850 rural rate-of-return regulated telecommunications providers in 45 states.

All NTCA members are small network operators that are "rural telephone companies" as defined in the Communications Act of 1934, as amended by the Telecommunications Act of 1996. All of NTCA's members are full service local exchange carriers and broadband service providers. Respondents to this year's survey report an average of 3,978 residential and 456 business fixed broadband connections in service.

This latest broadband survey is a follow-up to similar surveys conducted in recent years by NTCA and seeks to build upon the results of those surveys.[1] This year's survey asked about technologies used to provide broadband service in ILEC service areas, broadband availability and subscription rates, anchor institutions,[2] fixed wireless broadband services, competitive broadband services, mobile voice and broadband data service, competition/marketing, fiber deployment, the impact of COVID-19 on customer payments, internet backbone and middle mile connections, VoIP, and video service.

In August 2020, NTCA contracted with Association Research, Inc. (ARI)[3] to conduct its annual survey of broadband/internet availability. ARI sent an email with a link to the online survey to each of the companies (as reflected at the holding company level) in NTCA's email database; 217 members (32.9%) responded. It is important to note that not all respondents answered every question in the survey.

The average service area identified by respondents is approximately 2,063 square miles. Nearly half (49.5%) report having a service area of less than 500 square miles, while just over one-quarter (25.8%) have a service area between 500-1,999 square miles, and a proportion slightly smaller (24.7%) have a service area of 2,000 square miles or larger.

Respondents indicated that they use a variety of platforms within their respective service areas to provide broadband service to their customers.[4] On average, seven in 10 (69.9%) serviceable locations are served by fiber to the home (FTTH) in 2020, while an average of 21.2% are served via copper loops. Fiber to the node (FTTN) is used to serve an average of 5.8% serviceable locations, cable modems 1.4%, unlicensed fixed wireless 1.3% and licensed fixed wireless 0.5%.

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[1] Copies of this and previous NTCA survey reports can be downloaded from the NTCA website at https://www.ntca.org/ruraliscool/survey-reports.

[2] Anchor Institutions are defined by the Federal Communications Commission as entities such as "schools, libraries, hospitals and other medical providers, public safety entities, institutions of higher education, and community support organizations that facilitate greater use of broadband by vulnerable populations, including low-income, the unemployed, and the aged." A more in-depth look at types of broadband services that NTCA members offer to anchor institutions within their communities is available at https://www.ntca.org/sites/default/files/documents/2018-08/NTCA%20Rural%20Anchor%20Institution%20Survey%20Report_Final.pdf.

[3] Association Research, Inc., an independent survey research organization located in Gaithersburg, Maryland, conducted the survey, analyzed the findings and prepared this report. All responses have been kept confidential; this report does not reveal information from any individual source.

[4] For purposes of this survey, broadband is defined as throughput equal to or exceeding 200 kilobits per second in at least one direction.

On average, respondents indicated the following percentage of their customer base *can receive* maximum downstream speeds of:

- Greater than/equal to 1 Gig: 45.1%

- Greater than/equal to 100 Mbps but less than 1 Gig: 22.7%

- Greater than/equal to 25 Mbps but less than 100 Mbps: 12.6%

- Greater than/equal to 10 Mbps but less than 25 Mbps: 12.1%

- Greater than/equal to 4 Mbps but less than 10 Mbps: 5.3%

- Greater than/equal to 200 kbps but less than 4 Mbps: 2.3%

In NTCA's 2019 Broadband Survey Report, 75.3% of respondents' customers could receive a maximum downstream speed greater than 25 Mbps, lower than the 80.4% of customers identified by respondents in 2020. It is worth noting too in the midst of a pandemic that has placed greater emphasis on the need for robust broadband at home that respondents in the 2020 survey indicated that a higher proportion of their customers can receive a maximum downstream speed greater than/equal to 100 Mbps (67.8% vs. 60.8%), compared to 2019 – with particularly large gains for those able to obtain service that is greater than or equal to 1 Gig (45.1% vs 25.3%).

Respondents' customers *subscribe to* the following maximum downstream speeds:

- 7.9% subscribe to speeds greater than/equal to 1 Gig.

- 20.2% subscribe to greater than/equal to 100 Mbps but less than 1 Gig.

- 35.8% subscribe to greater than/equal to 25 Mbps but less than 100 Mbps.

- 21.3% subscribe to greater than/equal to 10 Mbps but less than 25 Mbps.

- 10.5% subscribe greater than/equal to 4 Mbps but less than 10 Mbps.

- 4.3% subscribe to service greater than/equal to 200 kbps but less than 4 Mbps.

The percentage of customers subscribing to downstream speeds greater than or equal to 25 Mbps has increased steadily in the past four years. In 2019, the proportion was 50%, up from just under 40% in 2018. In 2020, this percentage is approximately 64%. Moreover, the percentage of customers subscribing to higher levels of broadband speed increased in 2020 when compared to 2019, from 14.6% to 20.2% for speed greater than/equal to 100 Mbps but less than 1 Gig, and from 3.4% to 7.9% for speed greater than/equal to 1 Gig.

Likely related to the increases in speeds available to and demanded by consumers, respondents increased their own subscriptions of guaranteed middle mile bandwidth from 25 GB in 2019 to 38 GB in 2020. They expect this capacity to remain sufficient for a mean duration of 1.8 years.

Voice Grade Access Lines, Interconnected VoIP Lines and Fixed Broadband Connections

Fixed Voice and Broadband	Residential		Business	
	2019 Mean	2020 Mean	2019 Mean	2020 Mean
Number of voice grade access lines	3,212	3,385	1,057	1,197
Number of interconnected VoIP lines	779	1,945	280	279
Number of fixed broadband connections	3,442	3,978	462	456

Source: 2020 NTCA–Broadband/Internet Availability Survey

- The average respondent reports having 3,385 residential local exchange voice grade access lines in service in 2020, an increase from the average response for 2019 (3,212). The average number of business local exchange voice grade access lines in service in 2020 is 1,197, up from 2019 (1,057).

- The average respondent also reports having 1,945 residential interconnected VoIP lines and 279 business interconnected VoIP lines in service in 2020. The average number of residential interconnected VoIP lines is more than double of the average response in 2019, while the average reported number of business interconnected VoIP lines is essentially unchanged from a year ago. (Surveys prior to 2019 did not distinguish VoIP from other voice connections.)

- On average, respondents indicate having 3,978 residential fixed broadband connections in service in 2020, an increase from the reported average for 2019 (3,442). The average number of business fixed broadband connections in service is 456, a decline from 2019 (462).

- The average service area is approximately 2,063 square miles. Nearly half (49.5%) report having a service area of less than 500 square miles. Just over a quarter (25.8%) have a service area between 500-1,999 square miles, and a proportion slightly smaller (24.7%) have a service area of 2,000 square miles or larger.

- Most often, respondents in 2020 indicate that the population in their ILEC service area is remaining the same (44.4%). More than one-quarter say it is growing (28.6%), while just over one-fifth say it is declining (21.9%).

Have IP Switching Facilities (e.g., "softswitches") for Voice Traffic
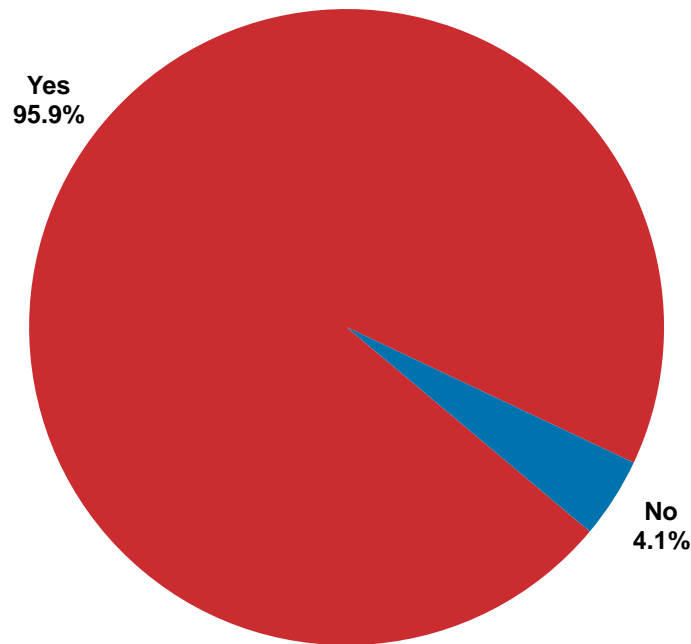
**Yes
95.9%**

**No
4.1%**

■ The vast majority of respondents (95.9%) indicate that they have IP switching facilities for voice traffic in their network. Just under one-half of respondents (48.9%), however, still use TDM switching facilities for voice traffic within some portion of their ILEC network.

■ Slightly more than half (52.3%) of ILEC survey respondents receive Universal Service Fund (USF) support through cost-based (i.e., CAF-BLS and/or HCLS) mechanisms, while just over 46% receive ACAM support—with 16.2% receiving ACAM 1 support and 29.9% receiving USF support through ACAM 2. Just 1.5% of ILEC respondents receive support via the Alaska Plan.

Network Platforms Used to Provide Fixed Broadband Service

■ 2020   ■ 2019

Platform	2020	2019
Fiber to the home	97.5%	93.5%
Copper Loops	58.1%	63.6%
Fiber to the node	33.5%	33.2%
Unlicensed fixed wireless	11.8%	22.0%
Licensed fixed wireless	8.4%	14.5%
Cable modem	8.4%	8.4%
Satellite	2.0%	5.6%
Other	0.5%	0.9%
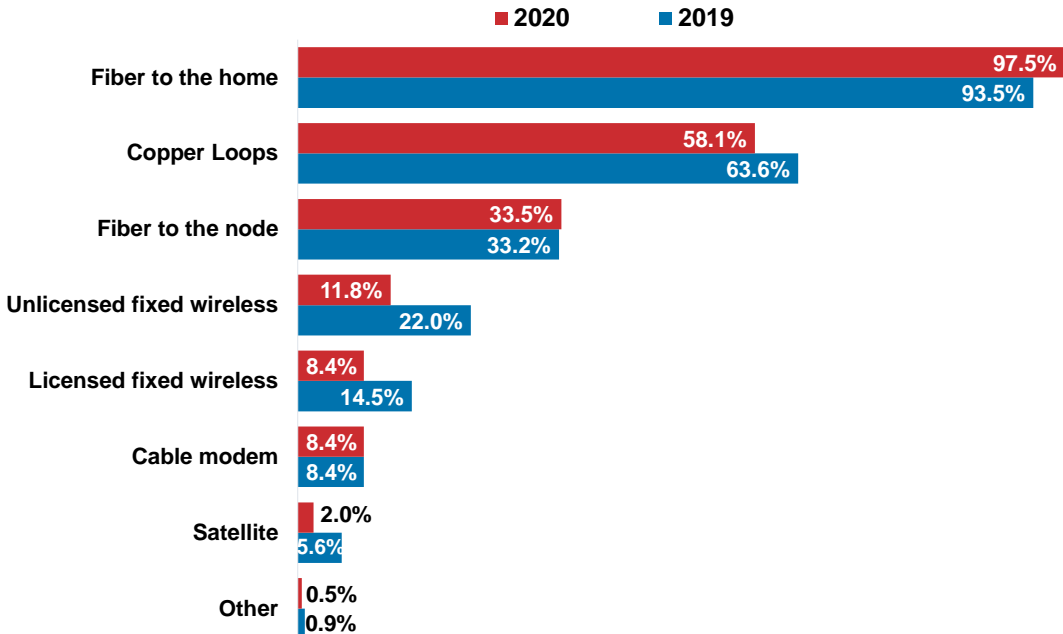
- Most respondents (97.5%) in 2020 report using fiber to the home to provide fixed broadband service to some portion of their service area, up from 93.5% in 2019 and 91.2% in 2018. More than half (58.1%) still use copper loops for some customers in their service area, a percentage which has steadily dropped over the last two years (63.6% in 2019 and 65.8% in 2018). Approximately one-third (33.5%) use fiber to the node, slightly higher than the proportion reported in 2019 (33.2%), but still lower than that reported in 2018 (37.3%). Percentages add up to more than 100% due to the presence and use of multiple technology platforms in individual respondents' networks.

- The platforms that respondents used least often to provide fixed broadband service are licensed fixed wireless (8.4%), cable modems (8.4%) and satellite (2.0%).

Average Percentage of Serviceable Locations for Network Platforms

■ 2020 ■ 2019

Platform	2020	2019
Fiber to the home	69.9%	63.8%
Copper Loops	21.2%	22.7%
Fiber to the node	5.8%	9.3%
Cable modem	1.4%	2.4%
Unlicensed fixed wireless	1.3%	1.1%
Licensed fixed wireless	0.5%	0.7%
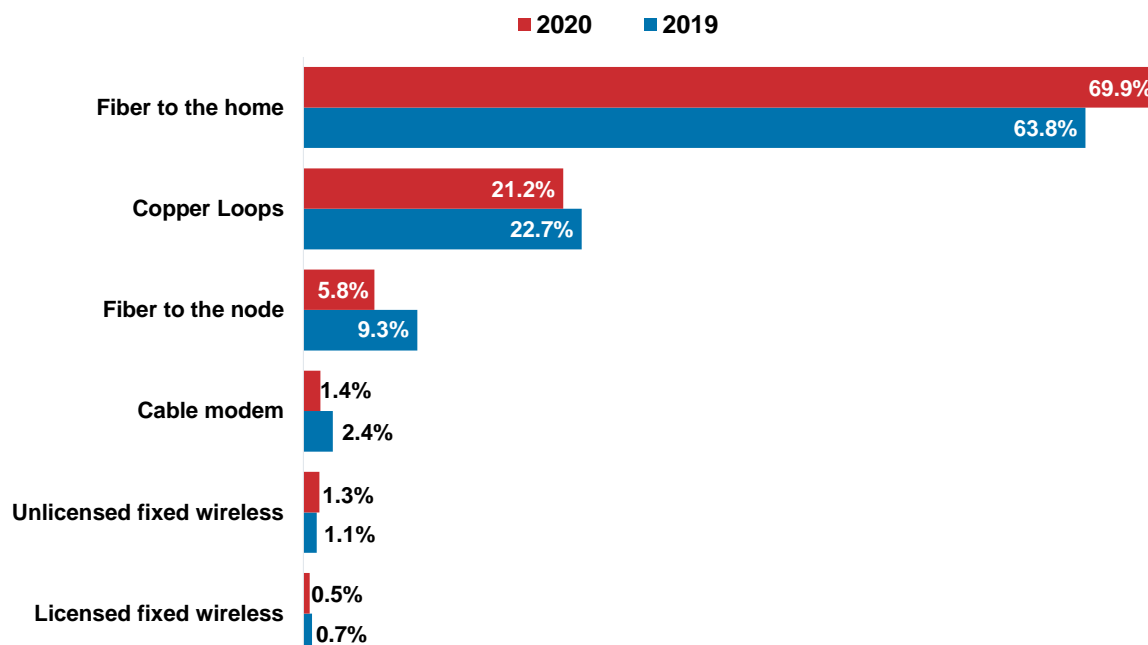
Source: 2020 NTCA–Broadband/Internet Availability Survey

- In 2020, respondents indicate that, on average, 69.9% of their serviceable locations are being served by fiber to the home, up from 63.8% in 2019. The proportion connected by copper loops is reported at 21.2%, dropping slightly from 22.7% in 2019. The proportion served by fiber to the node is 5.8% in 2020, dropping from 9.3% in 2019.

- In 2020, the average percentage of respondents' serviceable locations served by cable modem (1.4%), unlicensed fixed wireless (1.3%) and licensed fixed wireless (0.5%) continues to be very small.

Maximum Downstream Speed Availability

■ 2020 ■ 2019

| Speed Category	2020	2019
Greater than/equal to 1 Gig*	45.1%	25.3%
Greater than/equal to 100 Mbps but less than 1 Gig*	22.7%	35.5%
Greater than/equal to 25 Mbps but less than 100 Mbps	12.6%	14.5%
Greater than/equal to 10 Mbps but less than 25 Mbps	12.1%	14.0%
Greater than/equal to 4 Mbps but less than 10 Mbps	5.3%	7.3%
Greater than/equal to 200 kbps but less than 4 Mbps	2.3%	3.5%
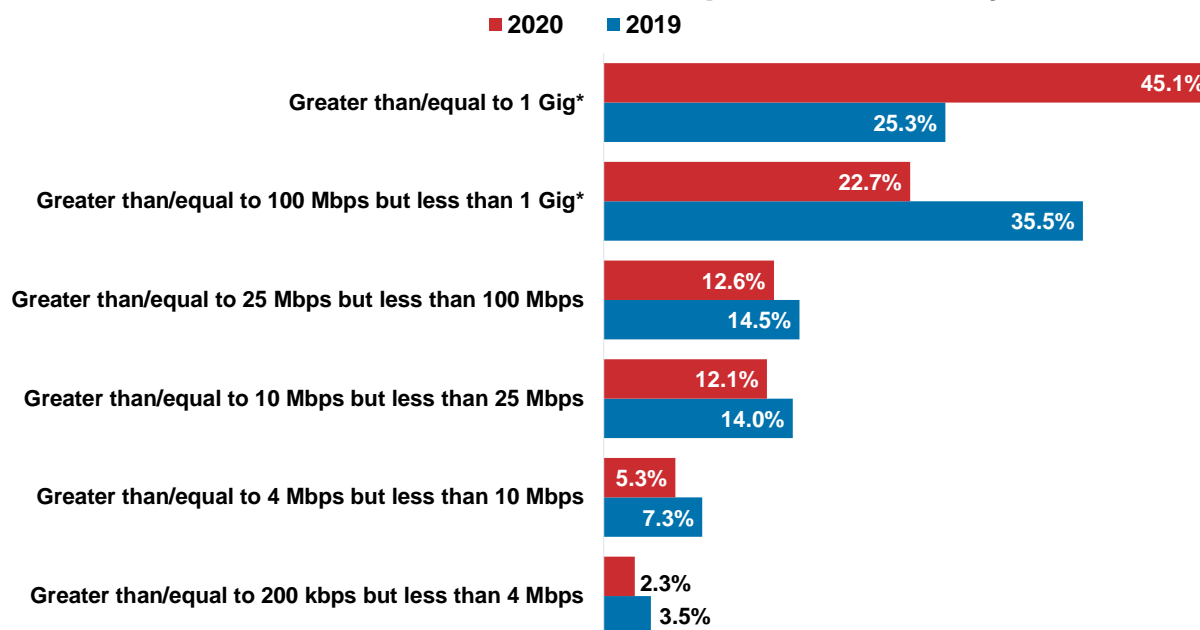
*1 Gig = 1,000 Mbps

Source: 2020 NTCA–Broadband/Internet Availability Survey

- The survey indicates significant increases in the availability of higher speed services, with respondents indicating that nearly 70% of customers are able to receive greater than or equal to 100 Mbps broadband in 2020. The most significant increase comes in the Gigabit tier, where respondents report that an average of 45.1% of their customer base can *receive* a maximum downstream speed for fixed broadband greater than or equal to 1 Gig, up from 25.3% who reported service availability at this level in 2019. The proportion who can receive greater than or equal to 100 Mbps but less than 1 Gig has dropped from 35.5% in 2019 to 22.7% currently.

- By contrast, the proportion of customers identified as receiving slower maximum speeds has declined. Specifically, 12.6% can receive a maximum downstream speed greater than or equal to 25.0 Mbps but less than 100 Mbps in 2020, down from 14.5% saying the same in 2019. Respondents report that 12.1% of their customer base can receive a maximum downstream speed greater than or equal to 10.0 Mbps but less than 25.0 Mbps, and 5.3% can receive a maximum downstream speed greater than/equal to 4.0 Mbps but less than 10.0 Mbps.

- Respondents report that a very small percentage of their customer base is still only able to receive maximum downstream speeds greater than or equal to 200 kbps but less than 4 Mbps (2.3%).

Broadband Adoption by Speed Tier

■ 2020   ■ 2019

Speed Tier	2020	2019
Greater than/equal to 1 Gig*	7.9%	3.4%
Greater than/equal to 100 Mbps but less than 1 Gig*	20.2%	14.6%
Greater than/equal to 25 Mbps but less than 100 Mbps	35.8%	32.0%
Greater than/equal to 10 Mbps but less than 25 Mbps	21.3%	25.5%
Greater than/equal to 4 Mbps but less than 10 Mbps	10.5%	17.1%
Greater than/equal to 200 kbps but less than 4 Mbps	4.3%	7.4%
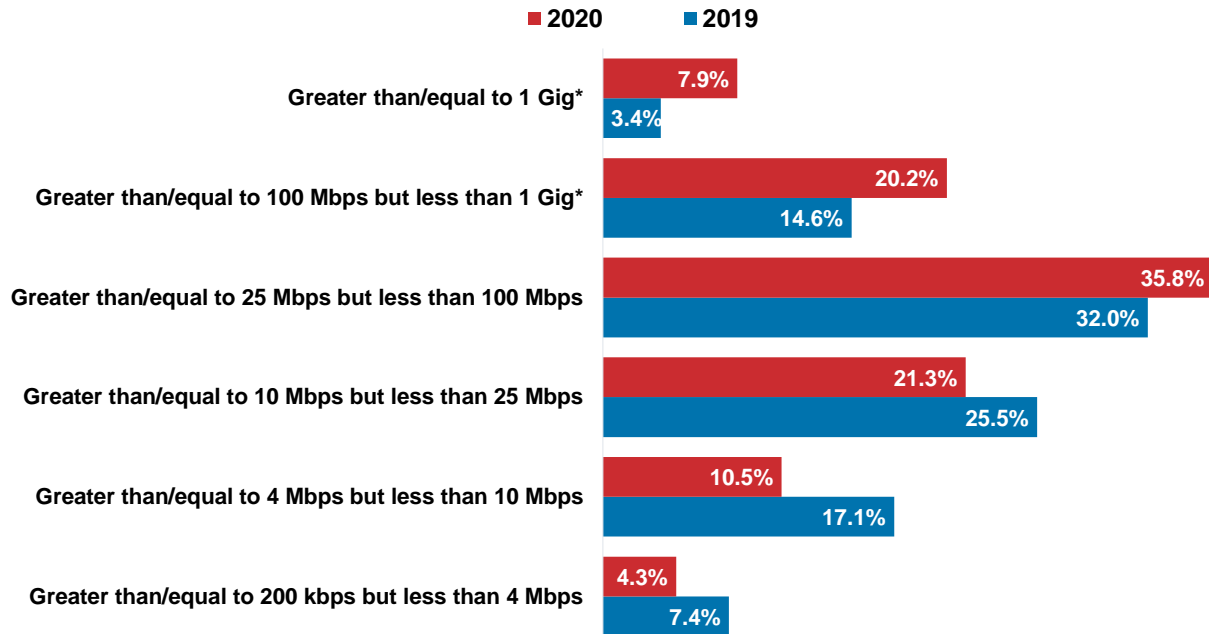
*1 Gig = 1,000 Mbps
Source: 2020 NTCA–Broadband/Internet Availability Survey

- The survey reflects that consumers continue to migrate steadily to higher speeds as they become available for subscription. The percentage of respondents' customer base in 2020 that *subscribes* to a maximum downstream speed for fixed broadband of greater than or equal to 1 Gig has more than doubled since 2019 (7.9% versus 3.4%). Moreover, just over one-fifth (20.2%) of the average customer base subscribes in 2020 to a downstream speed greater than or equal to 100 Mbps but less than 1 Gig, up from 14.6% saying the same in 2019.

- The largest percentage of customers, however, continues to subscribe to a downstream speed greater than or equal to 25.0 Mbps but less than 100 Mbps (35.8% average). At the same time, the proportion subscribing to speeds that do not exceed 25.0 Mbps is 36.1% in 2020, compared with 50.0% in 2019.

- On a more granular basis in 2020, survey respondents indicate that 21.3% of their customer base subscribe to a maximum downstream speed of greater than or equal to 10.0 Mbps but less than 25.0 Mbps, 10.5% subscribe to a speed greater than or equal to 4.0 Mbps but less than 10.0 Mbps, and 4.3% subscribe to speeds of greater than 200 kbps but less than 4.0 Mbps.

Speed Availability and
Estimated Cost of Bringing Customers Up to Each Level
(Upstream and Downstream)

Downstream Speed	Estimated Total Costs
	2020 Mean
25 Mbps	$11,414,891
100 Mbps	$19,730,582
1 Gig	$20,831,524

| Upstream Speed	2020 Mean
Percentage of customers that can receive an upstream speed of 3 Mbps or greater for fixed broadband service	83.8%
Estimated total cost of bringing all customers who are not already at 3 Mbps upstream up to that level	$14,190,708
Percentage of customers that can receive an upstream speed of 100 Mbps or greater for fixed broadband service	68.6%
Estimated total cost of bringing all customers who are not already at 100 Mbps upstream up to that level	$19,200,436

Source: 2020 NTCA–Broadband/Internet Availability Survey

- Respondents estimate that it would cost an average of approximately $20.8 million to bring all ILEC customers who are not already at 1 Gig fixed broadband service (downstream only) up to that speed. The total estimated cost to bring all customers up to the 100 Mbps (downstream) level of service is $19.7 million, while the total estimated cost to bring all customers up to the 25 Mbps (downstream) level of service is $11.4 million.

- Respondents report that an average of 83.8% of their customers can receive an upstream speed of 3 Mbps or greater for fixed broadband service, up from 79.2% reported in 2019. The average estimated total cost of bringing customers not at the level of 3 Mbps upstream up to this level is about $14.2 million, less than the averages reported in 2019 ($21.1 million) and 2018 ($21.6 million).

- More than two-thirds (68.6%) of respondents' ILEC customers can receive an upstream speed of 100 Mbps, while the total estimated cost of bringing all customers up to 100 Mbps upstream who are not already at that speed is estimated to be about $19.2 million (average).

Offer Standalone Broadband

2020

Yes
79.7%

No
20.3%

2019

Yes
63.6%

No
36.4%
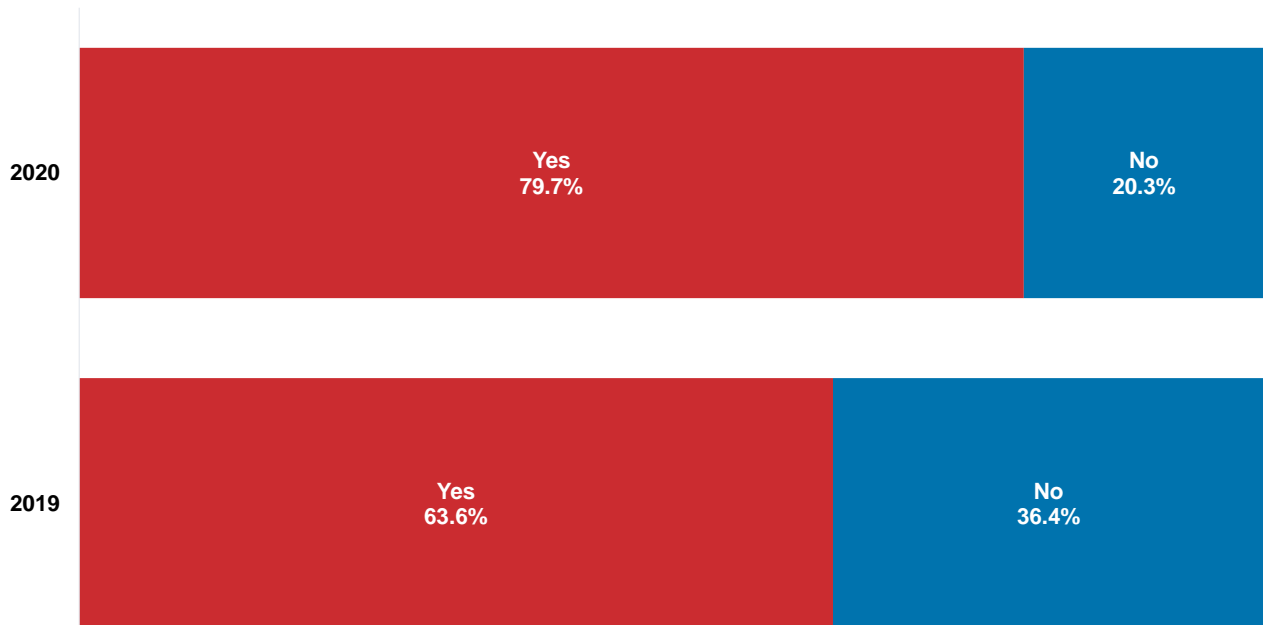
Source: 2020 NTCA–Broadband/Internet Availability Survey

- Nearly eight in 10 respondents (79.7%) report that they offer "standalone broadband." This percentage represents a significant increase from those saying the same in 2019 (63.6%) or 2018 (50.6%). Of those respondents offering standalone broadband, an average of 33.1% of their ILEC subscribers currently take this service. For this survey/report, "standalone broadband" was defined as broadband service only, with *no regulated* voice component as an ILEC (i.e., broadband offered with *unregulated* interconnected VoIP service qualifies as standalone broadband).

Anchor Institution Connection via Fiber

Anchor Institution	% Connected to Network via Fiber
	2020 Mean
Primary/secondary schools	**81.2%**
Public safety entities (police, fire, etc.)	**73.5%**
Public libraries	**68.9%**
Hospitals/medical clinics	**66.5%**
911 Call Centers	**43.3%**
Community colleges	**30.7%**
State universities and extensions	**20.7%**

Source: 2020 NTCA–Broadband/Internet Availability Survey

- In 2020, more than eight in 10 (81.2%) primary/secondary schools are connected to respondents' networks via fiber, up slightly from 80.2% in 2019.

- The proportion of public libraries that respondents to this year's survey identified as being connected via fiber has declined from last year's survey, from an average of 72.9% in 2019 to 68.9% in 2020.

- The proportion of other anchor institutions connected to respondents' networks via fiber has increased in the past year. Specifically, an average of 73.5% of public safety entities are connected to respondents' networks via fiber, 66.5% of hospitals/medical clinics, 43.3% of 911 call centers, and 30.7% of community colleges.

- An average of more than one in five state universities and extensions (20.7%) are connected to respondents' networks via fiber in 2020.

Number of Anchor Institutions in Service Area and Number Served With Fixed Broadband

Anchor Institution	Number in Service Area 2020 Mean	Number Served 2020 Mean
Primary/secondary schools	8	7
Public safety entities (police, fire, etc.)	10	9
Public libraries	3	3
Hospitals/medical clinics	8	8
911 Call Centers	3	3
Community colleges	2	2
State universities and extensions	4	4

Source: 2020 NTCA–Broadband/Internet Availability Survey

- Respondents report that their service areas include an average of three public libraries, two community colleges, four state universities and extensions, three 911 call centers, and eight hospitals/medical clinics. Respondents indicate that they serve all of these anchor institutions with fixed broadband

- Respondents in 2020 report serving, on average, seven of eight primary/secondary schools and nine of 10 public safety entities (police, fire, etc.) located in their service area with fixed broadband.

Anchor Institution Average Speed

Fixed Voice and Broadband	2017 Mean	2018 Mean	2019 Mean	2020 Mean
Average Maximum Speed of Broadband Available	1,030 Mbps	1,233 Mbps	1,350 Mbps	1,428 Mbps
Average Speed of Broadband Purchased	127 Mbps	196 Mbps	147 Mbps	235 Mbps

Source: 2020 NTCA–Broadband/Internet Availability Survey

- Respondents to the 2020 survey report that the average maximum broadband speed they make available to anchor institutions in their area is 1,428 Mbps. This average speed available to anchor institutions has increased steadily since 2017. The average broadband speed purchased by these institutions is 235 Mbps, which is also higher than that observed in any of the past three years.

Broadband Service Provided to Farms and Ranches, Maximum and Average Speeds

	Yes	No
Broadband service is provided to farms and ranches in service area	**94.7%**	**5.3%**

	2020 Mean
Average Maximum Speed of Broadband Available	**743 Mbps**
Average Speed of Broadband Purchased	**72 Mbps**

Source: 2020 NTCA–Broadband/Internet Availability Survey

- Nearly all respondents (94.7%) in 2020 provide service to farms or ranches in their service areas. The average maximum speed offered to these entities is 743 Mbps, and the average speed purchased is 72 Mbps.

Short-Term and Long-Term Fiber Deployment Strategy

SHORT-TERM STRATEGY

Deploy fiber to the node to X% of customers by year-end 2021 — **3.4%**

Deploy fiber to the home to X% of customers by year-end 2021 — **59.8%**

All fiber deployments are done — **30.5%**

No formal strategy — **6.3%**

58.8%:
Average % of Customers to the Node

69.9%:
Average % of Customers to the Home

LONG-TERM STRATEGY

Deploy fiber to the node to X% of customers by year-end 2026 — **2.4%**

Deploy fiber to the home to X% of customers by year-end 2026 — **51.2%**

All fiber deployments are done — **38.6%**

No formal strategy — **7.8%**

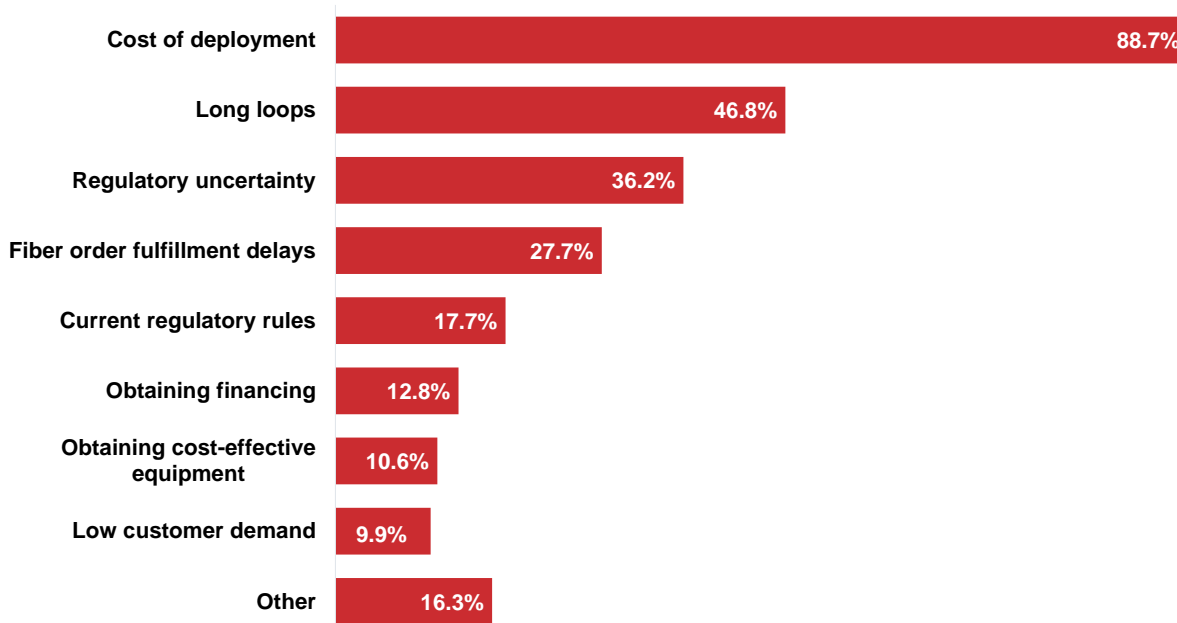**92.5%:**
Average % of Customers to the Node

89.4%:
Average % of Customers to the Home

Source: 2020 NTCA–Broadband/Internet Availability Survey

■ Nearly six in 10 responding companies (59.8%) report that their short-term fiber deployment strategy is to deploy fiber to the home to an average of 69.9% of customers by year-end 2021. Similarly, just over one-half (51.2%) of companies indicate that their long-term strategy is to deploy fiber to the home to an average of 89.4% customers by 2026. In 2019, 54.3% of respondents' short-term strategy was to deploy fiber to the home to an average of 64.0% of customers by 2020, and 51.4% planned to deploy fiber to the home to an average of 85.4% as a long-term strategy by 2025.

■ Companies are far less likely to deploy fiber to the node as either a short-term (3.4%) or a long-term (2.4%) strategy.

■ In terms of short-term strategies, 30.5% indicate that all fiber deployments are done and 38.6% report the same for long-term strategies. Few respondents report not having either a short-term (6.3%) or long-term (7.8%) formal strategy, proportions that have increased somewhat from 2019, with 5.3% having no short-term formal strategy and 5.5% having no long-term formal strategy at that time.

Significant Barriers to Widespread Fiber Deployment

| Barrier	Percentage
Cost of deployment	88.7%
Long loops	46.8%
Regulatory uncertainty	36.2%
Fiber order fulfillment delays	27.7%
Current regulatory rules	17.7%
Obtaining financing	12.8%
Obtaining cost-effective equipment	10.6%
Low customer demand	9.9%
Other	16.3%

Source: 2020 NTCA–Broadband/Internet Availability Survey

- As observed in 2019, the most significant barrier to widespread fiber deployment is the cost of deployment, cited by 88.7% of companies. This is somewhat lower than 91.4% of companies saying the same in 2019 and 93.2% in 2018.

- Additionally, respondents continue to name long loops as their second-most significant barrier, with 46.8% indicating this as a barrier in 2020. This proportion has fallen from 55.0% in 2019 and is just slightly higher than the 46.6% reported in 2018. Over one-third name regulatory uncertainty (36.2%), but this proportion is lower than it has been in the past (43.6% in 2019, and 59.4% in 2018). Fiber order fulfillment delays are named by 27.7%, up substantially from 9.3% of respondents who said the same in 2019.

- Companies are least likely to report that low customer demand is a significant barrier, with just 9.9% saying so, a drop from 20.0% who cited this issue a year ago. Other relatively infrequently named significant barriers are obtaining cost-effective equipment (10.6%) and obtaining financing (12.8%). Over one in six (17.7%) name current regulatory rules.

Offer Competitive Broadband Service Outside of ILEC Service Area

**Yes
71.1%**

**No
28.9%**
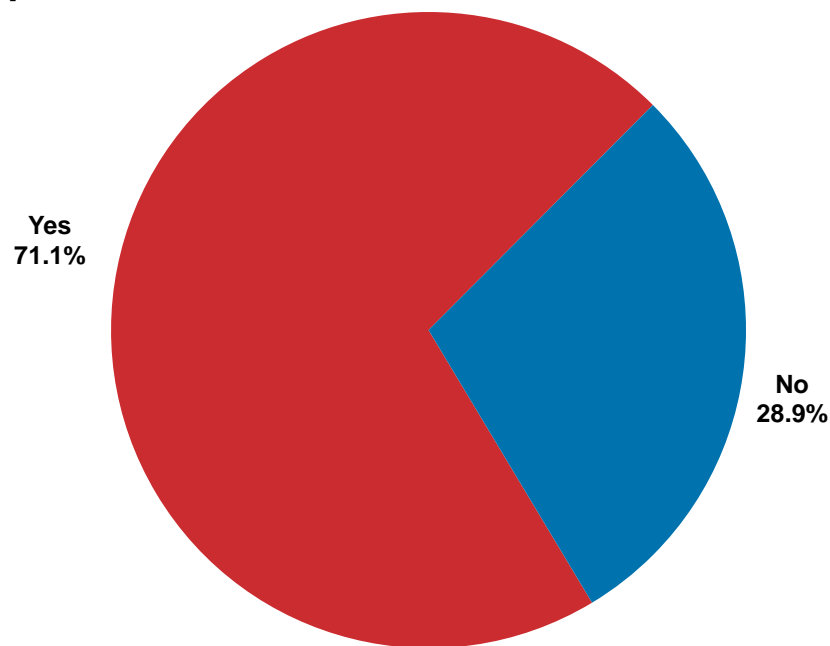
- More than seven in 10 respondents (71.1%) offer competitive broadband service outside of their ILEC service area.

Fixed Broadband Connections in Competitive ISP Operation

Competitive Broadband	2020 Mean	
	Residential	Business
Number of fixed broadband connections	1,650	375

- Responding companies say that their competitive ISP operation has an average of 1,650 residential fixed broadband connections and 375 business fixed broadband connections in service outside of their ILEC service area.
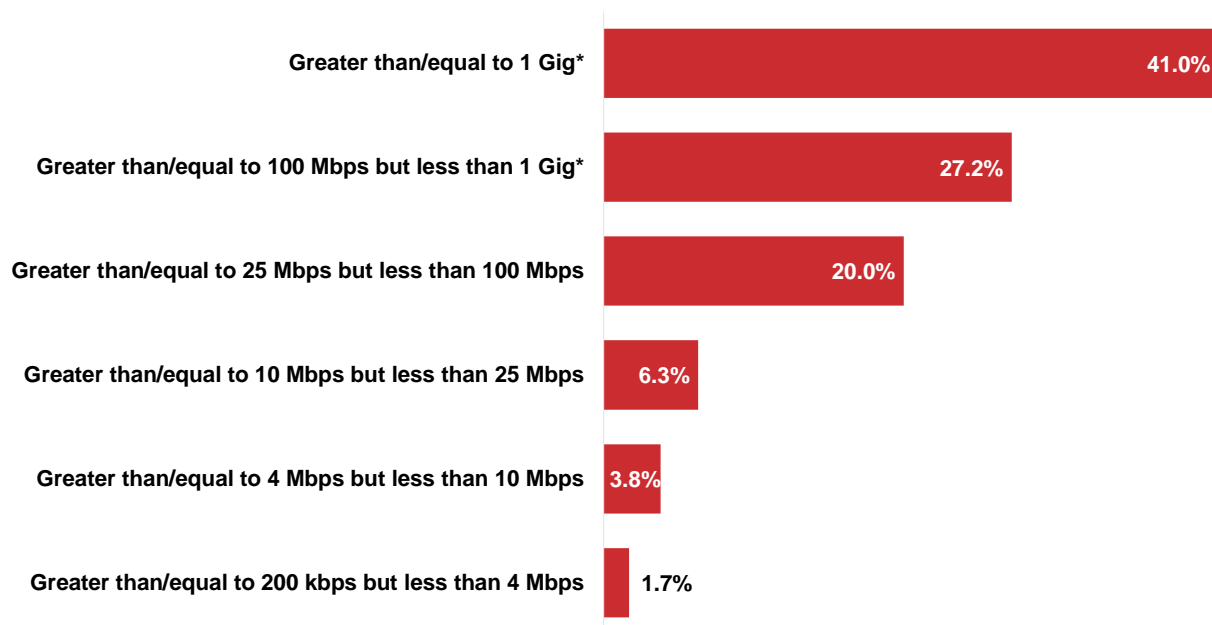
Network Platforms Competitive ISP Using to Provide Fixed Broadband Service Outside of ILEC Service Area

Platform	Percentage
Fiber to the home	87.5%
Unlicensed fixed wireless	30.5%
Licensed fixed wireless	18.8%
Cable modem	16.4%
Copper Loops	14.8%
Fiber to the node	11.7%
Satellite	2.3%
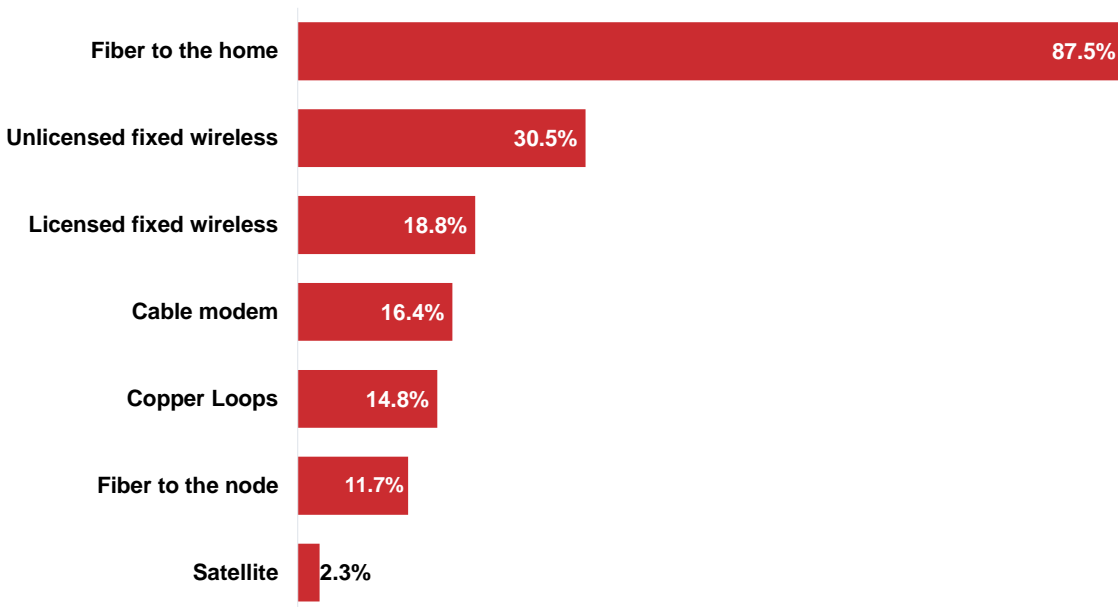
- Overwhelmingly, respondents who offer competitive broadband service outside of their ILEC service area indicate that their competitive ISP is using fiber to the home (87.5%). A much smaller percentage say their competitive ISP is using unlicensed fixed wireless (30.5%), 18.8% are using licensed fixed wireless, 16.4% are using cable modem, 14.8% are using copper loops, and 11.7% are using fiber to the node. Satellite is used very infrequently (2.3%).

Maximum Downstream Speed Availability in Competitive ISP Service Area

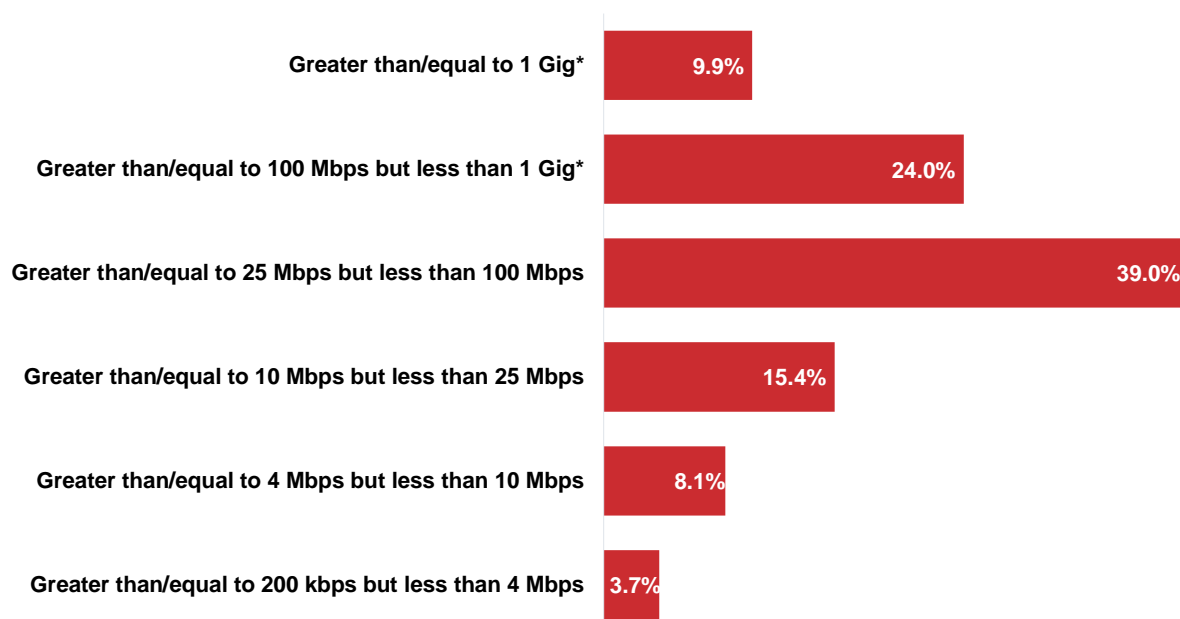| Category	Percentage
Greater than/equal to 1 Gig*	41.0%
Greater than/equal to 100 Mbps but less than 1 Gig*	27.2%
Greater than/equal to 25 Mbps but less than 100 Mbps	20.0%
Greater than/equal to 10 Mbps but less than 25 Mbps	6.3%
Greater than/equal to 4 Mbps but less than 10 Mbps	3.8%
Greater than/equal to 200 kbps but less than 4 Mbps	1.7%

*1 Gig = 1,000 Mbps

Source: 2020 NTCA–Broadband/Internet Availability Survey

- Respondent companies who offer competitive broadband service outside their ILEC service area say 41.0% (average) of their competitive ISP's customer base can receive downstream service at speeds greater than or equal to 1 Gig, 27.2% can receive downstream service at speeds greater than or equal to 100 Mbps but less than 1 Gig and 20.0% can receive downstream service at speeds greater than or equal to 25.0 Mbps but less than 100 Mbps. The remaining 11.8% can receive downstream service at slower speeds.

Broadband Adoption by Speed Tier in Competitive ISP Service Area

Speed Tier	Percentage
Greater than/equal to 1 Gig*	9.9%
Greater than/equal to 100 Mbps but less than 1 Gig*	24.0%
Greater than/equal to 25 Mbps but less than 100 Mbps	39.0%
Greater than/equal to 10 Mbps but less than 25 Mbps	15.4%
Greater than/equal to 4 Mbps but less than 10 Mbps	8.1%
Greater than/equal to 200 kbps but less than 4 Mbps	3.7%

*1 Gig = 1,000 Mbps

Source: 2020 NTCA–Broadband/Internet Availability Survey

■ An average of 9.9% of responding companies' competitive ISP customer base subscribe to a maximum downstream service of greater than or equal to 1 Gig, 24.0% subscribe to downstream service greater than or equal to 100 Mbps but less than 1 Gig, and 39.0% subscribe to downstream service greater than or equal to 25.0 Mbps but less than 100 Mbps. Smaller percentages subscribe to each of the slower range buckets (15.4%, on average, subscribing to downstream service greater than or equal to 10.0 Mbps but less than 25.0 Mbps, 8.1% greater than or equal to 4.0 Mbps but less than 10.0 Mbps, and 3.7% greater than 200 kbps but less than 4.0 Mbps).
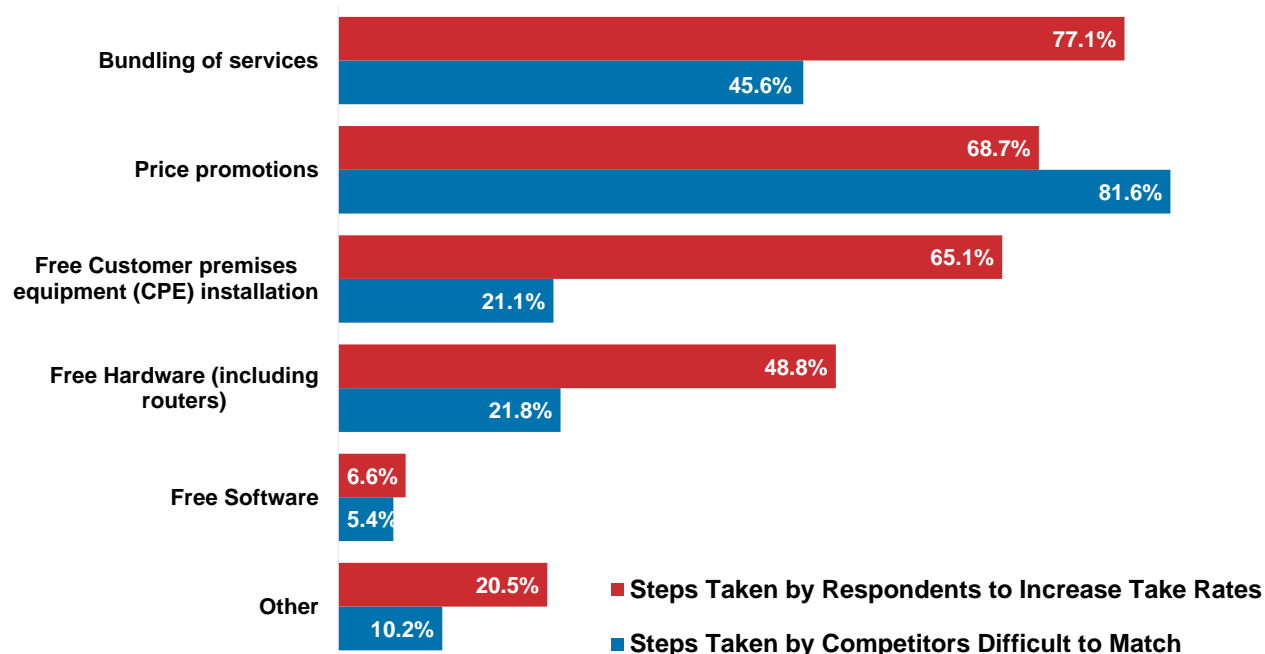
Competing Fixed Terrestrial Broadband Providers in Respondents' Service Area

Type of Providers	Fixed Terrestrial Broadband Providers in Service Area	
	Mean	% in Service Area
Cable Companies	1	65%
Electric Utilities	2	15%
Fixed Wireless ISPs (WISPs)	2	72%
Other	6	22%

Source: 2020 NTCA–Broadband/Internet Availability Survey

■ Respondents were asked to identify the kinds of competitors, if any, that offer competing fixed terrestrial broadband services to some portion of their service areas. More than seven in 10 (72.0%) indicated that fixed wireless internet providers operated within some portion of their service area, and 64.6% said the same about cable companies. Just 15.2% identified electric utilities as offering broadband in some portion of their service areas and 22.0% said the same about other providers.
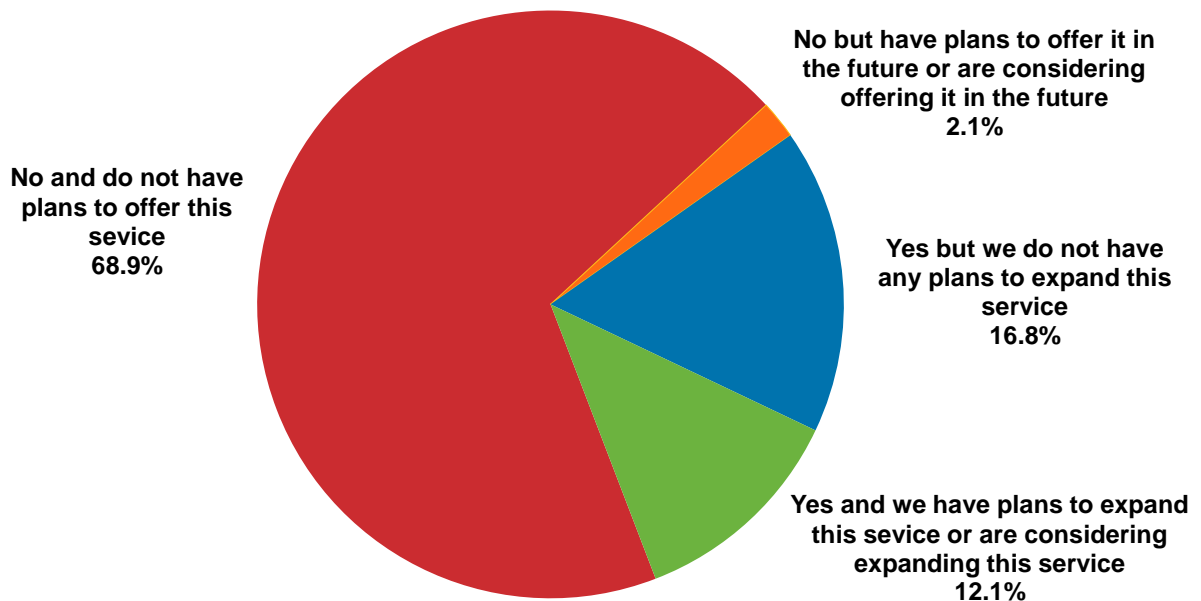
Marketing Steps Taken

	Steps Taken by Respondents to Increase Take Rates	Steps Taken by Competitors Difficult to Match
Bundling of services	77.1%	45.6%
Price promotions	68.7%	81.6%
Free Customer premises equipment (CPE) installation	65.1%	21.1%
Free Hardware (including routers)	48.8%	21.8%
Free Software	6.6%	5.4%
Other	20.5%	10.2%

Source: 2020 NTCA–Broadband/Internet Availability Survey

■ When asked about steps taken to increase broadband take rates, more than three-quarters of companies (77.1%) reported bundling of services. More than two-thirds have used price promotions (68.7%), and 65.1% have used customer premises equipment (CPE) installation. Nearly half (48.8%) have offered free hardware (including routers). It was far less likely that companies offered free software (6.6%). These proportions are similar to marketing steps taken in 2019.

- When asked about steps adopted by competitors that respondents find the most difficult to match, respondents are most likely to identify price promotions (81.6%). Fewer respondents report that their competitors have adopted other marketing steps that are difficult to match, such as bundling of services (45.6%), free hardware (including routers) (21.8%) or free customer premises equipment (CPE) installation (21.1%). Just 5.4% of respondents named free software, although 10.2% identified some other tactic.

Offer Fixed Wireless Broadband Service

No and do not have plans to offer this sevice
68.9%

No but have plans to offer it in the future or are considering offering it in the future
2.1%

Yes but we do not have any plans to expand this service
16.8%

Yes and we have plans to expand this sevice or are considering expanding this service
**12.1%**

Source: 2020 NTCA–Broadband/Internet Availability Survey

- ■ Nearly seven in 10 respondents (68.9%) indicate that they do not offer fixed wireless broadband service, and do not have plans to offer it in the future. A very small percentage (2.1%) report that they do not currently offer this service but have plans to offer it in the future or are considering offering it in the future.

- ■ Approximately one in six respondents (16.8%) offer this service but do not plan to expand it in the future. However, 12.1% offer this service and either have plans to expand it or are considering doing so.

Use Licensed or Unlicensed Spectrum*

(*Percentages based on respondents offering fixed wireless broadband spectrum)

A combination of licensed and unlicensed spectrum
34.5%

Unlicensed spectrum only
41.8%

Licensed spectrum only
23.6%
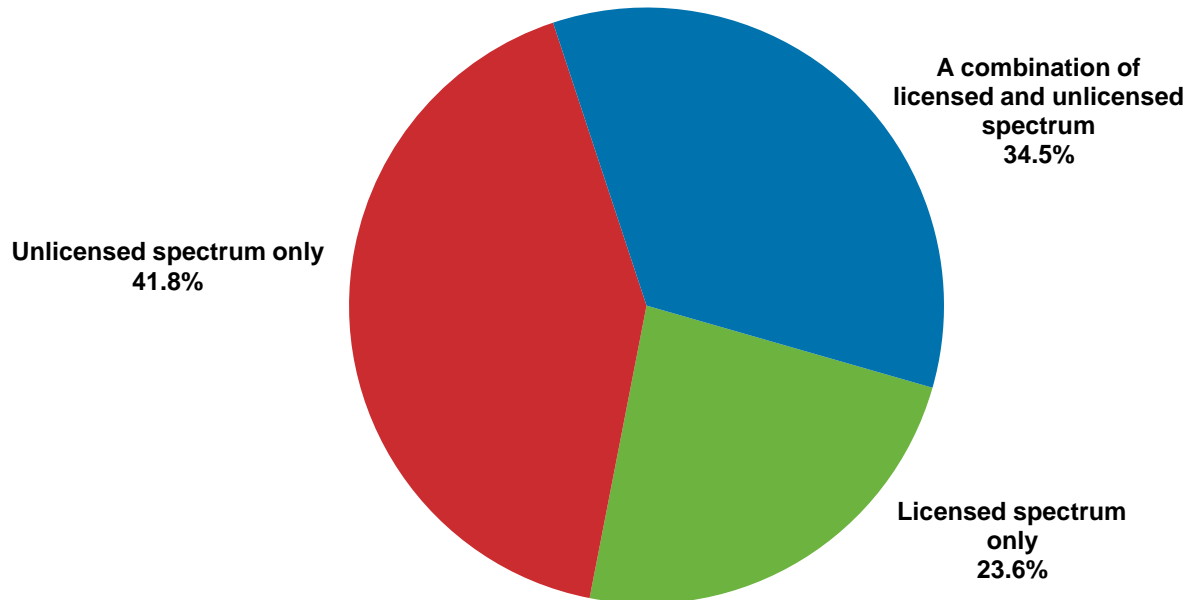
Source: 2020 NTCA–Broadband/Internet Availability Survey

■ Among those offering fixed wireless broadband spectrum, 41.8% offer unlicensed spectrum only, 34.5% offer a combination of licensed and unlicensed spectrum and 23.6% offer licensed spectrum only.

Licensed Spectrum Bands Used

	2020 Mean
Low-band spectrum, less than 1 GHz (e.g., 600 MHz, 700 MHz, 800 MHz Cellular/SMR)	**43.3%**
Mid-band spectrum, 1-6 GHz (e.g., AWS, PCS, 2.5 EBS, 3.5 CBRS)	**73.3%**
High-band or mmWave spectrum, above 6 GHz (e.g., 24 GHz, 28 GHz)	**20.0%**

Source: 2020 NTCA–Broadband/Internet Availability Survey

■ Respondents who offer fixed wireless broadband using *licensed* spectrum most often use mid-band spectrum, 1-6 GHz (e.g., AWS, PCS, 2,5 EBS, 3.5 CBRS), with 73.3% saying so. However, more than four in 10 (43.3%) who offer fixed wireless broadband using licensed spectrum use low-band spectrum, less than 1 GHz (e.g., 600 MHz, 700 MHz, 800 MHz Cellular/SMR) and one-fifth (20.0%) use high-band or mmWave spectrum, above 6 GHz (e.g., 24 GHz, 28 GHz).

Unlicensed Spectrum Bands Used

	2020 Mean
Low-band spectrum, less than 1 GHz (e.g., 600 MHz TV White Spaces, 900 MHz)	**17.9%**
Mid-band spectrum, 1-6 GHz (e.g., 2.4 GHz, 3.6 CBRS GAA, 5.8 GHz, 6 GHz)	**84.6%**
High-band or mmWave spectrum, above 6 GHz (e.g., 24 GHz or higher)	**7.7%**

Source: 2020 NTCA–Broadband/Internet Availability Survey

■ Respondents who offer fixed wireless broadband using *unlicensed* spectrum also most often use mid-band spectrum, 1-6 GHz (e.g., 2.4 GHz, 3.6 CBRS GAA, 5.8 GHz, 6 GHz), with 84.6% saying so. They are far less likely (17.9%) to offer fixed wireless broadband service using low-band spectrum, below 1 GHz (e.g., 600 MHz TV White Spaces, 900 MHz). Just 7.7% use high-band or mmWave spectrum, above 6 GHz (e.g., 24 GHz or higher).

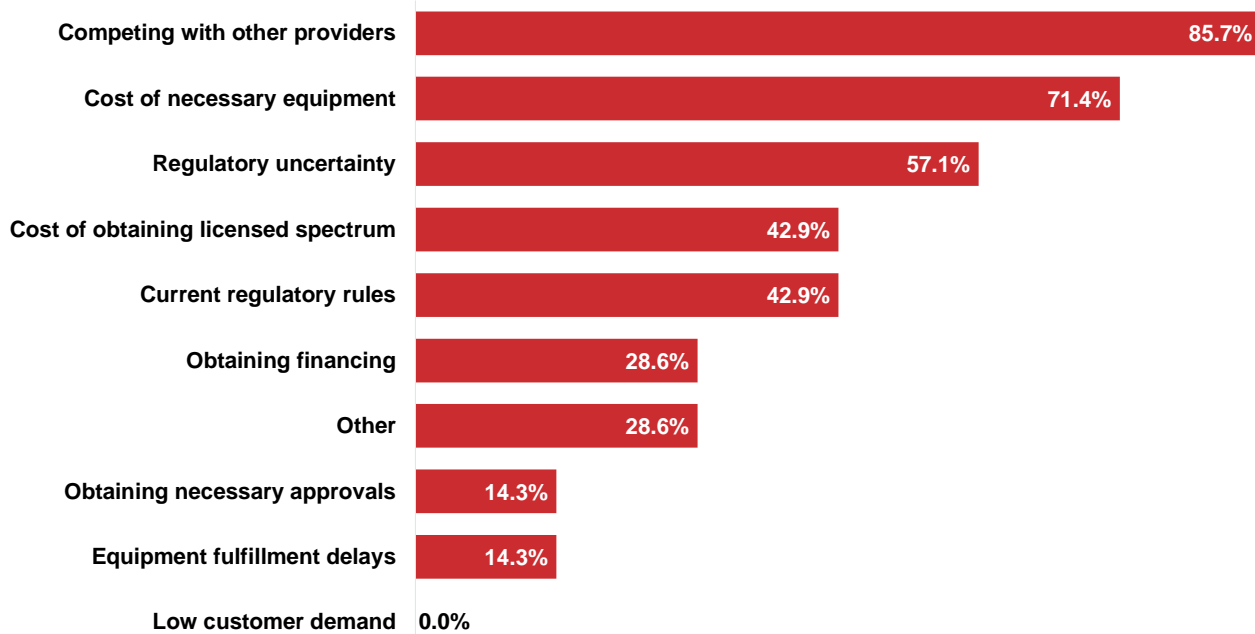## Have Participated in or Are Considering Participating in a Mid-Band Spectrum Auction
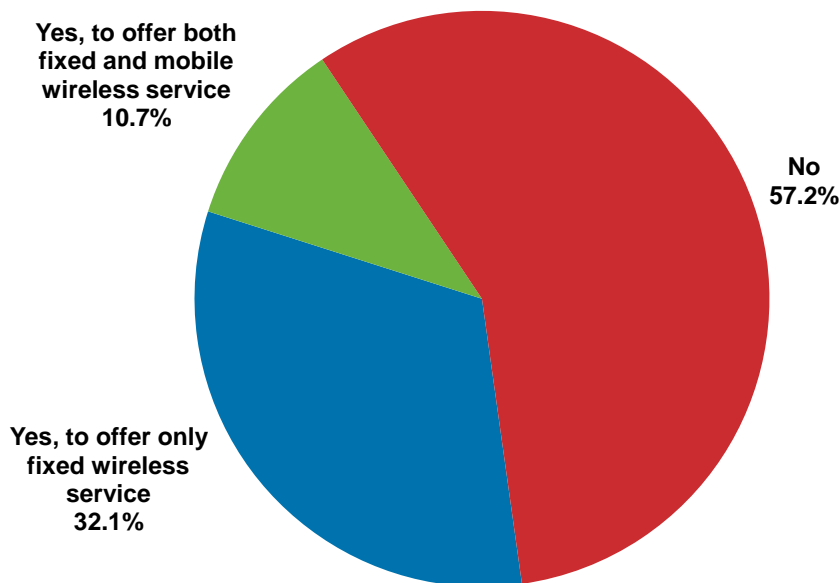
Yes, to offer both fixed and mobile wireless service 10.7%

No 57.2%

Yes, to offer only fixed wireless service 32.1%

Source: 2020 NTCA–Broadband/Internet Availability Survey

■ Respondents who offer fixed wireless broadband or have plans to most often (57.2%) have not participated in a mid-band spectrum auction and are not considering doing so. Just under one-third (32.1%) have participated in this type of auction, or plan to do so, to offer only fixed wireless service; 10.7% have participated in order to offer both fixed and mobile wireless service, or believe they will in the future.

■ The vast majority of respondents do not offer mobile wireless service (94.7%).

Primary Challenges in Offering a Mobile Broadband Data Service

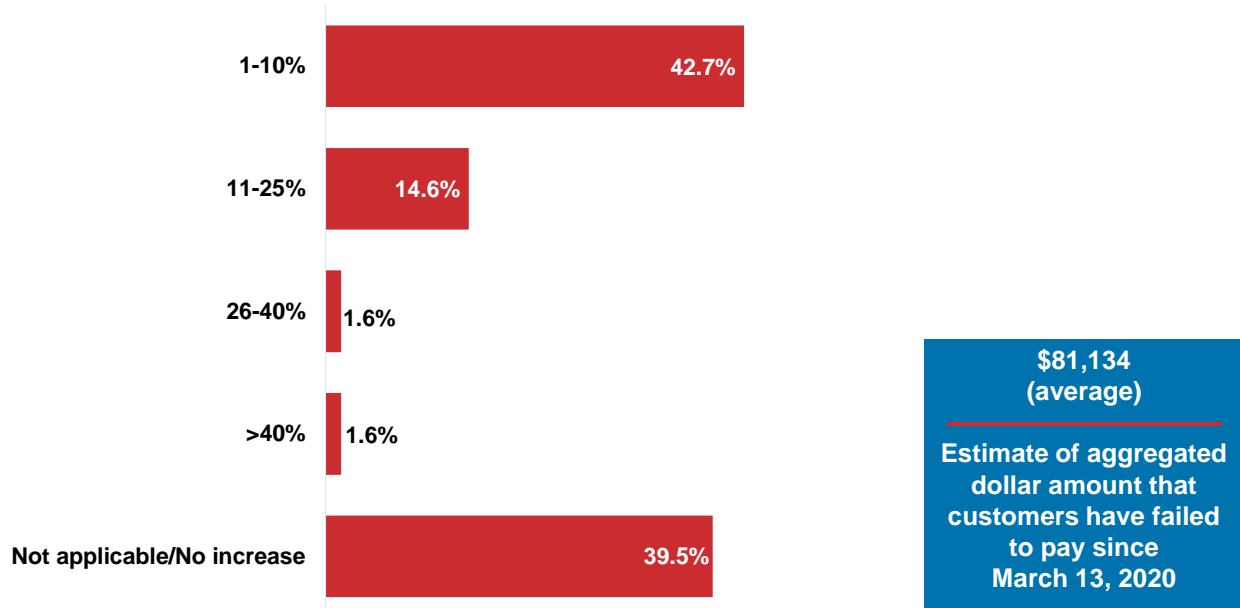| Challenge	Percentage
Competing with other providers	85.7%
Cost of necessary equipment	71.4%
Regulatory uncertainty	57.1%
Cost of obtaining licensed spectrum	42.9%
Current regulatory rules	42.9%
Obtaining financing	28.6%
Other	28.6%
Obtaining necessary approvals	14.3%
Equipment fulfillment delays	14.3%
Low customer demand	0.0%

Source: 2020 NTCA–Broadband/Internet Availability Survey

■ For those respondents who offer a mobile broadband data service, the primary challenge cited is competing with other providers. The proportion naming this challenge is 85.7%, down from 90.9% saying the same in 2019. The cost of necessary equipment is in second place, at 71.4%, but has dropped from 100% who named this as a primary challenge last year.

■ More than half name regulatory uncertainty (57.1%), although the proportion naming this challenge has also declined from 2019 (when it was 63.6%). More than four in 10 are challenged by current regulatory rules and the cost of obtaining licensed spectrum (42.9% each). (Respondents were permitted to select all challenges that applied to their operations.)

■ Companies that offer a mobile broadband data service are challenged less often by equipment fulfillment delays or obtaining necessary approvals (14.3% each).

■ It is worth repeating that the number of respondents offering mobile wireless service in the survey is very small, so caution should be exercised when interpreting the percentages stated above.

Percent Increase in Customers Failing to Pay Voice or Broadband Bills Due to COVID

$81,134 (average)

Estimate of aggregated dollar amount that customers have failed to pay since March 13, 2020

Source: 2020 NTCA–Broadband/Internet Availability Survey

- More than four in 10 respondents (42.7%) report that their company is observing a 1 to 10% increase in the percentage of their customer accounts who are failing to pay voice or broadband bills (in part or full), beginning with March 13, 2020, as a starting point. At the same time, however, 39.5% say they have not seen an increase, or that this is not applicable to their situation.

- Nearly one in six (14.6%) say their company has experienced an increase of 11 to 25% in the number of customer accounts who are failing to pay these bills.

- Responding companies estimate the aggregated average dollar amount that customers have failed to pay for voice and broadband service since March 13, 2020, is $81,134.

Internet Backbone/Middle Mile

	2019 Mean	2020 Mean
Number of miles from primary internet backbone connection	111	95
Number of middle mile transport providers available	3	2

Source: 2020 NTCA–Broadband/Internet Availability Survey

- On average, respondents report being 95 miles from their primary internet backbone connection in 2020, a decrease from 111 miles reported in 2019. They can choose to take service from an average of two middle mile transport providers, which is down from 3 reported in both 2019 and 2018.
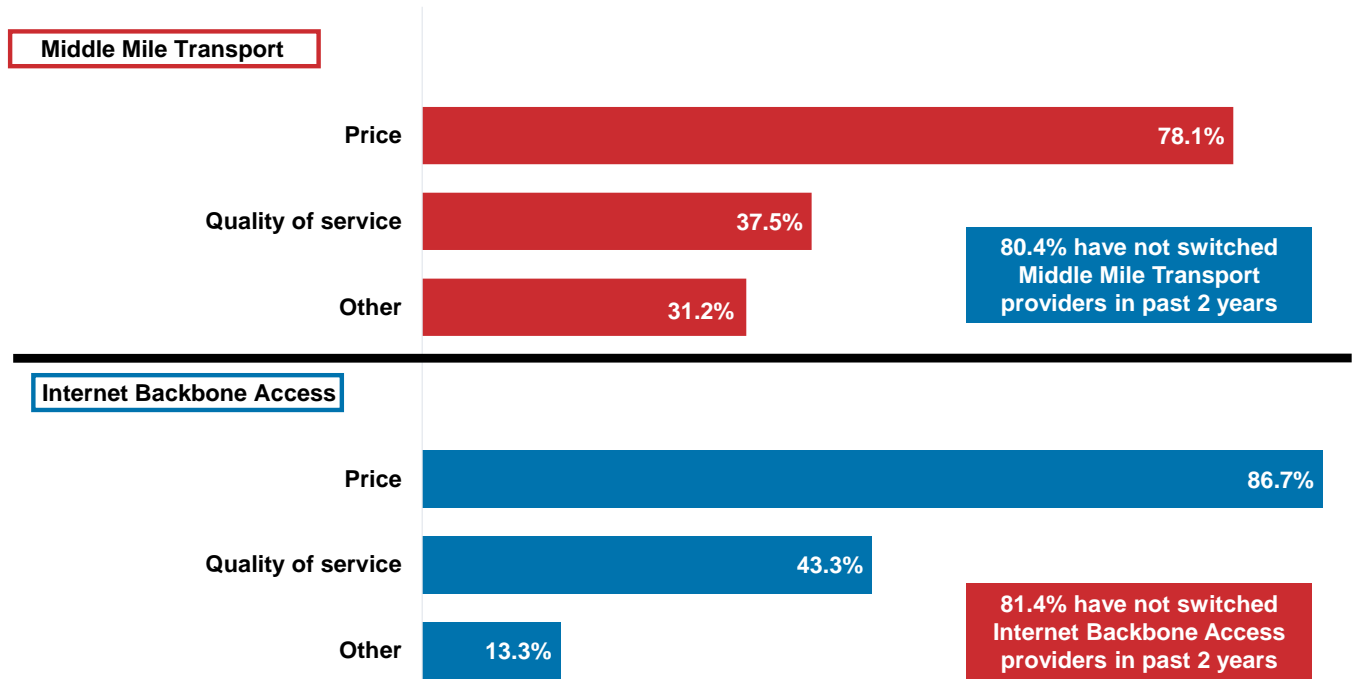
Middle Mile Bandwidth

	2019 Mean	2020 Mean
Middle mile bandwidth (in GB) currently subscribe to	25 GB	38 GB
Number of years expect this capacity to remain sufficient	2 Years	1.8 Years

Source: 2020 NTCA–Broadband/Internet Availability Survey

- Respondents subscribe to an average of 38 GB of guaranteed middle mile bandwidth in 2020 (compared to 25 GB in 2019) and pay an average of $1,145 per gigabyte (compared to $2,129 in 2019). They expect this capacity to remain sufficient for a mean duration of 1.8 years.

Reasons for Switching Providers

Middle Mile Transport

Reason	Percentage
Price	78.1%
Quality of service	37.5%
Other	31.2%

80.4% have not switched Middle Mile Transport providers in past 2 years

Internet Backbone Access

Reason	Percentage
Price	86.7%
Quality of service	43.3%
Other	13.3%

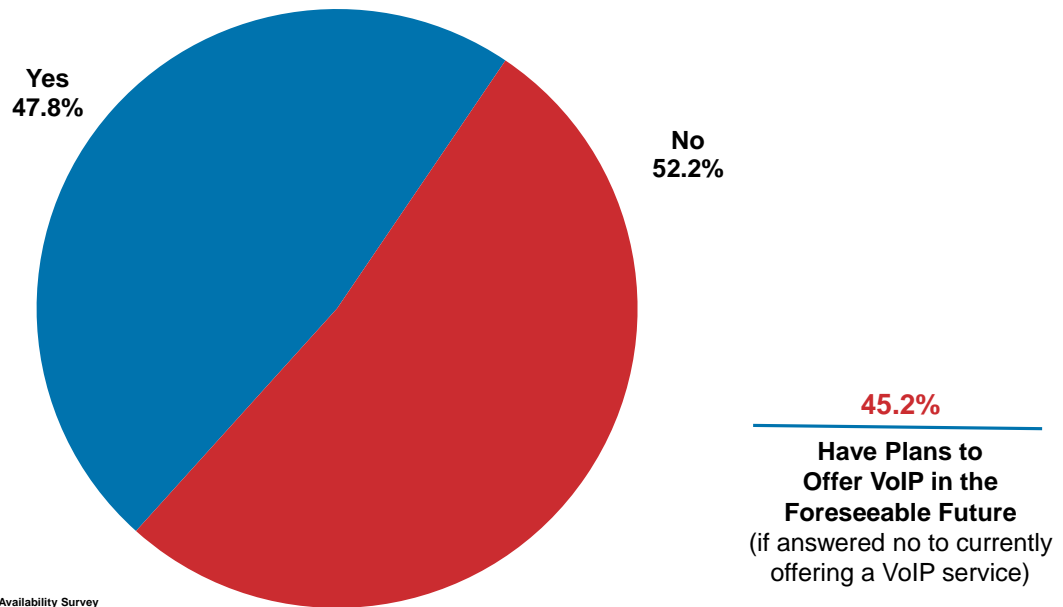**81.4% have not switched Internet Backbone Access providers in past 2 years**

Source: 2020 NTCA–Broadband/Internet Availability Survey

- More than eight in 10 companies report that they have not switched middle mile transport providers (80.4%) or internet backbone access providers (81.4%) in the past two years.

- For those who have switched in the past two years, 78.1% named price as the reason for switching middle mile transport providers, which is the highest percentage compared in recent history. Price was also the main reason for switching internet backbone access providers, with 86.7% citing this reason. This is higher than the percentage reporting this reason in 2019 (79.3%) or 2018 (85.2%), but just under the proportion reported in 2016 (87.5%).

- The percentage switching middle mile transport providers for quality of service is 37.5%, a recent high (31.0% in 2019, 24.0% in 2018, and 29.6% in 2016). Similarly, the proportion switching internet backbone providers for quality of service (43.3%) is also higher than recently observed, exceeding the previous high of 41.4% observed in 2019.

- On a scale of 1 to 6, where "1" is extremely satisfied and "6" is very dissatisfied, 73.0% give their primary middle mile transport provider a rating of "1" (40.7%) or "2" (32.3%). Just 12.0% rate their primary middle mile transport provider with a "5" (7.8%) or "6" (4.2%).

- When it comes to their primary Internet backbone access provider,72.6% provide a rating on the same scale of "1" (37.5%) or "2" (35.1%). Just 11.3% assign a rating of a "5" (7.7%) or "6" (3.6%) to their primary Internet backbone access provider.

Offer a VoIP Service

Yes
47.8%

No
52.2%

45.2%

**Have Plans to
Offer VoIP in the
Foreseeable Future**
(if answered no to currently
offering a VoIP service)

Source: 2020 NTCA–Broadband/Internet Availability Survey

- Nearly half (47.8%) of companies indicate that they currently offer a VoIP service in 2020, up from 32.3% saying so in 2019. Among those not offering VoIP in the current year, 45.2% indicated they have plans to offer it in the foreseeable future.

Video Service(s)

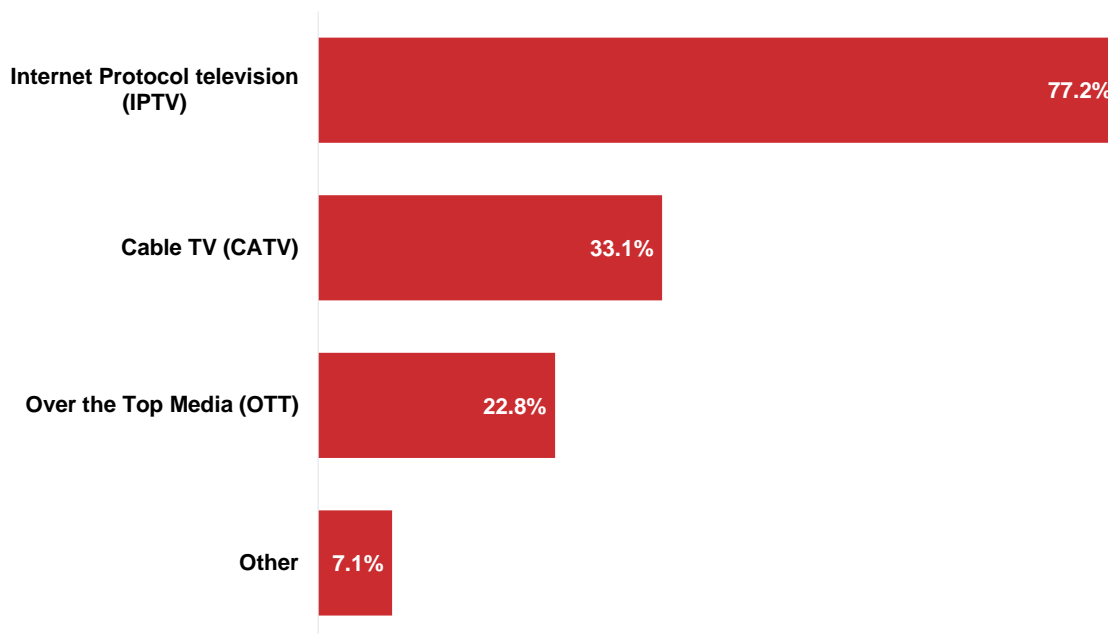|	Mean
Number of customers that currently subscribe to video service(s)	2,605
Number of homes passed or otherwise capable of connecting with video service(s)	9,525

Source: 2020 NTCA–Broadband/Internet Availability Survey

- Responding companies in 2020 report that an average of 2,605 customers currently subscribe to their video service(s), while an average of 9,525 homes are passed or otherwise capable of connecting with video service(s).

Types of Video Services Offered*
(*Percentages based on respondents currently offering video service)

Internet Protocol television (IPTV) — 77.2%
Cable TV (CATV) — 33.1%
Over the Top Media (OTT) — 22.8%
Other — 7.1%

Source: 2020 NTCA–Broadband/Internet Availability Survey

- Respondents who currently offer video service to their customers most frequently offer internet protocol television (IPTV), with 77.2% indicating so.

- Additionally, cable TV (CATV) is offered by 33.1% of respondents who offer video service, while 22.8% report offering over the top media (OTT). Respondents were asked to select all of the types of video services that they offer. Some respondents report offering multiple types of video services, resulting in the combined percentage of all types of video services offered exceeding 100%. Slightly more than three in 10 respondents (31.4%) do not offer video service to their customers.

- Almost eight in 10 respondents (79.5%) who currently offer CATV or IPTV service indicate that it is likely they will continue to do so for the foreseeable future, with 47.5% saying this is very likely and 32.0% saying it is somewhat likely. While 11.5% say it is not very likely, just 6.6% already have plans to discontinue.

- Respondents were asked to provide a percentage of their service area households that cannot receive over-the-air broadcast signals. More than three in 10 (31.4%) indicate that this percentage is less than 10%, 7.6% say it is 11 to 25%, 11.9% say it is 26 to 50%, 10.2% say it is 51 to 75%, and 12.7% indicate that more than 75% of service area households cannot receive over-the-air broadcast signals. Just over one-quarter (26.3%) say this percentage is unknown.

- More than two-thirds (67.2%) do not offer legacy coax (CATV) service, while 18.9% do offer this service (but only digitally), 11.5% offer both analog and digital and just 2.5% offer only analog.

Retransmission Consent Fees

Percentage of total operating expenditures go toward retransmission consent fees: 31.4% (mean)
In total dollars, amount retransmission consent fees increased in most recent consent agreement: $55,452 (mean)

Was total retransmission fee increase passed on to video subscribers:

2020	Yes 78.5%	No 10.3%	Phasing in an Increase 11.2%
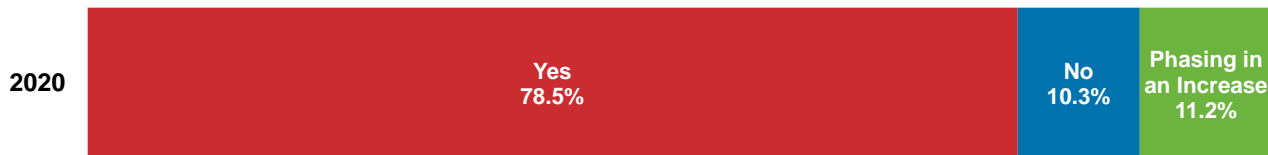
Percentage of total operating expenditures go toward retransmission consent fees: 34.8% (mean)
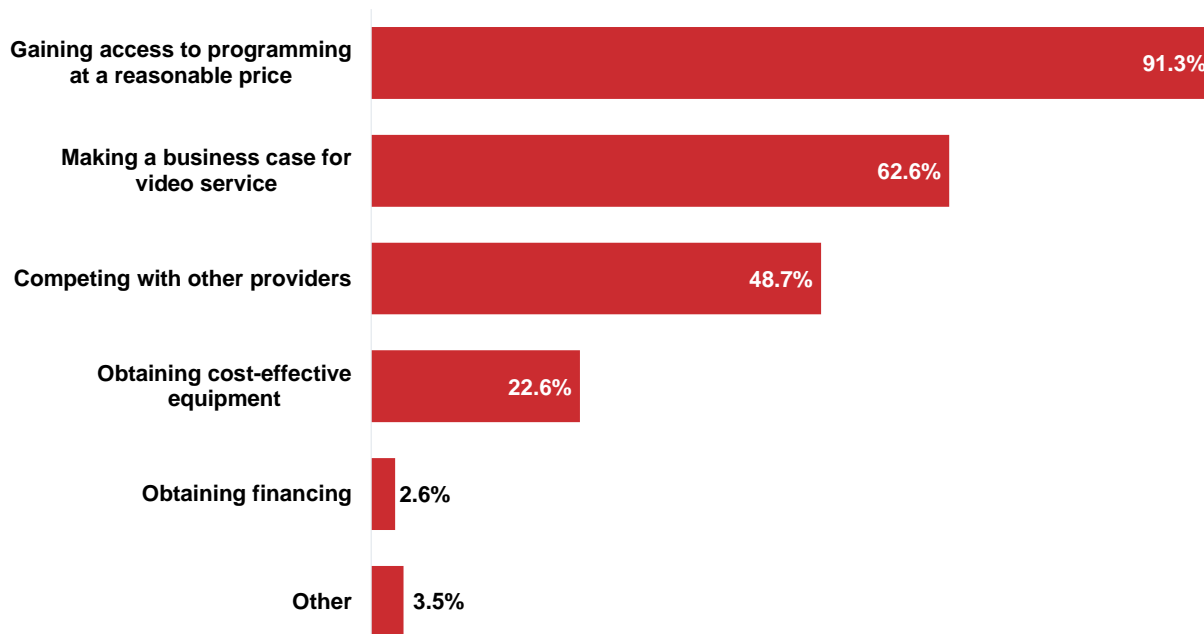**In total dollars, amount retransmission consent fees increased in most recent consent agreement: $53,969 (mean)**

Was total retransmission fee increase passed on to video subscribers:

2019	Yes 76.5%	No 10.1%	Phasing in an Increase 13.4%

Source: 2020 NTCA–Broadband/Internet Availability Survey

- More than three-quarters (78.5%) of responding companies report that they passed the increase in retransmission consent fees on to their subscribers, up from 76.5% in 2019 and 68.5% in 2018. Just 11.2% are phasing in an increase, compared with 13.4% who said so in 2019 and 16.5% in 2018.
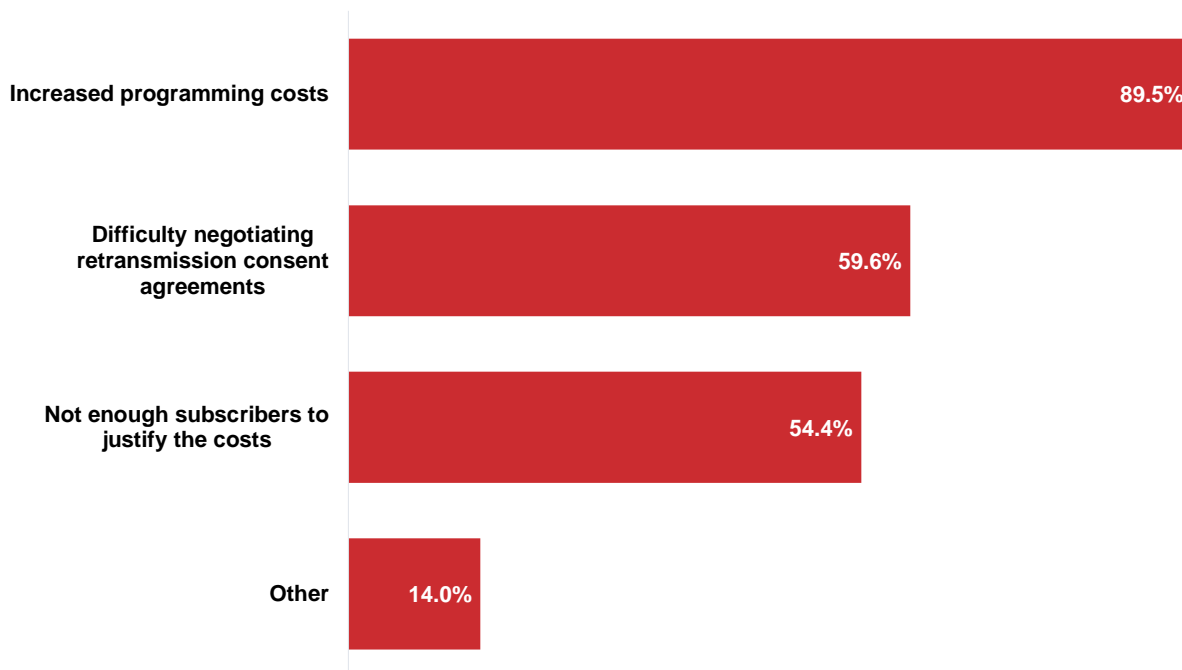
Barriers to Providing Video Service

Gaining access to programming at a reasonable price — 91.3%

Making a business case for video service — 62.6%

Competing with other providers — 48.7%

Obtaining cost-effective equipment — 22.6%

Obtaining financing — 2.6%

Other — 3.5%

Source: 2020 NTCA–Broadband/Internet Availability Survey

- Companies' largest barrier to providing video service is gaining access to programming at a reasonable price (91.3%). While this has increased from 2019 (85.2%), it is lower than in years prior (96.2% in 2018, and 97.6% in 2016).

- More than six in 10 (62.6%) indicate that making a business case for video service is a barrier. This is a decline from the last two surveys (70.4% in 2019 and 65.4% in 2018), but slightly higher than the 61.4% who said the same in 2016. Less than half (48.7%) cite competing with other providers as a barrier, the lowest that has been observed in recent survey waves. Just over one-fifth (22.6%) report obtaining cost-effective equipment as a barrier to providing video service this year, declining from 33.1% in 2019.

Reasons for Discontinuing CATV or IPTV Services

Reason	Percentage
Increased programming costs	89.5%
Difficulty negotiating retransmission consent agreements	59.6%
Not enough subscribers to justify the costs	54.4%
Other	14.0%

Source: 2020 NTCA–Broadband/Internet Availability Survey

- The primary reason for discontinuing video service is increased programming costs (89.5%), although more than half also cite difficulty negotiating retransmission consent agreements (59.6%) and not having enough subscribers to justify the costs (54.4%).

- **NTCA members continue to expand their fiber-to-the-home deployments.** The average proportion of customers served by fiber-to-the-home connections in 2016 was 41.3% and in 2020 this percentage has reached 69.9%, a gain of 28.6 percentage points. Consequently, more than eight in 10 customers, on average, now have access to 25 Mbps or higher downstream broadband speed. Particularly notable is that just under half (45.1%) of customers have access to 1 Gig or higher downstream broadband speed in 2020, a proportion which has nearly doubled in just two years (23.4% in 2018). The higher speed take rate also continues to increase. In 2020, 63.9% of respondents' customers subscribe to a broadband downstream speed of 25 Mbps or higher, a gain of nearly 14 percentage points in just one year alone.

- **Despite this progress, NTCA members continue to face challenges to advance and sustain broadband in rural America.** These challenges include moving those customers remaining on copper loops to fiber installations and the cost of increasing speed availability. More than one in five customers, on average, continue to be served by copper loops, and a proportion nearly as large (19.7%) still only have access to downstream speeds below 25 Mbps. The average cost to increase speed remains a significant factor. Although this has dropped in the past year, the cost of bringing customers receiving less than 3 Mbps upload speeds up to that level is currently estimated to be $20.5 million on average.

- **NTCA members provide critically important broadband service to anchor institutions in their communities.** Respondents provide robust levels of fixed broadband service to all of the public libraries, community colleges, state universities and extensions, 911 call centers, and hospitals/medical clinics located within their communities, and nearly all primary/secondary schools and public safety entities (police, fire department, etc.). These are critical lifelines for residents of their community and benefit the overall health and well-being of residents. Additionally, the average maximum speed of broadband available to anchor institutions in respondents' service area has increased from 1,350 Mbps in 2019 to 1,428 Mbps in 2020.

- **Bundling of services outperforms price promotions as the most adopted marketing strategy, while the provision of customer premises equipment has been successfully employed by many.** Nearly eight in 10 respondents (77.1%) have used bundling of services and 68.7% have used price promotions to attract new subscribers. The strategy of offering free customer premises equipment (CPE) installation has been nearly as popular this year, with 65.1% employing this tactic. Still more than eight in 10 (81.6%) indicate that their competition has used price promotions that they have found to be the most difficult marketing strategy to match, and 45.6% say the same about bundling of services. Free hardware and free CPE installation were tactics that approximately one-fifth of respondents found difficult to match as well.

- **NTCA members report concerns related to the pandemic.** COVID-19 appears to have had some impact on respondents, with more than four in 10 (42.7%) reporting that their company has observed an increase of 1 to 10% of their customer accounts who are failing to pay voice or broadband bills (in part or full) since March 13, 2020, and nearly one in six (14.6%) report an increase of 11 to 25% in the number of customers failing to pay their bills. Moreover, NTCA members report that supply chain concerns have risen dramatically, with 27.7% of respondents voicing concerns about fiber order fulfillment delays, up from 9.3% of respondents who said the same in 2019.