





Broadband in Yavapai County

(As of August 2021)

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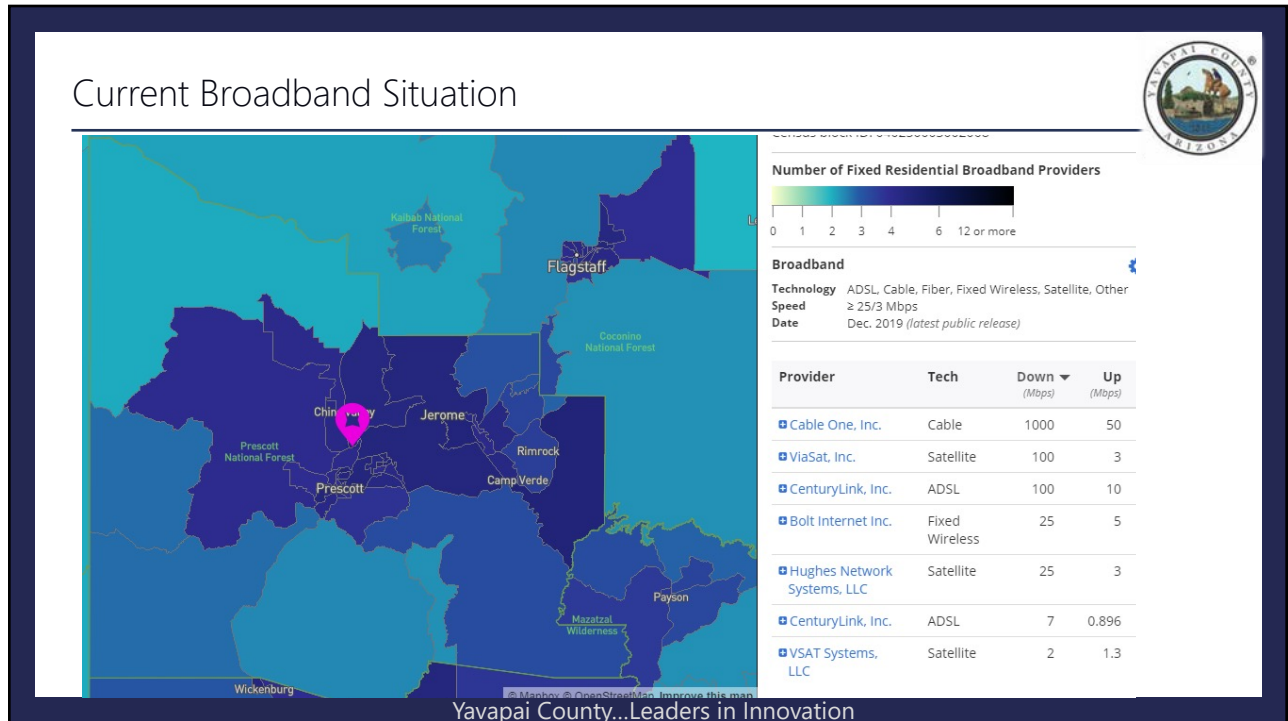


Agenda

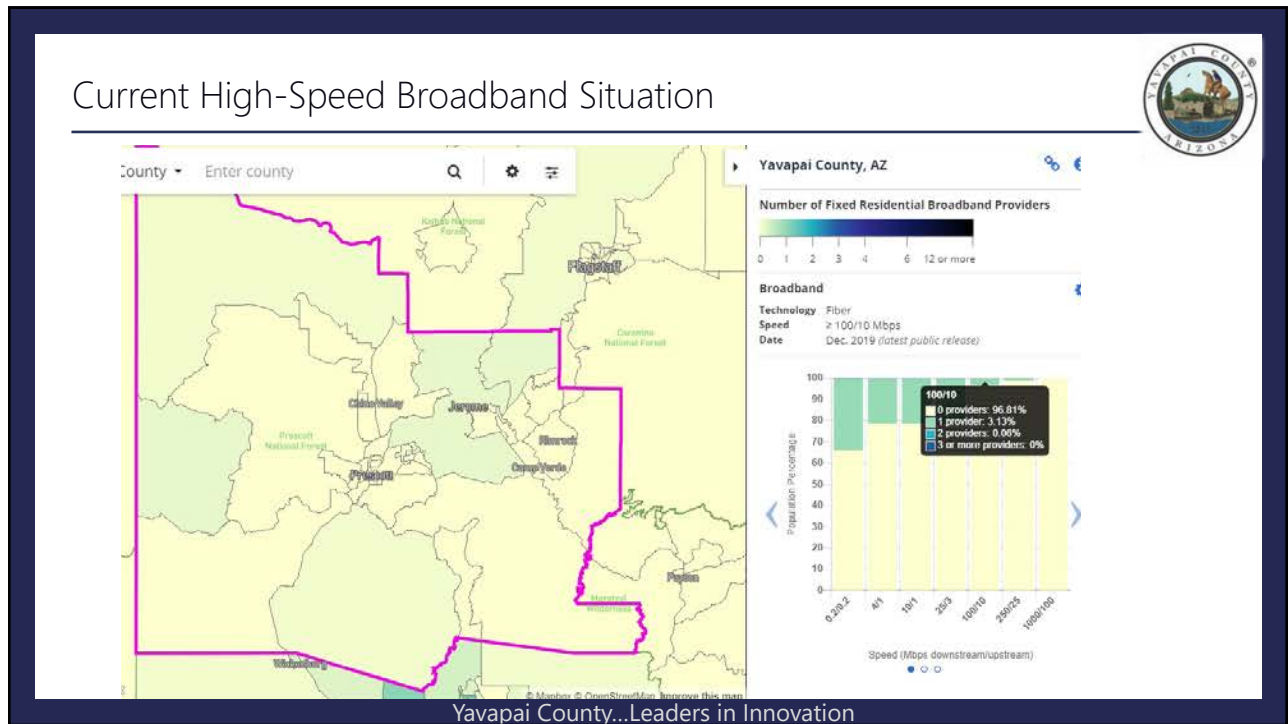
- Current Broadband Situation in Yavapai County
- Middle Mile versus Final Mile
- Method to Accomplish
- Timeline
- BOS Guidance and Requests

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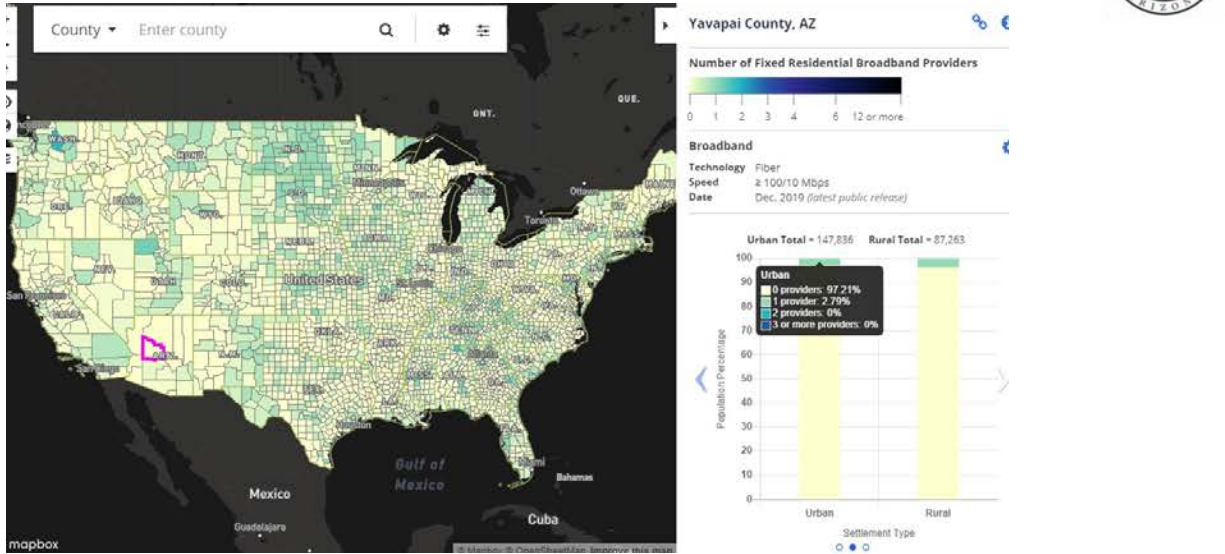


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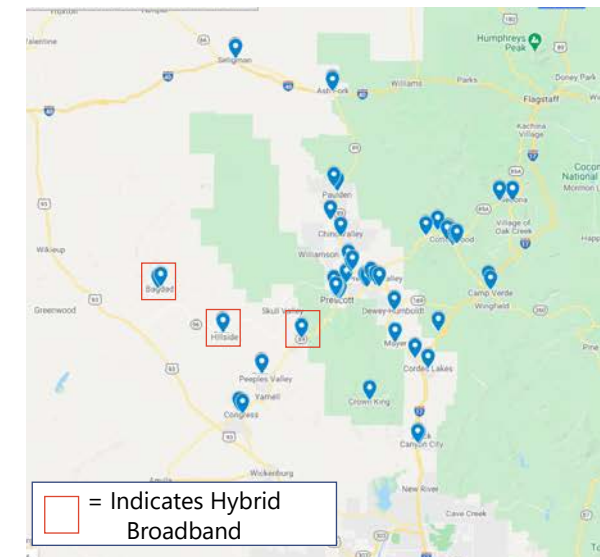
Nationwide High-Speed Broadband Situation



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High-Speed Broadband Delivery to Schools and Libraries

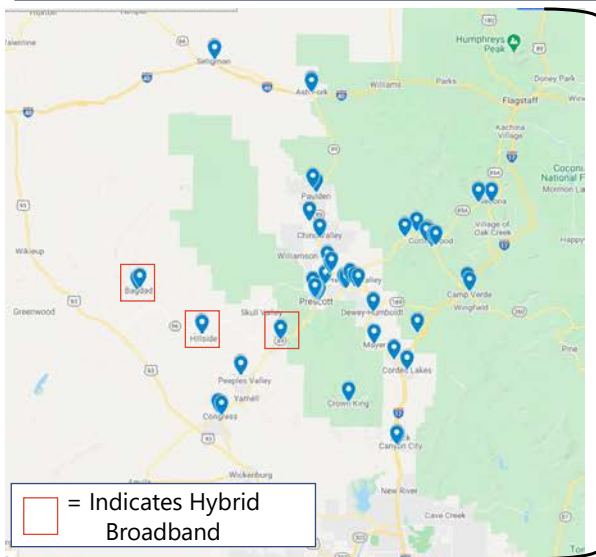


- 74 Schools and libraries connected through high-speed internet
- Not all locations have dedicated fiber to location (hybrid)
- High-speed broadband delivery achieved through \$1.8Mil funding
- RFP awardee kicked in an additional \$1.7Mil to complete the work
- 87% price reduction!!!

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High-Speed Broadband Delivery to Schools and Libraries

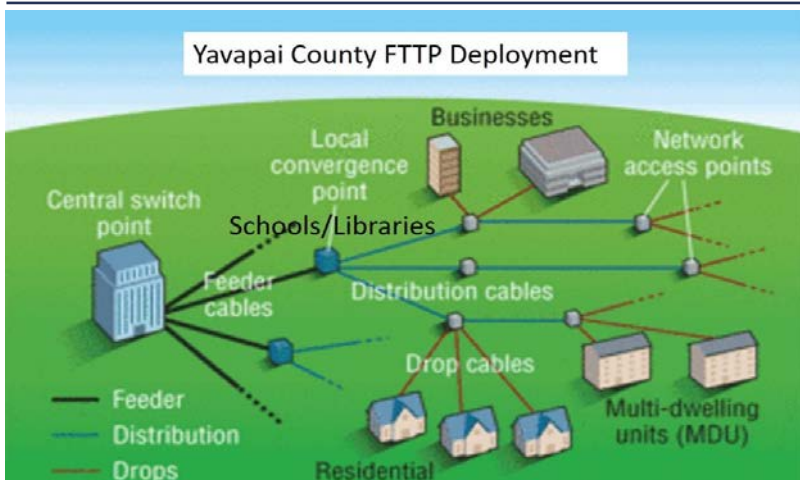


This is Yavapai County's Middle Mile!

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Technology for Final Mile



- Jerome: Proof of Concept has already occurred

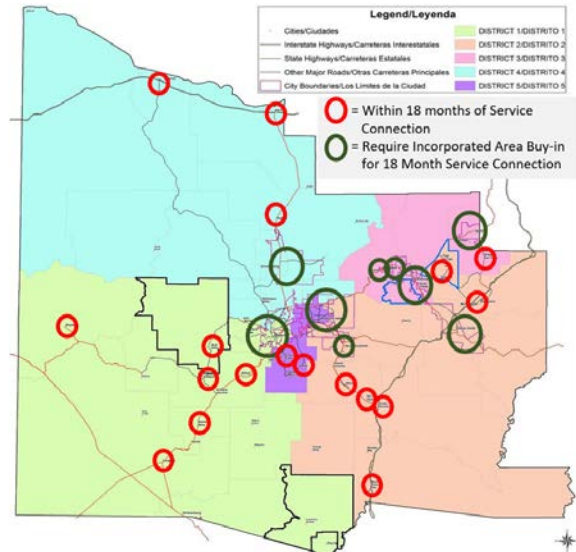
- Population: 235,099
- Housing Units: 120,646
- Employer Establishments: 6,024
- Households with a broadband subscription: 82.2

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Request from the BOS

- Within 18 Months of RFP Award
 - Emphasis to reach portions of each district (red circles)
 - Partnership with 9 municipalities (green circles)
- All other locations will be connected in remaining 6 months



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Partnership with Municipalities

- Initial meetings: Prescott, Sedona, Cottonwood, Clarkdale, Camp Verde, Chino Valley, Dewey-Humboldt, Prescott Valley, Jerome
- Will conduct multiple follow-up engagements and presentations at City Council Meetings

2021-2022 ARPA Funding to Yavapai County		
Municipality	ARPA Amount	20% Initiative Partnership
Prescott Valley	\$7,647,867	\$1,529,574
Prescott	\$5,920,074	\$1,184,015
Chino Valley	\$2,950,000	\$590,000
Cottonwood	\$2,920,000	\$584,000
Camp Verde	\$2,670,000	\$534,000
Sedona	\$2,470,000	\$494,000
Clarkdale	\$1,050,000	\$210,000
Dewey-Humboldt	\$990,000	\$198,000
Jerome	\$110,000	\$22,000
TOTAL:		\$5,345,589

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BOS Guidance and Request



- Go ahead to publish RFP
- Attendance at any incorporated and unincorporated meeting or function
- Support for the Final Mile Broadband Initiative
- Partnership with Incorporated Municipalities

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Additional Questions?

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Yavapai County

Our Mission: "Yavapai County will serve and protect its citizens through efficient management of all its resources to enhance the lives of those we serve."



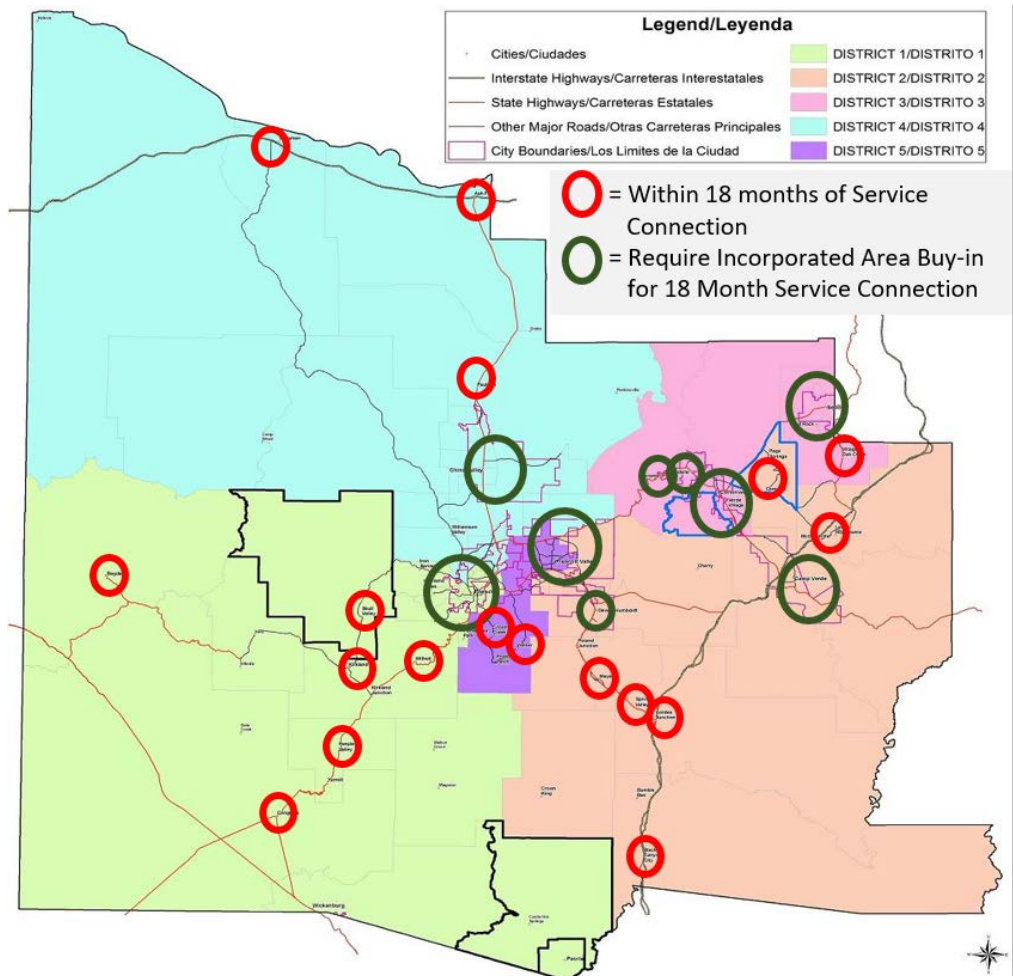
SUBJECT: Update to the Broadband Initiative and Proposal to the Yavapai County Board of Supervisors (BOS) in Response to the 2021-2022 American Rescue Plan ACT (ARPA) funding, as well as additional funding available through the Arizona Commerce Authority (ACA).

PURPOSE: Provide the Yavapai County BOS and municipalities with the short-term responsibilities to deliver Fiber to the Premises (FTTP) Technology with the detailed plan for the deployment of high-speed broadband to reach residents in all five Yavapai County Districts.

LOCATION EMPHASIS TO REACH PORTIONS OF EACH DISTRICT: In order to provide the impact of bringing FTTP technology throughout each of the five districts, depicted below are the locations that will have a high-speed broadband connection to each home and business within the first 12-18 months after the awarding of the RFP. The areas circled locations in red are the following unincorporated areas that will be concentrated on in the first eighteen months after the RFP Award in no particular order:

Ash Fork; Seligman;
Paulden; Bagdad;
Congress; Peeples Valley;
Kirkland; Wilhoit; Skull Valley; Mayer; Spring Valley; Cordes Lakes; Black Canyon City; Rimrock Community; Cornville; Walker, Groom Creek and the Village of Oak Creek.

The locations with a green circle will also have high-speed service connections within the first 18 months if the municipality allocate 20% of their ARPA funds: Prescott; Prescott Valley; Chino Valley; Dewey-Humboldt; Camp Verde; Cottonwood; Clarkdale; Jerome; Sedona.



All other locations will be connected in the remaining 6 months to a year.

UPDATED PROJECT TIMELINE AND DETAILS:

Yavapai County BOS Presentation: A presentation on the overall high-speed broadband plan and timeline will be presented to the county BOS on Aug 18th, 2021.

Initial Meetings with Incorporated Municipalities: The August 18th BOS presentation will also provide an opportunity for each district supervisor to schedule any meetings with the nine municipalities receiving their own ARPA funds. The meetings will provide the municipalities with detail of the high-speed broadband delivery plans and an initial consideration to buy-in with 20% of their ARPA funds.

To date, there are scheduled meetings in the month of August 2021 with the municipality leadership in Prescott, Camp Verde, and Clarkdale. Meetings with County Supervisor support still need to be established in Prescott Valley, Chino Valley, Sedona, Cottonwood, Dewey-Humboldt, and Jerome.

ARPA Funding for Each Municipality: According to the ARPA distributions, there are also 9 other municipalities that received funding (See adjacent chart titled “2021-2022 ARPA Funding to Yavapai County”). If any of the municipalities would like to join the Yavapai County broadband initiative, they can contribute 20% of their funding to leverage more dollars in other areas that the ARPA outlines as uses for the funding. This would not only reduce the cost for the larger municipalities to cover the costs of broadband, but it would provide more leverage for the smaller municipalities for high-speed broadband.

2021-2022 ARPA Funding to Yavapai County		
Municipality	ARPA Amount	20% Initiative Partnership
Prescott Valley	\$7,647,867	\$1,529,574
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TOTAL:		\$5,345,589

Within 15 Days after the August 18th Presentation, Develop and Issue a Request for Proposal (RFP): By issuing an RFP, this creates a competition among ISP’s or network providers. The premise behind the RFP will provide the guidelines to the following:

- Provide high speed broadband in the form of fiber to every platted residential home and business in Yavapai County within 2 years.
- Ensure every Local Convergence Point (LCP) is a Type 1- single fiber feed without lease from other entities within 1 year
- Provide plan for back-up coverage from the Central Switch Point to the LCP within 1 year.
- Provide the framework for every platted residential home and business to receive high-speed internet at a minimum of 100/100 Mbps, with the ability to increase to over 10 Gbps (based on the individual agreement with the ISP).
- Highlight the RFP will be awarded based on existing quality of service; completion of project within 2 years; ability to reach all locations in Yavapai County; illustrate a set price point for broadband usage that is economical for residents and business owners.

Within 30-120 Days:

- ISP’s develop details for RFP
- RFP Subcommittee schedules date for RFP presentations. (Request guidance from BOS to determine membership of the RFP Subcommittee).
- Prepared to award the RFP depending on cooperation with stakeholders and market conditions

Within Year 1 of RFP Award:

- County and city to develop and implement policies establishments the presence of adequate broadband prior to new developments
- ISP(s) finalize wholesale distribution agreements
- Distribution cables, drop cables, and network access points are established
- Quarterly reports to the Yavapai County BOS, county administrators, and municipality leadership
- FTTP deployment and connection are established under the following areas:

All unincorporated areas to include platted residential homes and businesses	*Incorporated areas to include platted residential homes and businesses:		**Tribal Nations
	▪ Prescott Valley	▪ Sedona	
	▪ Prescott	▪ Clarkdale	
	▪ Cottonwood	▪ Dewey-Humboldt	
	▪ Camp Verde	▪ Jerome	
	▪ Chino Valley		

*Municipalities that agree to join in the deployment and contribute 20% of their ARPA funding towards the FTTP network distribution under Yavapai County will be connected at the same priority as the Unincorporated Areas.

**We will work with any Tribal Nation wishing to join. Pricing and planning will be determined based on their available funding and agreement with ISP’s.

Note: Municipalities and Tribal Nation can run in parallel with the deployment in the unincorporated areas.

Within Year 2 of RFP Award:

- All LCP’s are established as Type I carriers
- Quarterly reports to the Yavapai County BOS, county administrators, and municipality leadership
- Public service announcements and economic development marketing
- Substantial project completion

Beyond Year 2 of RFP Award:

- Broadband is a utility just like water, electric and sewer/septic. Installing and maintaining this utility will never end.
- Through this project and our relationship with the ISP’s, Yavapai County is postured to create policy to ensure any additional platted residential homes and businesses has a plan to provide broadband.

RFP OPTIONS: There are two different options (refer to adjacent table) available when writing for RFP. Option I is the preferred option as it encourages corporation among the Type I ISP and the ISP for FTTP. This also allows for simultaneous work to be accomplished by multiple ISP's.

ASSUMPTION: This is a very aggressive plan that depends on much cooperation and coordination. However, pending any unforeseen delays (permitting restriction, extreme terrain, natural disaster (i.e. wildfires, flooding, etc.)) we are confident that we already possess the connections and means to complete this project on time and within the budget.

RFP Option I	RFP Option II
Issue two RFP's. One RFP will request plan to ensure all locations are TYPE I fiber lines with maximum bandwidth to allow for future growth. The 2nd RFP would request FTTP and plan to allow for future growth.	Issue a single RFP to request Type I fiber lines to all locations, as well as FTTP plan along with future growth plans.

UPDATED TOTAL COST TO COVER ALL OF YAPAPAI COUNTY: \$55,345,589

\$20,000,000 from Yavapai County government to cover the unincorporated areas (43.4% of ARPA funds)

\$30 Mil from the Arizona Commerce Authority (Rural Broadband Development Grant (RBDG))

\$5,345,589 total from the 9 municipalities receiving ARPA funding (20% of each municipalities ARPA funds)

NOTE: The cost will cover the entire amount to complete the project. Based on our previous experience, we can work with whatever amount is awarded. However, we believe the less an ISP uses out of their own pocket, the greater the return on their investment. This results in the greater potential for reduced rates for all customers in Yavapai County.

Point of Contact: Superintendent Tim Carter at tim.carter@yavapaiaz.gov or (928) 925-6560; Stan Goligoski at stan.goligoski@yavapaiaz.gov or (928) 442-5754.

Northern Arizona Council Of Governments (NACOG) Broadband Strategic Plan Survey Data Analysis – Final

TECHNICAL MEMORANDUM

Developed by:

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Date: 9/9/2021

Access to reliable, affordable high-speed broadband internet connections has become increasingly important for all communities. In recognition of the need for this connectivity, the Northern Arizona Council of Governments (NACOG) Economic and Workforce Development commissioned the development a regional Broadband Strategic Plan funded by the CARES Act in early 2021. The goal of the Broadband Strategic Plan is to assess broadband issues across the NACOG region, anticipate future needs, and create a blueprint for increasing access to high-speed internet for businesses, non-profits, and residents in northern Arizona.

In order to gain further insight into the current state of broadband and need for future connectivity to support the development of NACOG's Broadband Strategic Plan, Magellan Advisors and NACOG EWD conducted a broadband survey among businesses and residents across the region. The survey was open for approximately ten (10) weeks and received a total of 4,744 responses across Apache, Coconino, Navajo, and Yavapai Counties.

While the survey was promoted across the entire region, some counties performed their own promotional campaigns to achieve higher response rates. Therefore, some locations are more represented than others in the results metrics. Yavapai County, for example, received the majority of responses, with 3,391 total entries, whereas Apache County received only 65 responses. For this reason, we analyze the results by County rather than across the entire region. In instances where towns or cities straddle two counties, as is the case in Sedona, responses are attributed to the County in which the survey was taken (i.e., Sedona addresses that fall within Yavapai County are included in Yavapai County data, whereas those that fall within Coconino County are included in Coconino County data).

Because the survey was a convenience survey and not targeted to a specific subset of the population, we also compare the demographics of respondents to available Census Bureau data to determine which segments of the population may be overrepresented in the results. Overall, across the region, respondents who are older and who have higher educational attainment are somewhat overrepresented.

For the purposes of this analysis, we define broadband as internet service with speeds meeting or exceeding 25 mbps download and 3 mbps upload, in line with the federal definition of broadband as determined by the Federal Communications Commission (FCC).

A more concise version of this analysis will be included in the final report.

APACHE COUNTY

Out of 65 total survey responses from locations within Apache County, 44 were households and 21 were organizations.

Table 1. Apache County Survey Responses by Type

Type	Number
Household: Location is primarily a residence	44
Organization: Location is a business, government, non-profit, etc.	21
Total	65

Overall, Apache County was underrepresented in the regional survey. With 27 responses, Alpine had the most surveys of any location in Apache County, followed by Eagar with 8 responses. Based on population, we would expect to see more responses across all towns, especially from Eagar, Chinle, and Fort Defiance. The survey received no responses from Chinle and Fort Defiance, despite the fact that the towns are the second and third most populated areas in Apache County.

Table 2. Apache County Survey Responses by City

Location	Responses
Alpine	27
Blue Gap	1
Chambers	2
Concho	5
Eagar	8
Ganado	1
Nutrioso	3
Petrified Forest	3
Petrified Forest National Park	1
Sanders	1
Springerville	5
St. Johns	3
Vernon	3
Window Rock	2
Total	65

Household Demographics – Apache County

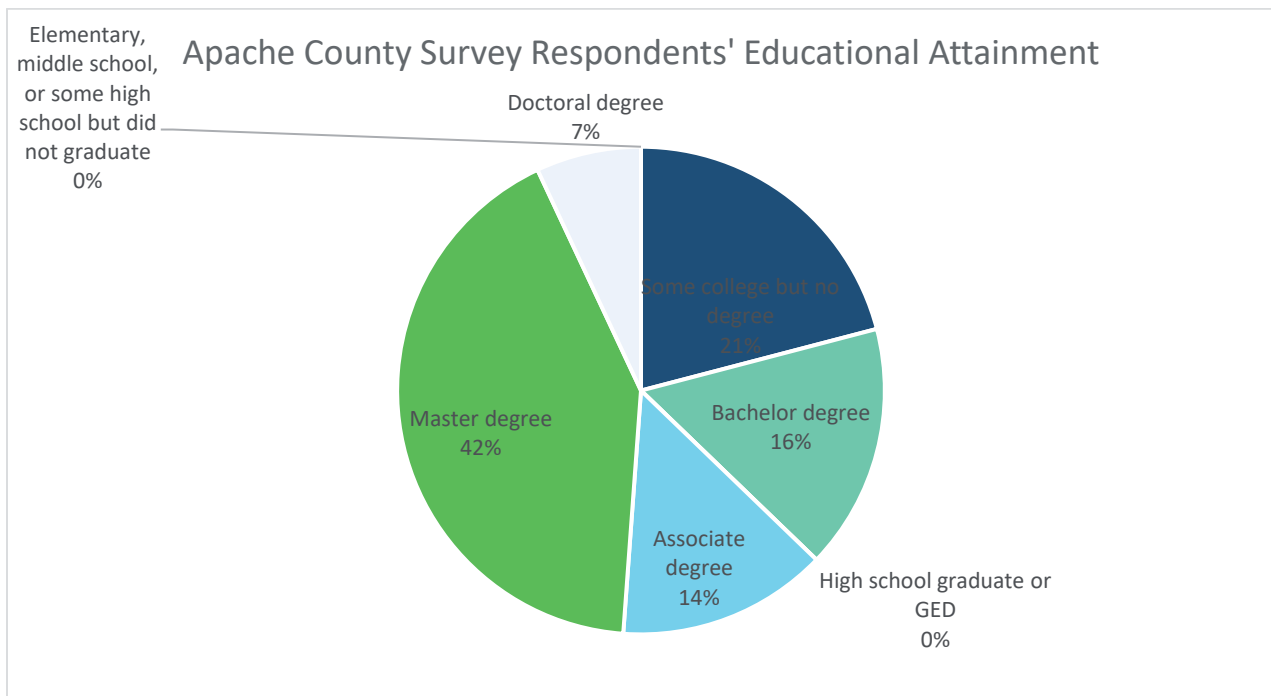
The average size of respondents’ households among respondents in Apache County was 3 people, which falls in line with the Census data average of 3.41. Respondents were slightly older than the general population, with the youngest household member averaging 49 years old and the oldest averaging 65 years old, compared with an average Census age of 36.6 years old.

Table 3. Apache County Household Demographics

	Average	Youngest	Oldest
How many people are in your household?	3	49	65

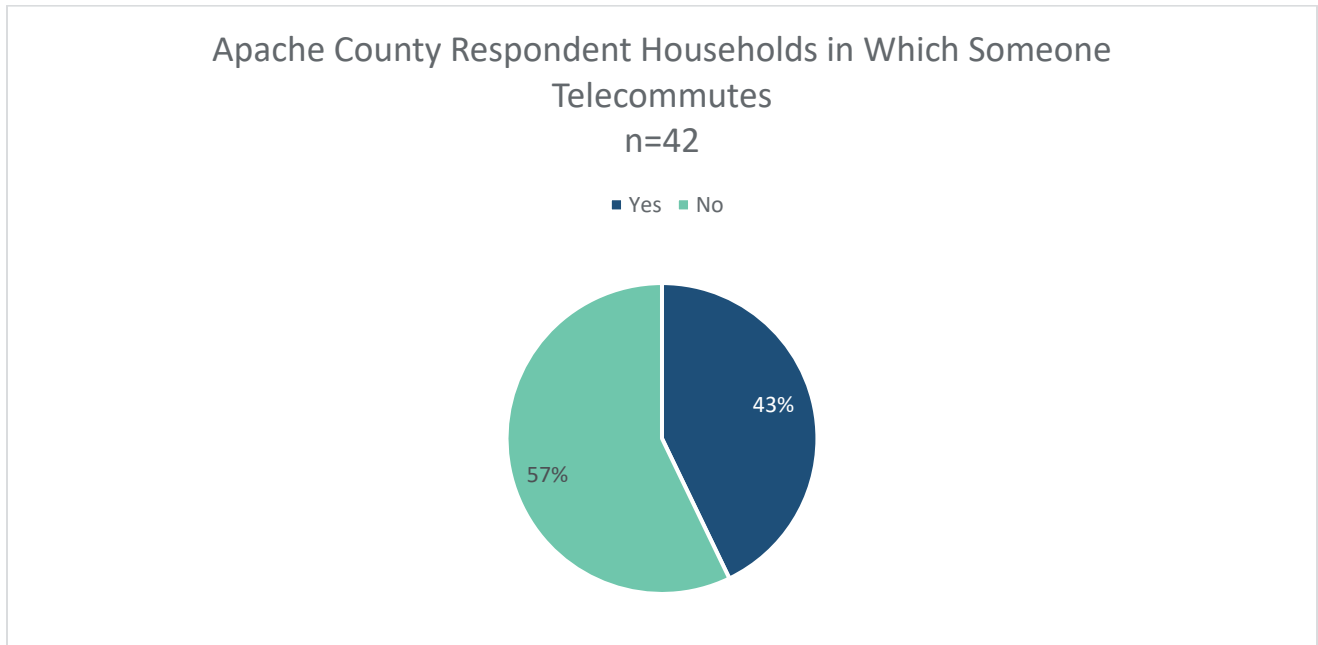
Respondents also had a relatively higher level of educational attainment than would be expected based on Census data. Whereas Census data indicate that 12% of Apache County residents have a Bachelor’s degree or higher, approximately 65% of respondents had a Bachelor’s degree or higher.

Figure 1. Apache County Survey Respondents’ Educational Attainment



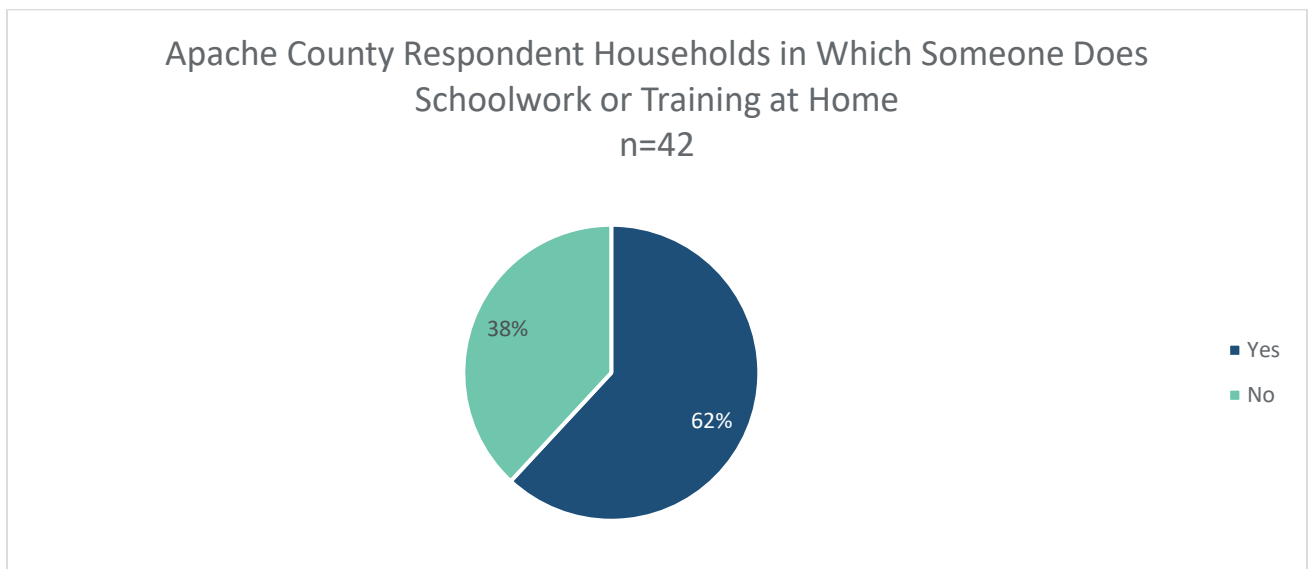
When household respondents were asked if there was any member of their household who regularly telecommutes, 43% of 42 respondents indicated yes.

Figure 2. Apache County Respondent Households in Which Someone Telecommutes



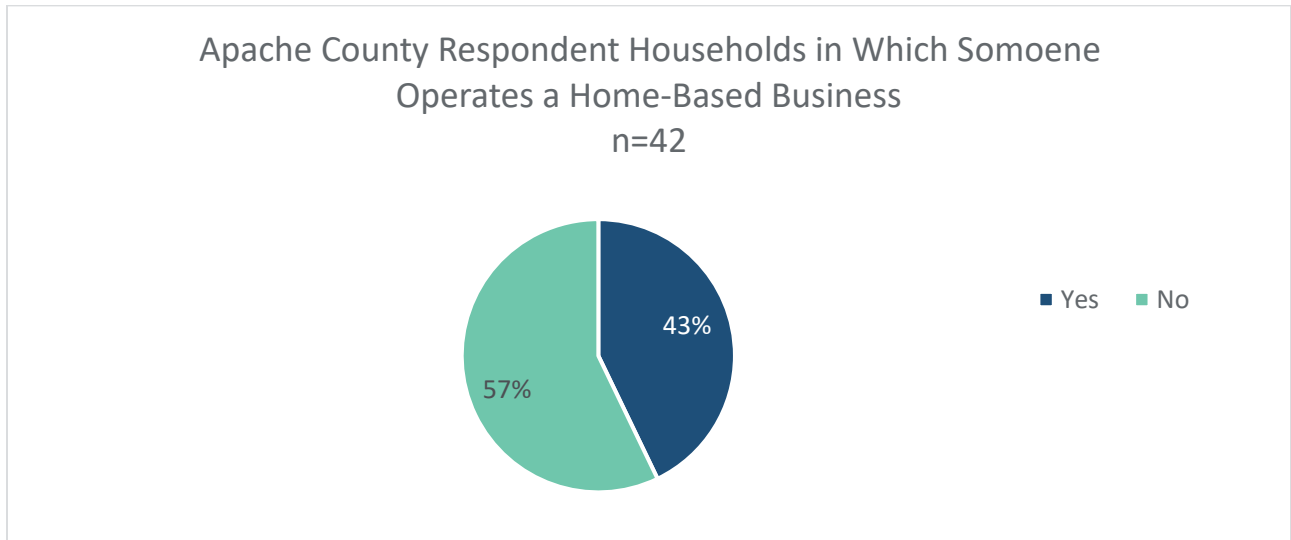
More often, respondents had a person in their household who did schoolwork or training at home. Of 42 respondents, 62% indicated that someone in their household participated in learning at home.

Figure 3. County Respondent Households in Which Someone Uses Online Learning



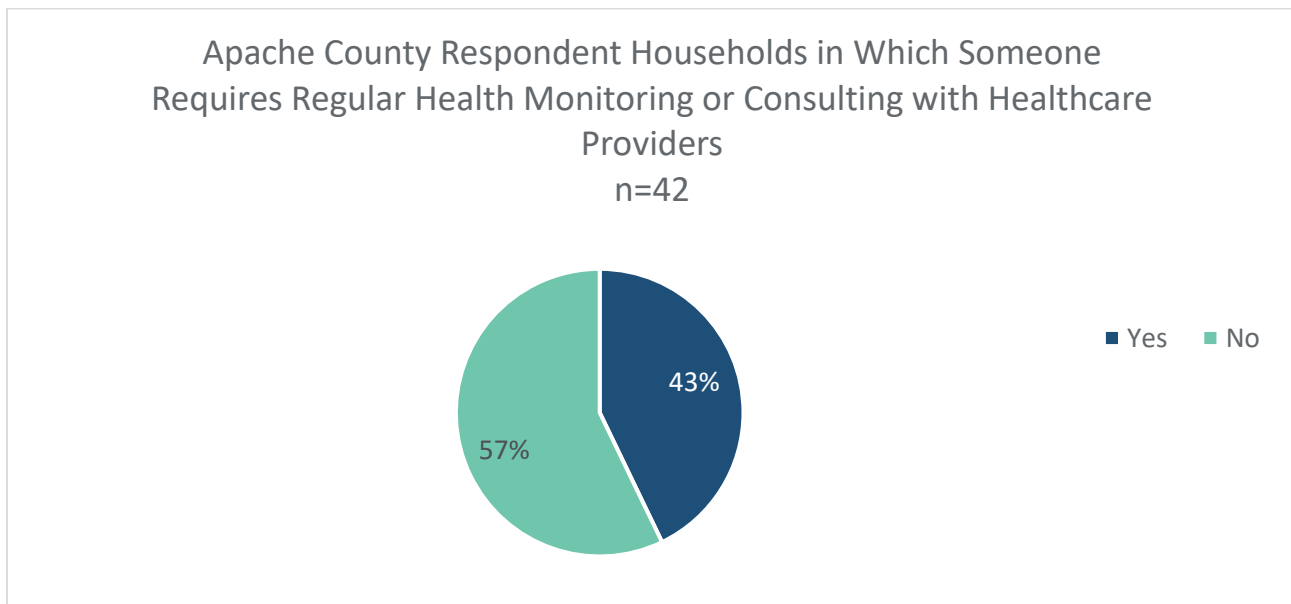
The survey also asked respondents to indicate whether or not someone in their household operated a home-based business. Out of 42 respondents, approximately 28% stated that that someone did operate a home-based business.

Figure 4. Percentage of Apache County Respondent Households with a Home-Based Business



Household respondents were also asked about whether anyone in their household requires regular health monitoring or consulting with healthcare providers. Out of 42 total responses, about 43% said that someone did.

Figure 5. Percentage of Apache County Respondents in Which Someone Requires Regular Health Monitoring or Consulting with Healthcare Providers



Organization Demographics – Apache County

Of the 21 responses from organizations, only 10 indicated their organizational sector, 3 of which were Public Administration. Several sectors in Apache County were not represented at all. Sectors were grouped based on North American Industry Classification System (NAICS) codes.

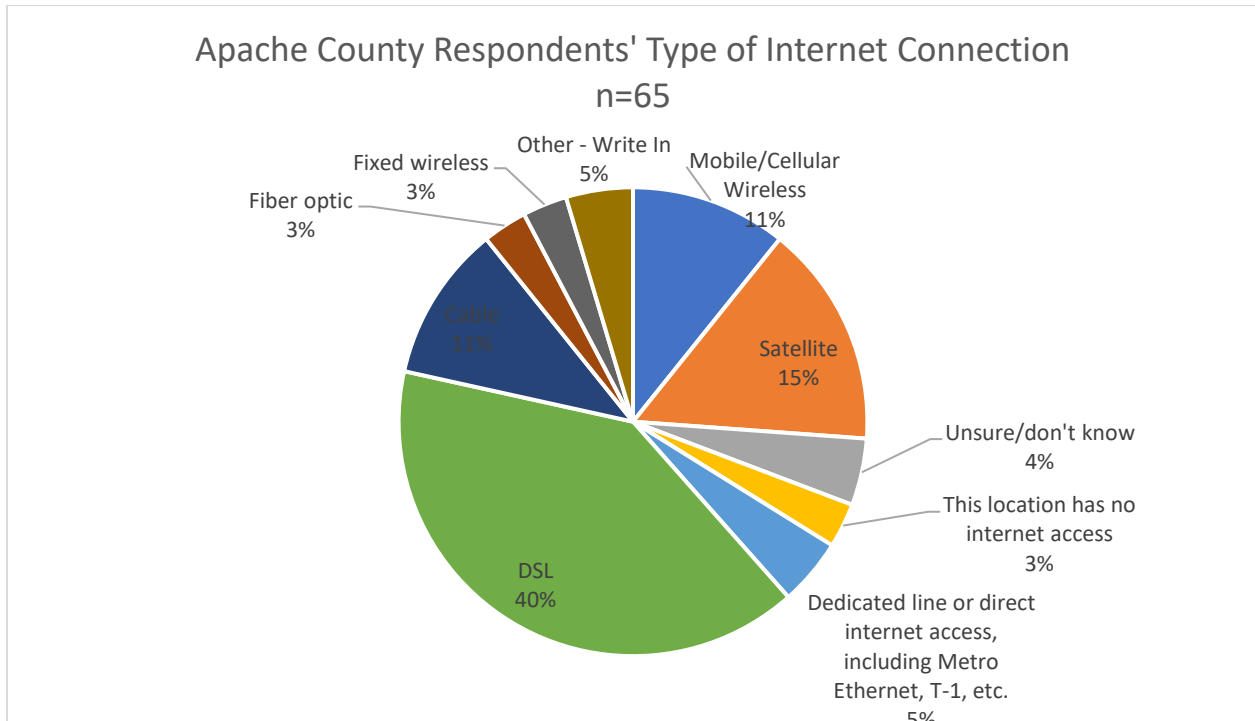
Table 4. Apache County Organizational Respondents by Sector

Other Services (except Public Administration)	0
Agriculture, Forestry, Fishing and Hunting	0
Educational Services	0
Accommodation and Food Services	0
Information	1
Retail Trade	2
Public Administration	3
Professional, Scientific, and Technical Services	1
Finance and Insurance	1
Health Care and Social Assistance	1
Real Estate and Rental and Leasing	1
Arts, Entertainment, and Recreation	0
Construction	0

Internet Services in Apache County

Most respondents (39%) reported having internet connections via DSL infrastructure, followed by satellite at 15%, neither of which we consider to be broadband¹. Only 2% of respondents had connections via fiber and 2% reported having no internet access at all at their locations.

Figure 6. Apache County Survey Respondents' Type of Internet Connection²



¹ For the purposes of the survey, broadband was defined as always-on high-speed internet with speeds of at least 25/3. DSL infrastructure is unable to deliver these speeds.

² Across all graphs and tables in this report, "n" indicates the number of responses received for each question.

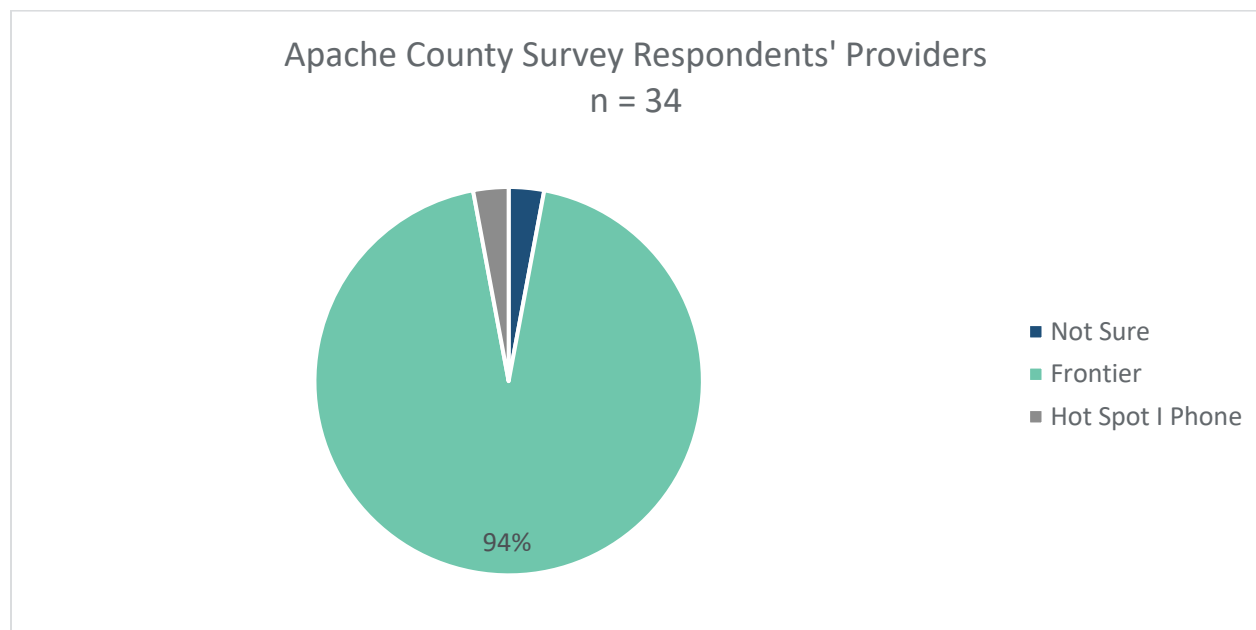
Among respondents who did not have broadband connections, the most important reason was that available services are too slow or unreliable, followed by broadband not being available at their location. The least important reason was that respondents do not need internet.

Table 5. Apache County Respondents' Reasons for Not Having Broadband

	Access Elsewhere	Too Expensive	Too Slow or unreliable	Broadband Not Available	Do not need internet	Smartphone meets needs	Other reason not listed here
1 – Most Important	0	2	6	5	2	1	1
2	0	1	1	1	0	0	0
3	0	3	0	1	1	0	0
4	0	1	1	0	0	3	0
5	2	0	1	1	0	2	0
6	0	1	1	0	0	1	0
7 – Least Important	3	0	1	2	3	0	0
Total Responses	5	8	11	10	6	7	1

Nearly all survey respondents in Apache County reported having service through Frontier, as shown in the chart below. One reported having service through a hot spot by an unspecified provider and another was unsure.

Figure 7. Survey Respondents' Providers in Apache County



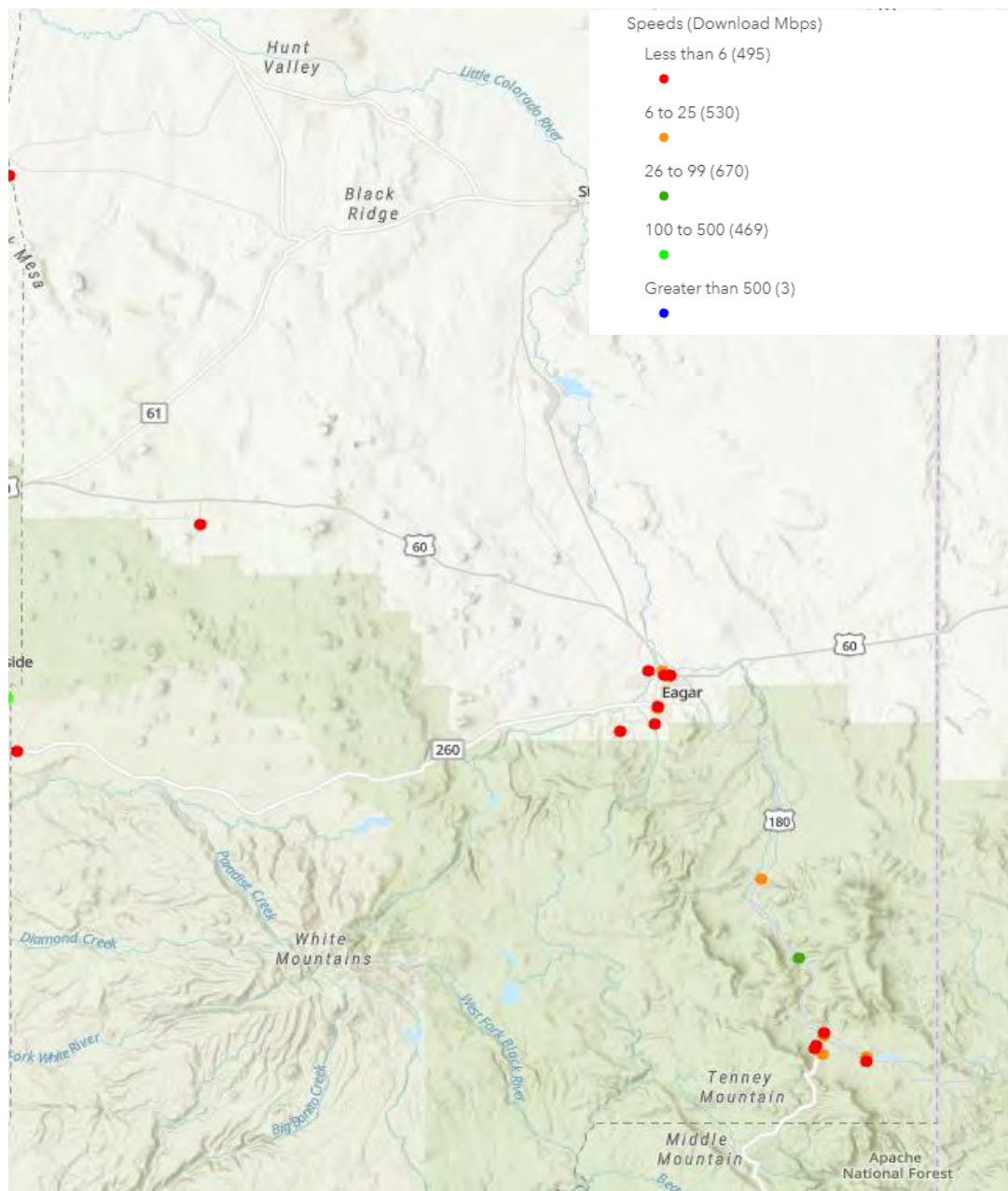
On average, survey respondents reported that they were contracted to receive speeds of 21 mbps download and 50 mbps upload. However, we note that there were likely errors in these numbers since it is uncommon to see upload speeds exceed download speeds. The survey’s embedded speed test captured respondents’ speeds at an average of just 12 mbps download and 3 mbps upload, indicating that actual speeds are far below the broadband definition of 25/3 mbps. It should be noted that although the survey instructions directed respondents to perform the test while directly connected to a wired internet connection, some respondents may have taken the test over a wifi connection, which may affect the speed data.

Table 6. Apache County Contracted Versus Actual Speeds

	Down	Up	Latency
Average Contracted Speed	21.45	49.97	N/A
Average Actual Speed	11.81	2.81	255.18

Below are maps of actual download speeds by location, as collected through the online survey instrument using the Measurement Labs speed test. Note that the only survey responses in which speed tests were taken were in the southern half of Apache County, as shown on the map. Almost no respondents had download speeds meeting the federal broadband definition of 25/3, although there was one lone response in Nutrioso that received 80 mbps through a Frontier cable connection.

Figure 8. Apache County Survey Respondents' Speed Test Results by Location



Respondents were also asked how often they experienced service slow downs and outages. As shown in the table below, a majority of respondents indicated that the service slows down daily and service outages lasting less than one day occurred every few months. The service goes out briefly every few weeks or every few months and is out for less than an hour every few days to every few months. Service being out for more than a day was a less than yearly occurrence for most respondents.

Table 7. Apache County Respondents' Internet Performance

	The service slows down	The service is out briefly	The service is out for less than an hour	The service is out for an hour or two	The service is out for several hours	The service is out for a day or more
Daily, every day	12	2	1	0	0	0
Every few days	10	7	9	2	1	0
Every few weeks	3	10	7	6	7	2
Every few months	4	10	9	14	12	8
About once a year	1	2	3	5	6	7
Less than once a year	1	0	0	1	3	9
Never	0	0	1	2	2	4

Respondents were also asked about their satisfaction with current services based on overall service, speed, price, reliability, and support. Most respondents were overall very dissatisfied with their service. The most common reason for dissatisfaction was speed and many were also very dissatisfied with reliability and support.

Table 8. Apache County Respondents' Satisfaction with Current Services

	Overall	Speed	Price	Reliability	Support
Very Satisfied	1	1	0	2	0
Somewhat Satisfied	3	2	4	3	8
Neither/ Not Sure	4	3	6	4	7
Somewhat Dissatisfied	4	8	12	7	6
Very Dissatisfied	17	17	8	15	10

The cost of broadband service was also relatively high. The average cost for broadband only (excluding all other services such as cable and telephone that might be part of a subscriber's package) was \$98.54 This means that respondents were paying an average of \$1.36 per mbps based on the speed test data. High-speed, fiber-based broadband commonly provides 1 Mbps for less than \$0.30 per month.

Table 9. Apache County Respondents' Average Costs for Service

Average Cost - All Services	\$ 161.14
Average Cost - Broadband Only	\$ 98.54

When asked what better broadband means to them, their family, their organization, and the area, respondents provided comments about a wide ranging set of issues including lack of choice, reliability, speed, and outages. Many also noted the value of bringing better broadband to the region including quality of life and economic development benefits. Below is a selection of comments provided by respondents from Apache County.

“Retired and elderly, living somewhat remote we rely on the internet to pay bills, banking, medical, general communication with family and part time employer (AZGFD). We've been told by service provider, many of our lines and connections are very old and should be updated. Our service goes out for 3-4 days at a time.” – Survey Respondent #943

“If we had broadband and redundancy we could attract business owners to fill up our empty (sic) store fronts.” – Survey Respondent #481

“We don't even have broadband by the FCC's definition (>25Mbps) but we are paying broadband prices. NO competition. No real choices.” – Survey Respondent #109

“Broadband is essential to serving our customers in all of our remote areas. Their healthcare is burdened, less available and even critically missing at times due to the lack of broadband capabilities.” – Survey Respondent #946

Overall, while few responses were received from Apache County, it is clear that there are few choices for provider and the speeds are not meeting the needs of the residents and businesses there. With little competition and high costs, Apache County is in need of additional investment in better infrastructure to increase performance, reliability, and affordability.

COCONINO COUNTY

In Coconino County, the survey received 184 total responses, 166 of which were households and 18 of which were organizations.

Table 10. Coconino County Survey Responses by Type

Type	Number
Household: Location is primarily a residence	166
Organization: Location is a business, government, non-profit, etc.	18
Total	184

Most responses from Coconino County came from Flagstaff, followed by Sedona³ and Munds Park. Based on population, Tuba City is far underrepresented, with only one response.

Table 11. Coconino County Survey Responses by Location

City	Responses
Bellemont	8
Cameron	1
Canyon Diablo	1
Flagstaff	89
Forest Lakes	1
Happy Jack	1
Kaibeto	2
Munds Park	22
Page	9
Parks	4
Sedona	32
Tuba City	1
Williams	13
Total	184

³ As previously indicated, responses from Sedona were analyzed with their respective counties based on the survey respondents' location.

Household Demographics – Coconino County

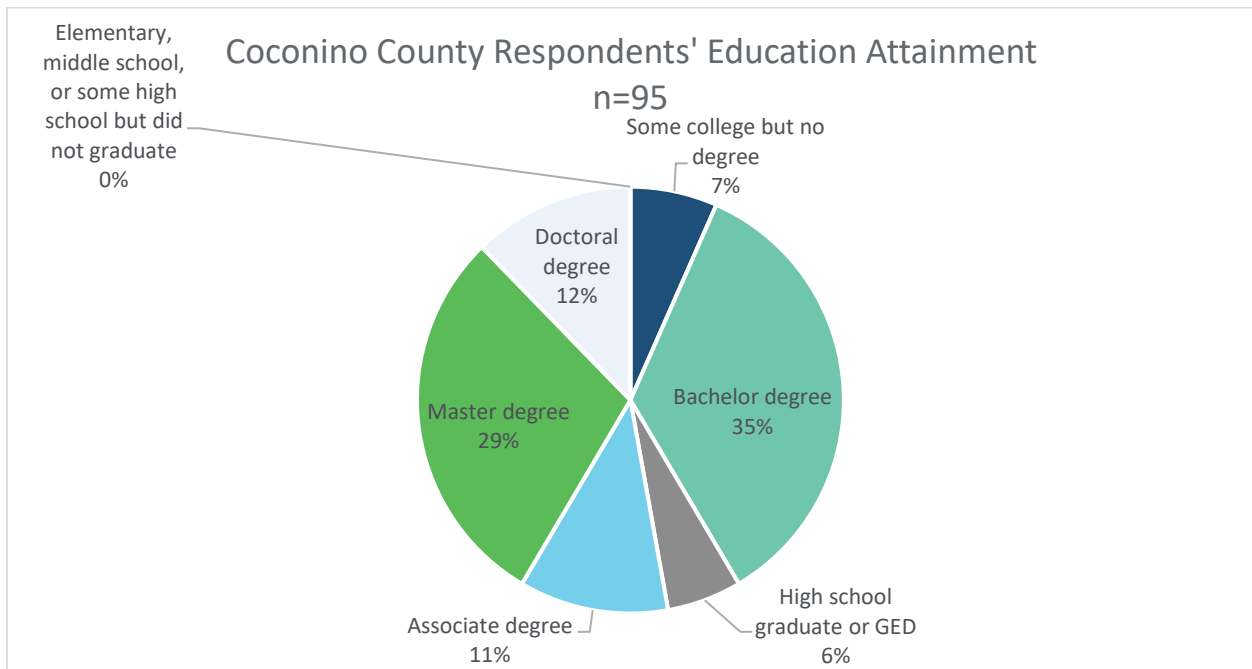
The average size of respondents’ households was 4 people, slightly higher than the Census data average size of 2.80. Respondents were slightly older than the general population, with the youngest household member averaging 37 years old and the oldest averaging 57 years old, compared with an average Census age of 30.7 years.

Table 12. Household Demographics – Coconino County

	Household Size	Youngest	Oldest
Average	4	37	57

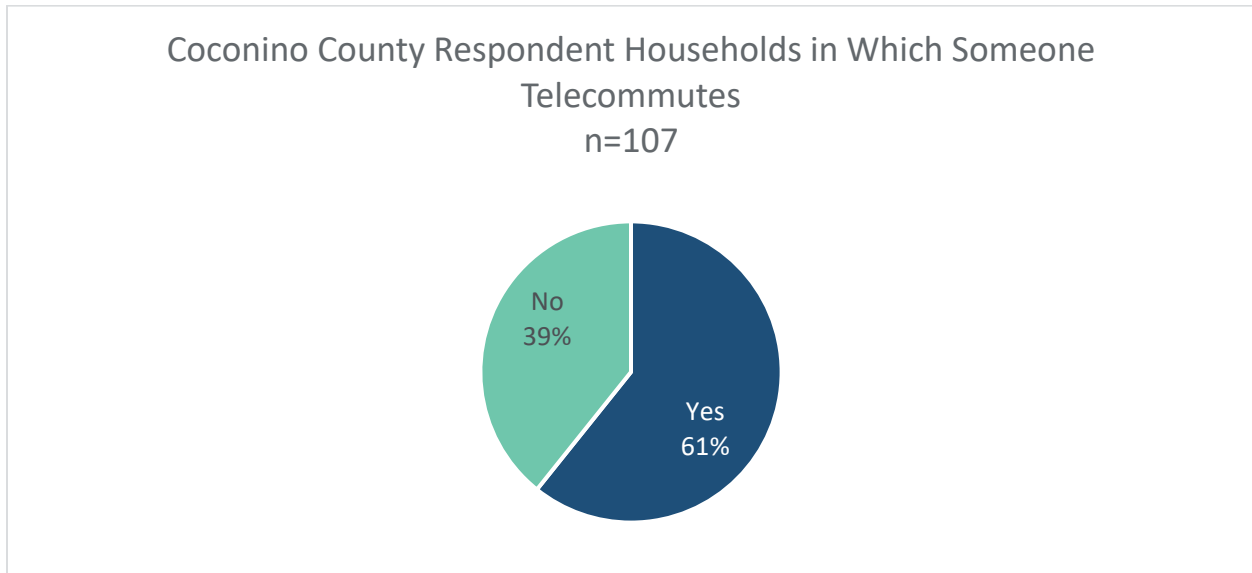
Respondents also had higher level of educational attainment than would be expected based on Census data. Whereas Census data indicate that 36.2% of Coconino County has a Bachelor’s degree or higher, approximately 76% of respondents had at least a Bachelor’s degree.

Figure 9. Coconino County Respondents’ Educational Attainment



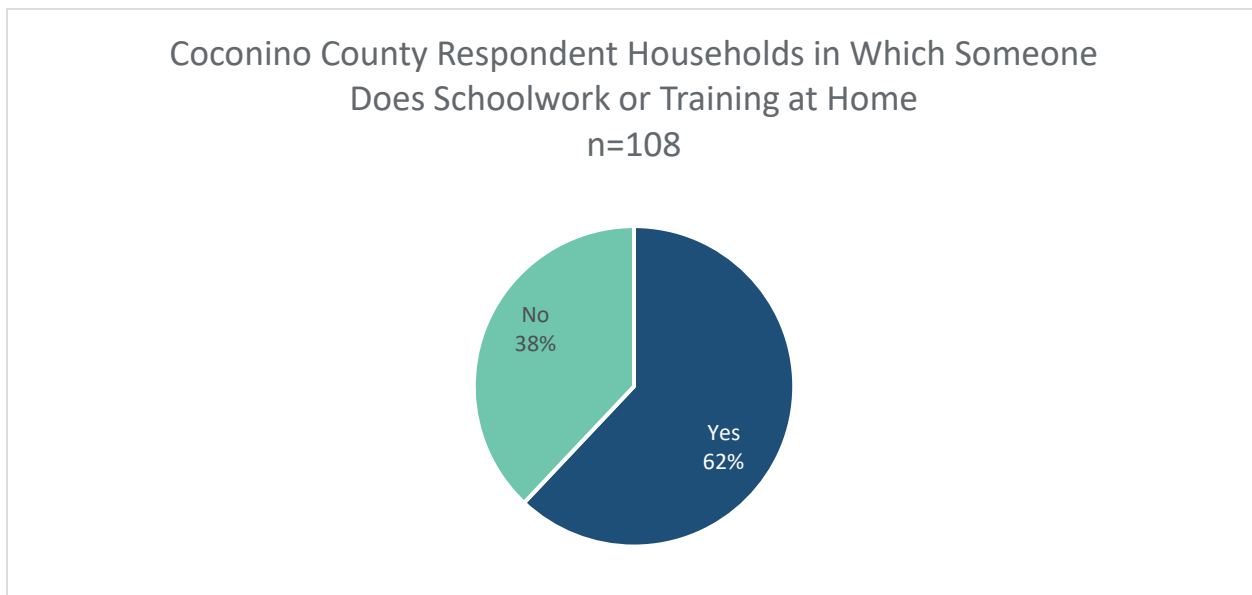
When household respondents were asked if there was any member of their household who regularly telecommutes, 61% of 107 respondents indicated yes.

Figure 10. Percentage of Households in Which Someone Telecommutes – Coconino County



As in Apache County, nearly two-thirds of respondents reported having someone in their home who does schoolwork or training remotely.

Figure 11. Percentage of Households in Which Someone Uses Online Learning – Coconino County



Just under one-third of respondents indicated that someone in their household operates a home-based business, and a similar number reported that someone in their household requires regular monitoring or consulting with healthcare providers.

Figure 12. Percentage of Households in Which Someone Operates a Home-based Business – Coconino County

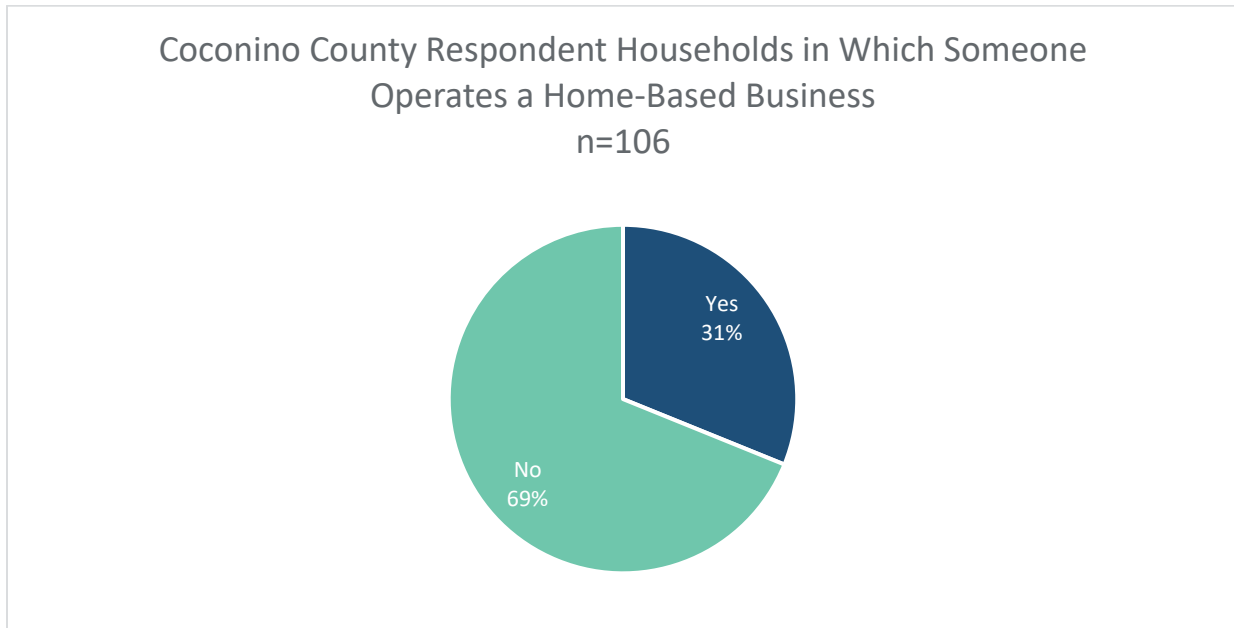
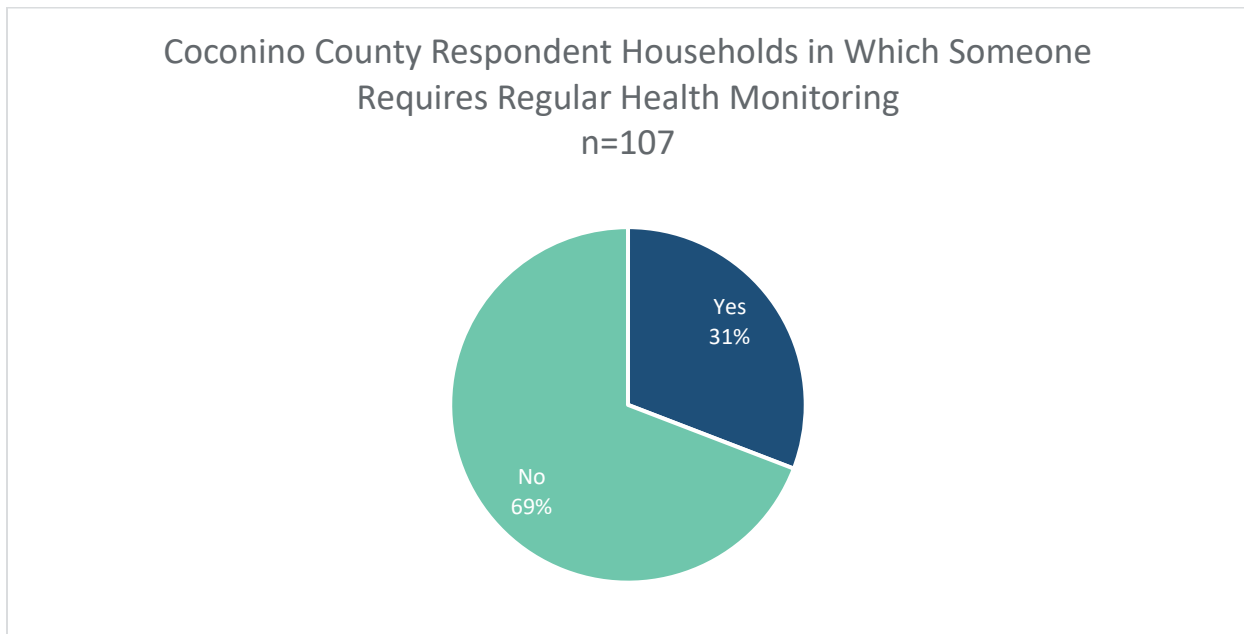


Figure 13. Percentage of Households in Which Someone Requires Regular Health Monitoring or Consulting with Healthcare Providers – Coconino County



Organization Demographics

The 18 responses from organizations included one or two responses across several sectors including Accommodation and Food Services and Public Administration.

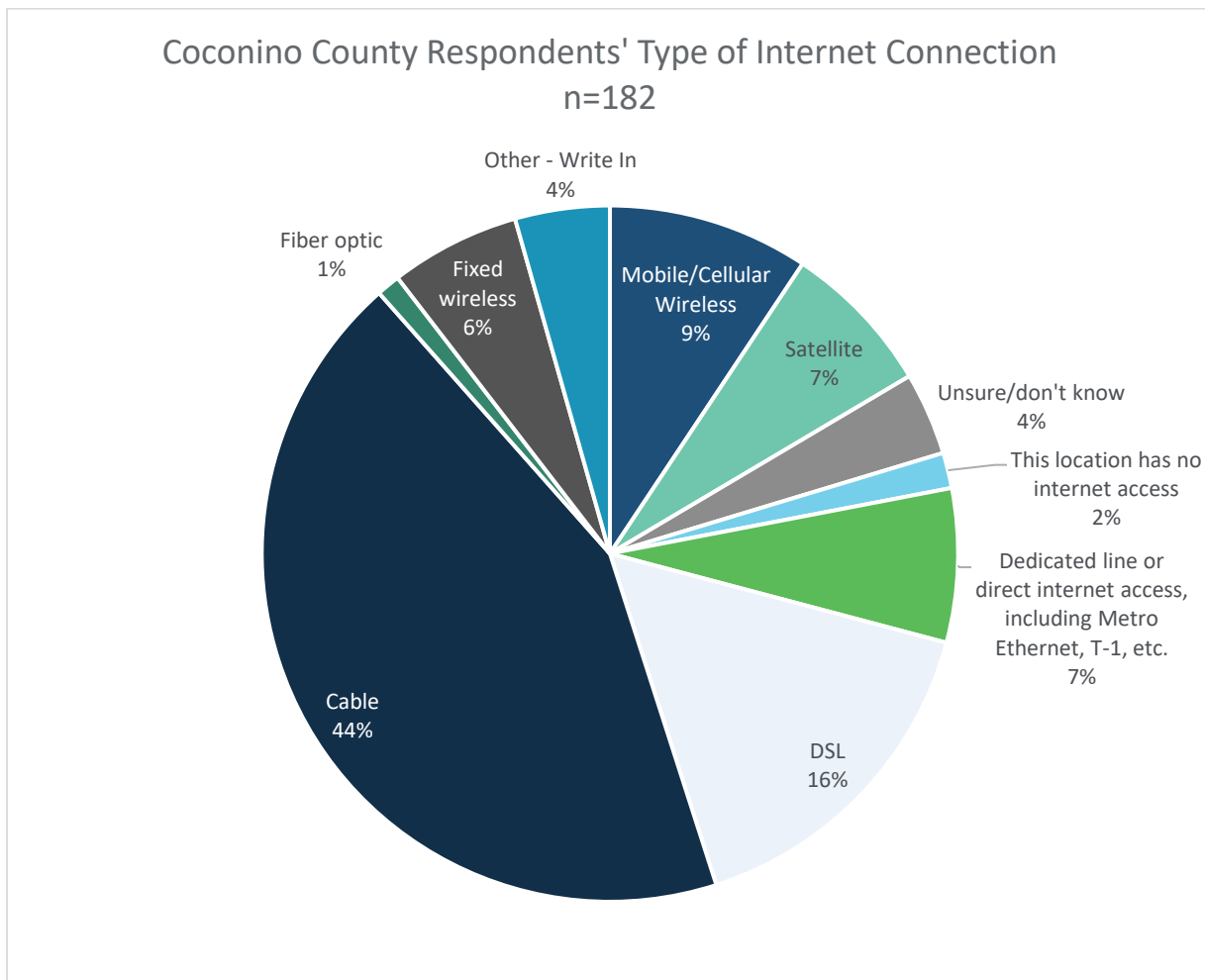
Table 13. Coconino County Respondents' Organization Sector

Other Services (except Public Administration)	2
Agriculture, Forestry, Fishing and Hunting	0
Educational Services	1
Accommodation and Food Services	2
Information	1
Retail Trade	1
Public Administration	2
Professional, Scientific, and Technical Services	1
Finance and Insurance	1
Health Care and Social Assistance	1
Real Estate and Rental and Leasing	0
Arts, Entertainment, and Recreation	1
Construction	1

Internet Services

Most respondents (44%) reported having internet connections via cable infrastructure. Approximately 39% of respondents reported having connections that we do not consider broadband including DSL, satellite, mobile/cellular connections, or no internet at all. Only 1% of respondents had connections via fiber and 2% reported having no internet access at all at their locations.

Figure 14. Coconino County Respondents' Type of Internet Connection



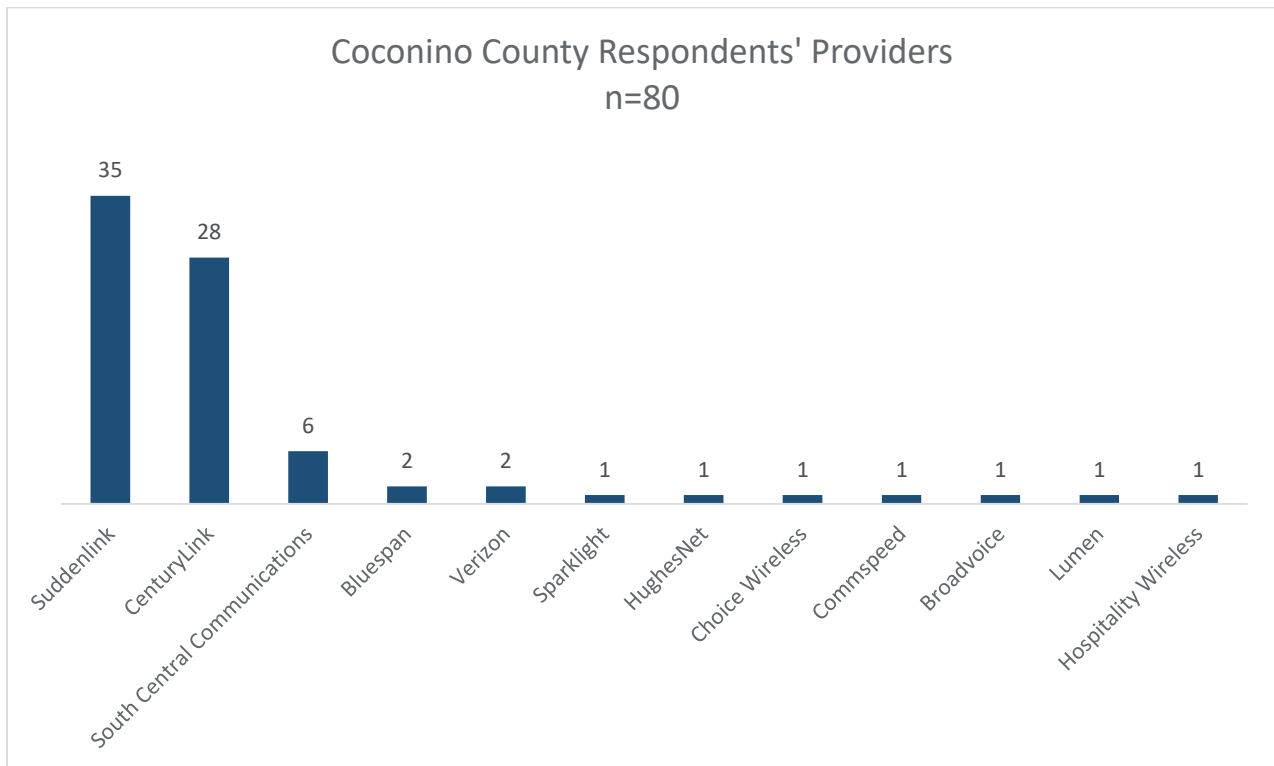
Among respondents who did not have broadband connections in Coconino County, the most important reason was that broadband was not available at their locations, followed by services being too expensive, and services being too slow or unavailable.

Table 14. Reasons for No Broadband Connection – Coconino County

	Access Elsewhere	Too Expensive	Too Slow or unreliable	Broadband Not Available	Do not need internet	Smartphone meets needs	Other reason not listed
1 – Most Important	1	4	4	15	1	1	2
2	2	4	2	0	2	2	0
3	3	0	6	1	0	0	0
4	0	0	2	2	1	3	1
5	1	0	0	3	0	2	0
6	1	1	2	1	2	3	1
7 – Least Important	0	3	1	2	4	0	3
Total Responses	8	12	17	24	10	11	7

The majority of survey respondents reported having either Suddenlink or CenturyLink, as shown in the chart below. A small amount had South Central Communications, and a few others reported having a handful of other providers.

Figure 15. Respondents' Internet Service Provider - Coconino County



On average, survey respondents in Coconino County were contracted to receive speeds of 175 mbps download and 90 mbps upload. However, the survey's embedded speed test captured respondents' speeds at an average of just 79 mbps download and 11 mbps upload, indicating that actual speeds are far less than contracted best effort, although they do meet the Federal broadband definition of 25/3. As previously noted, some respondents may have taken the test over a wifi connection, which may affect the speed data.

Table 15. Average Contracted vs. Actual Survey Respondents' Speeds - Coconino County

	Down (Mbps)	Up (Mbps)	Latency (ms)
Average Contracted Speed	175	90	N/A
Average Actual Speed	79	11	144

Below are maps of actual download speeds by location, as collected through the online survey instrument. In heavily populated areas, including Sedona and Flagstaff, about half of survey respondents were seeing higher speeds than other around them. This is especially apparent in Flagstaff, where many were receiving speeds between 26 and 500 mbps, indicated by the green dots, but many were also receiving speeds below 6 mbps, indicated by red dots. This may be due to issues of affordability or could be indicative of oversubscription by users competing for bandwidth in a concentrated area.

While some less populated areas such as Mountainaire and Page appear to show users getting speeds on the higher side, other locations such as Munds Park have a clear need for more bandwidth, as indicated by the many red and orange dots in that community.

Figure 16. Actual Download Speeds by Location – Coconino County – South County

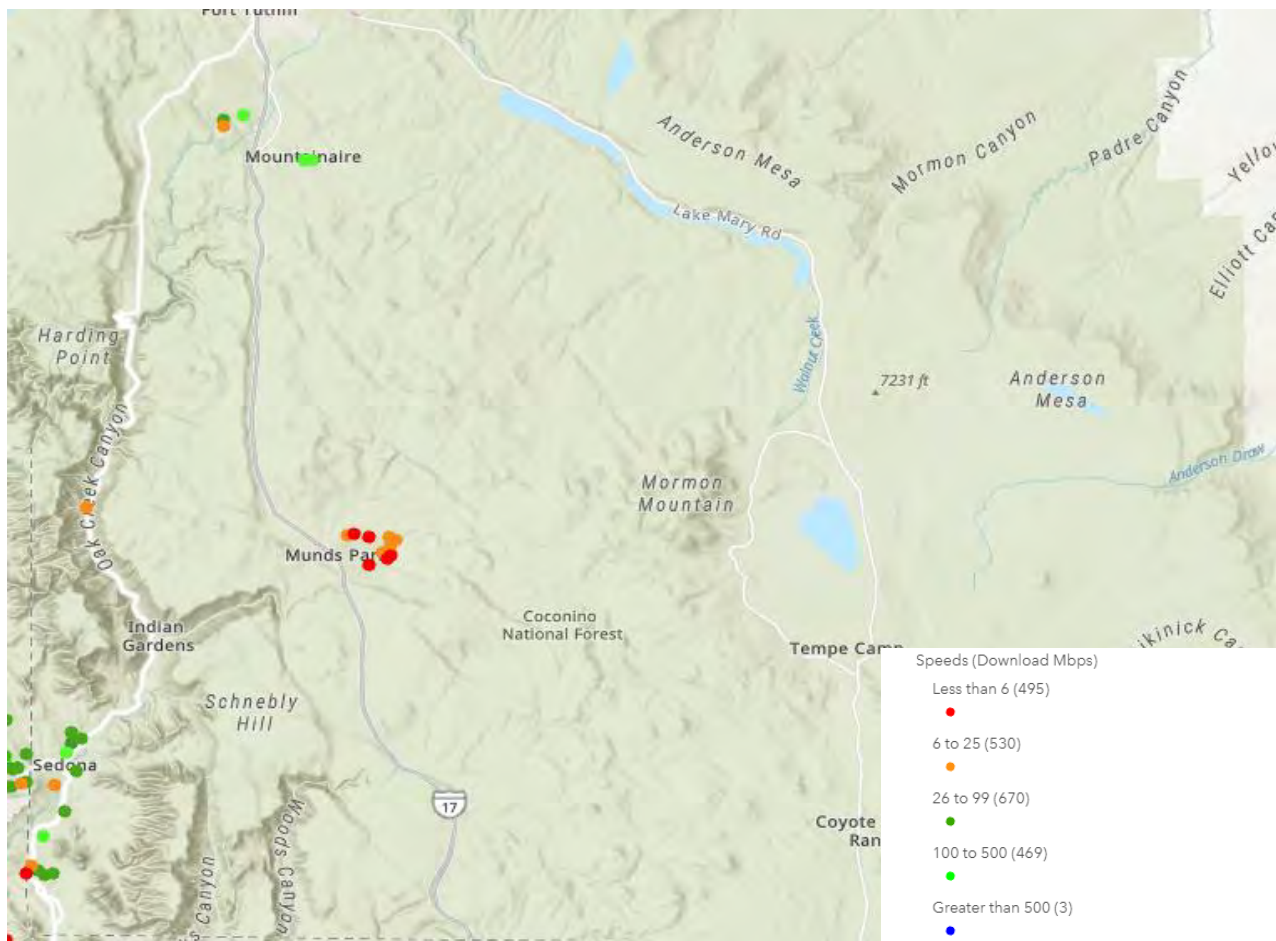


Figure 17. Actual Download Speeds by Location – Coconino County – Central County

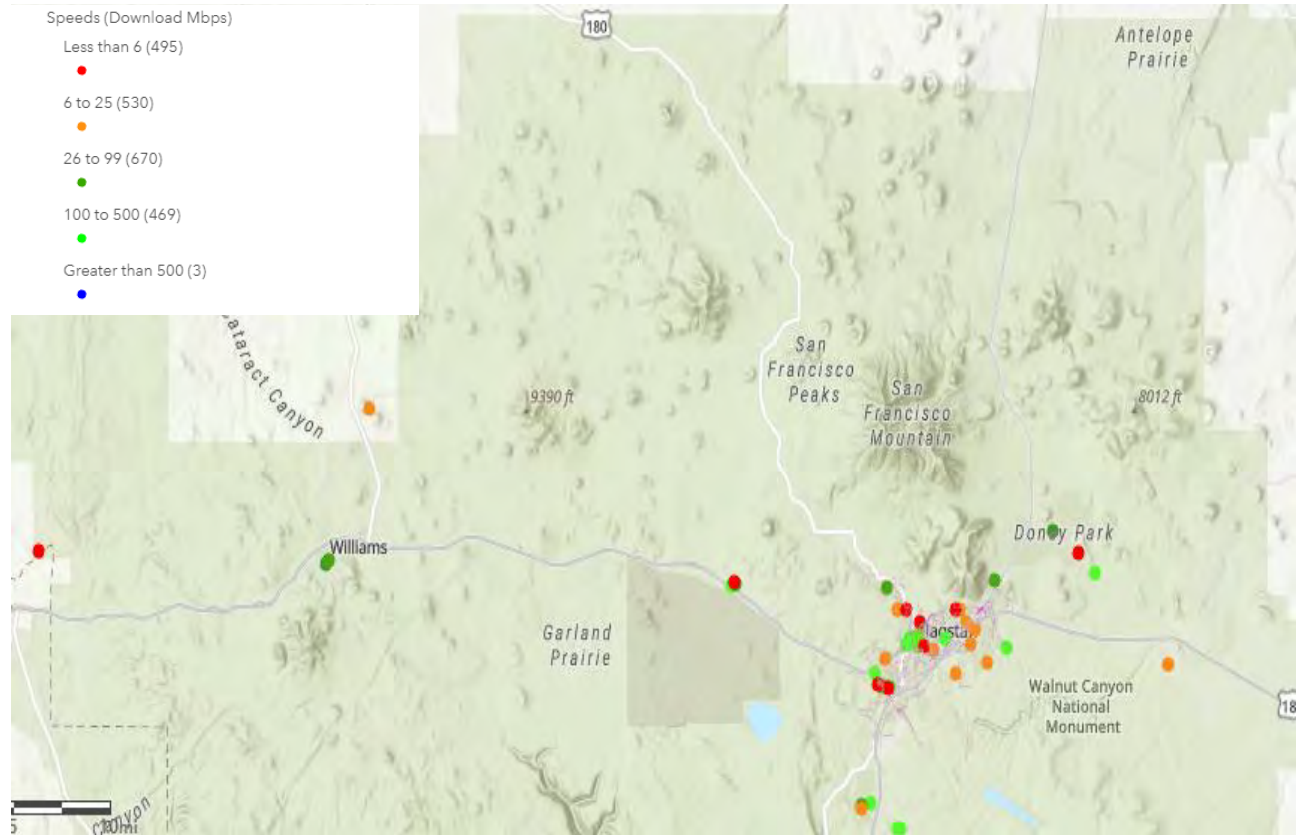
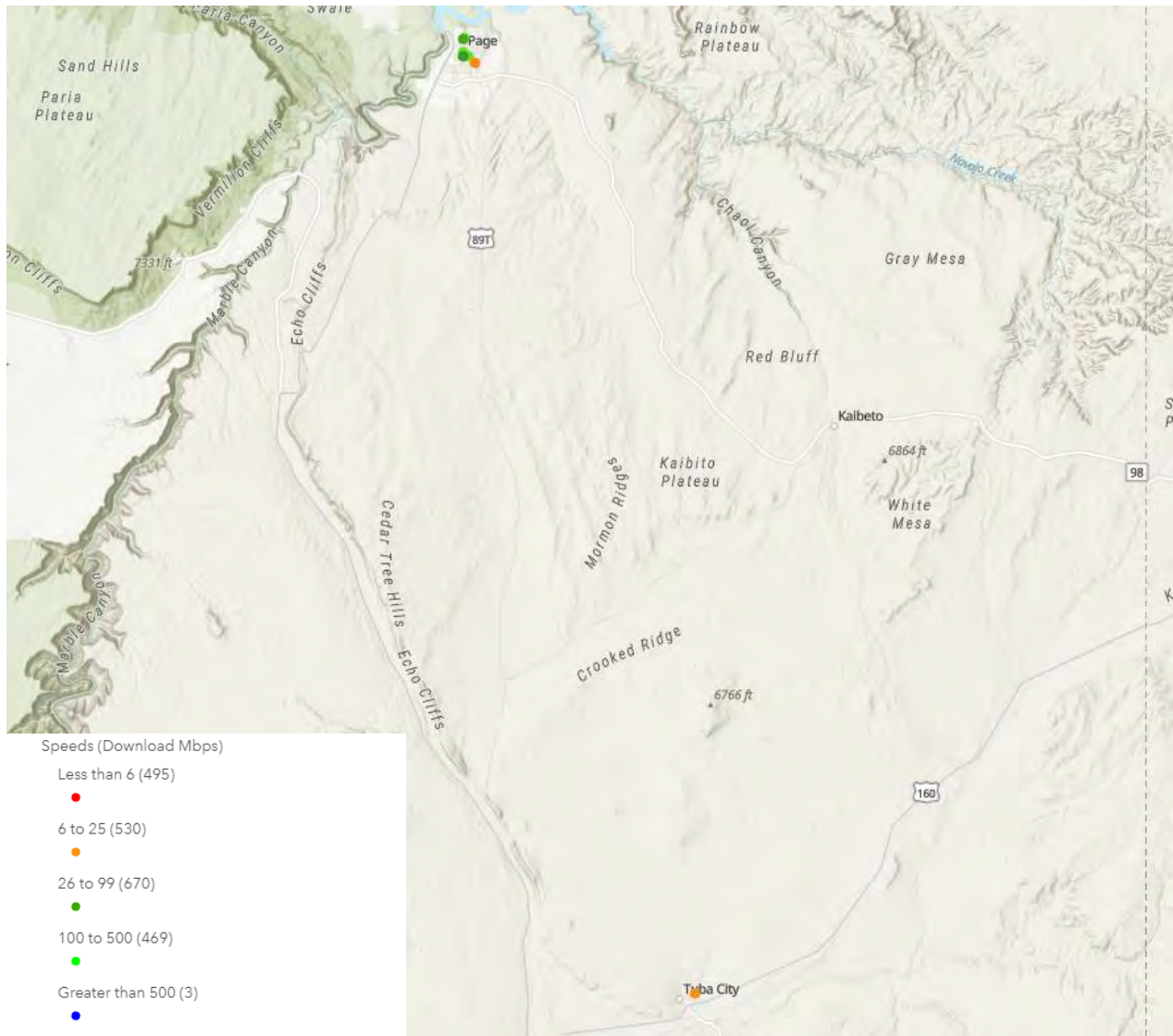


Figure 18. Actual Download Speeds by Location – Coconino County – North County



As shown in the table below, a majority of respondents indicated that the service slows down daily or every few days and service outages lasting less than one day occurred every few months. Outages lasting for a day or more occurred less than once a year or not at all for most respondents.

Table 16. Respondents' Internet Performance – Coconino County

	The service slows down	The service is out briefly	The service is out for less than an hour	The service is out for an hour or two	The service is out for several hours	The service is out for a day or more
Daily, every day	29	14	8	4	2	2
Every few days	20	14	12	8	6	3
Every few weeks	14	16	12	10	8	4
Every few months	10	26	30	29	26	11
About once a year	2	4	10	11	17	10
Less than once a year	3	5	6	13	14	29
Never	1	0	1	5	6	20

Many respondents in Coconino County were dissatisfied overall with their service, especially with their speed, price, and service. Some were somewhat satisfied overall.

Table 17. Respondents' Satisfaction with Current Services

	Overall	Speed	Price	Reliability	Support
Very Satisfied	5	4	2	5	3
Somewhat Satisfied	20	18	17	17	8
Neither/ Not Sure	10	11	14	13	21
Somewhat Dissatisfied	22	17	20	27	17
Very Dissatisfied	23	30	28	19	29

The cost of broadband service was also quite high. The average cost for broadband only (excluding all other services such as cable and telephone that might be part of a subscriber's package) was \$166.65. This means that respondents were paying an average of \$1.85 per mbps.

Table 18. Survey Respondents' Average Costs for Service - Coconino County

Average Cost - All Services	\$ 210.58
Average Cost - Broadband Only	\$ 166.55

Comments from respondents in Coconino County noted what better broadband would mean for their families, businesses, and the area, including

"Reliable internet would reduce headaches and not have to worry or rely on cellular data to take over for dropped broadband." - Survey Respondent #1511

"More efficient work, better classroom and meeting experiences with live video." - Survey Respondent #592

*“Broadband access should be like a utility for everyone. I complain about the reliability and performance of my internet, but I can't imagine having no access at all. The Covid pandemic illustrated the need for broadband available everywhere.” –
Survey Respondent #3592*

“Its 2021. The community is growing and much younger. As we stream TV and phone services this is essential to us. We need this in our community bad!” – Survey Respondent #1387

NAVAJO COUNTY

Out of 934 total survey responses from locations within Navajo County, 842 were households and 92 were organizations.

Table 19. Navajo County Survey Responses by Type

Type	Number
Household: Location is primarily a residence	842
Organization: Location is a business, government, non-profit, etc.	92
Total	934

With 261 responses, Show Low had the most surveys compared to other locations in the County, followed by Overgaard at 125 responses, and Snowflake at 106 responses. Based on the populations of these towns and cities, we would expect to see more responses from the Winslow area as it is the second most populous town in Navajo County. At just 46 responses, Winslow is underrepresented, whereas Overgaard is overrepresented based on its population. This may be indicative of the level of need for broadband options in each of these communities; locations that have insufficient broadband often garner more community engagement than communities where broadband is less of an issue.

Table 20. Navajo County Survey Responses by City

Location	Responses
Cibecue	4
Clay Springs	4
Dilkon	2
Fort Apache	2
Greasewood	1
Heber	31
Heber-Overgaard	127
Holbrook	103
Indian Wells	5
Joseph City	7
Kayenta	14
Keams Canyon	2
Lakeside	74
Shonto	10
Show Low	261
Snowflake	106
Sun Valley	2
Taylor	47
White Mountain Lake	4
Whiteriver	23
Winslow	46
Woodruff	5
Pinedale	4
Pinetop	49
Pinon	1
Total	934

Household Demographics

The average size of respondents' households in Navajo County was 3 people, comparable to the Census data average size of 3.04. Respondents were slightly older than the general population, with the youngest household member averaging 34 years old and the oldest averaging 56 years old, compared with an average Census age of 37.3 years.

Table 21. Household Demographics - Navajo County

	Household Size	Youngest	Oldest
Average	3	34	56

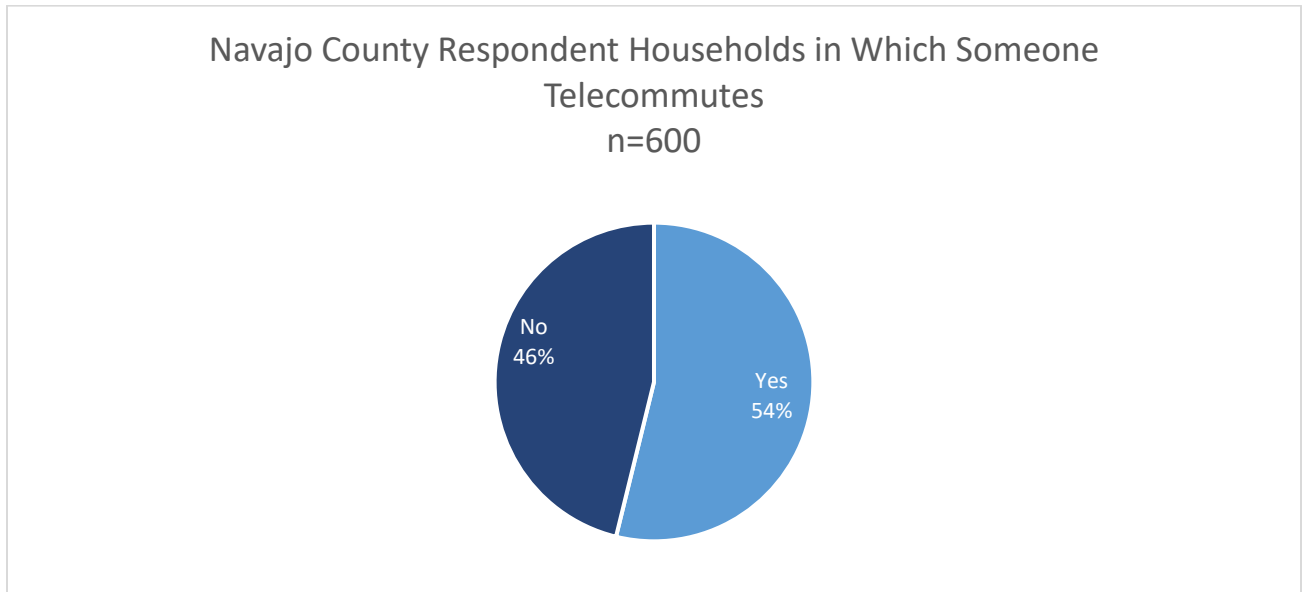
Navajo County respondents also had higher level of educational attainment than would be expected based on Census data. Whereas Census data indicate that 15.3% of Navajo County has a Bachelor's degree or higher, approximately 53% of respondents had at least a Bachelor's degree.

Table 22. Educational Attainment of Survey Respondents - Navajo County

Educational Attainment	Number of Responses
Bachelor degree	172
Some college but no degree	146
Master's degree	119
Associate degree	97
High school graduate or GED	35
Doctoral degree	28
Elementary, middle school, or some high school but did not graduate	1

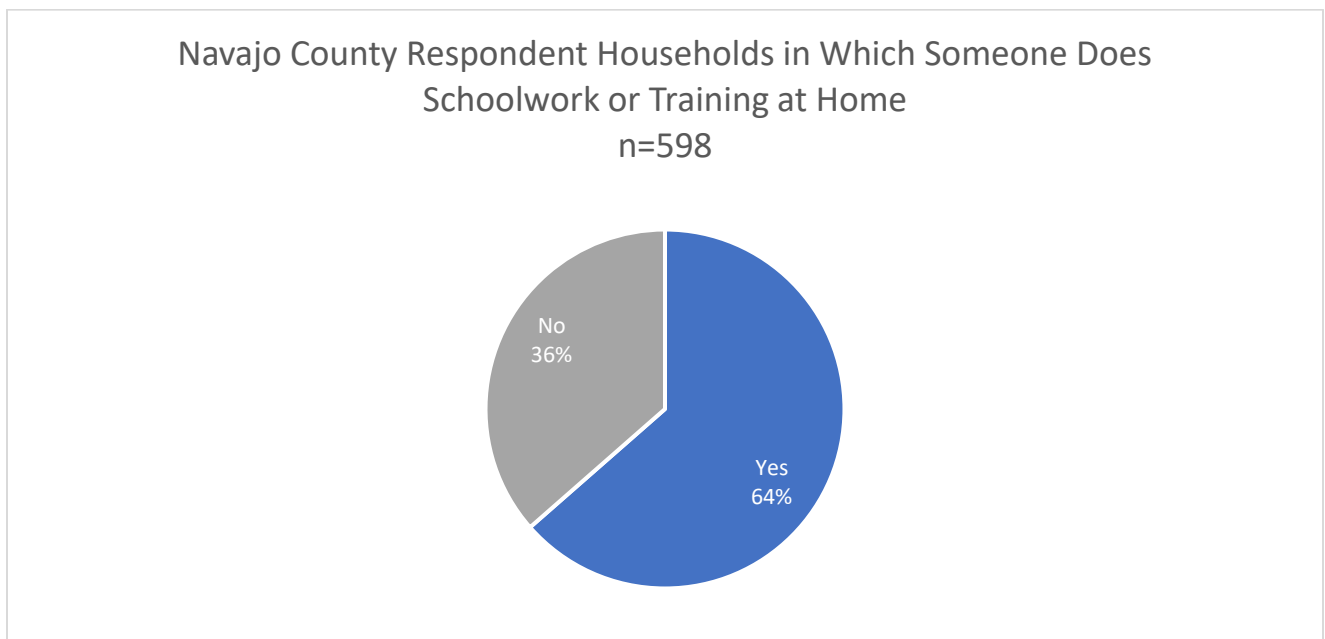
When household respondents were asked if there was any member of their household who regularly telecommutes, 54% of 600 respondents indicated yes.

Figure 19. Percentage of Households in Which Someone Telecommutes – Navajo County



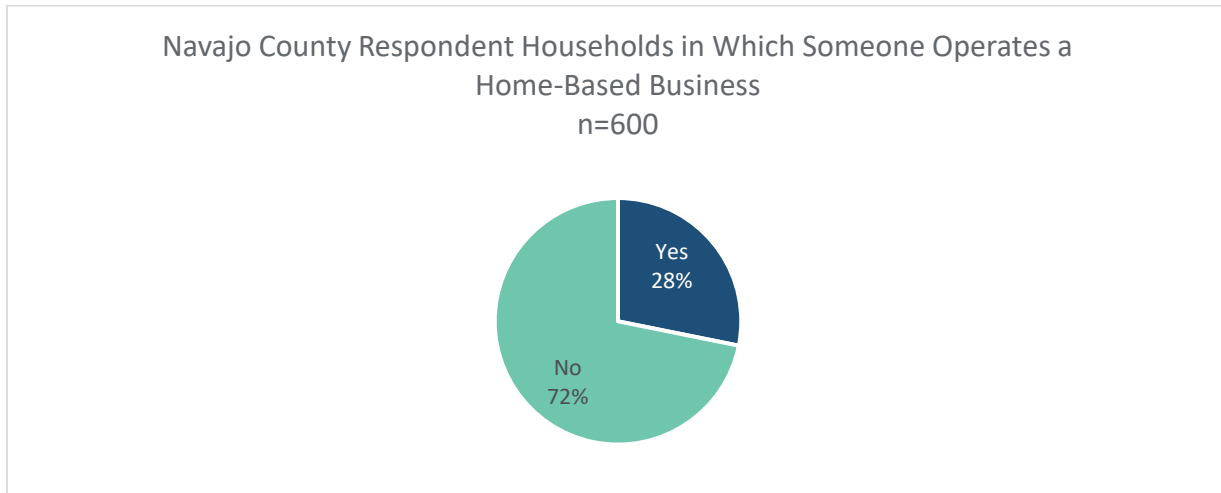
Almost two-thirds (64%) of respondents in Navajo County reported that someone in their household does schoolwork or training at home.

Figure 20. Percentage of Households in Which Someone Does Schoolwork or Training at Home



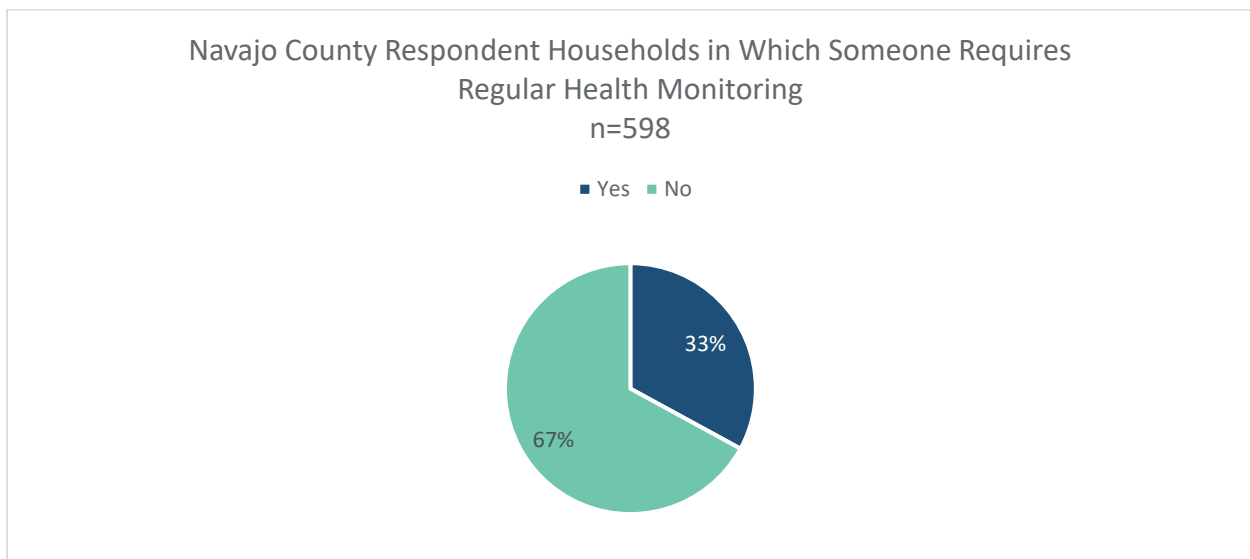
The survey also asked respondents to indicate whether or not someone in their household operated a home-based business. Out of 600 respondents, approximately 28% stated that that someone did operate a home-based business.

Figure 21. Percentage of Households in Which Someone Operates a Home-based Business – Navajo County



Household respondents were also asked about whether anyone in their household requires regular health monitoring or consulting with healthcare providers. Out of 598 total responses, about one third said that someone did.

Figure 22. Percentage of Households in Which Someone Requires Regular Health Monitoring or Consulting with Healthcare Providers – Navajo County



Organization Demographics

Of the 46 responses from organizations, most came from services, including ten (10) from Other Service (except Public Administration) and Educational Services.

Table 23. Navajo County Respondents' Organization Sector

Sector	Number of Respondents
Other Services (except Public Administration)	10
Agriculture, Forestry, Fishing and Hunting	1
Educational Services	9
Accommodation and Food Services	1
Information	2
Retail Trade	4
Public Administration	4
Professional, Scientific, and Technical Services	4
Finance and Insurance	3
Health Care and Social Assistance	3
Real Estate and Rental and Leasing	3
Arts, Entertainment, and Recreation	1
Construction	1

Internet Services

Most respondents (42%) reported having internet connections via cable infrastructure, following by DSL (23%) and mobile/cellular wireless (11%). Only 1% of respondents had connections via fiber and 3% reported having no internet access at all at their locations.

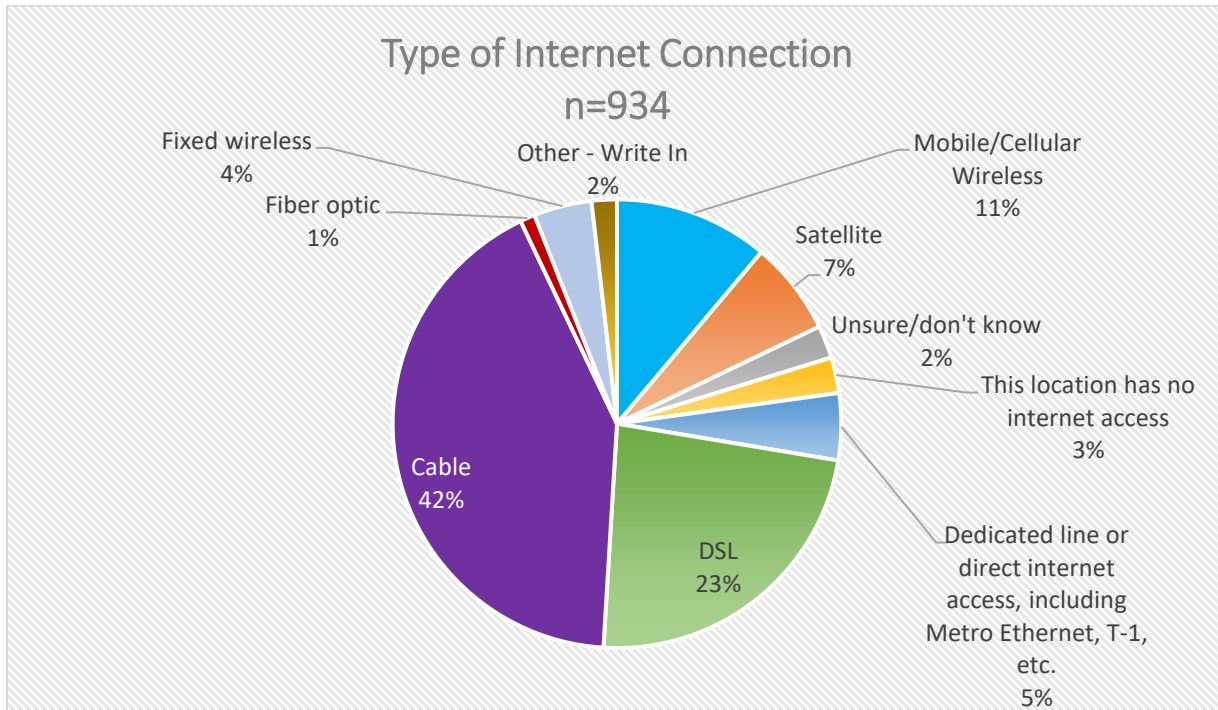
Among respondents who did not have broadband connections, the most important reason was that broadband was not available at their locations, followed by services being too slow and unreliable, and services being too expensive.

Table 24. Reasons for No Broadband Connection – Navajo County

	Access Elsewhere	Too Expensive	Too Slow or unreliable	Broadband Not Available	Do not need internet	Smartphone meets needs	Other reason not listed here
1 – Most Important	8	23	35	82	2	8	11
2	4	17	40	18	1	6	2
3	4	25	14	10	0	8	3
4	11	8	6	11	3	17	3
5	13	3	1	6	7	13	5
6	10	3	2	1	16	9	10
7 – Least Important	5	0	3	7	25	4	17
Total Responses	55	79	101	135	54	65	51

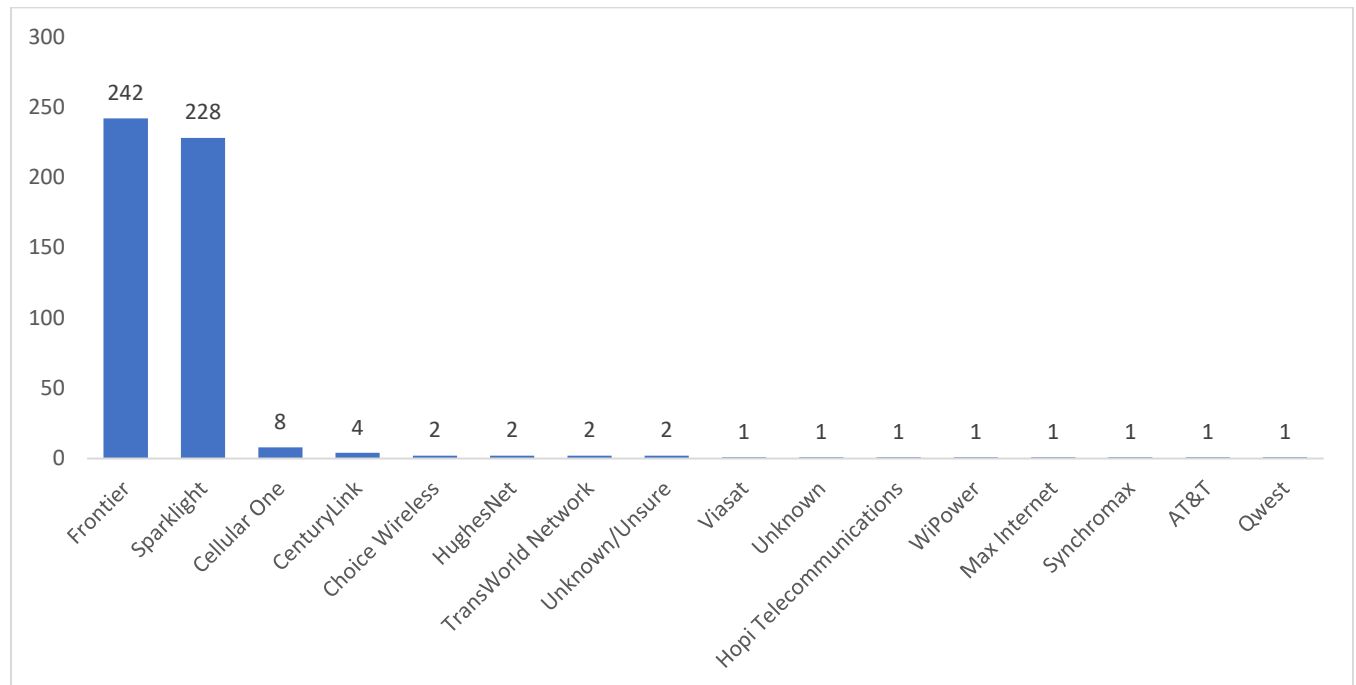
The majority of respondents in Navajo County indicated that their locations were connected via either cable or DSL. Only 1% of respondents indicated that they were connected via fiber.

Figure 23. Navajo County Survey Respondents' Type of Internet Connection



The majority of survey respondents reported having either Sparklight or Frontier, as shown in the chart below. A small amount had Cellular One, and a few others reported having Cellular One, CenturyLink, or a handful of other providers.

Figure 24. Navajo County Survey Respondents' Internet Service Providers



On average, survey respondents were contracted to receive speeds of 150 mbps download and 93 mbps upload. However, the survey's embedded speed test captured respondents' speeds at an average of just 48 mbps download and 16 mbps upload, indicating that actual speeds are less than a third of contracted best effort, but do meet the Federal standard of 25/2 mbps. Again, it should be noted that although the survey instructions directed respondents to perform the test while directly connected to a wired internet connection, some respondents may have taken the test over a wifi connection, which may affect the speed data.

Table 25. Average Contracted vs. Actual Survey Respondents' Speeds – Navajo County

	Down (Mbps)	Up (Mbps)	Latency (ms)
Average Contracted Speed	150.03	93.13	N/A
Average Actual Speed	47.66	15.64	172.33

Below are maps of actual download speeds by location in Navajo County. Throughout all areas of the County, the vast majority of respondents did not have download speeds meeting the federal broadband definition of 25/3, although there were some responses in the central parts of Winslow, Snowflake, and Show Low that had speeds between 300 and 400 mbps.

Figure 25. Actual Download Speeds by Location – Navajo County - North County

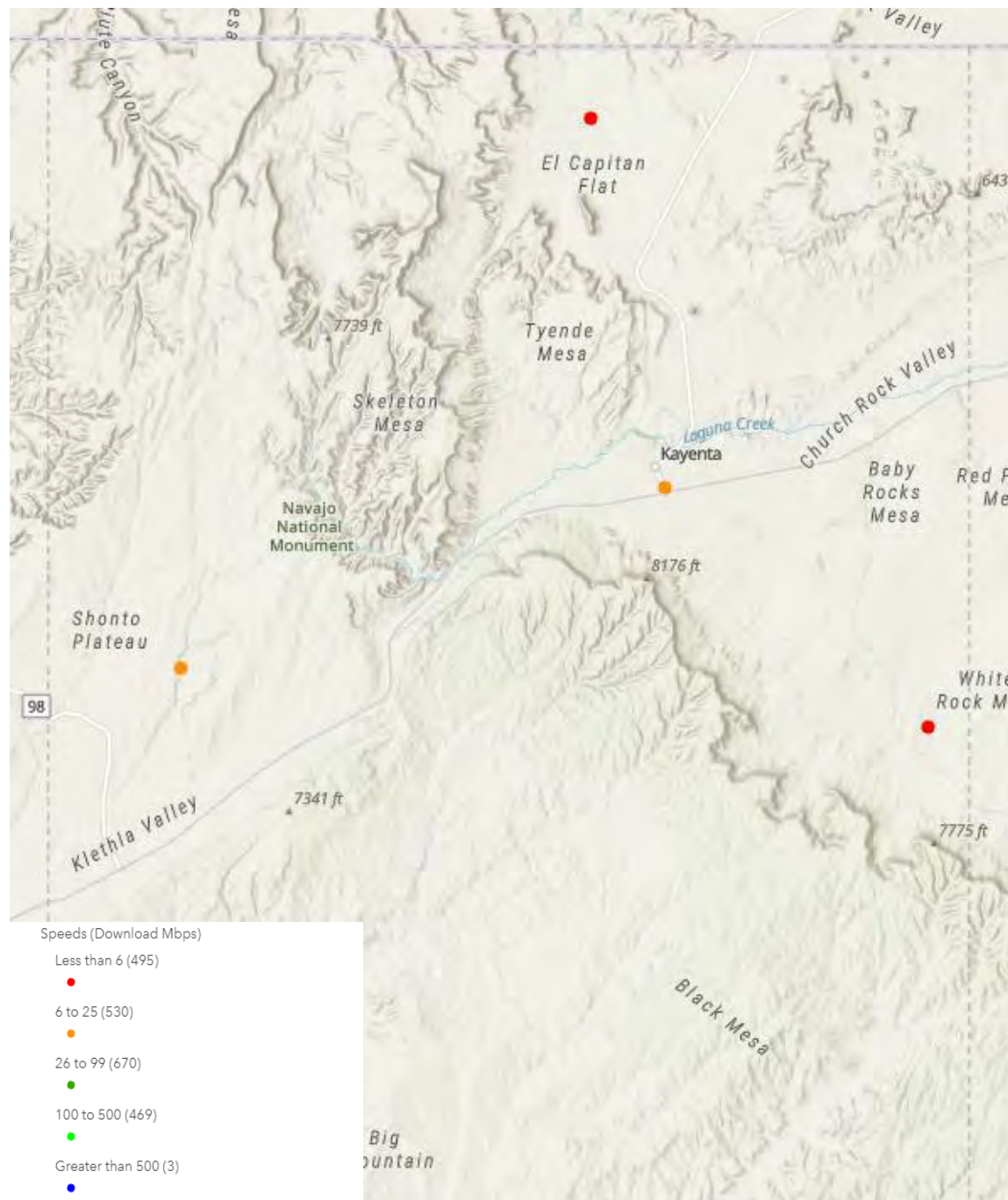


Figure 26. Actual Speeds by Location – Navajo County - Central County

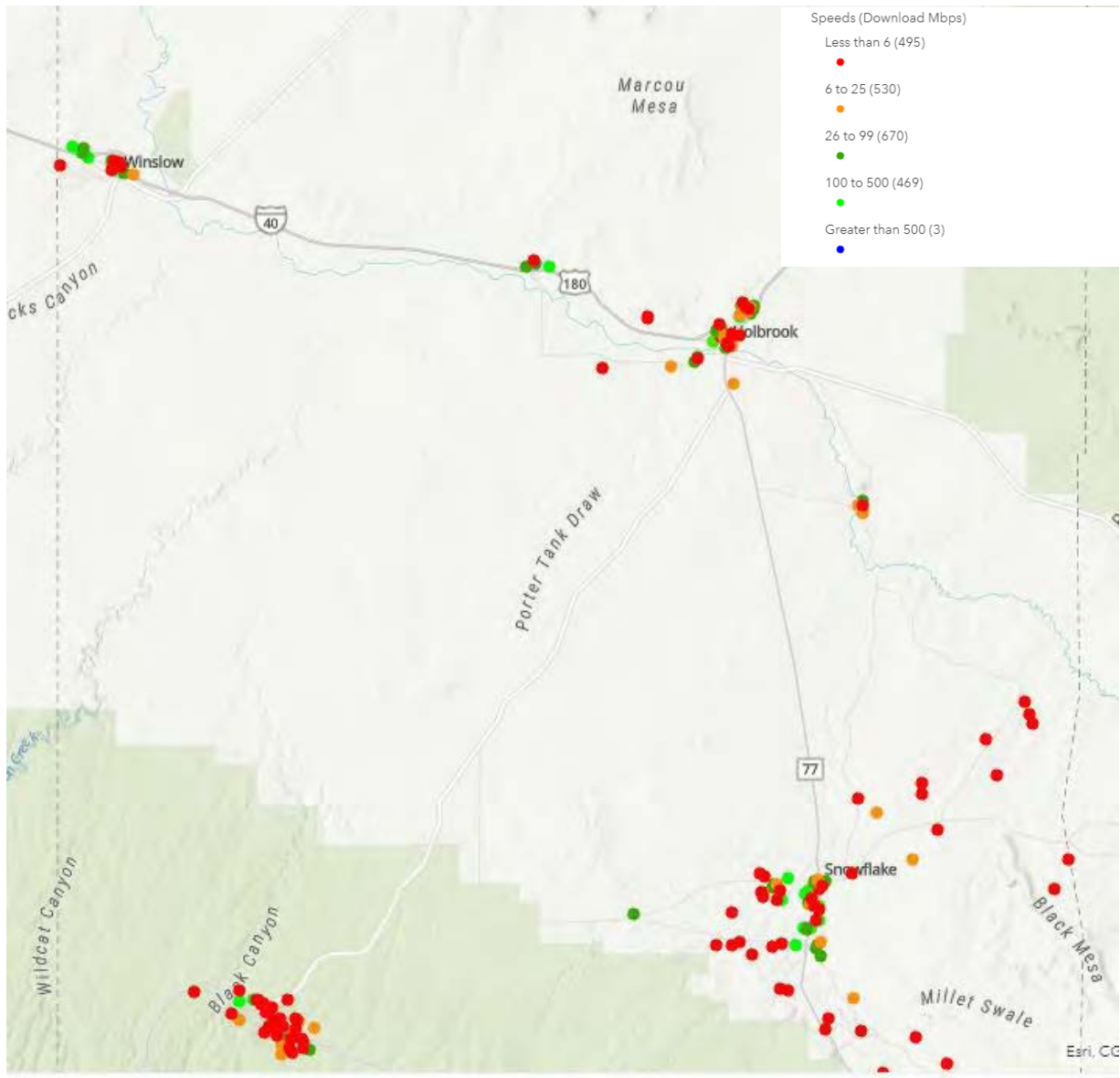
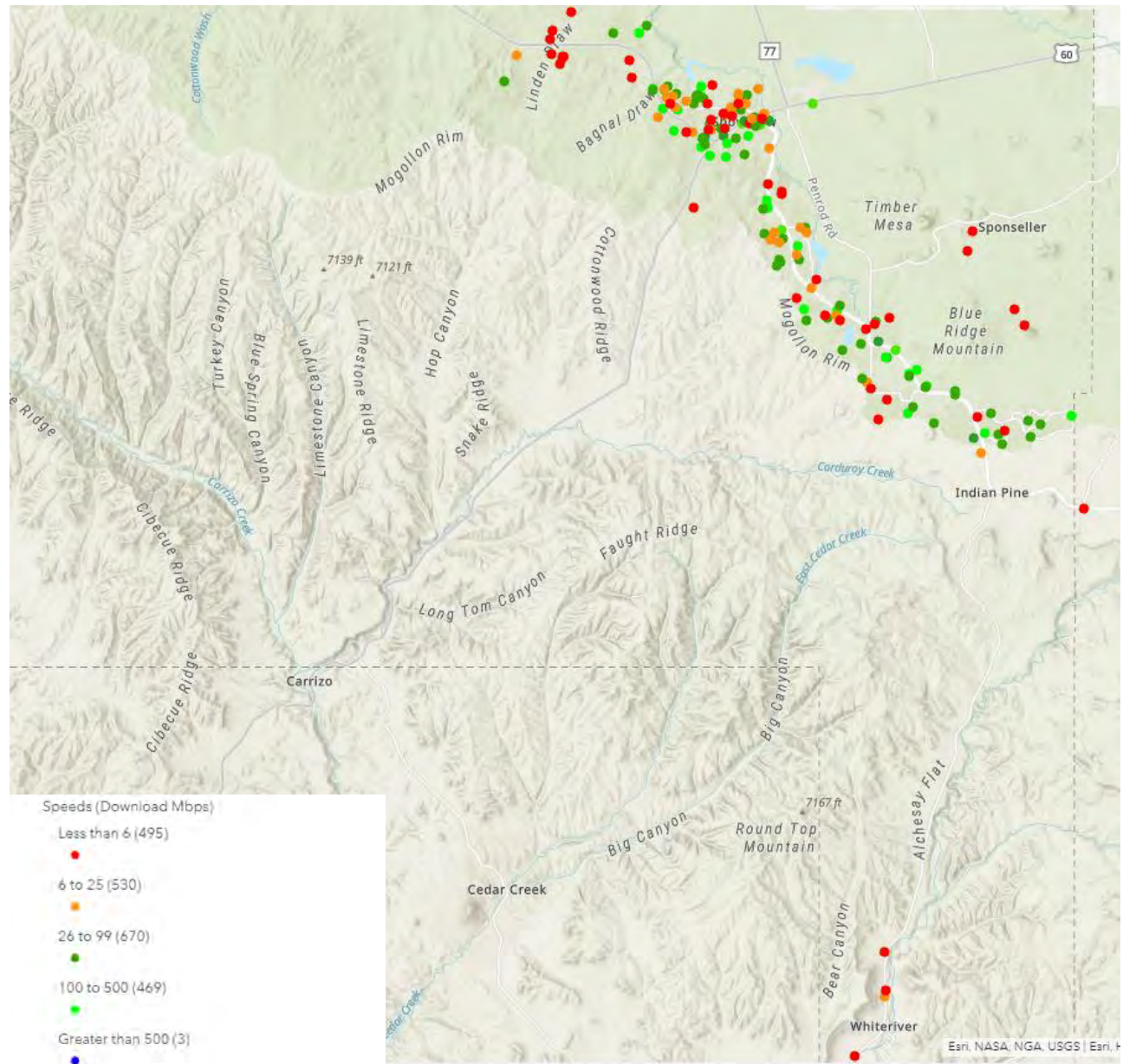


Figure 27. Actual Download Speeds by Location – Navajo County - South County



Respondents were also asked how often they experienced service slow downs and outages. As shown in the table below, a majority of respondents indicated that the service slows down daily and service outages lasting less than one day occurred every few months.

Table 26. Respondents' Internet Performance – Navajo County

	The service slows down	The service is out briefly	The service is out for less than an hour	The service is out for an hour or two	The service is out for several hours	The service is out for a day or more
Daily, every day	142	74	45	14	10	7
Every few days	115	83	78	38	22	7
Every few weeks	80	115	95	91	63	18
Every few months	77	124	136	170	153	92
About once a year	21	33	57	89	100	91
Less than once a year	9	20	23	37	79	128
Never	12	7	14	15	25	106

Respondents were also asked about their satisfaction with current services based on overall service, speed, price, reliability, and support. Most respondents were overall somewhat satisfied with their service, speed, and support. The most common reason for dissatisfaction was speed and many were somewhat dissatisfied with price and reliability.

Table 28. Respondents' Satisfaction with Current Services – Navajo County

	Overall	Speed	Price	Reliability	Support
Very Satisfied	42	34	30	27	35
Somewhat Satisfied	158	146	104	135	139
Neither/Not Sure	36	36	74	38	120
Somewhat Dissatisfied	116	104	149	142	100
Very Dissatisfied	104	137	96	112	58

The cost of broadband service was also relatively high. The average cost for broadband only (excluding all other services such as cable and telephone that might be part of a subscriber's package) was \$101.98. This means that respondents were paying an average of \$1.61 per mbps. High-speed, fiber-based broadband commonly provides 1 Mbps for less than \$0.30 per month.

Table 28. Survey Respondents' Average Costs for Service

Average Cost - All Services	\$ 156.45
Average Cost - Broadband Only	\$ 101.98

Below is a selection of comments provided by Navajo County's respondents about what better broadband would mean for the region.

Broadband internet would improve working from home while keeping an eye on a elderly family member. – Survey Respondent #215

Better internet would bring peace of mind for my family. Internet outages or slow speeds can affect progress of school for high school student and college student in household. – Survey Respondent #221

My business could be more competitive and more productive in comparison to urban areas. – Survey Respondent #418

It seems as though everybody else in the world has a faster Internet connection than we do. We really need this service due to threat of wildfires and other alerts, including weather related and governmental notices. Besides keeping in touch with friends and family is difficult at these slow speeds. – Survey Respondent #517

YAVAPAI COUNTY

In Yavapai County, the survey received 3391 total responses, 3239 of which were households and 152 of which were organizations.

Table 29. Yavapai County Survey Responses by Type

Type	Number
Household: Location is primarily a residence	3239
Organization: Location is a business, government, non-profit, etc.	152
Total	3391

Most responses from Yavapai County came from Prescott, followed by Prescott Valley and Sedona. As previously noted, responses from Sedona were grouped by the County in which the responses were located. Based on population, most towns and cities are fairly well represented, although we would have expected to see fewer from Sedona and more from Chino Valley.

Table 30. Yavapai County Survey Responses by Location

City	Responses
Ash Fork	14
Bagdad	9
Black Canyon City	28
Camp Verde	265
Chino Valley	68
Clarkdale	65
Congress	7
Cordes Lakes	11
Cornville	65
Cottonwood	232
Crown King	9
Dewey-Humboldt	176
Jerome	13
Kirkland	15
Lake Montezuma	4
Mayer	38
Paulden	32
Prescott	860
Prescott Valley	640
Rimrock	212
Sedona	586
Seligman	18
Skull Valley	12
Spring Valley/Mayer	1
Village Of Oak Creek	3
Wilhoit	3
Yarnell	4
Total	3391

Household Demographics – Yavapai County

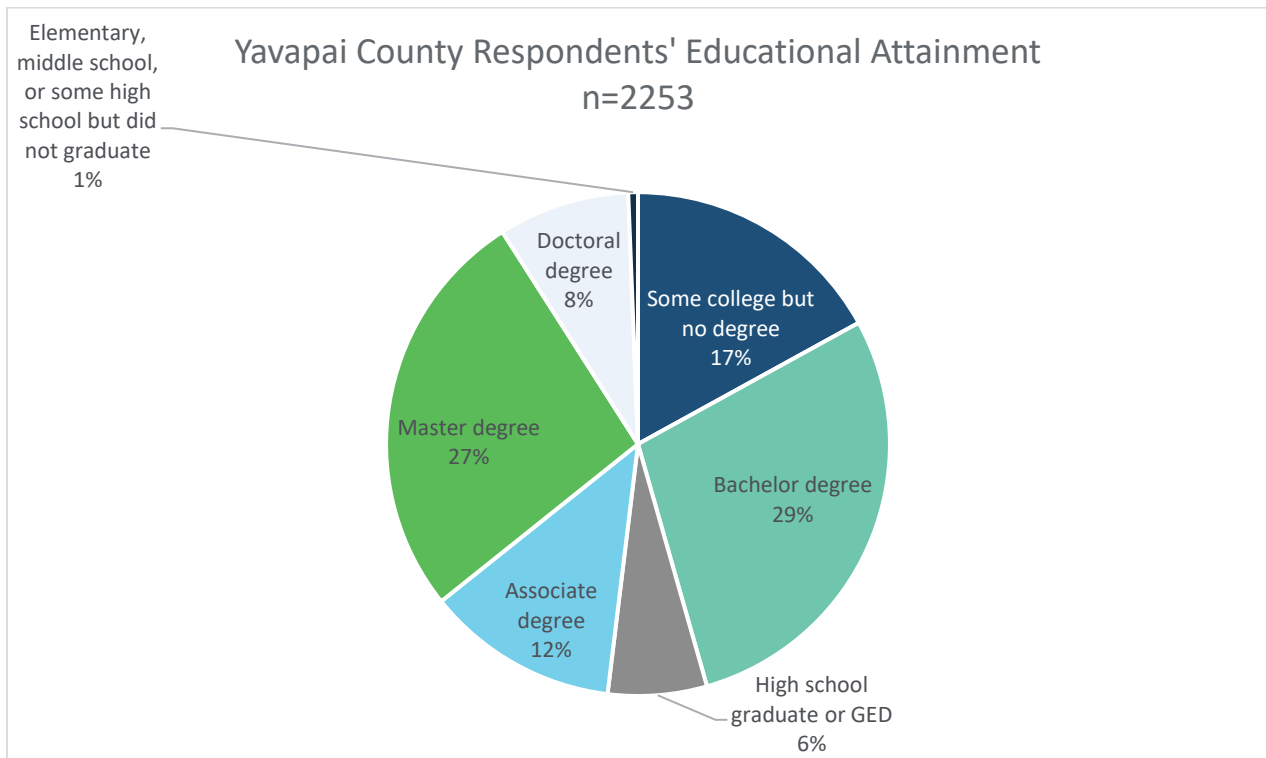
The average size of respondents’ households was 3 people, slightly higher than the Census data average size of 2.28. Respondents were slightly older than the general population, with the youngest household member averaging 42 years old and the oldest averaging 62 years old, compared with an average Census age of 49.2 years.

Table 31. Household Demographics – Coconino County

	Household Size	Youngest	Oldest
Average	3	42	62

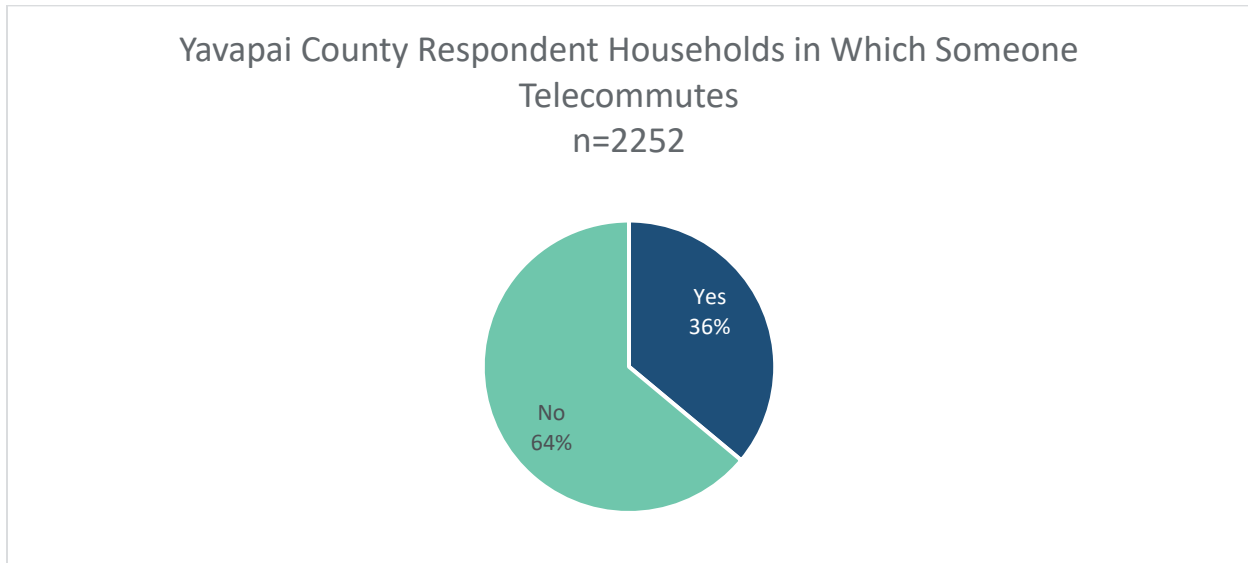
Respondents also had higher level of educational attainment than would be expected based on Census data. Whereas Census data indicate that 25.9% of Yavapai County has a Bachelor’s degree or higher, approximately 64% of respondents had at least a Bachelor’s degree.

Figure 28. Yavapai County Respondents’ Educational Attainment



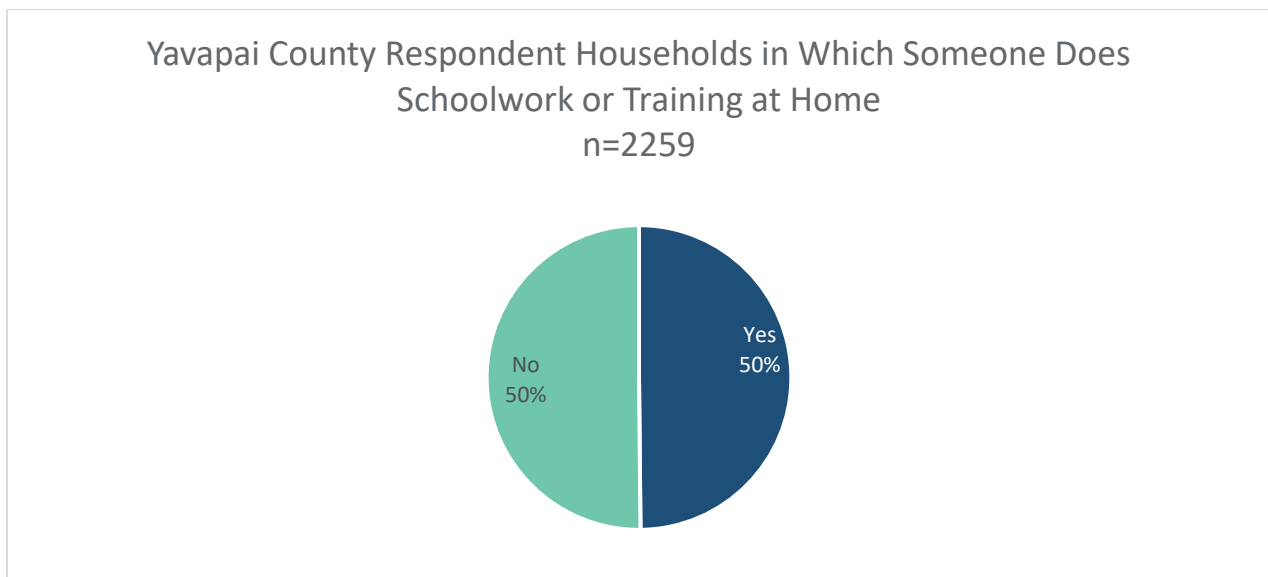
When household respondents were asked if there was any member of their household who regularly telecommutes, 36% of 2252 respondents indicated yes, far fewer than in other counties in the region. This is likely due to the large tourism sector in Yavapai County requiring in-person employment.

Figure 29. Percentage of Households in Which Someone Telecommutes – Yavapai County



Similarly, fewer respondents in Yavapai County reported that someone uses online learning in the household compared with the other three counties. About half of respondents indicated learning from home.

Figure 30. Percentage of Households in Which Someone Uses Online Learning – Yavapai County



Fewer than one-third of respondents indicated that someone in their household operates a home-based business. Just over one-third reported that someone in their household requires regular monitoring or consulting with healthcare providers.

Figure 31. Percentage of Households in Which Someone Operates a Home-based Business – Yavapai County

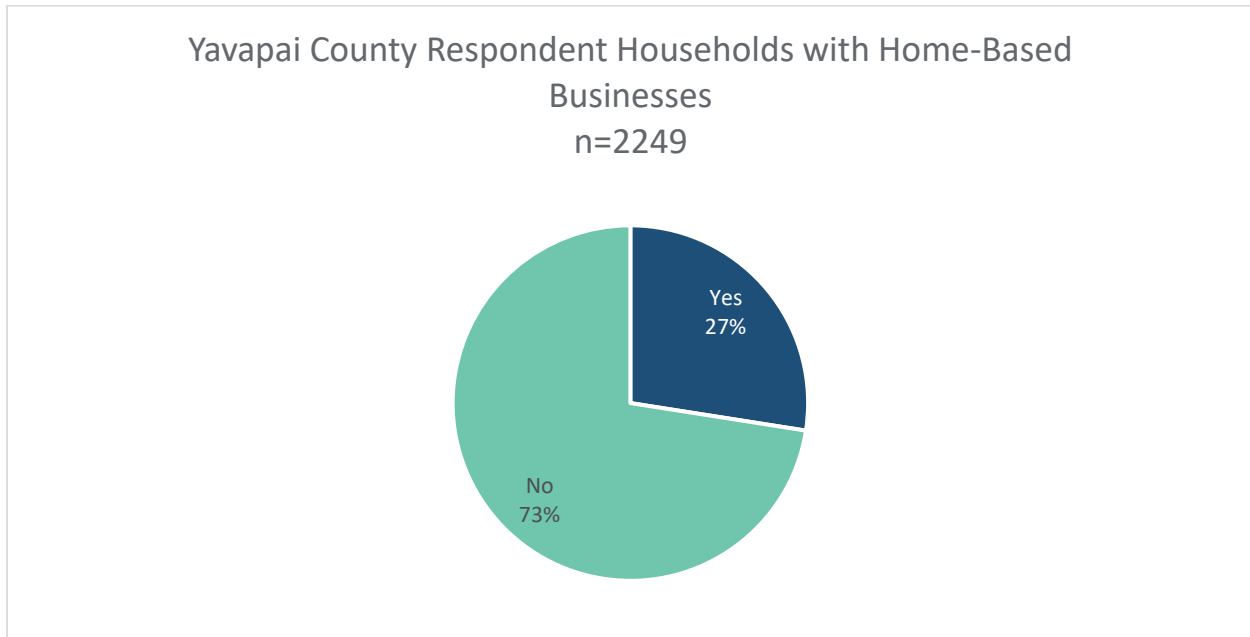
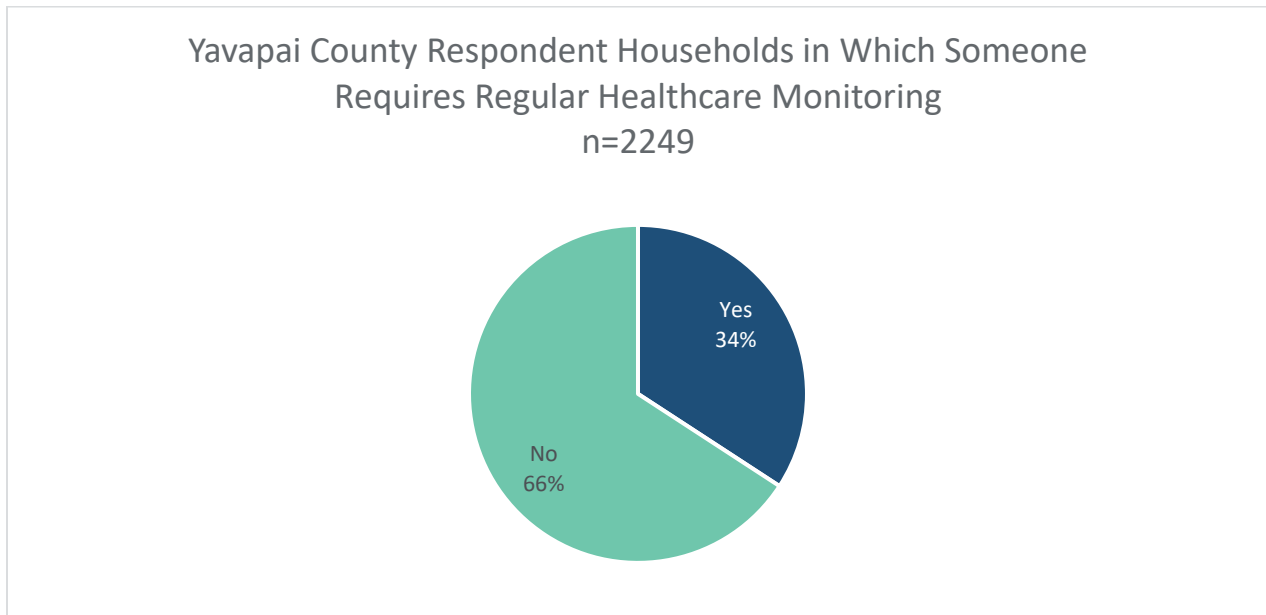


Figure 32. Percentage of Households in Which Someone Requires Regular Health Monitoring or Consulting with Healthcare Providers – Yavapai County



Organization Demographics

The responses from organizations in Yavapai County mostly came from services include Healthcare and Social Assistance, Other Services (except Public Administration), and Professional, Scientific, and Technical Services.

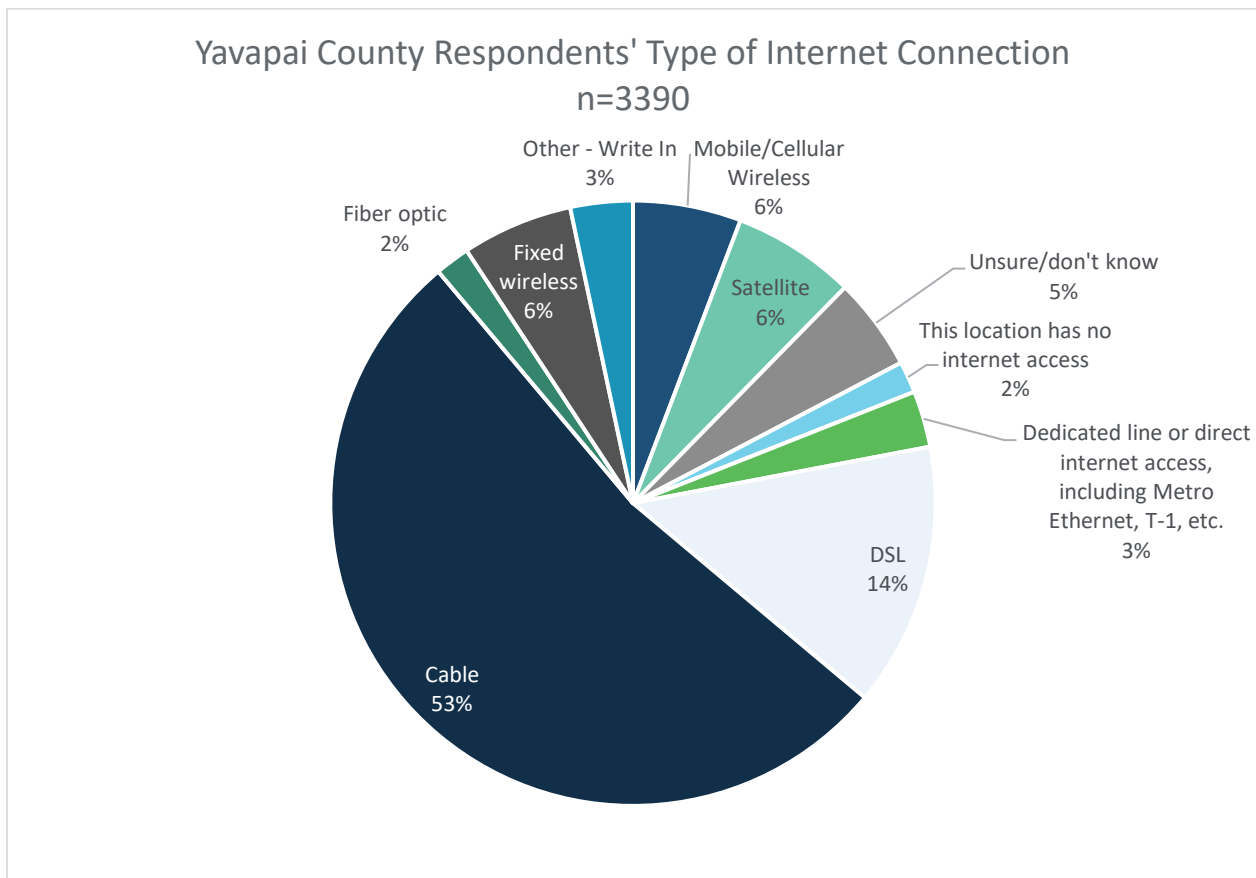
Table 32. Yavapai County Respondents' Organization Sector

Other Services (except Public Administration)	12
Agriculture, Forestry, Fishing and Hunting	1
Educational Services	6
Accommodation and Food Services	8
Information	4
Retail Trade	8
Public Administration	6
Professional, Scientific, and Technical Services	10
Finance and Insurance	1
Health Care and Social Assistance	15
Real Estate and Rental and Leasing	3
Arts, Entertainment, and Recreation	2
Construction	1

Internet Services

More than half of respondents (53%) reported having internet connections via cable infrastructure. Approximately 28% of respondents reported having connections that we do not consider broadband including DSL, satellite, mobile/cellular connections, or no internet at all. Only 2% of respondents had connections via fiber and an additional 2% reported having no internet access at all at their locations.

Figure 33. Yavapai County Respondents' Type of Internet Connection



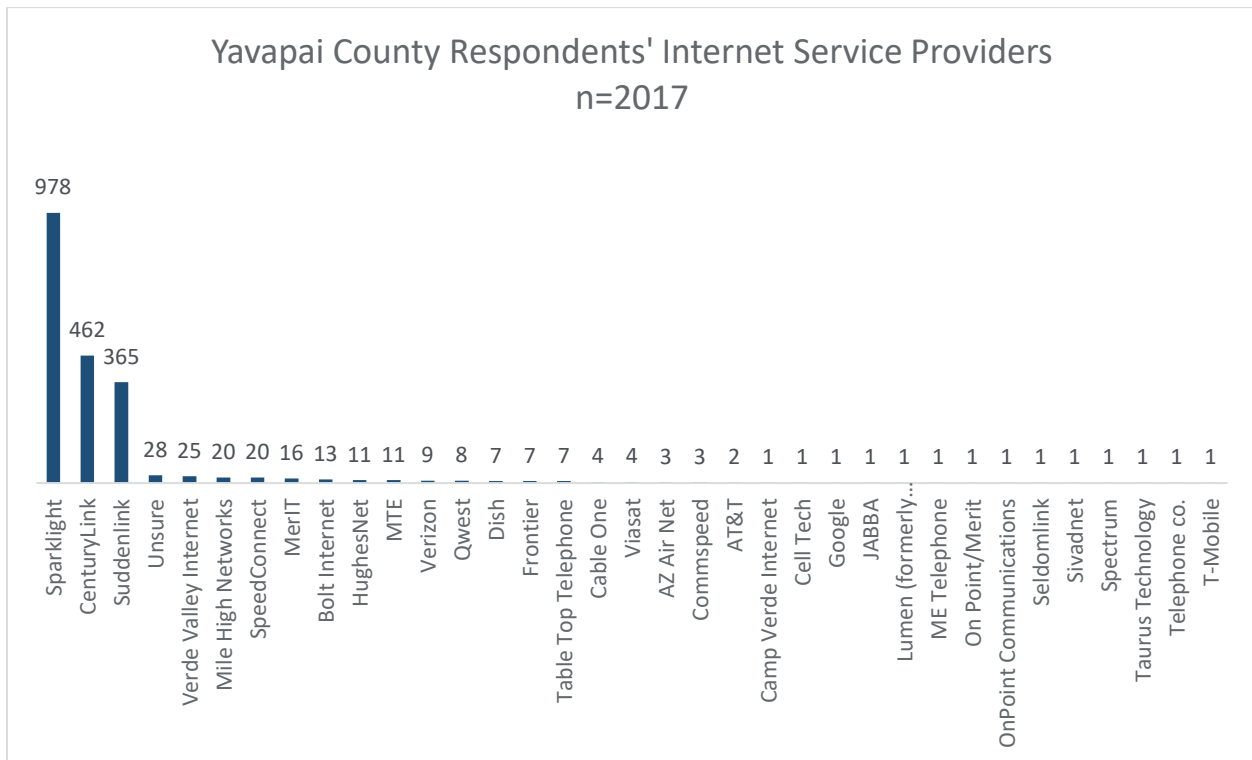
As in the other counties, among respondents who did not have broadband connections in Yavapai County, the most important reason was that broadband was not available at their locations, followed by services being too slow and unreliable, and services being too expensive.

Table 33. Reasons for No Broadband Connection – Yavapai County

	Access Elsewhere	Too Expensive	Too Slow or unreliable	Broadband Not Available	Do not need internet	Smartphone meets needs	Other reason not listed here
1 – Most Important	26	78	80	176	18	22	30
2	14	50	72	18	1	21	8
3	23	37	35	25	3	27	6
4	35	27	16	14	6	31	16
5	28	14	10	9	5	42	11
6	21	16	9	10	34	15	20
7 – Least Important	15	12	13	38	56	24	41
Total Responses	162	234	235	290	123	182	132

The variety of service providers was much more diverse than in any of the other three counties in the region. The majority of survey respondents reported having Sparklight, followed by CenturyLink and Suddenlink, as shown in the chart below. Several other providers were also reported by respondents.

Figure 34. Respondents' Internet Service Provider - Yavapai County



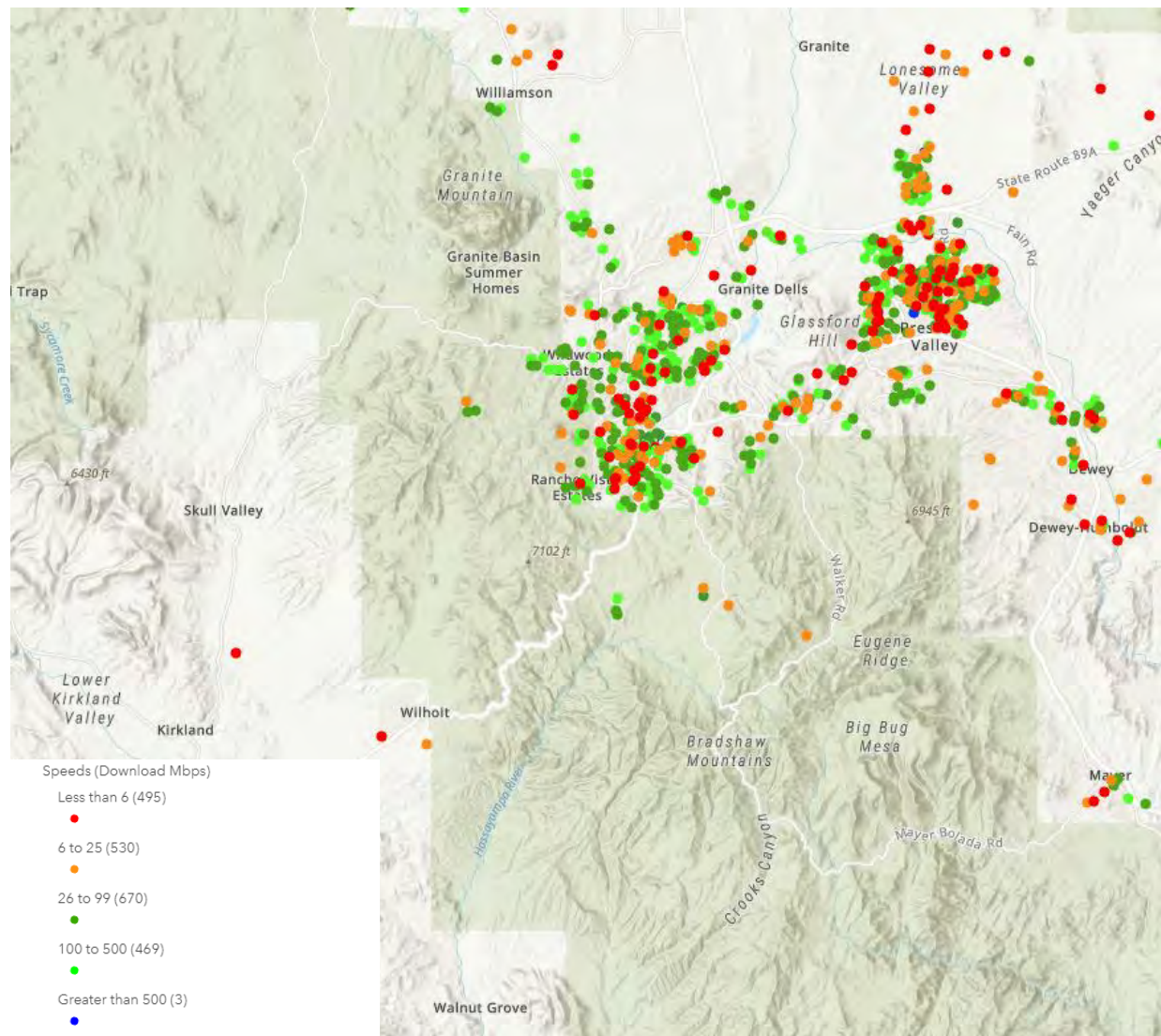
On average, survey respondents in Yavapai County were contracted to receive speeds of 85 mbps download and 35 mbps upload. The survey's embedded speed test captured respondents' speeds at an average of 63 mbps download and 12 mbps upload, meeting the Federal definition of 25/3 mbps and indicating that actual speeds are somewhat less than contracted best effort, but not as dramatically different as in the other counties. Again, some respondents may have taken the test over a wifi connection, which may affect the speed data.

Table 34. Average Contracted vs. Actual Survey Respondents' Speeds - Yavapai County

	Down (Mbps)	Up (Mbps)	Latency (ms)
Average Contracted Speed	85	35	N/A
Average Actual Speed	63	12	144

Below are maps of actual download speeds by location in Yavapai County. In some cities, including Prescott and Prescott Valley, about half of survey respondents were seeing broadband speeds, while the other half were seeing slower connections. It also appears that the slower speeds are concentrated toward the center of the towns, where the infrastructure is likely older. As stated previously, this may be due to issues of affordability but is more likely due to the need for additional bandwidth across the community.

Figure 35. Speed Test Results by Location - Yavapai County – Central County



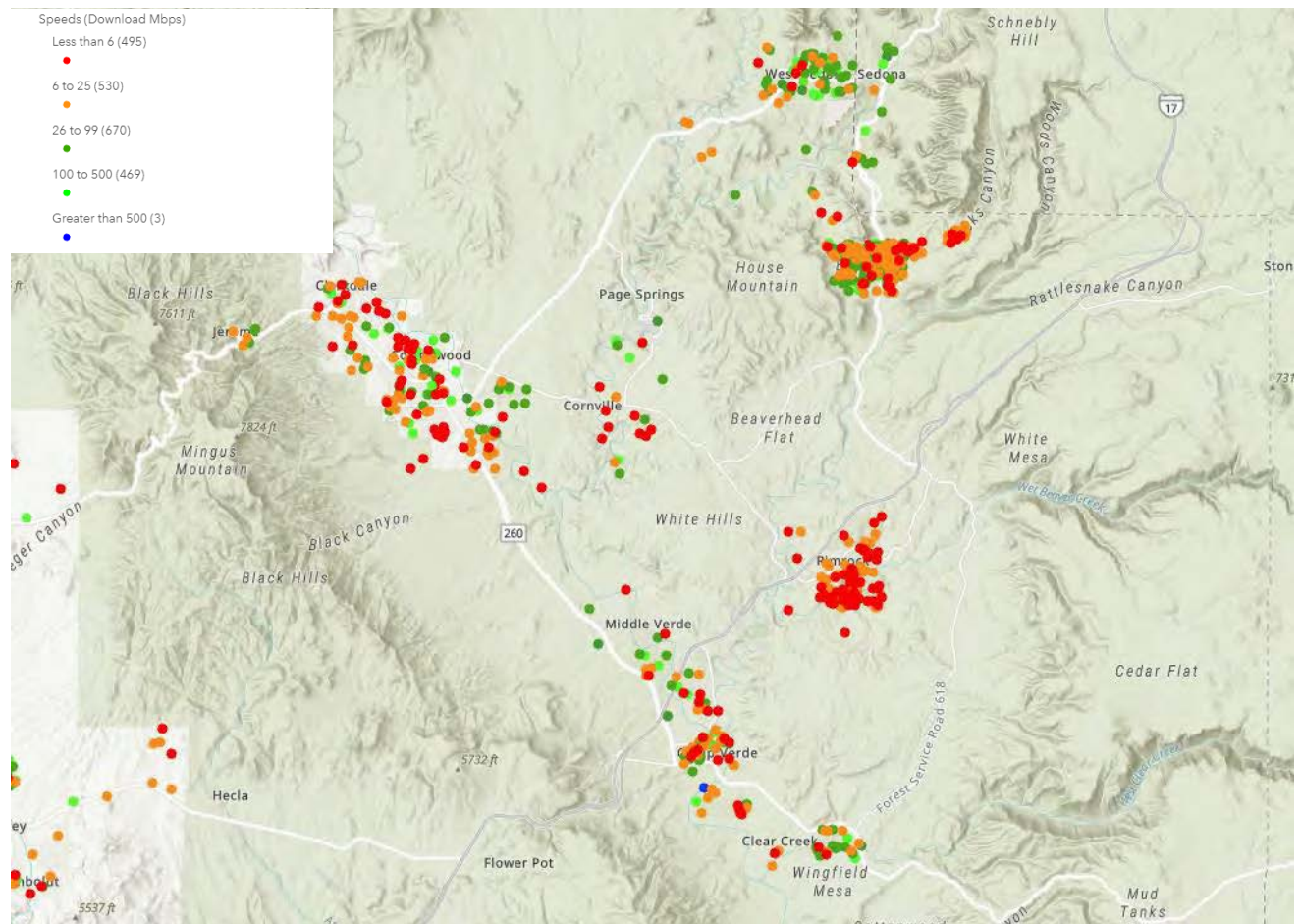
A few speed test results were captured in the rural parts of western Yavapai County, especially in Bagdad, where speeds were less than 25/3.

Figure 36. Speed Test Results by Location – Yavapai County – West County



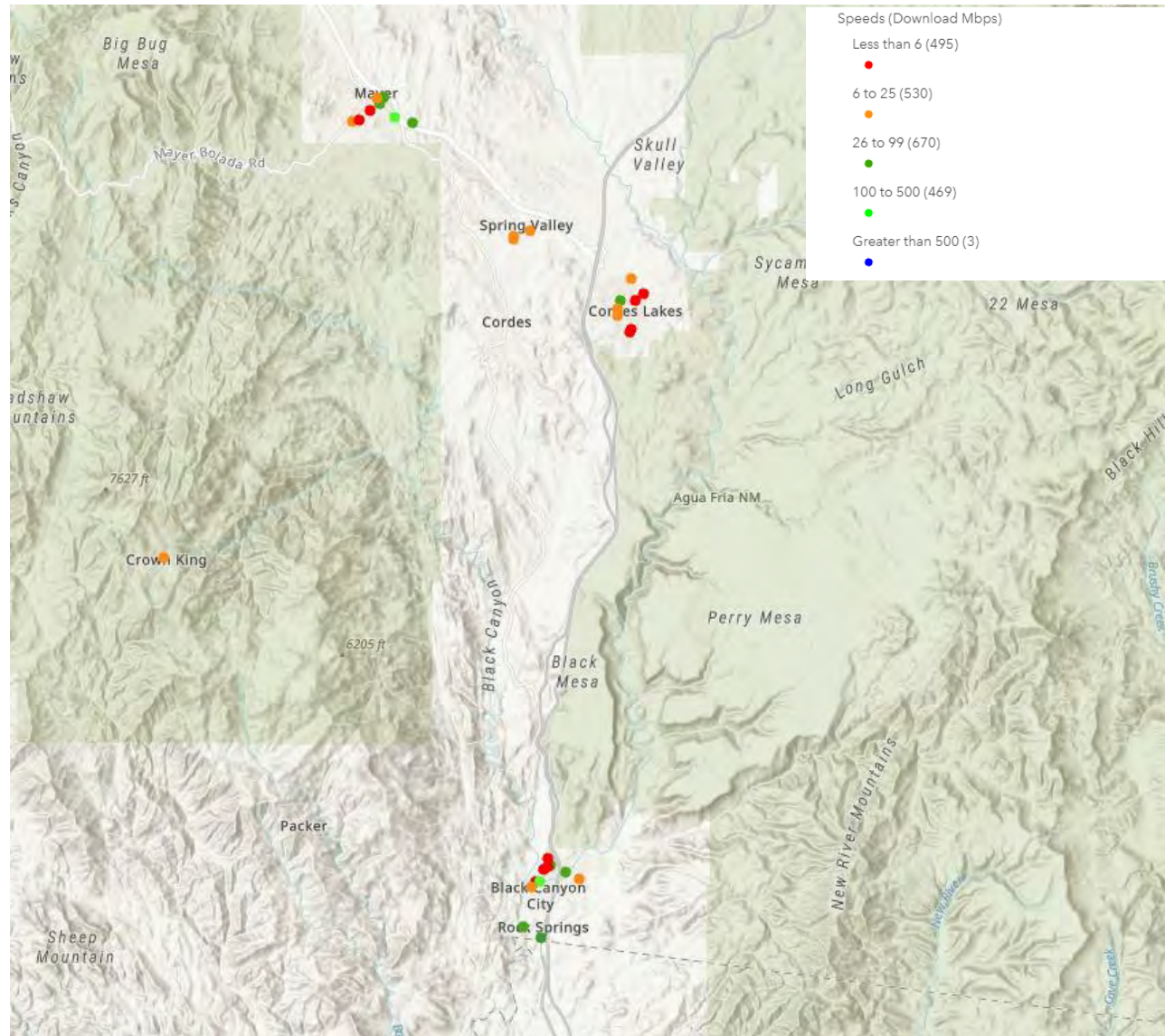
In the eastern portions of the County, the mix of high and low speeds is also apparent in the towns, including in Cottonwood and Camp Verde. Sedona had relatively more high speeds than elsewhere, while Oak Creek had more slow speed connections and Rim Rock had almost no tests that would be considered broadband speeds.

Figure 37. Speed Test Results by Location – Yavapai County – East County



In the southern portions of the County, most speeds were slower, although there were some higher speed results in Mayer, Cordes Lakes, Black Canyon City, and Rock Springs.

Figure 38. Speed Test Results by Location – Yavapai County - South County



As shown in the table below, a majority of respondents indicated that the service slows down daily or every few days and service outages lasting less than one day occurred every few months. Respondents largely reported that the service went out for less than one day every few months. Outages lasting for a day or more occurred less than once a year or not at all for most respondents.

Table 35. Respondents' Internet Performance – Yavapai County

	The service slows down	The service is out briefly	The service is out for less than an hour	The service is out for an hour or two	The service is out for several hours	The service is out for a day or more
Daily, every day	490	208	146	49	30	15
Every few days	417	269	226	104	64	28
Every few weeks	331	378	330	255	176	75
Every few months	375	586	579	620	582	266
About once a year	104	233	245	369	464	400
Less than once a year	78	112	185	258	304	477
Never	55	61	102	159	212	557

Many respondents in Yavapai County were somewhat satisfied with their service overall, speed, and reliability. Many, however, were somewhat dissatisfied with price and reliability.

Table 36. Respondents' Satisfaction with Current Services – Yavapai County

	Overall	Speed	Price	Reliability	Support
Very Satisfied	238	242	169	198	213
Somewhat Satisfied	719	636	448	601	478
Neither/ Not Sure	156	151	269	178	451
Somewhat Dissatisfied	409	449	524	513	350
Very Dissatisfied	352	387	452	364	346

The cost of broadband service was somewhat more reasonable in Yavapai County than in surrounding areas. The average cost for broadband only (excluding all other services such as cable and telephone that might be part of a subscriber's package) was \$79.44. This means that respondents were paying an average of \$1.06 per mbps.

Table 37. Survey Respondents' Average Costs for Service – Coconino County

Average Cost - All Services	\$ 108.11
Average Cost - Broadband Only	\$ 79.44

Comments from respondents in Yavapai County noted what better broadband would mean for their families, businesses, and the area, including

“Speed with our customer communications is critical. Reliability is KEY.” – Survey Respondent #513



“Broadband should be classified as a utility, too much of life depends on it just as we do electricity.” – Survey Respondent #1490

“The service is actually good, but the price is high and rises about 10% per year. Tough on me and those on fixed income.” – Survey Respondent #3599

“Better broadband would mean more employment opportunities, more reliable connections for school work, and better communication with family and friends that live far away.” – Survey Respondent #4351

CONCLUSIONS

Overall, reliable, affordable high-speed internet services throughout the NACOG region is sporadic. Many locations have no choice in providers, making costs across the region high and service standards low compared with other areas. In many of the surveyed areas, both businesses and residents do not have access to broadband speeds of at least 25/3 mbps.

Apache County has the fewest options for service and the lowest speeds across survey respondents' locations. Navajo County has only two options for service and also struggles with low speeds and frequent outages. In Coconino and Yavapai Counties, service is slightly better, but with larger populations, the demand for bandwidth is increasing and residents and businesses have limited options for getting better service.

Survey respondents across all areas of the NACOG region, both residential and organizational, indicate dissatisfaction with current offerings and a need for additional investment in broadband for the region to improve access to everyday needs including remote work, online learning, and telemedicine, as well as to enhance economic development and overall quality of life.

Overall, just over half (53%) of household respondents indicated that someone at their home does schoolwork or training, while slightly more

(59%) had someone in their household who telecommutes. Approximately a third (34%) of respondents have someone in their household who requires regular healthcare monitoring, and slightly fewer (28%) are operating home-based businesses. All of these uses require robust, reliable internet connections.

Respondent organizations were overwhelmingly from service sectors, led by Other Services (Except Public Administration), Healthcare and Social Assistance, and Professional, Scientific, and Technical Services. As these organizations continue to provide services to their customers and their communities, they will require increasing amounts of bandwidth as online delivery of services continues to rise.

All of these factors point to the need for additional broadband infrastructure in the NACOG region. Based on the needs expressed in the survey, Magellan Advisors will incorporate these findings into our final report and recommendations for the NACOG Regional Broadband Strategic Plan.