Harnett County
Broadband Assessment

Prepared by
ECC Technologies, Inc.

June 2019

Statement of Confidentiality

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1. Introduction

In the fall of 2018 Harnett County contracted ECC Technologies, Inc. (ECC) to conduct an online broadband assessment survey to determine the residences and businesses within the County who continue to struggle with limited access to Internet services, with a particular focus on broadband availability.

Due to the largely rural nature of the County, Harnett has continued to lag behind many more urbanized counties in regards to access to the Internet at speeds the FCC defines as "broadband" (25Mbps down x 3Mbps up). Work on the project began in October of 2018, with the online survey launching December 1st.

1.1 Broadband Assessment Overview and Methodology

For the Broadband Assessment portion of this effort Harnett County utilized ECC's Broadband Availability & Adoption Tool (BAAT). This online survey (https://www.harnettbroadband.com/) targeted residents and commercial entities within the County and ran from December 1, 2018 to May 31, 2019. Below is a screenshot of the actual survey landing page.

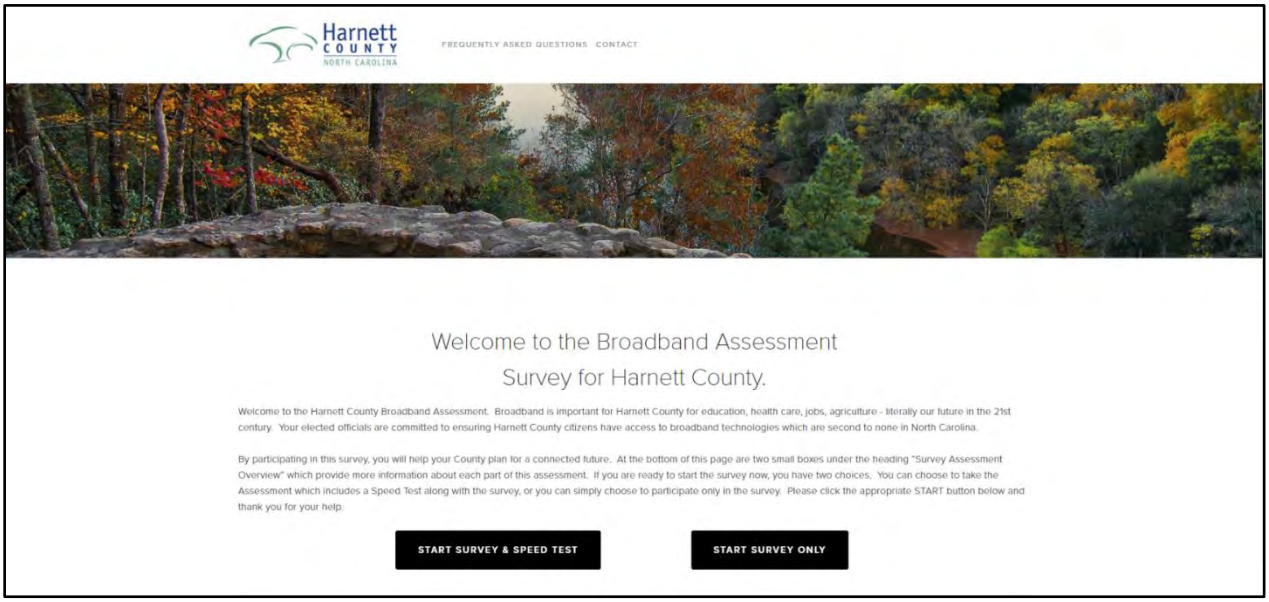


Figure 1 Survey Landing Page

Harnett County worked with local libraries and the County school district to ask citizens and businesses to participate in this broadband assessment.

This assessment was created to:

- verify availability of current broadband services in the County,
- to identify actual speeds available through the speed test, and
- collect information on demand for services from residents and businesses across these counties.

Clarifying actual current availability of broadband services, combined with demand assessment and aggregation, is critical for enticing broadband providers, existing or new to the marketplace, to invest in expanding broadband services for areas in need of improvement.

Participants were informed of the purpose of both the optional speed test and the survey itself on the landing page. They were given the ability to start the speed test and the survey or start only the survey.

The choice between these two options was critical for anyone lacking home broadband. Those without home broadband service were able to take the survey remotely (from a library, a mobile phone, etc.). Although broadband speeds were not reported from these specific residents, it allowed for other data to be collected on locations where the respond had no broadband service. Figures 2 and 3 below show the instructions and speed test pages of the survey.

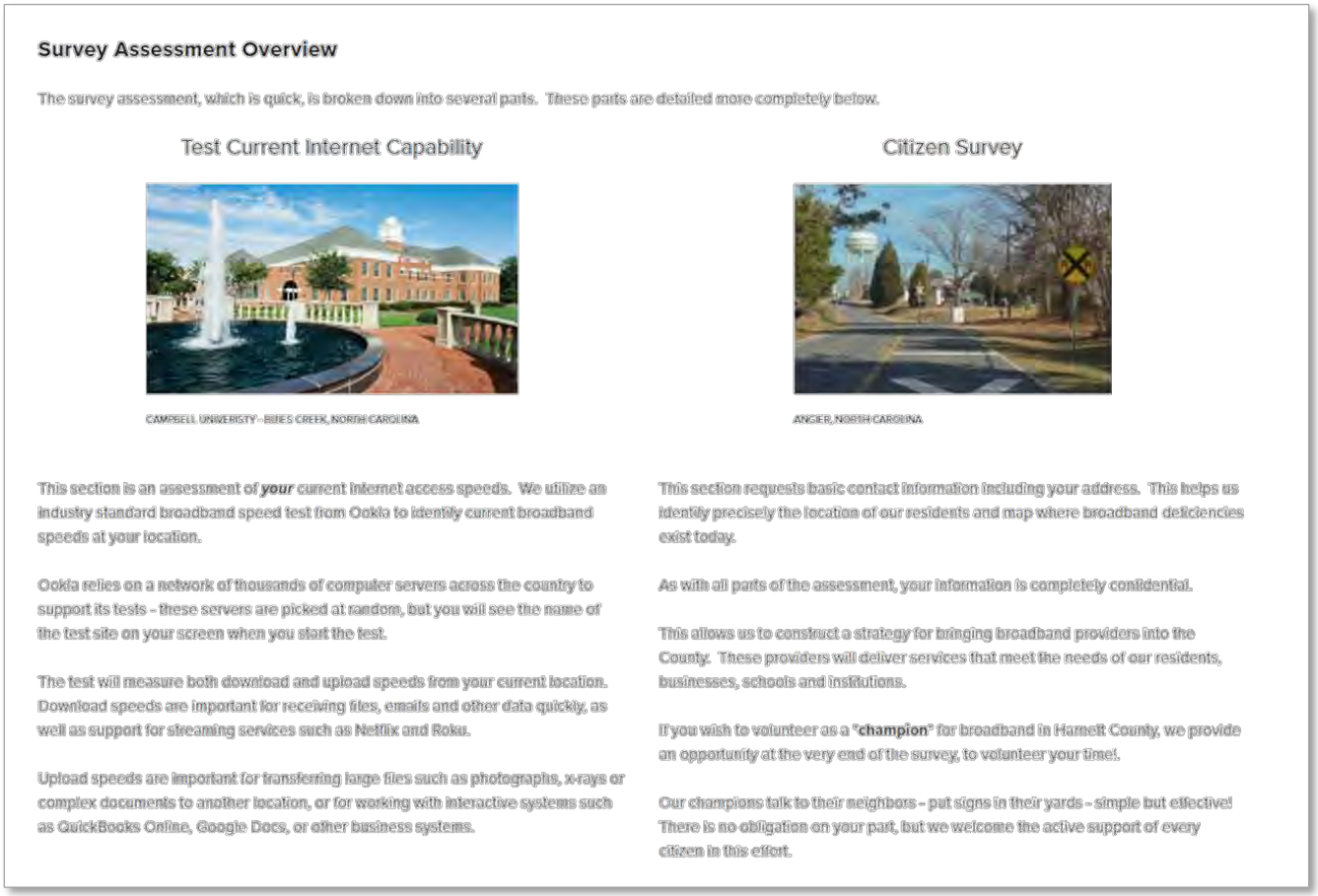


Figure 2 Section of Assessment Site Home Page

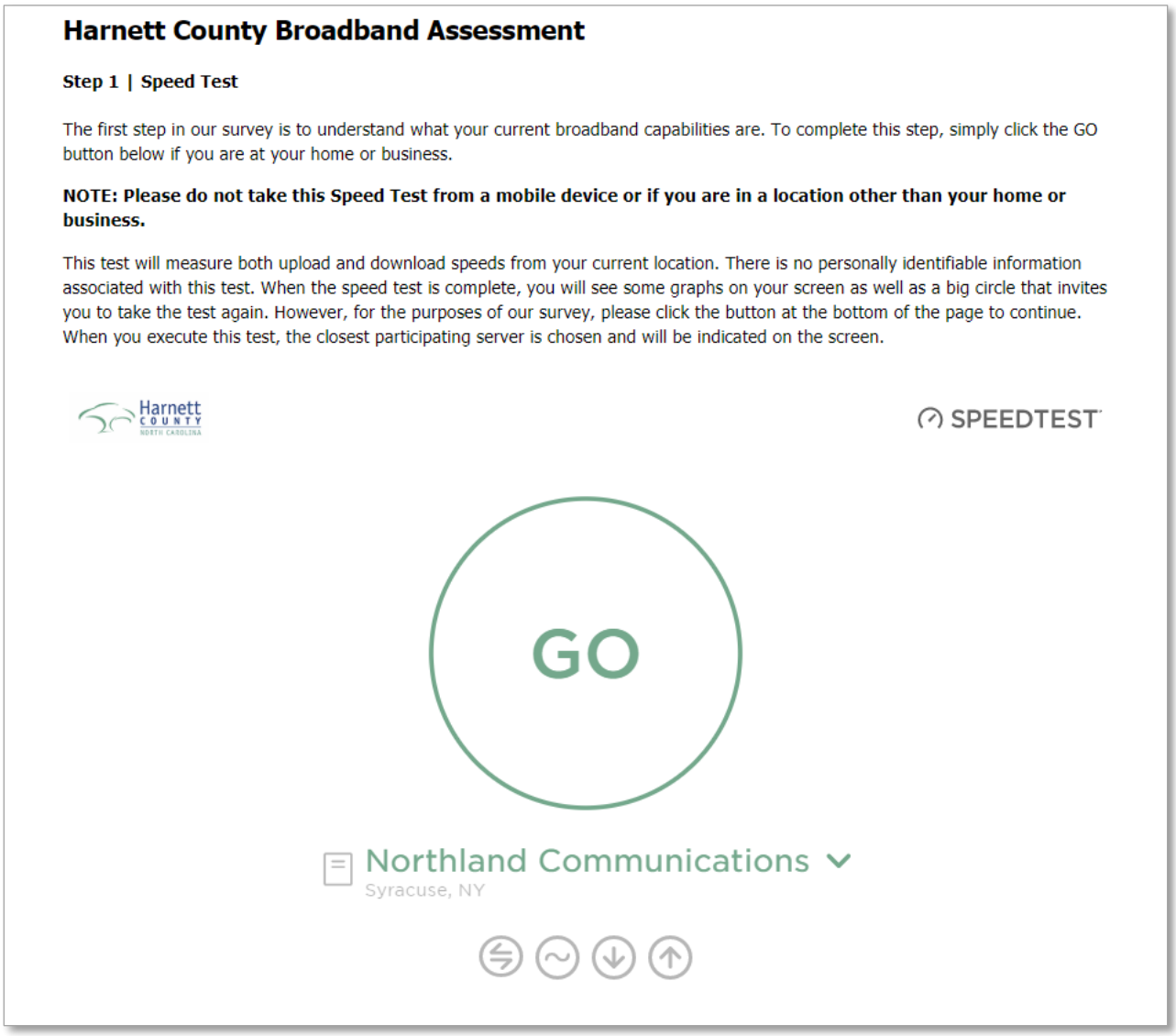


Figure 3 Assessment Site - Speed Test

Participants were asked to take the test from the address provided on the survey and instructed to skip the speed test if they were not taking the survey from the address entered on the home page. Actual speeds available are a critical part of the broadband assessment information gathering.

Participants were asked to respond to a set of survey questions, which addressed broadband availability, speeds and capacity, subscriptions, and questions of broadband utilization and adoption.

1.2 Results of Broadband Assessment

The results of the survey have been compiled into this report, with related charts, graphs, and mapping to support future efforts the County may wish to pursue in addressing broadband issues within the surveyed areas.

The raw data has been provided to the County GIS and IT staff to develop additional mapping as they see fit. Availability and demand data, specifically data indicating respondents who do not have access to service currently and who would be interested in additional providers/willing to switch their services, have been included throughout this report in maps. Survey question responses are charted and provided by area.

Data is also mapped in a KMZ file by download speed. (KMZ files include GIS-mapped data viewable in Google Earth.) Static maps of respondent locations and download speeds are also provided. The final survey question for both residents and commercial respondents includes a section for general comments. Those comments are provided as written and edited only for spelling and grammar.

Over 1,600 responses were received during the survey period with roughly 90% of responses marked as "complete" by the surveying tool. Only 10% were marked "partial," indicating the respondent abandoned the survey at some point.

Duplicate surveys, where the same respondent took the survey more than once, or where the respondent abandoned the survey initially and later returned to complete it were removed. In total, 1,583 residential responses and 78 commercial responses are included in the County survey response data.

Data collected in this survey will provide valuable information to Harnett County in their efforts to work towards broadband and economic development planning. Anonymized data can be shared with local government partners from each township. Harnett County and potential partners can then analyze and map the data in various ways, depending on particular questions of focus.

1.3 Next Steps – Further Analysis and Incorporation

The survey questions, provider interviews, and speed tests allow us to begin to piece together an overall "story" for the County that will be critical in determining the next steps to bringing broadband to areas that do not have it and provider choice to areas that do but are dissatisfied. Harnett County presents unique challenges that will be discussed further with the results, but the low population density is a central issue.

The largest city in Harnett – Dunn – had fewer than 10,000 residents as of the 2010 census. The County itself, as of the same census, had 114,678 residents within its 601 square miles. To put this in perspective, the entire County has only one quarter the population of the City of Raleigh.

The median household income is also relatively modest at $34,105 per year, while median income for families fared only slightly better at $41,176. Nearly 15% of the overall population lives below the poverty line, with nearly 20% of teenagers and 20% of seniors living in poverty as well. While these numbers surely come as no surprise to the leaders of Harnett County, they are largely the same challenges seen across the country when it comes to bridging the Digital Divide in rural areas.

There is a clear and present need not only for access to true broadband service but for provider choice that shows how critical it is to find a solution that benefits as many residents as possible.

While 85% of residential respondents stated they have Internet access at their home, only 32% are able to purchase the speed of service that they need. The primary reasons for respondents without Internet to lack

service is that it is simply unavailable (62%), with service being too expensive the second most common reason for having no home Internet (22%).

Eighty-three percent of residential respondents without home Internet would sign up immediately if service were available, while only 2% said they would not sign up for Internet service, and 62% percent of homes without Internet have someone in their household who has difficulty completing homework. With North Carolina's requirement for digital text books and assignments, this presents a significant problem to Harnett County residents who either have no access to Internet services in their homes or who are unable to purchase the speeds they need.

More evidence of need, even among those who report having service, is illustrated in the write-in responses to the survey. While anecdotal evidence is not considered "hard data," it is difficult to ignore the pressing need in rural communities when reading responses such as:

> *"In my neighborhood of 150+ homes Windstream DSL and satellite-based internet is the only services available. Some of my neighbors only have the option for satellite as Windstream cannot support bonded pair dsl lines to all homes in the neighborhood. We have been asking the cable companies that service Harnett County to run services to our neighborhood for the last decade and we have had no luck. The homes literally across the street have 100Mbps service. We are lucky to have 12Mbps service."*
>
> *"Yes, the speeds we pay for monthly are not what we retrieve. Centurylink technicians have been dispatched to our home several times during the course of having them as a provider. Nothing is really solved when they come out besides giving us a new modem each time which doesn't help the speed. Basically, they've told us that this will be the fastest speed for location. We've contacted Spectrum for quotes but they say our home is not serviceable, because we are 500ft away from the road. Help us get better WiFi."*
>
> *"We pay for 4mbps and can get 3 at best. Our upload isn't even 1mbps. We can't even have a security system or cameras installed because the minimum upload speed required is 1.5mbps. We also can't rent movies off of our satellite due to such slow service."*
>
> *"Spectrum wants to charge $5000.00 to connect me, there is no DSL option. I could only do satellite service, which also required direct TV."*
>
> *"I have one step above dial up and keep getting told this is the only option available for my home?!?!?! My kids cannot even get their homework up and I am nervous about returning to school online, as I don't have the Internet, I need to get the job done! I pay $100 a month for the worst internet I've had since internet was discovered. Something for the people of Harnett County has to be done!"*
>
> *"I feel it is disgraceful that cable broadband is not available in my area. We moved to this address 3 years ago. We moved less than 2 miles and it was like entering the twilight zone. I was a Charter customer for over 20 years. And now the only services available are satellite tv and internet. I am 20 feet from the road, not in the boondocks and could walk to my former address in 5 minutes. I feel that is wrong on their part. If they have a franchise, they should have to provide service to all areas."*
>
> *"I was told by my employer that in 2019 I would telecommute 90% of my working 2019 hours. The availability of my internet speed and reliability depends on my keeping my position. My speed is 2.9 and needs to be 5.0 or higher. Therefore, I'm at jeopardy for losing a position that I have fought to keep and need to survive at my age/time in life as I look to retire in the next 6 years. Harnett County is low on the job market now and this would bring us up as many positions move to working from home."*

"I am a teacher for Harnett County Schools. I had no idea when I purchased my home that there was not an option for internet. Many nights, I stay at school until 7, 8 or 9 o'clock because I really need internet to complete my work. I had Hughes Net for a short time but kept losing the signal. Now it is gone altogether. They told me I would need to cut down my trees to get a better signal. I live in a subdivision. I would be very thankful to have internet at home."

Anecdotal write-in responses help to flesh out and provide context for the data driven responses to the survey, which may in some instances appear to tell competing stories. A location may appear to be well served based on the number of households that have Internet access, but the verbatim comments of respondents illustrate the ways in which service is still lacking, unavailable in a practical sense, or prohibitively expensive.

In Harnett County, numerous write-in responses also indicate that the problems are not confined to a single area or a single provider. The comments overall illustrate that cost, access, and reliability are all issues for respondents who have home Internet, with a constant refrain of paying too much for speeds that are too slow and/or service that routinely drops. Residents clearly express the desire for more competition to force providers to address these issues.

Lack of Internet at even minimum definitions of broadband speeds for rural areas negatively impacts County residents in numerous activities many urban residents take for granted, such as telecommuting and submitting schoolwork online.

When all of these pieces are slotted together, a clearer path to solving the broadband puzzle comes into view, including specific steps the County can take to expand access to the residents most in need. The data suggests that there are areas within the County which do not have access to sufficient broadband speeds and other areas of the County which have sufficient speed but no viable competitive option.

2. Harnett County Data

The responses for Harnett County are outlined on the following pages of this report. Harnett strove for a goal of 1,500 responses within the six-month surveying period (roughly 13% of the population) and exceeded the goal by over 100 responses.

Many rural counties with such a widespread population struggle to reach more than 10% of the population, so Harnett's success without the need to extend the survey indicates a highly engaged population that is eager for access and choice. As previously stated, the survey had a 90% completion rate, signaling the questions and structure were well designed to reduce respondent fatigue and were not viewed as too personal or intrusive.

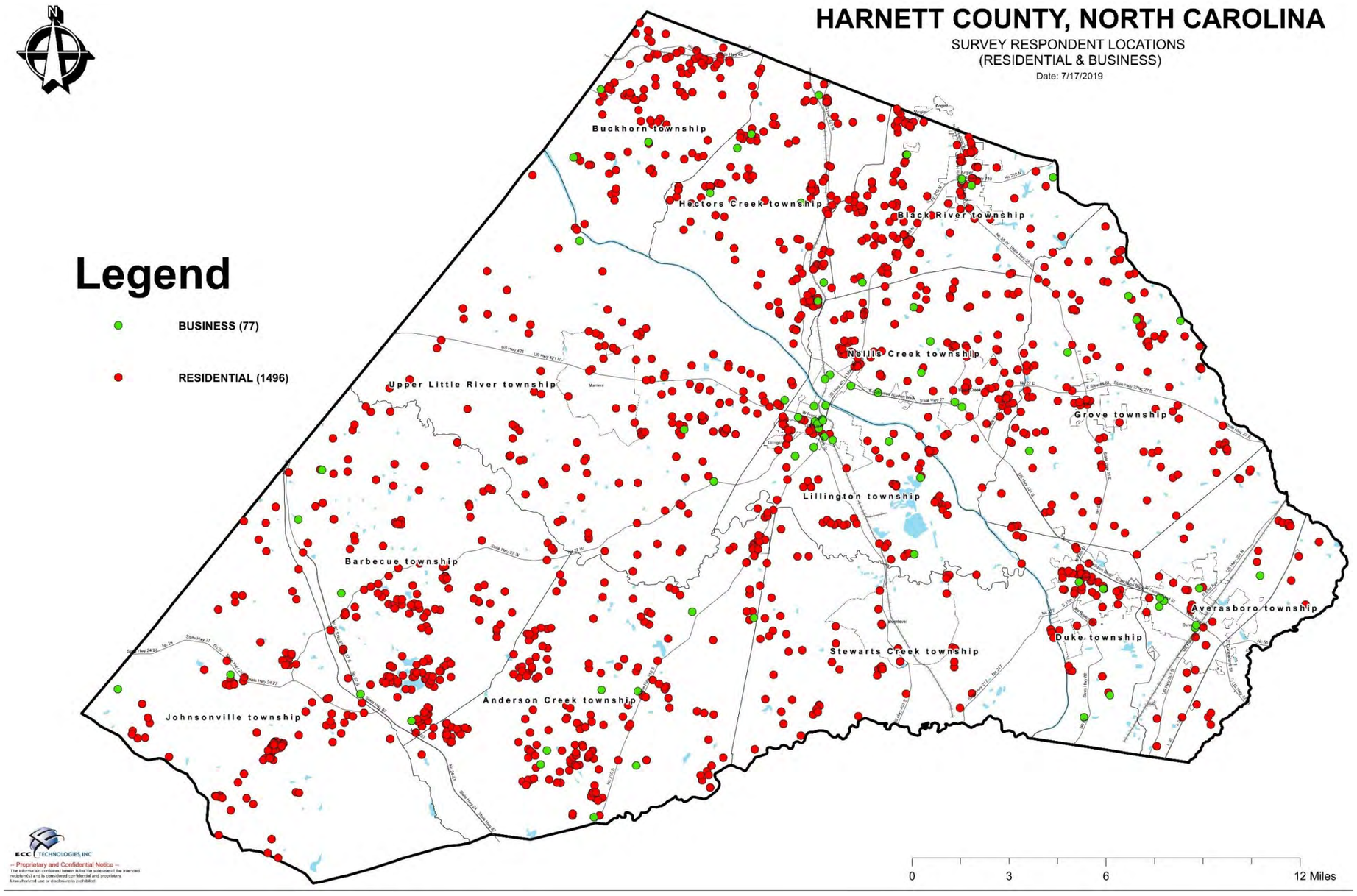
Of particular note in the respondent data is that issues with access not only to broadband services but sufficient speeds in general are not relegated to one or two sections of the County. Respondents who do not have home Internet access are spread throughout Harnett County. Likewise, respondents who do have home Internet but indicate they are unable to purchase the speeds they require are also spread throughout the County.

2.1 Respondent Map

The map on the following page depicts the location of responses received throughout Harnett County. This map incorporates both commercial and residential respondents.

HARNETT COUNTY, NORTH CAROLINA

SURVEY RESPONDENT LOCATIONS
(RESIDENTIAL & BUSINESS)
Date: 7/17/2019



2.2 Survey Questions and Responses

After entering their address on the landing page, respondents were presented with the following survey. This survey branched at several points, specifically:

1) If the address was a home or business; and
2) If the home or business had Internet access.

This branching has been outlined in the questions below.

1. Please enter in your address information. (required)

2. Is this for Internet access at your home or business in Harnett County?
   - Home
   - Business

If respondent selected "Home"

3. Do you currently have Internet Access at this residential location in Harnett County? (required)
   - Yes
   - No

If respondent selected "Yes"

4. What is your current Internet access speed?
   - Less than 1.5 Mbps
   - 1.5 Mbps-6.0 Mbps
   - 6.0 Mbps-10.0 Mbps
   - 10-24 Mbps
   - 25-49 Mbps
   - 50-99 Mbps
   - Greater than 100 Mbps
   - I don't know

5. Who is your current Internet access provider?
   - AT&T
   - CenturyLink
   - Hughes Network/Viasat
   - Time Warner/Spectrum/Charter
   - Windstream
   - Cellular phone carrier
   - Other (Not listed)
   - I don't know

If respondent selected "No"

4. Please tell us why you do not have Internet access.
   - Not available
   - Too expensive
   - Not needed or relevant
   - I don't know how to use it
   - I don't have a computer or device

5. Does anyone in your house have difficulty completing schoolwork due to lack of Internet service (ages K-12 through college)?
   - Yes
   - No
   - No one in my household is in school

6. If you selected OTHER above, please enter the name of your provider.

7. Are you able to subscribe to the level of service you require?
   - Yes
   - No
   - I don't know

8. What are you paying per month for Internet access?
   - Less than $25.00 per month
   - $25-$50 per month
   - $50-$75 per month
   - $75-$100 per month
   - More than $100 per month
   - I don't know

6. If additional competitive services were available in Harnett County, which services or package would you be most likely to subscribe to?
   - Internet only
   - Internet and TV
   - Internet and Phone
   - TV and Phone only
   - TV only
   - Phone only
   - I don't know
   - None of the above

Asked of all respondents after initial branching

7/8. How important is Internet access…

	Not important	Somewhat important	Very important	Not applicable
To my quality of life?				
To my ability to earn a living?				
To pursue education?				
For my healthcare?				

8/9. How many people are in this household?
   - 1
   - 2
   - 3
   - 4
   - 5 or more

10/11. Who are (or would be) the primary users of Internet at this address? (check all)

- School age child(ren) – K-12
- Young adults – Ages 19-25
- Adults – Ages 26-45
- Mature adults – Ages 46-65
- Wise adults – Ages 66 & older
- I am unsure of who would be the primary users

11/12. What is the highest level of education obtained by any one person in this household?

- Middle school
- High school
- Technical or two year college
- Four year college
- Post graduate work
- Military Service
- I don't know

12/13. Is there any other information you want us to know concerning Broadband and Internet access in Harnett County?

If respondent selected "Business"

3. How many people does your company employ?
   - Myself only
   - 2-4
   - 5-9
   - 10-19
   - 20-49
   - More than 50

4. What is your position with the company?
   - Owner
   - Officer (President, VP, CEO, etc.)
   - Manager
   - Employee
   - Other

5. What is the **primary** line of business at your location?
   - Agriculture
   - Manufacturing
   - Automobiles (Sales or Repairs)
   - Medical
   - Professional (Law, Accounting, etc.)
   - Retail
   - Local Government

- Business Services
- Residential Construction
- Commercial Construction
- Trades (Electrician, Plumbing, other)
- Electronic Commerce
- Other

6. Do you have broadband service at this location?
   - Yes
   - No

If respondent selected "Yes"

7. What is the current download speed or throughput at your location?
   - 10.0 Mbps or less
   - 10-24 Mbps
   - 25-49 Mbps
   - 50-99 Mbps
   - Greater than 100 Mbps

8. Who is your Internet service provider?
   - AT&T
   - CenturyLink
   - Spectrum
   - Hughes Network Systems
   - Windstream
   - I don't know
   - None of these

9. Please write in the name or your provider.

If respondent selected "No"

7. What would be the **primary** uses of broadband in your business?
   - Email services
   - Credit card and payment processing
   - Manage online presence
   - Security/Video
   - Place or receive orders
   - Send and receive large files
   - Control equipment
   - Other
   - Use remote applications (Google Docs, Office Online, etc.)

8. Why do you not have broadband service today?
   - Not available
   - Too expensive
   - Poor service
   - Other

9. What combinations of business class services would you be interested in?
   - Internet
   - Internet and Phone
   - Internet Phone Hosting
   - Managed LAN and WAN
   - Managed Security
   - Don't know

10. Do you have legacy communications circuits at your business location? (Please exclude regular dial ton telephone service *(POTS – Plain Old Telephone Service)*.)

- T-1 Circuit
- PRI Circuit
- BRI Circuit
- DSL Connection
- I do not have legacy services or circuits

10. Would your business require a guaranteed level of broadband service, or best efforts?

- Guaranteed service (SLA)
- Best efforts service
- I don't know

11. What services do you receive from your provider?

- Internet
- Voice
- TV
- Hosting
- Email
- Managed Services
- Other

Asked of all respondents after initial branching

11/12. How important is broadband access to my:

	Not important	Somewhat important	Very important	Critical	Not applicable
Business profitability					
Customer/client satisfaction					
Vendor satisfaction					
Industry updates					
Employee satisfaction					

12/13. Does broadband access enable you to be more competitive in your business?

- Yes
- No
- I don't know

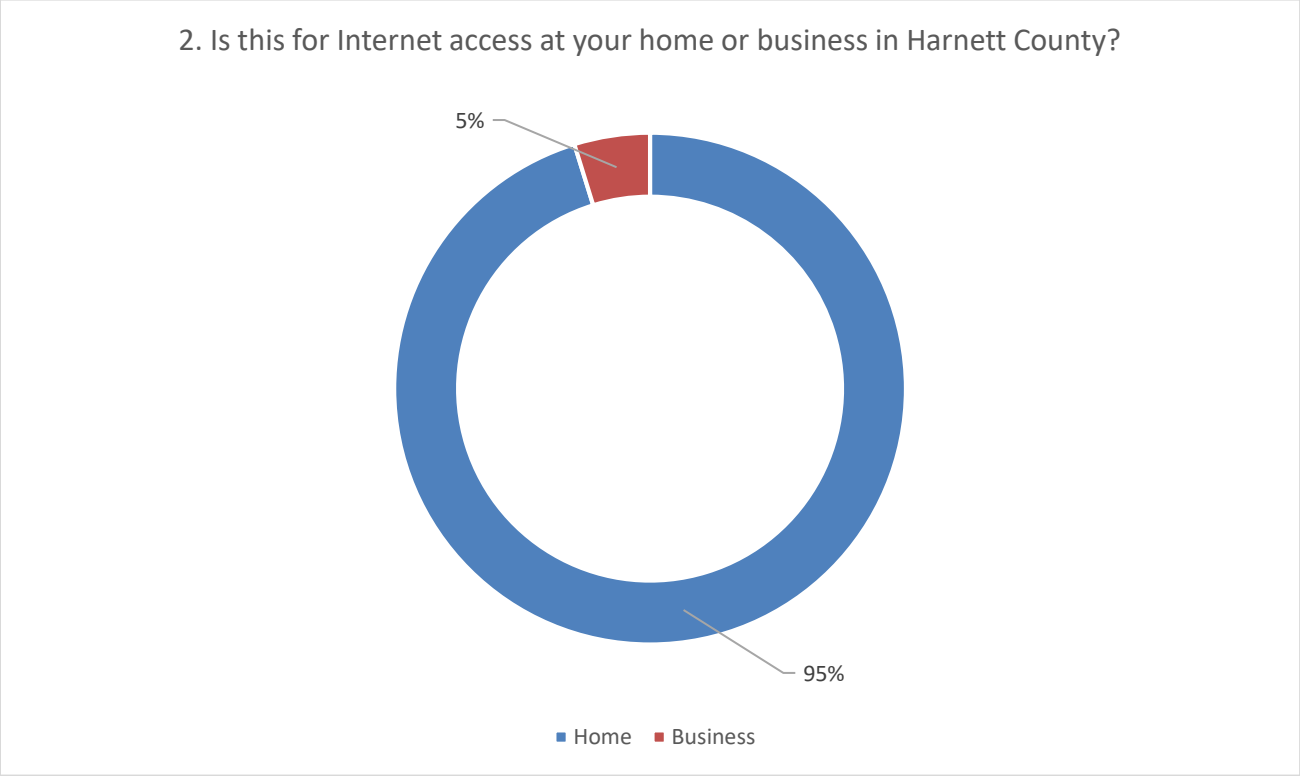
13/14. Is there any other information you want us to know concerning Broadband and Internet access in Harnett County?

A total of 1,661 respondents in Harnett County submitted a survey. The 1,661 responses to the questions outlined above are included in the following charts and graphs, broken out by survey branching and business vs. residential address. Some residential respondents did not select if they had Internet access, resulting in varying bases for the branched questions based on which follow-up questions for which they provided answers.

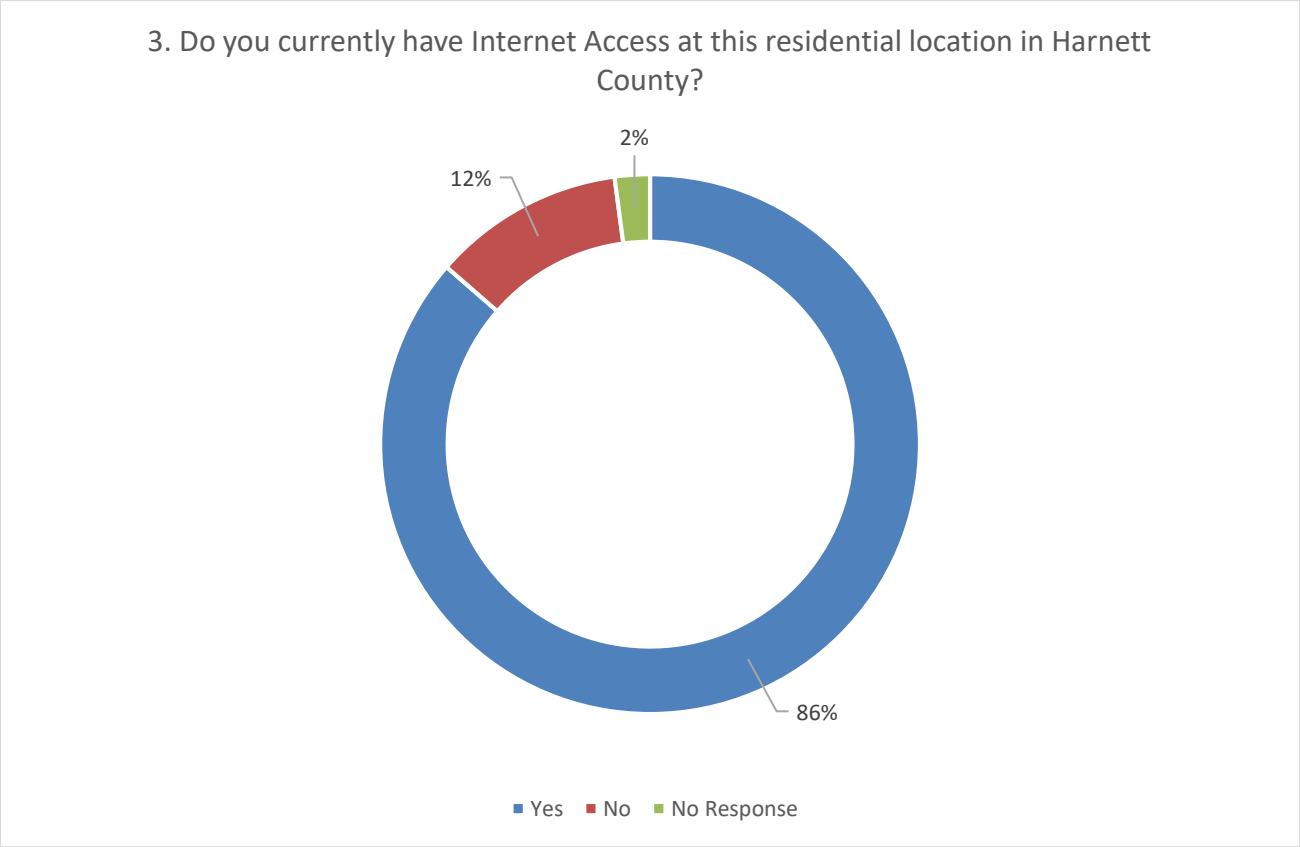
Respondents who did not answer whether they had Internet access exclusively responded to the questions presented in the "Yes" branching. Pie charts are reported as percentages of total response. Graphs report the actual number of respondents.

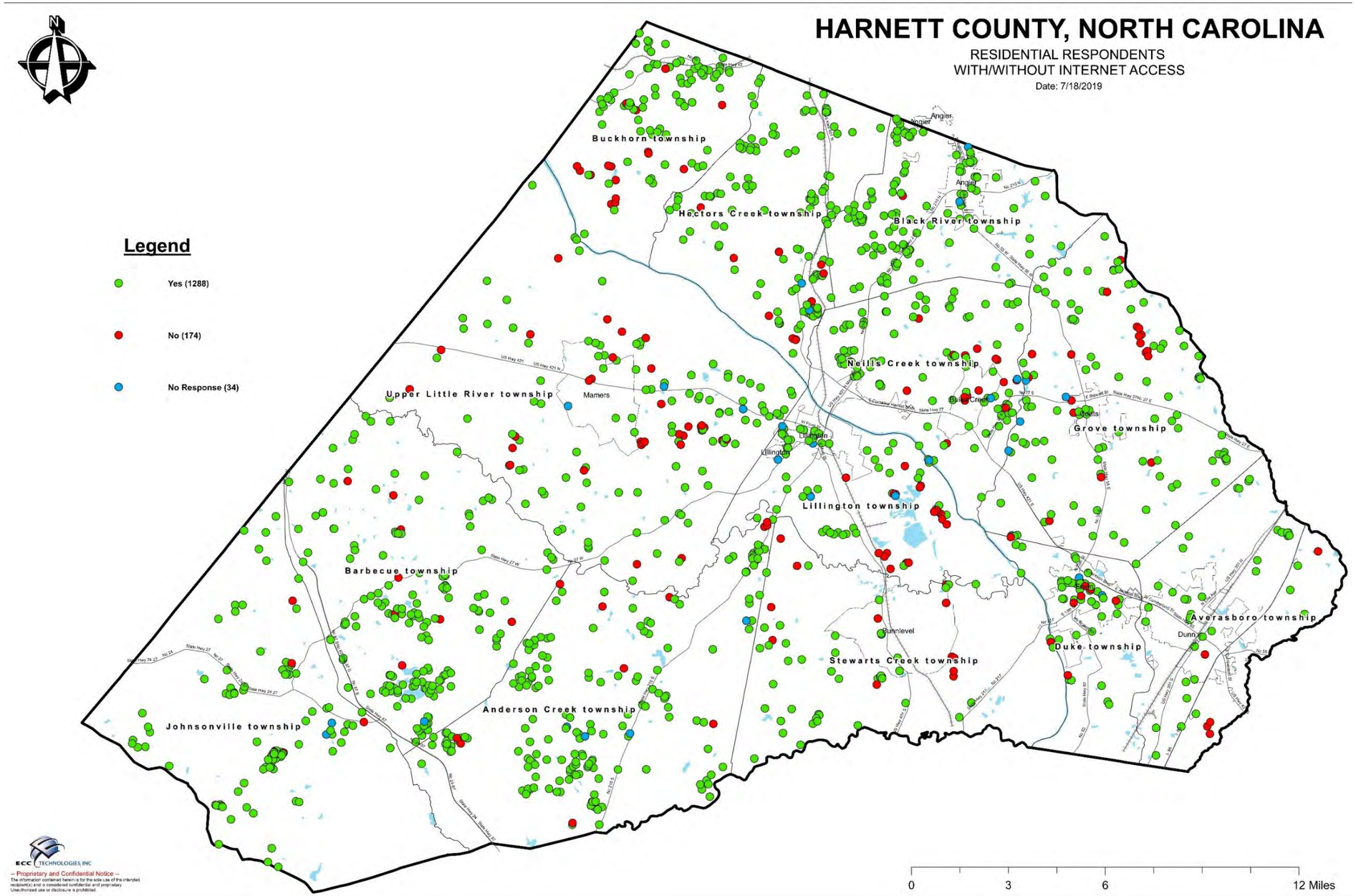
Write-in questions are reported with parenthetical data to show how many respondents wrote in the same provider. Where there is no parenthetical number, the provider was written in only once. Also included are maps of the responses to questions that ECC feels would be of special interest to the County and any interested potential providers presented with the results.

Residential responses are presented first, as they provide the bulk of data.

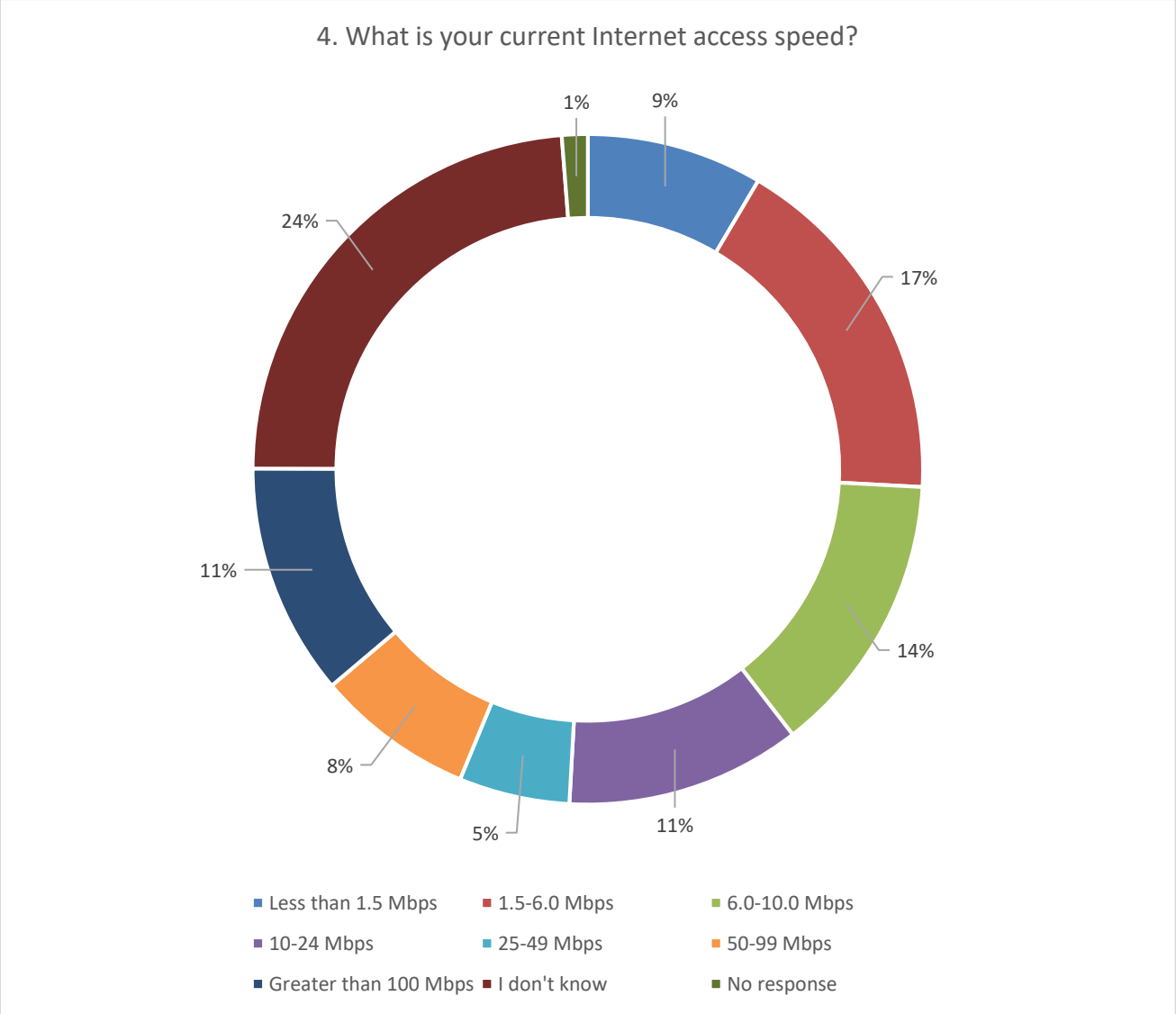


Respondents selecting "Home" (Base: 1,583)

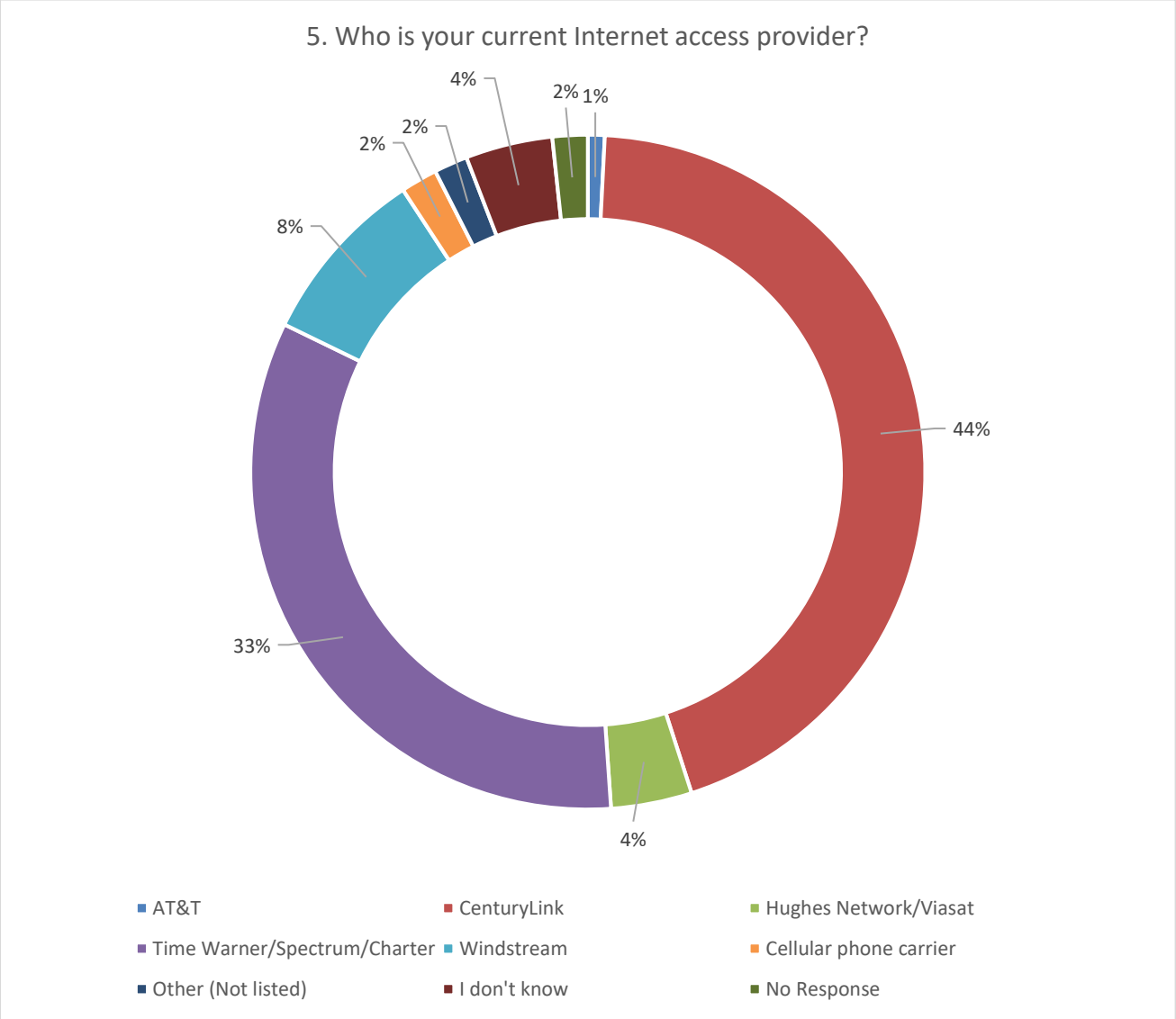



HARNETT COUNTY, NORTH CAROLINA
RESIDENTIAL RESPONDENTS
WITH/WITHOUT INTERNET ACCESS
Date: 7/18/2019
Legend
Yes (1288)
No (174)
No Response (34)
Buckhorn township
Hectors Creek township
Black River township
Neills Creek township
Upper Little River township
Mamers
Grove township
Lillington township
Barbecue township
Averasboro township
Duke township
Stewarts Creek township
Anderson Creek township
Johnsonville township
Angier
Lillington
Dunn
0
3
6
12 Miles
ECC TECHNOLOGIES, INC
– Proprietary and Confidential Notice –

"Home" respondents selecting "Yes" to Q. 3 or providing responses without answering "Yes" (base: 1,366)



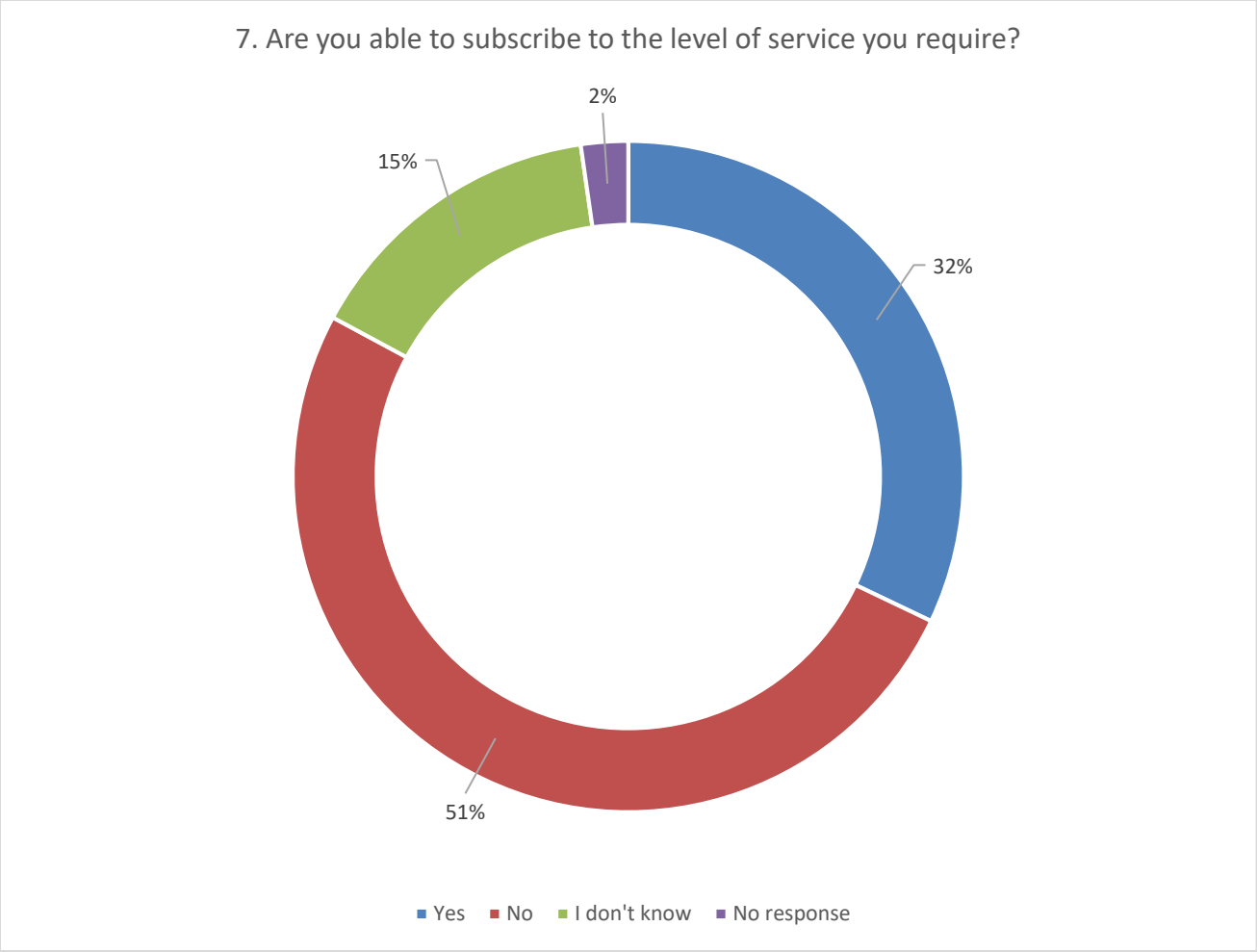
Base: 1,366


5. Who is your current Internet access provider?
4%
2%
1%
2%
2%
8%
44%
33%
4%
AT&T
CenturyLink
Hughes Network/Viasat
Time Warner/Spectrum/Charter
Windstream
Cellular phone carrier
Other (Not listed)
I don't know
No Response

6. If you selected OTHER above, please enter the name of your provider.

- ABC Company
- Direct TV
- Dish Net
- Hotspot
- Hotwire (5)
- Pay by the gigabit scheme
- Spectrum/Charter (7)
- Verizon (3)
- Verizon Wireless Jetpack WiFi
- VIASAT/Excede

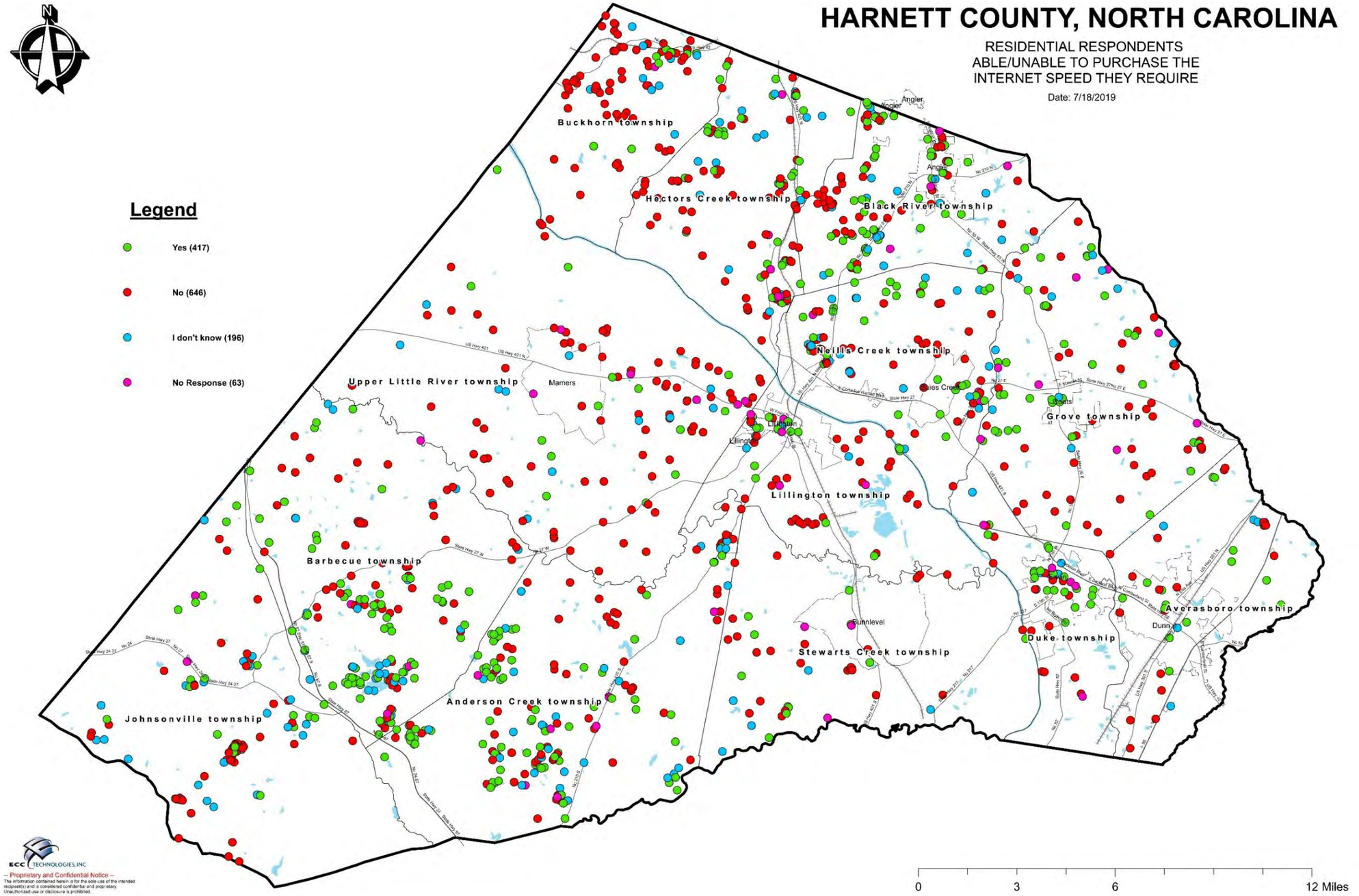
Base: 1,365


7. Are you able to subscribe to the level of service you require?
2%
15%
32%
51%
Yes
No
I don't know
No response

HARNETT COUNTY, NORTH CAROLINA

RESIDENTIAL RESPONDENTS
ABLE/UNABLE TO PURCHASE THE
INTERNET SPEED THEY REQUIRE

Date: 7/18/2019



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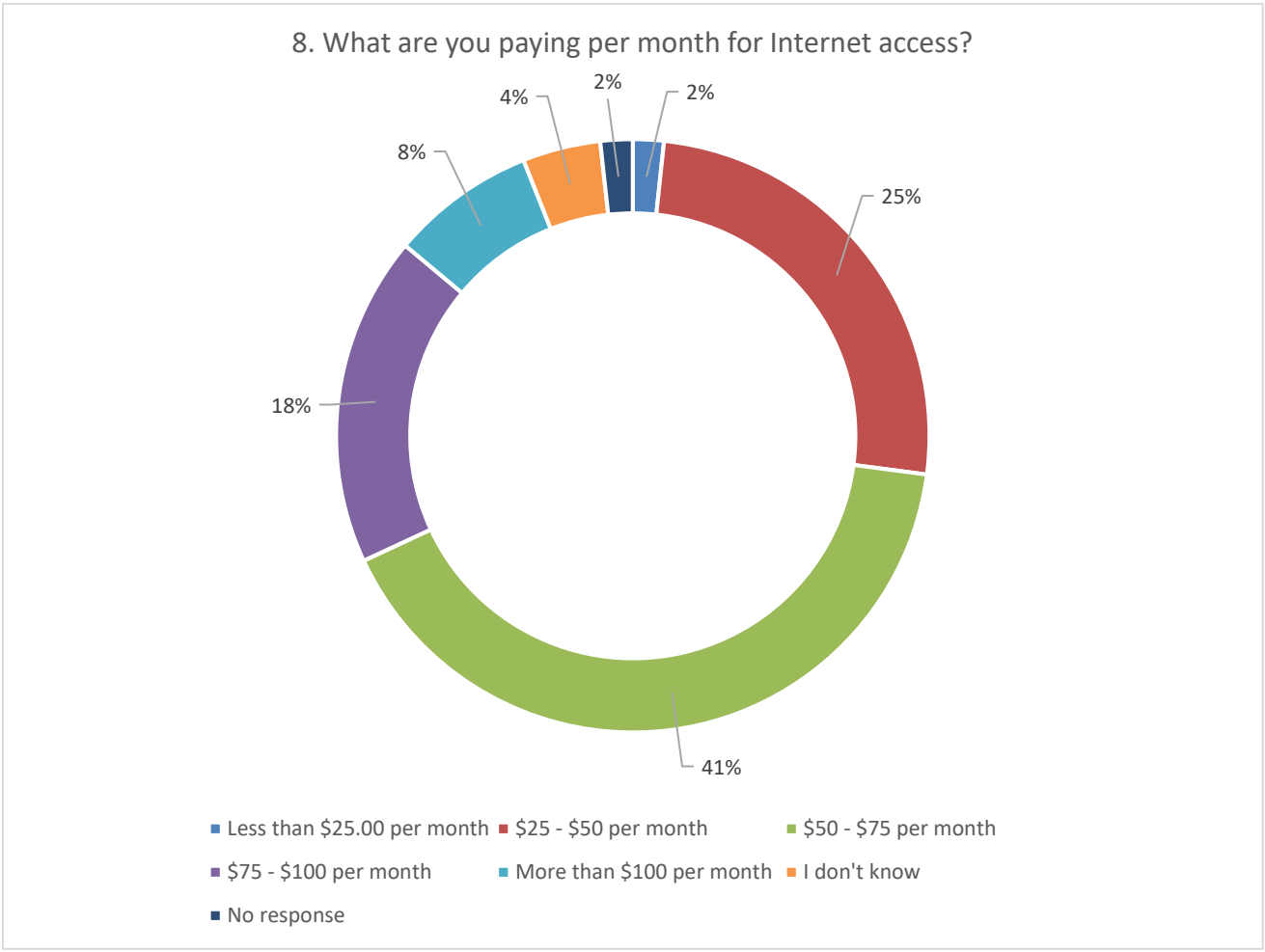
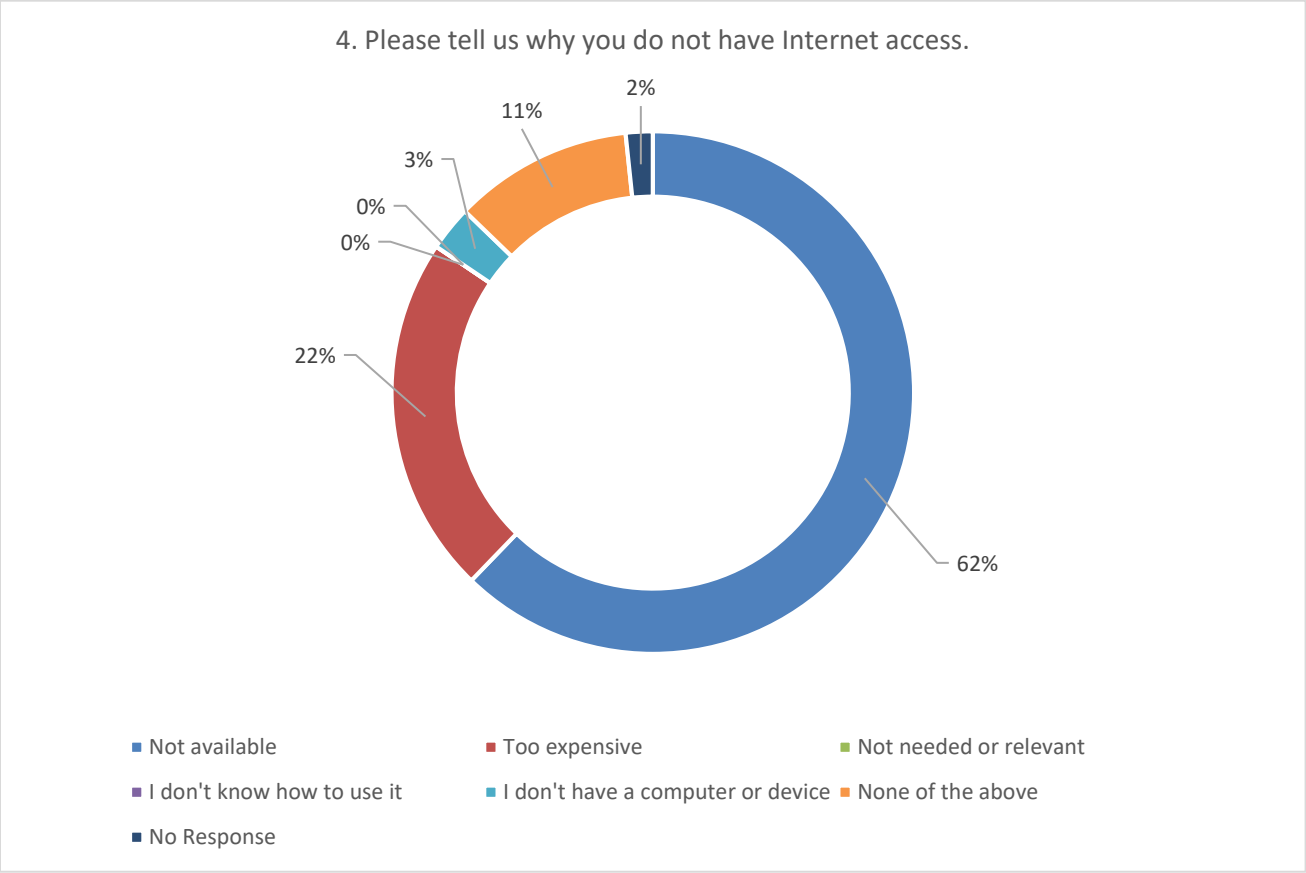
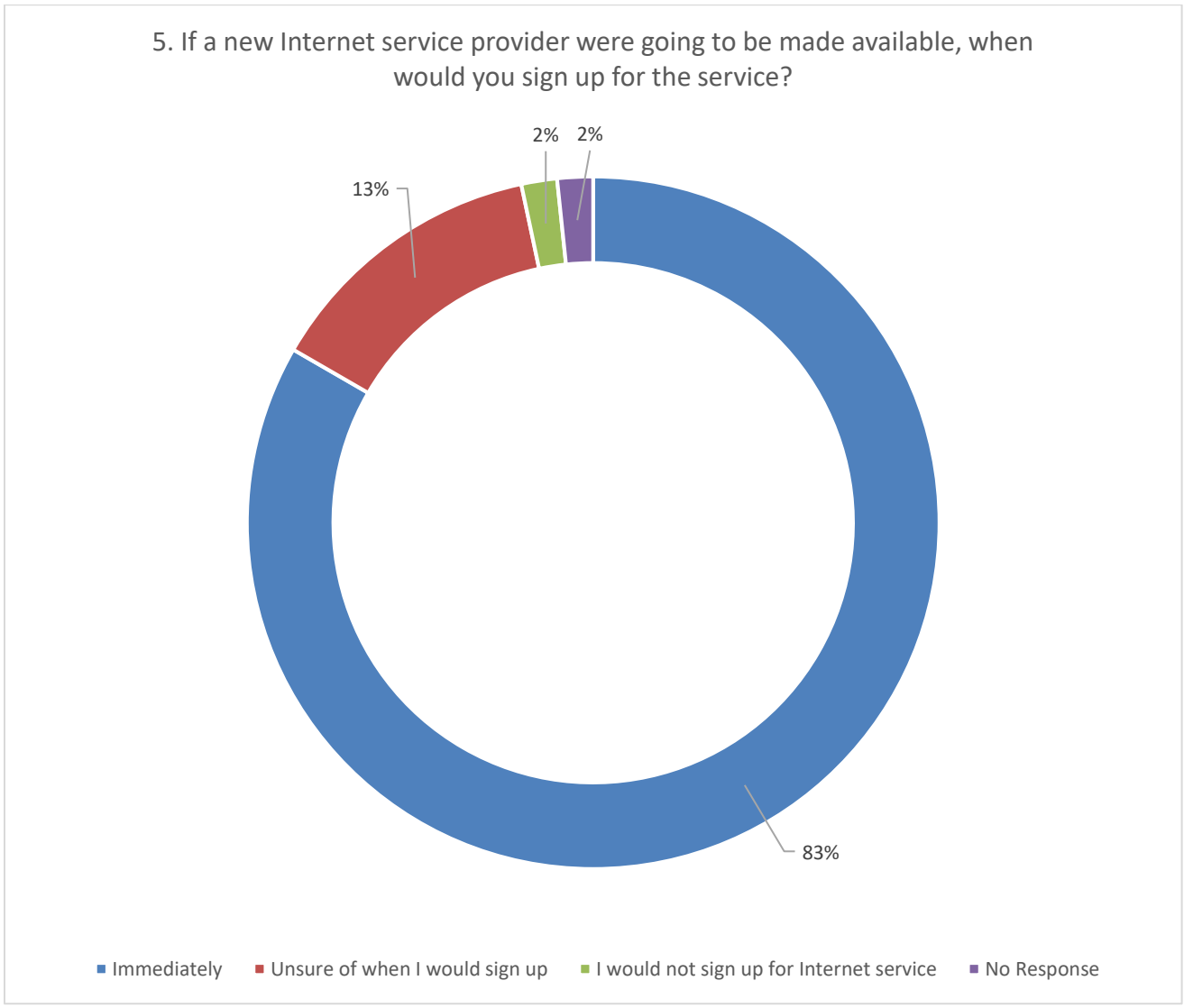

8. What are you paying per month for Internet access?
2%
2%
4%
8%
25%
18%
41%
Less than $25.00 per month
$25 - $50 per month
$50 - $75 per month
$75 - $100 per month
More than $100 per month
I don't know
No response

"Home" respondents selecting "No" to Q. 3 (Base: 180)

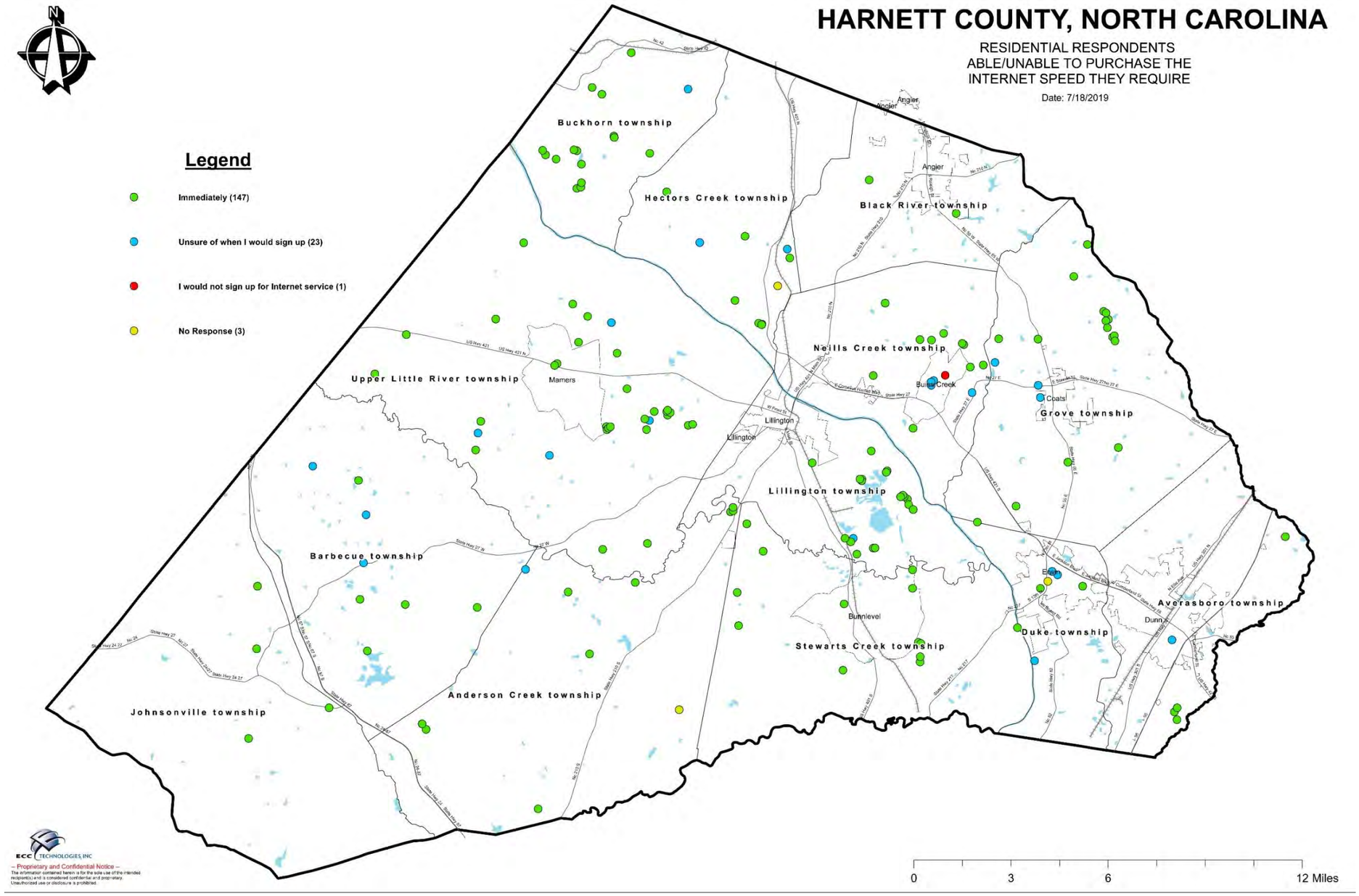


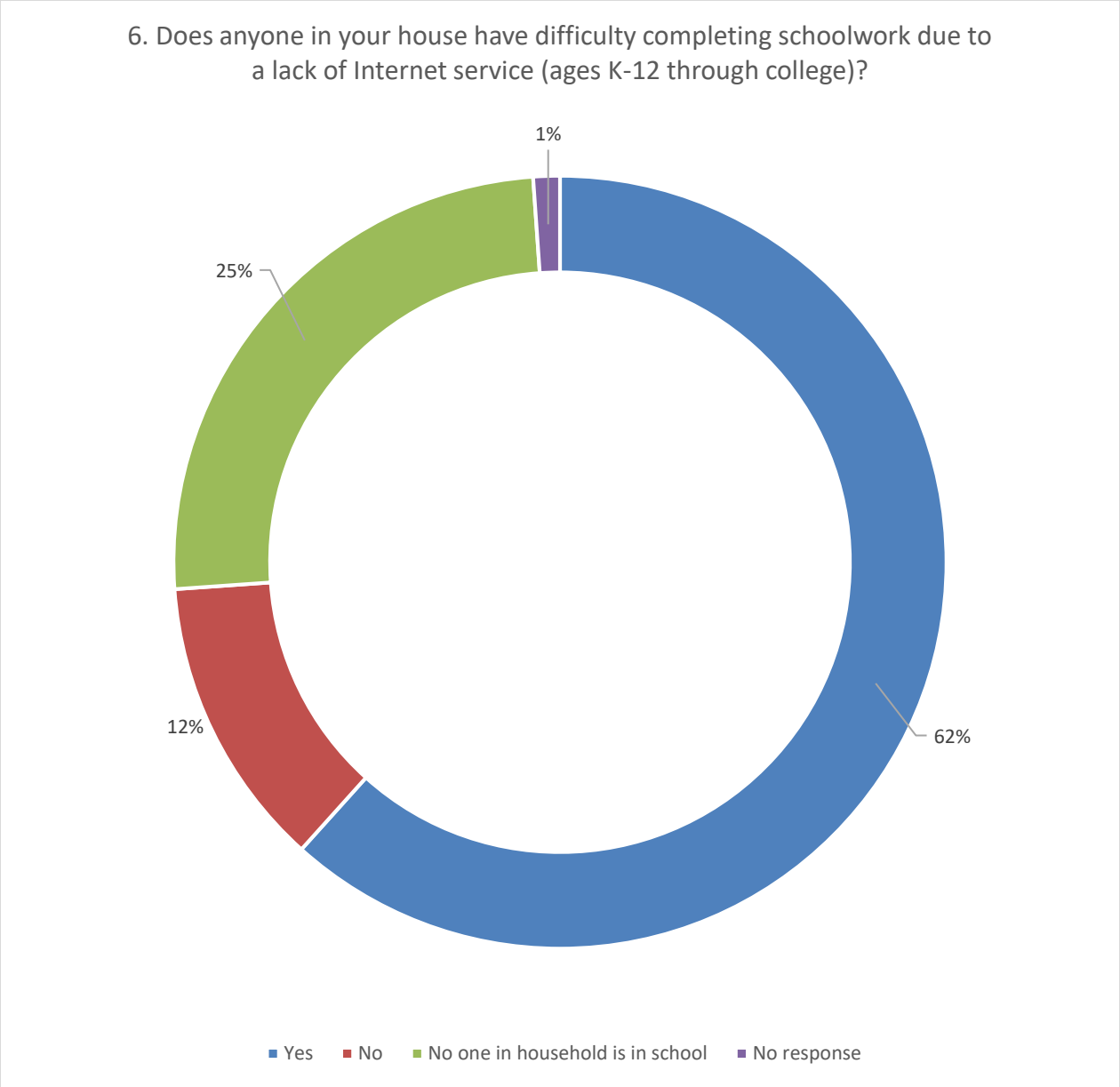

5. If a new Internet service provider were going to be made available, when would you sign up for the service?
2%
2%
13%
83%
Immediately
Unsure of when I would sign up
I would not sign up for Internet service
No Response

HARNETT COUNTY, NORTH CAROLINA

RESIDENTIAL RESPONDENTS
ABLE/UNABLE TO PURCHASE THE
INTERNET SPEED THEY REQUIRE

Date: 7/18/2019

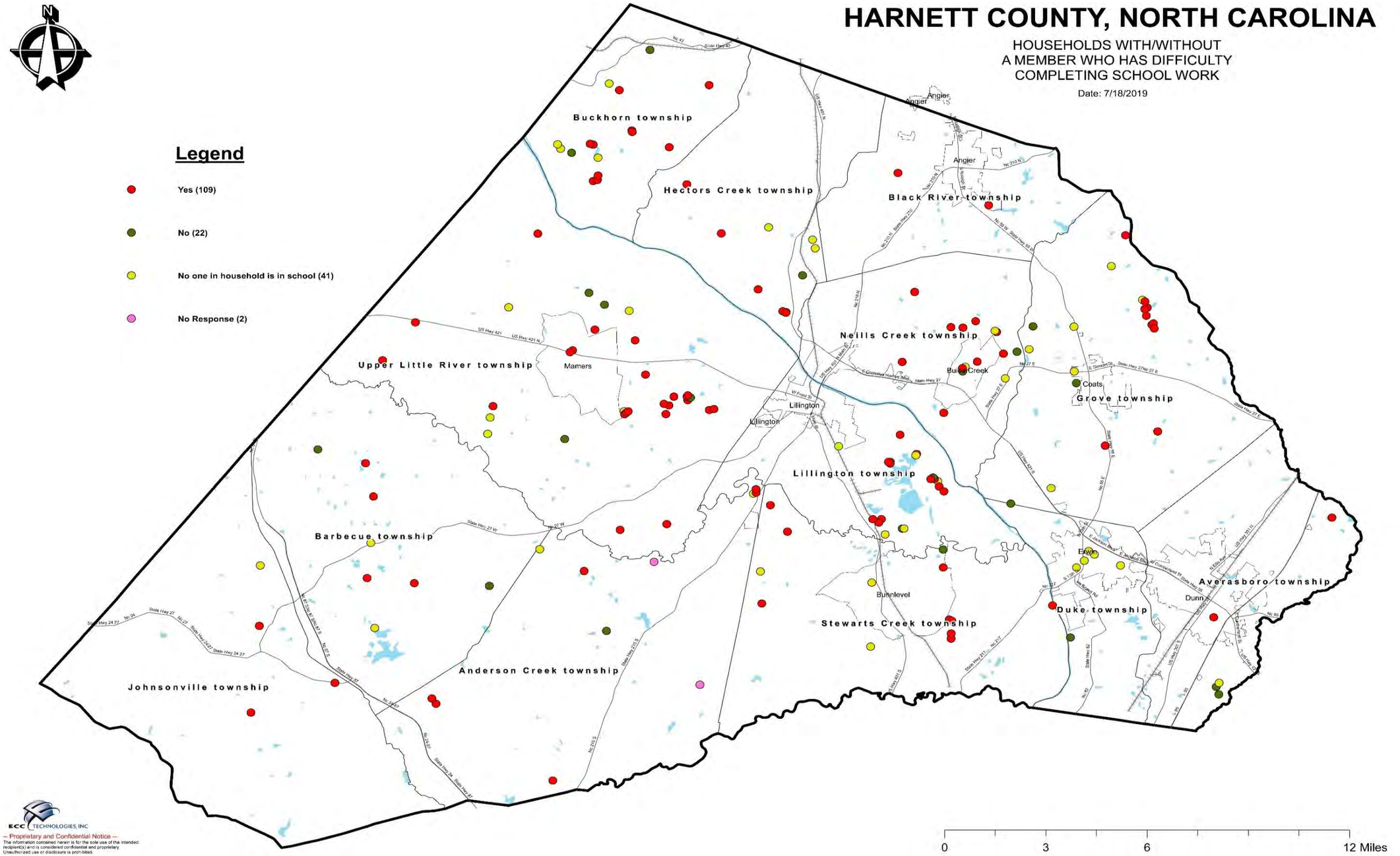



6. Does anyone in your house have difficulty completing schoolwork due to a lack of Internet service (ages K-12 through college)?
1%
25%
12%
62%
Yes
No
No one in household is in school
No response

HARNETT COUNTY, NORTH CAROLINA

HOUSEHOLDS WITH/WITHOUT
A MEMBER WHO HAS DIFFICULTY
COMPLETING SCHOOL WORK

Date: 7/18/2019



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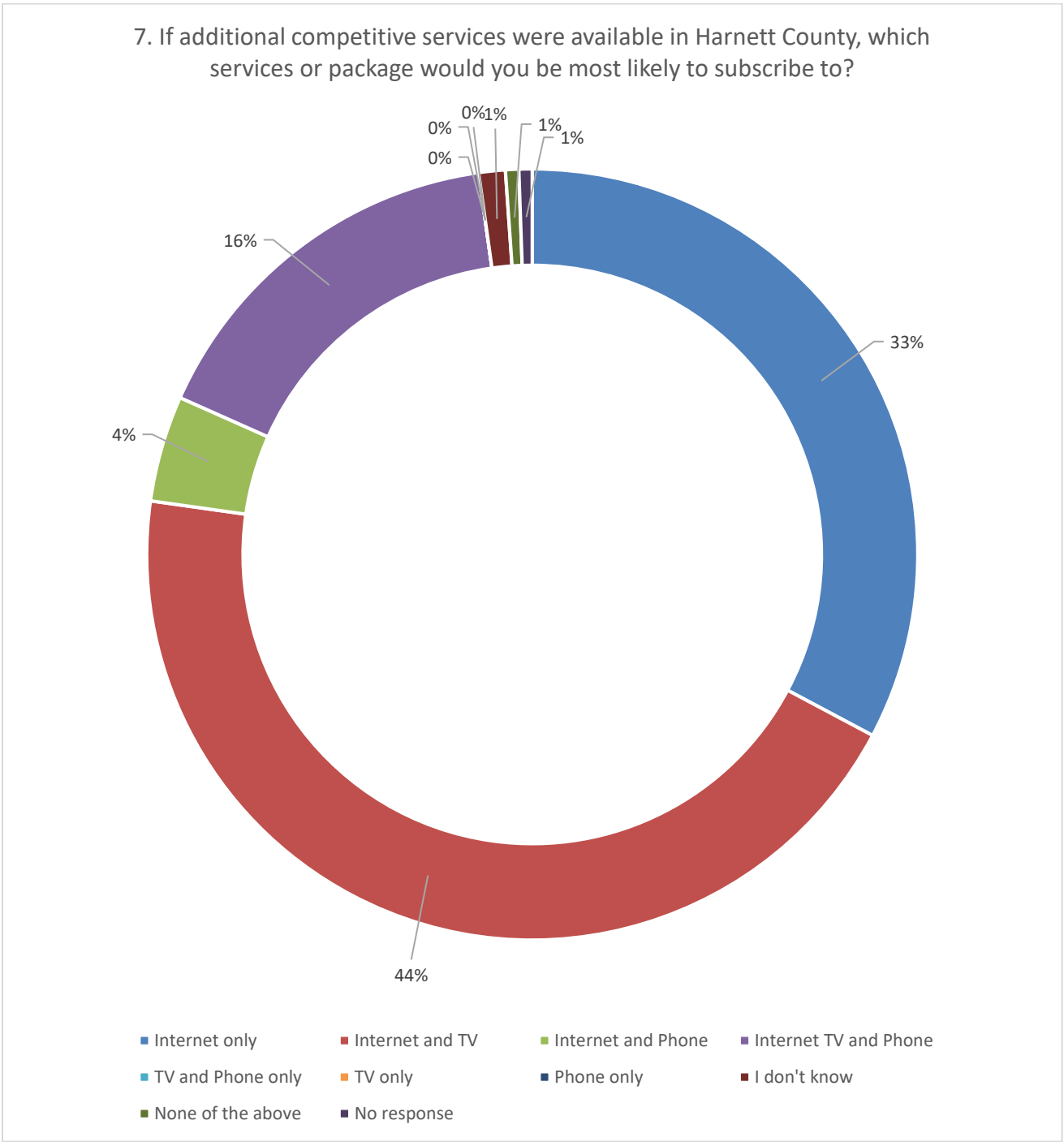
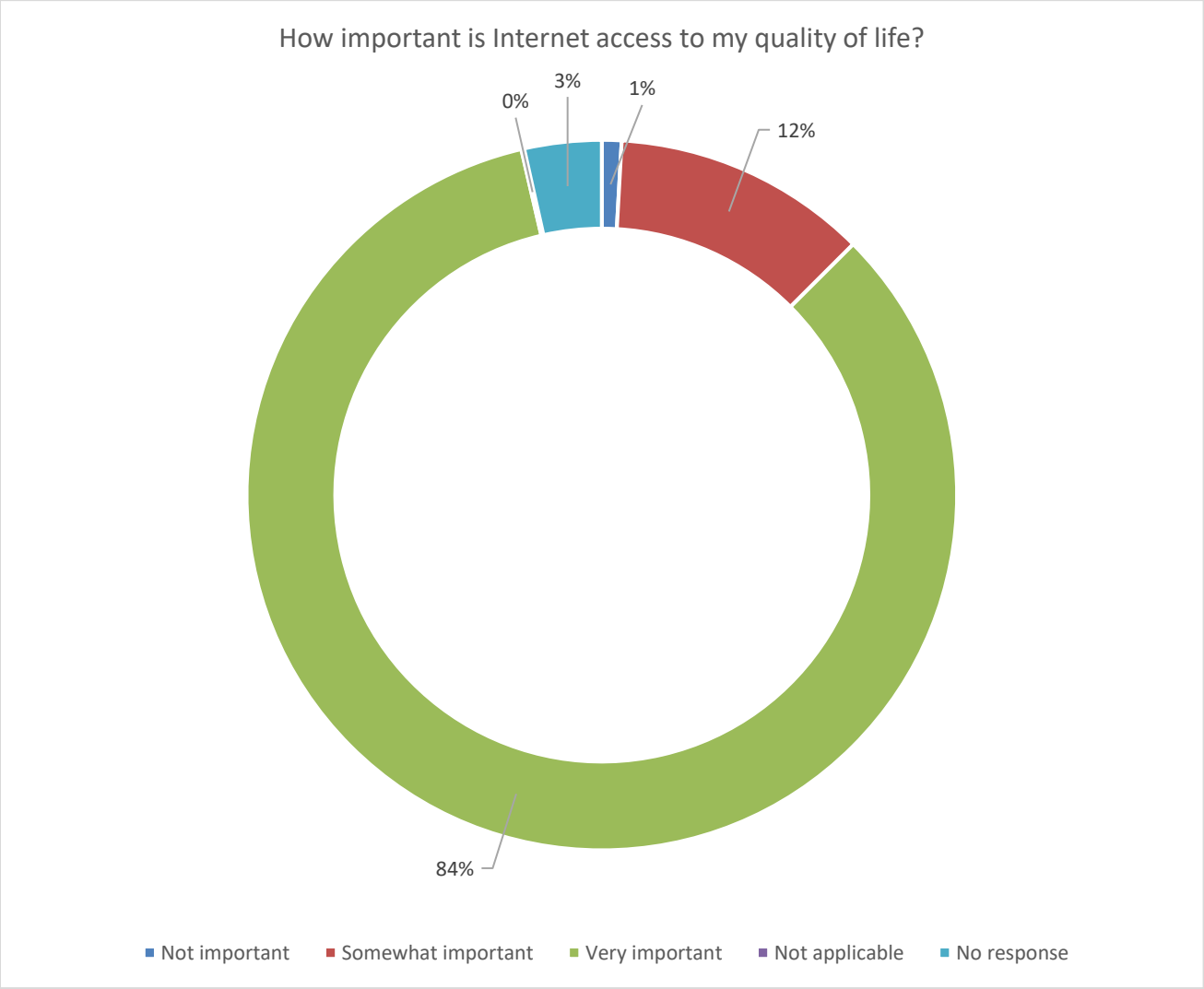

7. If additional competitive services were available in Harnett County, which services or package would you be most likely to subscribe to?
0%
0%
1%
1%
1%
0%
16%
33%
4%
44%
Internet only
Internet and TV
Internet and Phone
Internet TV and Phone
TV and Phone only
TV only
Phone only
I don't know
None of the above
No response

All residential respondents (Base: 1,583)

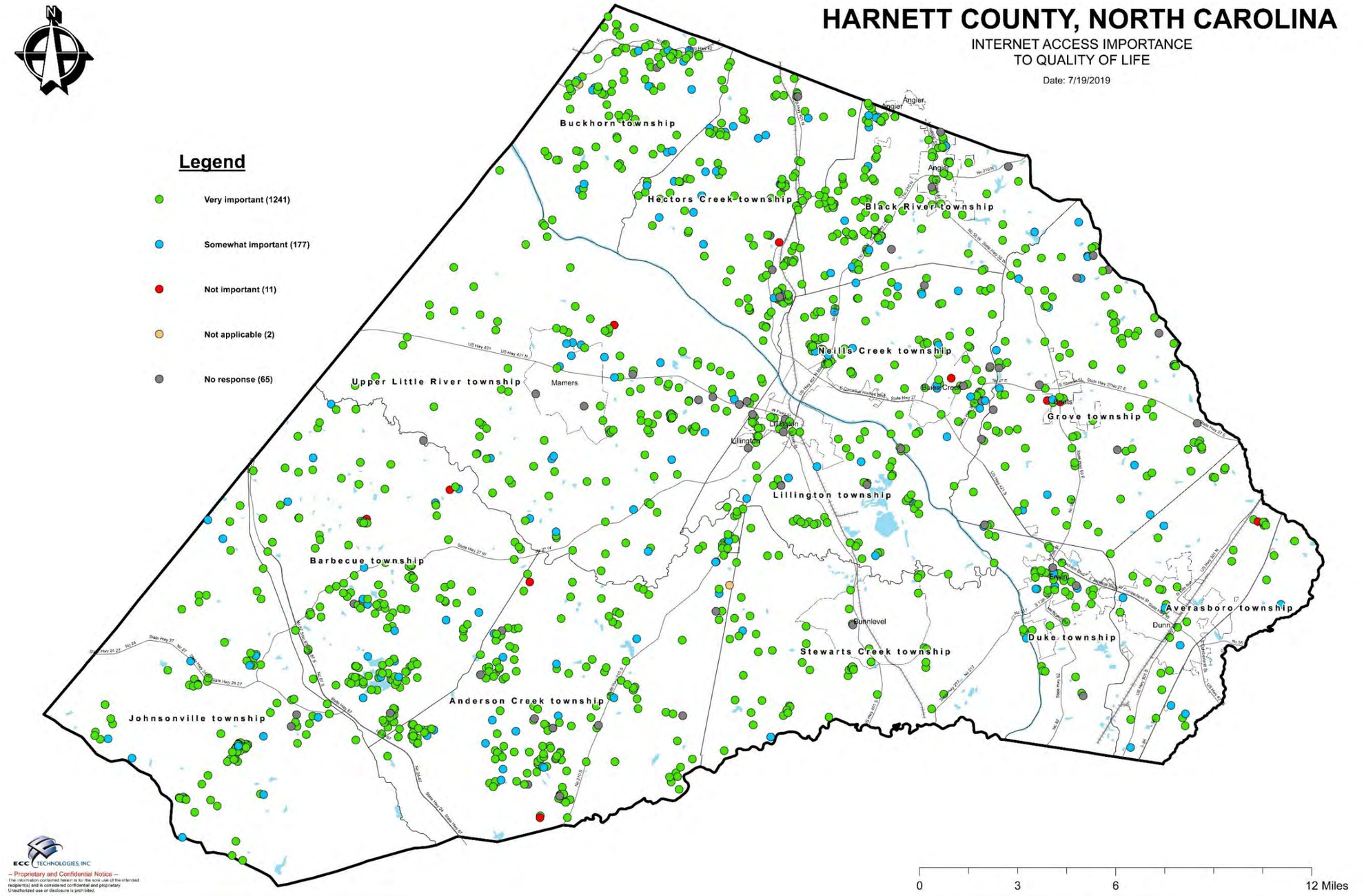
Matrix question 8/9 responses.

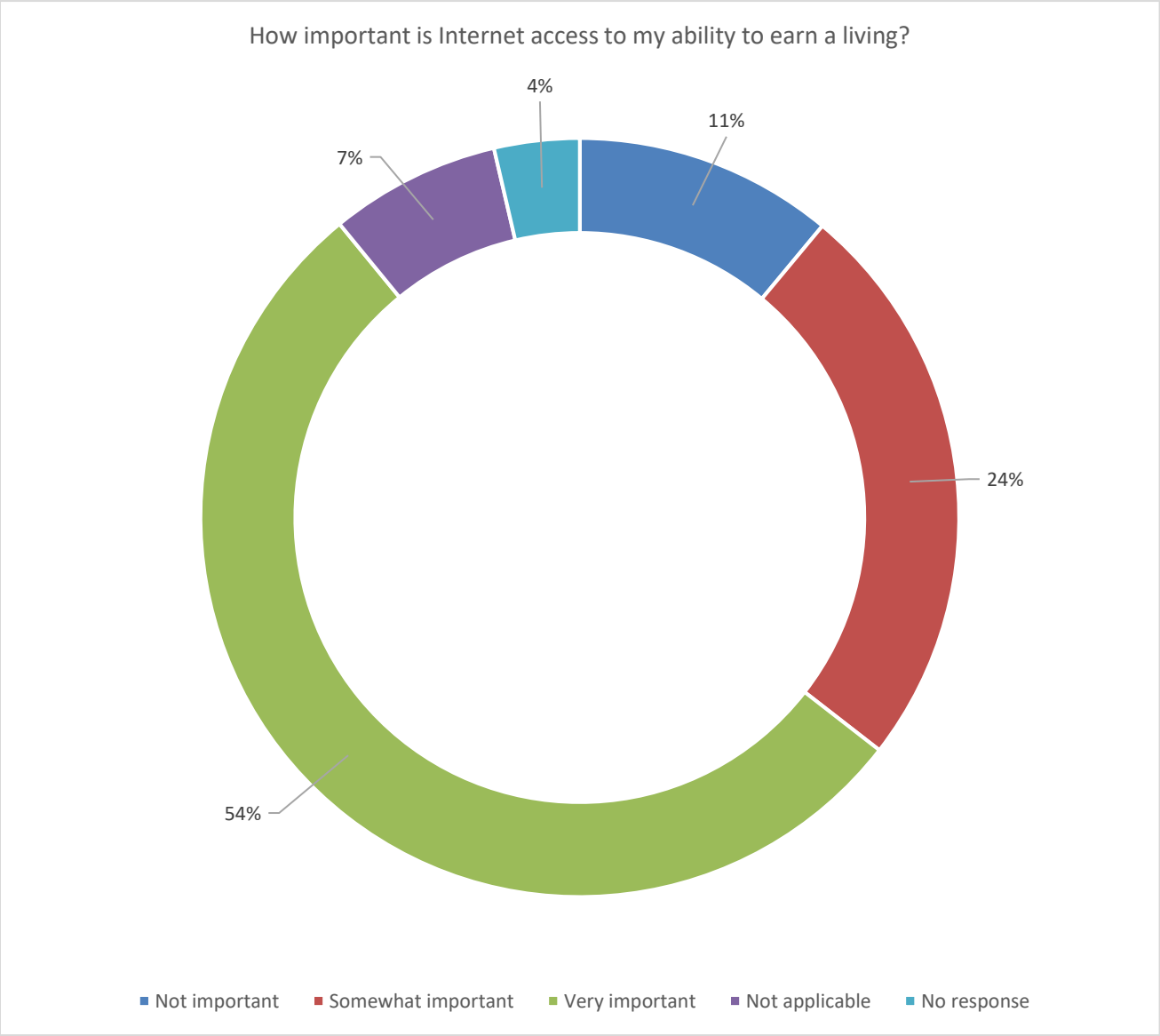


HARNETT COUNTY, NORTH CAROLINA

INTERNET ACCESS IMPORTANCE
TO QUALITY OF LIFE

Date: 7/19/2019

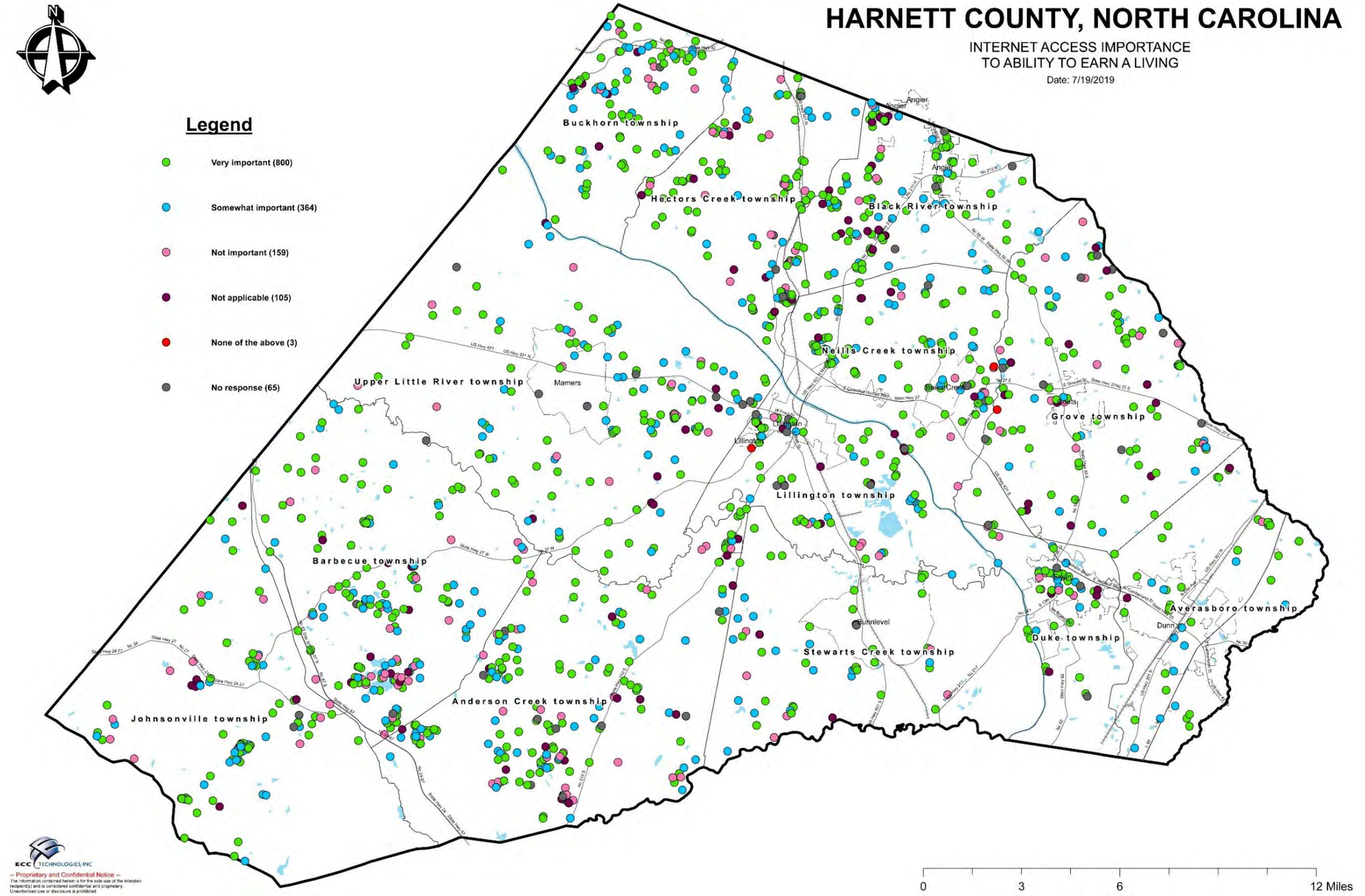



How important is Internet access to my ability to earn a living?
4%
11%
7%
24%
54%
Not important
Somewhat important
Very important
Not applicable
No response

HARNETT COUNTY, NORTH CAROLINA

INTERNET ACCESS IMPORTANCE
TO ABILITY TO EARN A LIVING

Date: 7/19/2019



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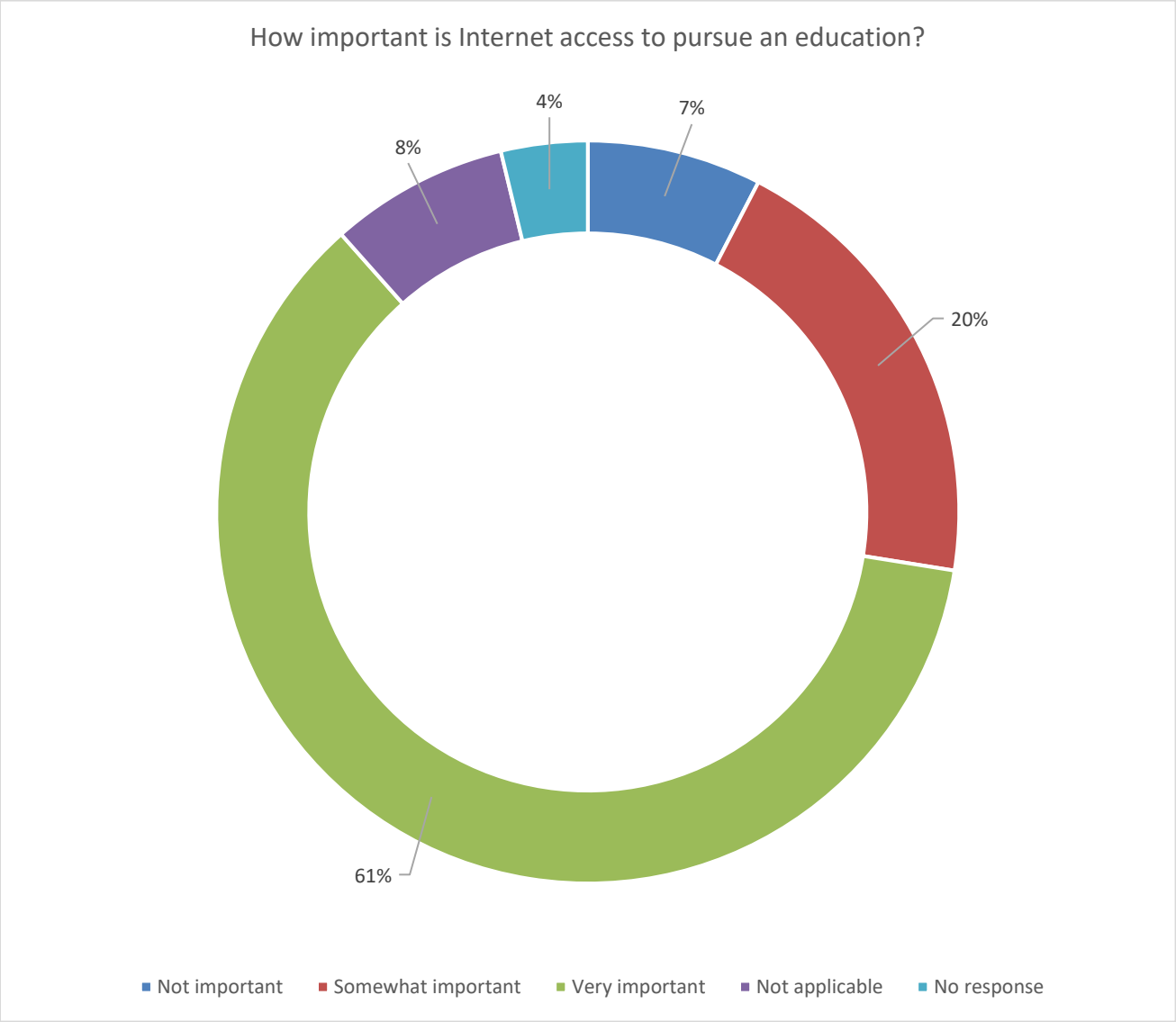
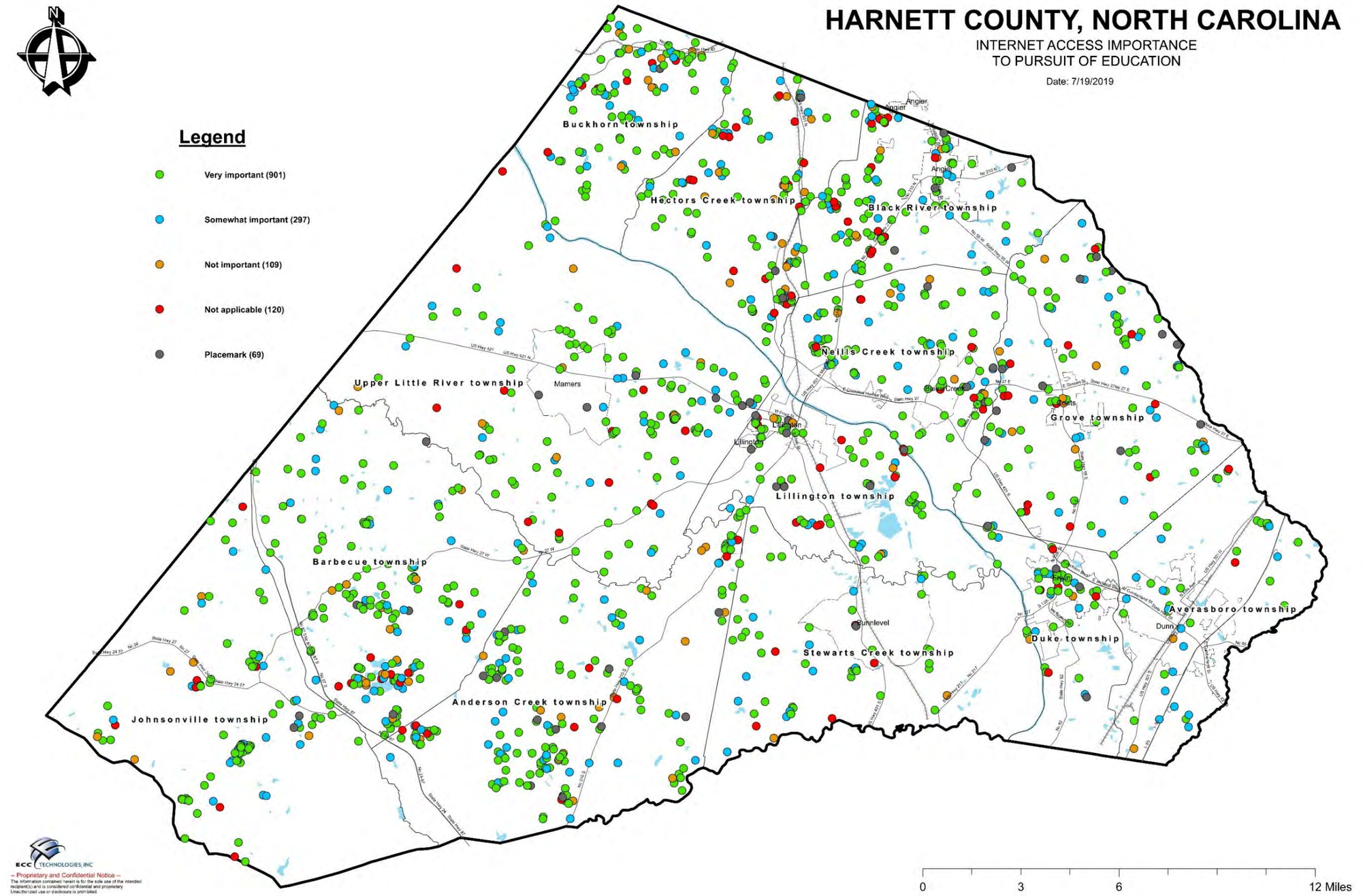
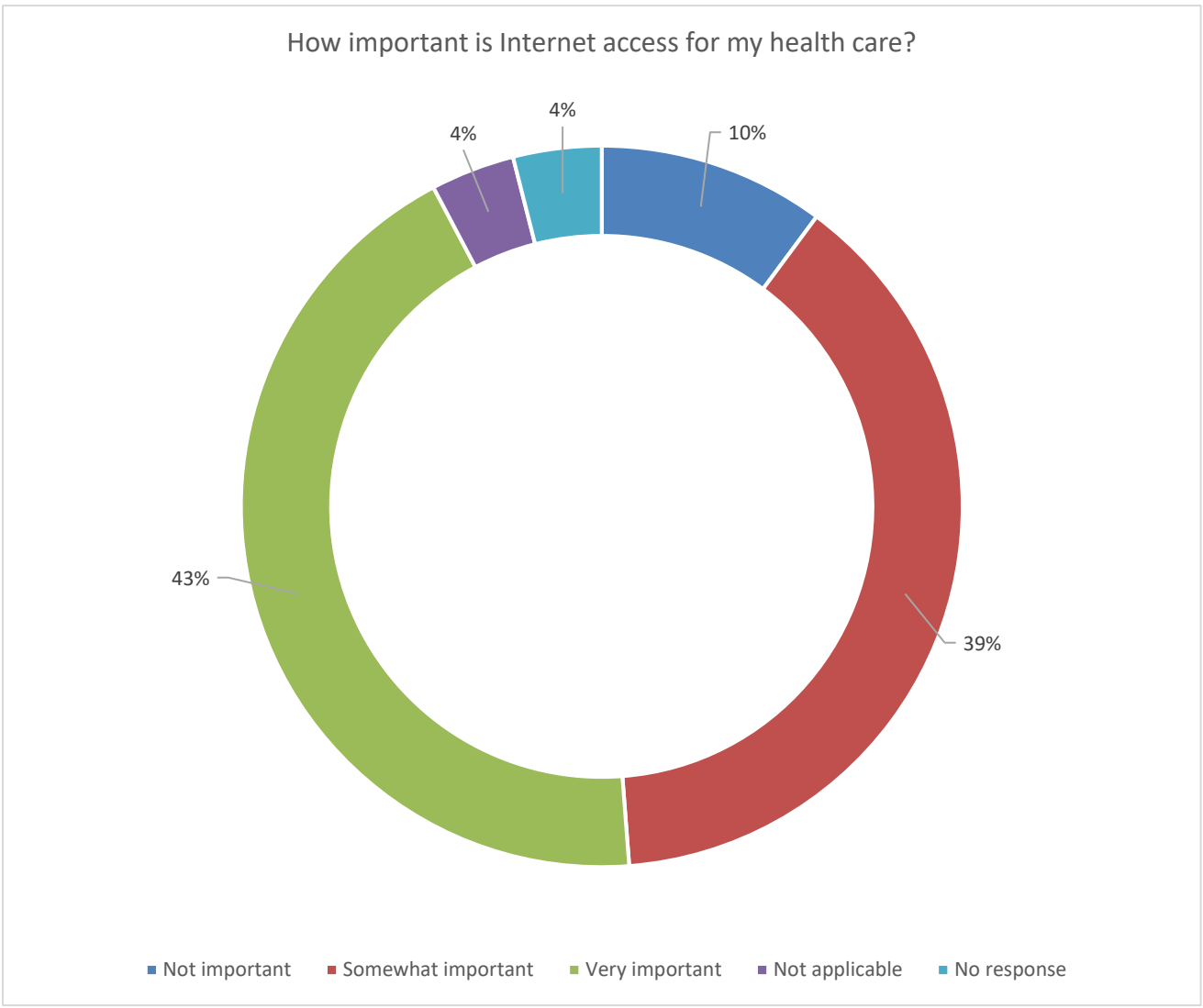

How important is Internet access to pursue an education?
4%
7%
8%
20%
61%
Not important
Somewhat important
Very important
Not applicable
No response

HARNETT COUNTY, NORTH CAROLINA

INTERNET ACCESS IMPORTANCE
TO PURSUIT OF EDUCATION

Date: 7/19/2019

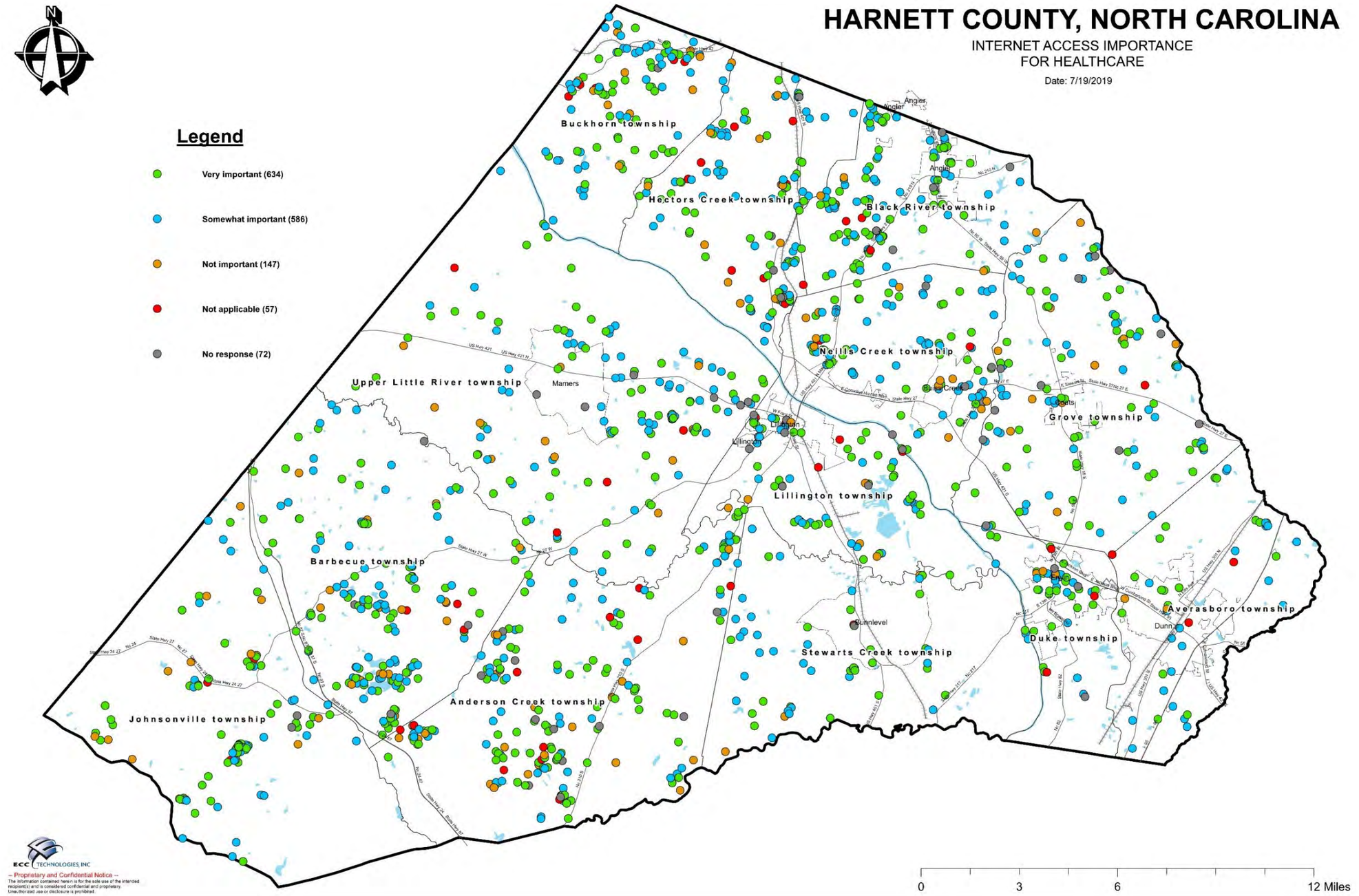


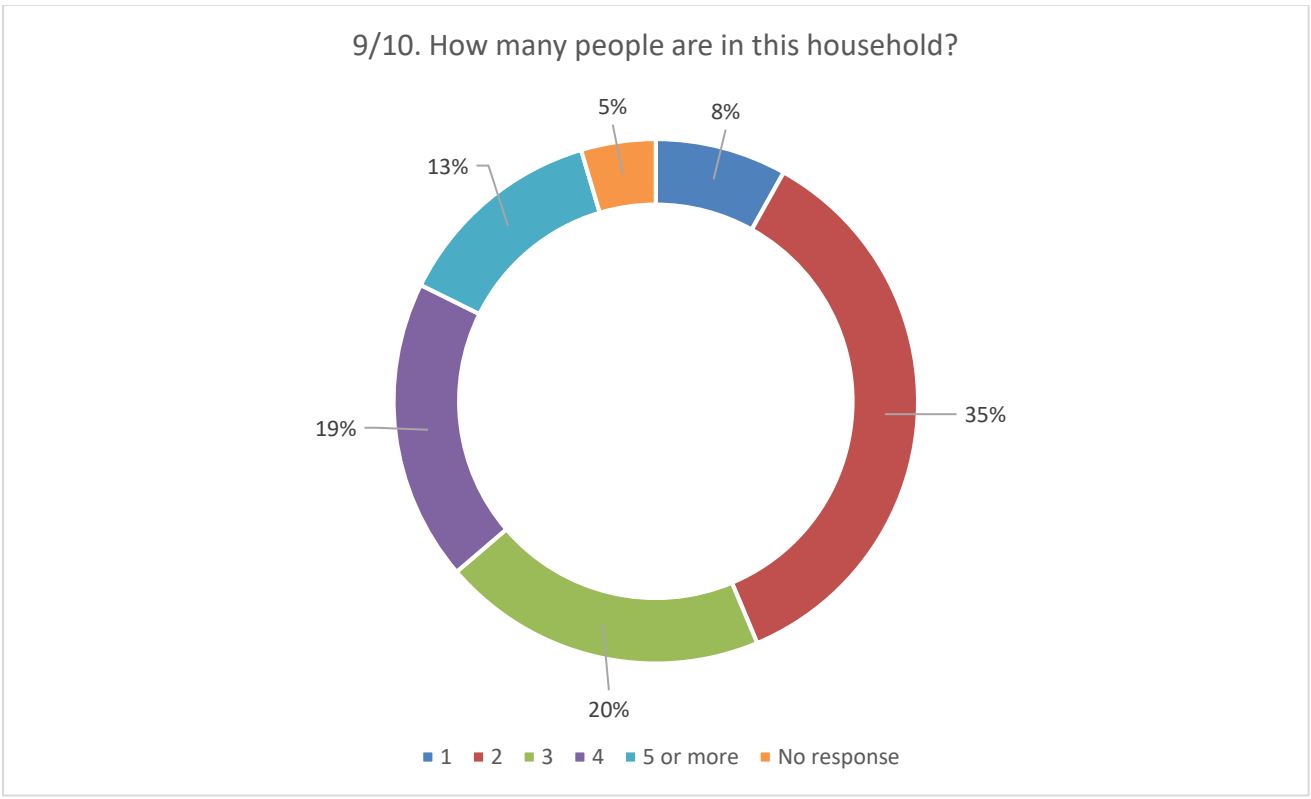

How important is Internet access for my health care?
4%
4%
10%
43%
39%
Not important
Somewhat important
Very important
Not applicable
No response

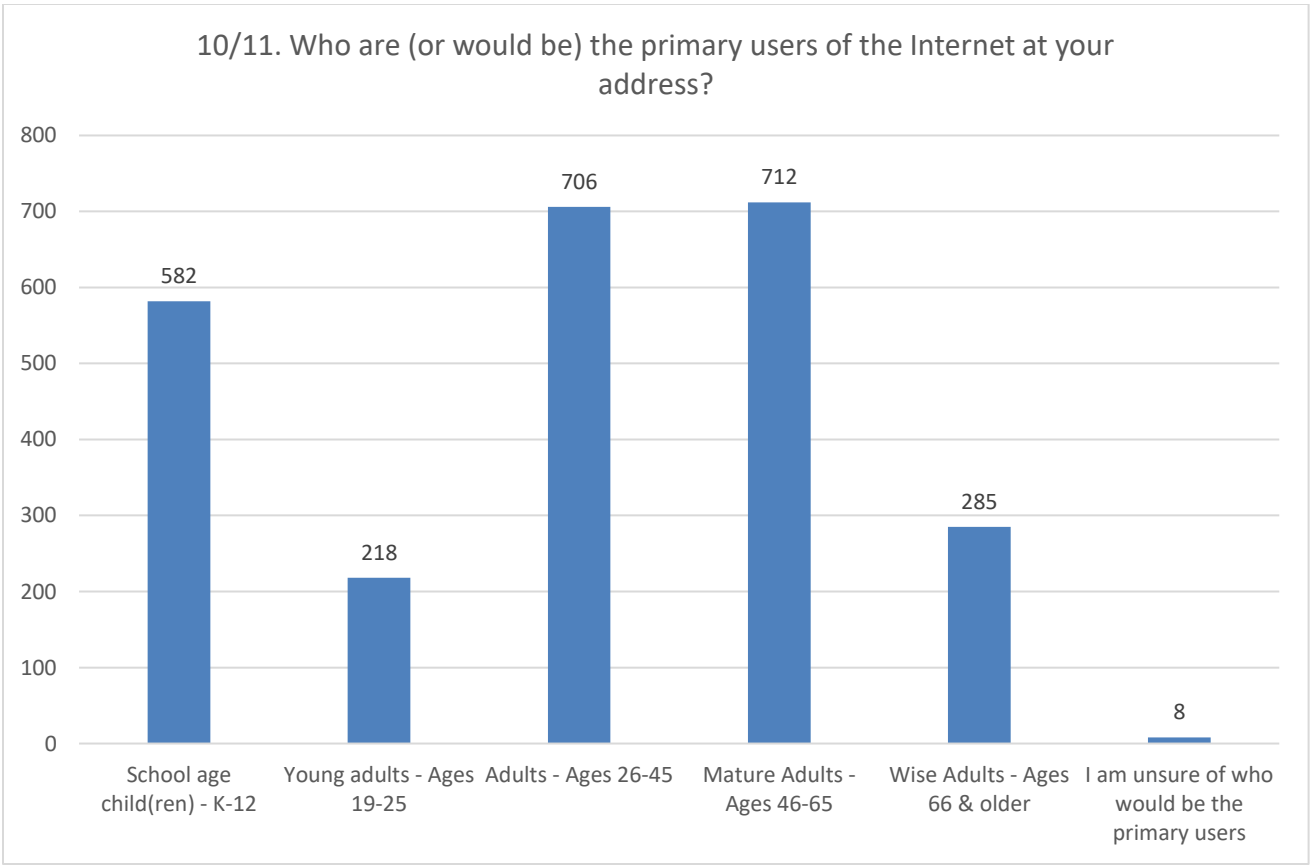
HARNETT COUNTY, NORTH CAROLINA

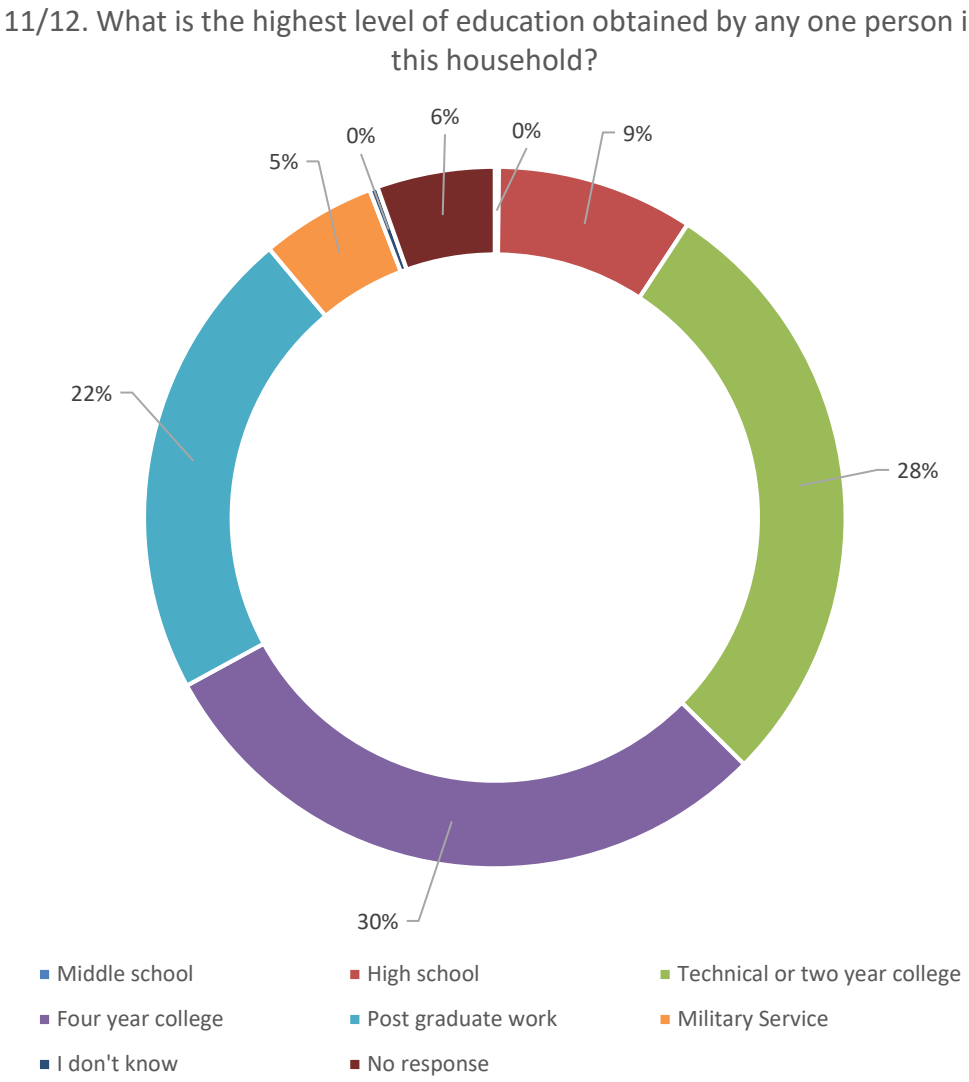
INTERNET ACCESS IMPORTANCE
FOR HEALTHCARE

Date: 7/19/2019

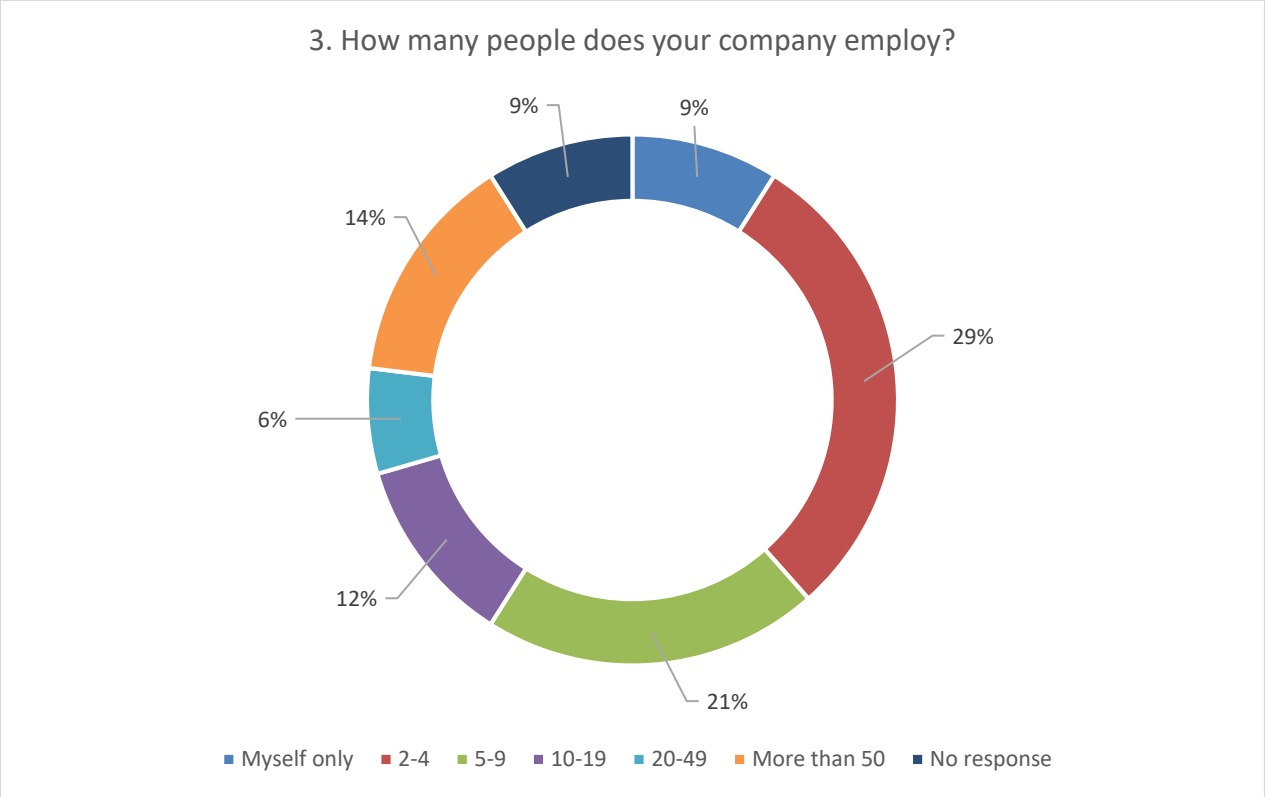


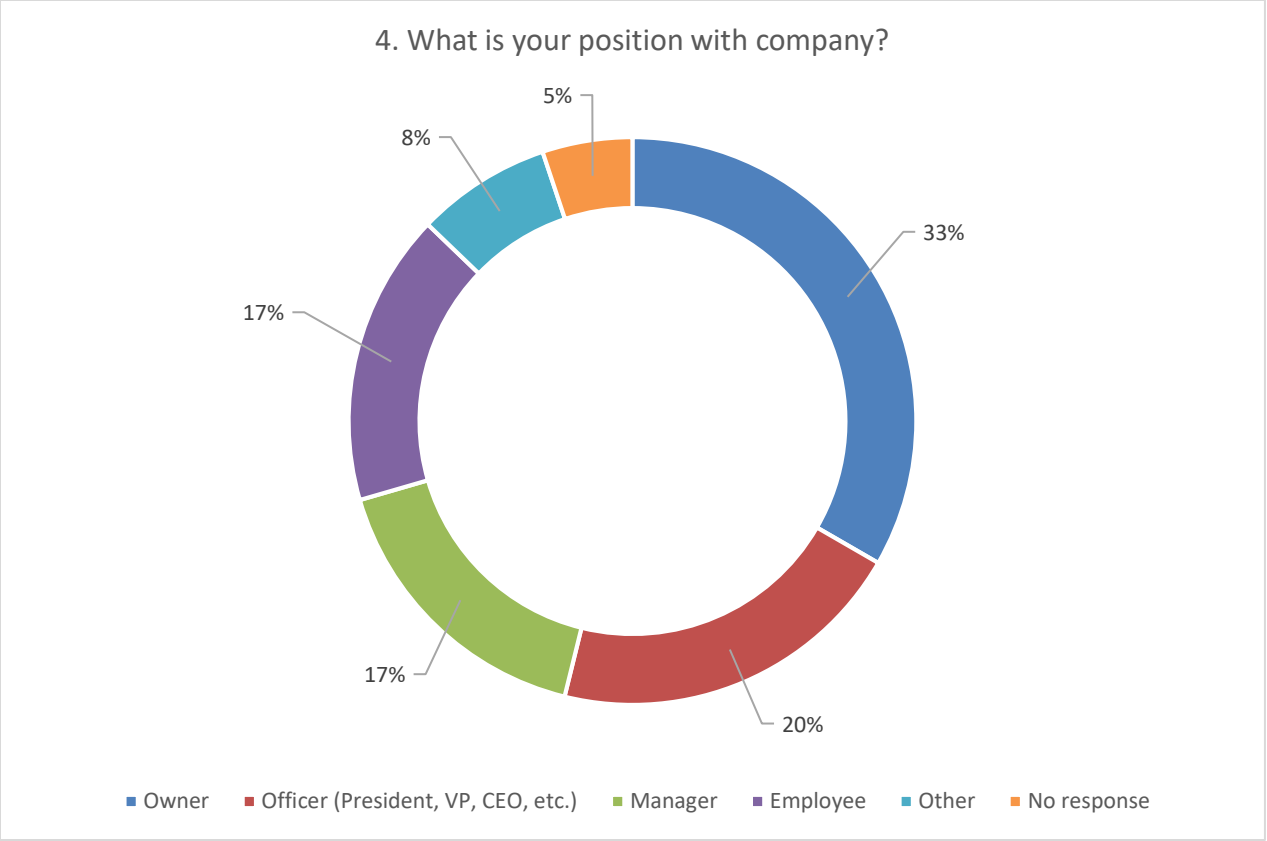

9/10. How many people are in this household?
5%
8%
13%
35%
19%
20%
1
2
3
4
5 or more
No response


10/11. Who are (or would be) the primary users of the Internet at your address?
800
700
600
500
400
300
200
100
0
582
218
706
712
285
8
School age child(ren) - K-12
Young adults - Ages 19-25
Adults - Ages 26-45
Mature Adults - Ages 46-65
Wise Adults - Ages 66 & older
I am unsure of who would be the primary users

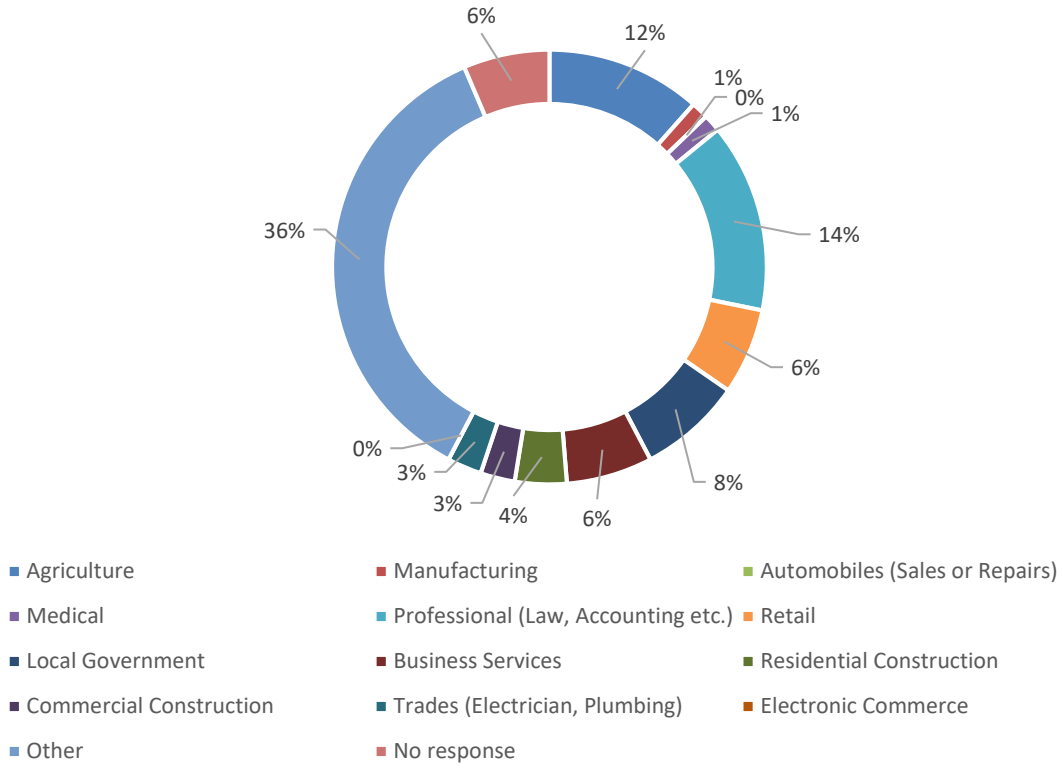

11/12. What is the highest level of education obtained by any one person in this household?
6%
0%
0%
9%
5%
22%
28%
30%
Middle school
High school
Technical or two year college
Four year college
Post graduate work
Military Service
I don't know
No response

Respondents selecting "Business" (Base: 78)

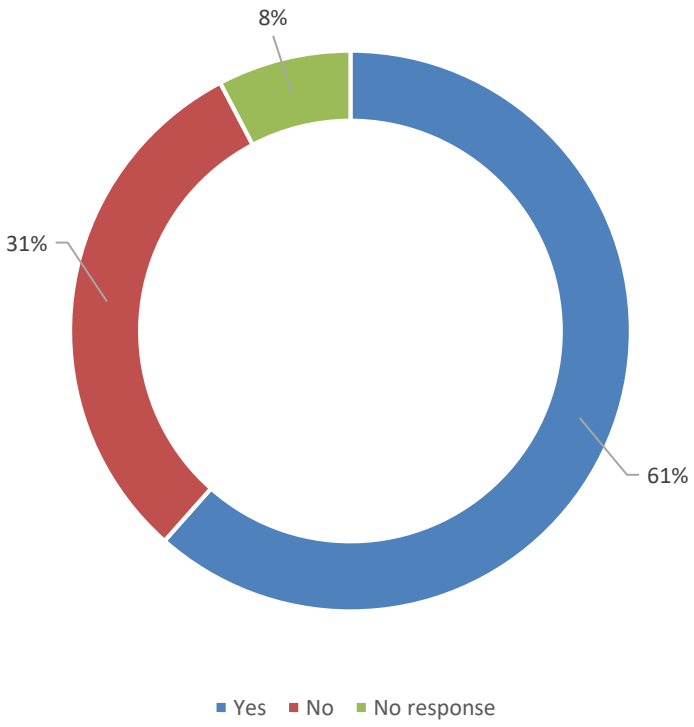



4. What is your position with company?
5%
8%
33%
17%
17%
20%
Owner
Officer (President, VP, CEO, etc.)
Manager
Employee
Other
No response

5. What is the primary line of business at your location?



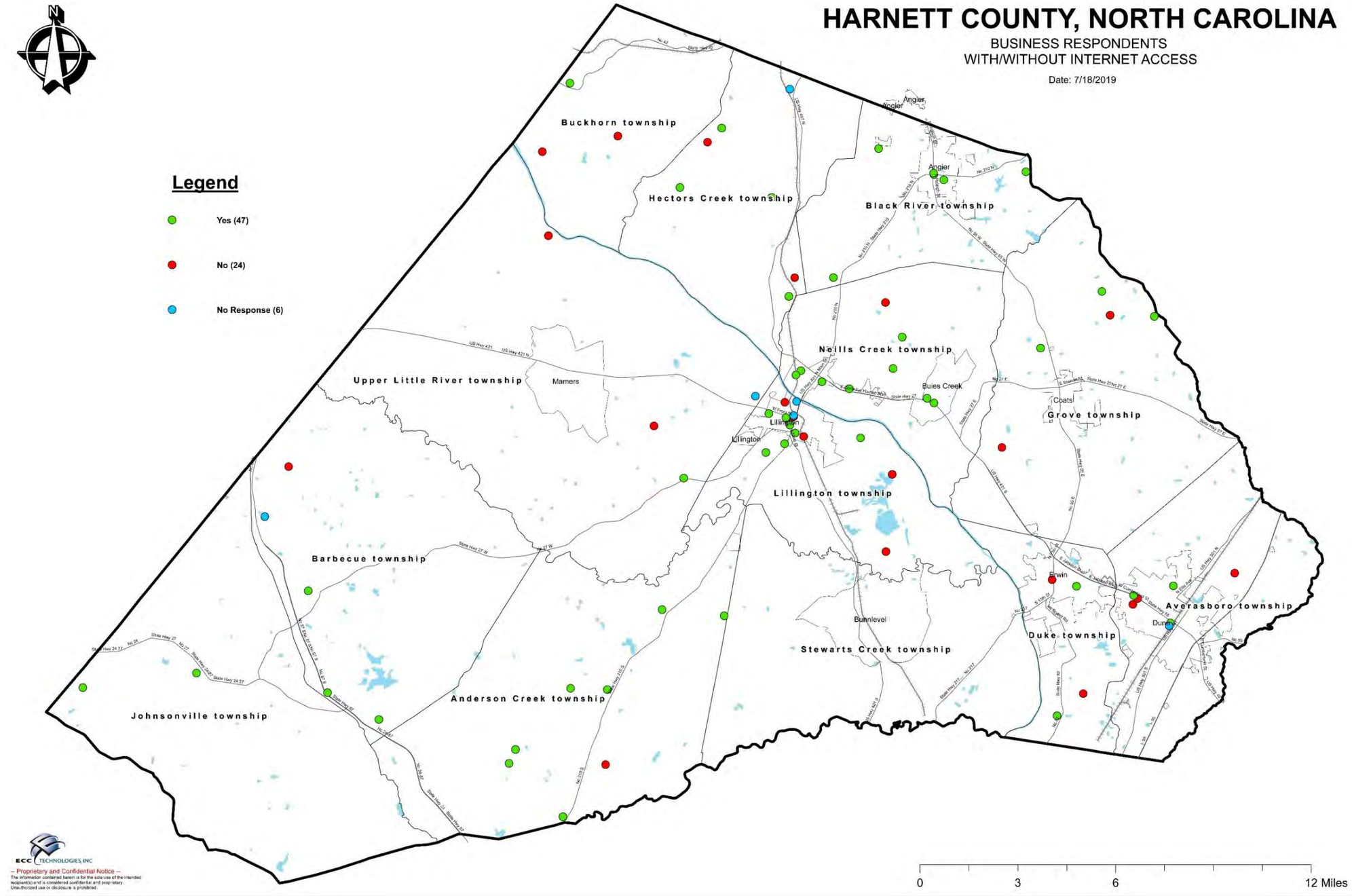
6. Do you have broadband service at this location?



HARNETT COUNTY, NORTH CAROLINA

BUSINESS RESPONDENTS
WITH/WITHOUT INTERNET ACCESS

Date: 7/18/2019



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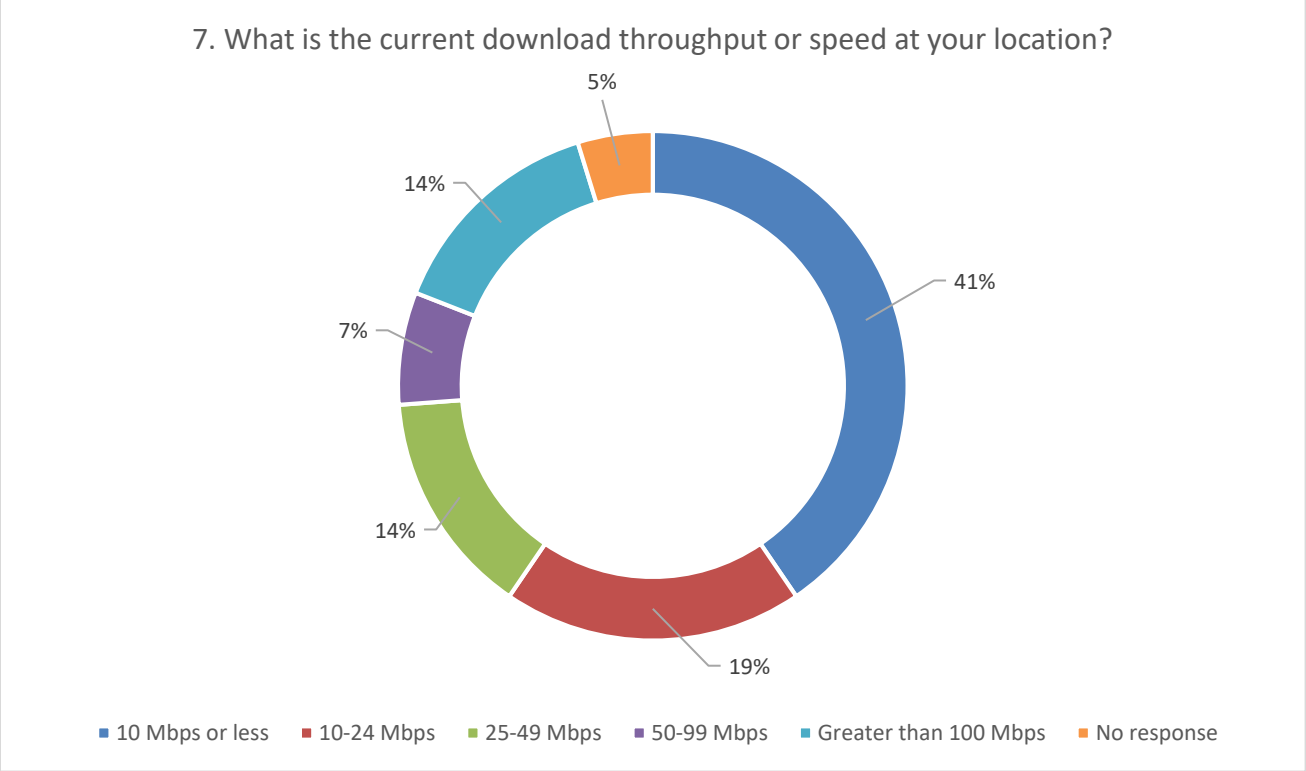
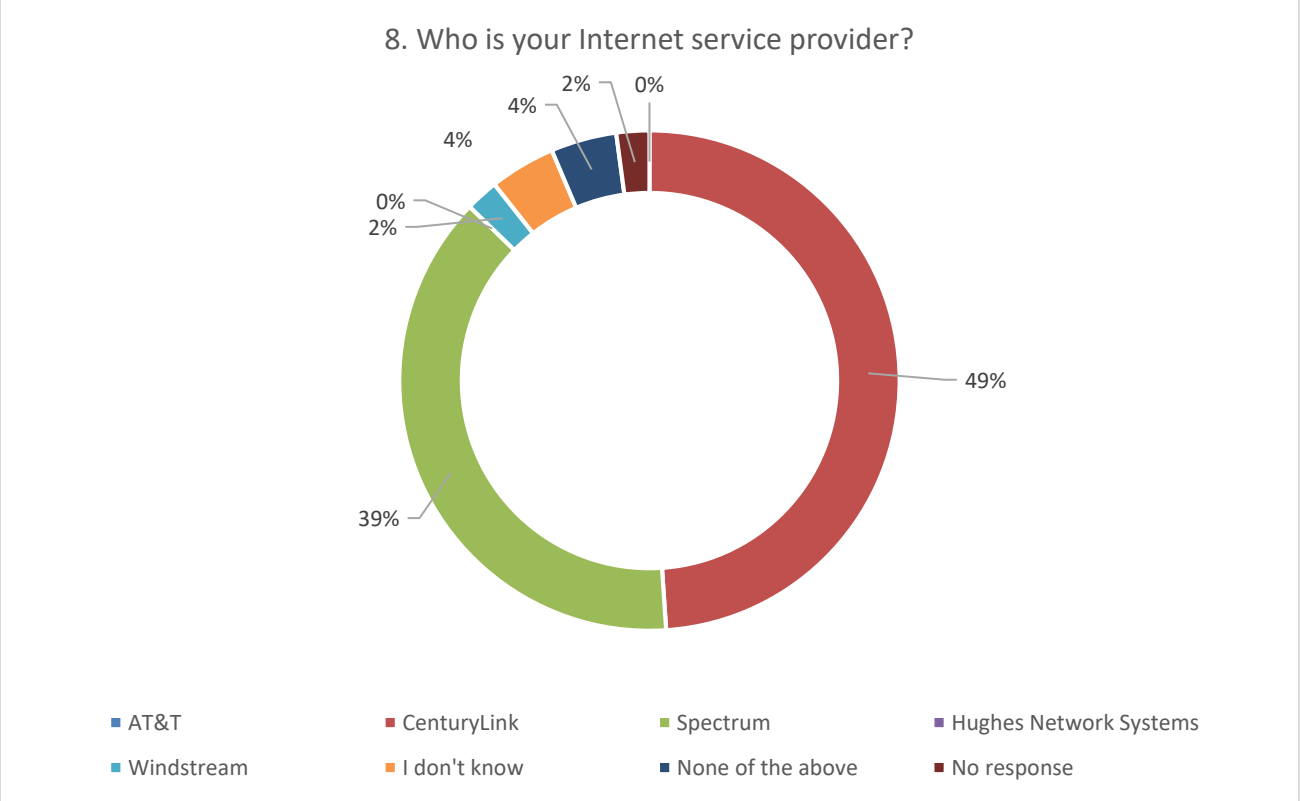
"Business" respondents selecting "Yes" to Q. 6 (base: 48)

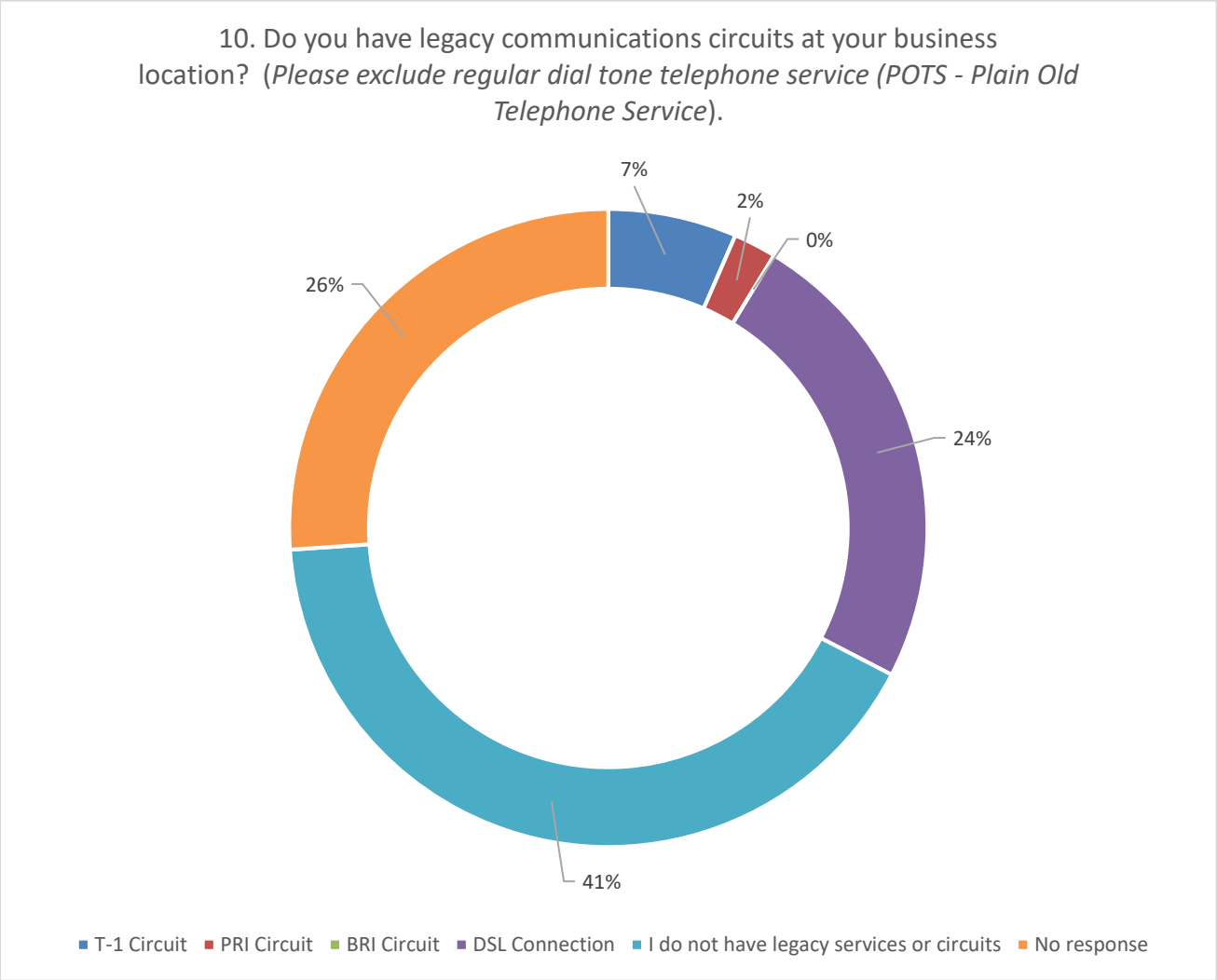


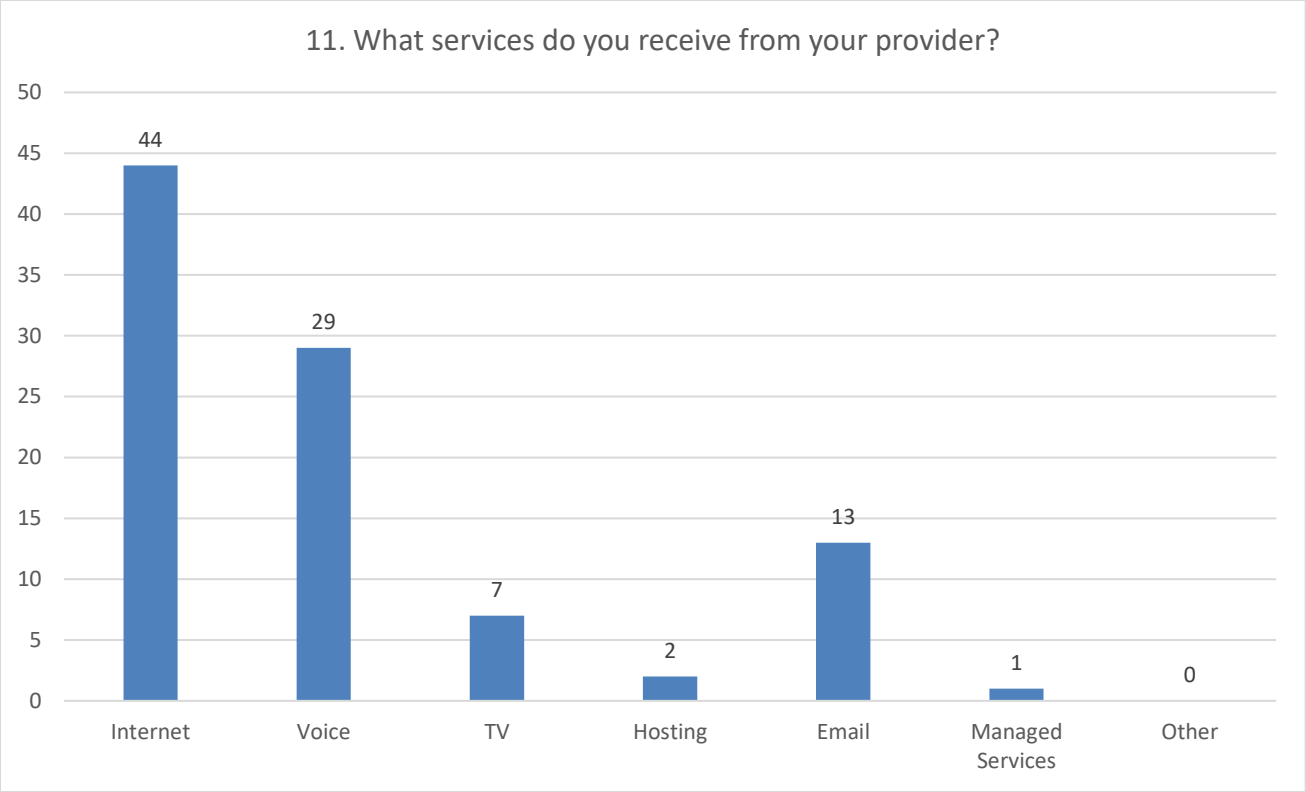


9. Please write in the name or your provider.

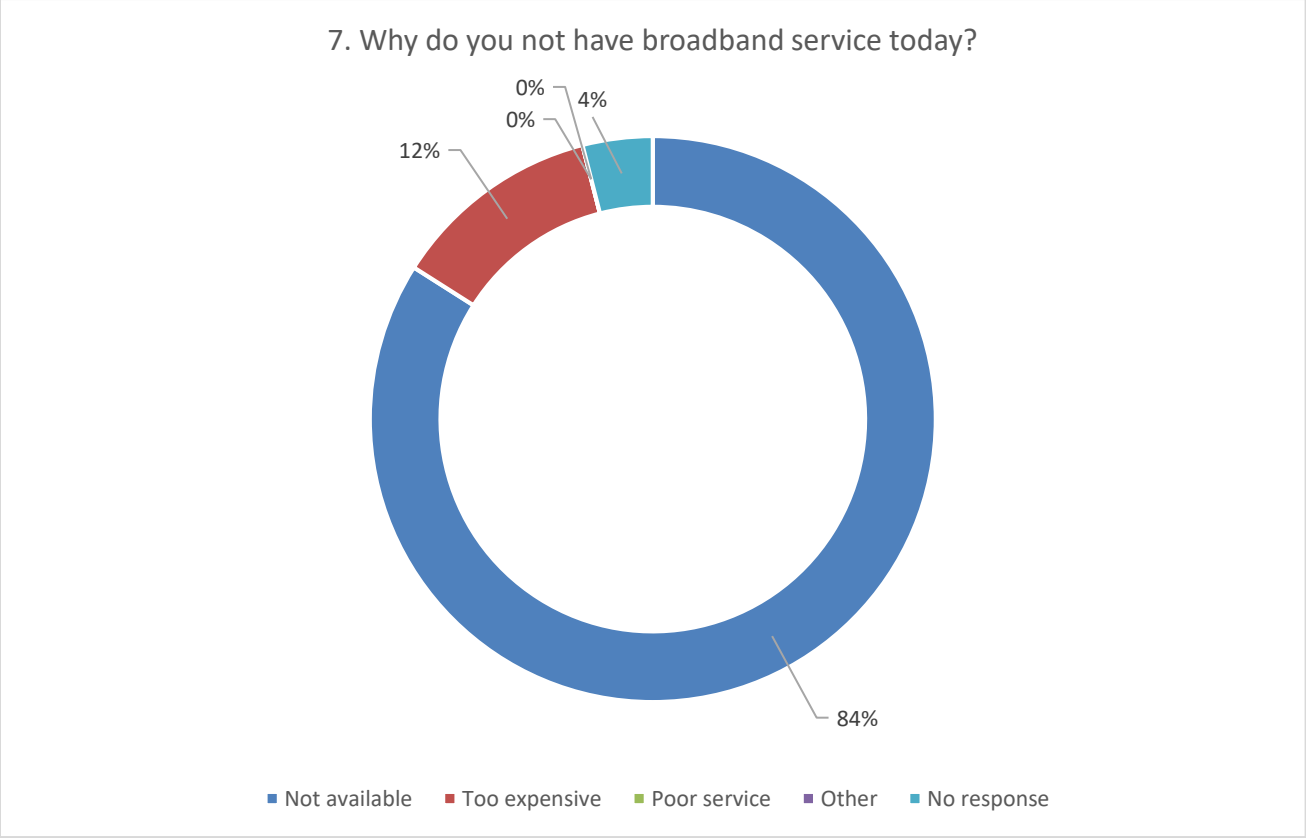
I don’t know

Verizon

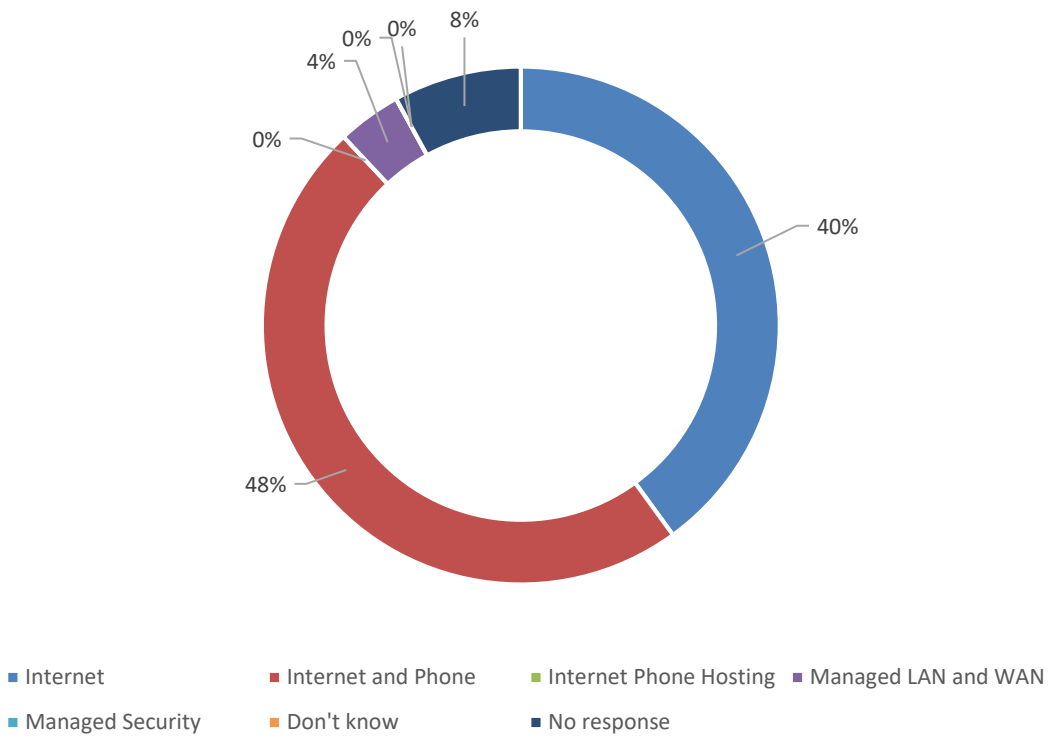




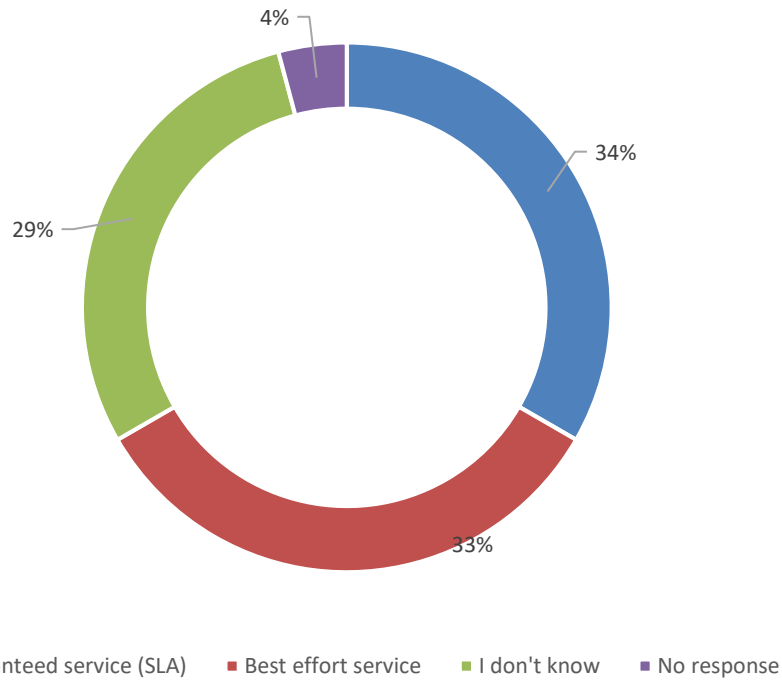
"Business" respondents selecting "No" to Q. 6 (base: 25)



8. What combinations of business class services would you be interested in?

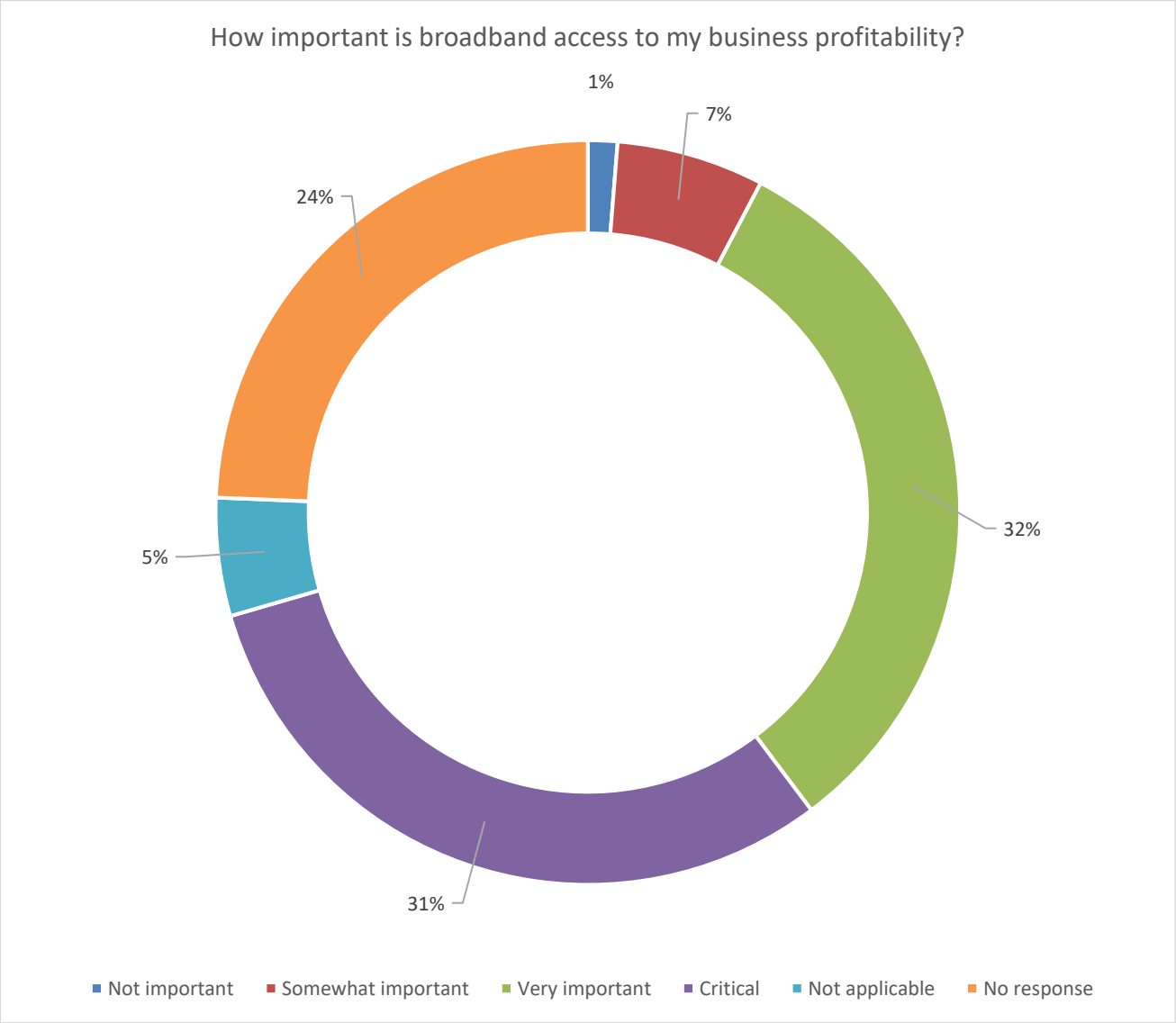


9. Would your business require a guaranteed level of broadband service, or best efforts?



All business respondents (Base: 78)

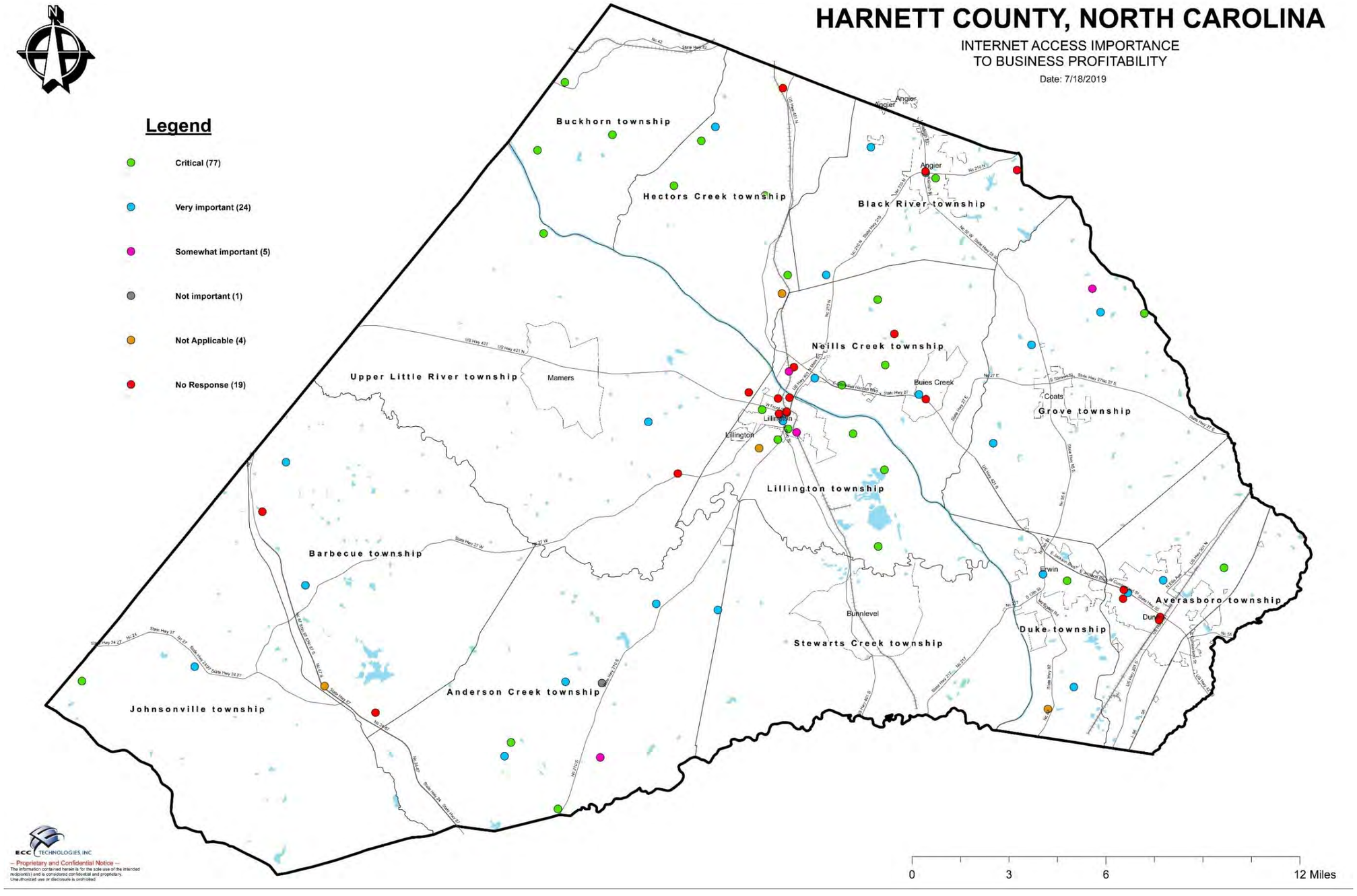
Matrix question 11/12 responses.



HARNETT COUNTY, NORTH CAROLINA

INTERNET ACCESS IMPORTANCE
TO BUSINESS PROFITABILITY

Date: 7/18/2019



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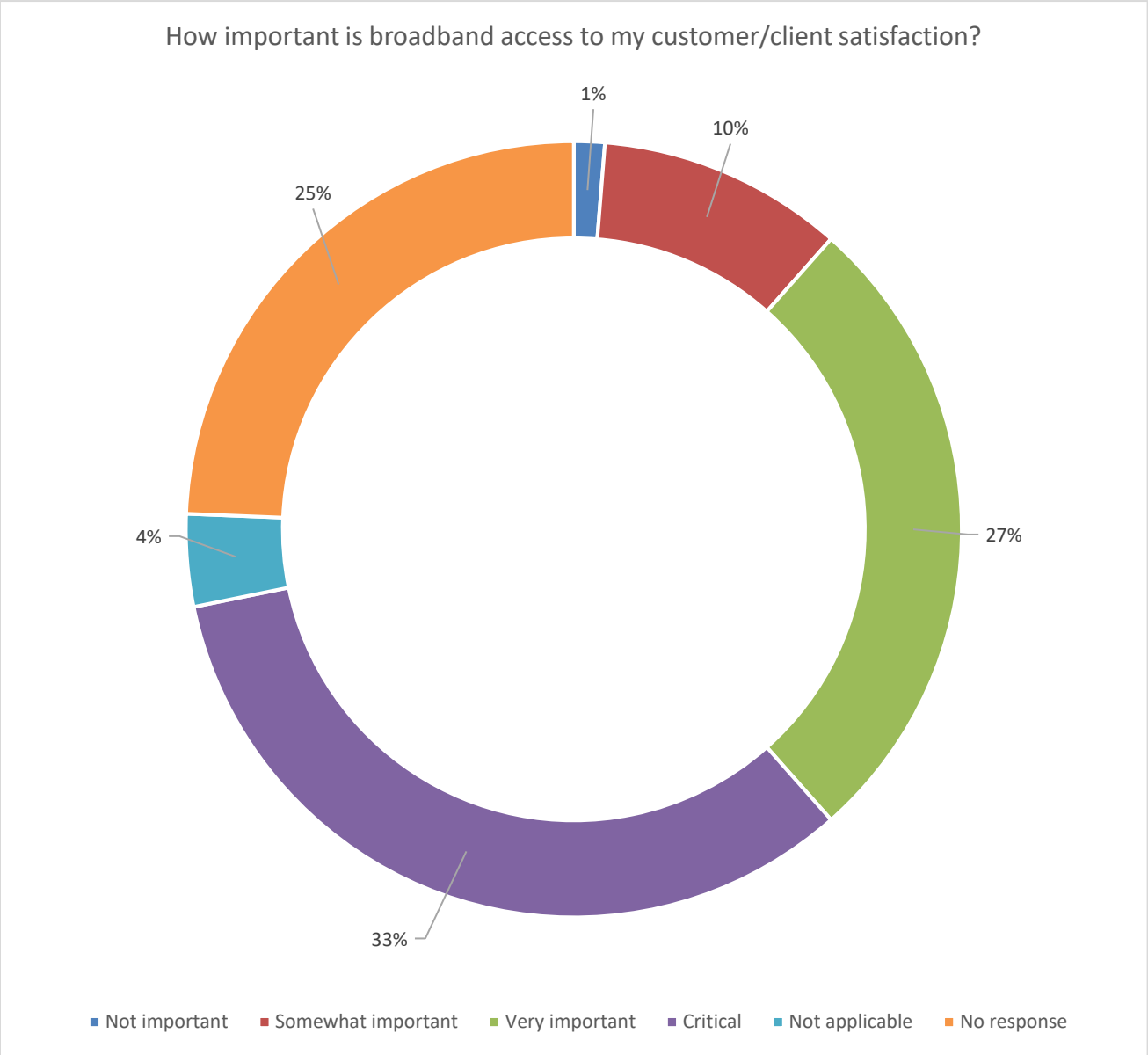
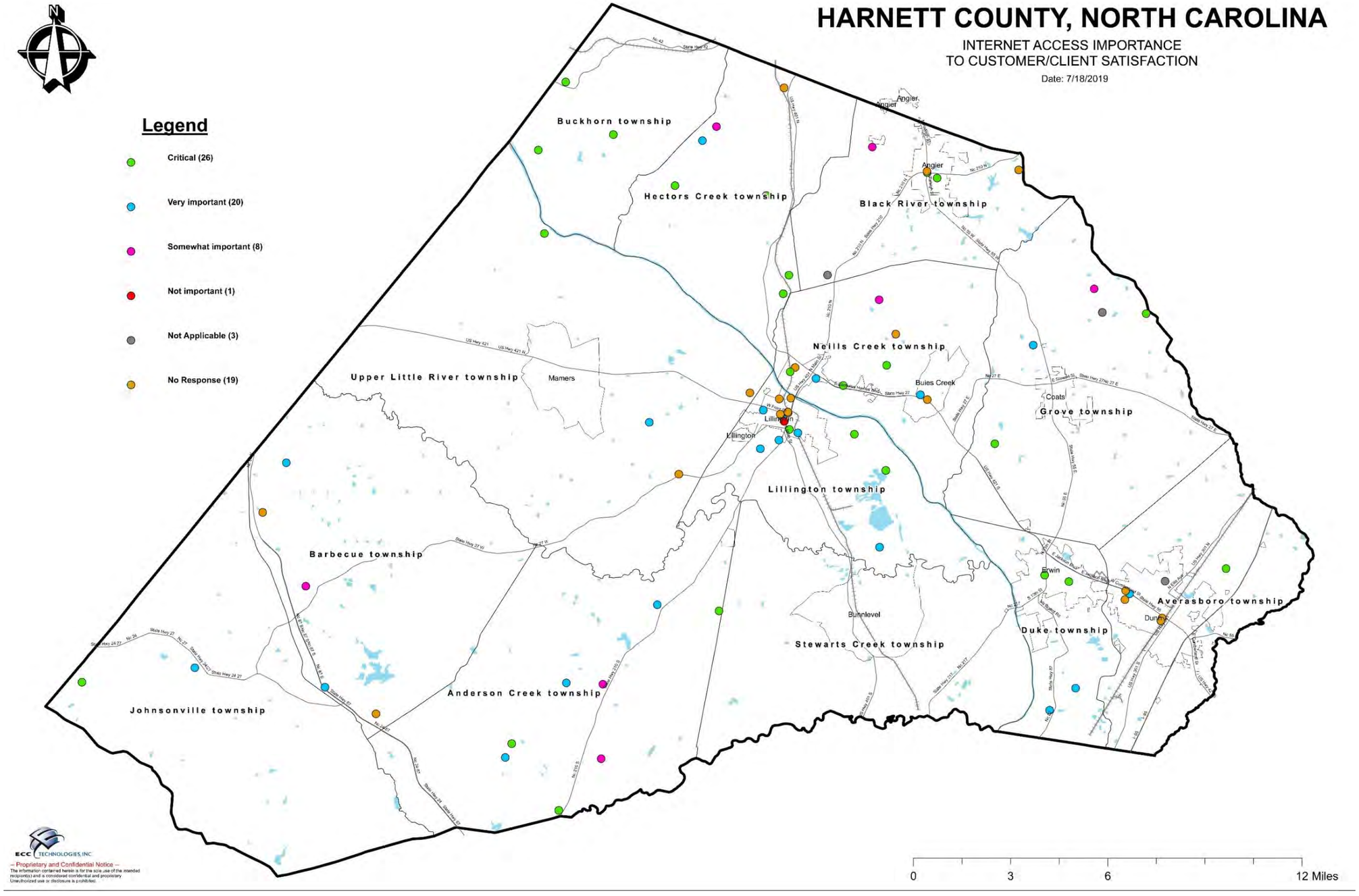

How important is broadband access to my customer/client satisfaction?
1%
10%
25%
27%
4%
33%
Not important
Somewhat important
Very important
Critical
Not applicable
No response

HARNETT COUNTY, NORTH CAROLINA

INTERNET ACCESS IMPORTANCE
TO CUSTOMER/CLIENT SATISFACTION

Date: 7/18/2019



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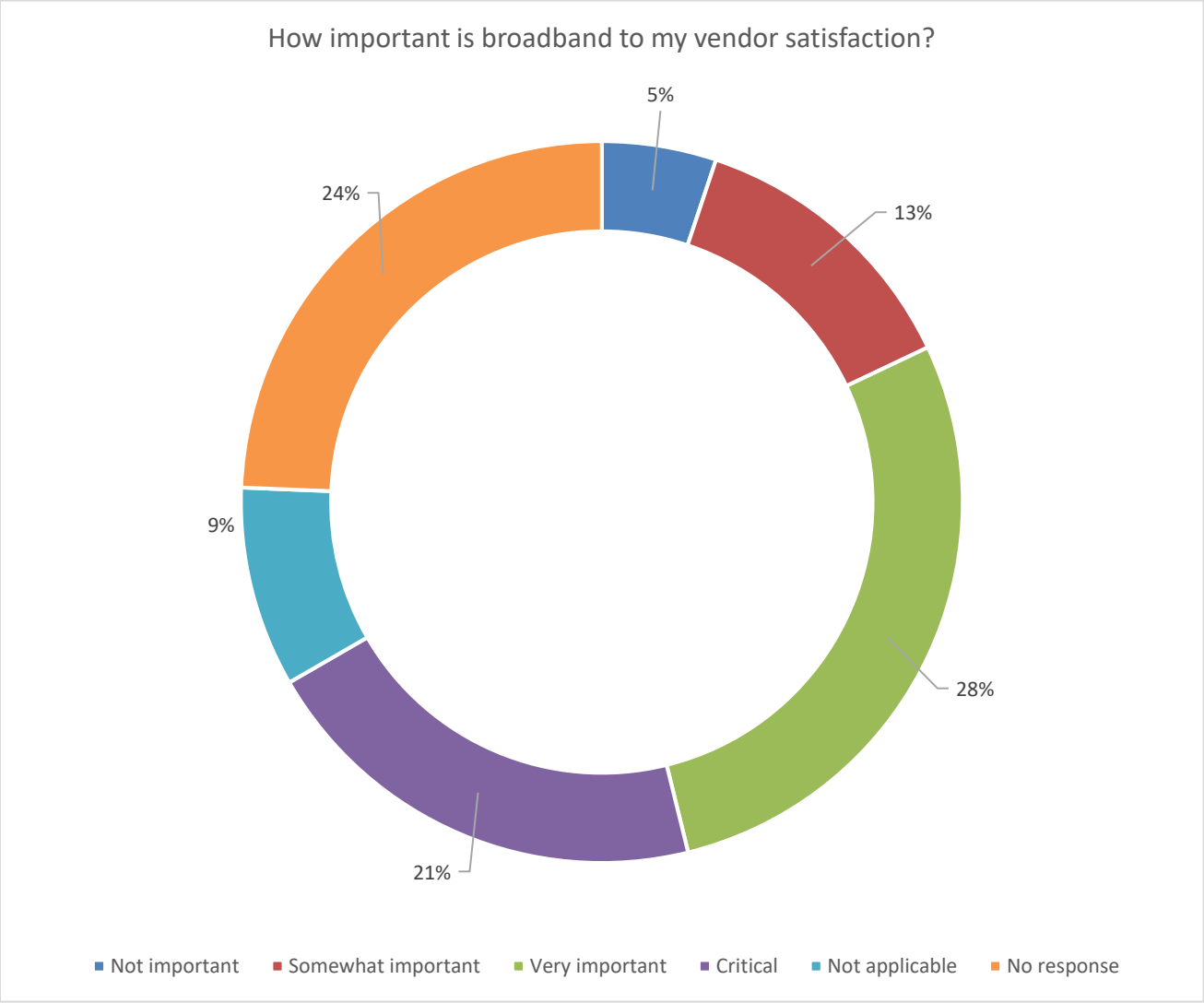
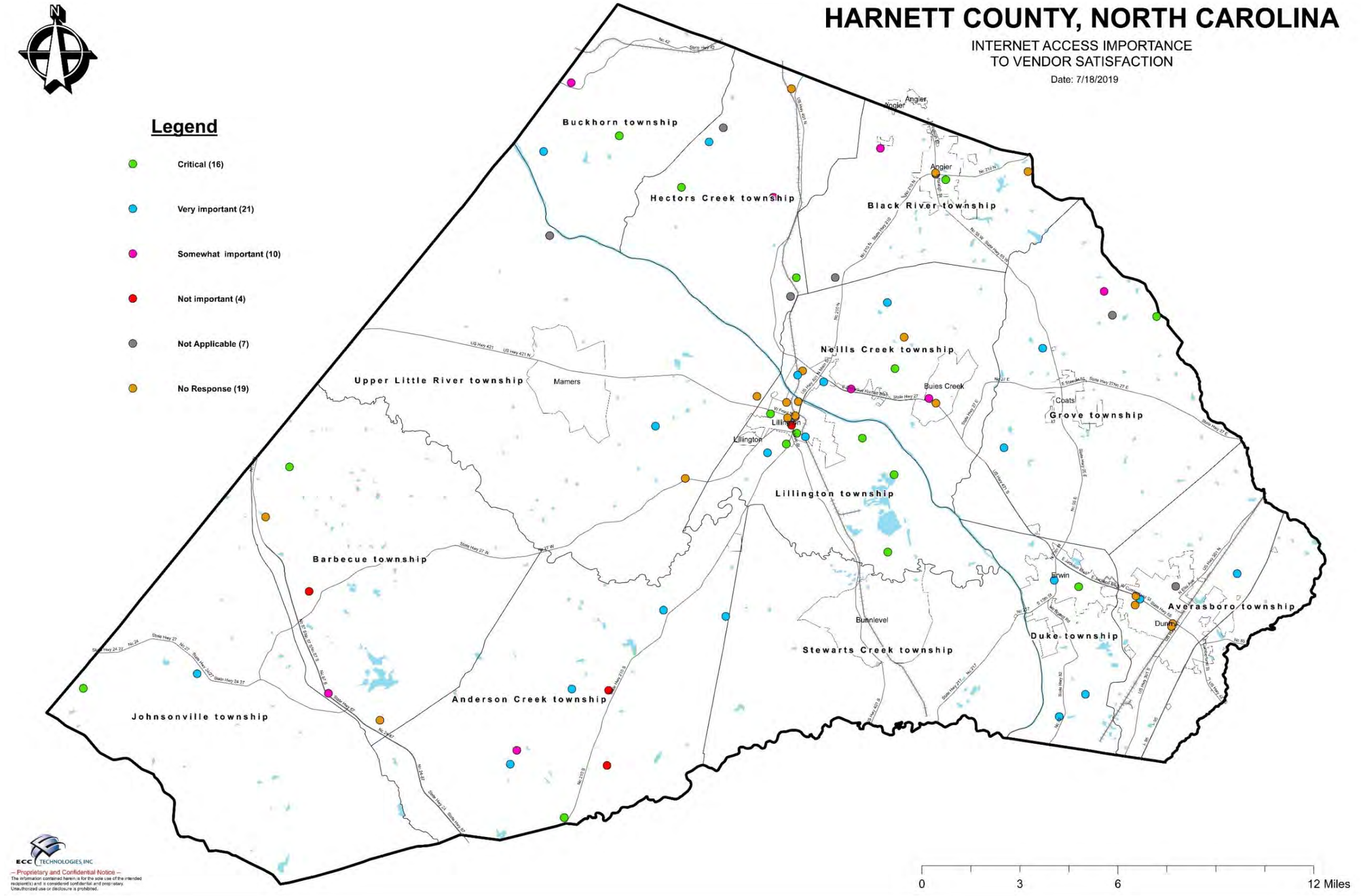

How important is broadband to my vendor satisfaction?
5%
13%
28%
21%
9%
24%
Not important
Somewhat important
Very important
Critical
Not applicable
No response

HARNETT COUNTY, NORTH CAROLINA

INTERNET ACCESS IMPORTANCE
TO VENDOR SATISFACTION

Date: 7/18/2019



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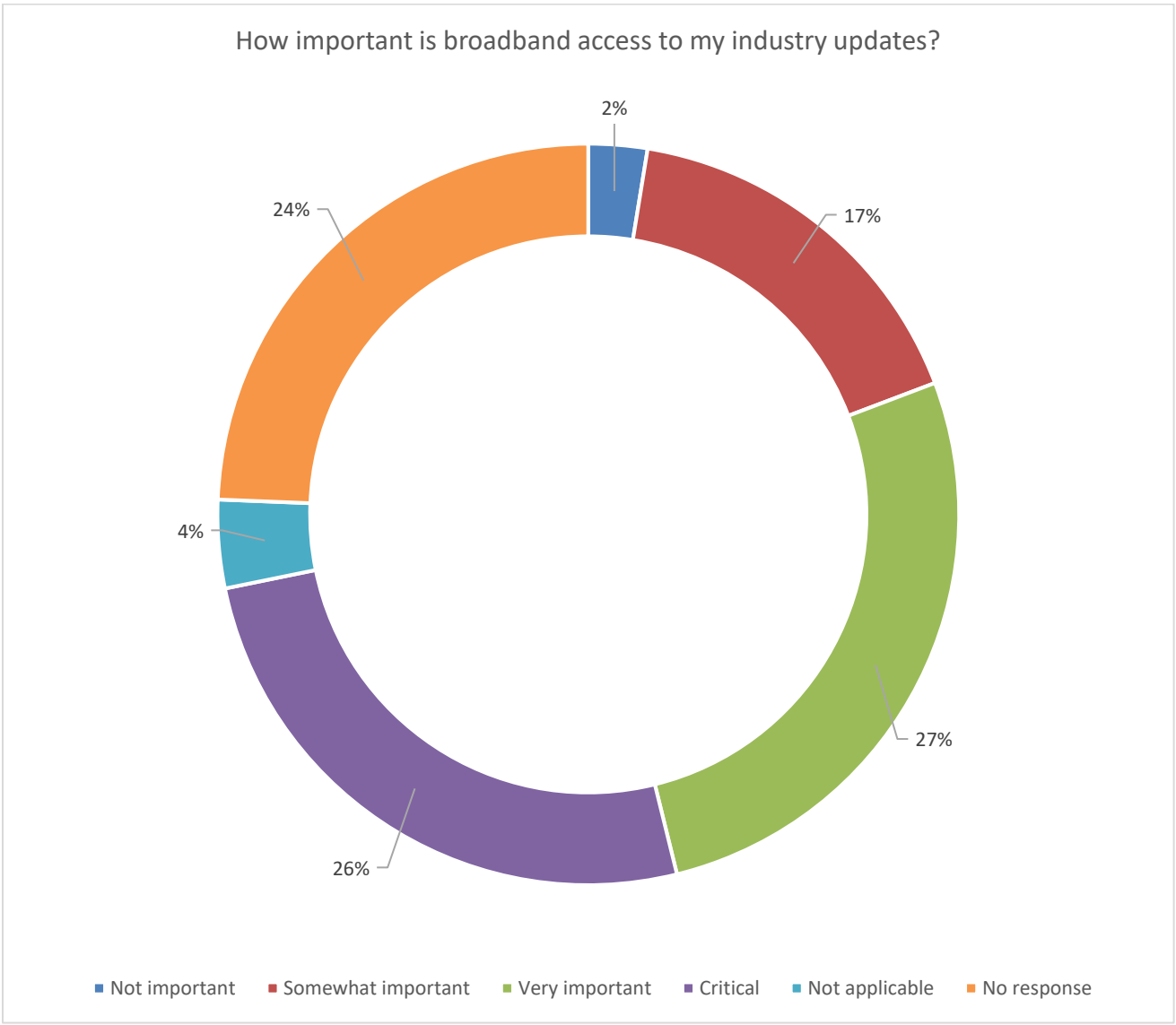
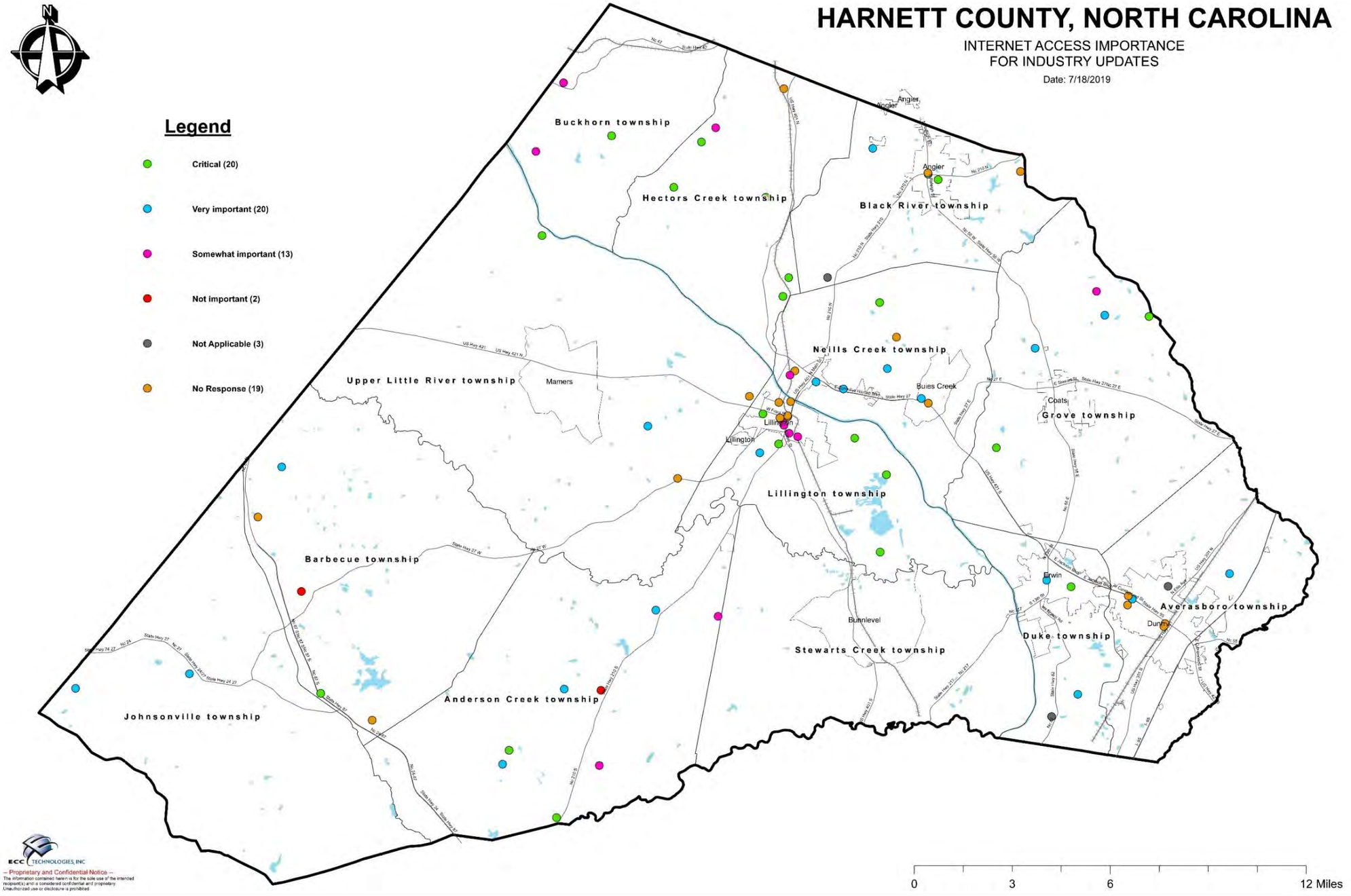

How important is broadband access to my industry updates?
2%
17%
24%
4%
27%
26%
Not important
Somewhat important
Very important
Critical
Not applicable
No response

HARNETT COUNTY, NORTH CAROLINA

INTERNET ACCESS IMPORTANCE
FOR INDUSTRY UPDATES

Date: 7/18/2019



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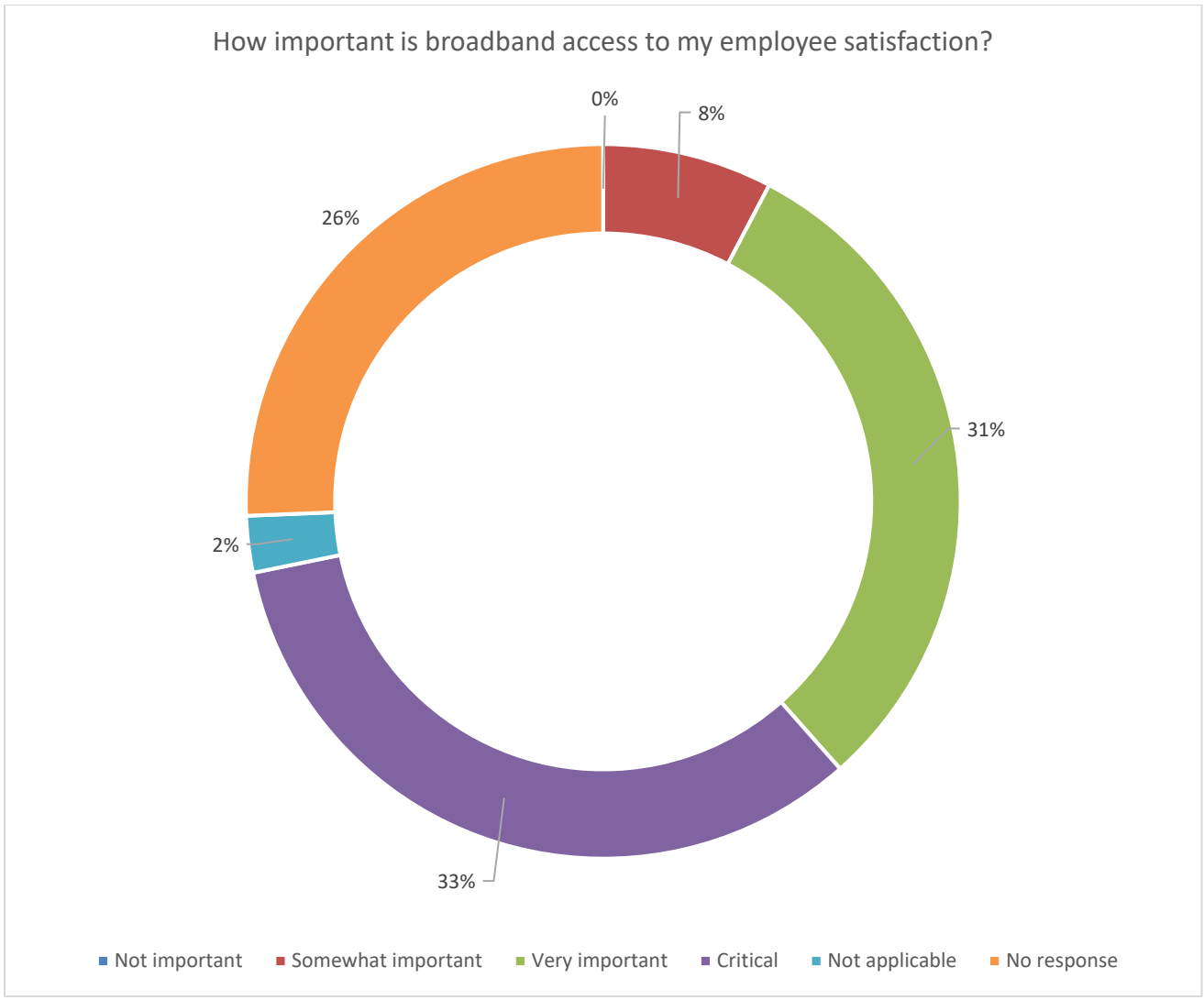
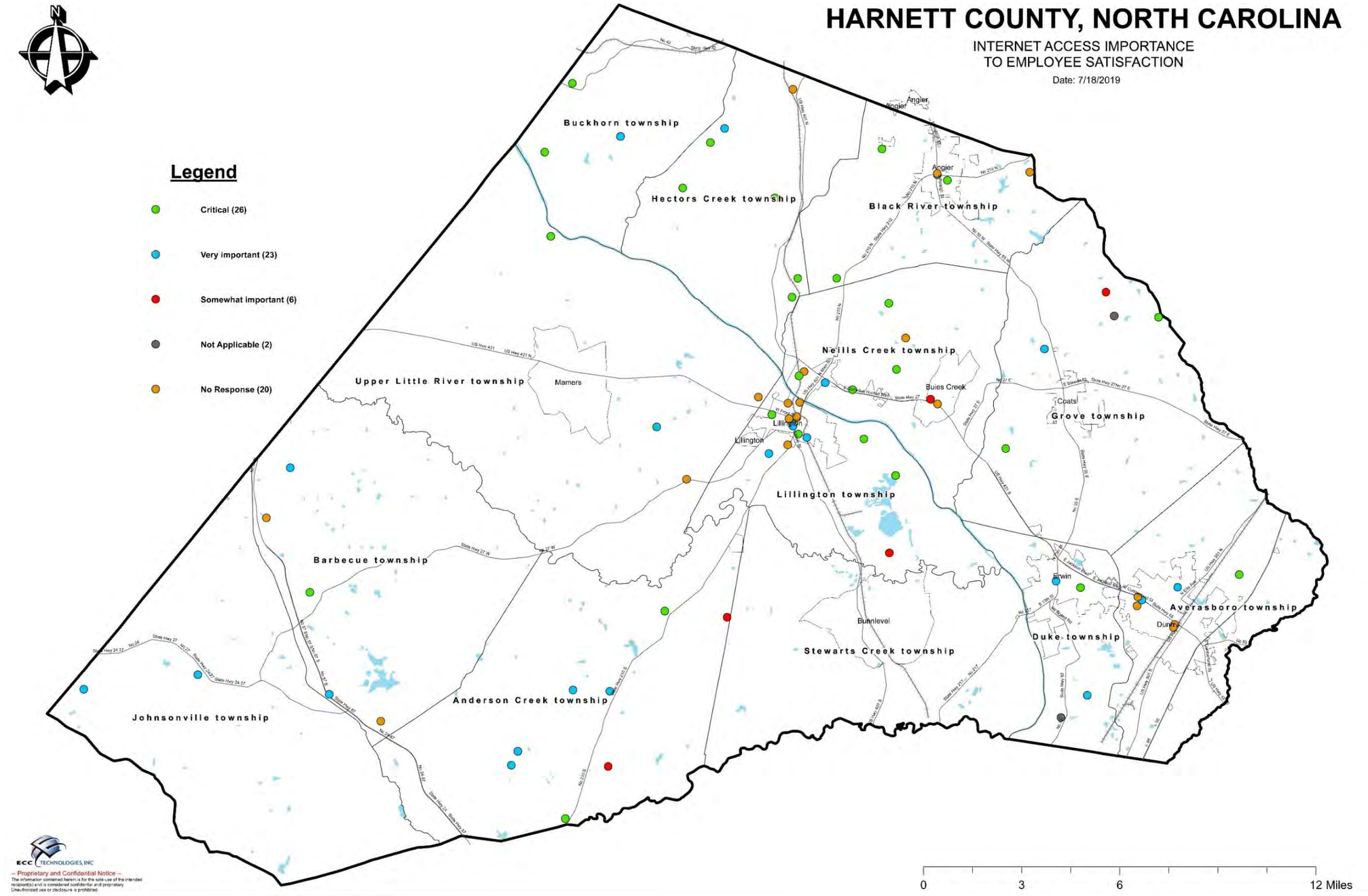
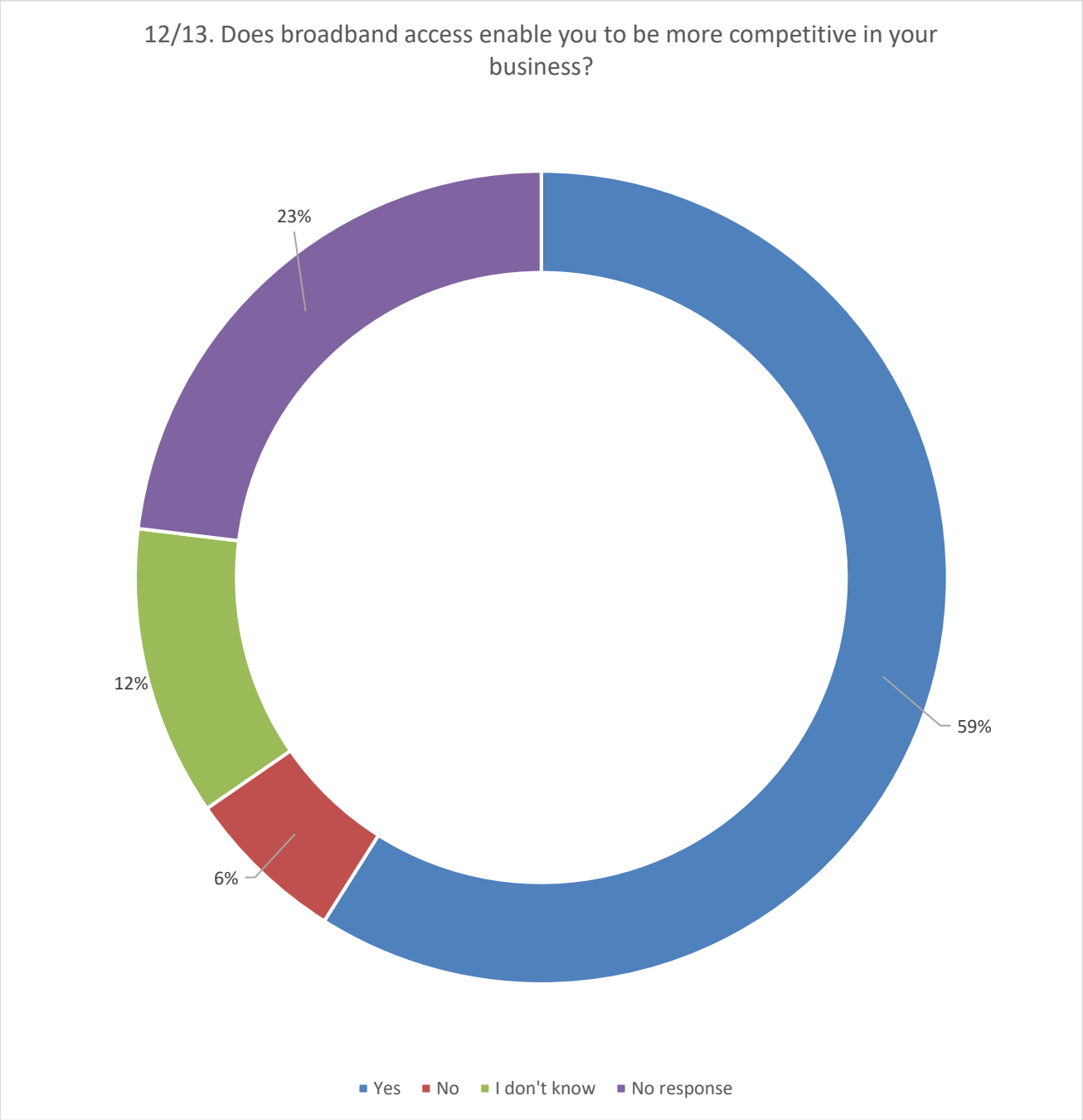

How important is broadband access to my employee satisfaction?
0%
8%
26%
31%
2%
33%
Not important
Somewhat important
Very important
Critical
Not applicable
No response

HARNETT COUNTY, NORTH CAROLINA

INTERNET ACCESS IMPORTANCE
TO EMPLOYEE SATISFACTION

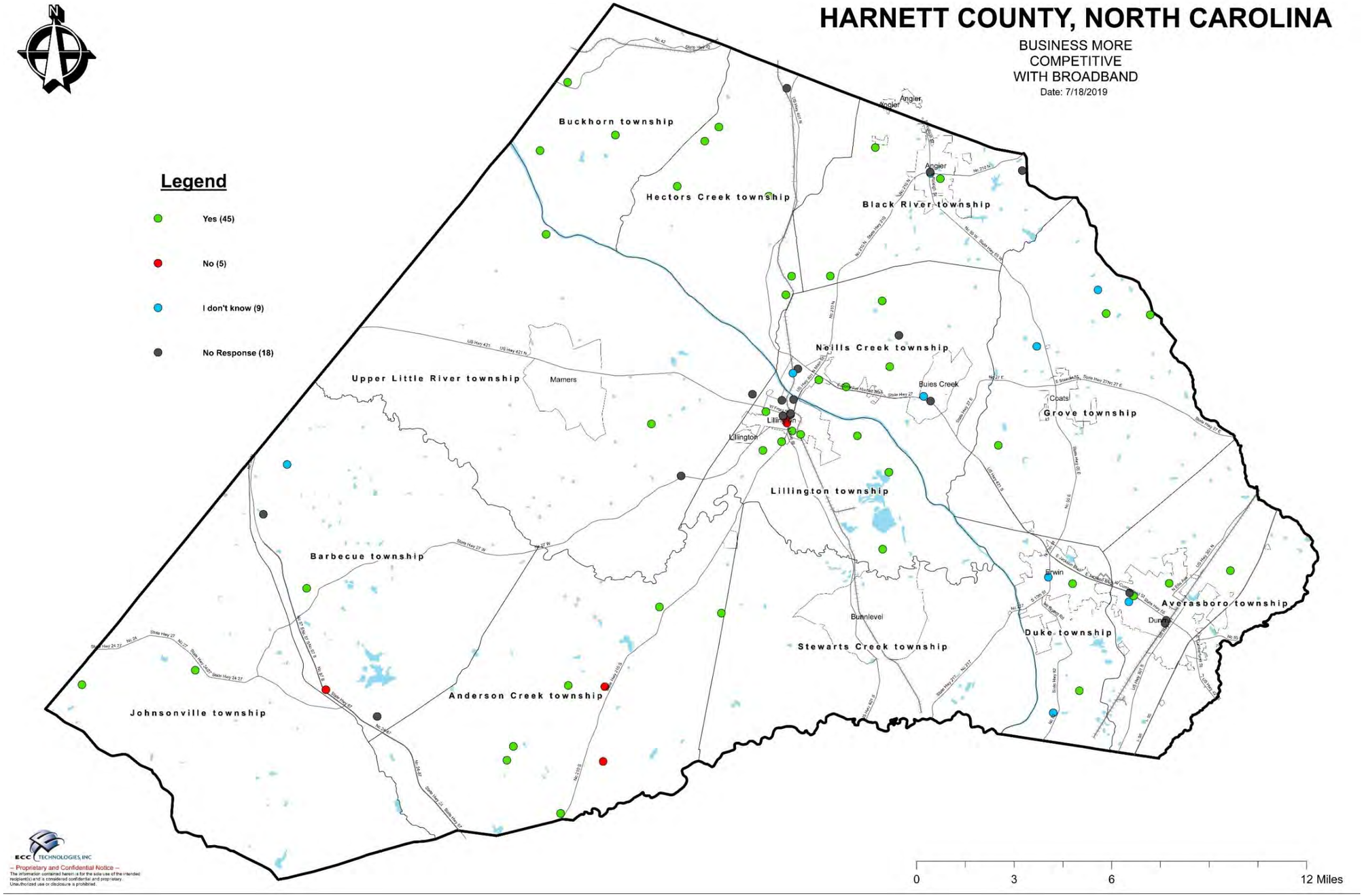
Date: 7/18/2019




12/13. Does broadband access enable you to be more competitive in your business?
23%
12%
6%
59%
Yes
No
I don't know
No response

HARNETT COUNTY, NORTH CAROLINA

BUSINESS MORE
COMPETITIVE
WITH BROADBAND
Date: 7/18/2019



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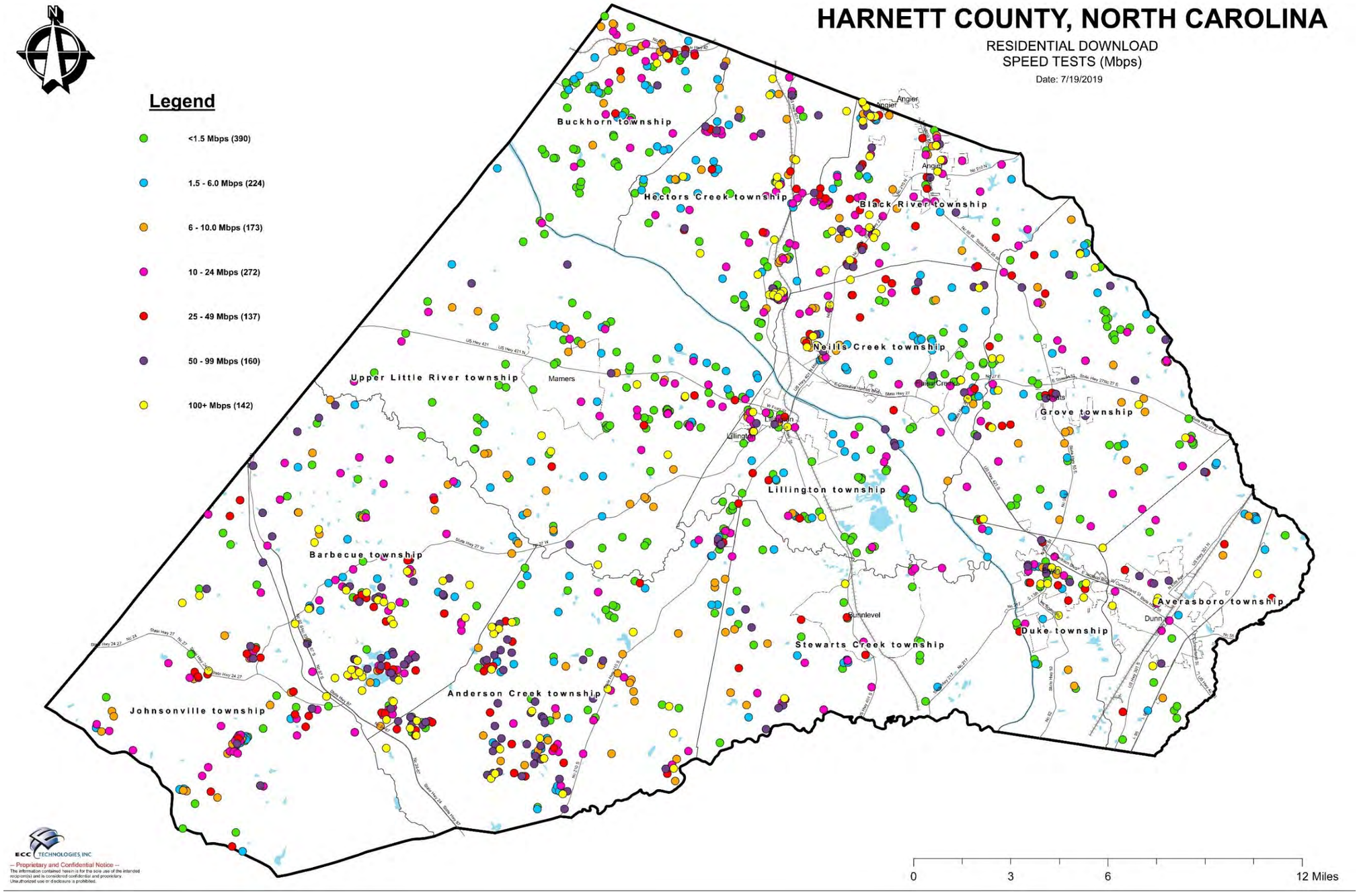
2.3 Speed Test Results

Before the survey, respondents were given the ability to conduct a speed test to check their upload speed, download speed, and latency. The following maps show the download speed test results for residential and commercial respondents throughout Harnett County. Based on the responses collected, 71% of residents who took the speed test receive speeds lower than the 25Mbps broadband download speed recognized by the FCC.

HARNETT COUNTY, NORTH CAROLINA

RESIDENTIAL DOWNLOAD
SPEED TESTS (Mbps)

Date: 7/19/2019



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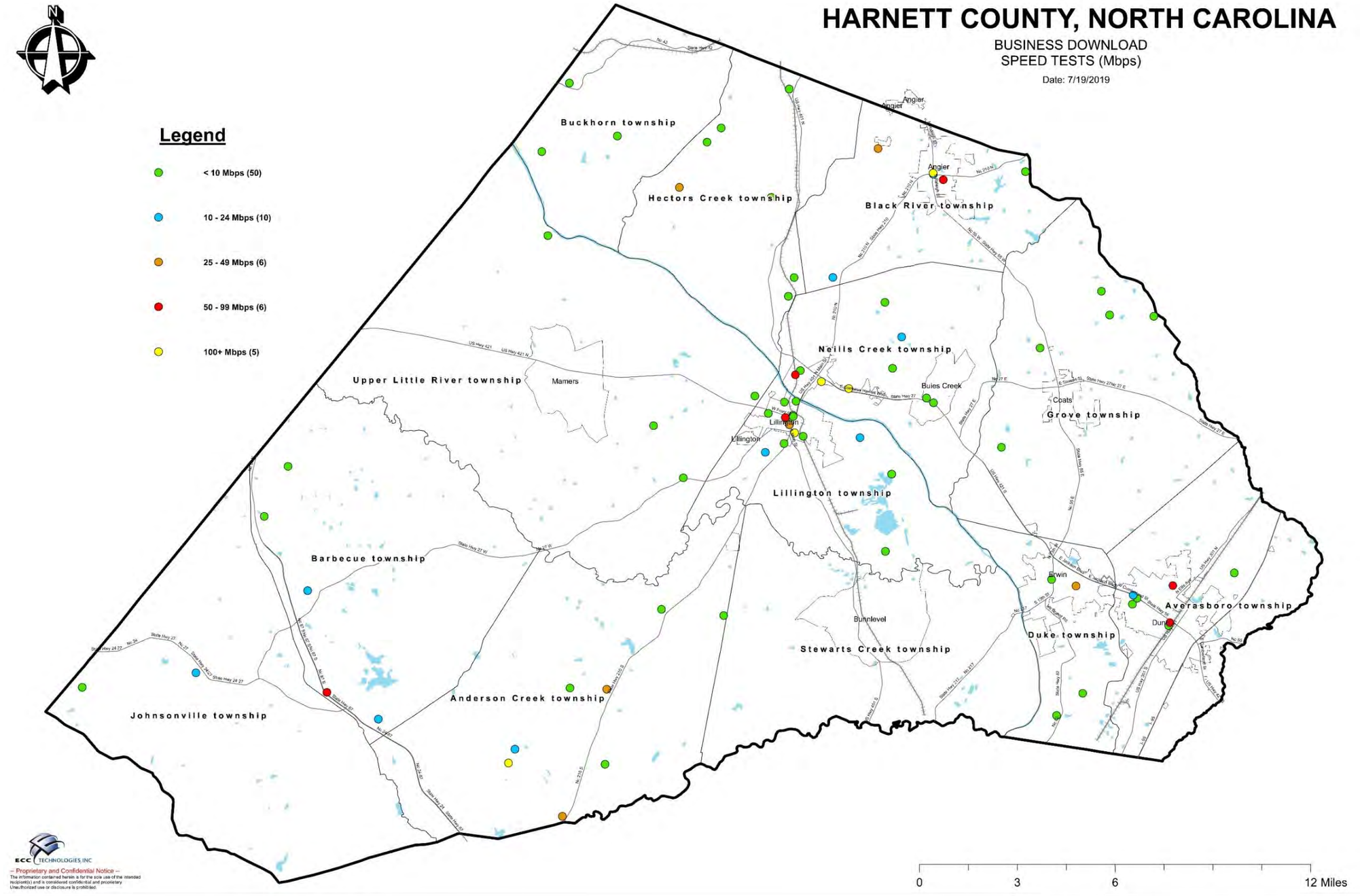
HARNETT COUNTY, NORTH CAROLINA

BUSINESS DOWNLOAD
SPEED TESTS (Mbps)

Date: 7/19/2019



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