NTCA 2015 BROADBAND/INTERNET AVAILABILITY SURVEY REPORT

July 2016

DISCLAIMER: Data from the survey has been presented as reported.

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EXECUTIVE SUMMARY

For a decade and a half, NTCA–The Rural Broadband Association has conducted its annual Broadband/Internet Availability Survey to gauge the deployment rates of advanced services by its member companies. In the spring of 2016, NTCA sent an electronic survey form to each of the companies (as reflected at the holding company level) in NTCA's e-mail database; 131 members (22%) responded.

One hundred percent of the 2015 survey respondents offer broadband to some part of their customer bases, compared with the 58% of the 2000 survey respondents who offered the then-lower definition of broadband service.[1] Respondents indicated that they use a variety of technologies within their respective serving areas to provide at least basic levels of broadband to their customers. Forty-nine percent of respondents' broadband customers are served via fiber to the home (FTTH), 29% via copper loops, 15% cable modem, 6% fiber to the node (FTTN), 1% licensed and unlicensed fixed wireless, and 0.1% satellite.

Fifty-five percent of those survey respondents currently deploying fiber serve at least 50% of their customers with FTTH, while 26% serve 20% of their customers or less via such technology. Seventy-four percent of survey respondents indicated they had a long-term fiber deployment strategy. Fifty percent of those respondents with a fiber deployment strategy plan to offer fiber to the node to more than 75% of their customers by year-end 2018, while 78% plan to offer fiber to the home to at least 50% of their customers over the same time frame. An additional 40% have already completed fiber deployments to all customers.

Deployment cost remains the most significant barrier to widespread deployment of fiber, followed by regulatory uncertainty, long loops, current regulatory rules, obtaining financing, low customer demand, fiber order fulfillment delays, and obtaining cost-effective equipment. Throughout the history of the survey, deployment cost has been respondents' most significant concern.

Approximately 0.3% of respondents' customers can receive a maximum downstream speed of between 768 kbps and 1.0 megabit per second (Mbps), 0.4% 1.0 to 1.5 Mbps, 1.6% 1.5 to 3.0 Mbps, 3.4% 3.0 to 4.0 Mbps, 2.3% 4.0 to 6.0 Mbps, 7.0% 6.0 to 10.0 Mbps, 13.7% 10.0 Mbps to 25.0 Mbps, and 71.3% greater than 25.0 Mbps.

Nearly thirty-nine percent of survey respondents' customers taking broadband subscribe to service greater than or equal to 10 Mbps downstream. The next most popular speed

[1] For the purpose of the 2015 survey, broadband was defined as throughput of at least 3 Mbps in one direction. This was an update from earlier NTCA Broadband Surveys, which defined broadband as throughput of at least 768 kbps (from 2009 through 2013) or 200 kbps (from 2000 through 2008) in one direction.

tiers are 6.0 Mbps to 10.0 Mbps (9.6%), and 4.0 Mbps to 6.0 Mbps (6.5%). The overall take rate for broadband service is 73% (up slightly from 70% last year).

The average respondent is 78 miles from its primary Internet connection; the median respondent is 48 miles away. Ninety-one percent of those who recently changed backbone providers did so for price reasons. Seventy-nine percent of respondents indicated they are generally satisfied with their current backbone access provider, while 21% are generally dissatisfied.

Survey respondents indicated they face some type of competition in selected portions of their serving areas from national Internet service providers (ISPs), cable companies and fixed and/or mobile wireless Internet service providers (WISPs.) Respondents are taking numerous marketing steps to increase broadband take rates, including bundling of services, free customer premise equipment installation, price promotions, free introductory service, free modems, and free education and training. Eighty-one percent of respondents find it difficult to compete with price promotions offered by competitors.

Thirty-one percent of respondents currently offer voice over Internet protocol (VoIP) service, unchanged from last year. Thirty-eight percent of respondents not currently offering VoIP have plans to do so in the foreseeable future, down from 48% last year. Seventy-two percent of respondents offer video service to their customers, down slightly from 73% last year.

INTRODUCTION

In the spring of 2016, NTCA–The Rural Broadband Association surveyed its members on their activities in the areas of providing broadband services and Internet availability to their members/customers. NTCA is a national association representing more than 850 rural rate of return regulated operating company telecommunications providers in 45 states. All NTCA members are small carriers that are "rural telephone companies" as defined in the Communications Act of 1934, as amended by the Telecommunications Act of 1996. Only four NTCA member companies serve 40,000 lines or more; the largest serves just over 65,000. Population density in most member service areas is generally in the 1 to 5 customers per square mile range.

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.[2] This year's survey asked about technologies used to provide broadband service, broadband availability and subscription rates, prices charged, quantity and type of competition, broadband marketing

[2] Copies of this and previous NTCA survey reports may be downloaded from the NTCA web site, www.ntca.org.

efforts, fiber deployment, emerging technologies, Internet backbone connections, finance and availability of capital. The survey also provided an opportunity for respondents to provide any specific comments they wished to share.

OVERVIEW OF SURVEY

The 2015 NTCA Broadband/Internet Availability Survey was conducted online. Every effort was made to minimize the reporting burden on the survey respondents.

The survey was composed of general questions about the respondent's current operations, competition/marketing and current and planned fiber deployment. Additional questions dealt with the Internet backbone, voice over Internet protocol (VoIP) and video. The survey also provided an opportunity for respondents to offer any miscellaneous thoughts.

SURVEY RESULTS

The survey URL for each part of the survey was distributed via e-mail to all member companies in NTCA's e-mail database. The message contained instructions for online access to the survey. Responses were received from 131 member companies, a 22% response rate.[3]

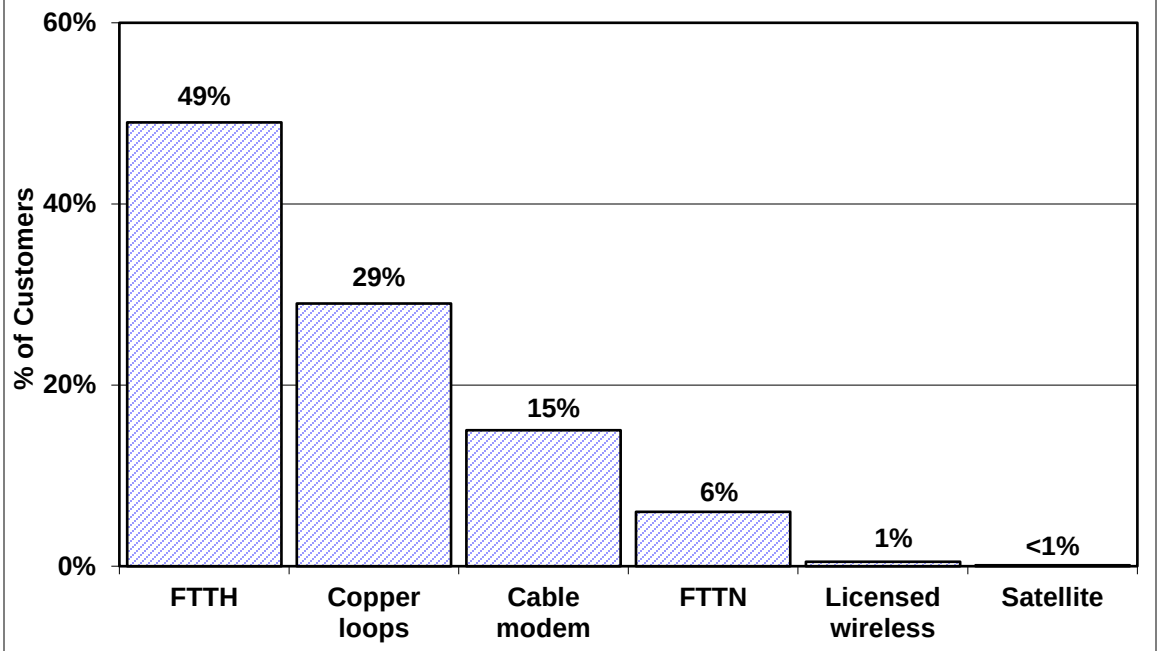
Forty-nine percent of survey respondents' service areas are 500 square miles or larger; 23% are at least 2,000 square miles. Two-thirds—66%—have customer densities in their service area of 10 residential customers per square mile or less. More than one-third—35%—have customer densities of two residential customers per square mile or less.

The average survey respondent serves 4,301 residential and 1,717 business voice grade access lines; a few larger companies skew these numbers upward, hence the median respondent serves 2,019 residential and 584 business lines. One hundred percent of survey respondents offer broadband service to some part of their customer base.[4] Respondents indicated that they use a variety of technologies, even within individual serving areas, to offer at least basic levels of broadband to their customers: 49% of respondents' customers are served via fiber to the home (FTTH), 29% via copper loops, 15% cable modem, 6% fiber to the node (FTTN), 0.5% fixed wireless, and 0.1% satellite. (See Figure 1.)

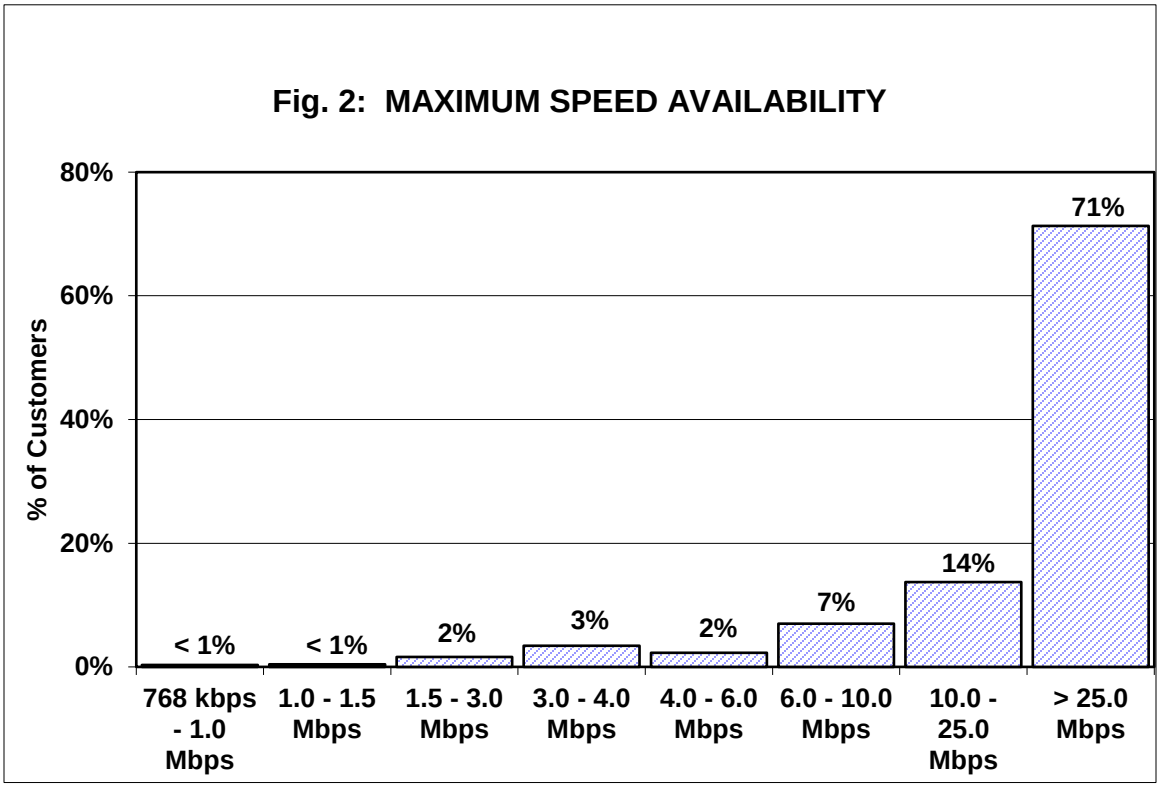
[3] Based on the sample size, results of this survey can be assumed to be accurate to within ± 7% at the 95% confidence level.

[4] For the purpose of this survey, broadband is defined as throughput of at least 3 Mbps in one direction.

Fig. 1: CUSTOMERS SERVED BY NETWORK PLATFORM

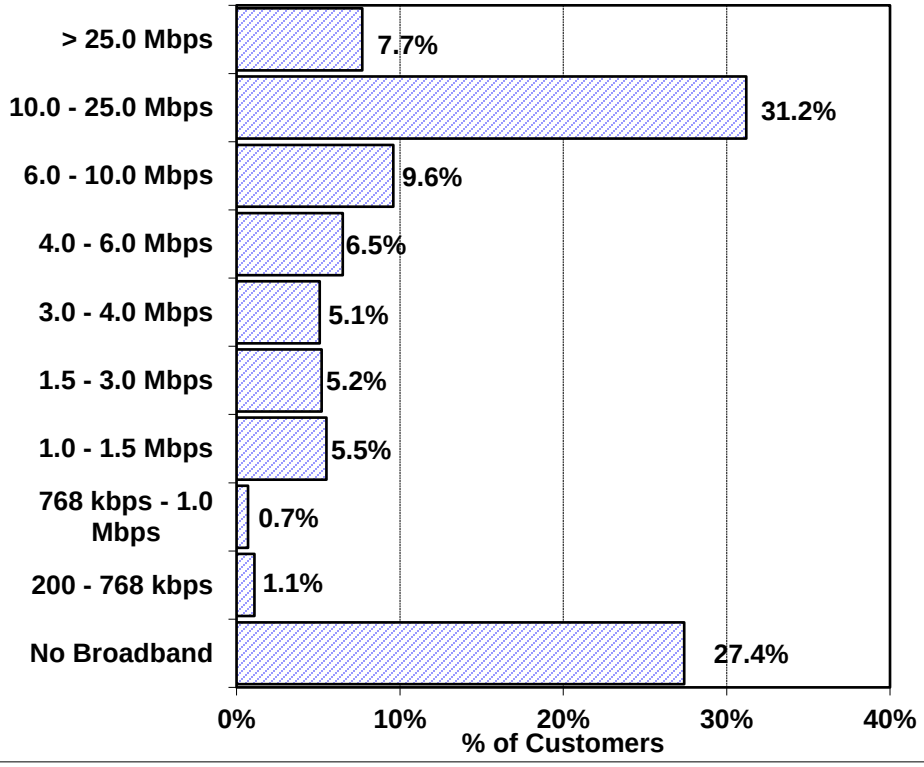


Approximately 0.3% of respondents' customers can subscribe to a maximum speed 768 kbps to 1.0 megabits per second (Mbps) service, 0.4% to 1.0 to 1.5 Mbps, 1.6% to 1.5 to 3.0 Mbps, 3.4% to 3.0 to 4.0 Mbps, 2.3% to 4.0 to 6.0 Mbps, 7.0% to 6.0 to 10.0 Mbps, 13.7% to 10.0 to 25.0 Mbps, and 71.3% to greater than 25 Mbps service. (See Figure 2.)



Survey results indicate an overall broadband take rate from NTCA member companies of 73%, up slightly from 70% a year ago. By far, the most popular speed tier among survey respondents' broadband subscribers is between 10.0 Mbps and 25.0 Mbps—31.2% of survey respondents' customers subscribe to this level of service. Next most popular is 6.0 Mbps to 10.0 Mbps (9.6%), greater than 25.0 Mbps (7.7%), 4.0 Mbps to 6.0 Mbps (6.5%), 1.0 Mbps to 1.5 Mbps (5.5%), 1.5 Mbps to 3.0 Mbps (5.2%), 3.0 Mbps to 4.0 Mbps (5.1%), and less than 1.0 Mbps (1.8%.) Non-broadband subscribers make up 27.4% of survey respondents' customer base. (See Fig. 3.)

Fig. 3: BROADBAND TAKE RATES BY SPEED TIER



Typical prices charged range from $34.95 to $44.95 for cable modem service, $29.95 to $49.95 per month for DSL service, $39.95 to $49.95 for wireless broadband service, and $39.95 to $59.95 for fiber-based broadband service.

Thirty-nine percent of survey respondents indicated their customers may purchase so-called "stand alone DSL"—broadband service without a voice component. Take rates for stand alone DSL service are relatively low, however, with the majority of those respondents offering stand alone DSL reporting take rates of 10% or less.

Thirty-seven percent of respondents estimate that they could bring all of their customers currently receiving service below 25 Mbps up to that speed for between $1 million and $10 million in additional capital investment. An additional 24% could do so for between $20 million and $50 million, 16% at a cost of more than $50 million, 13% for $1 million or less, and 11% estimate the total cost would be between $10 million and $20 million.

Fiber Deployment

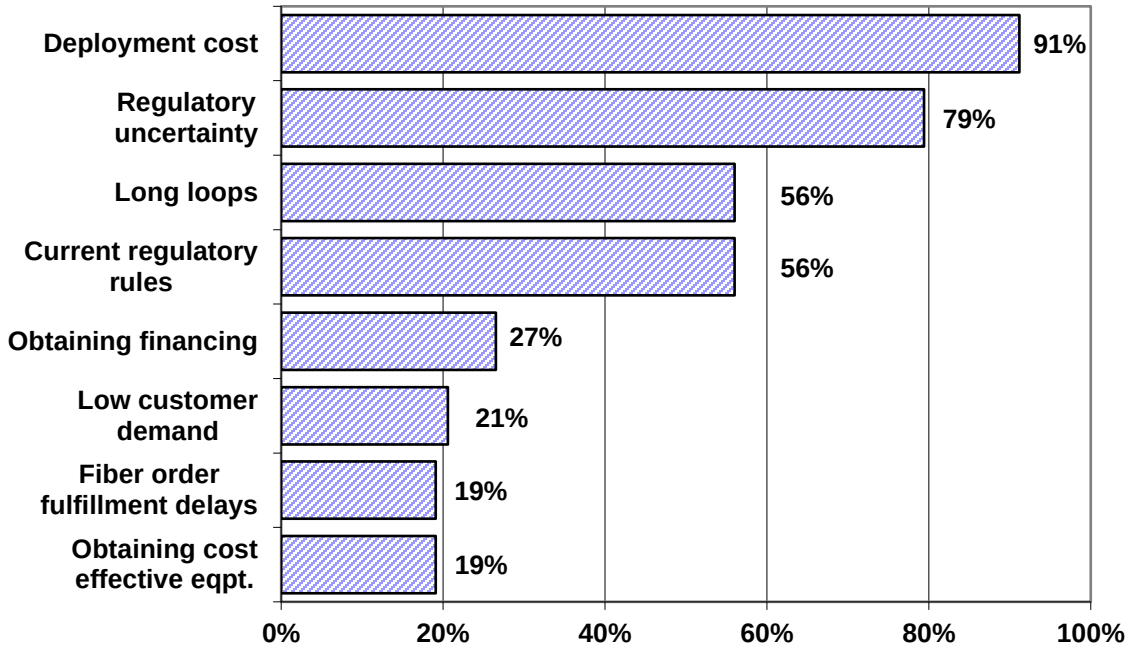
Fifty-five percent of those survey respondents currently deploying fiber serve at least 50% of their customers using fiber to the home (up from 45% last year), while 26% serve 20% of their customer base or less with fiber to the home (FTTH) technology (down from 29%.)

Survey respondents described their companies' plans to deploy fiber to the node (FTTN) and/or FTTH to their customers. Seventy-four percent of survey respondents indicated that they have a long-term fiber deployment strategy. Fifty percent of those survey respondents with a fiber deployment strategy expect to offer fiber to the node to more than 75% of their customers by the end of 2018. Seventy-eight percent of respondents expect to be able to provide FTTH to at least half of their customers by year-end 2018. An additional 40% have already completed fiber deployment to all of their customers.

Ninety-one percent of survey respondents identified the cost of fiber deployment as a significant barrier to widespread deployment. Regulatory uncertainty was the number two barrier (79%), followed by long loops (56%), current regulatory rules (56%), obtaining financing (27%), low customer demand (21%), fiber order fulfillment delays (19%) and obtaining cost-effective equipment (19%).[5] (See Figure 4.)

[5] Totals exceed 100% as respondents were allowed to select more than one barrier.

Fig. 4: BARRIERS TO FIBER DEPLOYMENT



Internet Backbone

Survey respondents are, on average 78 miles from their primary Internet connection; the median distance is 48 miles. Ninety-one percent of those respondents who recently switched Internet backbone access providers did so for price reasons, while 36% switched due to quality of service concerns and 18% for other reasons, such as the ability to add redundant routes.[6] Seventy-nine percent of respondents indicated they are generally satisfied with their current backbone access provider, while 21% are generally dissatisfied. Sixty-six percent of all survey respondents expect to need additional backbone capacity in one year or less.

Competition/Marketing

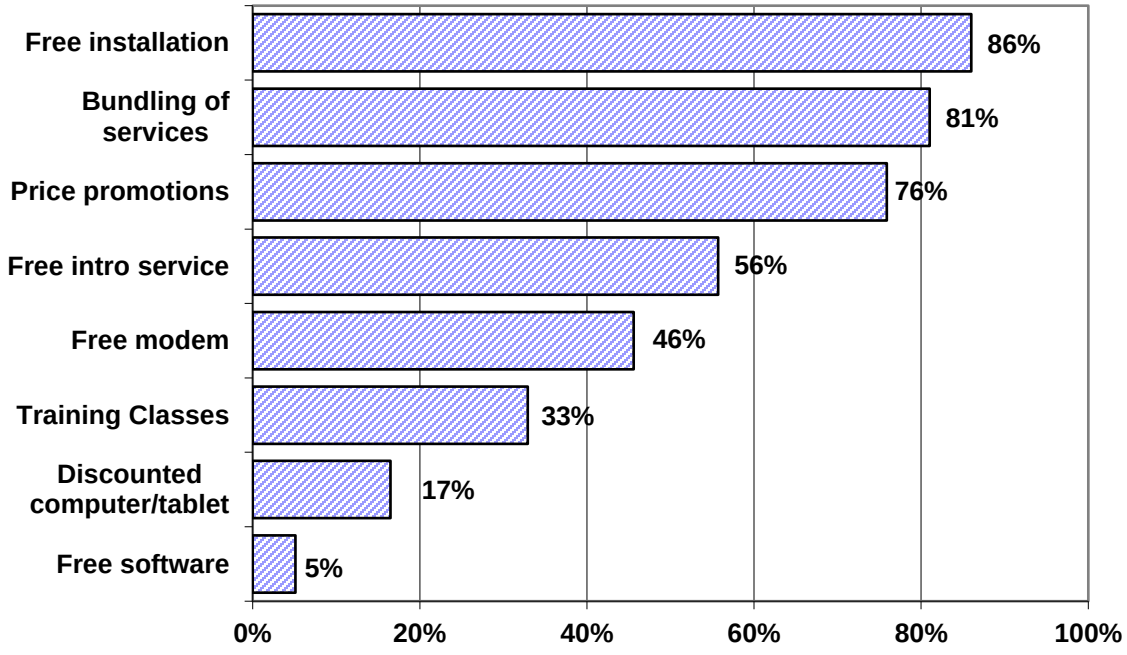
Virtually all survey respondents indicated that they face competition from at least one other service provider in some portion of their service area. Survey respondents typically compete with national ISPs, fixed and/or mobile wireless Internet service providers

[6] Totals exceed 100% as respondents were allowed to select more than one reason for switching providers.

(WISPs) and satellite broadband providers. Other potential competitors include cable companies, electric utilities, local ISPs and neighboring cooperatives.

Rural incumbent local exchange carriers are taking numerous steps in the marketing arena to increase broadband take rates. Eighty-six percent are offering free installation, 81% are bundling services, 76% are offering price promotions, 56% are offering free service for an introductory time period (such as 30 days), 46% are offering free modems, 33% are offering free education/training classes, 17% are offering discounted computers or tablets, and 5% are offering free software.[7] (See Figure 5.) Respondents consider their bundling of services, free installation and price promotions to be their most effective marketing promotions.

Fig. 5: BROADBAND MARKETING PROMOTIONS



[7] Totals exceed 100% as respondents' companies may be offering more than one marketing promotion.

Other Services

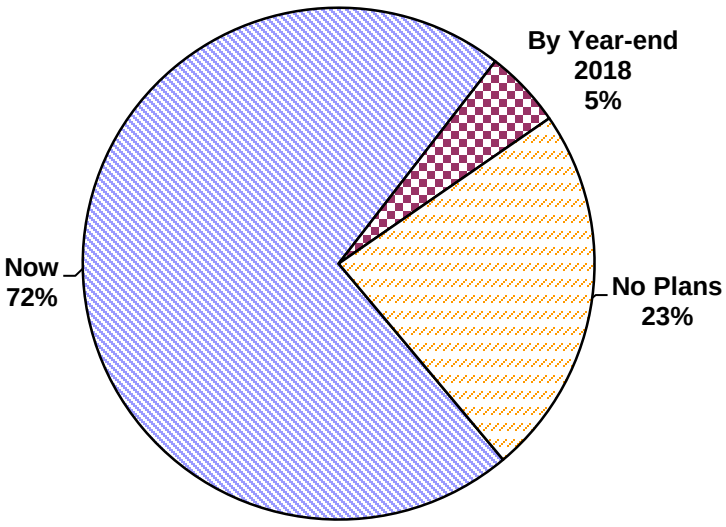
- **VoIP**

Thirty-one percent of survey respondents currently offer voice over Internet protocol (VoIP) service to their customers, unchanged from one year ago. Thirty-eight percent of those respondents not currently offering VoIP have plans to do so in the foreseeable future, down from 48% last year.

- **Video**

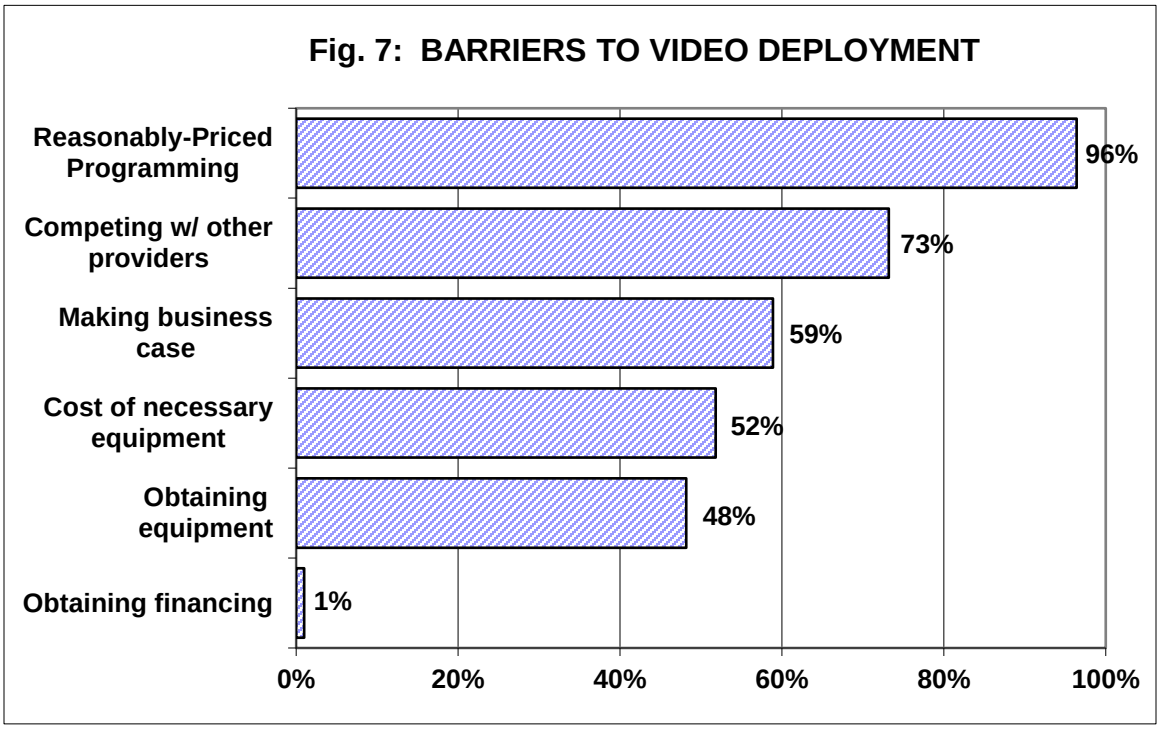
Seventy-two percent of survey respondents offer video service to their customers. Seventeen percent of those respondents not currently offering video (5% of all respondents) plan to do so by year-end 2018. The remaining 82% of those not currently offering video (23% of all respondents) currently have no plans to offer video service. (See Figure 6.) Fifty percent of those planning a future video offering intend to offer Internet protocol television (IPTV) service in the foreseeable future.

Fig. 6: OFFERING VIDEO SERVICE?



Of those respondents currently offering video services, 88% offer IPTV, and 46% offer legacy coax (CATV) service.[8] Twenty-seven percent of those providing CATV service use an analog system, while 73% use a digital system. The average respondent offers their customers three "tiers" of entertainment television packages from which to choose, unchanged from last year. Seventy-seven percent of the customers of those survey respondents offering video are able to watch programming on multiple devices, both inside and outside their home (i.e., "TV everywhere"), up from 60% last year.

The main barrier facing those survey respondents providing video service is access to reasonably-priced programming, as cited by 96% of survey respondents. Seventy-three percent cited difficulty competing with other providers, 59% the challenge of making a business case for video service, 52% the cost of necessary equipment, 48% difficulty obtaining necessary equipment, and 1% difficulty obtaining necessary financing.[9] (See Fig. 7.)



[8] Totals exceed 100% as respondents may offer more than one type of video service.
[9] Totals exceed 100% as respondents may be facing more than one barrier.

Miscellaneous

Survey respondents were asked what specific obstacles they have encountered in their efforts to deploy fiber to their customers, and how conditions would need to change to allow them to successfully overcome those obstacles. Their responses are presented in Appendix A of this report.

CONCLUSIONS

Despite the multitude of obstacles that small providers must face, fiber deployment continues to grow at an impressive pace. In the 2013 survey, 29% of respondents' customers were served by fiber to the home; in 2014, the percentage grew to 39%; and in this year's survey, almost half—49%--have access to FTTH service. This growth is all the more remarkable given the regulatory instability of the past several years. Clearly, these carriers recognize the importance of fiber to their network both now and in the coming future, and are taking the necessary steps to include it in their plans.

Due in no small part to increased fiber deployment, broadband speeds offered to customers continue to grow. In the 2013 survey, 66% of respondents' customers were able to subscribe to broadband speeds of 10 Mbps or greater. In the current survey, 85% have access to serve in excess of 10 Mbps, and 71% can subscribe to service of 25 Mbps or greater. The availability of robust and reliable broadband service plays a vital role in supporting the ongoing viability of rural America.

Respondents' customers continue to subscribe to higher speed broadband service. In the 2014 survey, the take rate for broadband service of 10 Mbps or greater was 34%; this year, the take rate was 39%--a gain of nearly 16%. This continued growth validates providers' decisions to make this service available, and allows them the necessary confidence to continue to invest in their networks in the years to come.

The ability to access reasonably-priced video content remains a significant concern for virtually all of those survey respondents offering video. The difficulties that small, rural carriers face in trying to negotiate for access to video content under reasonable terms are nearly ubiquitous, being cited as a significant challenge by 96% of respondents in this year's survey, as well as 98% and 99% in 2014 and 2013, respectively. This is a widespread problem that must be addressed if these providers are to be able to provide high quality video service to the customers in their rural service areas.

APPENDIX A

Q: What specific obstacles have you encountered in your efforts to deploy fiber to your customers, and how would conditions need to change to allow you to successfully overcome those obstacles?

Cost of deployment; regulatory stability & financing

Access to cash and cost to deploy. There is no rational business case for FTTH in rural areas.

Uncertain regulatory environment CAF funding Capital expenditure limits Financial position Expensive regulatory oversight Customers being "intentionally misinformed" by competitors.

Too much investment costs without knowing if we can adequately earn on and recover investment and operating costs.

The FCC has moved in the wrong direction in allocating USF funds. Unless they reform who needs to contribute there won't be enough money to support efforts to expand and maintain current investments.

Lack of fiber availability and costs to deploy have been our two biggest hurdles. Being a rural provider the costs to put fiber in the ground are very expensive.

Cost of deployment vs making a business case.

Weather Resources - manpower

Local Government

Regulatory uncertainty of funding and publicly subsidized over-builds. Changes are needed in accountability and a fair competitive market (Municipalities and PUDs, etc)

Construction costs in well-established neighborhoods & residential districts. Price resistance to higher bandwidth tiers across demographic segments. Older demographic (high % of retirees) resistant to technology.

Cost, long loops, time to install

Access to cash and cost to deploy.

Financial cost to deploy

Cost, RUS funding, fiber availability

The cost of construction, conversion costs, and the cost of additional equipment

Regulatory uncertainty, delays in obtaining fiber optics and uncertainty about continuing support of our network after the FTTH buildout is complete

Cost of deployment/build out and obtaining funding

Cost and density of homes

Cost

Cost. Simplified RUS financing

Currently getting RUS loan

Cost of deployment Cost of video programming Programmers need to decrease their programming costs and off the air providers need to decrease their retransmission fees