Broadband/Internet Availability Survey Report

NTCA–THE RURAL BROADBAND ASSOCIATION

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INTRODUCTION

NTCA–The Rural Broadband Association (NTCA) is a national association representing approximately 850 rural community-based providers that operate networks offering broadband and voice services in 44 states. To gauge the deployment of such networks and offering of advanced services by its member companies, NTCA has conducted its Broadband/Internet Availability Survey for two decades.

Respondents to this year's survey report an average of 4,287 residential and 648 business fixed broadband connections in service. There is also a reported average of 7,532 serviceable locations within the respondents' incumbent local exchange carrier (ILEC) service areas, and members report an average of 80% of customers in their areas subscribe to a broadband service of some speed.

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 members' historical incumbent and competitive service areas, broadband availability and subscription rates, anchor institutions,[2] fiber deployment and supply chain considerations, competition, internet backbone and middle mile connections, and video service. New this year, the survey asked about participation in the Affordable Connectivity Program (ACP) including the number of customers who have signed up for this discounted service, and the number of video subscribers to Cable TV (CATV) and Internet Protocol television (IPTV).

In August 2022, 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; 233 holding company members (38.3%) responded. It is important to note that not all respondents answered every question in the survey.

The average ILEC service area identified by respondents is approximately 2,080 square miles. Nearly half (49.1%) report having a service area of less than 500 square miles, while just over one-quarter (27.8%) have a service area between 500 and 1,999 square miles, and less than one-quarter (23.1%) have a service area of 2,000 square miles or larger.

[1] Copies of this and previous NTCA survey reports from recent years 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."

[3] Association Research, Inc., an independent survey research organization located in Ijamsville, 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.

Respondents indicated that they use a variety of platforms within their respective ILEC service areas to provide fixed broadband service to their customers.[4] On average, more than three-quarters (79.3%) of serviceable locations are served by fiber to the home (FTTH) in 2022; an increase of 4.3 percentage points from the 2021 survey. An average of 13.8% of locations continue to be served via copper loops. Fiber to the node (FTTN) is used to serve an average of 4.1% of serviceable locations, cable modems 1.8%, unlicensed fixed wireless 0.5% and licensed fixed wireless 0.4%.

With respect to *downstream service availability*, on average, respondents reported that the following percentages of their customer base can receive maximum speeds of:

- Greater than/equal to 1 Gig: 60.9%
- Greater than/equal to 100 Mbps but less than 1 Gig: 21.0%
- Greater than/equal to 25 Mbps but less than 100 Mbps: 9.3%
- Greater than/equal to 10 Mbps but less than 25 Mbps: 6.4%
- Less than 10 Mbps: 2.4%

More than nine in 10 (91.2%) of respondents' customers in 2022 could receive a maximum downstream speed greater than or equal to 25Mbps, higher than the 86.2% in NTCA's 2021 Broadband Survey Report. Also of note this year as compared to 2021 and 2020, there were particularly large gains for those able to obtain maximum downstream service that is greater than or equal to 1 Gig (60.9% vs 55.4% in 2021 and 45.1% in 2020).

With respect to *upstream service availability*, respondents indicated the following percentages of their customer base *can receive,* on average, maximum speeds of:

- Greater than/equal to 1 Gig: 56.8%
- Greater than/equal to 100 Mbps but less than 1 Gig: 20.7%
- Greater than/equal to 20 Mbps but less than 100 Mbps: 6.6%
- Greater than/equal to 10 Mbps but less than 20 Mbps: 4.3%
- Greater than/equal to 3 Mbps but less than 10 Mbps: 4.9%
- Less than 3 Mbps: 6.7%

In 2022, an average of 84.1% of respondents' customers can receive maximum upstream speeds of greater than or equal to 20 Mbps, while an average of 77.5% of respondents' customer base are able to receive maximum upstream speeds of greater than or equal to 100 Mbps.

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

In assessing what services customers are purchasing, respondents' customers, on average, *subscribe to* the following maximum speeds:

- 12.2% subscribe to speeds greater than/equal to 1 Gig.
- 36.7% subscribe to greater than/equal to 100 Mbps but less than 1 Gig.
- 31.1% subscribe to greater than/equal to 25 Mbps but less than 100 Mbps.
- 13.1% subscribe to greater than/equal to 10 Mbps but less than 25 Mbps.
- 7.0% subscribe to less than 10 Mbps.

The percentage of customers subscribing to speeds greater than or equal to 25 Mbps (80%) has increased steadily in the past five years—in 2021, this percentage was approximately 72%, in 2020, it was approximately 64% and in 2019 the proportion was 50%, which was up from just under 40% in 2018. Additionally, the percentage of customers subscribing to higher levels of broadband speed increased in 2022 when compared to 2021, from 28.3% to 36.7% for speed greater than/equal to 100 Mbps but less than 1 Gig, and from 9.0% to 12.2% for speed greater than/equal to 1 Gig.

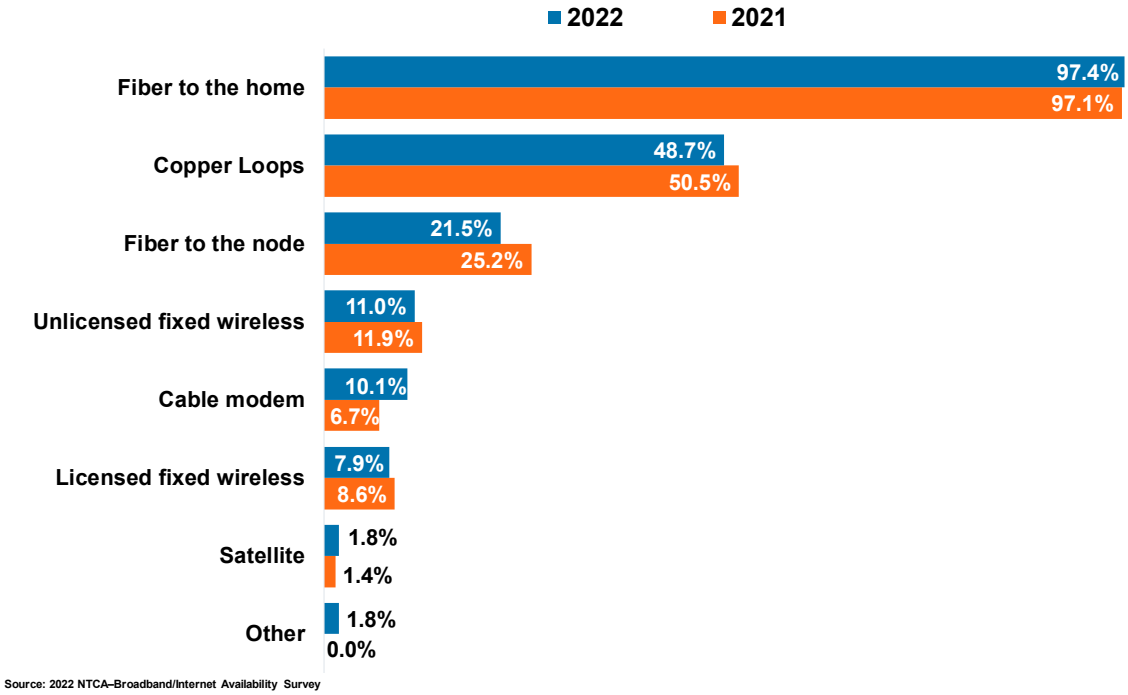
Voice Grade Access Lines, Interconnected VoIP Lines and Fixed Broadband Connections

Fixed Voice and Broadband	Residential		Business	
	2021 Mean	2022 Mean	2021 Mean	2022 Mean
Number of voice grade access lines	2,890	2,661	1,040	840
Number of interconnected VoIP lines	1,450	1,152	437	538
Number of fixed broadband connections	4,467	4,287	469	648

Source: 2022 NTCA–Broadband/Internet Availability Survey

- Respondents report having an average of 2,661 residential local exchange voice grade access lines in service in 2022, a decrease from 2021 (2,890). The average number of business local exchange voice grade access lines in service also decreased in 2022 to 840 from 1,040 in 2021. (The variations in these figures and others in the table above from 2021 to 2022 appear to represent a different mix of respondents from year to year rather than general reductions in subscribing customers.)
- The average respondent also reports having 1,152 residential interconnected VoIP lines, a decrease from the 1,450 reported in 2021, and 538 business interconnected VoIP lines in service, which is higher than the 437 reported in 2021.
- On average, respondents indicate having 4,287 residential fixed broadband connections in service in 2022, a decrease from 2021 (4,467). The average number of business fixed broadband connections in service is 648, up from 2021 (469).
- Respondents report having an average of 7,532 serviceable locations within the respondents' ILEC service areas with 80.4% (average) of customers subscribing to broadband at any speed.
- The average ILEC service area is approximately 2,080 square miles. Nearly half (49.1%) report having a service area of less than 500 square miles. More than one-quarter (27.8%) have a service area between 500 and 1,999 square miles, and slightly less than one-quarter (23.1%) have a service area of 2,000 square miles or larger.
- Just under half (49.1%) of the 2022 survey respondents receive support from the FCC's Universal Service Fund (USF) through cost-based (i.e., CAF-BLS and/or HCLS) mechanisms, while 21.4% receive ACAM 1 support, 31.7% receive USF support through ACAM 2, and 1.3% receive support via the Alaska Plan. (The amounts sum to greater than 100% due to some respondents receiving different kinds of support in different states.)
- The vast majority of respondents (91.5%) indicate that they have IP switching facilities for voice traffic in their networks. Just over one-half of respondents (53.4%) still use TDM switching facilities for voice traffic within some portion of their ILEC networks.

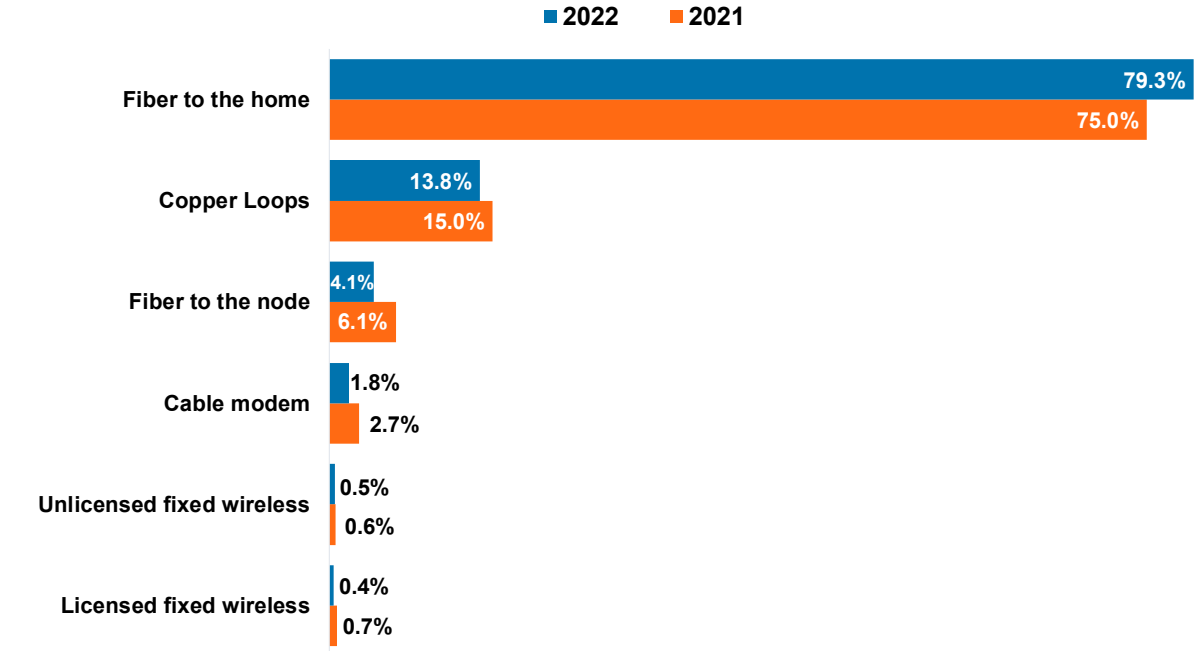
Network Platforms Used to Provide Fixed Broadband Service



Source: 2022 NTCA–Broadband/Internet Availability Survey

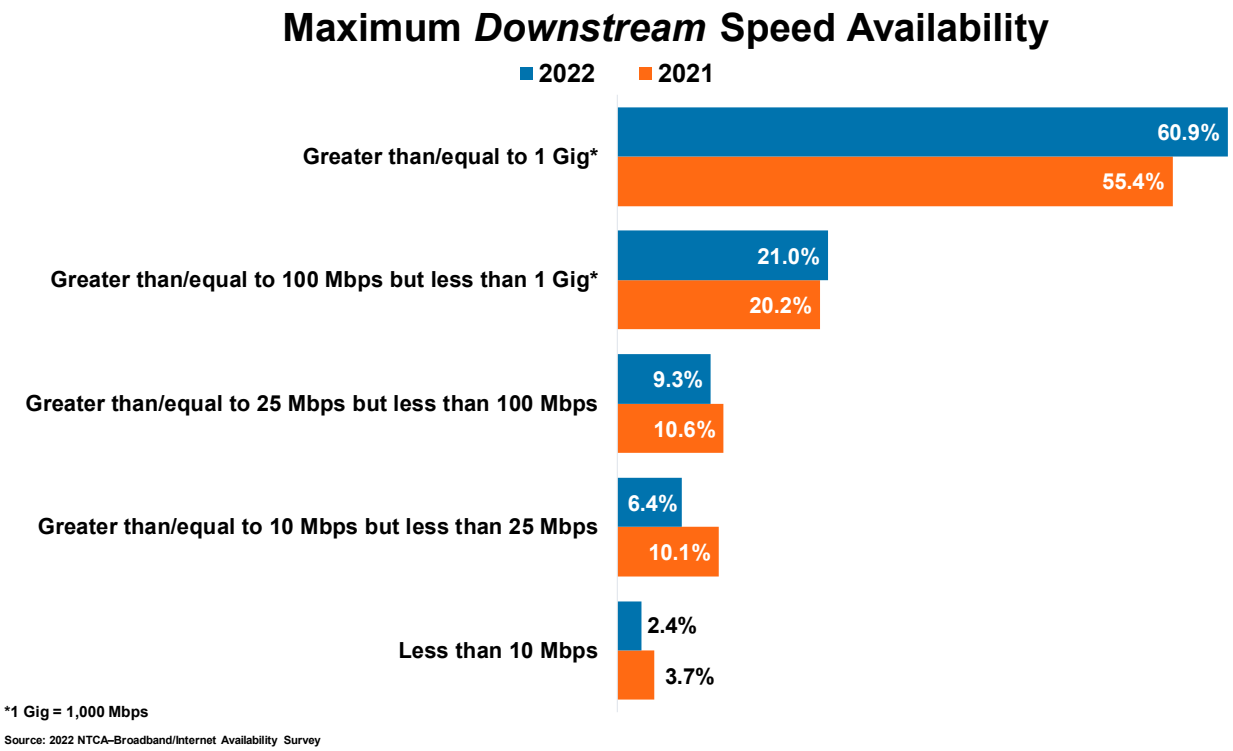
- Most respondents (97.4%) in 2022 report using fiber to the home to provide fixed broadband service to some portion of their service area, nearly the same as reported in 2021 (97.1%) and 2020 (97.5%). Less than half (48.7%) use copper loops for some customers in their service area, a percentage that has dropped steadily over the last three years (50.5% in 2021, 58.1% in 2020 and 63.6% in 2019).
- About one-fifth (21.5%) use fiber to the node, lower than the proportions reported in 2021 (25.2%), 2020 (33.5%) and 2019 (33.2%).
- The platforms that respondents use least often to provide fixed broadband service are licensed fixed wireless (7.9%) and satellite (1.8%).
- Percentages add up to more than 100% due to the presence and use of multiple technology platforms in individual respondents' networks.

Average Percentage of Serviceable Locations for Network Platforms



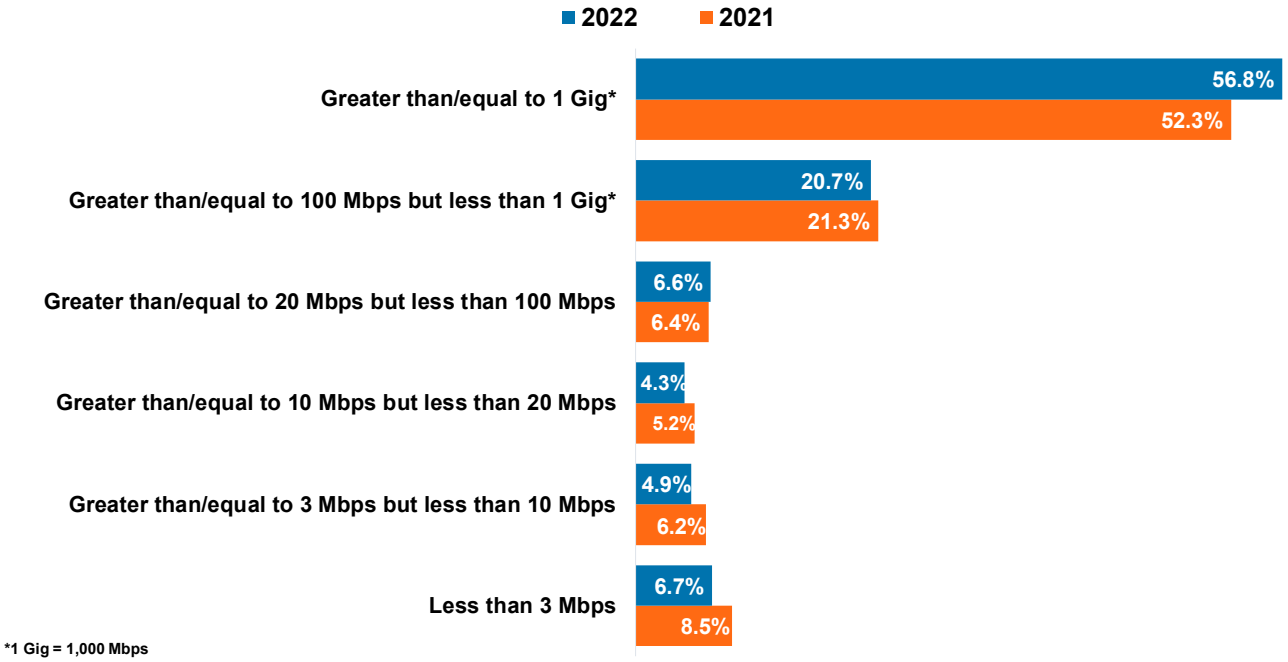
Source: 2022 NTCA–Broadband/Internet Availability Survey

- Respondents indicate that an average of 79.3% of their serviceable locations are served by fiber to the home, higher than in 2021 (75.0%). The average proportion connected by copper loops is 13.8%, down slightly from 15.0% in 2020. The average served by fiber to the node is 4.1%, also lower than in 2021 (6.1%).
- The average percentage of respondents' serviceable locations served by cable modem (1.8%), unlicensed fixed wireless (0.5%) and licensed fixed wireless (0.4%) continues to be very small.



- The survey results indicate increases in the availability of higher speed services, with respondents reporting that slightly more than eight in 10 (81.9%) of their customers are able to receive maximum *downstream* speed greater than or equal to 100 Mbps. The biggest increase again this year comes in the Gigabit tier, where respondents report that an average of 60.9% of their customer base can *receive* a maximum *downstream* speed for fixed broadband greater than or equal to 1 Gig, up from 55.4% in 2021, 45.1% reported in 2020, and 25.3% in 2019.
- In contrast, the proportion of customers identified as being able to receive slower maximum *downstream* speeds has declined. The average proportion who can receive a maximum *downstream* speed greater than or equal to 25 Mbps but less than 100 Mbps is 9.3%, lower than reported in 2021 (10.6%). Respondents also report that 6.4% of their customer base can receive a maximum *downstream* speed greater than or equal to 10 Mbps but less than 25 Mbps, and 2.4% can receive a maximum *downstream* speed of less than 10 Mbps. These averages are both lower than reported in 2021 (10.1% and 3.7%, respectively).

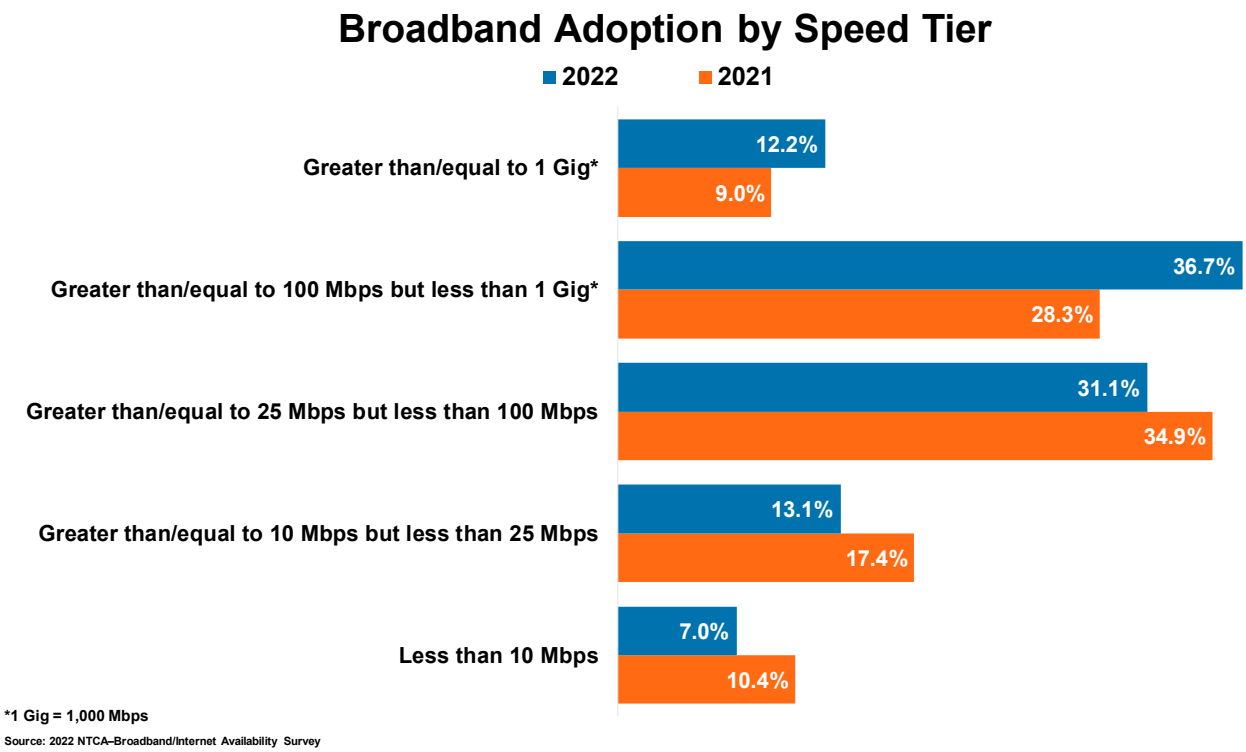
Maximum *Upstream* Speed Availability



*1 Gig = 1,000 Mbps

Source: 2022 NTCA–Broadband/Internet Availability Survey

- On average, more than half (56.8%) of respondents' customers can receive a maximum *upstream* speed of greater than or equal to 1 Gig, while another average of 20.7% can receive a maximum *upstream* speed that is greater than or equal to 100 Mbps but less than 1 Gig.
- Respondents report that an average of 93.3% of their customers can receive a maximum *upstream* speed of 3 Mbps or greater for fixed broadband service, higher than reported in 2021 (91.4%).
- More than three-quarters (77.5%) of respondents' ILEC customers can receive a maximum upstream speed of 100 Mbps or higher, while in 2021 the average was 73.6% of customers.



*1 Gig = 1,000 Mbps

Source: 2022 NTCA–Broadband/Internet Availability Survey

- The survey reflects that consumers continue to migrate steadily to higher speeds as those speeds become available. The percentage of respondents' customer base in 2022 that *subscribes* to a maximum speed for fixed broadband of greater than or equal to 1 Gig is 12.2%, higher than the 9.0% reported in 2021 and the 7.9% reported in 2020. Moreover, just over one-third (36.7%) of the average customer base subscribes to a speed greater than or equal to 100 Mbps but less than 1 Gig, up from an average of 28.3% in 2021 and 20.2% in 2020. For the first time, the percentage of customers subscribing to service between 100 Mbps and less than 1 Gig is the most popular tier (at 36.7%), surpassing the 25 Mbps to less than 100 Mbps tier (at 31.1%).
- The proportion subscribing to speeds that do not exceed 25 Mbps is just 20.1%, compared with 27.8% in 2021, 36.1% in 2020 and 50.0% in 2019. More specifically, survey respondents indicate that an average of 13.1% of their customer base subscribes to a maximum speed of greater than or equal to 10 Mbps but less than 25 Mbps, and 7.0% subscribes to a speed less than 10 Mbps.

Estimated Total Costs of Bringing Customers Up to Certain Speeds
(Upstream and Downstream)

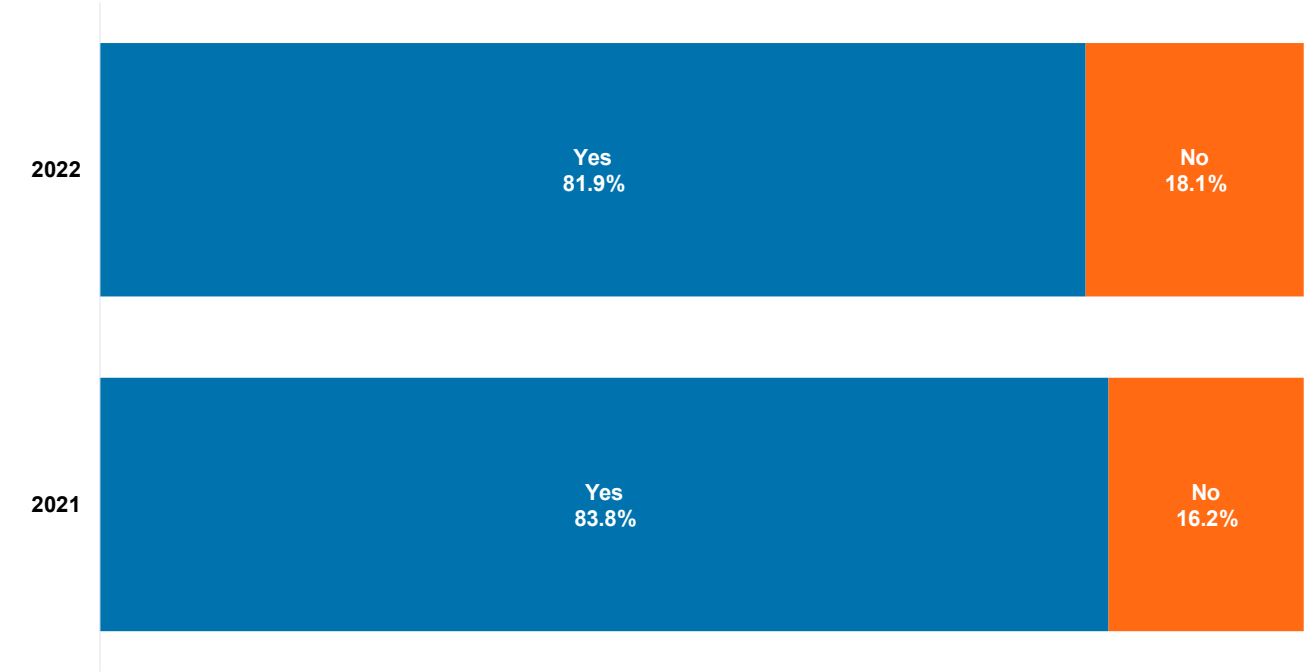
Downstream Speed	Estimated Total Costs 2022 Mean
25 Mbps	$19,162,039
100 Mbps	$30,026,183
1 Gig	$26,808,378

Upstream Speed	Estimated Total Costs 2022 Mean
3 Mbps	$12,059,635
20 Mbps	$20,557,170
100 Mbps	$37,064,835
1 Gig	$21,339,219

Source: 2022 NTCA–Broadband/Internet Availability Survey

- Respondents estimate that it would cost an average of $26.8 million to bring all ILEC customers who are not already at 1 Gig of fixed broadband service (*downstream*) up to that speed. The average cost to bring all customers up to the 100 Mbps (*downstream*) level of service is estimated to be $30.0 million, while the average estimated cost to bring all customers up to the 25 Mbps (*downstream*) level of service is $19.2 million.
- The average estimated cost of bringing customers not at the level of 3 Mbps *upstream* up to this level is about $12.1 million, down from $16.4 million reported in 2021 as well as the average costs in 2020 ($14.2 million), 2019 ($21.1 million) and 2018 ($21.6 million). The estimated cost of bringing all customers up to 100 Mbps *upstream* who are not already at that speed is an average of $37.1 million.
- To bring all customers up to 1 Gig *upstream* who are not already at that speed is estimated to cost an average of $21.3 million, and the average cost to bring customers up to 20 Mbps upstream is $20.6 million.

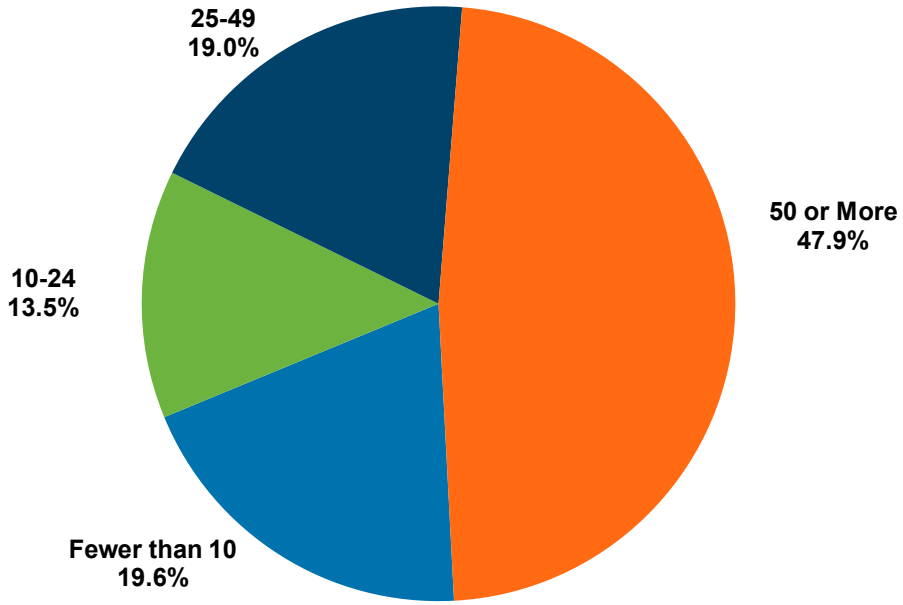
Offer Standalone Broadband



Source: 2022 NTCA–Broadband/Internet Availability Survey

- More than eight in 10 respondents (81.9%) report that they offer "standalone broadband," virtually unchanged from 2021 reports. Of those respondents offering standalone broadband, an average of 41.5% of their ILEC subscribers currently take this service, an increase from the 37.0% reported in 2021. 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).

Number of Customers Who Signed Up for the Affordable Connectivity Program if Offered



Source: 2022 NTCA–Broadband/Internet Availability Survey

- More than three-quarters (77.8%) of all respondents report that they offer the Affordable Connectivity Program (ACP) to their customers. Of those respondents offering the ACP, less than half (47.9%) had 50 or more customers sign up for the discount, while one-fifth (19.6%) had fewer than 10 customers sign up and 19.0% of respondents had 25–49 customers do the same.

Anchor Institution Connection via Fiber

Anchor Institution	% Connected to Network via Fiber	
	2021 Mean	2022 Mean
Primary/secondary schools	83.7%	91.3%
Public safety entities (police, fire, etc.)	74.4%	87.3%
Public libraries	77.1%	84.8%
Hospitals/medical clinics	71.5%	83.4%
911 Call Centers	46.1%	49.9%
Community colleges	27.4%	28.2%
State universities and extensions	25.2%	19.8%

Source: 2022 NTCA–Broadband/Internet Availability Survey

- In 2022, more than nine in 10 (91.3%) primary/secondary schools are connected to respondents' networks via fiber, up from 83.7% in 2021.
- Nearly nine in 10 (87.3%) public safety entities (police, fire, etc.) are connected to respondents' networks via fiber, an increase from 74.4% in 2021.
- The proportion of public libraries that respondents identified as being connected via fiber has steadily increased to 84.8% in 2022 from an average of 77.1% in 2021, 68.9% in 2020 and 72.9% in 2019.
- The proportion of most of the other anchor institutions connected to respondents' networks via fiber has also increased. Specifically, in 2022 an average of 83.4% of hospitals/medical clinics are connected to respondents' networks via fiber (71.5% in 2021), 49.9% of 911 call centers (46.1% in 2021), and 28.2% of community colleges (27.4% in 2021). The exception is the proportion of state universities and extensions where 19.8% are connected to respondents' networks via fiber in 2022 compared to 25.2% in 2021.

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

Anchor Institution	Number in Service Area	Number Served
	2022 Mean	2022 Mean
Primary/secondary schools	7	7
Public libraries	3	3
Public safety entities (police, fire, etc.)	9	8
Hospitals/medical clinics	7	6
911 Call Centers	2	2
Community colleges	1	1
State universities and extensions	2	2

Source: 2022 NTCA–Broadband/Internet Availability Survey

- Respondents report that the average number of anchor institutions in the area they serve with fixed broadband includes nine public safety entities, seven primary/secondary schools, seven hospitals/medical clinics, three public libraries, two 911 call centers, two state universities and extensions and one community college. On average, respondents serve all of the anchor institutions located in their service areas with fixed broadband except for public safety entities where an average of eight of the nine entities are served, and six of the seven hospitals/medical clinics are served.

Anchor Institution Average Speed

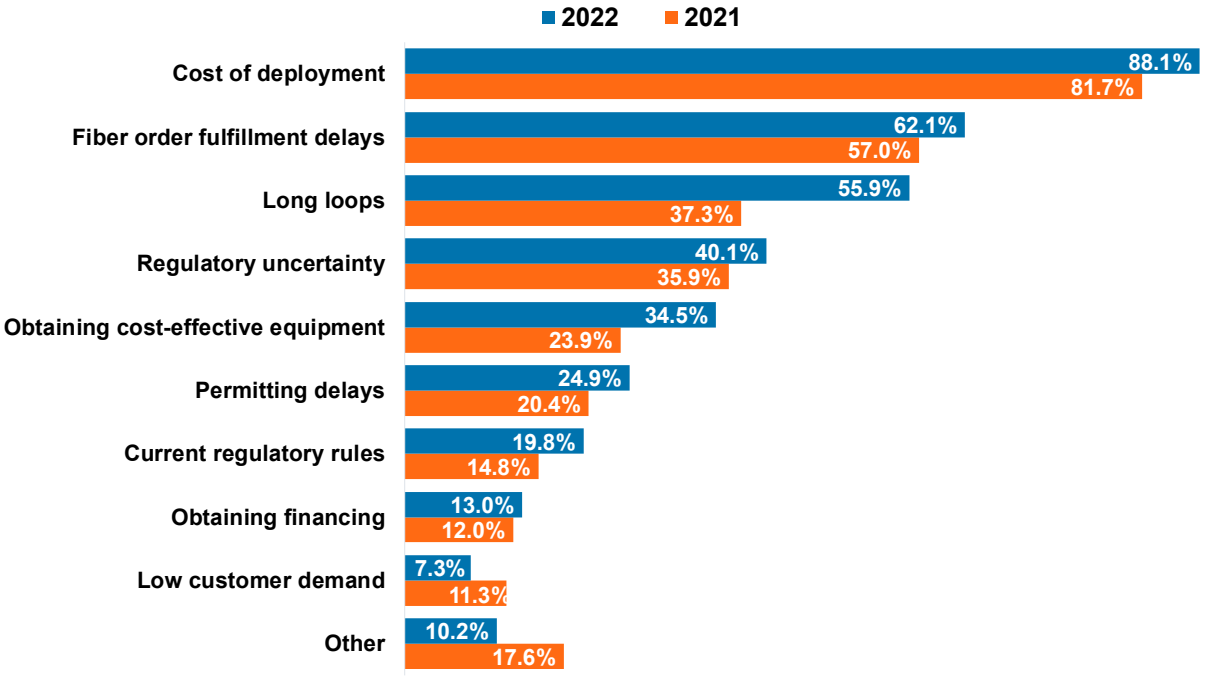
Fixed Voice and Broadband	2018 Mean	2019 Mean	2020 Mean	2021 Mean	2022 Mean
Maximum Speed of Broadband Available	1,233 Mbps	1,350 Mbps	1,428 Mbps	1,730 Mbps	2,025 Mbps
Average Speed of Broadband Purchased	196 Mbps	147 Mbps	235 Mbps	313 Mbps	336 Mbps

Source: 2022 NTCA–Broadband/Internet Availability Survey

- The average maximum speed of broadband available to anchor institutions has increased steadily since 2018. Respondents to the 2022 survey report that the maximum broadband speed they make available to anchor institutions in their area averages 2,025 Mbps. The average speed of broadband purchased by these institutions is 336 Mbps, which is also higher than observed in the past four years (313 Mbps in 2021, 235 Mbps in 2020, 147 Mbps in 2019 and 196 Mbps in 2018).

FIBER DEPLOYMENT & SUPPLY CHAIN CONSIDERATIONS

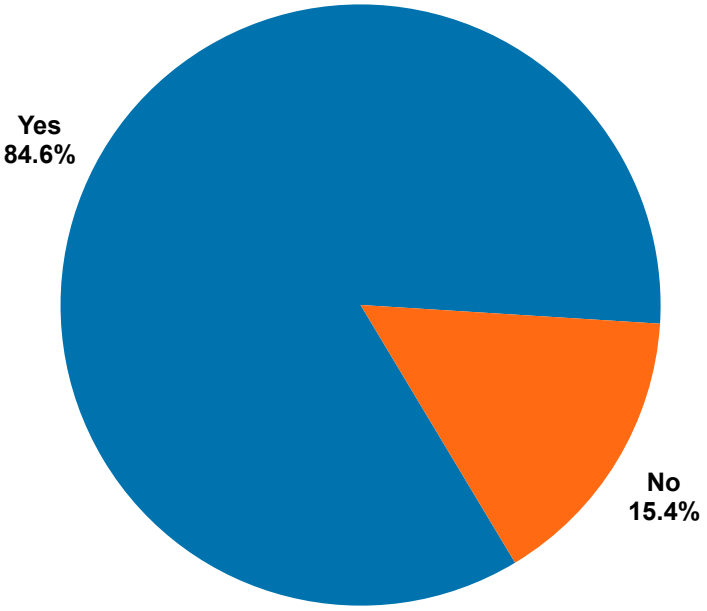
Significant Barriers to Widespread Fiber Deployment



Source: 2022 NTCA–Broadband/Internet Availability Survey

- The cost of deployment continues to be the most significant barrier to widespread fiber deployment as cited by 88.1% of companies. This is higher than the 81.7% reporting this in 2021 but in line with the 88.7% reported in 2020.
- More than six in 10 (62.1%) respondents name fiber order fulfillment delays as their second-most significant barrier, an increase from 57.0% in 2021 and more than double the 27.7% who said the same in 2020.
- Long loops remain the third-most significant barrier with 55.9% indicating this as a barrier in 2022, an increase from the 37.3% who indicated the same in 2021 as well as 46.8% in 2020. Four in 10 respondents name regulatory uncertainty (40.1%) as a significant barrier, an increase from the past few years (35.9% in 2021 and 36.2% in 2020).
- Companies are least likely to report that low customer demand is a significant barrier, with just 7.3% saying so, a decrease from the 11.3% who indicated this was an issue a year ago. Other less significant barriers include obtaining financing (13.0% in 2022 and 12.0% in 2021) and current regulatory rules (19.8% in 2022 and 14.8% in 2021).

Experience Inability or Delay in Procuring Supplies for Communications Network Deployment

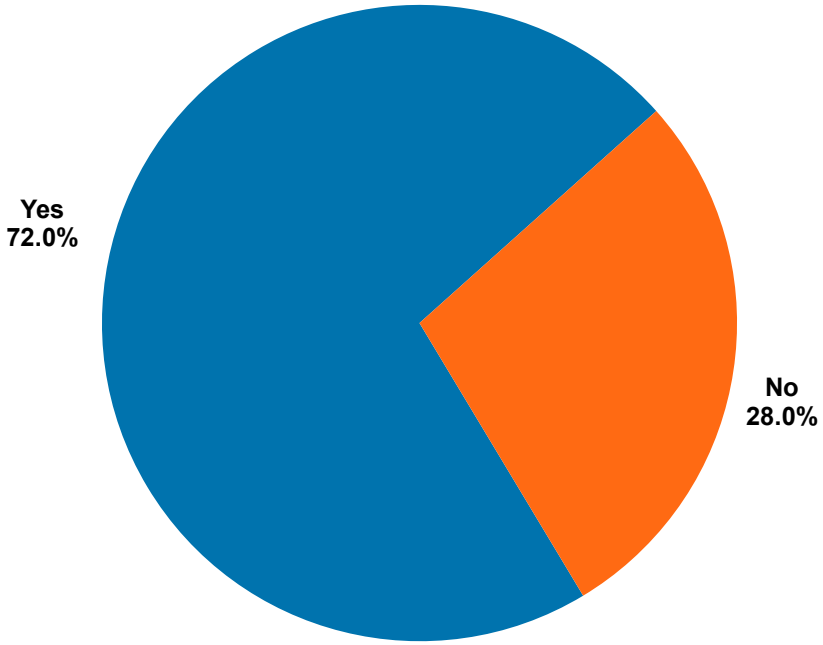


Source: 2022 NTCA–Broadband/Internet Availability Survey

- More than eight in 10 (84.6%) respondents reported experiencing an inability or delay in procuring supplies needed for network deployment—an increase of 4.2 percentage points from 2021.
- Of those experiencing issues, 85.9% report problems procuring Customer Premises Equipment (including ONTs and routers).
- Another 79.7% report that they are either unable to acquire or are delayed in procuring fiber while a similar proportion (79.1%) are experiencing problems procuring network electronic components for fixed *wireline* service.
- The impact of these delays or the inability to procure supplies has resulted in delayed network construction for 73.3% of responding companies and delayed installation of service at customer premises for 67.0% of responding companies.
- More than half (57.4%) of the responding companies that have experienced an inability or delay in procuring supplies report that it is taking longer to replace older equipment.
- Only 6.2% of those that have experienced issues procuring supplies report that there has been no impact on their operations.

COMPETITIVE ISP BROADBAND SERVICES

Offer Competitive Broadband Service Outside of ILEC Service Area



Source: 2022 NTCA–Broadband/Internet Availability Survey

- Nearly three-quarters of respondents (72.0%) offer competitive broadband service outside of their ILEC service area, a percentage very similar to last year (72.7%).

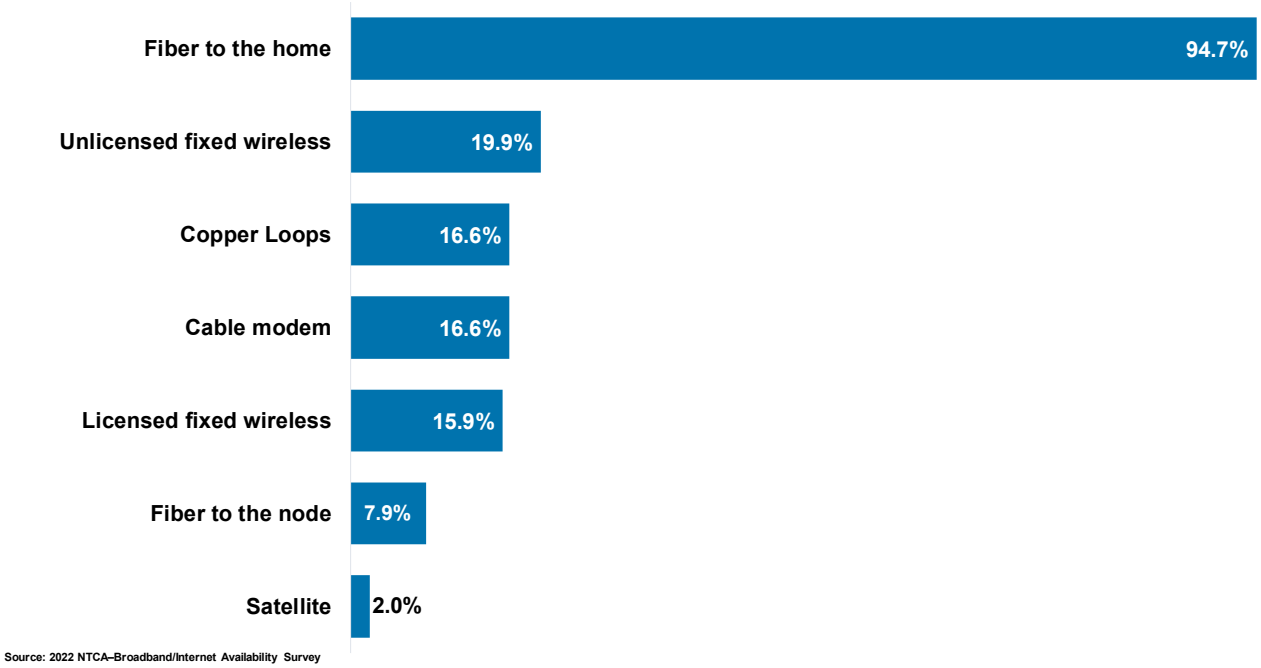
Fixed Broadband Connections in Competitive ISP Operation

Competitive Broadband	2022 Mean	
	Residential	Business
Number of fixed broadband connections	2,261	404

Source: 2022 NTCA–Broadband/Internet Availability Survey

- Responding companies report that their competitive ISP operation has an average of 2,261 residential fixed broadband connections and 404 business fixed broadband connections in service outside of their ILEC service area.

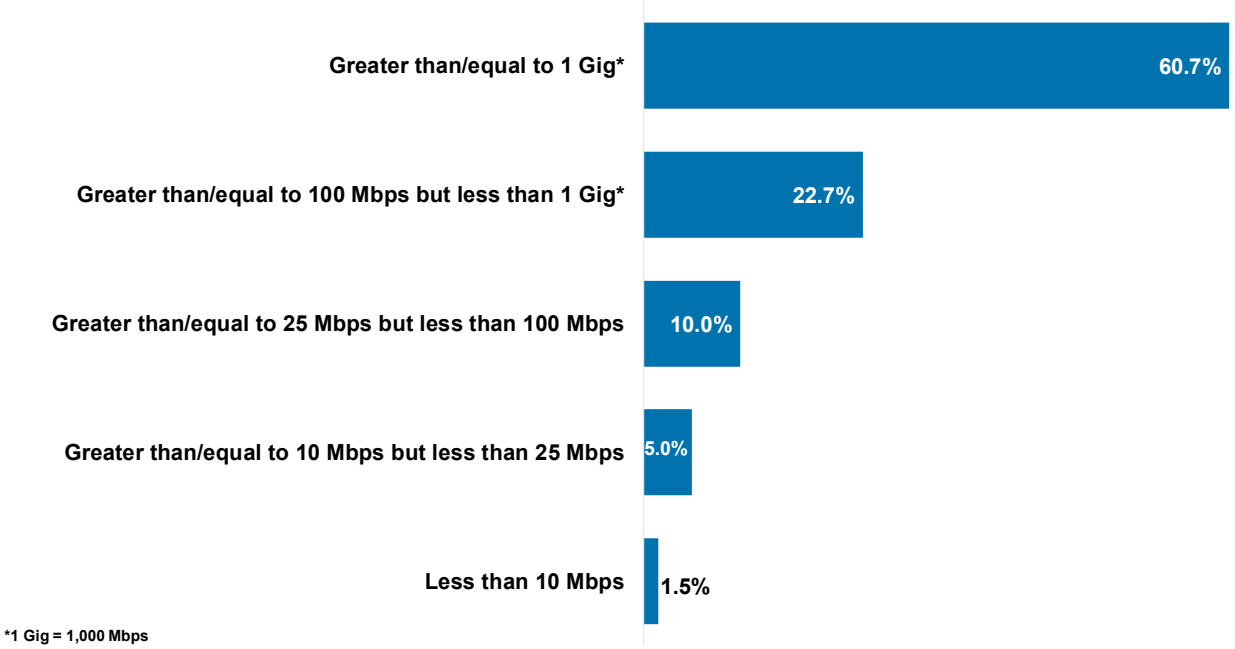
Network Platforms Competitive ISPs Using to Provide Fixed Broadband Service Outside of ILEC Service Area



Source: 2022 NTCA–Broadband/Internet Availability Survey

- Nearly all respondents who offer competitive broadband service outside of their ILEC service area indicate that their competitive ISP is using fiber to the home (94.7%). A much smaller percentage say their competitive ISP is using unlicensed fixed wireless (19.9%), while 16.6% are using copper loops and the same percentage are using cable modems. The survey indicates that 15.9% are using licensed fixed wireless and 7.9% are using fiber to the node. Satellite is used very infrequently (2.0%).

Maximum Downstream Speed Availability in Competitive ISP Service Area

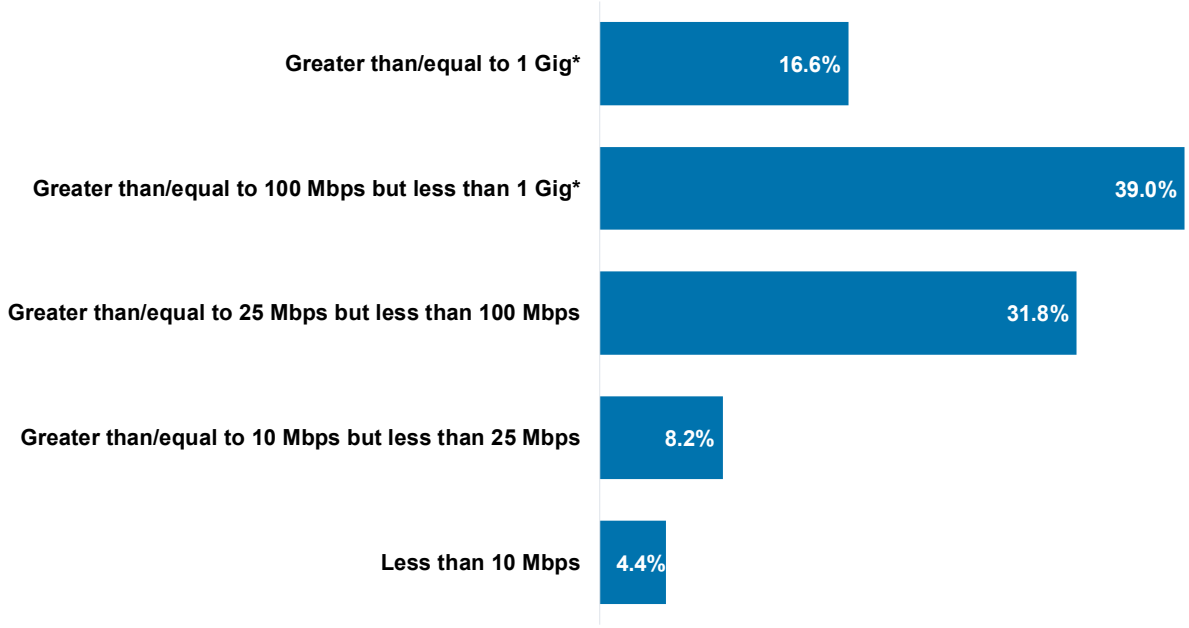


*1 Gig = 1,000 Mbps

Source: 2022 NTCA–Broadband/Internet Availability Survey

- Responding companies who offer competitive broadband service outside their ILEC service area say that 60.7% (average) of their competitive ISP's customer base can receive maximum downstream service at a speed that is greater than or equal to 1 Gig and 22.7% can receive downstream service at a maximum speed greater than or equal to 100 Mbps but less than 1 Gig. Much smaller proportions can receive downstream service at a maximum speed that is greater than or equal to 25 Mbps but less than 100 Mbps (10.0%) and greater than or equal to 10 Mbps but less than 25 Mbps (5.0%). The remaining 1.5% can receive downstream service at a maximum speed of less than 10 Mbps.

Broadband Adoption by Speed Tier in Competitive ISP Service Area



*1 Gig = 1,000 Mbps

Source: 2022 NTCA–Broadband/Internet Availability Survey

- An average of 16.6% of responding companies' competitive ISP customer base subscribe to a maximum service of greater than or equal to 1 Gig, 39.0% subscribe to maximum service greater than or equal to 100 Mbps but less than 1 Gig, and 31.8% subscribe to a maximum service that is greater than or equal to 25 Mbps but less than 100 Mbps. Smaller percentages subscribe to each of the slower ranges (8.2%, on average, subscribe to maximum service greater than or equal to 10 Mbps but less than 25 Mbps and 4.4% subscribe to maximum service of less than 10 Mbps).

Competition in ILEC Service Areas

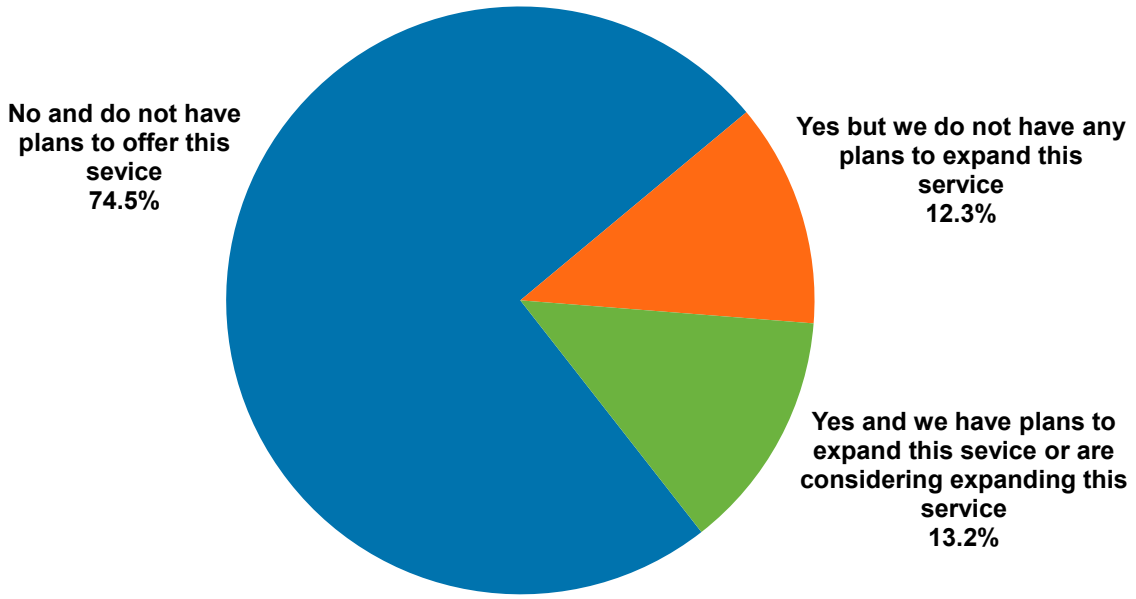
Type of Providers	Fixed Terrestrial Broadband Providers in Service Area	
	Mean	% in Service Area
Cable Companies	1	61.2%
Electric Utilities	1	16.9%
Fixed Wireless ISPs (WISPs)	2	74.7%
Other	3	24.7%

Source: 2022 NTCA–Broadband/Internet Availability Survey

- Respondents were asked to identify the kinds of competitors, if any, that offer competing fixed terrestrial broadband services to even just a limited portion of their service areas. About three-quarters (74.7%) indicate that fixed wireless internet providers operate within some portion of their service areas, and 61.2% said the same about cable companies. Just 16.9% identify electric utilities as offering broadband in some portion of their service areas and 24.7% said the same about other providers.

FIXED WIRELESS BROADBAND SERVICES

Offer Fixed Wireless Broadband Service

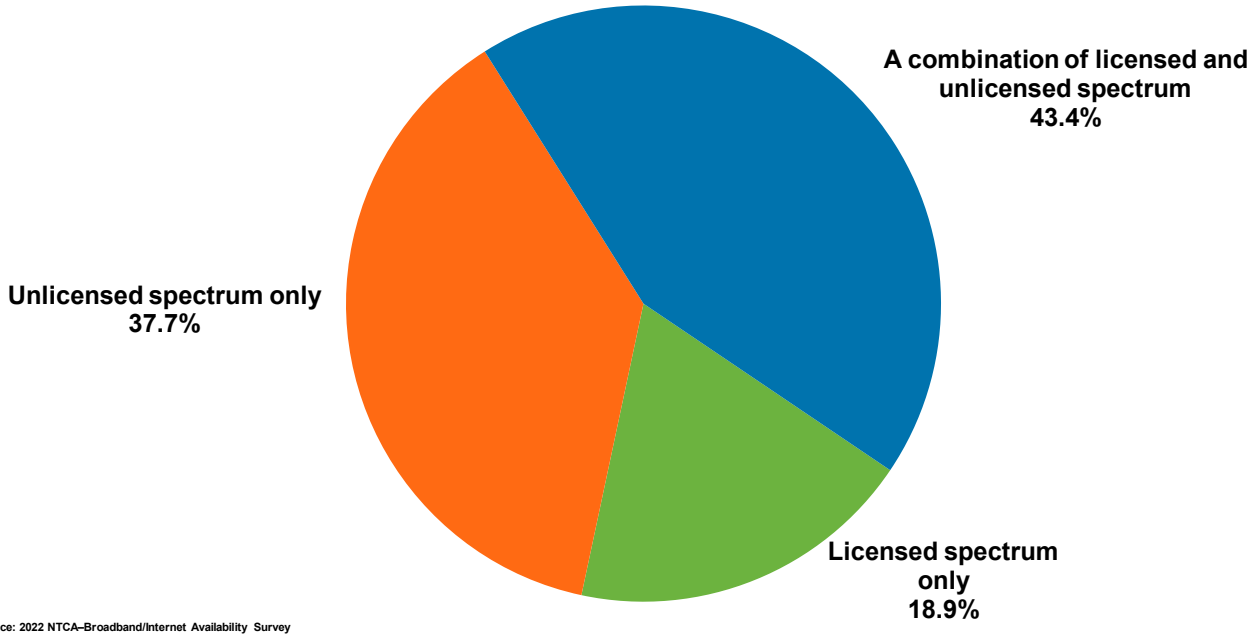


Source: 2022 NTCA–Broadband/Internet Availability Survey

- Approximately three-quarters of respondents (74.5%) indicate that they *do not offer* fixed wireless broadband service and do not have plans to offer it in the future.
- More than one in 10 respondents (12.3%) offer this service but do not plan to expand it in the future, and 13.2% offer this service and either have plans to expand it or are considering expansion.

Use Licensed or Unlicensed Spectrum*

(*Percentages based on respondents offering or planning to offer fixed wireless broadband spectrum)



Source: 2022 NTCA–Broadband/Internet Availability Survey

- Among those offering or planning to offer fixed wireless broadband service, 43.4% use or will use a combination of licensed and unlicensed spectrum, 37.7% use or will use *unlicensed* spectrum *only* and 18.9% use or will use *licensed* spectrum *only*.

Licensed Spectrum Bands Used

	2022 Mean
Low-band spectrum, less than 1 GHz (e.g., 600 MHz, 700 MHz, 800 MHz Cellular/SMR)	40.0%
Mid-band spectrum, 1-6 GHz (e.g., AWS, PCS, 2.5 EBS, 3.5 CBRS)	83.3%
High-band or mmWave spectrum, above 6 GHz (e.g., 24 GHz, 28 GHz)	10.0%

Source: 2022 NTCA–Broadband/Internet Availability Survey

- Respondents who offer fixed wireless broadband using *licensed* spectrum most often (83.3%) use mid-band spectrum, 1-6 GHz (e.g., AWS, PCS, 2,5 EBS, 3.5 CBRS). Four in 10 (40.0%) use low-band spectrum, less than 1 GHz (e.g., 600 MHz, 700 MHz, 800 MHz Cellular/SMR). Only one in 10 (10.0%) use high-band or mmWave spectrum, above 6 GHz (e.g., 24 GHz, 28 GHz).

Unlicensed Spectrum Bands Used

	2022 Mean
Low-band spectrum, less than 1 GHz (e.g., 600 MHz TV White Spaces, 900 MHz)	24.4%
Mid-band spectrum, 1-6 GHz (e.g., 2.4 GHz, 3.6 CBRS GAA, 5.8 GHz, 6 GHz)	92.7%
High-band or mmWave spectrum, above 6 GHz (e.g., 24 GHz or higher)	14.6%

Source: 2022 NTCA–Broadband/Internet Availability Survey

- Respondents who offer fixed wireless broadband using *unlicensed* spectrum most often use mid-band spectrum, 1-6 GHz (e.g., 2.4 GHz, 3.6 CBRS GAA, 5.8 GHz, 6 GHz), with 92.7% saying so. Nearly one-quarter (24.4%) use low-band spectrum, less than 1 GHz (e.g., 600 MHz TV White Spaces, 900 MHz). Just 14.6% offer fixed wireless broadband service using high-band or mmWave spectrum, above 6 GHz (e.g., 24 GHz or higher).

Internet Backbone/Middle Mile

	2021 Mean	2022 Mean
Number of miles from primary internet backbone connection	85	94
Number of middle mile transport providers available	3	3

Source: 2022 NTCA–Broadband/Internet Availability Survey

- On average, respondents report being 94 miles from their primary internet backbone connection in 2022, which is a slightly longer distance than the average reported in 2021 (85 miles) but similar to the average reported in 2020 (95 miles). They also can choose to take service from an average of three middle mile transport providers, the same average as reported in 2021.

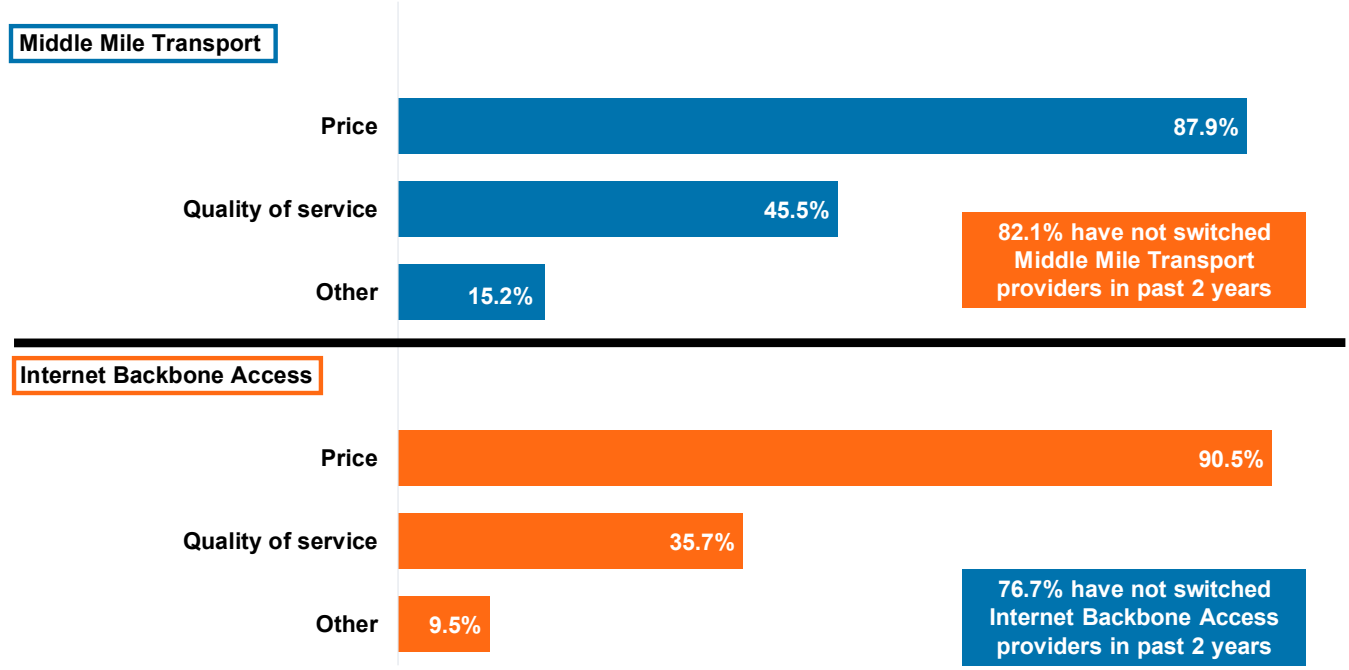
Middle Mile Bandwidth

	2021 Mean	2022 Mean
Middle mile bandwidth (in GB) currently subscribe to	32 GB	54 GB
Number of years expect this capacity to remain sufficient	2.0 Years	2.3 Years

Source: 2022 NTCA–Broadband/Internet Availability Survey

- Respondents subscribe to an average of 54 GB of guaranteed middle mile bandwidth (compared to 32 GB in 2021, 38 GB in 2020, and 25 GB in 2019) and pay an average of $813 per gigabyte (compared to $981 in 2021, $1,145 in 2020, and $2,129 in 2019). They expect this capacity to remain sufficient for an average duration of 2.3 years.

Reasons for Switching Providers



Source: 2022 NTCA–Broadband/Internet Availability Survey

- More than eight in 10 (82.1%) responding companies report that they have not switched middle mile transport providers in the past two years, while more than three-quarters (76.7%) have not switched internet backbone access providers.
- For those who have switched in the past two years, 87.9% named price as the reason for switching middle mile transport providers, up from 78.1% in both 2021 and 2020. Price was also the main reason for switching internet backbone access providers, with 90.5% citing this reason, an increase over the percentage reporting this reason in 2021 (79.3%), 2020 (86.7%), and 2019 (79.3%).
- The percentage of respondents switching middle mile transport providers because of quality of service is 45.5%, up from 31.2% in 2021 (37.5% in 2020, 31.0% in 2019, 24.0% in 2018 and 29.6% in 2016). Similarly, the proportion switching internet backbone providers for quality of service is 35.7%, lower than recently observed (37.9% in 2021, 43.3% in 2020 and 41.4% in 2019).

Video Service(s)

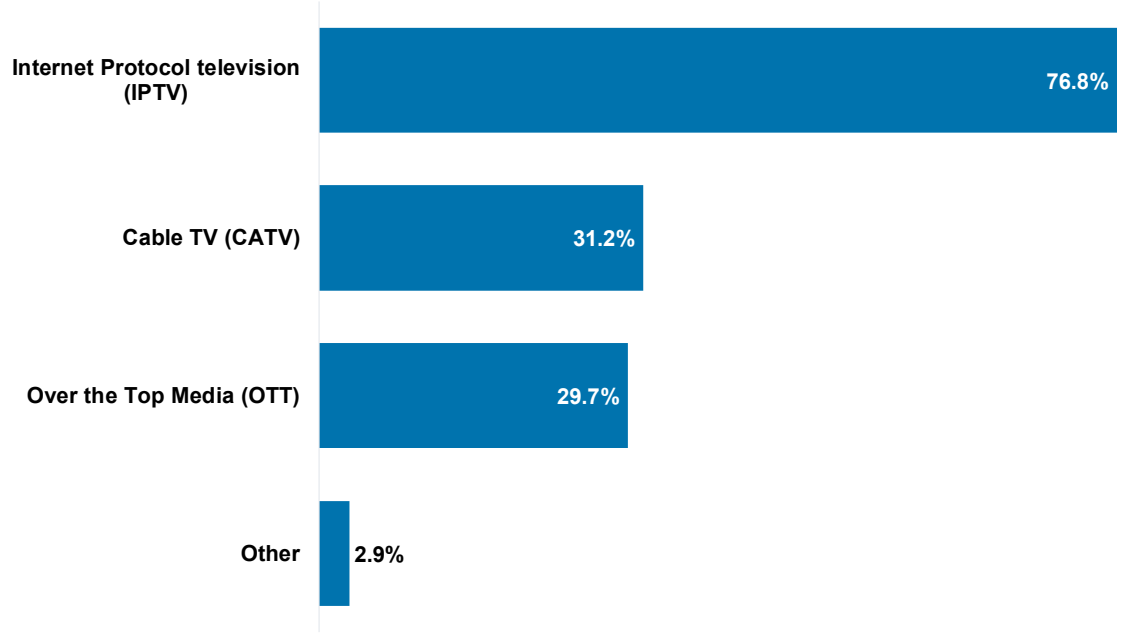
	Mean
Number of subscribers for Cable TV (CATV)	2,252
Number of subscribers for Internet Protocol Television (IPTV)	1,840
Number of homes passed or otherwise capable of connecting with video service(s)	10,494

Source: 2022 NTCA–Broadband/Internet Availability Survey

- Responding companies report that an average of 2,252 customers currently subscribe to their video service(s) for Cable TV (CATV) and an average of 1,840 subscribe for Internet Protocol Television (IPTV), while an average of 10,494 homes are passed or otherwise have the ability to connect with their video service(s).
- Using predetermined ranges, respondents report the approximate percentage of households within their service area that *cannot receive* over-the-air broadcast signals. Specifically, approximately one-quarter (24.4%) indicate that 10% or less of households in their service area cannot receive an over-the-air broadcast signal, 12.9% say it is 11 to 25% of households, 6.0% say it is 26 to 50%, 6.0% say it is 51 to 75%, and 18.9% indicate that more than 75% of service area households cannot receive an over-the-air broadcast signal. Just under one-third (31.8%) say this percentage is unknown.

Types of Video Services Offered*

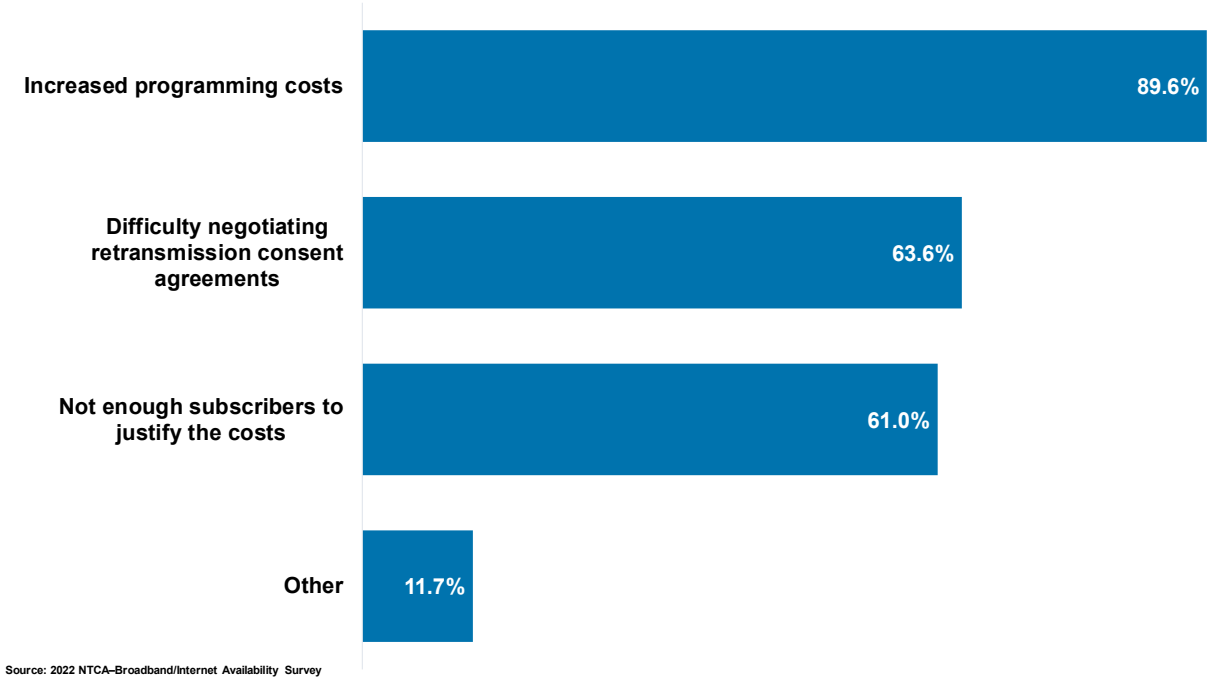
(*Percentages based on respondents currently offering video service)



Source: 2022 NTCA–Broadband/Internet Availability Survey

- Respondents who currently offer video service to their customers most frequently (76.8%) offer Internet Protocol Television (IPTV).
- Cable TV (CATV) is offered by less than one-third (31.2%) of responding companies that offer video service, and another 29.7% 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%.
- Of those that currently offer CATV or IPTV service, approximately three-quarters (75.2%) say they will likely continue to do so for the foreseeable future; more specifically, 36.8% say they are *very likely* to continue and 38.4% say they are *somewhat likely*. Only 16.0% say they are *not very likely* to continue offering CATV or IPTV service, and 8.8% report that they already have plans to discontinue this service.

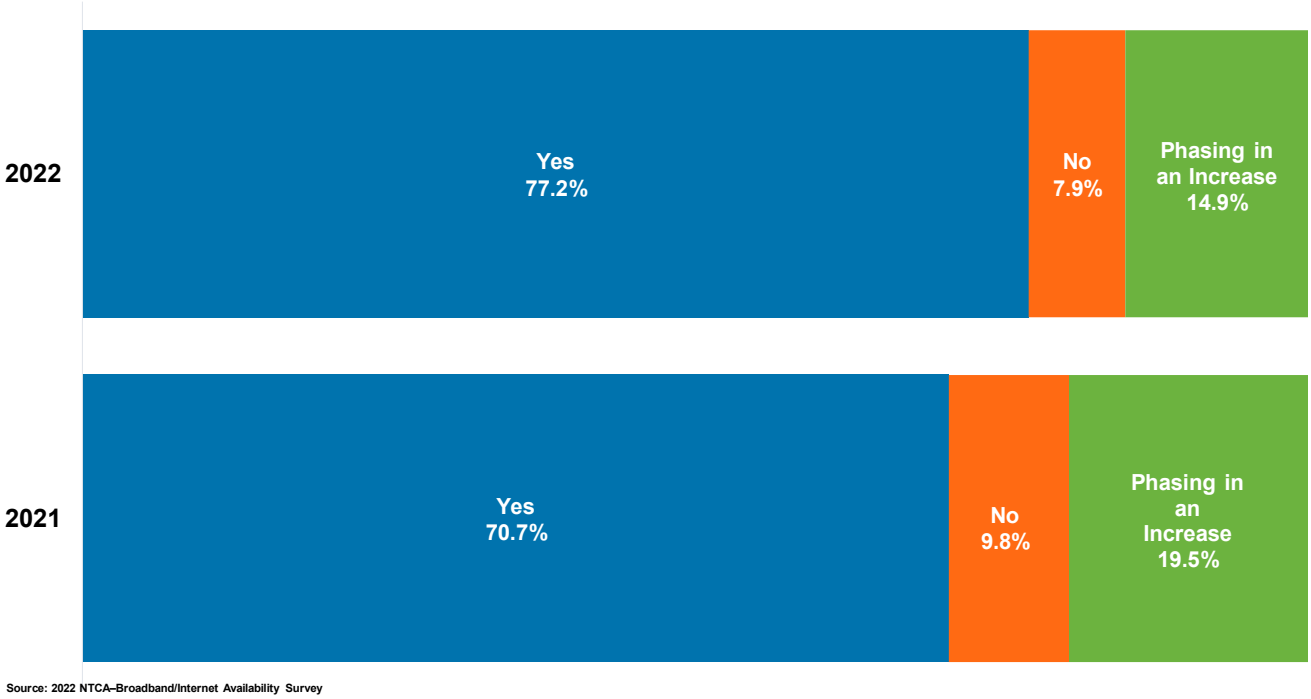
Reasons for Discontinuing CATV or IPTV Services



Source: 2022 NTCA–Broadband/Internet Availability Survey

- More than one-third (34.3%) of responding companies *do not currently offer* video service to their customers.
- The primary reason for discontinuing or considering discontinuing video service is increased programming costs (89.6%), although more than six in 10 also cite difficulty negotiating retransmission consent agreements (63.6%) and not having enough subscribers to justify the costs (61.0%).

Total Retransmission Fee Increase Passed on to Video Subscribers



Source: 2022 NTCA–Broadband/Internet Availability Survey

- More than three-quarters (77.2%) of responding companies report that they passed the increase in retransmission consent fees on to their subscribers, a higher percentage than reported in 2021 (70.7%) but more similar to what was reported in 2020 (78.5%) and 2019 (76.5%). Slightly more than one in seven (14.9%) are phasing in an increase, compared with 19.5% who reported the same in 2021 and 11.2% in 2020.
- The average percentage of total operating expenditures that went toward retransmission consent fees in 2022 was 36.2%, a slight increase when compared to the 35.0% reported in 2021.
- In most recent retransmission consent agreements, retransmission consent fees increased by an average of $71,545 total dollars. In 2021, average retransmission consent fees increased by $63,609.

CONCLUSIONS

- **NTCA members continue to increase their fiber-to-the-home deployments and offer more robust broadband services as more consumers demand higher speeds.** The average proportion of customers served by fiber-to-the-home connections has increased from 75.0% in 2021 to 79.3% in 2022. More than eight in 10 customers (81.9%), on average, now have access to 100 Mbps or higher downstream broadband speed, compared to 75.6% in 2021. The biggest increase this year comes again in the Gigabit tier, where respondents report that an average of 60.9% of their customer base can receive a maximum downstream speed for fixed broadband greater than or equal to 1 Gig, up from 55.4% reported in 2021. The rate of adopting faster speeds also continues to increase. The percentage of respondents' customers who subscribe to a maximum broadband downstream speed of 100 Mbps or higher has increased to 48.9% in 2022 from 37.3% in 2021.

- **Cost of deployment continues to be the most significant barrier to widespread fiber deployment in rural America faced by NTCA members**, with 88.1% of respondents citing this barrier compared to 81.7% in 2021. Other significant challenges include fiber order fulfillment delays, long loops, and regulatory uncertainty. Notable this year is the increase in the percentage of respondents citing long loops as a barrier, from 37.3% in 2021 to 55.9% in 2022. Also notable is the sustained increase in the percentage of respondents (84.6% in 2022, up from 80.4% in 2021) experiencing an inability or delay in procuring supplies for network deployment, including fiber and customer premises equipment, among others. Inability or delays in procuring necessary equipment have resulted in delayed network construction and delayed installation of service at customer premises for more than two-thirds of responding companies.

- **NTCA members continue to provide higher speeds of broadband service to anchor institutions in their communities.** Respondents provide robust levels of fixed broadband service to all public libraries, community colleges, state universities and extensions, 911 call centers, and primary/secondary located within their communities. Notably, the average maximum speed of broadband available to anchor institutions in respondents' service area has increased from 1,730 Mbps in 2021 to 2,025 Mbps in 2022, and the average speed purchased by those institutions increased from 313 Mbps in 2021 to 336 Mbps in 2022. A new question in this year's survey revealed that 15.6% of responding companies served tribal areas in 2022.

- **Most NTCA members offer the Affordable Connectivity Program (ACP) to their customers.** Of the 77.8% of respondents that offer the ACP to their customers, 47.9% reported that 50 or more of their customers signed up for the discounted service.

- **Most NTCA members offer video services through Internet Protocol Television (IPTV).** Over three-quarters of responding companies currently offering video services to their customers most often offer IPTV, whereas three in 10 companies offer video services through cable TV (CATV) or over the top media (OTT). The primary reason for discontinuing CATV or IPTV services is increased programming costs, followed by difficulty negotiating retransmission consent agreements and not having enough subscribers to justify the costs.