UNDERSTANDING WHERE and HOW to SUPPORT BROADBAND ADOPTION in WESTERN NORTH CAROLINA

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CONTENTS

INTRODUCTION

## Western North Carolina has challenges with connectivity.

As is the case with much of rural America, the area has shortfalls in quality broadband infrastructure—either a lack of wireline service entirely or poor-quality copper-based service, such as digital subscriber line service. These deficiencies in infrastructure, along with affordability of service, contribute to low at-home broadband subscription rates in the region.

A comparison of the 18 Western North Carolina counties that the Blue Ridge Broadband Alliance (BRBA) focuses on shows:

- 84 percent of households in the 18 counties have broadband of any type (which means, for the most part, either a wireline or cellular data plan subscription), compared with 89 percent for the rest of North Carolina counties.

- For wireline subscriptions at home, the gaps are larger. Some 66 percent of those in the 18 counties have subscriptions of this sort, compared with 76 percent for all other North Carolina households.

- Even cellular data plan subscriptions show gaps, with 77 percent of residents in the 18 counties having subscriptions to such service, while that figure is 82 percent for all other North Carolina households.

Another way to characterize gaps in the 18 BRBA Western North Carolina counties is to compare adoption figures for these counties with those for all 423 counties designated by the Appalachian Regional Commission (ARC) to comprise the Appalachian region and the entire nation. The ARC is a federal government entity that supports the economic development of Appalachia, aiming to eliminate disparities in prosperity between the region and the rest of the United States. The following chart displays broadband adoption data for the three geographies:

ADOPTION of INTERNET SERVICE PLANS

UNITED STATES **ARC** **18 BRBA COUNTIES**

BROADBAND of ANY TYPE: US 90, ARC 86, 18 BRBA Counties 84
WIRELINE SUBSCRIPTIONS: US 75, ARC 70, 18 BRBA Counties 66
CELLULAR DATA PLAN: US 83, ARC 78, 18 BRBA Counties 77
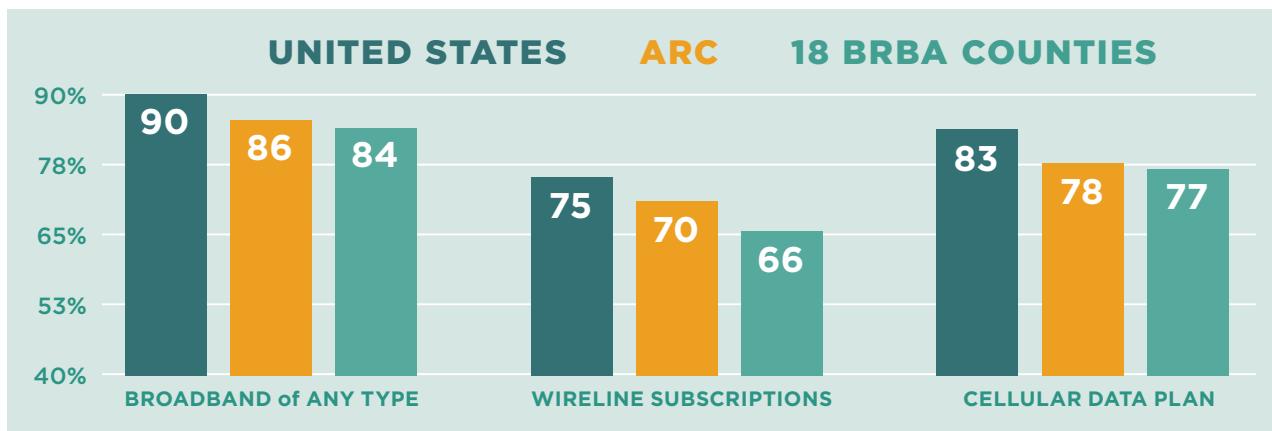
Source: ACS 5-year data 2019-2023

This data invites questions about where to focus energy and resources to address gaps. This research examines how patterns related to technology adoption and use vary at the county level. What follows are profiles of the 18 BRBA counties that look at not only the adoption of digital tools but also variations in socioeconomic and demographic factors. This broad exploration—looking at digital connectivity metrics, economic metrics, and community skills capacity—aims at helping stakeholders formulate strategies to close gaps.

The county profiles that follow present metrics in the following categories:

- **DIGITAL CONNECTIVITY METRICS:** These metrics focus on technology adoption, using American Community Survey (ACS) data that illuminates relative scarcity of access to digital tools. This includes the share of households with no broadband internet subscription services at home, the share of households that rely solely on cellular data plans for service, and the share of households reliant on satellite internet services for home access.

- **ECONOMIC METRICS:** Service affordability is a well-known barrier to subscribing to internet service plans, and county-level data shows where affordability challenges are likely to be greatest. These metrics include the share of households below 125 percent of the federal poverty level, the unemployment rate, and the percent of households enrolled in the Supplemental Nutrition Assistance Program (SNAP). A high incidence of these characteristics means that households face challenges affording and maintaining broadband subscriptions and computing devices.

- **COMMUNITY SKILLS CAPACITY:** Another barrier to broadband adoption is digital skills. Households may have the means to subscribe, but not the knowhow to fully take advantage of what the internet offers. Several metrics

are well known to be correlated with digital skills. Research indicates that people age 65 or older and those with only a high school education may need assistance to develop digital skills; people with a disability are often at a disadvantage for meaningful broadband use because of inaccessibility of hardware, software, and services.

In addition, understanding community skills capacity benefits from having a proxy measure of the resources available in the community. This research uses a metric that builds off the Benton Institute for Broadband & Society's Affordable Connectivity Program (ACP) Performance Tool, which conveys how well an area did in enrolling eligible households in the ACP when it was in operation. It brings enrollment data from the Universal Service Administrative Company (USAC) together with ACS data for statistical analysis that compares predicted levels of enrollment (based on the number of eligible households in an area, as well as other relevant socioeconomic and demographic factors) with actual enrollment. A place found to have enrolled more households than predicted was a "high-performing" area. For this analysis, ACP performance is captured by showing whether, in enrolling ACP households, a county was a "high" performer, "medium" (i.e., about average), or a "low" performer (significantly below average).

Other resources available in the community include organizations that provide public access to computing devices and the internet, digital navigation services where clients receive assistance with tech issues, digital skills classes, and help finding affordable service offerings. The North Caroline Department of Information Technology's Resource Finder contains a directory of such resources.

Another measure of interest is where a county stands in terms of the Appalachian Regional Commission's (ARC) classification of a county's economic status. The ARC puts counties into one of five categories: a top tier labeled "attainment," a second tier called "economically competitive," followed by "transitional," then "at risk," and finally the lowest tier, which is "distressed." These designations are based on their positions in the national ranking. "Transitional counties" are those transitioning between strong and weak economies. They make up the largest economic status designation. Transitional counties rank between the worst 25 percent and the best 25 percent of the nation's counties.

Details about the data used for this analysis are in an appendix at the end of this document.

The following tables present the data discussed in the profiles for each county, with figures for the 18 combined BRBA counties in North Carolina and the 423 Appalachian Region counties, as listed by the ARC. Table 1 displays the digital connectivity metrics by county. Table 2 displays the economic metrics and community skills capacity data by county.

TABLE 1: **DIGITAL CONNECTIVITY METRICS**

| COUNTY	POPULATION	HOUSEHOLDS	BROAD-BAND of ANY TYPE	WIRELINE SUBSCRIP-TIONS	CELLULAR DATA PLAN	NO INTERNET at HOME	CELLULAR SERVICE ONLY	SATELLITE SERVICE
AVERY	14,968	6,559	83%	63%	74%	17%	13%	10%
BUNCOMBE	265,007	102,672	88%	73%	82%	12%	11%	4%
BURKE	85,482	35,873	83%	67%	75%	17%	12%	7%
CHEROKEE	28,841	13,042	82%	61%	72%	18%	9%	16%
CLAY	11,252	5,041	79%	61%	71%	21%	5%	12%
CLEVELAND	98,200	37,218	81%	64%	73%	19%	12%	7%
GRAHAM	7,883	3,312	81%	54%	63%	19%	9%	24%
HAYWOOD	61,714	26,772	83%	62%	76%	17%	14%	8%
HENDERSON	115,963	50,423	88%	73%	81%	12%	10%	9%
JACKSON	39,227	18,164	76%	52%	71%	24%	13%	12%
MACON	37,071	18,090	81%	58%	72%	19%	11%	13%
MADISON	20,780	8,399	82%	63%	71%	18%	11%	9%
McDOWELL	43,337	18,445	83%	57%	75%	17%	17%	9%
MITCHELL	14,580	6,411	80%	63%	72%	20%	13%	4%
POLK	19,354	8,727	83%	62%	71%	17%	12%	15%
RUTHERFORD	63,623	26,589	83%	55%	75%	17%	18%	11%
SWAIN	13,729	5,837	76%	51%	69%	24%	12%	12%
TRANSYLVANIA	32,275	14,590	86%	72%	75%	14%	10%	4%
ALL 18 BRBA COUNTIES	973,286	406,164	84%	66%	77%	16%	12%	8%
ALL ARC COUNTIES	25,450,350	10,419,408	86%	70%	78%	14%	12%	7%

TABLE 2: ECONOMIC METRICS and COMMUNITY SKILLS CAPACITY

COUNTY	HOUSE-HOLDS at 125% or LESS of FEDERAL POVERTY LEVEL	HOUSE-HOLDS with DISABLED PERSON	HOUSE-HOLDS USING SNAP	UNEMPLOY-MENT (5 YR AVERAGE)	% AGE 65 and OLDER	HEAD of HOUSE-HOLD has NO MORE than HIGH SCHOOL DEGREE	ACP PERFOR-MANCE	ACP ENROLL-MENT	ARC ECONOMIC DESIGNA-TION
AVERY	15%	18%	11%	4%	26%	29%	LOW	41%	TRANSI-TIONAL
BUNCOMBE	16%	14%	9%	3%	21%	22%	LOW	67%	TRANSI-TIONAL
BURKE	23%	20%	15%	5%	21%	33%	MEDIUM	68%	TRANSI-TIONAL
CHEROKEE	19%	18%	11%	5%	31%	32%	MEDIUM	30%	AT RISK
CLAY	17%	17%	10%	4%	32%	25%	MEDIUM	24%	TRANSI-TIONAL
CLEVELAND	22%	17%	20%	5%	19%	33%	LOW	91%	TRANSI-TIONAL
GRAHAM	13%	19%	12%	7%	25%	36%	MEDIUM	35%	TRANSI-TIONAL
HAYWOOD	15%	17%	13%	3%	25%	27%	LOW	64%	TRANSI-TIONAL
HENDERSON	15%	15%	9%	3%	26%	24%	HIGH	21%	TRANSI-TIONAL
JACKSON	23%	13%	10%	6%	22%	29%	HIGH	16%	AT RISK
MACON	20%	16%	9%	3%	29%	30%	HIGH	19%	TRANSI-TIONAL
MADISON	16%	19%	12%	2%	23%	33%	MEDIUM	43%	TRANSI-TIONAL
McDOWELL	19%	17%	18%	5%	21%	34%	MEDIUM	63%	TRANSI-TIONAL
MITCHELL	16%	20%	14%	5%	26%	30%	LOW	51%	TRANSI-TIONAL
POLK	19%	17%	9%	4%	32%	27%	LOW	35%	TRANSI-TIONAL
RUTHERFORD	23%	21%	19%	5%	22%	30%	HIGH	36%	AT RISK
SWAIN	27%	17%	14%	8%	19%	34%	HIGH	22%	TRANSI-TIONAL
TRANSYLVANIA	18%	15%	10%	3%	31%	23%	HIGH	21%	TRANSI-TIONAL
ALL 18 BRBA COUNTIES	19%	16%	12%	4%	23%	28%		51%	
ALL ARC COUNTIES	16%	13%	13%	5%	19%	19%		55%	

What follows is a profile for each of the 18 counties that aims to capture their broadband capacity—or, from a different perspective, their degree of broadband scarcity. This is done through the lens of the three categories of metrics described above. A county may exhibit "broadband scarcity" as captured by low values for digital connectivity metrics, but a look at economic or community skills capacity metrics may help better characterize the problem. For example, a county may have significant numbers of households at or near the 125 percent federal poverty level, which would suggest that service affordability is the problem. Another county might not ring economic alarm bells, but a high share of older adults would suggest that digital skills support could be relevant.

NORTH CAROLINA

COUNTY PROFILE
HIGHLIGHTS
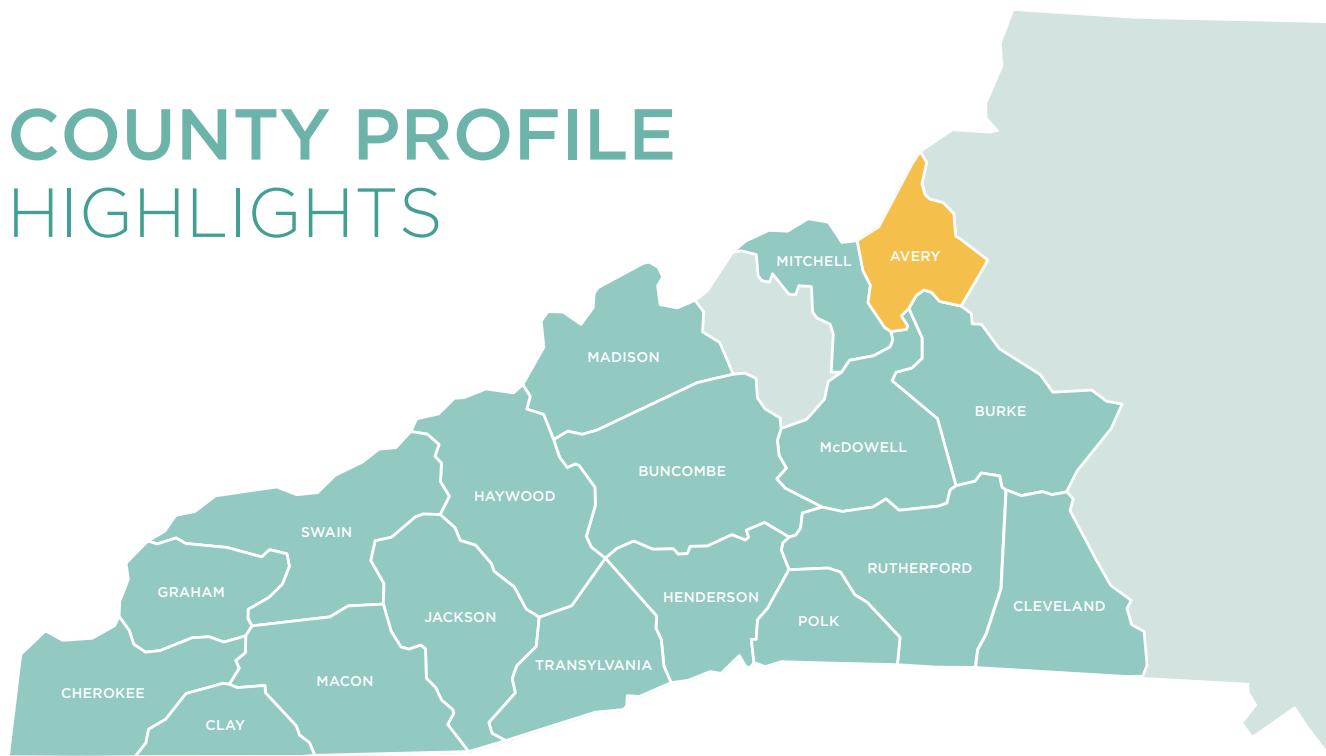
AVERY COUNTY

Avery County's population is 14,968, located in 6,559 households.

CONNECTIVITY MEASURES: In Avery County, 63 percent of homes have wireline broadband service and 74 percent have cellular data plans, both similar to the BRBA 18-county figures of 66 percent and 77 percent. Some 10 percent have satellite service, and 17 percent lack any service, also similar to the BRBA 18-county figures of 8 percent and 16 percent, respectively.

ECONOMIC METRICS: The county's economic metrics are not exceptional relative to the 18 BRBA counties. Avery County's figure for households living at or below 125 percent of FPL is 15 percent, its five-year unemployment rate is 5 percent, and 11 percent of households use SNAP. The county is classified as "transitional" by the ARC.

COMMUNITY SKILLS CAPACITY: Avery's population is 26 percent age 65 and older, and a slightly higher number (18 percent) include a person with a disability, compared with the 18 BRBA counties' 16 percent. Some 41 percent of eligible ACP households in Avery County enrolled in the benefit.
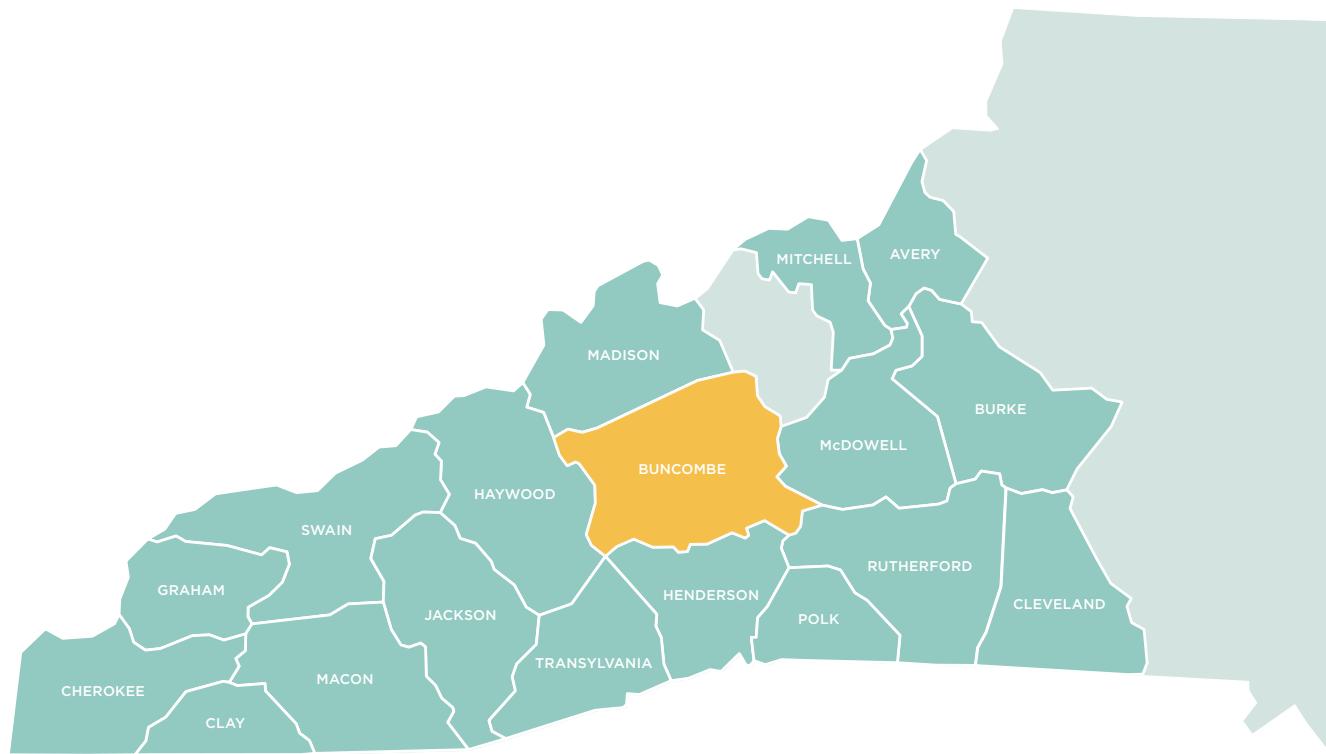
BUNCOMBE COUNTY

Buncombe County's population is 265,007, located in 102,672 households.

CONNECTIVITY MEASURES: The overall picture in Buncombe County is not one of "broadband scarcity"—at least relative to the 18-county BRBA figures. Some 73 percent of homes have wireline broadband subscriptions, and 82 percent have a cellular data plan. Just 4 percent subscribe to satellite service, and only 12 percent do not have internet service at home.

ECONOMIC METRICS: Buncombe County's five-year unemployment rate is low (3 percent), and 21 percent of its population is 65 or older. The county has 16 percent of its residents living below the 125 percent FPL, compared with 19 percent across all 18 BRBA counties. And 9 percent of Buncombe households use SNAP.

COMMUNITY SKILLS CAPACITY: Some 67 percent of eligible households in Buncombe County enrolled in the ACP—a figure below what performance measures would expect.
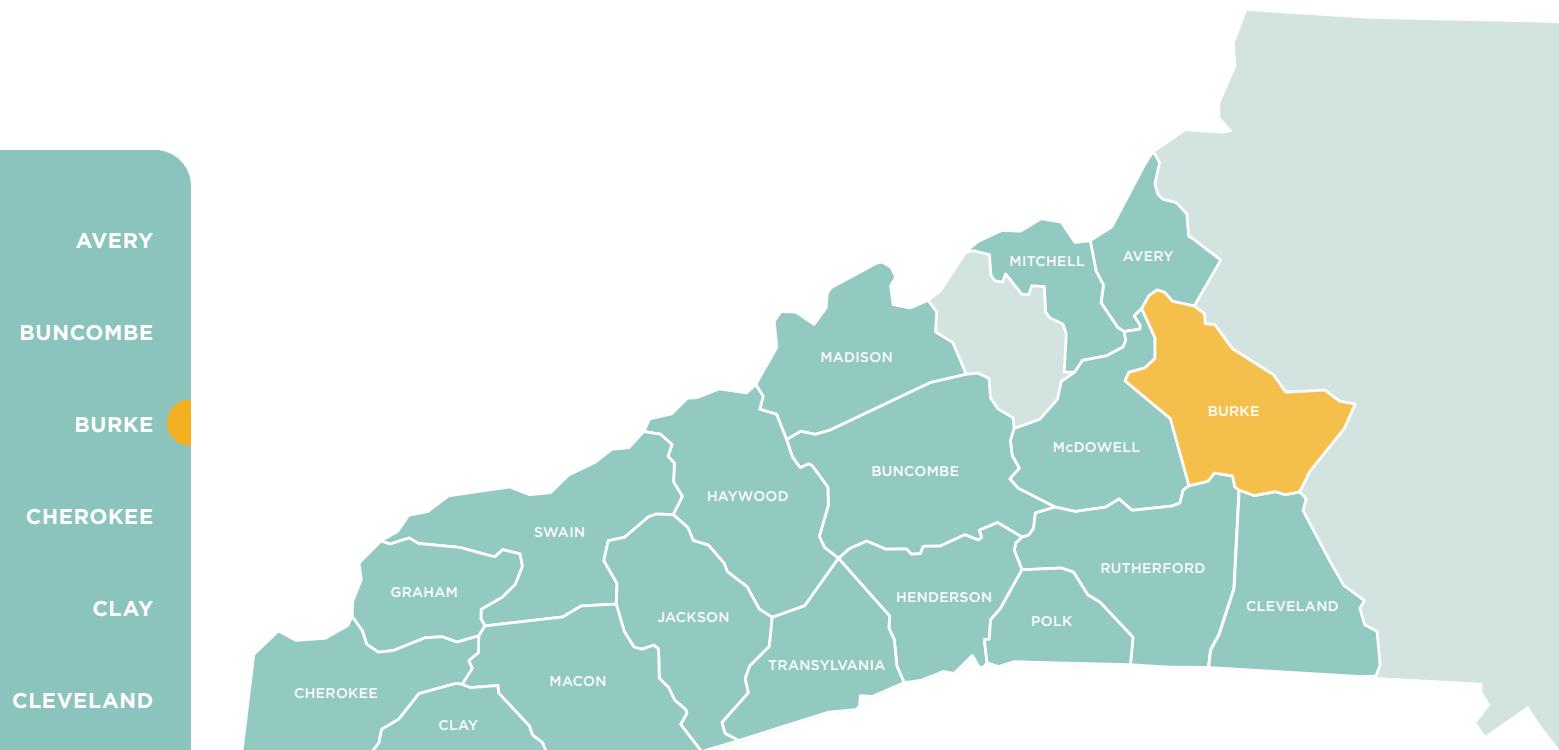
BURKE COUNTY

Burke County's population is 85,482, located in 35,873 households.

CONNECTIVITY MEASURES: Burke County's adoption measures are in line with the 18 BRBA counties, as 67 percent have wireline service and 75 percent have cellular data plans. The rate of those lacking any internet service is similar to the 18-county BRBA average—17 percent in Burke County, compared with 16 percent for the 18 BRBA counties.

ECONOMIC METRICS: Burke County faces some economic challenges, as 23 percent of households are at 125 percent or below of FPL, and 15 percent use SNAP. Burke is classified as a "transitional county" by the ARC.

COMMUNITY SKILLS CAPACITY: The share of households including people with a disability (20 percent) and those with at most high school degrees (33 percent) are both above the 16 percent and 28 percent figures, respectively, for all 18 BRBA counties. Burke County residents enrolled in the ACP at a high rate (68 percent of eligible households).
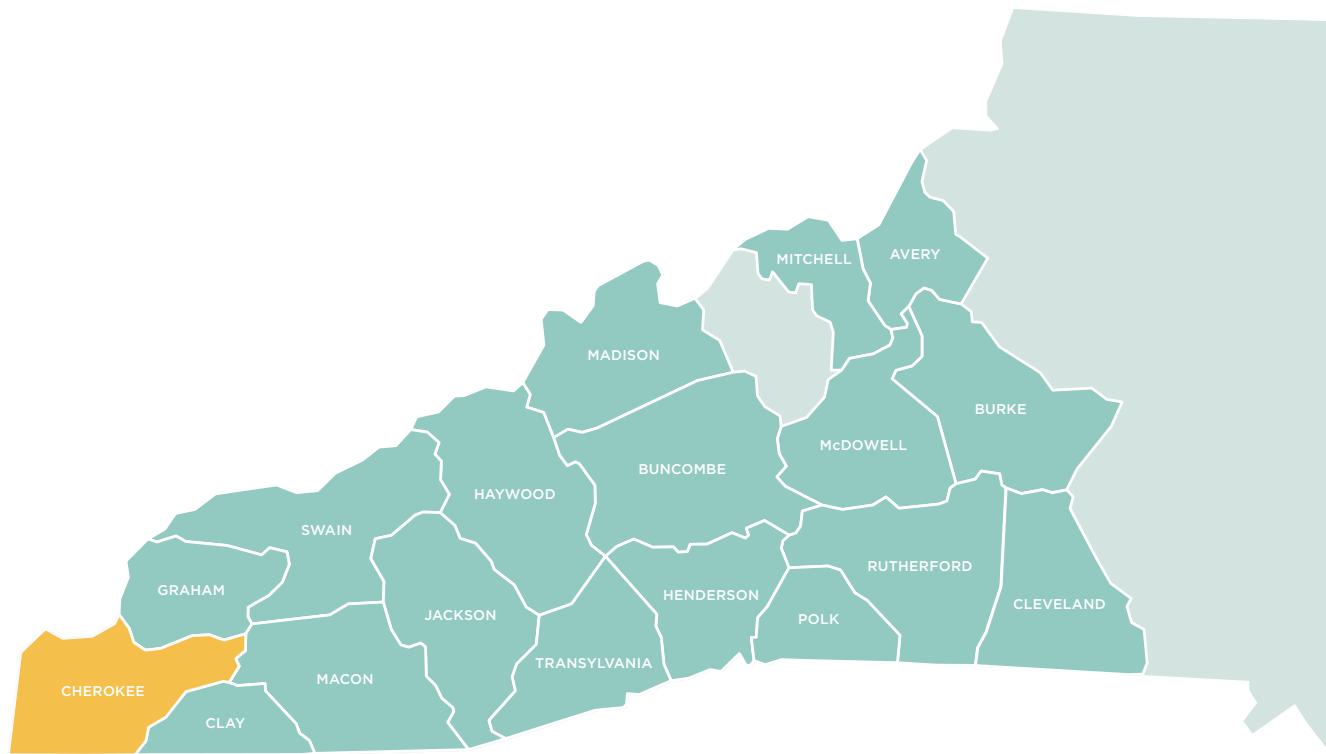
CHEROKEE COUNTY

Cherokee County's population is 28,841, located in 13,042 households.

CONNECTIVITY MEASURES: Cherokee County is somewhat below other counties in wireline broadband adoption (61 percent) and above the norm on satellite service adoption (16 percent). Residents' cellular data plan adoption figure of 72 percent is below the 18-county BRBA total figure of 77 percent, and 18 percent have no internet at home.

ECONOMIC METRICS: Cherokee County is listed as "at risk" by the ARC, even if its 125 percent FPL figure of 19 percent matches the figure for the 18 BRBA counties, and its five-year unemployment rate is 5 percent.

COMMUNITY SKILLS CAPACITY: Cherokee County profiles with an older population—31 percent of residents are 65 or older, while the BRBA 18-county average is 23 percent. Its ACP enrollment rate (30 percent of enrolled households) was below that for North Carolina ARC counties (55 percent).
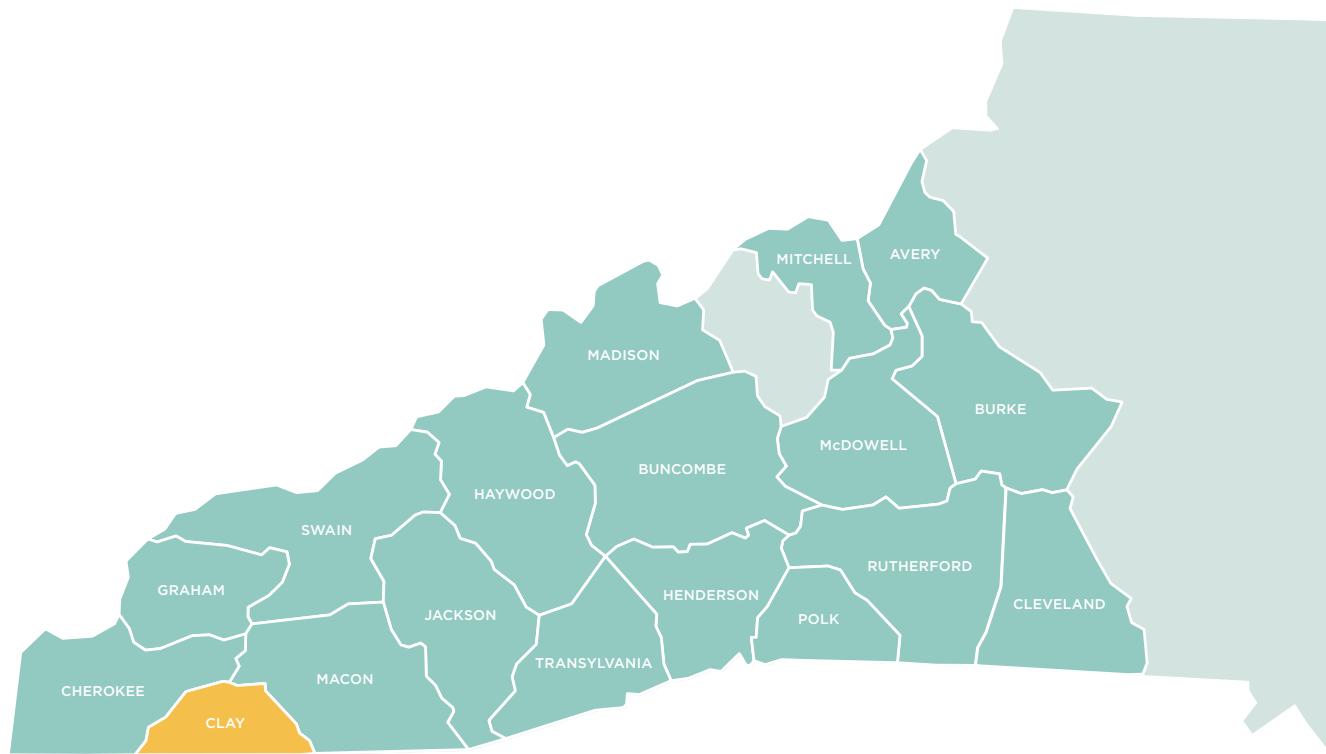
CLAY COUNTY

Clay County's population is 11,252, located in 5,041 households.

CONNECTIVITY MEASURES: Clay County's wireline adoption rate, at 61 percent, is below that of all 18 BRBA counties (66 percent), but the adoption data points that stand out are the figures for households with no internet (21 percent) and satellite service (12 percent). Both are above the 18-county BRBA figures of 16 percent and 8 percent, respectively. Some 71 percent have cellular data plans, below the BRBA 18-county figure of 77 percent.

ECONOMIC METRICS: Although the ARC classifies the county as transitional, Clay County's five-year unemployment rate was 4 percent, and the share of households at or below the 125 percent FPL level is 17 percent, below the BRBA 18-county overall figure (19 percent)

COMMUNITY SKILLS CAPACITY: Clay is also a county where the population is older; 32 percent are age 65 or older, compared with 23 percent for all 18 BRBA counties. Just 24 percent of eligible households enrolled in the ACP.
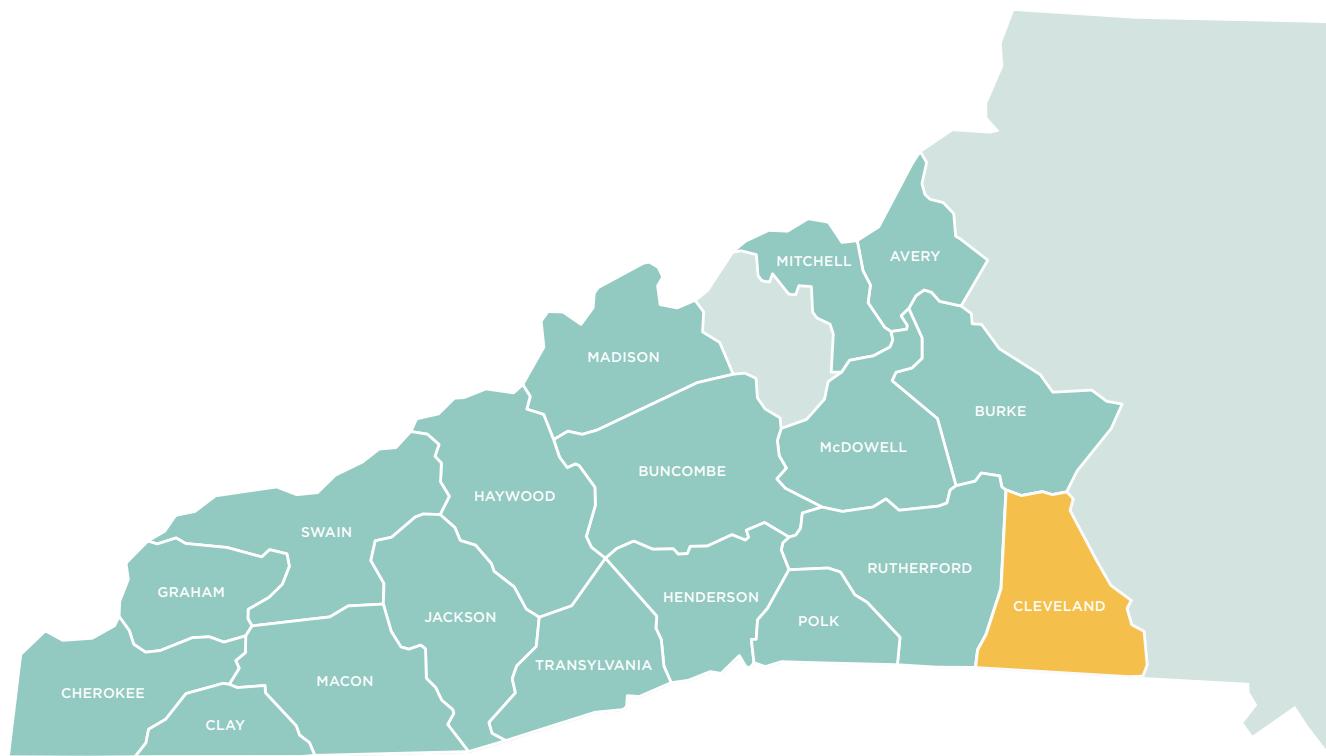
CLEVELAND COUNTY

Cleveland County's population is 98,200, located in 37,218 households.

CONNECTIVITY MEASURES: Cleveland County's adoption levels for home wireline broadband and cellular data plans are somewhat below the BRBA 18-county norm, at 64 percent and 73 percent, respectively. Its 7 percent satellite subscription rate indicates limited issues with network deployment throughout the county.

ECONOMIC METRICS: Although the county is listed as "transitional" by the ARC, a number of indicators suggest levels of economic distress. Cleveland County's share of households at or below 125 percent of FPL is 22 percent (above the BRBA 18-county average of 19 percent), and 20 percent of households use the SNAP benefit (versus the 12 percent figure for the 18 BRBA counties).

COMMUNITY SKILLS CAPACITY: The county has 33 percent of household heads with an educational attainment level at or below the high school level, above the 28 percent number for NC ARC counties.
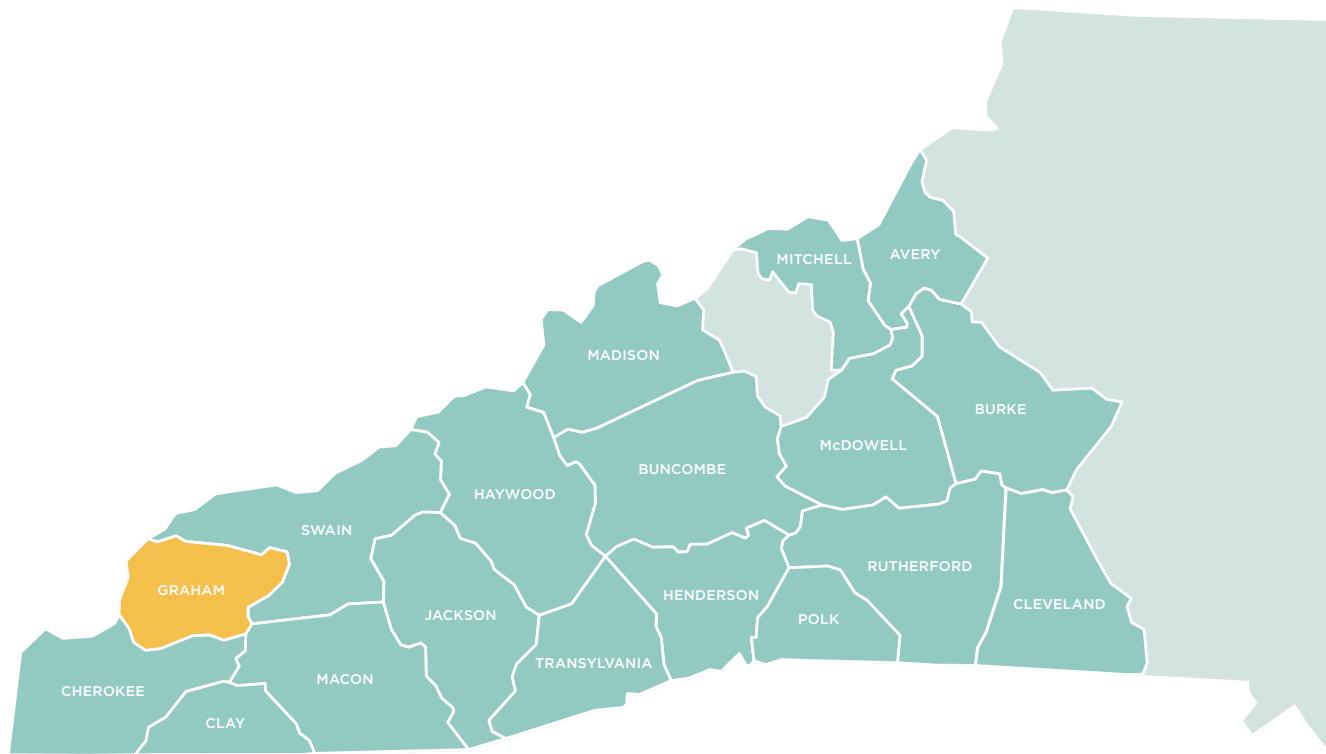
GRAHAM COUNTY

Graham County's population is 7,883, located in 3,312 households.

CONNECTIVITY MEASURES: Graham County has low subscription rates for wireline broadband (54 percent) and cellular data plans (63 percent), but a high rate of satellite subscription (24 percent).

ECONOMIC METRICS: Thirteen percent of Graham County households live below 125 percent of the federal poverty level (FPL), which is below the 19 percent figure for the 18 BRBA counties. Its five-year unemployment figure per American Community Survey data is 7 percent, above the 4 percent for the 18 BRBA counties.

COMMUNITY SKILLS CAPACITY: The county has an above-average share of residents with educational attainment at or below high school (36 percent) and residents age 65 or older (25 percent). Graham County rates as "medium" in terms of ACP enrollment performance. This means that the share of eligible ACP households enrolled (35 percent), though below the 18-county average of 51 percent, was roughly as expected.
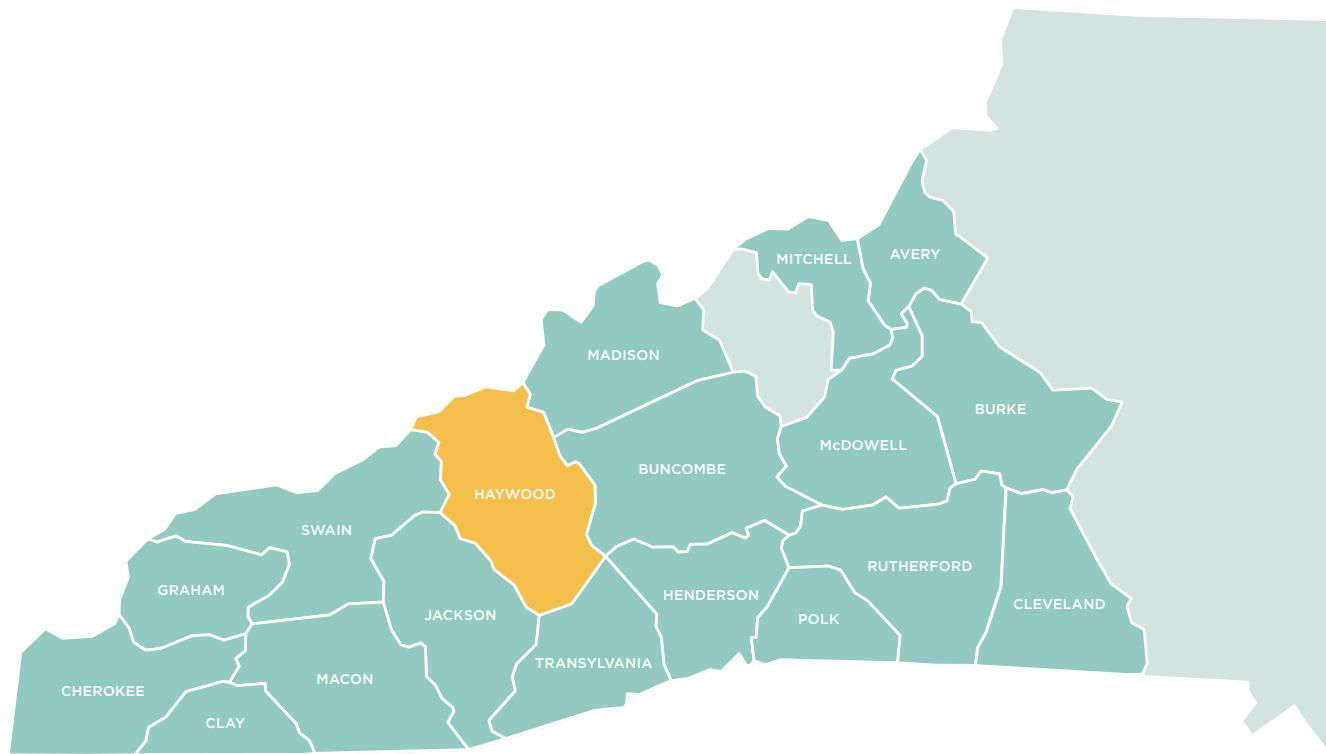
HAYWOOD COUNTY

Haywood County's population is 61,714, located in 26,772 households.

CONNECTIVITY MEASURES: Haywood County falls short of adoption levels for all 18 BRBA counties, with a 62 percent adoption figure, compared with 66 percent for the 18 BRBA counties. Haywood has more households with no internet (17 percent) and cellular-only service (14 percent) than other counties. Just 8 percent subscribe to satellite service.

ECONOMIC METRICS: Haywood County's share of households below the 125 percent FPL level is 15 percent (versus 19 percent for all 18 BRBA counties); other measures are in line with overall numbers for the 18 BRBA counties. Its five-year unemployment rate is 3 percent, and 13 percent of households use SNAP. The county's economy is listed as "transitional."

COMMUNITY SKILLS CAPACITY: Some 64 percent of eligible ACP households in Haywood County enrolled in the benefit. The county also has a somewhat higher share of households age 65 and over (25 percent).
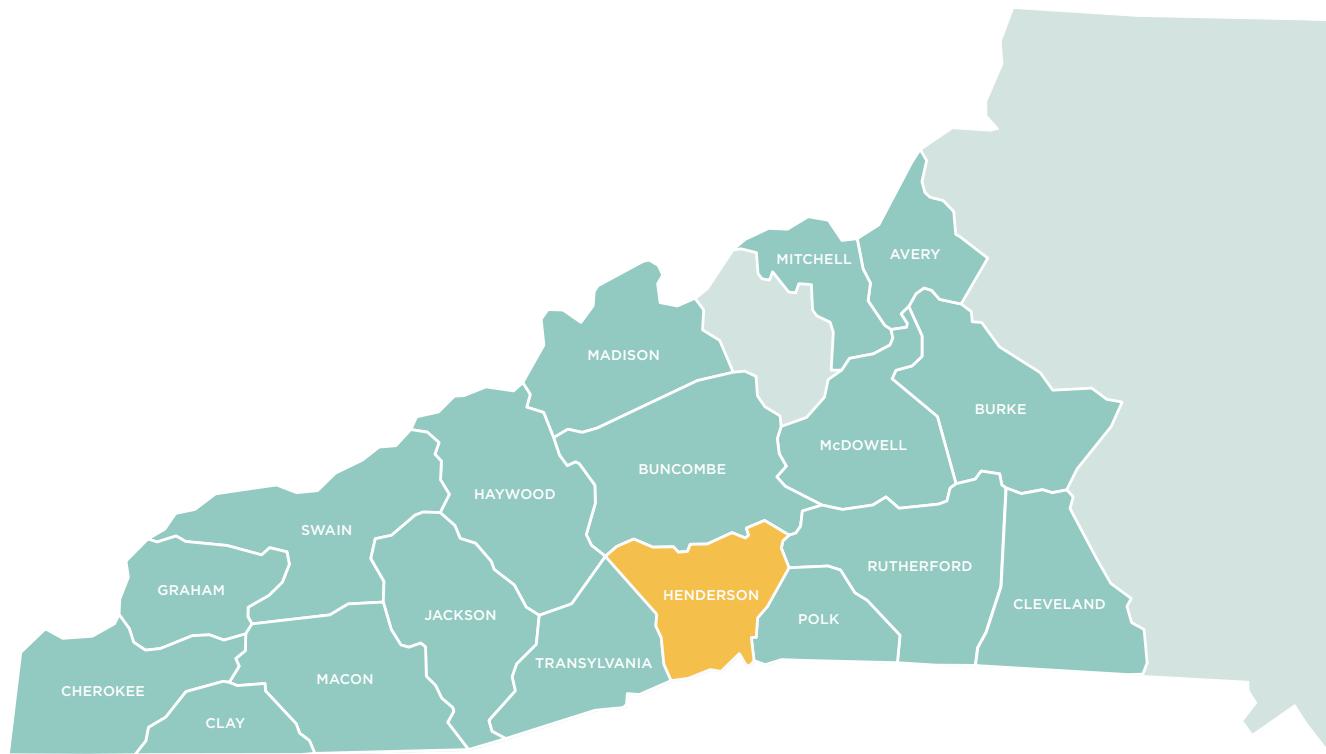
HENDERSON COUNTY

Henderson County's population is 115,963, located in 50,423 households.

CONNECTIVITY MEASURES: Henderson County does not suffer from a significant degree of broadband scarcity. Some 73 percent of households have wireline subscriptions, above the 66 percent figure for all 18 BRBA counties. The same is true for cellular data plans: 81 percent of households have one. Henderson is slightly above the norm in satellite subscriptions with 9 percent, and only 12 percent lack internet service at home.

ECONOMIC METRICS: Henderson County's economy seems robust, with 3 percent five-year unemployment and just 15 percent living at or below the 125 percent FPL level. Just 9 percent use SNAP.

COMMUNITY SKILLS CAPACITY: Just 21 percent of eligible households enrolled in the ACP. Henderson County also has few digital inclusion resources, at 0.1 per 10,000 households. Over a quarter (26 percent) of households are age 65 or older, above the 23 percent figure in the 18 BRBA counties.
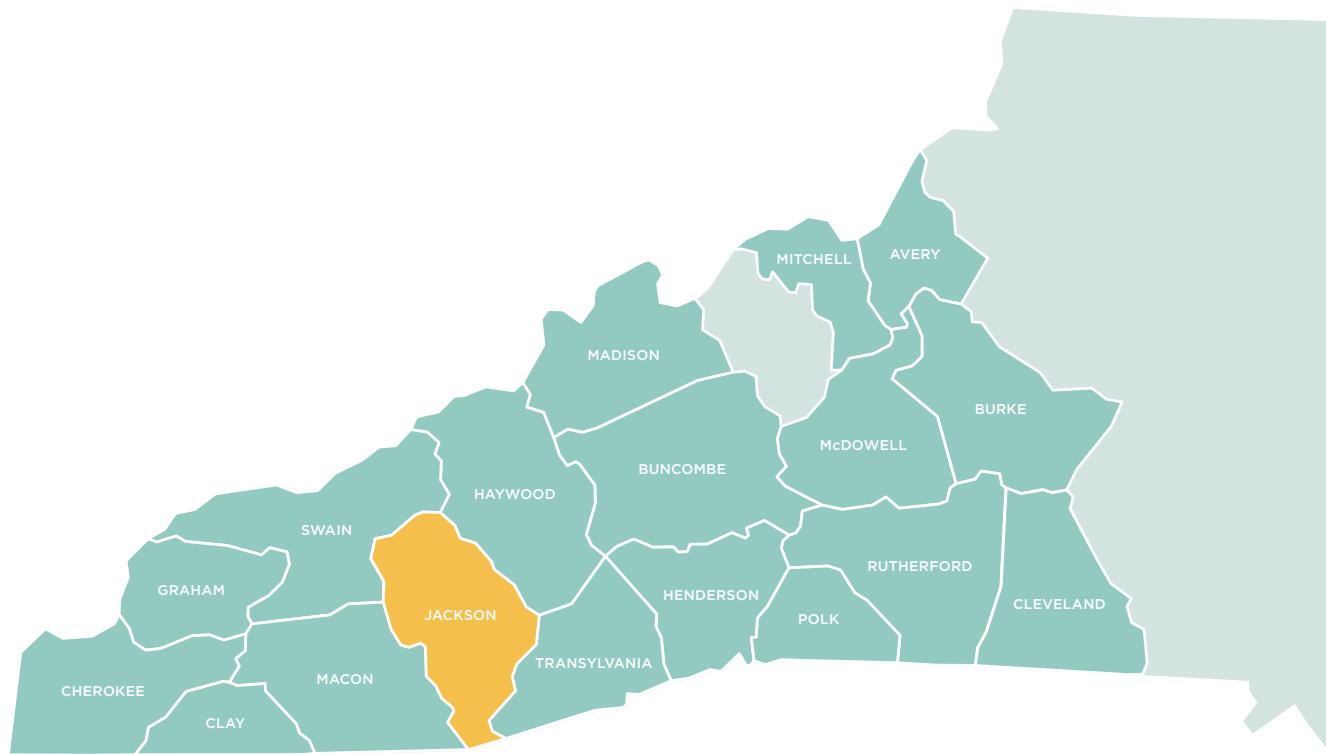
JACKSON COUNTY

Jackson County's population is 39,227, located in 18,164 households.

CONNECTIVITY MEASURES: Just 52 percent of Jackson County residents have wireline subscriptions at home, and 12 percent have satellite. Some 71 percent of residents report having cellular data plans (compared with 77 percent in the 18 BRBA counties).

ECONOMIC METRICS: There are likely to be challenges affording service for county residents, as 23 percent of Jackson County households live in households at or below 125 percent of the FPL. The county is deemed "at risk" economically, according to the ARC.

COMMUNITY SKILLS CAPACITY: Few Jackson County households enrolled in the ACP—just 16 percent.
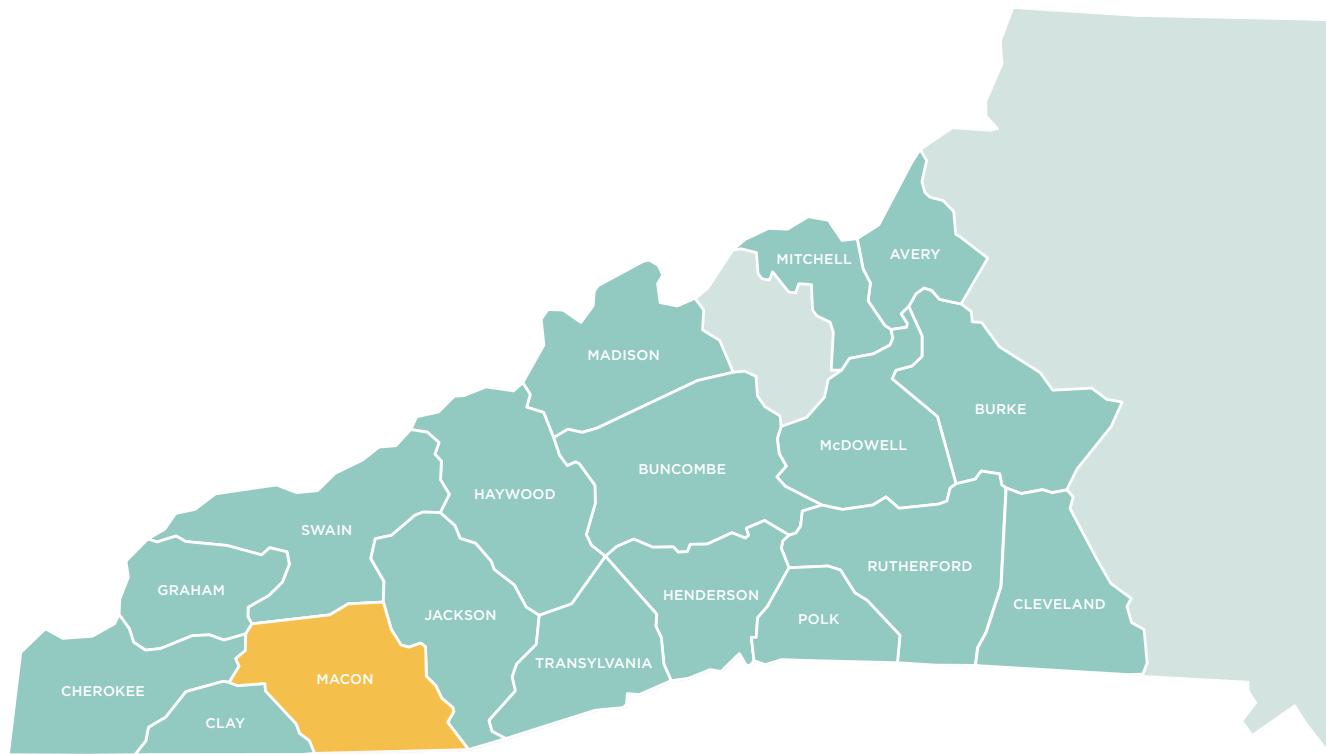
MACON COUNTY

Macon County's population is 37,071, located in 18,090 households.

CONNECTIVITY MEASURES: The combination of low wireline broadband adoption (58 percent of all households) and relatively high satellite service adoption (13 percent) indicate that many households in Macon County lack wireline service to their homes.

ECONOMIC METRICS: Macon County is classified as a "transitional county" economically by the ARC, although its share of households below 125 percent FPL (20 percent) is on par with other BRBA counties, and its SNAP participation rate (9 percent) is less than the overall BRBA 18-county figure (12 percent).

COMMUNITY SKILLS CAPACITY: The population of Macon County is older than elsewhere in the BRBA counties, with 29 percent age 65 and older, compared with 23 percent in the 18 BRBA counties. Few households enrolled in ACP (19 percent of eligible homes signed up).
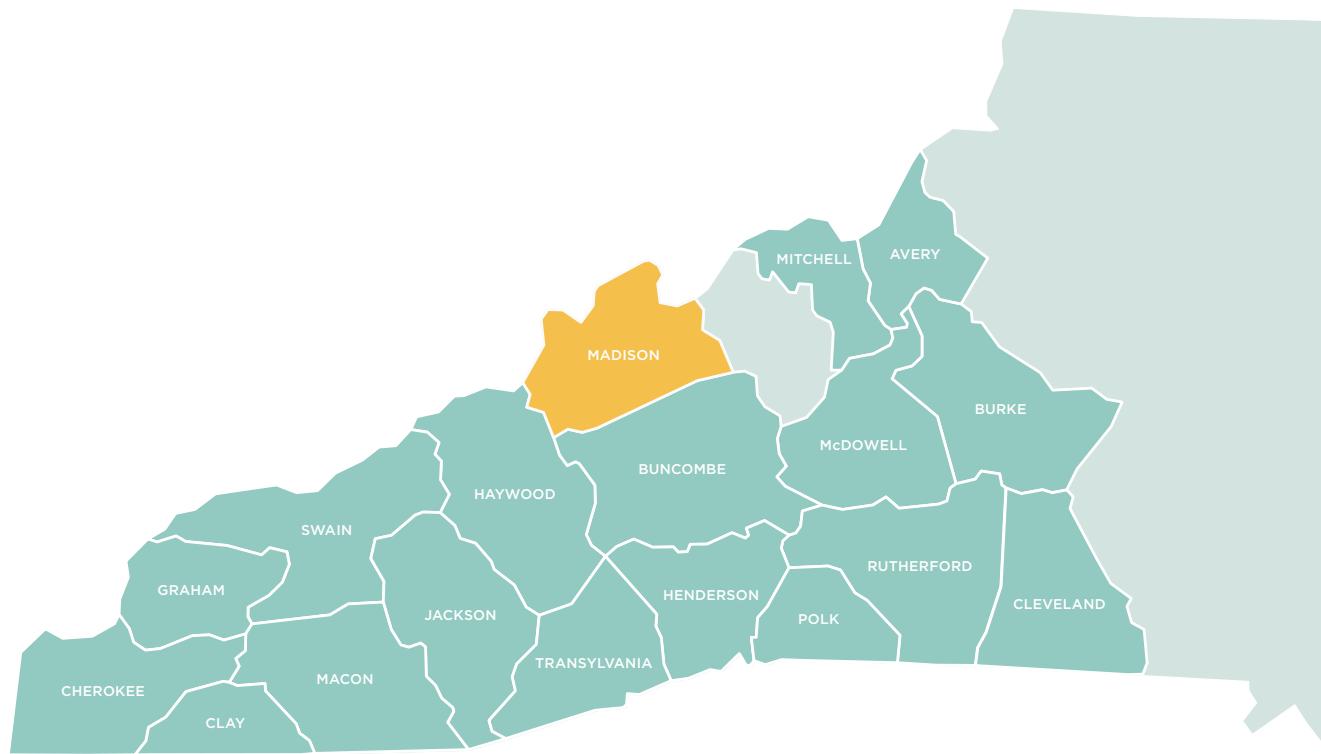
MADISON COUNTY

Madison County's population is 20,780, located in 8,399 households.

CONNECTIVITY MEASURES: Madison County exhibits below-the-norm adoption rates, as the county's wireline adoption rate (63 percent) is below the 66 percent figure for the 18 BRBA counties. Madison also has a significant number (18 percent) of households with no service; 9 percent have satellite service.

ECONOMIC METRICS: Although it is a "transitional" county according to the ARC, its average unemployment rate is low (2 percent). Some 12 percent of Madison County homes use the SNAP benefit, and 16 percent live below the 125 percent FPL level.

COMMUNITY SKILLS CAPACITY: Numbers show relatively more households in Madison County headed by those with no more than a high school education (33 percent) and including people with disabilities (19 percent) than the BRBA 18-county figures. Some 43 percent of eligible households enrolled in the ACP (below the NC ARC figure but on par with expected enrollment).
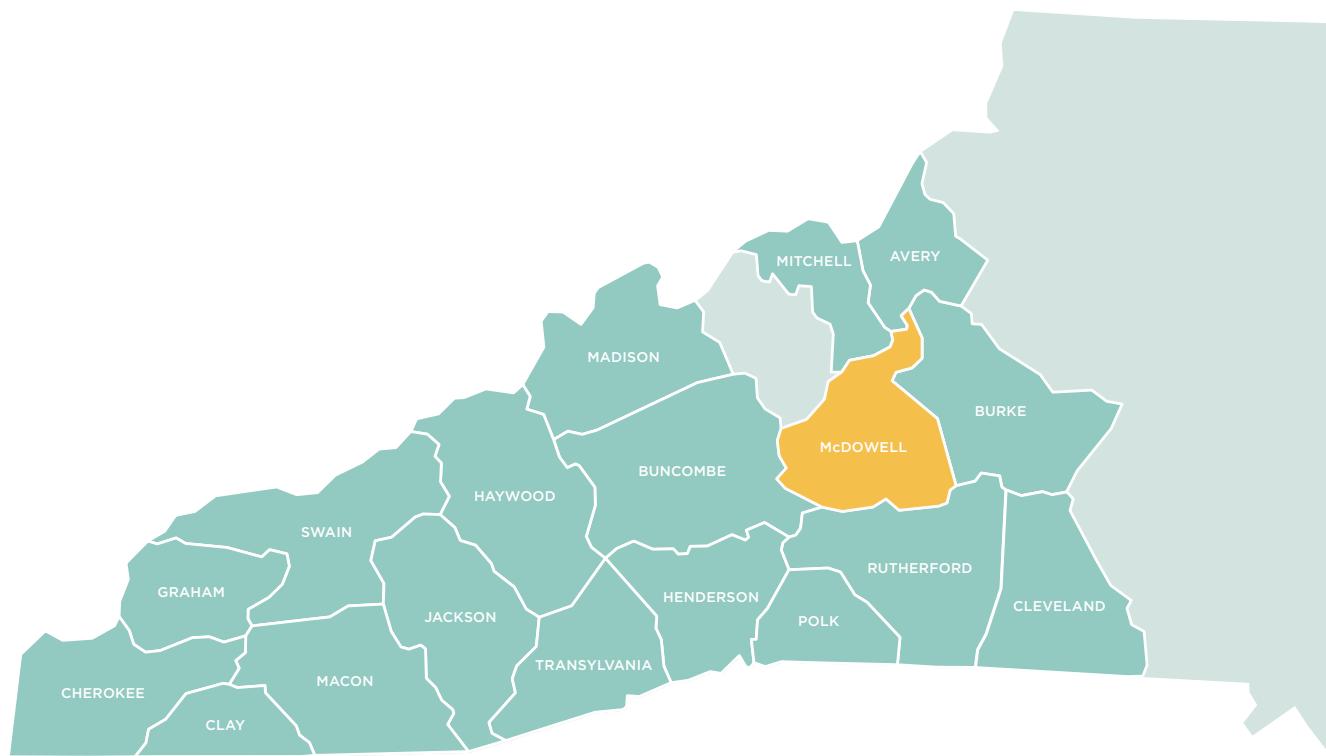
McDOWELL COUNTY

McDowell County's population is 43,337, located in 18,445 households.

CONNECTIVITY MEASURES: McDowell County residents have a high rate of "cellular only" reliance for home internet service, at 17 percent (above the 12 percent figure for the 18 BRBA counties). This goes along with a 57 percent home wireline adoption rate—again, below the 18-county BRBA average of 66 percent.

ECONOMIC METRICS: Residents of McDowell County are more likely to use SNAP benefits (18 percent, versus 12 percent for the 18 BRBA counties), although other measures are on par with the other BRBA counties, such as having 19 percent of households living below the 125 percent FPL threshold.

COMMUNITY SKILLS CAPACITY: McDowell County has a relatively high rate of heads-of-households whose highest educational attainment level is high school (34 percent). Sixty-three percent of McDowell County residents enrolled in the ACP (above the NC ARC figure).
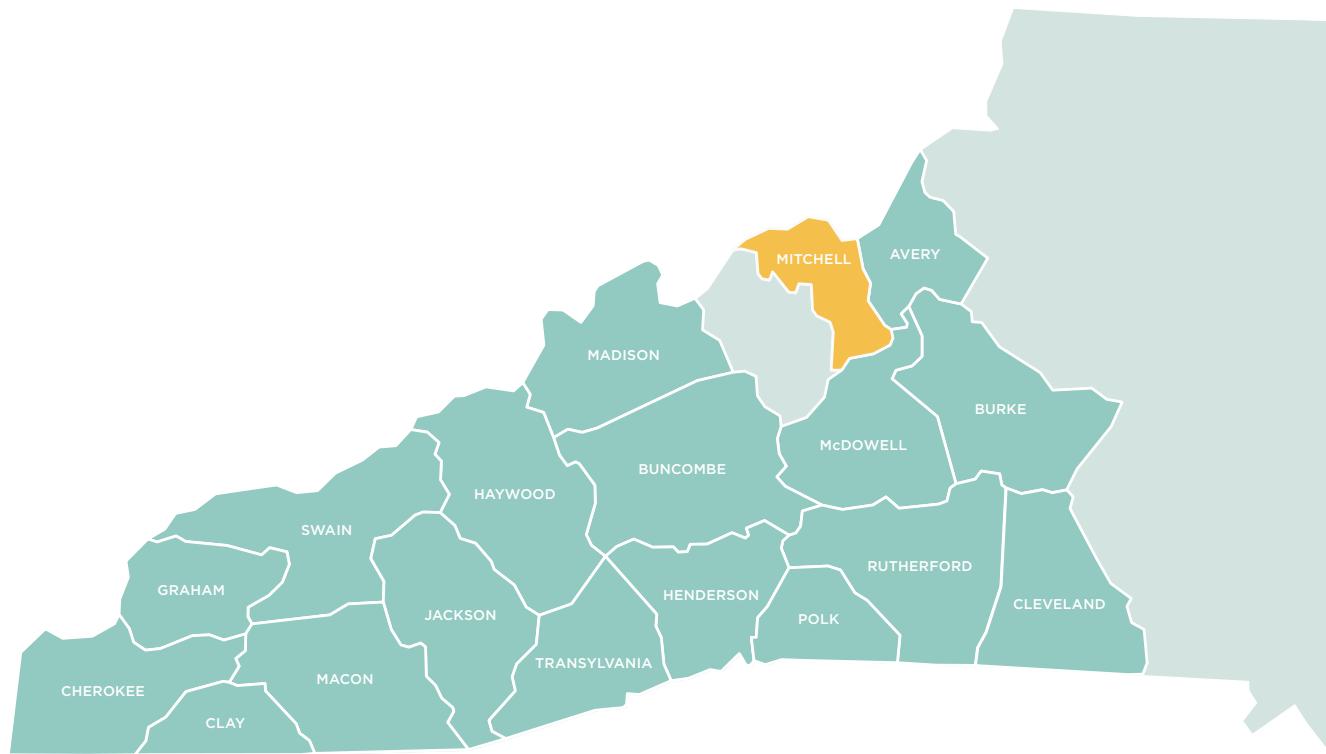
MITCHELL COUNTY

Mitchell County's population is 14,580, located in 6,411 households.

CONNECTIVITY MEASURES: Mitchell County shows high rates of households with no internet (20 percent) and cellular-only service (13 percent), which likely means broadband infrastructure is not available to many homes. At the same time, just 4 percent subscribe to satellite service. Some 63 percent of Mitchell County households have wireline broadband subscriptions at home.

ECONOMIC METRICS: The county's economic measures are somewhat better than all 18 BRBA counties, with just a 5 percent five-year unemployment rate. And 16 percent of those in Mitchell County live below the 125 percent FPL level, below the 19 percent figure for all 18 BRBA counties. Mitchell is classified as a "transitional" county by the ARC.

COMMUNITY SKILLS CAPACITY: Mitchell's share of people age 65 or older (26 percent) is above the average for the 18 BRBA counties. Twenty percent of Mitchell County households include a person with a disability, above the 16 percent figure for all 18 BRBA counties. Half (51 percent) of eligible county households enrolled in the ACP, although that level was below expectations of ACP enrollment performance.
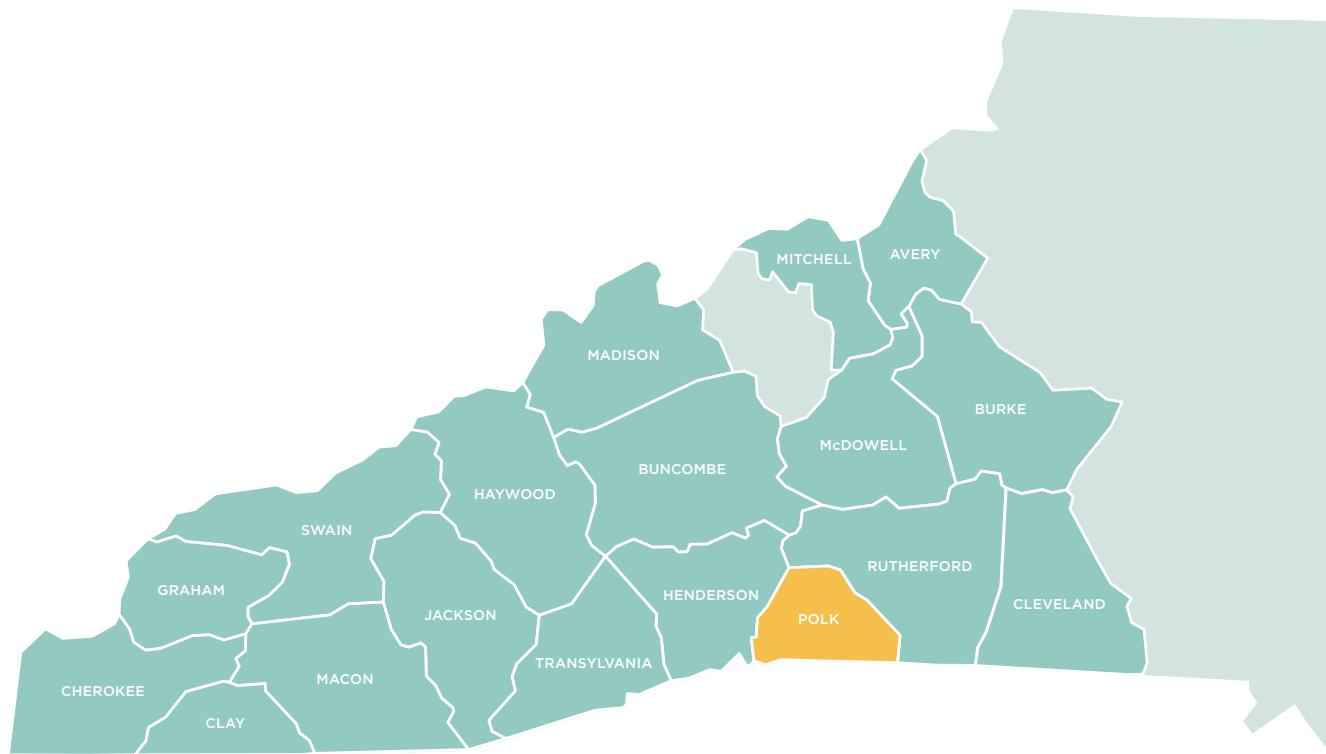
POLK COUNTY

Polk County's population is 19,354, located in 8,727 households.

CONNECTIVITY MEASURES: Although Polk County's wireline broadband adoption rate is not too far below the figure for the 18 BRBA counties (62 percent, compared with 66 percent), its satellite service adoption rate is greater than that for the 18 BRBA counties (15 percent to 8 percent). This indicates that there are a significant number of areas that lack wireline infrastructure.

ECONOMIC METRICS: Polk County's economic indicators (e.g., unemployment and those at or below 125 percent of FPL) match those of all 18 BRBA counties, with 4 percent and 19 percent, respectively.

COMMUNITY SKILLS CAPACITY: The county also contains a large share of people age 65 and older (32 percent). And some 35 percent of eligible Polk County residents enrolled in the ACP, below the figure for NC ARC counties and below expectations. Polk is classified by the ARC as a "transitional county" economically.
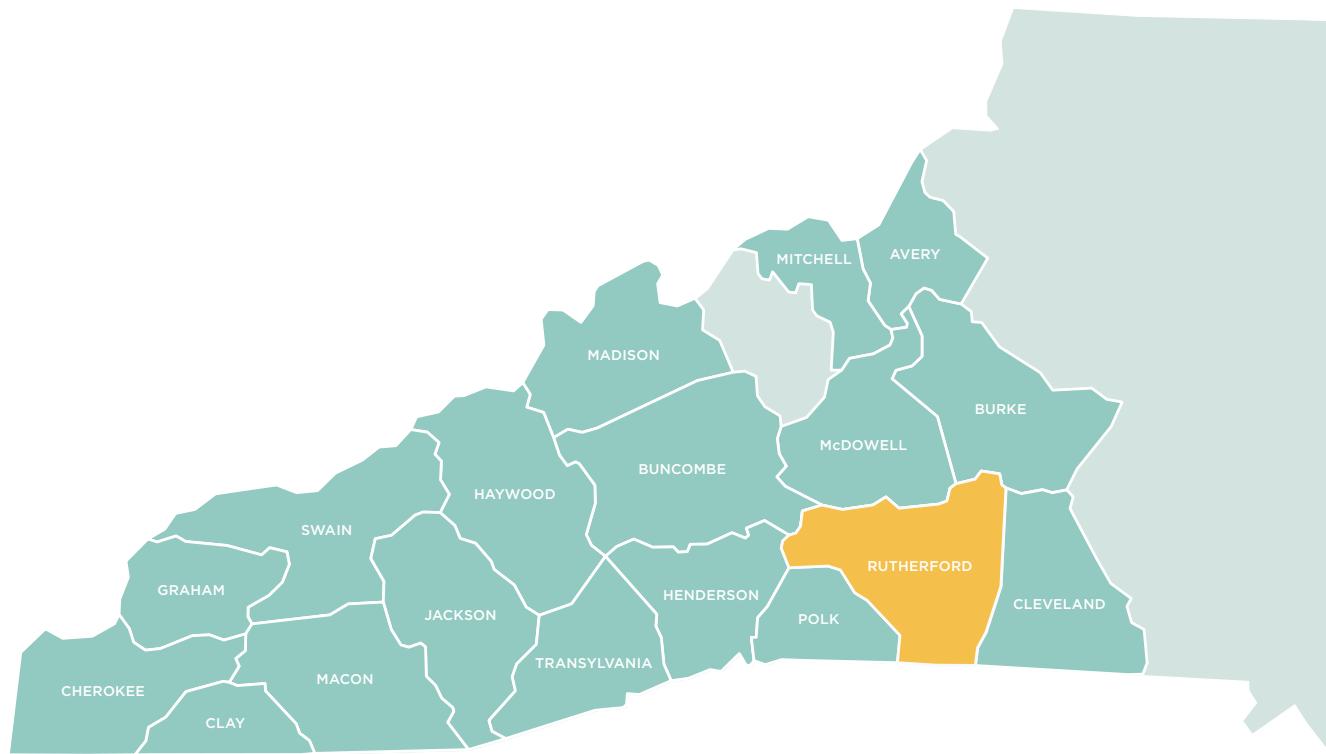
RUTHERFORD COUNTY

Rutherford County's population is 63,623, located in 26,589 households.

CONNECTIVITY MEASURES: Some 55 percent of residents in Rutherford County have wireline broadband at home (compared with 66 percent for all households in the 18 BRBA counties), and 11 percent have satellite service (above the 8 percent figure for the 18 BRBA counties). At the same time, 75 percent have cellular data plans, roughly on par with the 18 BRBA counties.

ECONOMIC METRICS: The county's share of households at or below the 125 percent FPL level is 23 percent (above the 19 percent average for the 18 BRBA counties), and Rutherford is one of three counties of interest classified as "at risk" economically by the ARC.

COMMUNITY SKILLS CAPACITY: Some 21 percent of households include a person with a disability (exceeding the 16 percent figure for all state ARC counties), and just 36 percent of households enrolled in ACP (below the 51 percent figure for the 18 BRBA counties).
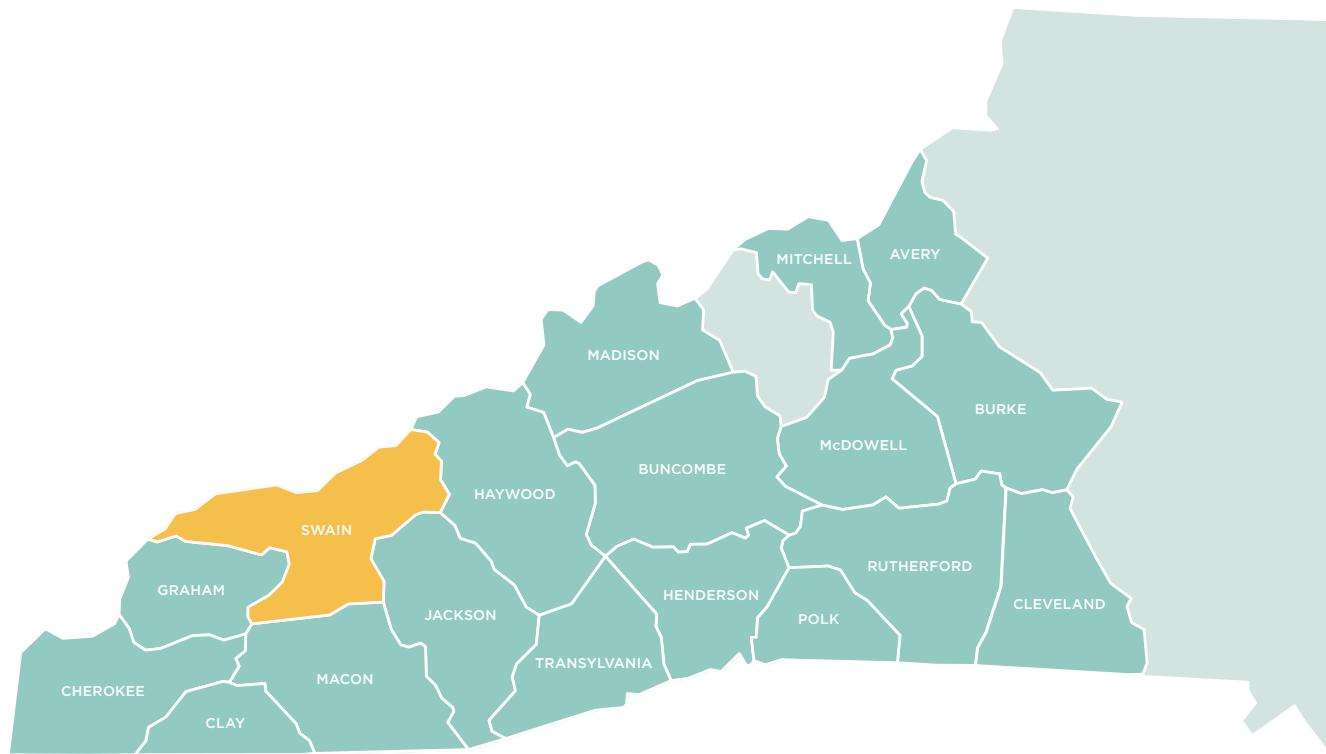
SWAIN COUNTY

Swain County's population is 13,279, located in 5,837 households.

CONNECTIVITY MEASURES: The county has a low wireline broadband adoption rate (51 percent, which is well below the BRBA 18-county overall figure of 66 percent) and a below-average cellular data plan adoption rate at 69 percent. Some 24 percent of households in Swain County have no internet at home, the highest (along with Jackson) of any of the 18 BRBA counties, and 12 percent have satellite service.

ECONOMIC METRICS: Swain County has a high rate of households at or below 125 percent of the FPL, with 27 percent in that group. Its five-year unemployment rate averaged 8 percent, above the 5 percent for all North Carolina counties in the Appalachian region.

COMMUNITY SKILLS CAPACITY: Just 22 percent of residents in Swain County enrolled in the ACP, even if that enrollment rate exceeded ACP performance metrics.
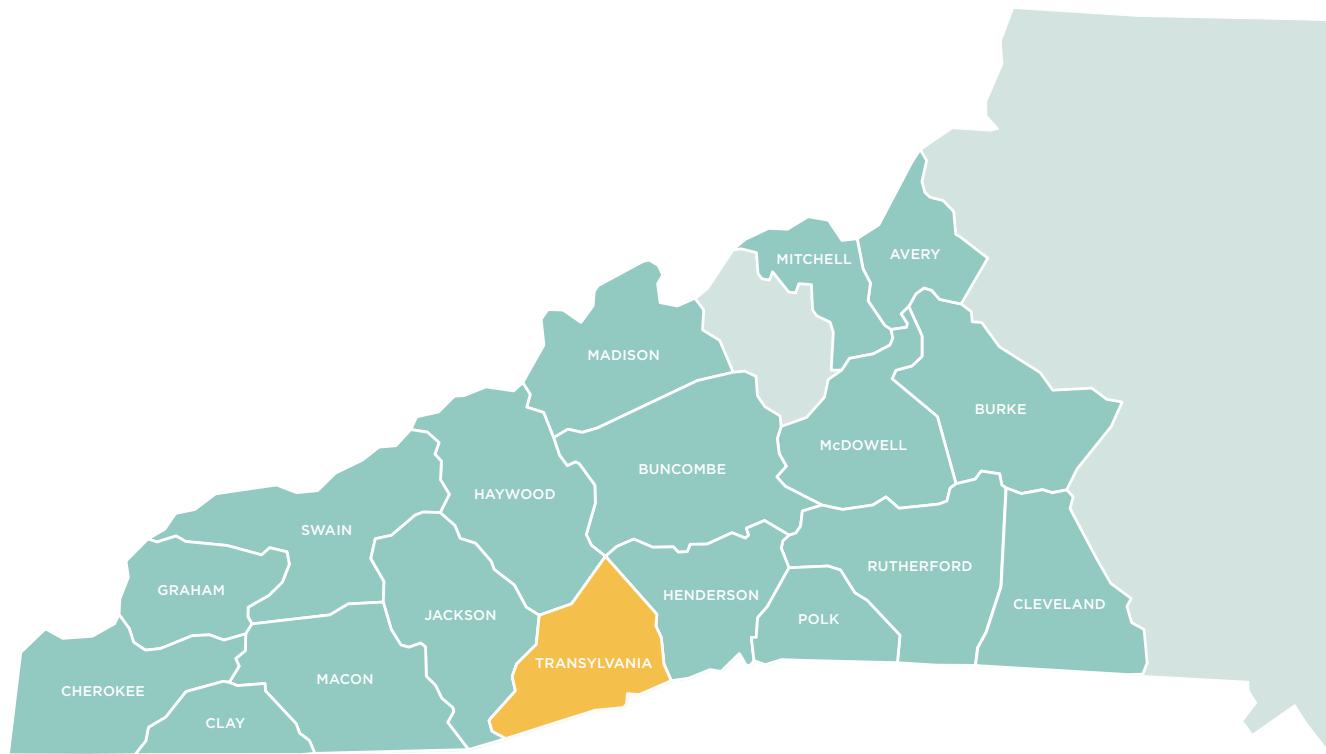
TRANSYLVANIA COUNTY

Transylvania County's population is 32,275, in 14,590 households.

CONNECTIVITY MEASURES: Transylvania County has strong adoption rates, with 72 percent of households with wireline subscriptions and 75 percent with cellular data plans. Only 4 percent subscribe to satellite service, and just 10 percent rely exclusively on cellular service.

ECONOMIC METRICS: Transylvania County's share of households at or below the 125 percent FPL level is 18 percent—on par with all 18 BRBA counties (19 percent). The county's five-year unemployment rate is just 3 percent, and only 10 percent use SNAP.

COMMUNITY SKILLS CAPACITY: Transylvania's most distinctive number is about age; 31 percent of residents in Transylvania County are age 65 or older, well above the figure for all 18 BRBA counties (23 percent). Just 21 percent of eligible households enrolled in the ACP, but that was above performance expectations.

USING the DATA for DECISION-MAKING

The data presented here can serve as key inputs into decision-making and aid in understanding priorities. The data illuminates where certain types of barriers or challenges warrant more attention, but it is important to underscore that the road to meaningful broadband adoption invariably means solving a range of problems in communities (e.g., providing digital skills resources, improving infrastructure, and addressing affordability).

One way to use the data is to explore counties that have, in the aggregate, much in common, yet exhibit variations in key metrics upon closer scrutiny. Rutherford and Burke counties are good examples. Their populations are similar, their overall "broadband of any type" measures are the same at 83 percent, and the same share of households (75 percent) have cellular data plans. Beneath that, however, are differences. Rutherford has far more satellite subscribers than Burke (18 percent to 12 percent), and Burke has more at-home wireline subscriptions (67 percent to 55 percent). Rutherford is classified as "at risk" by the ARC, while Burke is transitional and had far more ACP subscribers. This suggests that Rutherford may need interventions that address both infrastructure (in relation to the higher satellite subscription rate) and affordability (taking into account the ARC "at risk" status), while infrastructure is perhaps a less urgent priority in Burke.

In a similar vein, Macon and McDowell counties look similar for tech adoption, as wireline and cellular data plan adoption figures are within a few percentage points. But a closer look indicates that service affordability should be a real concern in McDowell County, since many households rely on cellular service only for the internet (i.e., they cannot afford both wireline and wireless service) and far more use the SNAP benefit than in Macon County.

Additionally, population density is a factor to keep in mind. Counties with abundant land and sparse populations may have significant broadband challenges because the private sector has weak incentives to build infrastructure due to the small customer base. That may not be the case in larger and more densely populated counties or in counties that have some densely populated areas. But even if the overall broadband picture may seem brighter in those larger counties, a significant number of households may face challenges in affording service or would benefit from training on how to use computers and the internet.

Finally, as useful as the results may be for understanding gaps, they are not a substitute for also understanding the needs of individuals in the community and a community's willingness and capacity to improve broadband. Combining these ingredients—community capacity and data that help understand priorities—can result in better broadband networks and more affordable service for North Carolina citizens.

APPENDIX I

THE DATA

The data for this report comes from the American Community Survey five-year combined 2019–2023 data. This information allows for analysis of all U.S. counties, whereas one-year data (which offers a more contemporary snapshot of conditions) does not have a sufficiently large sample size to include smaller counties. The tables used are:

S1701 to determine poverty status.

S1810 for disability characteristics.

S1901 for income levels.

S2201 for SNAP participation at the household level.

B28002 for presence and types of internet subscriptions in the household.

The ACP performance metric was developed by the Benton Institute for Broadband & Society to examine ACP enrollment at the five-digit zip code level of geography. The methodology for developing the tool is available online here, and the same approach is used in this analysis to assess enrollment performance for counties (as opposed to five-digit zip codes). Those interested in results at more-granular zip code geographies are encouraged to use the Benton Institute's ACP Performance Tool.

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