# 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 over two decades.

Respondents to this year's survey report an average of 5,494 residential and 551 business fixed broadband connections in service. There is also a reported average of 10,231 serviceable locations within the respondents' incumbent local exchange carrier (ILEC) service areas, and members report that an average of 82% of active 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. This year's survey had companies select the technology codes they specify on the FCC's Broadband Data Collection (BDC)[3] to deliver fixed broadband service in their ILEC area as well as to specify the percentage of their ILEC's BDC locations served by each of the platforms. Previous year data and current year data have been regrouped, as needed, to be comparable.

In August 2023, NTCA contracted with Association Research, Inc. (ARI)[4] 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; 205 holding company members (36.0%) 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 2,008 square miles. Nearly half (49.2%) report having a service area of less than 500 square miles, while just over one-quarter (29.3%) have a service area between 500 and 1,999 square miles, and less than one-quarter (21.5%) 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] For more information on BDC technology codes, see: **https://help.bdc.fcc.gov/hc/en-us/articles/5290793888795-Fixed-Technology-Codes-**

[4] 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.

Using the FCC's BDC technology codes, respondents indicated that they use a variety within their respective ILEC service areas to provide fixed broadband service to their customers.[5] On average, more than eight in 10 (83.5%) of serviceable locations are served by Optical Carrier/Fiber to the Premises (BDC Technology Code 50) in 2023, an increase from the 2022 survey data (79.3%). An average of 15.2% of locations are served via Copper Wire (Code 10), a decrease of 2.7 percentage points from those who reported leveraging copper loops or fiber-to-the-node capability in the 2022 survey. Coaxial Cable/HFC (Code 40) is used to serve an average of 1.8% of serviceable locations, and Licensed Terrestrial Fixed Wireless (Code 71) is used to serve 1.1%. (Note that in this year's survey, the reported percentages of BDC locations served by the various platforms could add to more than 100% if the ILEC reported being capable of serving a single location through multiple technologies.)

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: 67.1%
- Greater than/equal to 100 Mbps but less than 1 Gig: 16.9%
- Greater than/equal to 25 Mbps but less than 100 Mbps: 8.1%
- Greater than/equal to 10 Mbps but less than 25 Mbps: 6.0%
- Less than 10 Mbps: 2.0%

More than nine in 10 (92.1%) of respondents' customers in 2023 could receive a maximum downstream speed greater than or equal to 25 Mbps, slightly higher than the 91.2% in NTCA's 2022 Broadband Survey Report. Again of note this year as compared to past reports, there were large gains for those able to obtain maximum downstream service greater than or equal to 1 Gig (67.1% vs 60.9% in 2022, 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: 61.1%
- Greater than/equal to 100 Mbps but less than 1 Gig: 20.7%
- Greater than/equal to 20 Mbps but less than 100 Mbps: 4.9%
- Greater than/equal to 10 Mbps but less than 20 Mbps: 4.0%
- Greater than/equal to 3 Mbps but less than 10 Mbps: 4.4%
- Less than 3 Mbps: 4.9%

In 2023, an average of 86.7% of respondents' customers can receive maximum upstream speeds of greater than or equal to 20 Mbps, while an average of 81.8% of respondents' customer bases are able to receive maximum upstream speeds of greater than or equal to 100 Mbps.

[5] 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:

- 10.1% subscribe to speeds greater than/equal to 1 Gig.
- 48.5% subscribe to greater than/equal to 100 Mbps but less than 1 Gig.
- 27.4% subscribe to greater than/equal to 25 Mbps but less than 100 Mbps.
- 9.7% subscribe to greater than/equal to 10 Mbps but less than 25 Mbps.
- 4.4% subscribe to less than 10 Mbps.

The percentage of customers subscribing to speeds greater than or equal to 25 Mbps (86%) has increased steadily in the past five years—in 2022, this percentage was 80%; in 2021, it was approximately 72%; in 2020, it was approximately 64%; and in 2019 the proportion was 50%. Additionally, the percentage of customers subscribing to speeds greater than/equal to 100 Mbps but less than 1 Gig increased materially in 2023 when compared to the previous year, from 36.7% in 2022 to 48.5% this year.

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

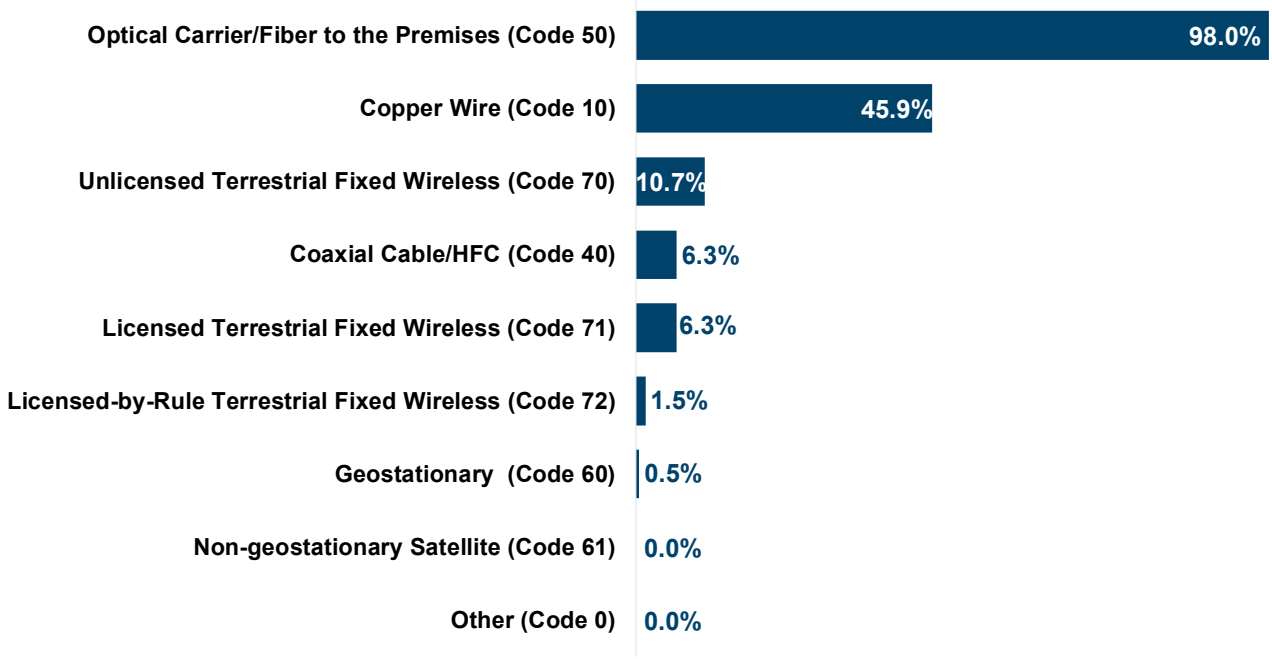
| Fixed Broadband and Voice | Residential | | Business | |
|---|---|---|---|---|
| | 2022 Mean | 2023 Mean | 2022 Mean | 2023 Mean |
| Number of fixed broadband connections | 4,287 | 5,494 | 648 | 551 |
| Number of voice grade access lines | 2,661 | 2,673 | 840 | 947 |
| Number of VoIP lines | 1,152 | 1,003 | 538 | 368 |

Source: 2023 NTCA–Broadband/Internet Availability Survey

- On average, respondents indicate having 5,494 residential fixed broadband connections in service in 2023, an increase from 2022 (4,287). The average number of business fixed broadband connections in service is 551, down from 2022 (648).
- Respondents report having an average of 2,673 residential voice grade access lines in service in 2023, a slight increase from 2022 (2,661). The average number of business local exchange voice grade access lines in service also increased in 2023 to 947 from 840 in 2022.
- The average respondent also reports having 1,003 residential VoIP lines, a decrease from the 1,152 reported in 2022, and 368 business interconnected VoIP lines in service, also a decrease from the 538 reported in 2022.
- Respondents report having an average of 10,231 serviceable locations within their ILEC service areas, with 82.1% (average) of active customers subscribing to broadband at any speed.
- The average ILEC service area is approximately 2,008 square miles. Nearly half (49.2%) report having a service area of less than 500 square miles. Approximately three in 10 (29.3%) have a service area between 500 and 1,999 square miles, and fewer than one-quarter (21.5%) have a service area of 2,000 square miles or larger.
- The 2023 survey asked respondents what kind of Universal Service Fund (USF) support they expect to receive in 2024 for their ILEC operations. Most will receive support either through cost-based mechanisms (i.e., CAF-BLS and/or HCLS) (43.5%) or Enhanced ACAM (42.5%), while 9.5% expect to receive ACAM 1 support, 17.5% expect to receive USF support through ACAM 2, and 1.5% expect to 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 (81.4%) indicate that they use owned or leased IP switching facilities (e.g., "softswitches") for voice telephony services in their networks. Nearly three-quarters of this year's respondents (73.6%) indicated, however, that they still use TDM switching facilities for some voice traffic within certain portions of their ILEC networks.
- Nearly three in 10 (29.2%) are utilizing cloud-based VoIP platforms to provide voice telephony services for some portions of their ILEC areas.

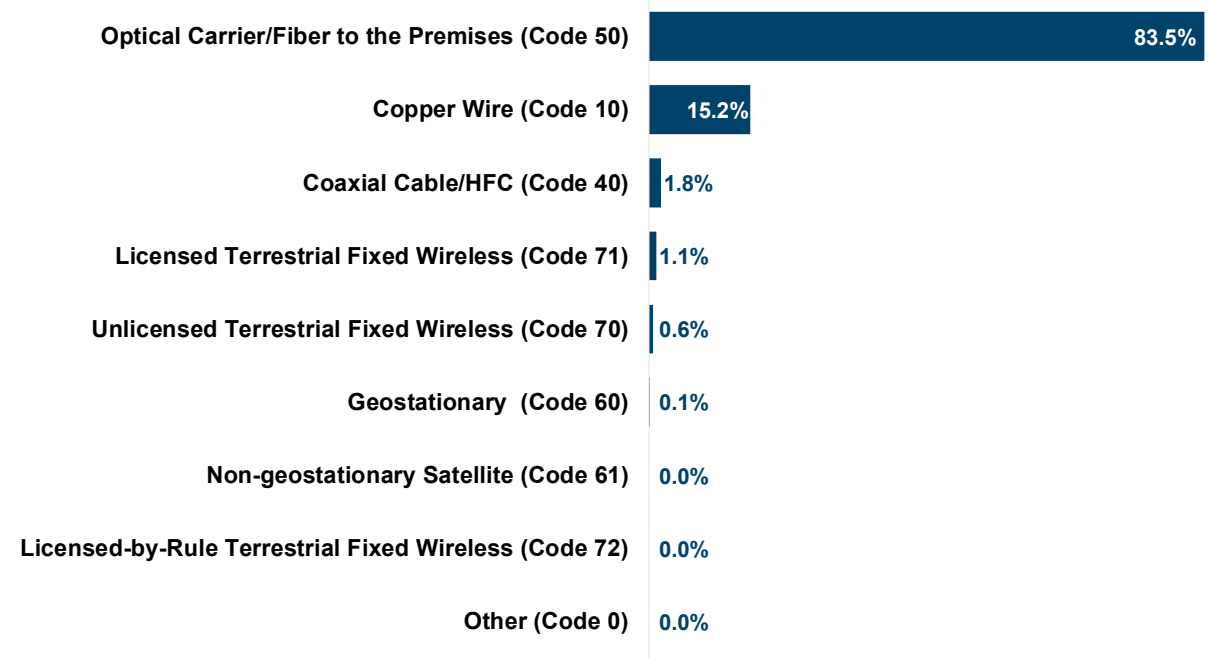
## Technologies Used to Deliver Fixed Broadband Service




Source: 2023 NTCA–Broadband/Internet Availability Survey

- Nearly all respondents (98.0%) report using Optical Carrier/Fiber to the Premises (BDC Technology Code 50) to provide fixed broadband service to some portion of their service area, a slight increase from what was reported in 2022 (97.4%). Fewer than half (45.9%) use Copper Wire (Code 10) for customers in their service area, dropping from 53.1% reported in 2022 for Copper Loops and Fiber to the Node deployments.
- Respondents make more sparing and selective use of other technologies to provide fixed broadband service, including Unlicensed Terrestrial Fixed Wireless (BDC Technology Code 70) at 10.7%, Coaxial Cable/HFC (Code 40) and Licensed Terrestrial Fixed Wireless (Code 71) at 6.3% each, Licensed-by-Rule Terrestrial Fixed Wireless (Code 72) at 1.5%, and Geostationary Satellite (Code 60) at 0.5%. No respondent reported using Non-geostationary Satellite (Code 61) to provide fixed broadband service in 2023.
- For comparison to previous year data, the technology codes were matched to those used on the FCC's Broadband Data Collection. The technology used most often, Optical Carrier/Fiber to the Premises (Code 50), corresponds with the previous categories of Fiber to the Home, and Copper Wire (Code 10) corresponds with Fiber-to-the-Node and Copper Loops.
- Percentages add up to more than 100% due to the presence and use of multiple technology platforms in individual respondents' networks.

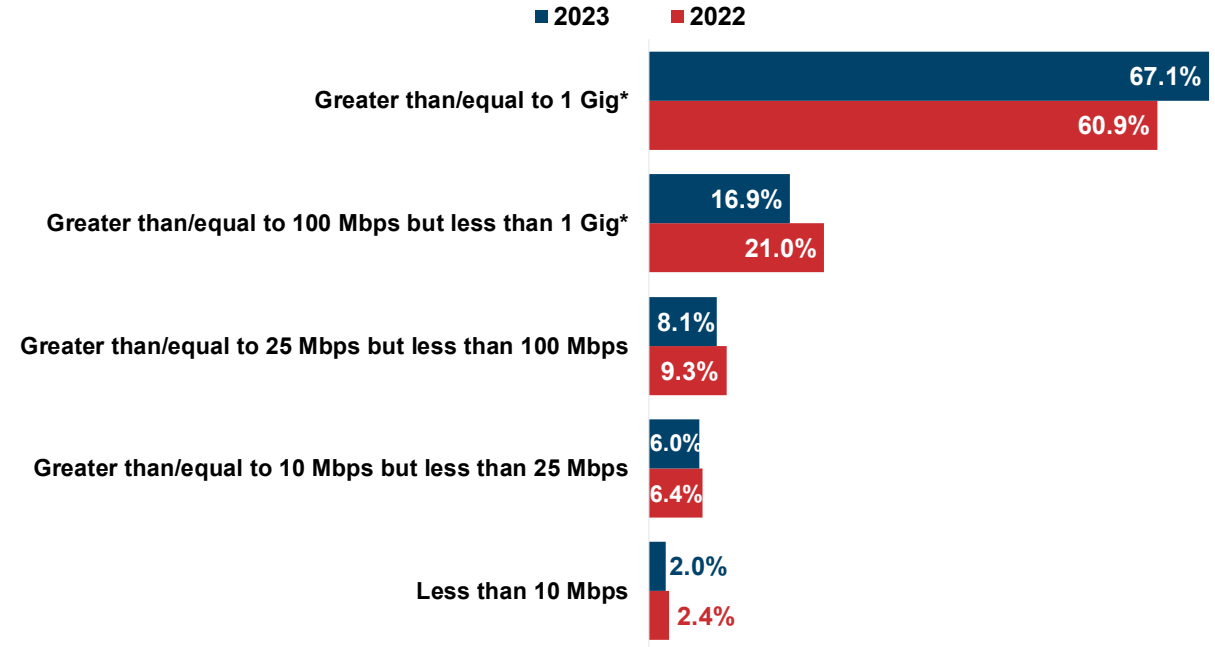
## Average Percentage of BDC Locations Served by Technologies




Source: 2023 NTCA–Broadband/Internet Availability Survey

- Respondents indicate that an average of 83.5% of their serviceable locations are served by Optical Carrier/Fiber to the Premises (Code 50), an increase from what was reported in 2022 (79.3%). The average proportion connected by Copper Wire (Code 10) is 15.2%, slightly lower than reported in 2022 (17.9%).
- The average percentage of respondents' serviceable locations served by Coaxial Cable/HFC (Code 40) is 1.8%. Licensed Terrestrial Fixed Wireless (Code 71) at 1.1% and Unlicensed Terrestrial Fixed Wireless (Code 70) at 0.6% continue to be very small. Respondents indicated nearly no customers received service via Licensed-by-Rule Terrestrial Fixed Wireless (Code 72).
- Note that on this year's survey, the reported percentages of BDC serviceable locations could add to more than 100% if multiple technologies are reported on the BDC by the ILEC as being capable of serving a single location, whereas in previous reports, locations were reported only as capable of being served and not broken down into the technology(ies) used to serve the locations.

## Maximum *Downstream* Speed Availability

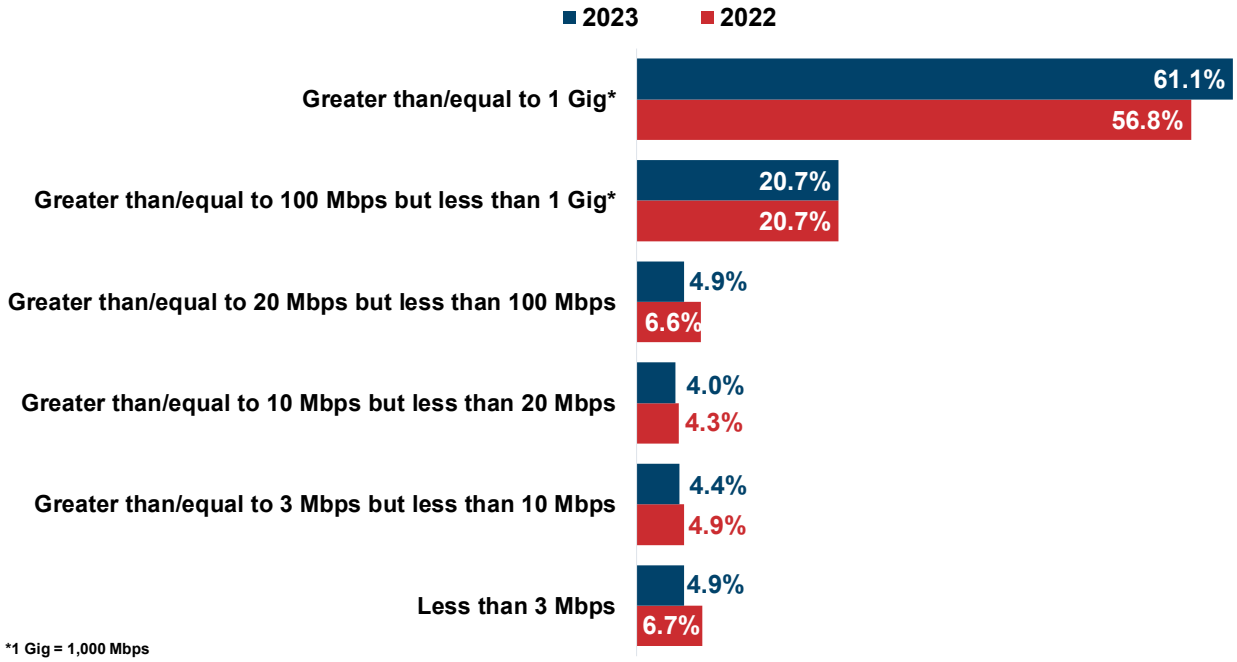



*1 Gig = 1,000 Mbps

Source: 2023 NTCA–Broadband/Internet Availability Survey

- The survey results again indicate increases in the availability of higher speed services, with respondents reporting that more than eight in 10 (84.0%) of their customers are able to receive maximum downstream speed greater than or equal to 100 Mbps (up from 81.9% the year before). The biggest increase again this year comes in the Gigabit tier, where respondents report that an average of 67.1% of their customer base can receive a maximum downstream speed for fixed broadband greater than or equal to 1 Gig, up from 60.9% in 2022, 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 continued to decline. The average proportion who can receive a maximum downstream speed greater than or equal to 25 Mbps but less than 100 Mbps is 8.1%, lower than reported in 2022 (9.3%). Respondents also report that 6.0% of their customer base can receive a maximum downstream speed greater than or equal to 10 Mbps but less than 25 Mbps, and 2.0% can receive a maximum downstream speed of less than 10 Mbps. These averages are both lower than reported in 2022 (6.4% and 2.4%, respectively).

## Maximum *Upstream* Speed Availability

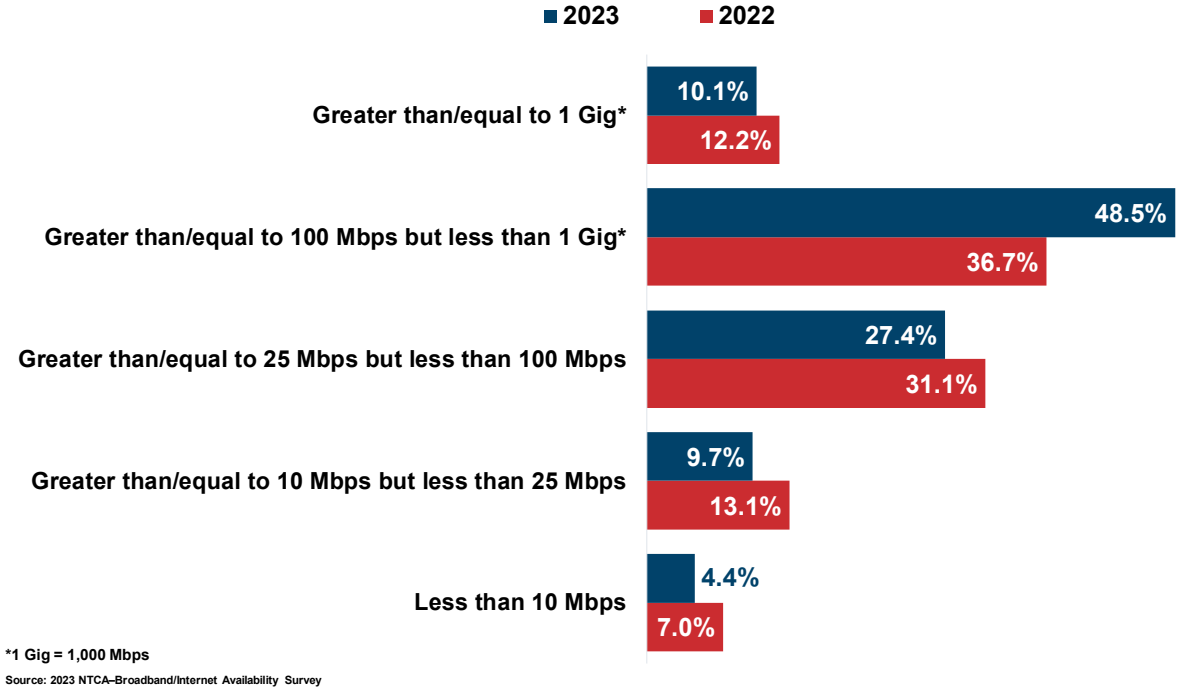



*1 Gig = 1,000 Mbps

Source: 2023 NTCA–Broadband/Internet Availability Survey

- On average, about six in 10 respondents' customers (61.1%) 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.
- More than eight in 10 (81.8%) of respondents' ILEC customers can receive a maximum upstream speed of 100 Mbps or higher, while in 2022 the average was 77.5% of customers.
- Respondents report that an average of 86.7% of their customers can receive a maximum upstream speed of 20 Mbps or greater for fixed broadband service, higher than reported in 2022 (83.1%).

## Broadband Adoption by Speed Tier

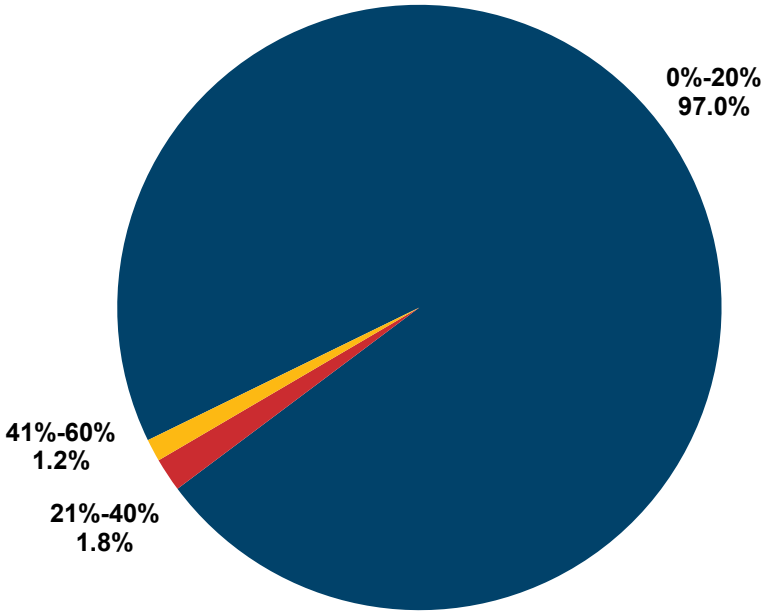



*1 Gig = 1,000 Mbps

Source: 2023 NTCA–Broadband/Internet Availability Survey

- The survey shows that consumers continue to migrate steadily to higher speeds as those speeds become available. More than half (58.6%) of the average customer base subscribes to a speed greater than or equal to 100 Mbps, up from an average of 48.9% in 2022 and 37.3% in 2021. The percentage of customers subscribing to service between 100 Mbps and less than 1 Gig (48.5%) is nearly twice that of the next-most popular tier of 25 Mbps to less than 100 Mbps tier (at 27.4%).
- The proportion subscribing to speeds lower than 25 Mbps is just 14.1%, compared with 20.1% in 2022, 27.8% in 2021 and 36.1% in 2020. More specifically, survey respondents indicate that an average of 9.7% of their customer base subscribes to a maximum speed of greater than or equal to 10 Mbps but less than 25 Mbps, and 4.4% subscribes to a speed less than 10 Mbps.
- Nearly one-half (49.7%) of respondents' ILEC subscribers on average currently take a standalone broadband service from them, an increase from the 41.5% reported in 2022 and 37.0% reported in 2021. For this survey/report, broadband is "standalone" if the customer purchases broadband but does not purchase regulated local exchange service from the ILEC (i.e., if the customer purchases non-regulated VoIP service, this would still be considered "standalone" broadband).

## Percentage of Total Customers Who Signed Up for the Affordable Connectivity Program, if Available




Source: 2023 NTCA–Broadband/Internet Availability Survey

- More than eight in 10 (84.4%) of all respondents report that they offer the Affordable Connectivity Program (ACP) to their customers. Of those respondents offering the ACP, nearly all (97.0%) had 0%–20% of their total customers sign up for the discounted service.

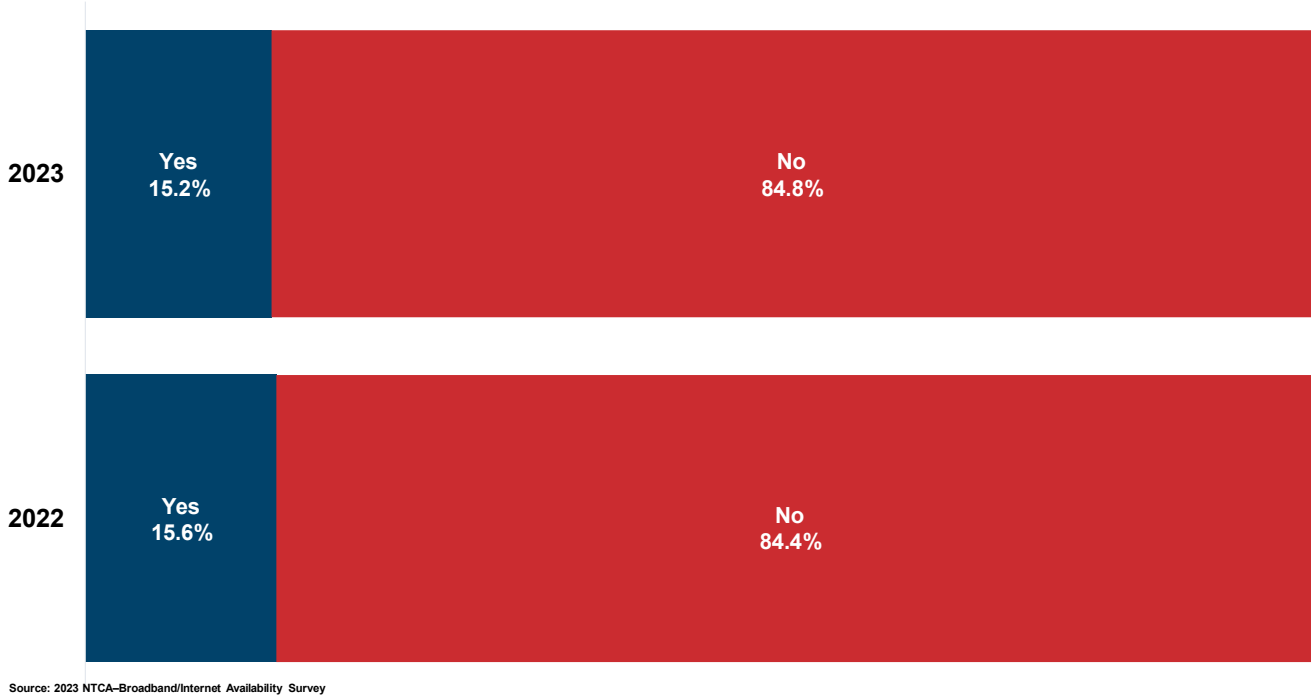
# Anchor Institution Connection via Fiber

| Anchor Institution | % Connected to Network via Fiber | |
|---|---|---|
| | 2022 Mean | 2023 Mean |
| Primary/secondary schools | 91.3% | 86.0% |
| Public safety entities (police, fire, etc.) | 87.3% | 81.1% |
| Public libraries | 84.8% | 79.6% |
| Hospitals/medical clinics | 83.4% | 77.8% |
| 911 Call Centers | 49.9% | 49.1% |
| Community colleges | 28.2% | 33.2% |
| State universities and extensions | 19.8% | 31.2% |

Source: 2023 NTCA–Broadband/Internet Availability Survey

- Nearly nine in 10 (86.0%) primary/secondary schools are connected to respondents' networks via fiber, down from 91.3% in 2022 but higher than in 2021 (83.7%).
- Slightly more than eight in 10 (81.1%) public safety entities (police, fire, etc.) are connected to respondents' networks via fiber; while a decrease compared to 87.3% in 2022, it is higher than reported in 2021 (74.4%).
- The proportion of public libraries that respondents identified as being connected via fiber dropped to 79.6% from an average of 84.8% in 2022, but it is an increase from 77.1% in 2021.
- In 2023, an average of 77.8% of hospitals/medical clinics are connected to respondents' networks via fiber compared with 83.4% in 2022 and 71.5% in 2021; 49.1% of 911 call centers are connected vs 49.9% in 2022 and 46.1% in 2021.
- More than three in 10 (31.2%) state universities and extensions are connected to respondents' networks via fiber in 2023, a considerable increase from 19.8% reported in 2022 and 25.2% in 2021. Also increasing this year is the percentage of community colleges connected via fiber at 33.2% up from 28.2% in 2022.

# Serve Tribal Areas




Source: 2023 NTCA–Broadband/Internet Availability Survey

- In 2022, a new question revealed that 15.6% of responding companies served tribal areas; a similar percentage reported serving tribal areas this year (15.2%).

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

| Anchor Institution | Number in Service Area | Number Served |
|---|---|---|
| | 2023 Mean | 2023 Mean |
| Primary/secondary schools | 8 | 7 |
| Public libraries | 3 | 3 |
| Public safety entities (police, fire, etc.) | 10 | 8 |
| Hospitals/medical clinics | 7 | 7 |
| 911 Call Centers | 2 | 2 |
| Community colleges | 2 | 1 |
| State universities and extensions | 2 | 1 |

Source: 2023 NTCA–Broadband/Internet Availability Survey

- Respondents report that the average number of anchor institutions in the area they serve with fixed broadband includes 10 public safety entities, eight primary/secondary schools, seven hospitals/medical clinics, three public libraries, two 911 call centers, two state universities and extensions and two community colleges.
- Respondents serve all of the public libraries, hospitals/medical clinics and 911 call centers located in their service area with fixed broadband service. Additionally, on average, respondents serve most of the remaining anchor institutions in their service area, including: public safety entities, where an average of eight of the 10 entities are served; primary/secondary schools, where seven of eight are served; and community colleges as well as state universities and extensions, where one of two of each type of entity is served.

## Anchor Institution Average Speed

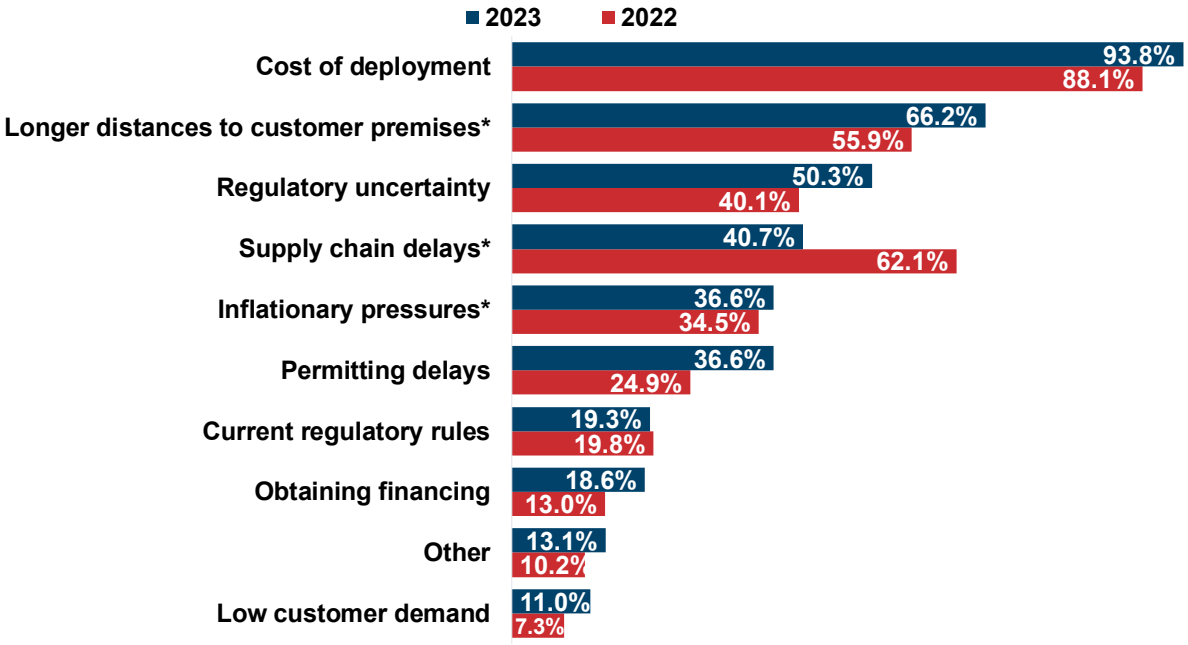
| Fixed Broadband and Voice | 2019 Mean | 2020 Mean | 2021 Mean | 2022 Mean | 2023 Mean |
|---|---|---|---|---|---|
| Maximum Speed of Broadband Available | 1,350 Mbps | 1,428 Mbps | 1,730 Mbps | 2,025 Mbps | 3,197 Mbps |
| Average Speed of Broadband Purchased | 147 Mbps | 235 Mbps | 313 Mbps | 336 Mbps | 453 Mbps |

Source: 2023 NTCA–Broadband/Internet Availability Survey

- The average maximum speed of broadband available to anchor institutions has increased significantly since 2019. Respondents to the 2023 survey report that the maximum broadband speed they make available to anchor institutions in their area averages 3,197 Mbps up from 2,025 Mbps just a year ago. The average speed of broadband purchased by these institutions is 453 Mbps, which is also higher than observed in the past four years (336 Mbps in 2022, 313 Mbps in 2021, 235 Mbps in 2020, and 147 Mbps in 2019).

# FIBER DEPLOYMENT & SUPPLY CHAIN CONSIDERATIONS

## Significant Barriers to Widespread Fiber Deployment

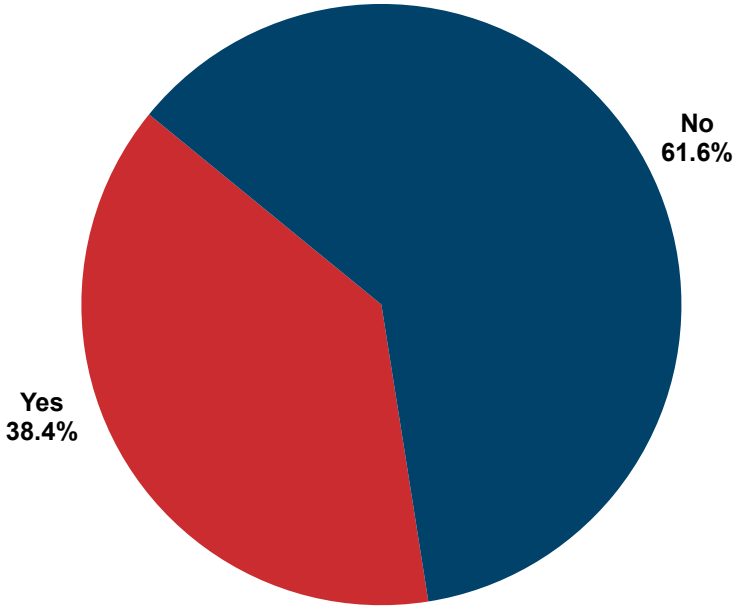



*Note change in wording of this response option from 2022 survey to 2023 survey.

Source: 2023 NTCA–Broadband/Internet Availability Survey

- The cost of deployment continues to be the most significant barrier to widespread fiber deployment as cited by more than nine in 10 (93.8%) companies, even higher than the 88.1% reporting this in 2022.
- Longer distances to customer premises, worded as long loops in previous surveys, is the second-most significant barrier with two-thirds (66.2%) indicating this as a continuing challenge in 2023, an increase from 55.9% who indicated long loops in 2022 as well as 37.3% in 2021.
- Half of all respondents name regulatory uncertainty (50.3%) as a significant barrier, an increase from the past few years (40.1% in 2022 and 35.9% in 2021).
- More than four in 10 (40.7%) respondents name supply chain delays as their fourth-most significant barrier, a significant decrease from the past few surveys (62.1% in 2022 and 57.0% in 2021) where the response option was previously worded as fiber order fulfillment delays.
- Inflationary pressures (worded as obtaining cost-effective equipment in previous surveys) and permitting delays both were cited by 36.6% of respondents as a significant barrier to widespread fiber deployment in 2023, more than the 2022 survey at 34.5% and 24.9%, respectively.
- Companies are least likely to report that low customer demand is a significant barrier, with just 11.0% saying so, an increase from the 7.3% who indicated this was an issue a year ago. Other less significant barriers include obtaining financing (18.6% in 2023 and 13.0% in 2022) and current regulatory rules (19.3% in 2023 and 19.8% in 2022).

## Experience Inability or Delay in Procuring Equipment, Fiber, and/or Other Supplies for Communications Network Deployment

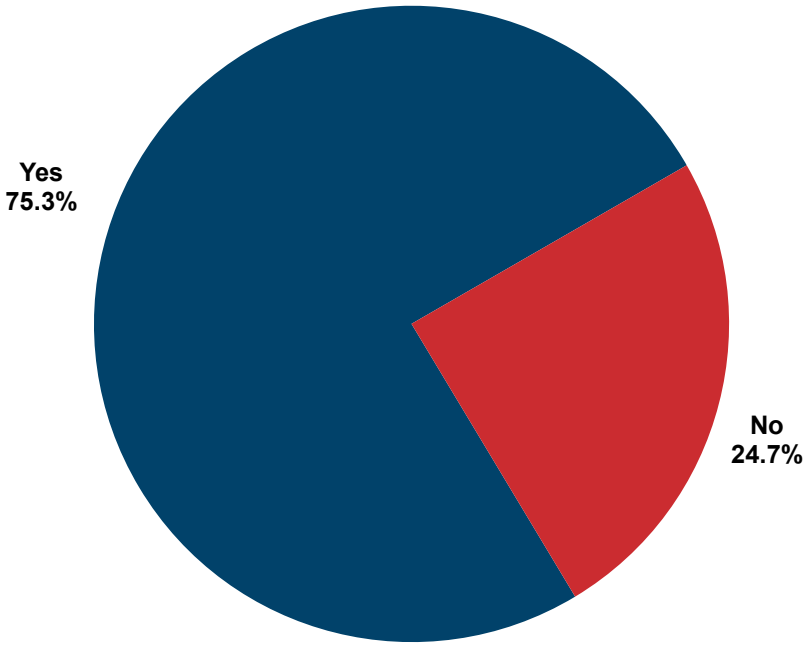



Source: 2023 NTCA–Broadband/Internet Availability Survey

- Fewer than four in 10 respondents (38.4%) indicated that they were experiencing an inability or delay in procuring equipment, fiber, and/or other supplies needed for communications network deployment.
- Of those experiencing issues, seven in 10 (70.3%) are experiencing problems procuring network electronic components and slightly less than that (67.6%) report problems procuring Customer Premises Equipment (including ONTs and routers).
- Another six in 10 (62.2%) report that they are either unable to acquire or are delayed in procuring fiber.
- The impact of these delays or the inability to procure equipment, fiber, and/or other supplies has resulted in delayed network construction for 62.7% of responding companies affected by such issues, and 61.3% report that it is taking longer to replace older equipment.
- Almost half of respondents experiencing issues (48.0%) report that installation of service at customer premises has been delayed.
- Only 12.0% of those that have experienced issues procuring equipment, fiber, and/or other 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: 2023 NTCA–Broadband/Internet Availability Survey

- Three-quarters of respondents (75.3%) offer competitive broadband service outside of their ILEC service area, a slight increase from last year (72.0%).

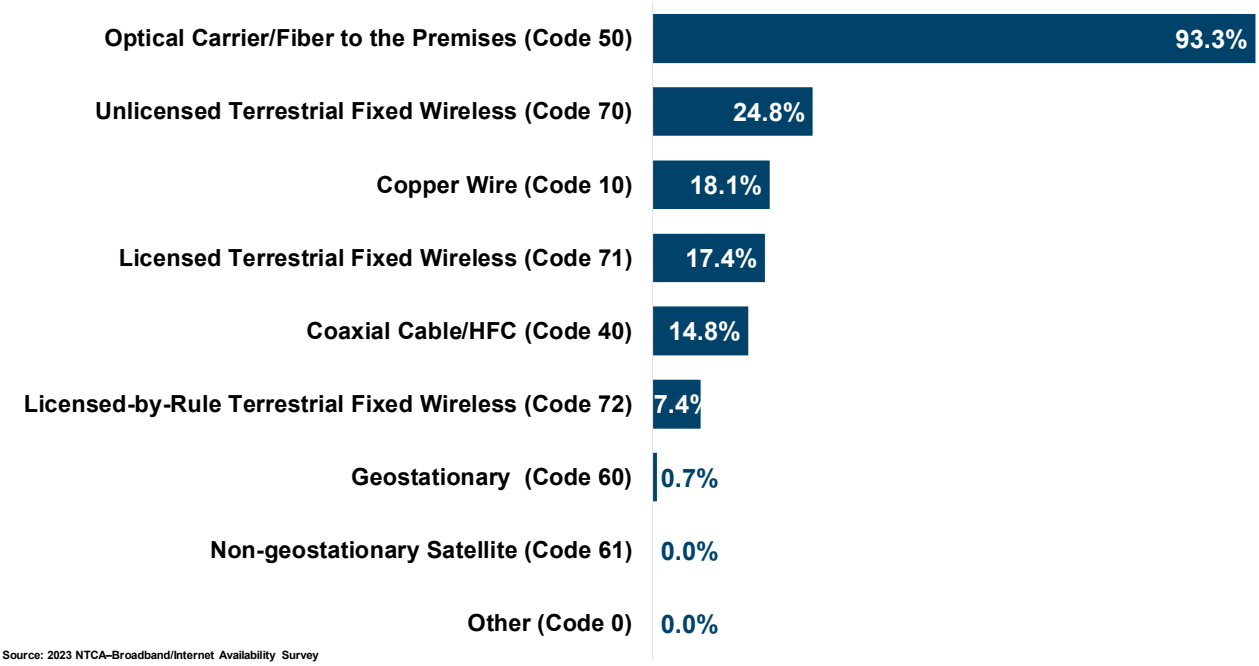
## Fixed Broadband Connections in Competitive ISP Operation

| Competitive Broadband | 2023 Mean | |
|---|---|---|
| | Residential | Business |
| Number of fixed broadband connections | 2,268 | 508 |

Source: 2023 NTCA–Broadband/Internet Availability Survey

- Responding companies report that their competitive ISP operations have an average of 2,268 residential fixed broadband connections and 508 business fixed broadband connections in service outside of their ILEC service area.

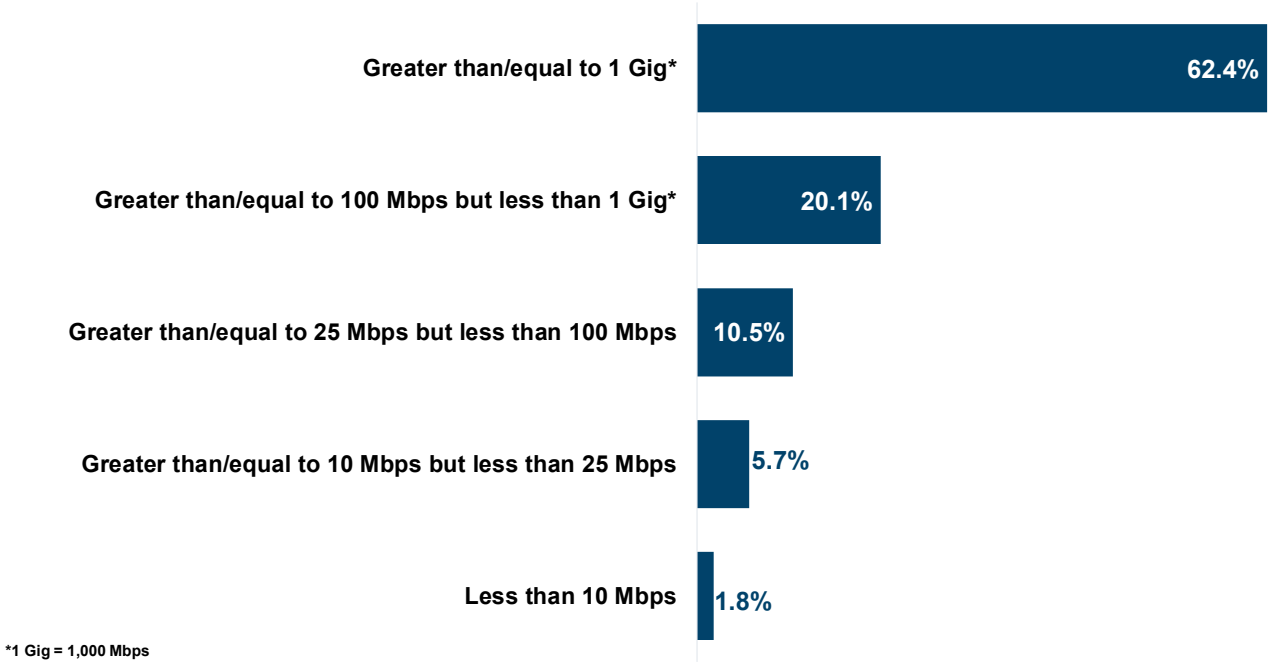
# Technologies Competitive ISPs Using to Provide Fixed Broadband Service Outside of ILEC Service Area




Source: 2023 NTCA–Broadband/Internet Availability Survey

- Most all (93.3%) respondents who offer competitive broadband service outside of their ILEC service area indicate that their competitive ISP is using Optical Carrier/Fiber to the Premises (Code 50), a slight decrease from the 94.7% who said the same in 2022. Approximately one-quarter (24.8%), say their competitive ISP is using Unlicensed Terrestrial Fixed Wireless (Code 70), an increase from 2022 when 19.9% reported using this technology. Another 18.1% are using Copper Wire (Code 10), a decrease from 19.9% who reported using this technology in 2022. The survey also indicates that 17.4% are using Licensed Terrestrial Fixed Wireless (Code 71) and 14.8% are using Coaxial Cable/HFC (Code 40). (Percentages add to more than 100% because members report using multiple technologies to offer competitive service outside of their ILEC area.)
- Geostationary Satellite (Code 60) is used very infrequently (0.7%).

## Maximum *Downstream* Speed Availability to Competitive ISP's Customer Base

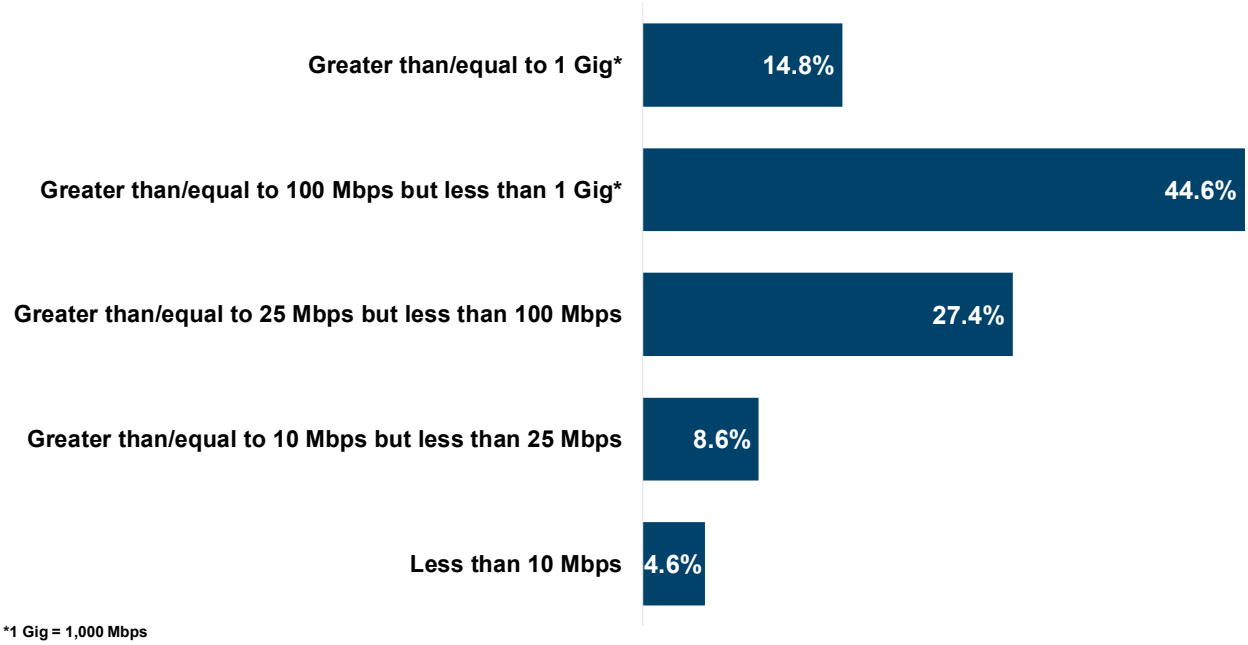



*1 Gig = 1,000 Mbps

Source: 2023 NTCA–Broadband/Internet Availability Survey

- Responding companies who offer competitive broadband service outside their ILEC service area say that 62.4% (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 20.1% 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 (10.5%) and greater than or equal to 10 Mbps but less than 25 Mbps (5.7%). The remaining 1.8% can receive downstream service at a maximum speed of less than 10 Mbps.

## *Downstream* Broadband Adoption by Competitive ISP's Customer Base

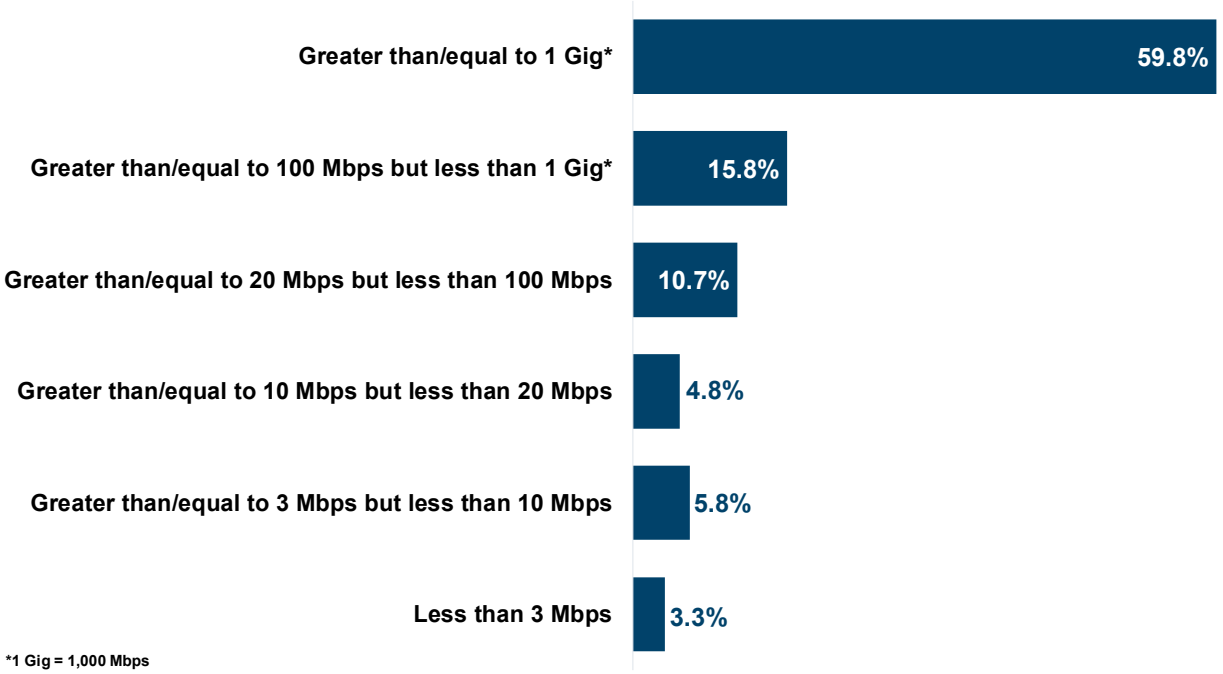



*1 Gig = 1,000 Mbps

Source: 2023 NTCA–Broadband/Internet Availability Survey

- An average of 14.8% of responding companies' competitive ISP customer base subscribes to a maximum speed of greater than or equal to 1 Gig, 44.6% subscribe to a maximum speed greater than or equal to 100 Mbps but less than 1 Gig, and 27.4% subscribe to a maximum speed that is greater than or equal to 25 Mbps but less than 100 Mbps. Smaller percentages subscribe to each of the slower ranges (8.6%, on average, subscribe to maximum service greater than or equal to 10 Mbps but less than 25 Mbps, and 4.6% subscribe to maximum service of less than 10 Mbps).

## Maximum *Upstream* Speed Availability to Competitive ISP's Customer Base

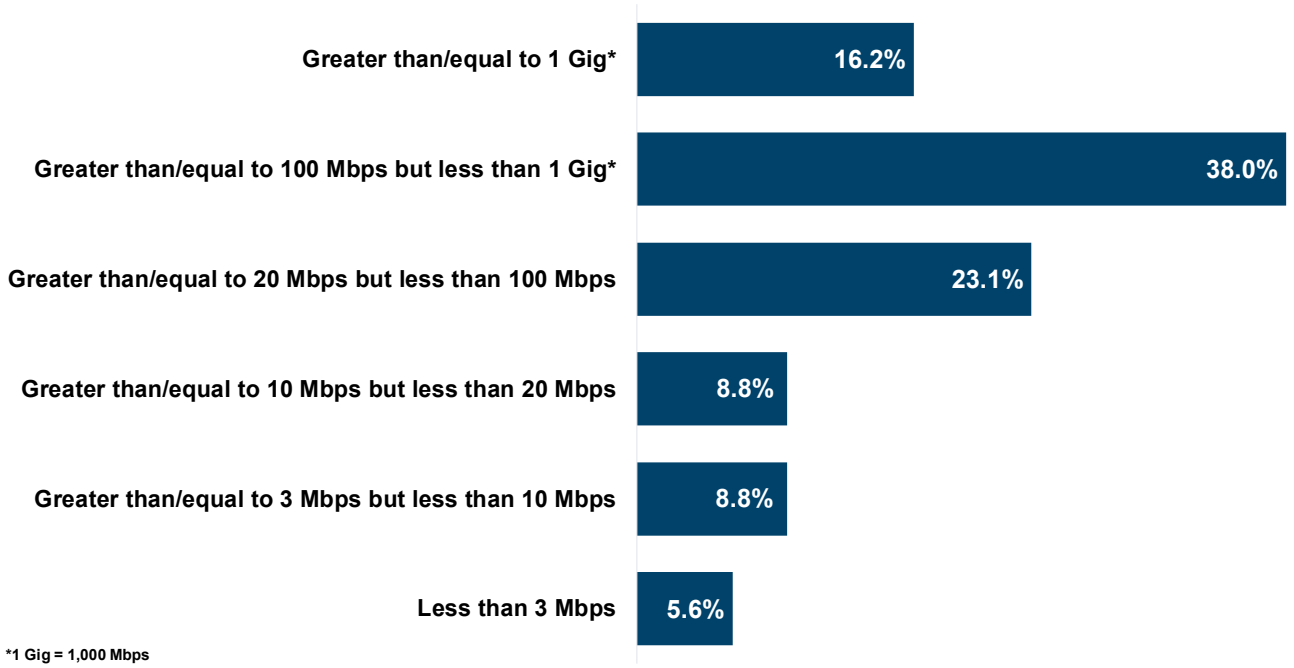



*1 Gig = 1,000 Mbps

Source: 2023 NTCA–Broadband/Internet Availability Survey

- Approximately six in 10 (59.8% average) responding companies who offer competitive broadband service outside their ILEC service area report that their competitive ISP's customer base can receive a maximum upstream service at a speed that is greater than or equal to 1 Gig, and less than one in six (15.8%) can receive upstream service at a maximum speed greater than or equal to 100 Mbps but less than 1 Gig. Smaller proportions can receive upstream service at a maximum speed that is greater than or equal to 20 Mbps but less than 100 Mbps (10.7%), greater than or equal to 10 Mbps but less than 20 Mbps (4.8%), and greater than or equal to 3 Mbps but less than 10 Mbps (5.8%). The remaining 3.3% can receive upstream service at a maximum speed of less than 3 Mbps.

## Maximum *Upstream* Speed Adoption by Competitive ISP's Customer Base




*1 Gig = 1,000 Mbps

Source: 2023 NTCA–Broadband/Internet Availability Survey

- Of responding companies' competitive ISP customer bases, an average of 16.2% subscribe to a maximum upstream speed of greater than or equal to 1 Gig, 38.0% subscribe to maximum upstream speed greater than or equal to 100 Mbps but less than 1 Gig, and 23.1% subscribe to a maximum upstream speed that is greater than or equal to 20 Mbps but less than 100 Mbps. Smaller percentages subscribe to each of the slower ranges—8.8%, on average, subscribe to maximum service greater than or equal to 10 Mbps but less than 20 Mbps as well as greater than or equal to 3 Mbps but less than 10 Mbps; 5.6% subscribe to maximum service of less than 3 Mbps.

## Competition in ILEC Service Areas

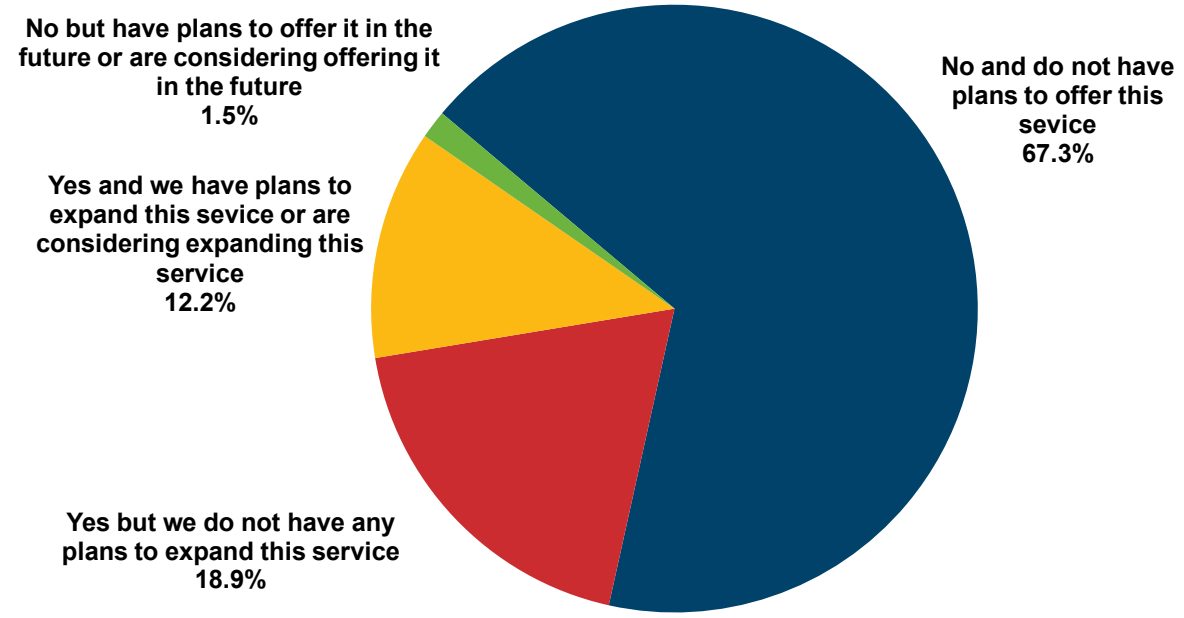
| Type of Providers | Fixed Terrestrial Broadband Providers in Service Area | |
|---|---|---|
| | Mean | % of ILECs Reporting Competition in Service Area |
| Cable Companies | 1 | 60.6% |
| Electric Utilities | 1 | 19.4% |
| Fixed Wireless ISPs (WISPs) using licensed spectrum | 2 | 63.4% |
| WISPs using unlicensed spectrum | 2 | 46.9% |
| Other | 3 | 21.1% |

Source: 2023 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 six in 10 (63.4%) indicate that fixed wireless ISPs (WISPs) using licensed spectrum operate within some portion of their service areas, and 60.6% said the same about cable companies. Nearly half (46.9%) report that WISPs using unlicensed spectrum are a competitor in their service area. Just 19.4% identify electric utilities as offering broadband in some portion of their service areas and 21.1% said the same about other types of providers.
- Respondents estimate that fixed service competitor(s) offer broadband at speeds of 100 Mbps downstream/20 Mbps upstream or greater at prices comparable to them, on average, to 25.9% of their ILEC service area. This percentage decreases to 20.0% for those competitor(s) offering broadband at speeds of 100 Mbps symmetrical or greater at prices comparable to respondents' prices.

# FIXED WIRELESS BROADBAND SERVICES

## Offer Fixed Wireless Broadband Service




Source: 2023 NTCA–Broadband/Internet Availability Survey

- Approximately two-thirds of respondents (67.3%) indicate that they do not offer fixed wireless broadband service and do not have plans to offer it in the future.
- Nearly two in 10 respondents (18.9%) offer this service but do not plan to expand it in the future, and 12.2% offer this service and either have plans to expand it or are considering expansion.

# Licensed Spectrum Bands Used or Have Plans to Use

| | 2023 Mean |
|---|---|
| Low-band spectrum, less than 1 GHz (e.g., 600 MHz, 700 MHz, 800 MHz Cellular/SMR) | 32.1% |
| Mid-band spectrum, 1-6 GHz (e.g., AWS, PCS, 2.5 EBS, 3.5 CBRS) | 92.9% |
| High-band or mmWave spectrum, above 6 GHz (e.g., 24 GHz, 28 GHz) | 10.7% |

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

Source: 2023 NTCA–Broadband/Internet Availability Survey

- Respondents who offer or have plans to offer fixed wireless broadband using licensed spectrum use or have plans to use mid-band spectrum, 1-6 GHz (e.g., AWS, PCS, 2,5 EBS, 3.5 CBRS) most often (92.9%). Close to one-third (32.1%) use or have plans to use low-band spectrum, less than 1 GHz (e.g., 600 MHz, 700 MHz, 800 MHz Cellular/SMR). Only one in 10 (10.7%) use or have plans to use high-band or mmWave spectrum, above 6 GHz (e.g., 24 GHz, 28 GHz).

# Unlicensed Spectrum Bands Used or Have Plans to Use

| | 2023 Mean |
|---|---|
| Low-band spectrum, less than 1 GHz (e.g., 600 MHz TV White Spaces, 900 MHz) | 16.3% |
| Mid-band spectrum, 1-6 GHz (e.g., 2.4 GHz, 3.6 CBRS GAA, 5.8 GHz, 6 GHz) | 91.8% |
| High-band or mmWave spectrum, above 6 GHz (e.g., 24 GHz or higher) | 16.3% |

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

Source: 2023 NTCA–Broadband/Internet Availability Survey

- Respondents who offer or have plans to offer fixed wireless broadband using unlicensed spectrum most often use or plan to use mid-band spectrum, 1-6 GHz (e.g., 2.4 GHz, 3.6 CBRS GAA, 5.8 GHz, 6 GHz), with 91.8% saying so. Approximately one in six (16.3% each) use or plan to use either low-band spectrum, less than 1 GHz (e.g., 600 MHz TV White Spaces, 900 MHz) and/or high-band or mmWave spectrum, above 6 GHz (e.g., 24 GHz or higher).

## Internet Backbone/Middle Mile

| | 2022 Mean | 2023 Mean |
|---|---|---|
| Number of miles from primary internet backbone connection | 94 | 108 |
| Number of middle mile transport providers available | 3 | 3 |

Source: 2023 NTCA–Broadband/Internet Availability Survey

- On average, respondents report being 108 miles from their primary internet backbone connection in 2023, which is a longer distance than the average reported in 2022 (94 miles). They also can choose to take service from an average of three middle mile transport providers, the same average reported in 2022.

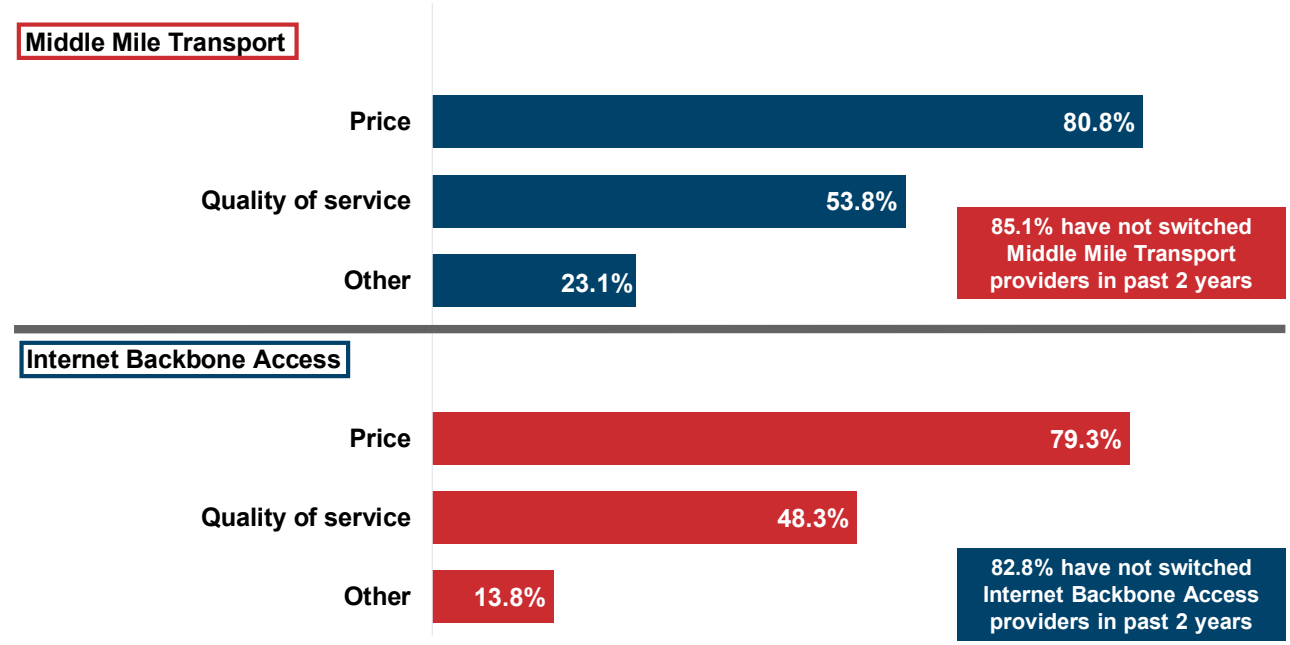
## Middle Mile Bandwidth

| | 2022 Mean | 2023 Mean |
|---|---|---|
| Middle mile bandwidth (in GB) currently subscribe to | 54 GB | 63 GB |
| Number of years expect this capacity to remain sufficient | 2.3 Years | 2.3 Years |

Source: 2023 NTCA–Broadband/Internet Availability Survey

- Respondents currently subscribe to an average of 63 GB of guaranteed middle mile bandwidth (compared to 54 in GB 2022, 32 GB in 2021, 38 GB in 2020, and 25 GB in 2019) and pay an average of $798 per gigabyte (compared to $813 in 2022, $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: 2023 NTCA–Broadband/Internet Availability Survey

- More than eight in 10 (85.1%) responding companies report that they have not switched middle mile transport providers in the past two years, while a similar percentage (82.8%) have not switched internet backbone access providers.
- For those who have switched middle mile transport providers in the past two years, 80.8% named price as the reason for switching, down from 87.9% in 2022 and more similar to 78.1% reported in both 2021 and 2020. Price was also the main reason for switching internet backbone access providers, with 79.3% citing this reason, a decrease from the percentage reporting this reason in 2022 (90.5%) but the same percentage as reported in 2021 (79.3%).
- The percentage of respondents switching middle mile transport providers because of quality of service is 53.8%, up from 45.5% in 2022 and 31.2% in 2021. Similarly, the proportion switching internet backbone providers for quality of service is 48.3%, higher than recently observed (35.7% in 2022 and 37.9% in 2021).

## Video Service(s)

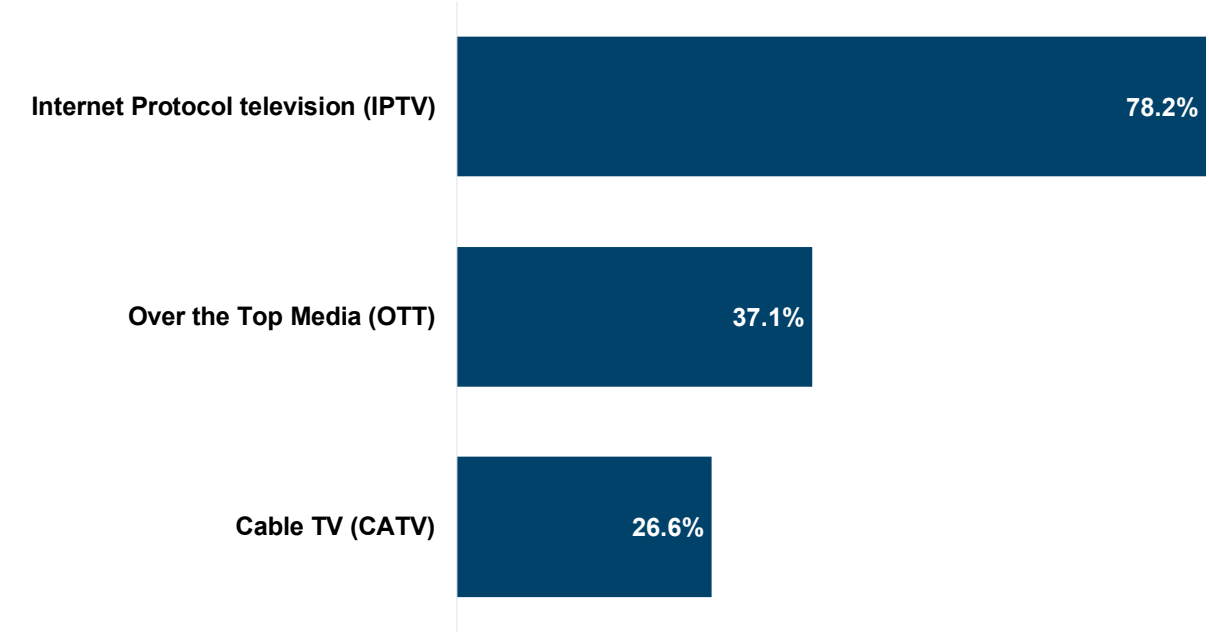
| | Mean |
|---|---|
| Number of subscribers for Cable TV (CATV) | 2,650 |
| Number of subscribers for Internet Protocol Television (IPTV) | 1,927 |
| Number of homes passed or otherwise capable of connecting with video service(s) | 13,061 |

Source: 2023 NTCA–Broadband/Internet Availability Survey

- Responding companies report that an average of 2,650 customers currently subscribe to respondents' Cable TV (CATV) service and an average of 1,927 customers subscribe to Internet Protocol Television (IPTV), while an average of 13,061 homes are passed or otherwise have the ability to connect with respondents' 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 (22.5%) indicate that 10% or less of households in their service area cannot receive an over-the-air broadcast signal, 8.6% say it is 11 to 25% of households, 10.2% say it is 26 to 50%, 9.6% say it is 51 to 75%, and 16.0% indicate that more than 75% of service area households cannot receive an over-the-air broadcast signal. Just under one-third (33.2%) say this percentage is unknown.

# Types of Video Services Offered*

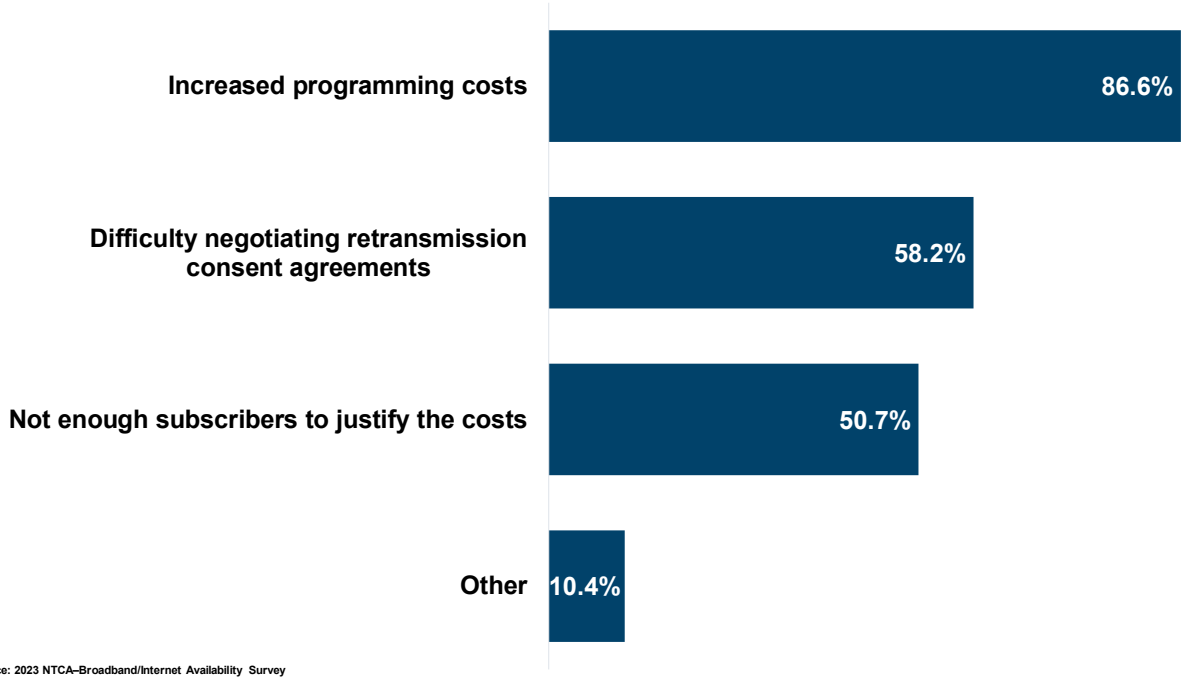
**(*Percentages based on respondents currently offering video service)**




Source: 2023 NTCA–Broadband/Internet Availability Survey

- Respondents who currently offer video service to their customers most frequently (78.2%) offer Internet Protocol Television (IPTV).
- Over the top media (OTT) is offered by more than one-third (37.1%) of responding companies that offer video service, and another 26.6% report offering Cable TV (CATV). 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 seven in 10 (70.8%) say they will likely continue to do so for the foreseeable future; more specifically, 34.0% say they are very likely to continue and 36.8% say they are somewhat likely. Only 17.9% say they are not very likely to continue offering CATV or IPTV service, and 11.3% report that they already have plans to discontinue this service.
- More than one-third (36.7%) of responding companies do not currently offer video service to their customers.

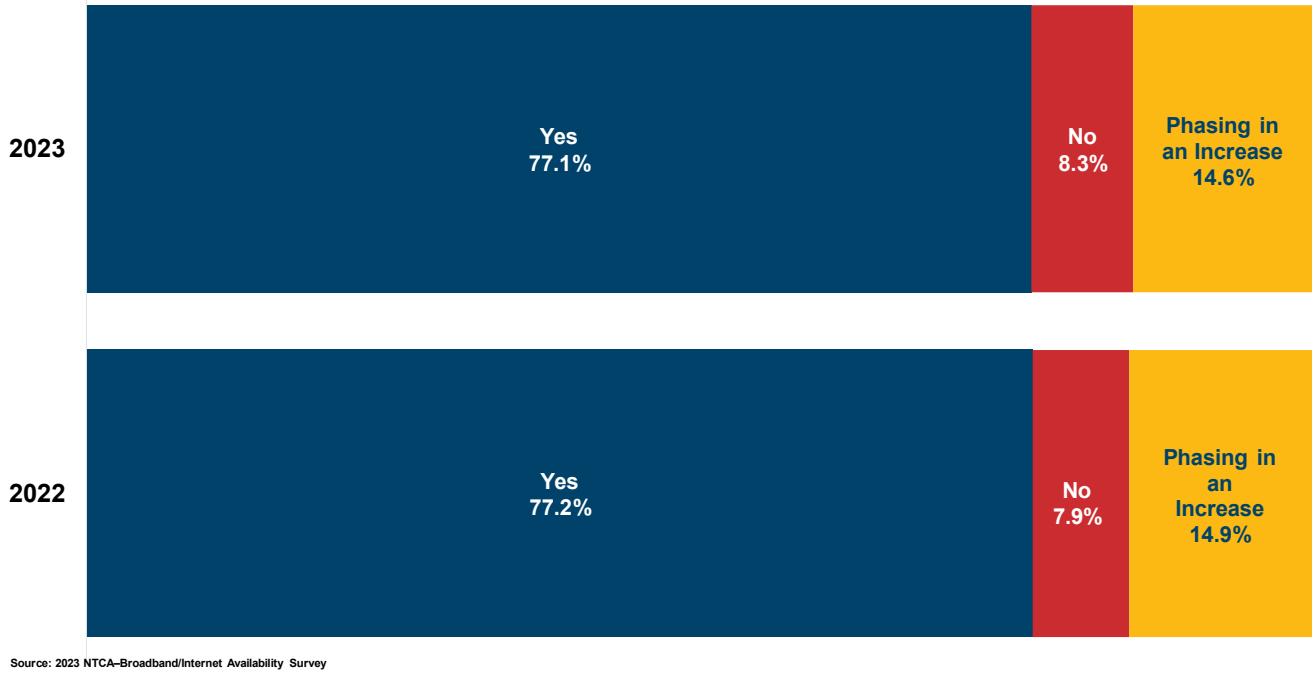
# Reasons for Discontinuing CATV or IPTV Services




Source: 2023 NTCA–Broadband/Internet Availability Survey

- Responding companies who reported having plans to discontinue, or are considering discontinuing, video service cite increased programming costs (86.6%) as the reason, although nearly six in 10 also cite difficulty negotiating retransmission consent agreements (58.2%) and one-half cite not having enough subscribers to justify the costs (50.7%).

# Total Retransmission Fee Increase Passed on to Video Subscribers




Source: 2023 NTCA–Broadband/Internet Availability Survey

- In respondents' most recent retransmission consent agreements, retransmission consent fees increased by an average of $78,022 total dollars. In 2022, average retransmission consent fees increased by $71,545.
- More than three-quarters (77.1%) of responding companies report that they passed the increase in retransmission consent fees on to their subscribers, nearly the same as reported in 2022 (77.2%). Slightly more than one in seven (14.6%) are phasing in an increase, similar to the 14.9% who planned to phase in the increase in 2022.
- The average percentage of total operating expenditures that went toward retransmission consent fees in 2023 was 27.9%, a decrease when compared to the 36.2% reported in 2022.

# CONCLUSIONS

- **NTCA members maintain their fiber deployments and offer more robust broadband services as more consumers demand higher speeds.** The average proportion of customers served by fiber-to-the premises connections continues to be high, with more than 80% on average served by this technology. In turn, more than eight in 10 customers (84%), on average, have access to 100 Mbps or higher downstream broadband speed, compared to 81.9% in 2022 and 75.6% in 2021. The biggest increase this year comes again in the Gigabit tier, where respondents report that an average of 67.1% of their customer base can receive a maximum downstream speed for fixed broadband greater than or equal to 1 Gig, up from 60.9% reported in 2022 and 55.4% 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 58.6% this year compared to 48.9% in 2022 and 37.3% in 2021. In fact, the percentage of respondents' customers who subscribe to a maximum broadband downstream speed of greater than or equal to 100 Mbps but less than 1 Gig has increased from 36.7% in 2022 to 48.5% this year.
- **Cost of deployment continues to represent the most significant barrier to widespread fiber deployment in rural America**, with 93.8% of respondents citing this as a significant barrier in 2023, up from the 88.1% reported in 2022 and 81.7% in 2021. Other significant challenges include longer distances to customer premises, regulatory uncertainty, and supply chain delays. Previously reported as long loops, longer distances to customer premises was reported as a barrier by 66.2% of respondents this year, which is an increase from the 55.9% reported in 2022 and 37.3% in 2021. Respondents experiencing an inability or delay in procuring equipment, fiber, and/or other supplies needed for communications network deployment reported most often and more specifically that network electronic components, customer premises equipment (including ONTs and routers) and fiber were affected, and that there were delays in network construction and a longer time for replacing older equipment as a result of these delays.
- **NTCA members persist in providing higher speeds of broadband service to anchor institutions in their communities.** Respondents report providing fixed broadband service to all public libraries, hospitals/medical clinics, and 911 call centers in their service area, as well as to most primary/secondary schools, public safety entities (police, fire, etc.), community colleges, and state universities and extensions. The maximum speed of broadband available to anchor institutions in respondents' service area has continued to increase, with an average of 3,197 Mbps in 2023 compared to 2,025 Mbps in 2022 and 1,730 Mbps in 2021. The average speed purchased by those institutions increased again in 2023 to 453 Mbps, up from 336 Mbps in 2022.
- **Most NTCA members offer the Affordable Connectivity Program (ACP) to their customers**, but adoption continues to be a challenge. Of the 84.4% that offer the ACP to their customers, 97% reported that 0%–20% of all of their customers have signed up for the discounted program.
- **Of those NTCA members that offer video services, most do so through Internet Protocol Television (IPTV).** Almost eight in 10 of responding companies that offer video services offer IPTV to an average of 1,927 subscribers. Respondents who reported having plans to discontinue, or are considering discontinuing, CATV or IPTV services cite increased programming costs, followed by difficulty negotiating retransmission consent agreements, as the reason. The average total amount paid by these providers in the most recent retransmission consent agreements increased by $78,022, while 77.1% report that the total retransmission fee increase is passed on to their video subscribers.