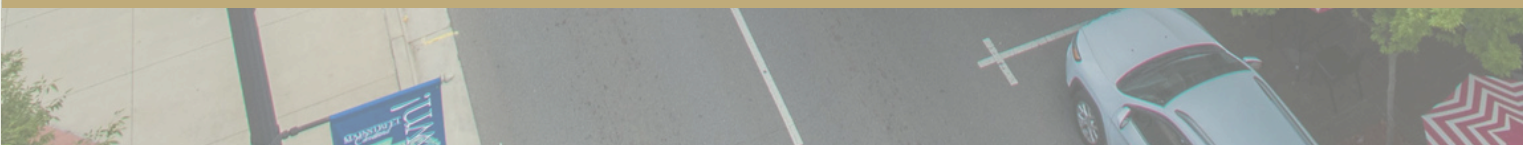




BRADLEY COUNTY, TENNESSEE COMMUNITY CONNECTIVITY PLAN 2025



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CONNECTIVITY PLAN AUTHORS

This plan was written by the following individuals:

- Shannon Millsaps, Chief Operating Officer, Thrive Regional Partnership
- Virginia Petite, Project Coordinator, Thrive Regional Partnership
- Brian Snider, Managing Director of Broadband Project Implementation, Connect Humanity
- Adam Lewis, Executive Assistant to County Mayor, Bradley County Government

CONTRIBUTORS

The following people and organizations were critical to the planning, research, and writing process:

- Michelle Smith, Data and Research Analyst, Thrive Regional Partnership
- Rhett Bentley, Chief Communications Officer, Thrive Regional Partnership
- Debra Socia, former President/Chief Executive Officer, The Enterprise Center
- Sammy Lowdermilk, Program Director, The Enterprise Center

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- Blair Deacon, Director of Resource Development, United Way Ocoee
- Brian Heusterberg, Director, Veterans Services
- Brittany Cannon, Director, PIE Innovation Center, Bradley County Schools
- Brittany Hopkins, Bradley County Health Department
- Chris Duggan, Athletic Coordinator, Bradley County Parks and Recreation
- Danielle Seals, Workforce Development Director, Cleveland/Bradley Chamber of Commerce
- Dewayne Scoggins, Director of Communications and Technology, Bradley County Sheriff's Office
- Hannah Goodson, M. Ed., County Director, Extension Agent II
- Chief Jeff Stewart, Fire Chief, Bradley County Tennessee Fire - Rescue
- Dr. John Squires, Vice President of Economic & Community Development, Cleveland State Community College
- Keisha Parks, MLS Library Director, Cleveland Bradley County Public Library
- Kristen Murray Grisham, M.Ed, Director of Community Engagement, Lee University
- Lucy Rymer, Executive Director, Museum Center at Five Points
- Robert Knepper, IT Coordinator, Cleveland Bradley County Public Library
- Director Ruthie Forgey, Corps Administrator, Cleveland Corps Salvation Army
- Scott Web, Instructional Technology Supervisor, Bradley County Schools
- Sharon Westfield, Senior Services Coordinator, Senior Activity Center at Bradley Cleveland Community Services Agency
- Troy Spence, Director, Cleveland-Bradley County Office of Emergency Management & Homeland Security
- Willie Thomas, Vice President of Student Affairs, Cleveland State Community College

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EXECUTIVE SUMMARY

Executive Summary

Bradley County has conducted a comprehensive Connectivity Plan assessment to collect the data necessary for evaluating, selecting, and implementing effective solutions to enhance local broadband connectivity and affordability. This effort positions the county to take full advantage of federal funding opportunities, including the Broadband Equity, Access, and Deployment (BEAD) Program and the Digital Equity Act (DEA).

Broadband infrastructure is a critical community asset that directly contributes to residents' quality of life and fuels economic growth in the global marketplace of the 21st century. It enables e-commerce, remote work, distance learning, tele-health, innovation, and entrepreneurship—driving societal progress and strengthening the local economy.

As broadband usage continues to evolve, today's users demand internet service that is accessible, reliable, and affordable. This need was further underscored by the COVID-19 pandemic, which highlighted the importance of a robust digital infrastructure for everyday activities.

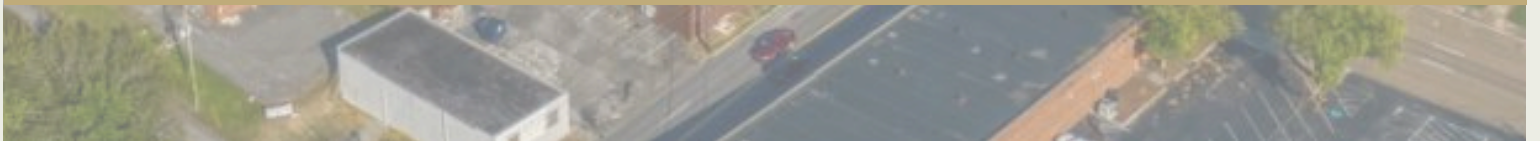
While there are detailed recommendations within this plan, **the biggest need identified is to ensure that all unserved and underserved locations have access to broadband connectivity.** This can be advanced through federal funding opportunities and by continued public-private partnerships.

Bradley County realizes the need to prioritize digital equity within the county. To this end, Bradley County has already applied for and received a \$100,000 Broadband Ready grant from the State of Tennessee on behalf of the Bradley-Cleveland Senior Activity Center to teach digital skills training to the aging population.

This Digital Connectivity Plan marks the initial phase in developing a strategic plan and serves as a guiding document for Bradley County in making decisions about identified broadband deployment projects and digital skills training. For maximum effectiveness, this document must be dynamic and continuously evolving. By identifying and addressing the gaps in broadband infrastructure, Bradley County will be able to form strategies such that all residents will have the ability to participate in the workforce, have access to public healthcare, engage in community resources, support agriculture, connect with emergency response services, and participate in educational opportunities.



PRELIMINARY RESEARCH AND READINESS



Geographic and Demographic Profile

“Population is important because it is people who make use of land; the local economy helps to determine how many people live, work, and play in Bradley County and what uses land is being utilized for.” - the Bradley County Regional Planning Commission

GENERAL COMMUNITY DEMOGRAPHIC INFORMATION

Bradley County is nestled among parallel ridges and valleys running north to south along the county, with a population of 108,859 according to the 2022 Census data¹. As part of the Great Appalachian Valley, Bradley County is surrounded by four counties in Tennessee and two counties in Georgia. Cleveland, located at the center of the county, is the largest incorporated city, with Charleston located in the north². The very ridges and valleys that so define Bradley County’s character have also contributed to its identity. White Oak Mountain (with the highest elevation in the county at 1,495 feet above sea level) on the western edge of the county, separates Bradley County from Chattanooga’s urban sprawl, and has strengthened Cleveland as the county center, a city with deep manufacturing roots supported by railway access. With two drainage basins, drained by tributaries of the Hiwassee River in the north and the Conasauga River in the south, Bradley County is subject to flooding, particularly along Candies Creek and South Mouse Creek, as well as along the steep slopes running throughout the county. Shale is the predominant rock, with limestone second, and with variable soil type and depth³.

During the years from 2010–2022, Bradley County has seen an increase in population of 12%.⁴ Compared to the 95 counties in Tennessee⁵, Bradley County is ranked 13th by population and is 67th in size, with 331 square miles. The Boyd Center (UTK) population projections support the expected continued growth of the county, estimating a 13.9% increase from 2022 to 2040, which would result in a population of 126,026 by 2040⁶.

Bradley County utilized demographic data from the 2022 US Census American Community Survey to obtain the following information:

DEMOGRAPHIC DATA

Total Population Number	108,859
Square Miles Covered	331
Number of People per Square Mile	329

¹ U.S. Census Bureau. "Age and Sex." American Community Survey, ACS 5-Year Estimates Subject Tables, Table S0101, 2022

² Bradley County Land-Use Plan

³ Bradley County Comprehensive Plan

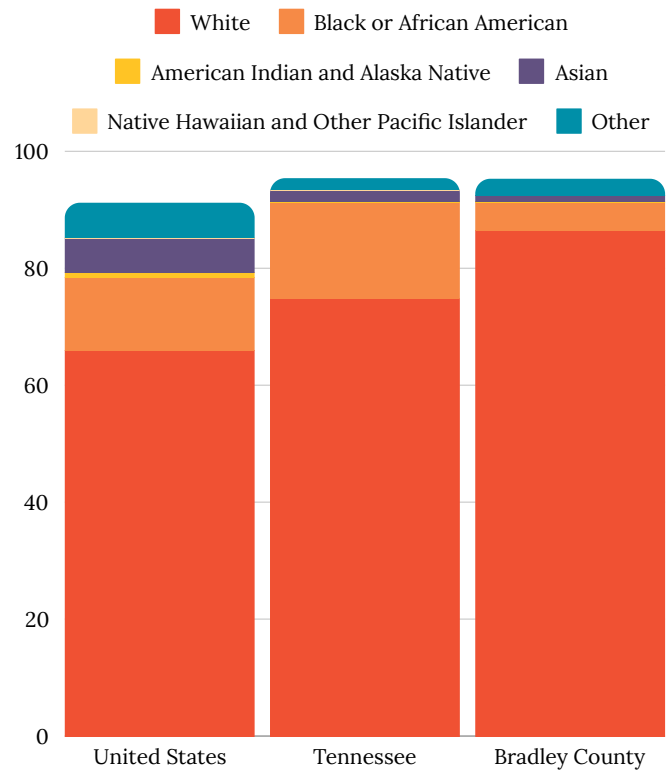
⁴ U.S. Census Bureau. "ACS DEMOGRAPHIC AND HOUSING ESTIMATES." American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP05, 2010, 2017, 2022

⁵ Bradley County Land-Use Plan

⁶ 2022-2070 Boyd Center Population Projections

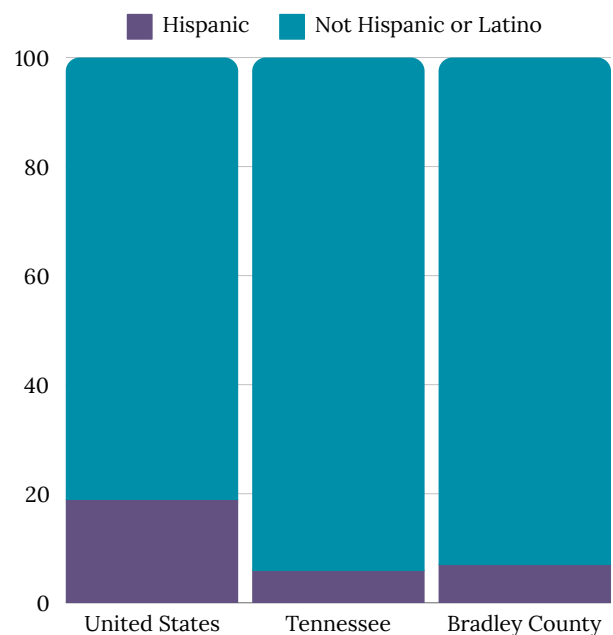
Residents Who Identify as White	86.4%⁷
Residents Who Identify as Black	4.8%
Residents Who Identify as Hispanic or Latino	6.9%
Residents Who Identify as American Indian and Alaska Native	0.2%
Residents Who Identify as Asian	1%
Residents Who Identify as Other	2.9%

DEMOGRAPHIC PROFILE



Although Bradley County largely identifies as white, there is a growing hispanic population. From 2010 to 2022 the hispanic population grew by 80.39%, whereas the non-hispanic population grew by 8.95%⁸. There has also been a small but definite increase in Ukrainian and Russian populations since 2011, however, the margins of error in the census data are such that the numbers are not yet substantiated. These populations should be monitored for continued growth and future resource needs.

HISPANIC POPULATION



⁷U.S. Census Bureau. "ACS Demographic and Housing Estimates." American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP05, 2022

⁸ U.S. Census Bureau. "ACS DEMOGRAPHIC AND HOUSING ESTIMATES." American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP05, 2017

U.S. Census Bureau. "ACS DEMOGRAPHIC AND HOUSING ESTIMATES." American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP05, 2010

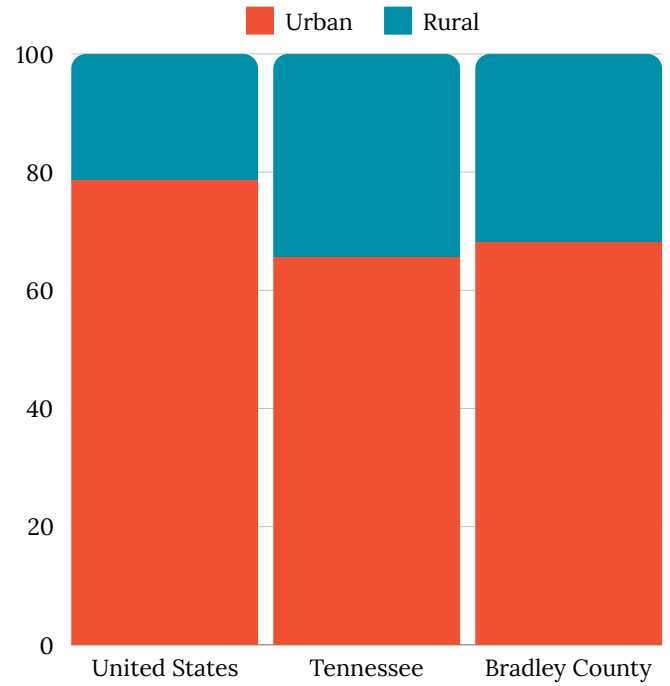
Total Number of Households	41,340⁹
Number of Households That Are Owner Occupied	28,102¹⁰
Average Household Size	2.56¹¹
Rural Housing Units	31.7%¹²

Bradley County utilizes the population’s age structure to determine strategies to meet future needs for facilities and services. For those ages 0-17, educational needs are prioritized, while considering future needs for workforce training and sufficient housing stock. For those 65 and older, health care and alternative housing is prioritized¹³.

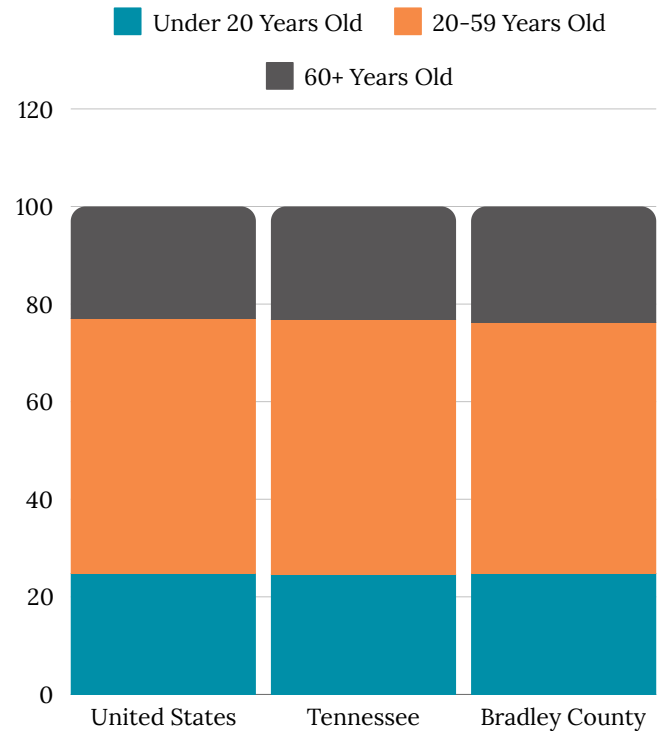
Median Age	39.9
Residents 60 years and older	23.8%¹⁴

⁹ U.S. Census Bureau. "Selected Economic Characteristics." American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP03, 2022
¹⁰ U.S. Census Bureau. "Selected Housing Characteristics." American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP04, 2022
¹¹ U.S. Census Bureau. "Households and Families." American Community Survey, ACS 5-Year Estimates Subject Tables, Table S1101, 2022
¹² U.S. Census Bureau. "URBAN AND RURAL." Decennial Census, DEC Demographic and Housing Characteristics, Table H2, 2020
¹³ Bradley County Land-Use Plan
¹⁴ U.S. Census Bureau. "ACS Demographic and Housing Estimates." American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP05, 2022

URBAN AND RURAL HOUSING UNITS



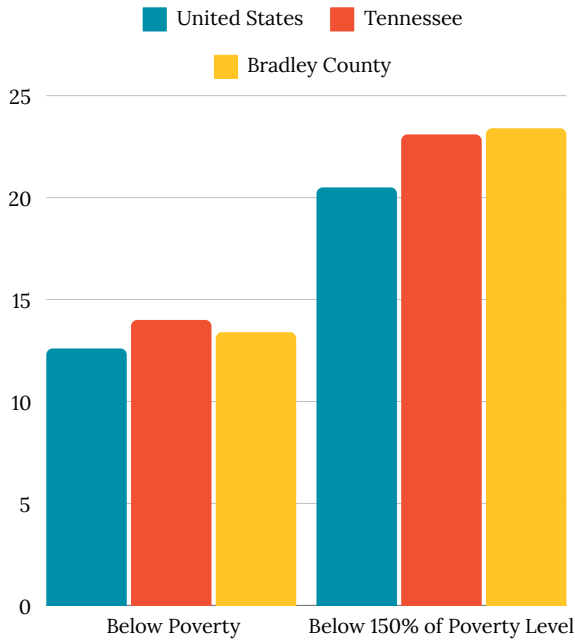
AGE DISTRIBUTION



“The growing complexity of technology and the technical advances in manufacturing, electronics and service industries require a well-educated and highly trained workforce. The pace of technological development requires re-training of persons whose jobs have become obsolete to qualify for new jobs being created. It is generally accepted that the more educated a worker is, the easier it is to retrain them for other jobs.”

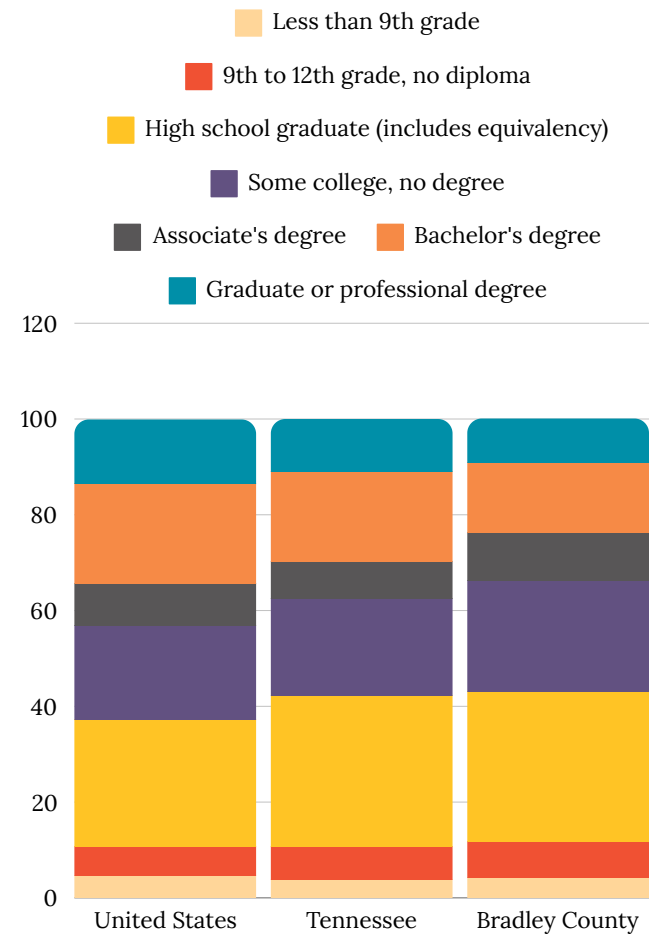
- the Bradley County Regional Planning Commission

NEARNESS TO POVERTY



Mean Household Income	\$79,443¹⁵
Median Household Income	\$60,692
Per Capita Income	\$31,121
Individuals Living Below the Poverty Line	13.4%¹⁶
Individuals Below 150% of the Poverty Line	23.4%¹⁷
Unemployment Rate	5.4%¹⁸
Less than 9th grade education (25 and older)	4.2%¹⁹

EDUCATIONAL ATTAINMENT



¹⁵ U.S. Census Bureau. "Selected Economic Characteristics." American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP03, 2022

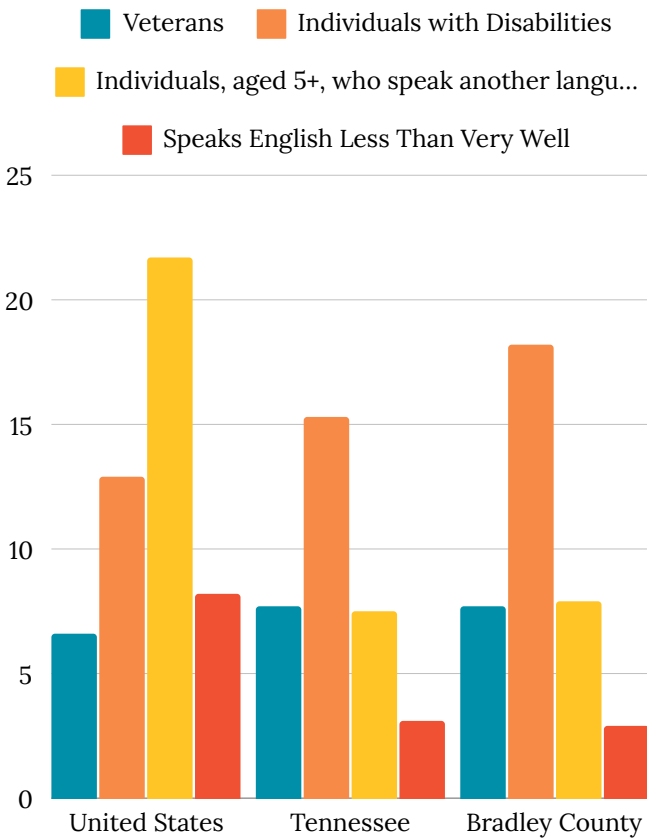
¹⁶ U.S. Census Bureau. "Poverty Status in the Past 12 Months by Sex by Age." American Community Survey, ACS 5-Year Estimates Detailed Tables, Table B17001, 2022

¹⁷ U.S. Census Bureau. "Poverty Status in the Past 12 Months." American Community Survey, ACS 5-Year Estimates Subject Tables, Table S1701, 2022

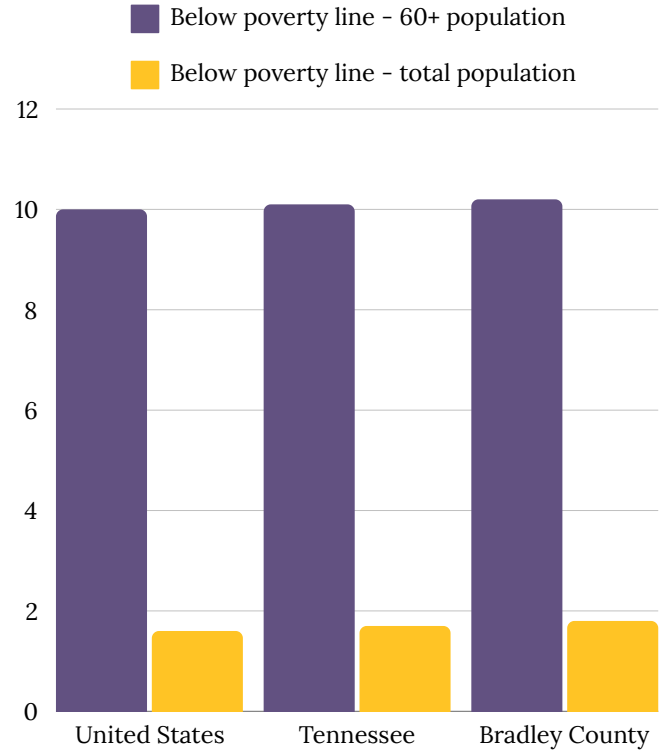
¹⁸ U.S. Census Bureau. "Selected Economic Characteristics." American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP03, 2022

¹⁹ U.S. Census Bureau. "Selected Social Characteristics in the United States." American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP02, 2022

COVERED POPULATION



POVERTY LEVELS 60+ POPULATION



Individuals with a Disability **18.2%²⁰**

Speak a language other than English at home (5 years and older) **7.9%²¹**

Speaks English less than very well **2.9%**

Veterans **7.7%²²**

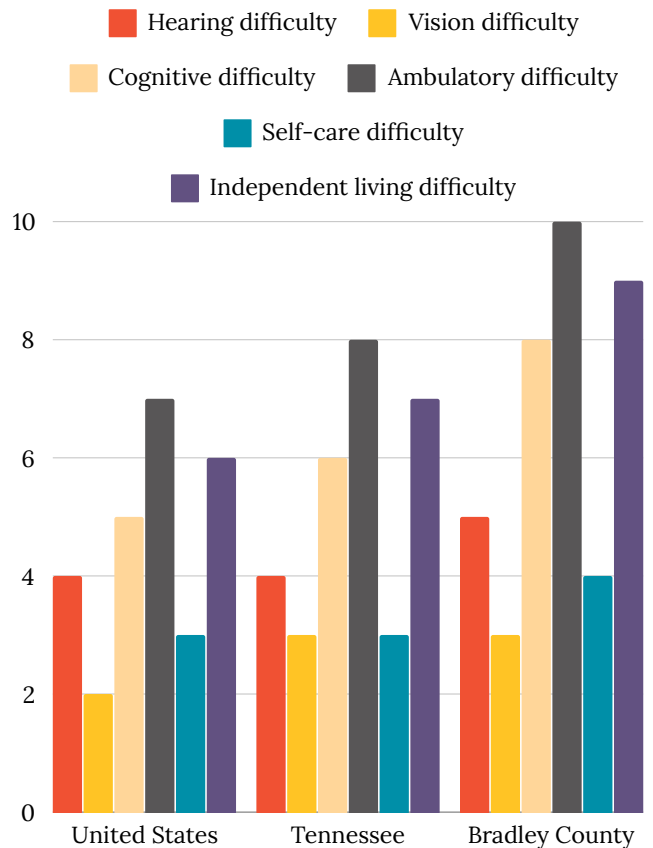
²⁰ U.S. Census Bureau. "Selected Social Characteristics in the United States." American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP02, 2022

²¹ U.S. Census Bureau. "Language Spoken at Home." American Community Survey, ACS 5-Year Estimates Subject Tables, Table S1601, 2022

²² U.S. Census Bureau. "Selected Social Characteristics in the United States." American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP02, 2022

²³ U.S. Census Bureau. "Disability Characteristics." American Community Survey, ACS 5-Year Estimates Subject Tables, Table S1810, 2022

DISABILITY BY TYPE²³



Social Determinant

When addressing the health of a county, economic and social insecurity often are associated with poor health. Poverty, unemployment, and lack of educational achievement affect access to care and overall well being. Addressing these determinants is crucial for promoting equity and improving the overall wellbeing of the residents of Bradley County.

Economic Factors

Income Inequality

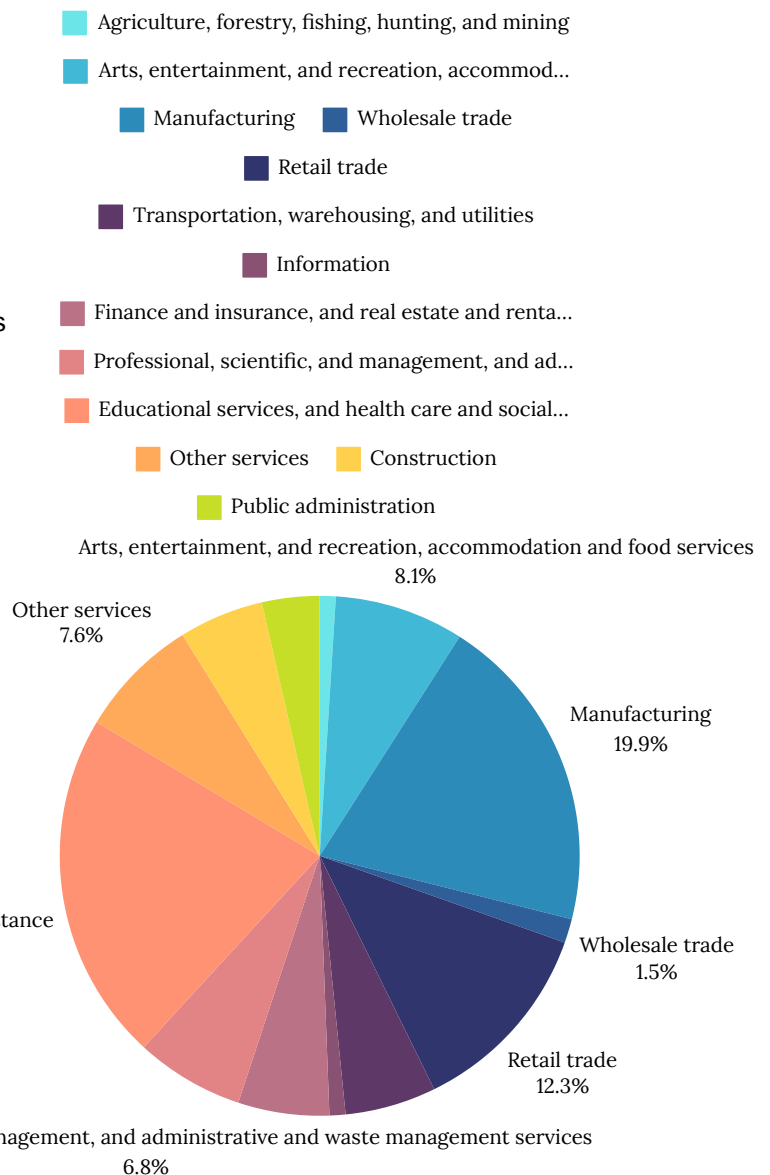
According to the Living Wage Calculator, two working adults with one child need \$78,703 annually in Bradley County²⁴. The mean household income is \$79,443, revealing the average household income according to the Living Wage Calculator is providing for basic needs. Transitioning to a job that requires one digital skill, from a job that does not, increases wages on average by 23%.²⁵

Unemployment Rate

Labor Force participation for the population over 16 years old is 61.3%, slightly lower than the State average, with unemployment rates of 5.4%.²⁶ According to the National Skills Coalition, 90% of jobs in Tennessee require digital skills. The most needed skills for the workforce are computer literacy, data entry and typing, Microsoft Excel and PowerPoint, Word Processing. Examples include ability to use Enterprise Resource Planning (ERP) software and robotics in manufacturing.²⁷

Educational services, and health care and social assistance
21.8%

EMPLOYMENT BY INDUSTRY²⁸



²⁴ Living Wage Calculator

²⁵ National Skills Coalition

²⁶ U.S. Census Bureau. "Selected Economic Characteristics." American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP03, 2022

²⁷ National Skills Coalition

²⁸ U.S. Census Bureau. "Selected Economic Characteristics." American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP03, 2022

Poverty Levels

For those with less than a high school education, poverty rates are 31.3%.²⁹ For those who achieve a high school education, it drops to 12.2% showing a direct correlation with education and skills training for attaining higher income levels. Considering single householders in poverty, 24% are female householders while males householders only make up 5% of poverty households.

Economic Opportunities

Bradley County has been ranked as the leading county in Tennessee for job creation³⁰. Some of the notable manufacturing companies are Wacker Polysilicon (the second largest producer of polysilicon in the world), Duracell (who produces their C-and D-cell batteries in Cleveland), Mars Chocolate, and Whirlpool (currently the leading manufacturing, with the highest number of employees in Bradley County).³¹

Migration and Commuting

According to the Bradley County Regional Planning Committee, Bradley County must continue to look to commuter workers from other counties for future expansion of its labor pool³². According to the US Census data from 2021, 46.5% of those living in Bradley County also worked in Bradley County. 24.5% commuted to Hamilton County showing a significant relationship between the neighboring county for employment opportunities.³³

²⁹ U.S. Census Bureau. "Poverty Status in the Past 12 Months." American Community Survey, ACS 5-Year Estimates Subject Tables, Table S1701, 2022

³⁰ Cleveland Banner

³¹ Bradley County Land-Use Plan

³² Bradley County Land-Use Plan

³³ OnTheMap

³⁴ TDOE

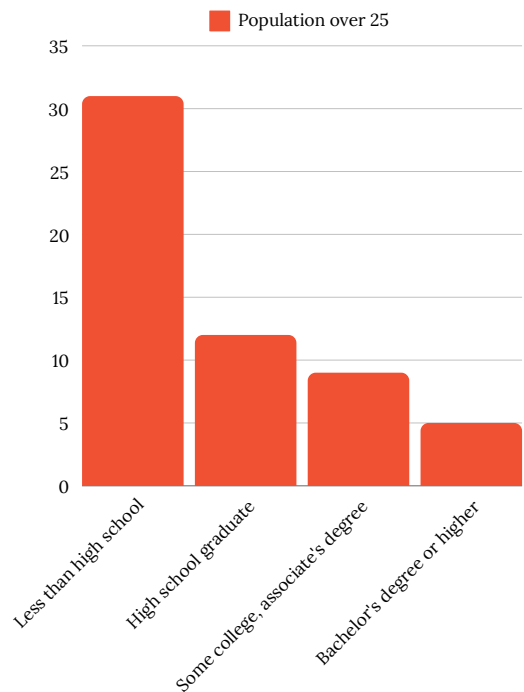
³⁵ U.S. Census Bureau. "Poverty Status in the Past 12 Months." American Community Survey, ACS 5-Year Estimates Subject Tables, Table S1701, 2022

Education

Educational Attainment

When compared to the State of Tennessee, Bradley County’s population is slightly ahead for educational attainment of those achieving an associate’s degree or some college. However, Bradley County falls behind the State in achievement of Bachelor and Graduate degrees. Cleveland State Community College (CSCC) is a key resource for Bradley County, offering accessible pathways to associate’s degrees with affordable tuition, scholarships, and financial support options. Through flexible course offerings and career-focused programs, CSCC empowers students to gain valuable skills for the workforce or further education, driving economic growth and supporting the region’s educational attainment goals. While 11.8% of the population do not have a highschool diploma, 96.5% of students from Cleveland and Bradley County schools from the most recently reported school year graduated high school³⁴, with Bradley County recently having a record graduation rate of 97.7% at the high school level.

POVERTY LEVELS BY EDUCATIONAL ATTAINMENT³⁵



BEST Partnerships (Business & Education Serving Together)

Bradley County puts a strong emphasis on Workforce development and industry partnerships. BEST Partnerships is a Chamber program that connects area businesses with the local school system. Additionally, the school system established the creation of the PIE Innovation Center.

Access to Quality Education

The Bradley County School system is composed of twelve elementary schools, three middle schools, four high schools, and two alternative facilities. Bradley County Schools serves 10,269 students across 11 Elementary Schools, 2 Middle Schools and 2 High Schools.

Healthcare

Healthcare Access

10.90% of residents do not have health insurance coverage³⁶. As of July of 2023, 26.08% of the county's population was enrolled in TennCare; 22.16% of the population participates in Medicare. Although there is a hospital in Bradley County, it is estimated that residents travel up to 47 minutes for hospital treatment. There are three urgent care centers, all of which are located in the City of Cleveland³⁷.

Health Priorities

According to the CDC, in 2021, there were 130 drug overdoses per 100,000 people, which is three times the State average and four times the national. A non-residential treatment facility in Cleveland serves patients seeking opioid treatment³⁸. As of 2019, the USDA reported six census tracts with food deserts in Bradley County.³⁹

³⁶ U.S. Census Bureau. "Selected Economic Characteristics." American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP03, 2022

³⁷ Healthcare Needs Assessment

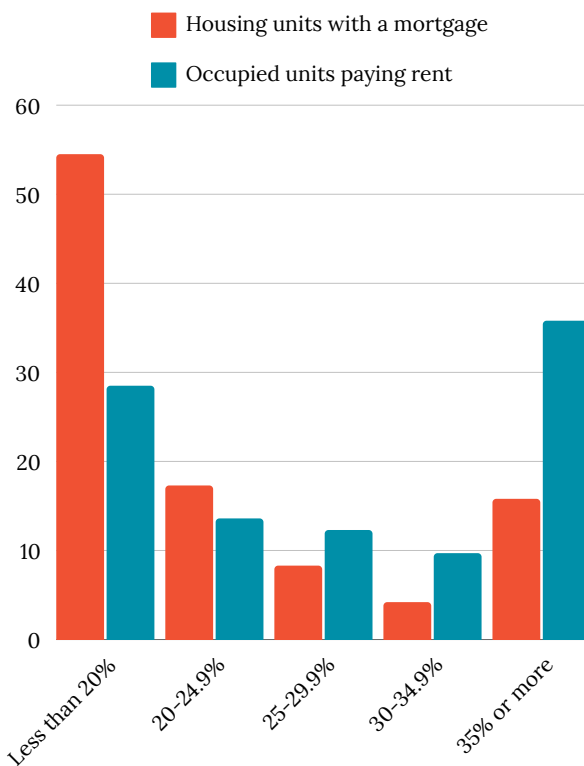
³⁸ Healthcare Needs Assessment

Housing

Affordable Housing

Housing prices have risen significantly over the last five years. In 2017, the average median home value was \$150,100; in 2022 the median home value had risen to \$209,800. Median rent in 2017 was \$746 and by 2022, it had risen to \$917. 45.5% of rental households live in cost burdened households (30% or more of total household income spent on gross rent).⁴⁰ Countywide there are 1809 parcels that are either a duplex or triplex. And 145 parcels that are 4 units or more. 1,036 units are classified as income-based housing and 252 units classified as income-restricted housing.⁴¹

HOUSING COST AS A PERCENT OF INCOME



³⁹ Food Access Research

⁴⁰ According to the CPI inflation Calculator - \$64,083 in Dec 2017 has the same buying power as \$77,151 in Dec 2022. Rent - \$746 in Dec 2017 is \$898 in Dec 2022.

U.S. Census Bureau. "SELECTED HOUSING CHARACTERISTICS." American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP04, 2017

U.S. Census Bureau. "Selected Housing Characteristics." American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP04, 2022

⁴¹ National Housing Preservation Database - requires income at or below 60% of the Area Median Income (AMI) shared by United Way

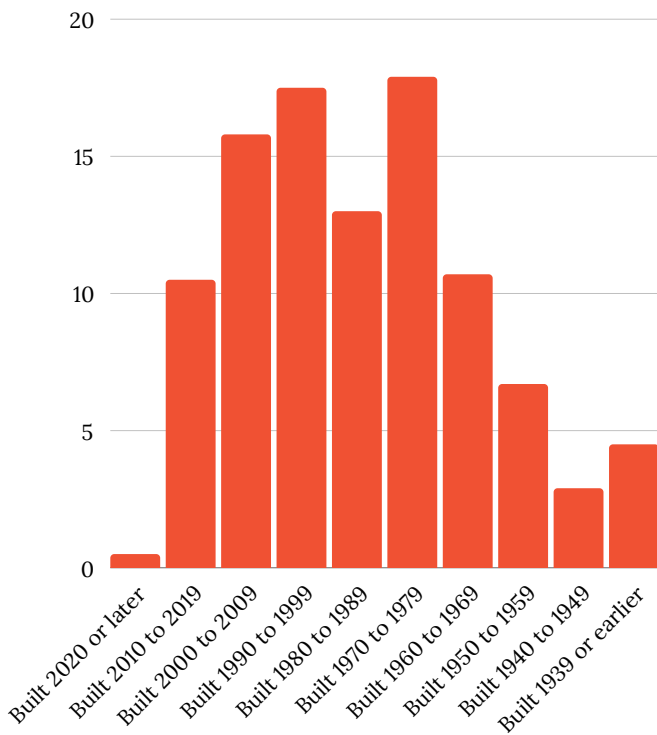
Homeownership

68% of occupied housing units are owner occupied⁴². 20% of the population who owns and occupies their house are considered mortgage cost burdened.

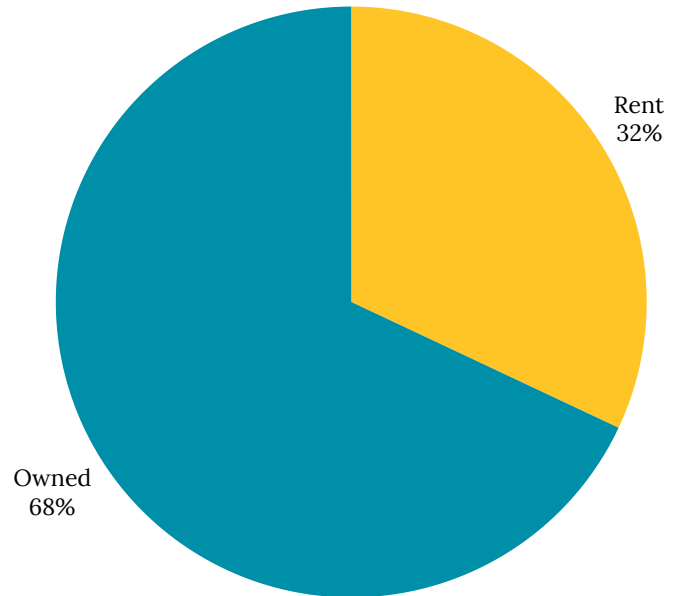
Housing Quality

The median year houses were built is 1986, with the majority of homes being built between 1970-1979 and 1990-1999.⁴³

AGE OF HOUSING STRUCTURE



OCCUPIED UNITS OWNED VS RENTAL



Infrastructure and Environment

Infrastructure Investment

Bradley County is largely characterized by rural landscape of agricultural land, pasture, and forest. Residential subdivisions, golf courses, schools, commercial, and industrial areas are spread throughout the county. Growth is concentrated along existing roads. However, development in the southern part of Bradley is restricted by the absence of public water and sewer. The northern and western parts of the county have attracted the majority of the development, due to the infrastructure already in place.⁴⁴

Environmental Hazards

The Central City area has a number of brownfield industrial sites that are known to be hazardous, such as the former Hardwick Woolen Mill site, Harry’s #17, and the Cleveland Municipal Airport.⁴⁵ It is estimated that 17,600 acres of land is in flood zones.⁴⁶

⁴² U.S. Census Bureau. "Selected Housing Characteristics." American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP04, 2022

⁴³ U.S. Census Bureau. "Selected Housing Characteristics." American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP04, 2022

⁴⁴ Bradley County Land-Use Plan

⁴⁵ EPA

⁴⁶ Bradley County Land-Use Plan

Transportation Access

I-75 is a major route that runs across the United States from Canada to Florida and provides direct access to Chattanooga, Atlanta, and Knoxville.⁴⁷ 4.7% of households have no motor vehicle⁴⁸. Public sidewalks do not exist in much of the county and public transportation is limited in the areas it services. Southeast Tennessee Human Resource Agency (SETHRA) provides “demand response” (curb-to-curb paratransit services) and operates a fixed-route system in Cleveland, however, the buses can also pick-up/drop-off riders a short distance off the route.⁴⁹

Social Support

Community Resources

13.4% of households received Snap Benefits and 1.6% of households received some kind of cash assistance income.⁵⁰

Incarceration

The Bradley County Jail is designed for a capacity of 520 inmates with the addition of the workhouse. The average number of inmates is 480.

⁴⁷ Bradley County Land-Use Plan

⁴⁸ U.S. Census Bureau. "Selected Housing Characteristics." American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP04, 2022

⁴⁹ Bradley County Comprehensive Plan

⁵⁰ U.S. Census Bureau. "Selected Economic Characteristics." American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP03, 2022

⁵¹ Bradley County Comprehensive Plan

⁵² City of Cleveland

⁵³ BCC 2035 Joint Strategic Plan

Cultural Character

Scenic

Among the natural treasures of Bradley County are the Cherokee National Forest, Ocoee River, Red Clay State Historic Park and Hiwassee State Scenic River. The Bradley County Parks and Recreation Department oversees the following parks and open space within Bradley County: Bradley County Recreational Park, Elrod Park, Blue Springs Park, Bradley North Park, Freedom Park and the county office green space. According to the National Recreation and Park Association (NRPA), 10 acres of parks and open space should be provided for every 1,000 residents. In addition to the county-operated open spaces, Bradley County also includes Candie’s Creek Wildlife Management Area, and Red Clay State Park⁵¹

Historic

Bradley County was originally home to the Cherokee Nation and significant Cherokee historical sites are located throughout the county to include the last eastern home of Chief John Ross, the original home of his brother Lewis Ross, the former location of Fort Cass and Rattlesnake Springs, the holding camps for the Cherokee during the first stage of the Trail of Tears.⁵²

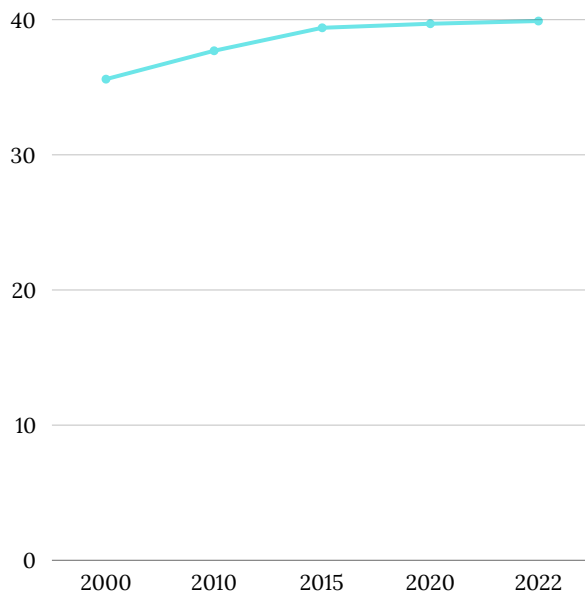
Natural

Much of the soil in Bradley County is not suitable for septic tanks and directly impacts the urban growth area causing restrictions on how and where growth and development can occur. According to the 2035 BCC Joint Strategic Plan, 23% of Bradley County has moderate constraints to development and 21% has severe constraints to development.⁵³

Based on social determinants, geographic, and demographic information of Bradley County, the following observations can be made:

- A significant increase in total population over time impacts healthcare providers and the utilization of community resources.⁵⁴
- The size of the workforce, and the shift between those entering and exiting, impact the health and strength of a county’s economy. The State and County reflect similar age distribution. The median age in Bradley County has been increasing over time from 35.6 in 2000⁵⁵ to 39.9 in 2022⁵⁶, a steadily increasing aging population.
- Living wage and actual wage are aligned, such that the expectation is the average population is able to afford what is considered basic needs, including potential broadband or device access. Yet, as of January 2024, 10,309 people were enrolled in Bradley County in the now defunct ACP⁵⁷, showing affordability is still an issue in Bradley County.
- The more education the population receives, the more likely they will earn more than the poverty level. Ensuring adequate educational opportunities is key for quality of life.
- There has been a significant increase in the hispanic population revealing a need to increase resources accordingly.
- Among those 65 and older, 42.86% have a disability, showing that more than one determinant can impact an individual.⁵⁸
- Older apartment buildings have connectivity challenges associated with them, including maintaining connection over WiFi, insufficient bandwidth, and difficulty implementing repairs and upgrades to wiring.⁵⁹
- Cost burdened housing is more likely to impact those who are renting, and affordable housing options needs to be a priority for Bradley County, as well as increased opportunities for the workforce and associated income levels.

MEDIAN AGE⁶⁰



⁵⁴ SparkMap

⁵⁵ U.S. Census Bureau. "Profile of General Demographic Characteristics: 2000." Decennial Census, DEC Summary File 4 Demographic Profile, Table DP1, 2000

⁵⁶ U.S. Census Bureau. "Age and Sex." American Community Survey, ACS 5-Year Estimates Subject Tables, Table S0101, 2022

⁵⁷ To qualify for ACP (which ran December 2021 to February 2024), households must have met at least one of the following example criteria: income at or below 200% of the federal poverty guidelines, participated in the assistance programs (SNAP, Medicaid, Federal Public Housing Assistance, SSI, WIC, or Lifeline), among other criteria

⁵⁸ U.S. Census Bureau. "Disability Characteristics." American Community Survey, ACS 5-Year Estimates Subject Tables, Table S1810, 2022

⁵⁹ Fierce Network

⁶⁰ U.S. Census Bureau. "Profile of General Demographic Characteristics: 2000." Decennial Census, DEC Summary File 4 Demographic Profile, Table DP1, 2000

U.S. Census Bureau. "AGE AND SEX ." American Community Survey, ACS 5-Year Estimates Subject Tables, Table S0101, 2010

U.S. Census Bureau. "AGE AND SEX ." American Community Survey, ACS 5-Year Estimates Subject Tables, Table S0101, 2015

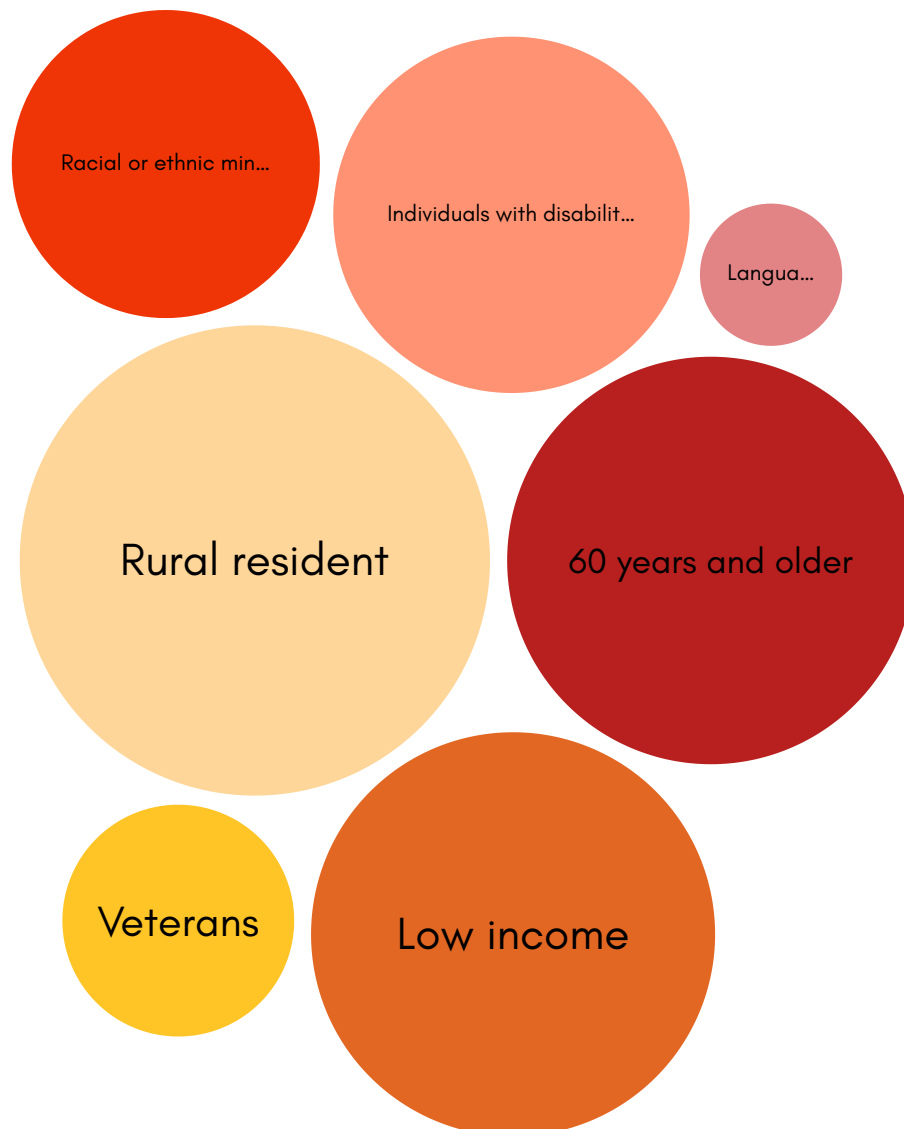
U.S. Census Bureau. "AGE AND SEX." American Community Survey, ACS 5-Year Estimates Subject Tables, Table S0101, 2020

U.S. Census Bureau. "Age and Sex." American Community Survey, ACS 5-Year Estimates Subject Tables, Table S0101, 2022

Documented Presence of Covered Populations

The covered populations, as defined in the Infrastructure Investment and Jobs Act (IIJA), would see an impact from projects and outcomes that result from the Digital Equity Act (DEA) and Broadband Equity, Access, and Deployment (BEAD) programs. In Bradley County, these covered populations identified as most prevalent are:

- Individuals living below 150% of the poverty level
- Residents of rural areas
- Individuals with disabilities
- The aging and elderly



General Community Economic and Workforce Status

“Research suggests people living in high poverty areas experience significant barriers to wellbeing whether or not they’re poor themselves. The longer poverty exists in an area, the more likely the community lacks adequate infrastructure and support services.”⁶¹

Bradley County, Tennessee is designated as a transitional county, which is defined as a county that is moving from a weak economy to a strong economy. According to the US Census, there are four census tracts with persistent poverty in Bradley County (based on data over a thirty year time period and represents census tracts that have over 20% of the population in persistent poverty).⁶² The following census tracts were designated as distressed areas (distressed areas are designated only in at-risk and transitional counties)⁶³:

- Census Tract 107, with a population of 5,185, has a median family income of \$50,025 which is 54.0% of the national average and a poverty rate of 25.5%
- Census Tract 108, with population of 3,161, has a median family income of \$39,112 (42.2% of national average) and a poverty rate of 31.1%
- Census Tract 104, with population of 2,815, has a median family income of \$24,800 (26.8% of national average) and a poverty rate of 48.2%

“One thing shared between all citizens is the spirit of community. Above all else this spirit of community has pushed Cleveland to prosper with each new generation and that very spirit of community is what ensures a bright future ahead for Cleveland.”⁶⁴ - City of Cleveland

⁶¹ U.S. Census

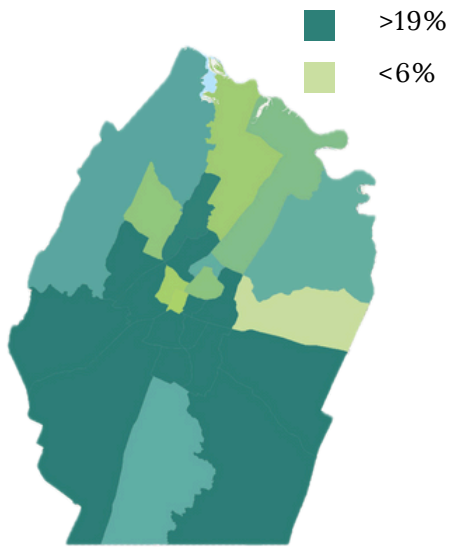
⁶² To identify counties in persistent poverty, poverty estimates from the 1990 and 2000 Censuses, the 2005–2009 American Community Survey (ACS) 5-year estimates, and the 2015–2019 ACS 5-year estimates were used.

⁶³ ARC

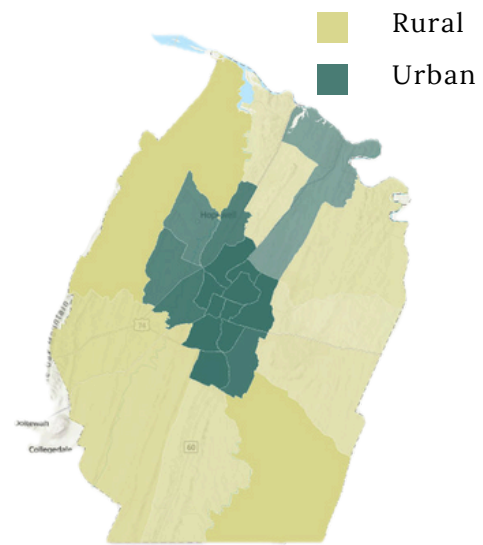
⁶⁴ City of Cleveland

Covered populations can belong to more than one group and populations often overlap. The following mapping shows areas most likely to be impacted by targeted implementation strategies. Those living in rural areas are often negatively affected by limited infrastructure and stand to benefit from funding opportunities like the BEAD program. Similarly, individuals with disabilities and those 60 years old and older are more likely to benefit from funding through the DEA or a combination of programs.

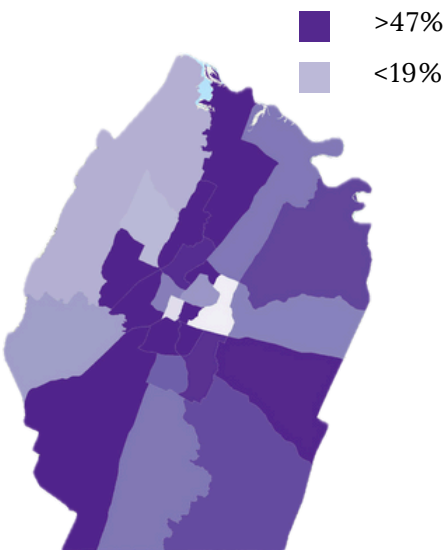
POPULATION WITH DISABILITY⁶⁵



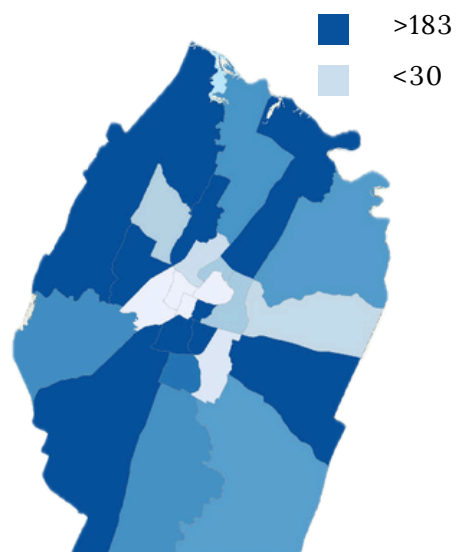
URBAN VS RURAL POPULATION⁶⁶



POPULATION 65+ WITH DISABILITY⁶⁷



POPULATION 60+ BELOW POVERTY (COUNT)⁶⁸



⁶⁵ Map generated through ESRI using U.S. Census Bureau's American Community Survey (ACS) 2018-2022 5-year estimates, Table(s) B18101, B18102, B18103, B18104, B18105, B18106, B18107, C18108

⁶⁶ Map generated through ESRI using U.S. Census Bureau's 2020 Census Demographic and Housing Characteristics information

⁶⁷ Map generated through ESRI U.S. Census Bureau's American Community Survey (ACS) 2018-2022 5-year estimates, Table(s) B17020, C17002

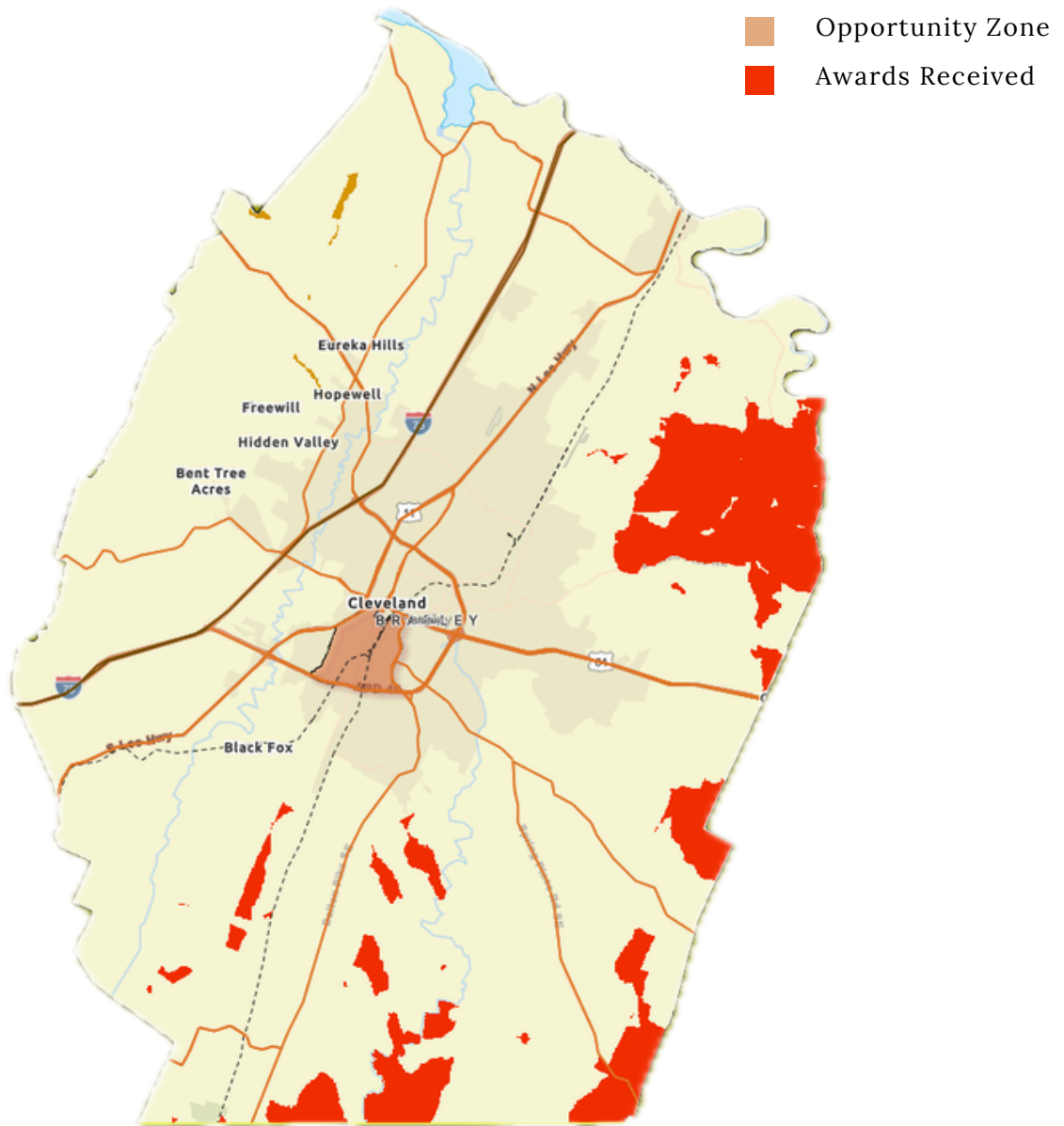
⁶⁸ Map generated through ESRI using U.S. Census Bureau's American Community Survey (ACS) 2018-2022 5-year estimates, Table(s) B18101

Previous Funding Sources for Broadband Implementation Strategies

Bradley County has secured funding through a variety of state and federal grants, and has collaborated with Volunteer Energy Corporation (VEC) on projects by providing matching funds or contributing half of the required funding through direct match grants.

Project	Homes/Businesses in Project Area	Started	Finished	Percentage Complete	Funding Source
Pilot - Bigsby Creek Road, No Pone Road Phase 1, Van Davis Road	391	July 2017	December 2017	100%	VEC
Pilot - No Pone Road Phase 2	299	April 2018	October 2018	100%	VEC
East Bradley - Tasso A and Tasso B	257	April 2023	August 2023	100%	ARP
West Bradley - Owl Hollow	260	July 2023	May 2024	100%	ARP
East Bradley - Chestuee Road	412	March 2024	In progress Phase 1 and 2 complete Phase 3 underway (Chestuee)	20%	ARP
West Bradley 3 Phases	499	March 2024	In progress Phase 1 complete Phase 2 underway	17%	ARP
South Bradley - McDonald 3 Phases	867	July 2024	In progress Phase 1 complete Phase 2 underway	37%	Bradley County

The following maps demonstrate areas that have already received funding through the Rural Digital Opportunity Fund (RDOF). There were only a few areas in Bradley that were eligible for state awards.



State Data

The State of Tennessee has developed a Digital Opportunity Plan which includes a detailed assessment of the digital divide and an implementation plan for achieving digital opportunity. Additionally, the State, in response to grant funds from the National Telecommunications and Information Administration (NTIA), has created Initial Proposal(s) Volume I and II for how to distribute the funds from the Broadband Equity, Access, and Deployment (BEAD) Program and what the resulting impacts will be for the State of Tennessee.

Broadband Plan	Purpose of Broadband Plan
<i>Digital Opportunity Plan</i> ⁶⁹	<i>Outlines the goals and strategies the Tennessee Department of Economic and Community Development will deploy to close the digital divide. The primary objective is to expand existing digital opportunities by working with state and local stakeholders to increase the availability and quality of services provided statewide.</i>
<i>BEAD Initial Proposal Volume I</i> ⁷⁰	<i>Details how the State of Tennessee will meet all requirements of NTIA’s BEAD Notice of Funding Opportunity. Includes previous efforts to deploy broadband funded by the federal government or the State of Tennessee, identifies <u>unserved</u> and <u>underserved</u> locations, as well as addresses how the State is approaching <u>community anchor institutions</u> and the challenge process.</i>
<i>BEAD Initial Proposal Volume II</i> ⁷²	<i>The State of Tennessee has created a detailed <u>broadband accessibility</u> map that is reflective of this.⁷¹</i>
<i>BEAD Initial Proposal Volume II</i> ⁷²	<i>Describes how the State of Tennessee will distribute the allocated BEAD funding in compliance with state and federal requirements.</i>

⁶⁹ Digital Opportunity Plan

⁷⁰ BEAD Initial Proposal I

⁷¹ Tennessee Broadband Connected GIS

⁷² BEAD Initial Proposal II

Identify and Document State Priorities

The State of Tennessee’s vision for digital opportunity is one such that all Tennesseans have access to affordable and reliable internet service and the digital literacy skills necessary to access digital opportunities. The primary goal for closing the digital divide in Tennessee is to expand existing digital opportunities through the collaboration and partnership of stakeholders to increase the availability of the services and also the quality of services provided.

To achieve this vision, Tennessee Department of Economic and Community Development (TNECD) has established three goals⁷³ for itself:

1. Serve as a catalyst to magnify current efforts
2. Convene stakeholders and communities to develop new relationships, and
3. Communicate success stories and best practices that unfold across the State.

Statewide, TNECD has established five goals for Digital Opportunities:

1. Expand digital opportunity infrastructure and awareness statewide
2. Enhance broadband availability and affordability
3. Improve online accessibility and inclusivity of state agency resources
4. Help Tennesseans develop the digital skills needed for work and life
5. Expand access to affordable devices and technical support

Additionally, the State’s Digital Opportunity Plan further describes how broadband connectivity meets the State’s broader goals:

Economic and Workforce Development

To be the #1 state in the Southeast for high quality jobs⁷⁴

Educational Outcomes

To be the fastest improving state in the country

Health Outcomes

To promote healthy behavior and provide high quality services to our most vulnerable populations

Delivery of other Essential Services

To be the best managed state, providing high-quality services at the lowest possible price to taxpayers

⁷³ The State of Tennessee Digital Opportunity Plan

⁷⁴ TN.gov High Quality Job Commitments

According to the State of Tennessee’s Digital Opportunity Plan, the following priorities are being implemented:

Priority

Expand digital opportunity infrastructure and awareness statewide

Enhance broadband availability and affordability

Improve online accessibility and inclusivity of state agency resources

Help Tennesseans develop the digital skills needed for work and life

Expand availability of affordable devices and technical support

Strategy

- *Strengthen and expand the Digital Opportunity Task Force*
- *Increase percentage of at risk and distressed counties having at least one tele-health access point*
- *Raise awareness of the Digital Opportunity efforts and impacts underway*

- *Through federal funds, deploy broadband to all remaining unserved and underserved (less than 100/20 Mbps) locations*
- *Ensure state prisons have at least one Gig*
- *Make internet more affordable to all covered populations*

- *Assessment of state department websites to identify barriers and opportunities to improve online accessibility for specific covered populations*
- *Develop training modules for all covered populations that teach users how to navigate government websites and access resources*

- *Expand the availability of digital skills programs through a competitive grant program*
- *Expand the availability of workforce development programs through a competitive grant program*
- *Develop cybersecurity training modules, digital safety best practices, and promotional messages, specifically customized for all covered populations*

- *Require TNECD funded digital skills and workforce programs to provide a no or low-cost laptop or desktop pathway*
- *Develop a refurbishment platform to promote device availability and affordability to organizations that serve covered populations*
- *Create a statewide technical assistance hub to provide support to Tennesseans who need basic assistance with digital devices at no cost*

Summary of the State’s Goals

According to the State of Tennessee’s Digital Opportunity Plan, the following priorities are being implemented across the State through both the BEAD and DEA programs:

Goal	Description	Impact
<p><i>To be the #1 State in the Southeast for high quality jobs</i></p>	<p><i>Make rural areas more attractive for advanced manufacturing firms that require interconnectivity and a digitally skilled workforce to effectively operate in an Industry 4.0 world</i></p> <p><i>Increase labor participation by members of all covered populations throughout Tennessee with online employment information, training programs, and remote work opportunities</i></p> <p><i>Increase small business development opportunities and entrepreneurship skills throughout the state through access to education and training, entrepreneurship counseling, global markets, e-commerce opportunities, access to capital, and other tools and resources that enhance business creativity and innovation</i></p>	<p><i>Growth of capital investment in rural areas, high quality jobs, and reduce the number of rural, distressed counties</i></p> <p><i>A critical workforce driver will be significantly impacted</i></p> <p><i>Make Tennessee the best state in the nation for start-up businesses</i></p>
<p><i>Be the fastest improving state in the country, as defined by educational attainment levels and the presence of a skilled workforce</i></p>	<p><i>Enable more students representing all covered populations to participate in online learning opportunities that lead to degrees and certificates</i></p>	<p><i>More Tennesseans equipped with a college degree or certificate</i></p>

PRELIMINARY RESEARCH AND READINESS

Goal	Description	Impact
	<p><i>Expand opportunities for educators in K-12 professional development, bachelor’s and graduate degrees, and educator interaction, through enhanced broadband services to help educators increase student and parent access to E-learning platforms, homework assignments, and other school information</i></p> <p><i>Expand participation in the Adult Education Program by members of all covered populations</i></p>	<p><i>Quality of teaching and learning as well as increased access and opportunity for all students</i></p> <p><i>Connect with covered populations across the state</i></p>
<p><i>A healthier Tennessee, made possible by promoting healthy behavior and providing high quality services to our most vulnerable populations</i></p>	<p><i>Access includes optimizing clinical efficiency, improving external primary care access, leveraging innovation through tele-health, and expanding partnerships</i></p> <p><i>Create collaborative pathways to resilience, recovery, and independence for Tennesseans living with mental illness and substance abuse disorders</i></p>	<p><i>Connecting more Tennesseans with healthcare education, information, and services</i></p> <p><i>Increasing digital access to crisis services and other behavioral health safety net services to covered populations and underserved communities across the state</i></p>
<p><i>Advancing civil and social engagement and making Tennessee the best managed state</i></p>	<p><i>Make state agency resources more accessible to members of all covered populations, particularly aging individuals, and people with disabilities</i></p> <p><i>Increasing digital literacy to covered populations and expanding access to underserved communities</i></p>	<p><i>Improve access to information, enhance civic education, and increase participation in community activities</i></p> <p><i>Increases transparency which is key to informed civic engagement</i></p>

Existing State Grant Opportunities

The Digital Opportunity Plan builds upon already existing broadband programs in the state including the Broadband Ready Community (BRC) and the Training Opportunities for the Public (TOP), established in 2017 through the Broadband Accessibility Act. TOP allocated funds to public libraries for hotspots, laptop equipment, and digital skills training through grants. The Broadband Community Designation is a county level administration ordinance that removes barriers for broadband deployment. Bradley County received the Broadband Ready Community designation in October 2018. The Broadband Ready Community designation historically awards additional points on state grant applications.

Method for Determining Eligibility

The State of Tennessee's BEAD Initial Proposal Volume I describes the process being undertaken to identify eligible locations for funding, as shown below:

- The State of Tennessee identified the existing broadband funding allocated within the state (Requirement 3), including sources of funding, description of the funded activities, total funding, amount expended and remaining funding available. This step was necessary to prevent any locations with existing broadband funding from being eligible to receive BEAD funding.
- The State identified unserved locations as those with service below 25 Megabits per second (Mbps) download and 3 Mbps upload speeds, and underserved locations as those with service below 100 Mbps download and 20 Mbps upload speeds (Requirement 5), utilizing Federal Communications Commission (FCC) National Broadband Map data collected through the Broadband Data Collection process (data as of December 31, 2022).
- The State identified the types of Community Anchor Institutions (Requirement 6) eligible to receive BEAD funding within the state, including a "school, library, health clinic, health center, hospital or other medical provider, public safety entity, institution of higher education, public housing organization (including any public housing agency, HUD-assisted housing organization, or Tribal housing organization), or community support organization that facilitates greater use of broadband service by vulnerable populations, including, but not limited to, low-income individuals, unemployed individuals, children, the incarcerated, and aged individuals."⁷⁵
- The State confirmed that it will adopt the NTIA's BEAD Model Challenge process (Requirement 7), with minor modifications that added specificity, and allowed for all identified eligible locations to be reviewed and challenged ahead of the BEAD Subgrantee selection process. Modifications include not adopting additional pre-challenge modules.
- Following the completion of the State's BEAD Challenge process, the State may modify the eligibility of certain locations with enforceable commitments, planned service deployment, and allow for a rebuttal phase prior to making its final determination.

⁷⁵ BEAD Initial Proposal I

Further details regarding the State's Deployment Subgrantee Selection process (Requirement 8), can be found in Volume II of the BEAD Initial Proposal. According to the State's plans, TNECD will implement all Subgrantee Accountability Procedures mandated by NTIA. These include rules for disbursement, claw-back mechanisms, reporting and monitoring. The State will accept BEAD proposals geographically based on published application areas which will include a list of unserved and underserved locations within these areas. Applicants must submit a letter of intent and commit to serve 100% of eligible broadband serviceable locations (BSLs) in the application areas. TNECD will use both a technical review and community support review in the scoring. Among the primary criteria for BEAD awards, affordability points will be awarded based on the monthly service costs for speeds of 1G symmetrical, encouraging lower priced options. Secondary criteria will include speed to deployment and the economic and community impacts specifically to low and middle income households. Other requirements also include Environmental and Historic Preservation as well as Build America, Buy America Act compliance.

To achieve the State of Tennessee's vision, broadband access is described as all Tennessee households and businesses having fixed terrestrial connection with speeds of at least 100/20 Mbps with the ability to scale to meet future speed needs. For all Tennesseans who do not yet have access to broadband infrastructure, there should be access to an interim solution which could include access at a community anchor institution or other public WiFi location. In addition to access, all Tennessee residents should have options for plans which meet needs for both adequate speed and cost. **Digital Opportunity is described by the State as all Tennessee residents having access to resources to learn and improve digital skills to enable the use of a connected device as well as having access to an affordable device.**

Applicant Grant Readiness

Bradley County has obtained the following federal registrations and information, as required to apply for federal funding programs:

- Assigned and active Federal Tax ID
- Assigned and active Unique Entity Identification (UEI) number
- Completed entity registration in SAM.gov

Current Internet Access, Adoption, and Use

Understanding the current landscape of the broadband infrastructure and services in Bradley County will enable strategic planning to target and prioritize closing the digital divide and offering equitable broadband opportunities to all residents and businesses. This approach will also need to include minimizing risk to achieve a connected and resilient community.

Data analyzed by Thrive Regional Partnership on behalf of Bradley County include, but were not limited to:

- Availability
 - Mapping created by Reid Consulting Group, LLC in June 2024 for Connect Humanity, as part of the Appalachian Broadband Accelerator Program
 - Speed tests from FCC data and Ookla
- Affordability
 - Mapping created by Reid Consulting Group, LLC in June 2024 for Connect Humanity, as part of the Appalachian Broadband Accelerator Program
 - American Communities Survey (ACS) Census 5-year estimates mapped in ESRI
 - Census data from the ACS 5-year estimates compiled and analyzed by Thrive Regional Partnership

- Adoption and Device Information
 - Census data from the ACS 5-year estimates compiled and analyzed by Thrive Regional Partnership
 - Data compiled by Jimmy Boogs of Generation West Virginia for Connect Humanity, as part of the Appalachian Broadband Accelerator Program
- Type of Broadband Service and Internet Service Providers
 - Mapping created by Reid Consulting Group, LLC in June 2024 for Connect Humanity, as part of the Appalachian Broadband Accelerator Program
 - FCC data
 - Census data from the ACS 5-year estimates compiled and analyzed by Thrive Regional

The majority of the data tables referenced and analyzed from the FCC are based on census blocks; mapping utilized a combination of census tracts, blocks, or H3 geospatial indexing (hexagons). Ookla speed testing used tiles. In addition, most of the data analyzed in relation to internet service providers is based on connected population and census blocks and may not add up to the entire state population/units/square miles.

Currently Available Internet Services

To analyze available internet services, Bradley County’s Connectivity Plan project team reviewed data provided by Connect Humanity of publicly available local datasets and broadband data sources. This data was compiled to reflect the existing broadband landscape, including:

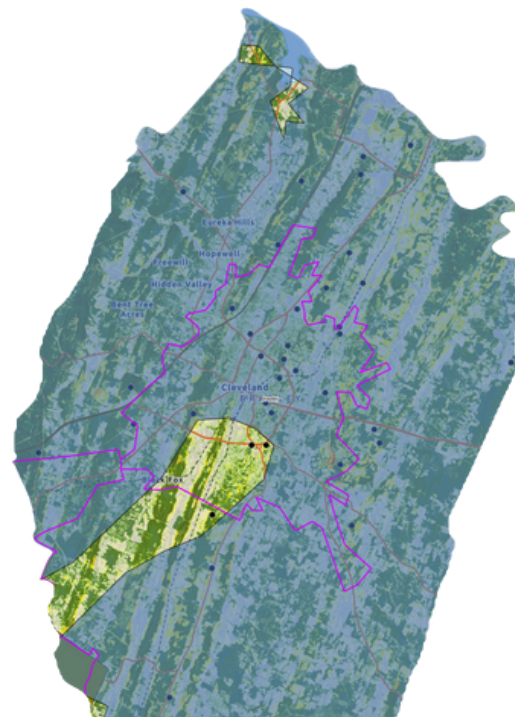
- An inventory of existing fiber networks within the county, including vertical structures, roads, ridges/slopes, and administrative forest overlay;
- An overview of previous awards, award eligibility, and qualified opportunity zones;
- An overview of poverty levels and previous ACP subscribers;
- An overview of current broadband providers’ services, speed testing, and coverage areas;
- To the best extent possible, the locations of existing fiber and broadband-related electronics; and
- To the best extent possible, device access; and
- To the best extent possible, areas of no access.

Bradley County benefits from an established cooperative partnership between Volunteer Energy Cooperative (VEC) and Twin Lakes, which provides fiber optic broadband service to the majority of the county. Rooted in the community’s historical spirit of cooperation, VEC is a member-owned, member-controlled cooperative, giving local residents the autonomy and independence to address their needs and interests.

Operating based on seven core principles—voluntary membership, democratic control, economic participation, autonomy, education, cooperation, and community concern—VEC ensures that services are offered at cost, with profits reinvested into the community. Through this collaboration, VEC and Twin Lakes work together to provide reliable internet service to members in Bradley and Polk Counties, furthering their shared commitment to community growth and connectivity⁷⁶.

In addition to VEC, Bradley County is provided with electrical power from Cleveland Utilities (within the City of Cleveland and surrounding area) and EPB (western portions of the county adjacent to Hamilton County), both of whom also provide broadband service in their power footprint. The following map demonstrates these electrical power boundaries with the purple line.

ELECTRIC CO-OPS



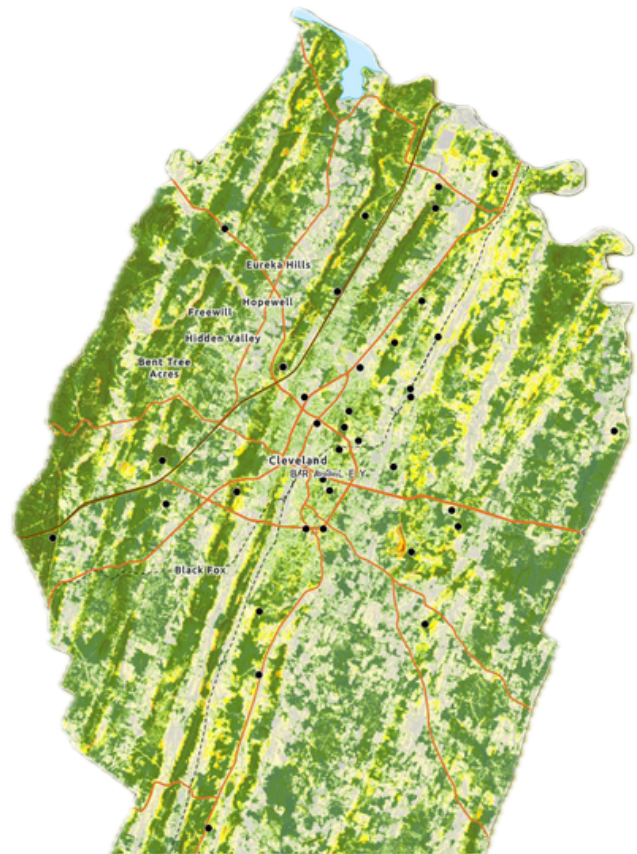
⁷⁶ VEC

“In addition to limiting the developability of land, the ridges and valleys of the surrounding county make the construction of east-west connecting roads very challenging. Cleveland has strong road connections within its core area surrounding the downtown, but faces limited connections to eastern and western portions of the county. Due to this, the carrying capacity of much of the county’s existing road network to support additional development in a safe manner is limited. In addition, severe slopes present challenges in the provision of utilities, other municipal facilities, and adequate drainage⁷⁷.” - Bradley County Joint Strategic Comprehensive Plan 2035

Broadband infrastructure expansion faces the same challenges described for connecting eastern and western portions of the county. The landscape and existing infrastructure of Bradley County includes tree canopy, slopes, and the railroad line which runs centrally through the county north to south which are considerations for broadband expansion in regards to permitting and expansion limitations. However, there are no administrative forests, national parks, or wildlife areas in Bradley which have a more extensive/time consuming permitting processes and have considerations for protecting the habitat and natural ecosystems. There is an acknowledgement that as the county continues to grow, demand will be placed on the current county services, which will include broadband infrastructure. There is a need for coordinated development for current implementation to meet future needs especially as it relates to the southern part of the county, as Bradley County has not been successful in receiving grants to fund projects in this area.

The following map displays the tree canopy, slopes, and railroad line along with registered vertical structures.

VERTICAL STRUCTURES



- Solid brown lines represent primary roads
- Solid orange lines represent secondary roads
- - Dashed black lines represent rail lines
- Solid dot represents antenna structures

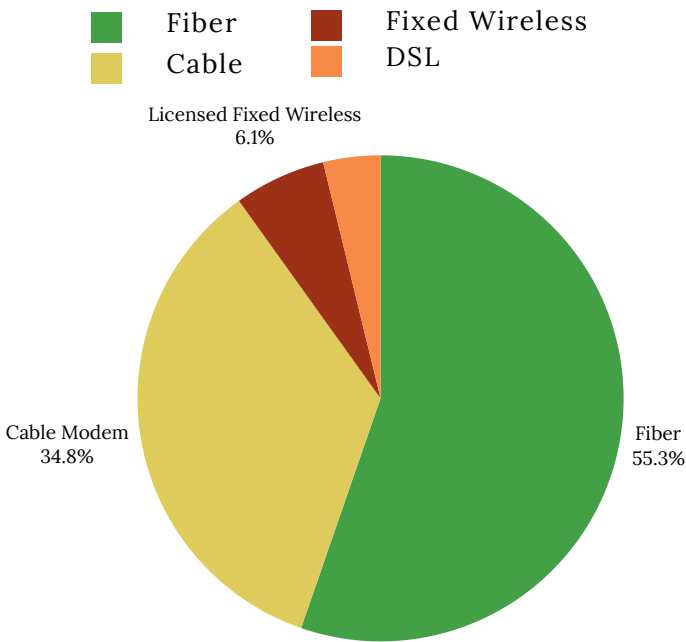
⁷⁷ Bradley County Comprehensive Plan

Truth on the Ground

According to Broadband Deployment Data from the FCC, the following five technologies are currently deployed to connect Bradley County residents and businesses to the internet:

1. Wired Broadband: Fiber, Cable, and Asymmetrical DSL
2. Wireless Broadband: Fixed Wireless and Satellite (not represented in pie chart or map)

TECHNOLOGY PROVIDED BY SQUARE MILES

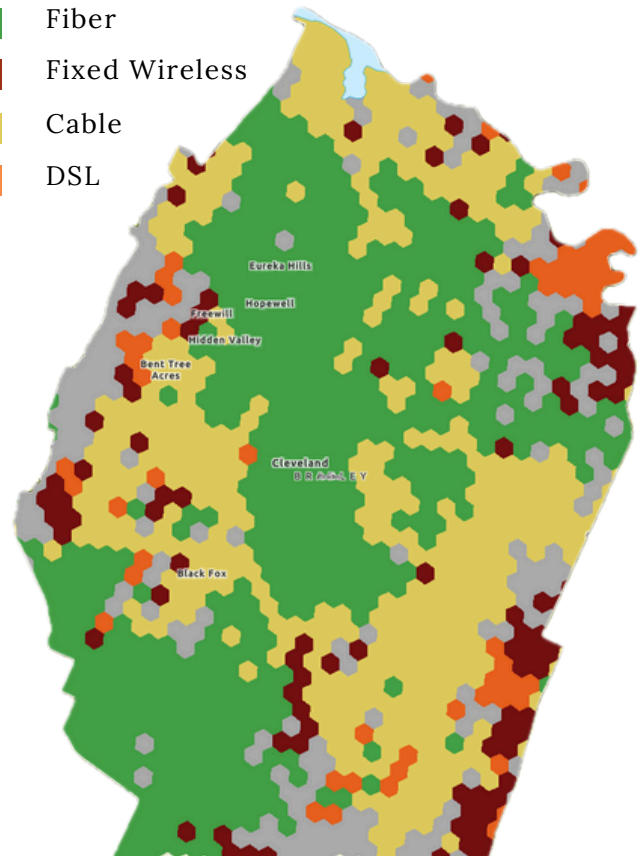


For those with internet service, fiber is used in more census units than any other connection type:

- Fiber - there are pockets of slow speed tests but overall it performs well
- DSL and Licensed Fixed Wireless (if tested) - connections are more likely to perform poorly
- Cable (dependent on the area) - overall there is variation in performance with some areas performing better than others

TOP TECHNOLOGY

- Fiber
- Fixed Wireless
- Cable
- DSL

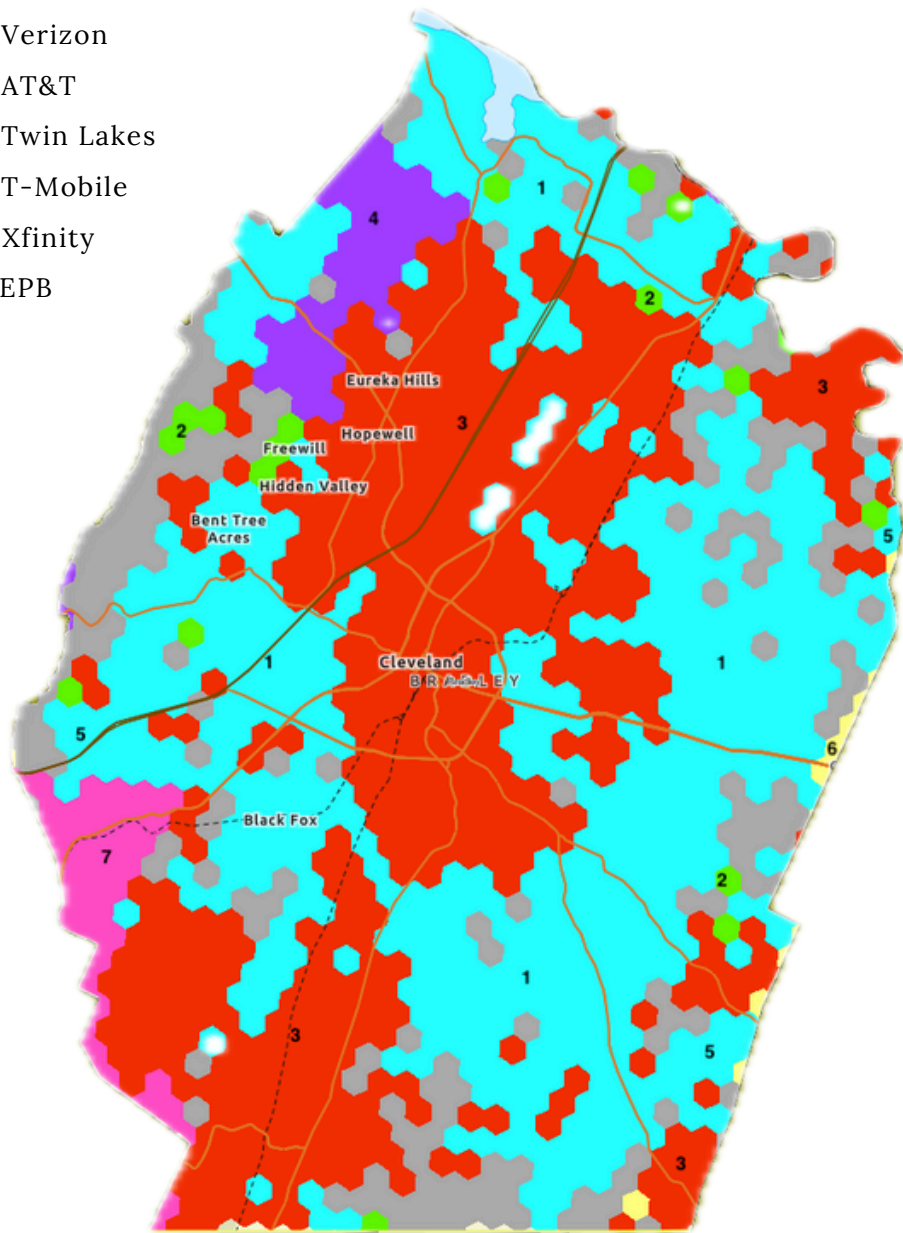


Tech Type	Total Census Units	Square Mile Covered	% Square Mile Coverage
Fiber	31,008	168.49	55.3%
Cable Modem	12,534	105.88	34.8%
Licensed Fixed Wireless	543	18.61	6.1%
DSL	386	11.65	3.8%

The FCC Broadband Deployment Data identifies the following top eight internet service providers (ISPs) in Bradley County. There are eight providers listed in Bradley County, to include Windstream Georgia Communications, LLC. However, Windstream Georgia Communications, LLC currently does not have significant enough of a presence in Bradley County to be represented on any of the maps.

TOP ISP

- 1 Charter
- 2 Verizon
- 3 AT&T
- 4 Twin Lakes
- 5 T-Mobile
- 6 Xfinity
- 7 EPB



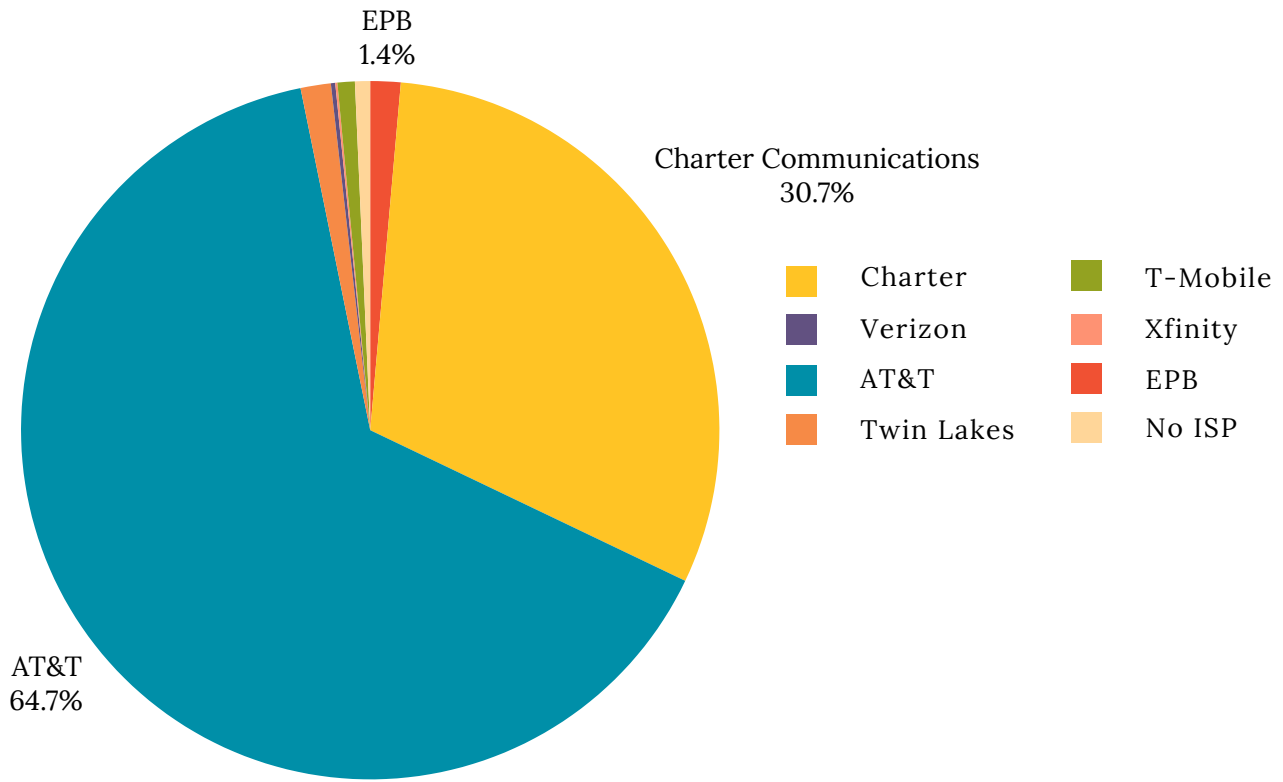
PRELIMINARY RESEARCH AND READINESS

These broadband services are offered by eight ISPs:

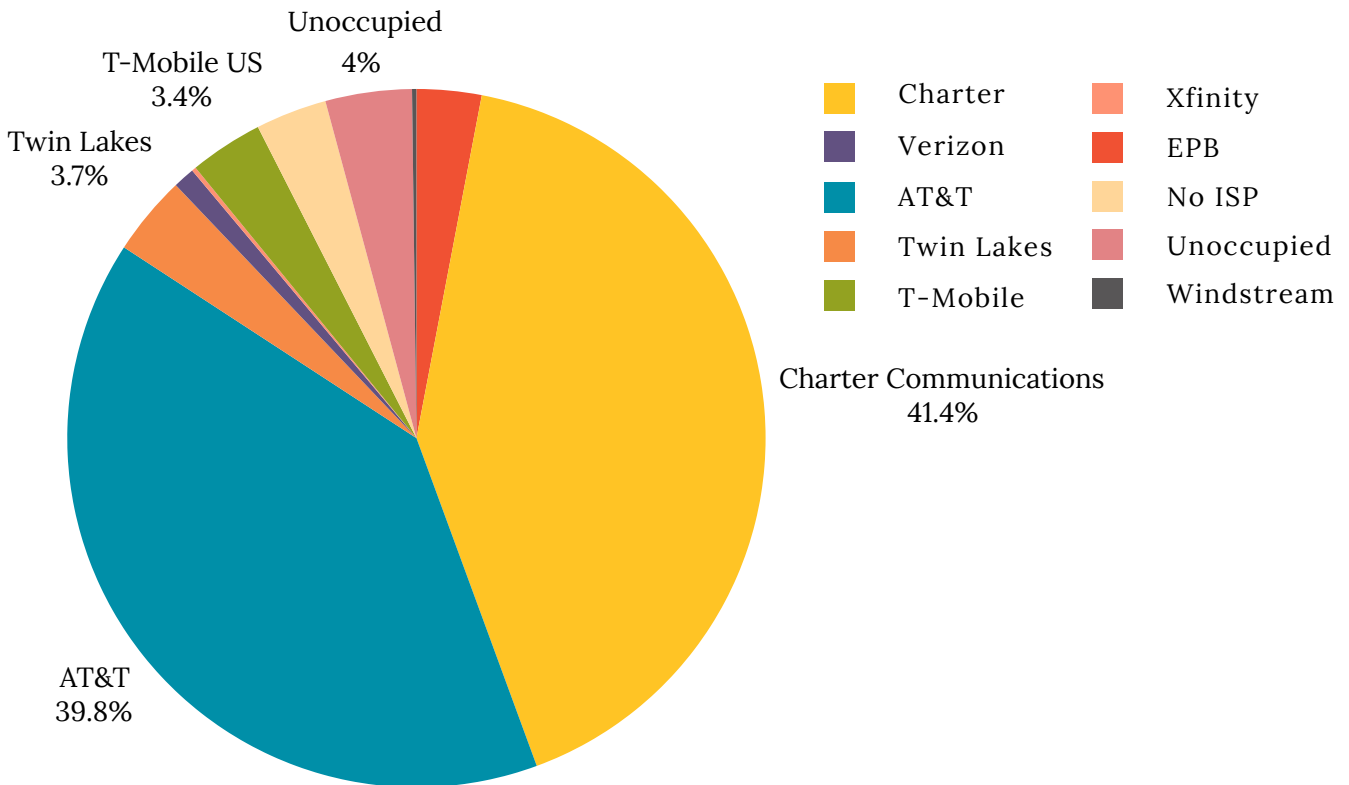
- Fiber: EPB, AT&T Inc, Twin Lakes, Charter Communications Inc
- Cable: Xfinity, Charter Communications Inc
- Licensed Fixed Wireless: VERIZON, T-Mobile US, AT&T Inc
- DSL: Windstream Georgia Communications, LLC, AT&T Inc

ISP	Tech Type	Total Census Units	% of Units	Total Sq. Mile	% of Sq Mile
AT&T Inc	DSL, Fiber, Licensed Fixed Wireless	28,967	64.7%	131	39.8%
Charter Communications Inc	Cable Modem, Fiber	13,750	30.7%	136	41.4%
T-Mobile US	Licensed Fixed Wireless	370	0.8%	11	3.4%
EPB	Fiber	639	1.4%	10	3.0%
Twin Lakes	Fiber	610	1.4%	12	3.7%
VERIZON	Licensed Fixed Wireless	103	0.2%	3	1.0%
Xfinity	Cable Modem	31	0.1%	1	0.2%
Windstream Georgia Communications, LLC	DSL	1	0.0%	0	0.0%
Occupied with no service or ISP listed		307	0.7%	11	3.3%

ISP SHARE BASED ON CENSUS UNITS

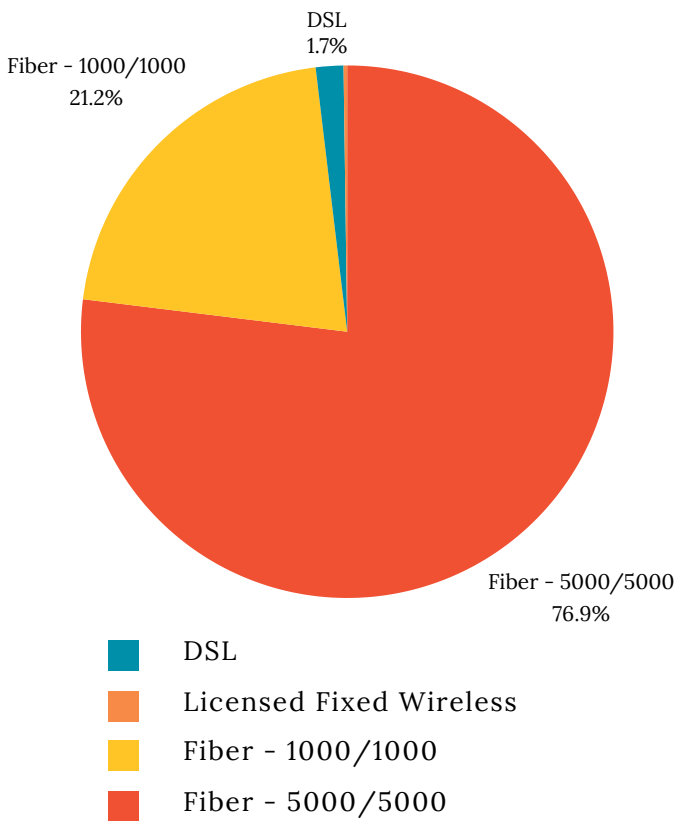


ISP SHARE BASED ON SQUARE MILES



AT&T has the largest number of census units of any one provider, accounting for almost 60% of the total census units and census population. AT&T provides three different types of technology: Licensed Fixed Wireless, DSL, and Fiber. AT&T claims many different speeds even among the same type of technology. AT&T performs fairly well overall, especially in fiber.

SHARE OF AT&T BY TECHNOLOGY AND SPEED

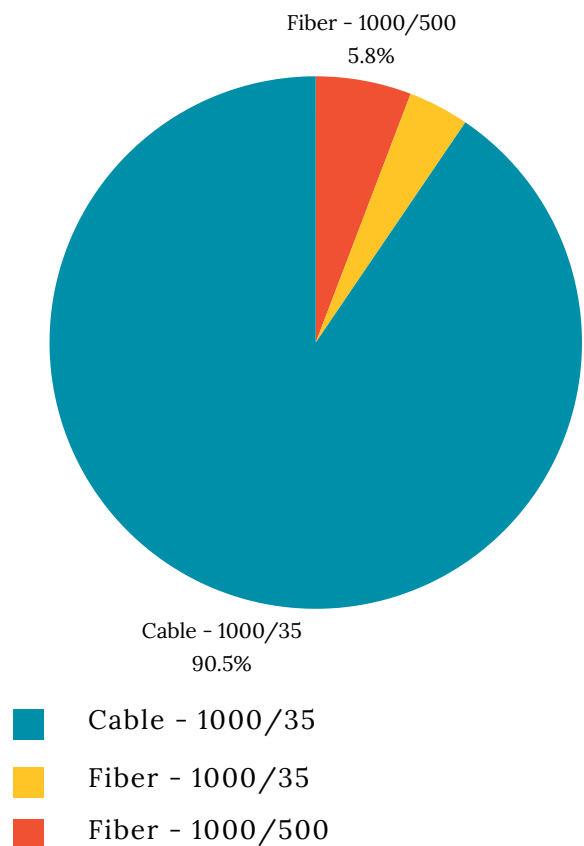


EPB claims speeds of 25000 Mbps symmetrical and their fiber connections usually perform well when compared to speed tests. EPB accounts for less than 2% of the census units.

Twin Lake reports speeds of 2000/1000 Mbps with their fiber network. Twin Lake accounts for less than 2% of the census units. Their service area isn't large but overall they have good performance.

Charter Communications is the second largest provider according to the number of census units served. Charter services 30% of the census units and census population. While it doesn't reach as many census units as AT&T, it covers more square miles, at 40% of Bradley County. Charter Communications uses mainly cable at speeds of 1000/35 Mbps and fiber at two different reported speeds of 1000/500 Mbps and 1000/35 Mbps. The speed test results show it comes close to its claim in many areas; however, there are areas with mixed speed test results.

SHARE OF CHARTER BY TECHNOLOGY AND SPEED

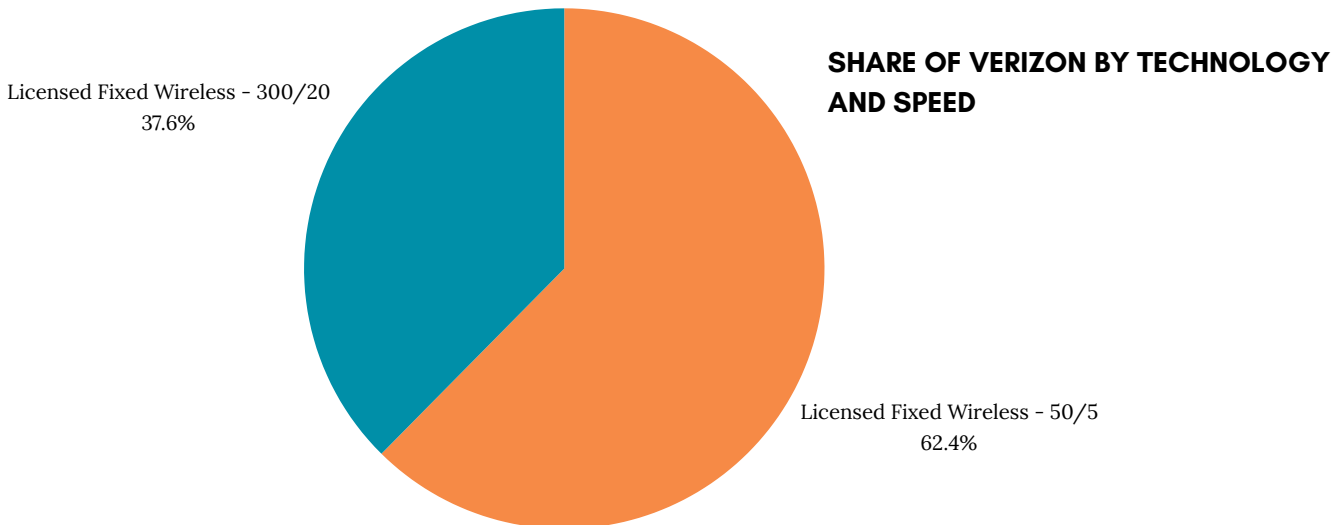
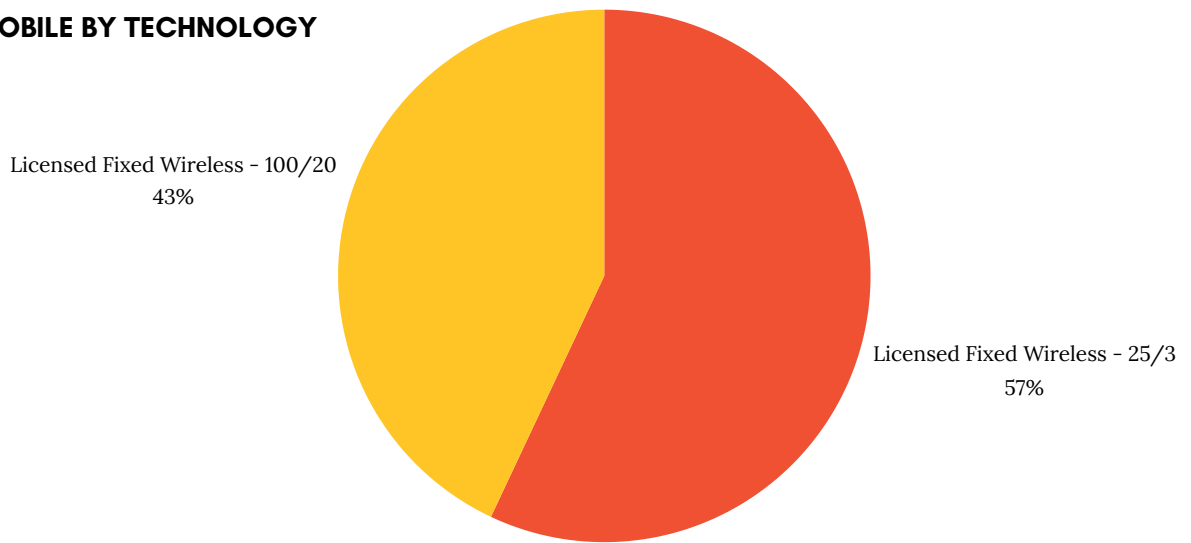


Windstream Communications, LLC is listed as a service provider but they only cover one census block, with one census unit. They use DSL with 10/1 Mbps, which is considered unserved according to the FCC.

T-Mobile and Verizon both perform poorly with their Licensed Fixed Wireless networks. Their coverage is mainly on the perimeters of Bradley County and their speeds are more likely to be measured as slower than reported in speed tests, with claim speeds ranging from 10/1 Mbps to 300/20 Mbps. When compared to other providers in Bradley County, these claimed speeds are still slower, and some areas are considered unserved.

Xfinity covers less than 0.5% of the units in Bradley County. Xfinity claims speeds of 1200/35 Mbps. These connections are mainly on the eastern edge of the county and do not have speed testing data.

SHARE OF T-MOBILE BY TECHNOLOGY AND SPEED

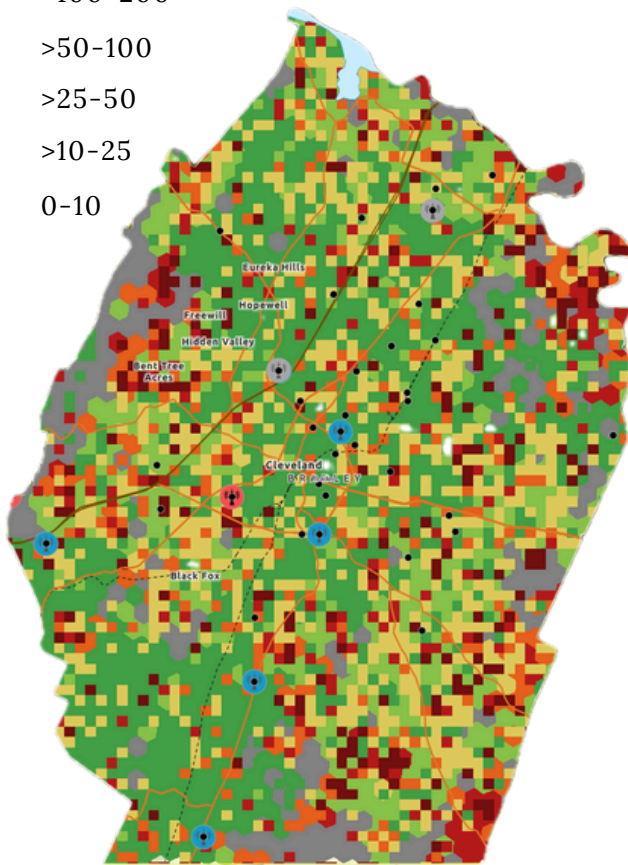


FCC Claimed Speeds with Speed Tests

Speed tests are measured with Ookla and are displayed as 600 meter tiles. FCC Data, which is self-reported by ISPs, is displayed as H3R8 Hexagons. The background color represents speed reported by ISPs to the FCC. The overlapping tiles illustrate areas where the claimed speeds do not match the speed tests on the ground.

SPEED TEST RATINGS

- >200
- >100-200
- >50-100
- >25-50
- >10-25
- 0-10



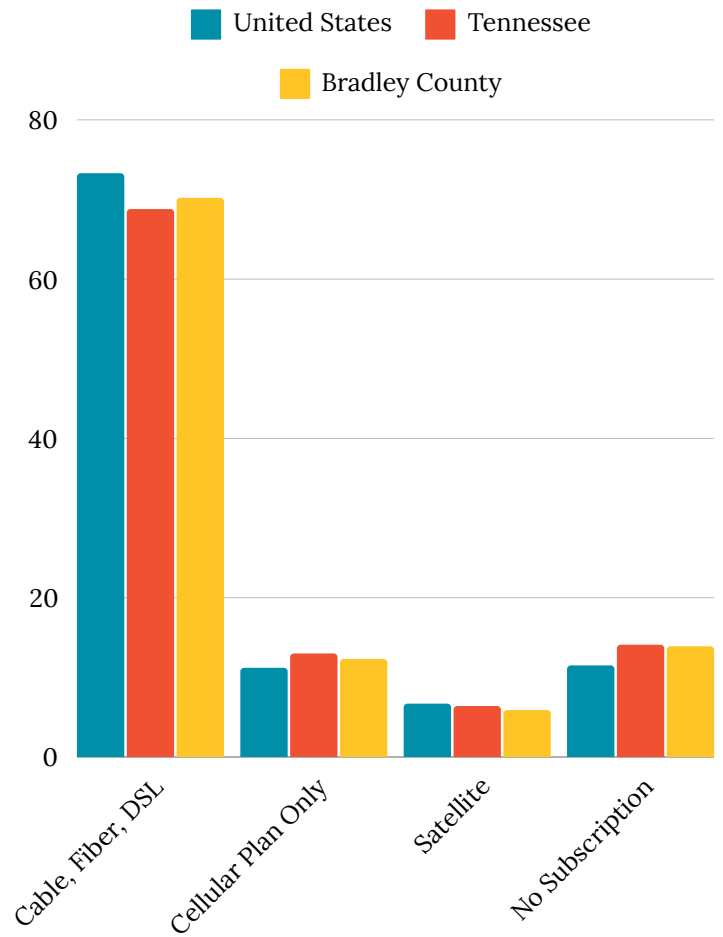
A further breakdown of the performance of these ISP's and their speeds with resulting technology type is valuable for understanding the true scope of the quality of the service being provided ([available in the Appendix](#)).

Tech Type	Provider Name	Max Download Speed (mbps)	Max Upload Speed (mbps)
Fiber	EPB	25000	25000
Fiber	AT&T Inc	5000	5000
Fiber	Twin Lakes	2000	1000
Fiber	Charter Communications Inc	1000	500
Cable Modem	Xfinity	1200	35
License d Fixed Wireless	VERIZON	300	20
License d Fixed Wireless	T-Mobile US	100	20
DSL	Windstream Georgia Communications, LLC	10	1

Internet Affordability and Adoption

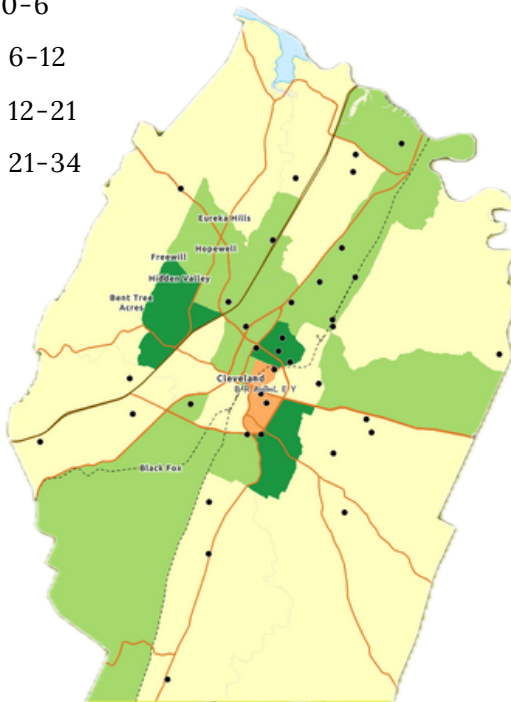
Bradley County utilized broadband usage data from the ACS 5 year survey census data specific to the community, which illustrates the overall profile of internet affordability and adoption percentages:

Internet Data	Percentage per Household
Number of Total Households	41,340
Households with DSL, Cable, Fiber	70.2% ⁷⁸
Households with Satellite	5.9%
Households with Mobile (Cellular) Internet Only	12.3%
No Internet Subscription	13.9%

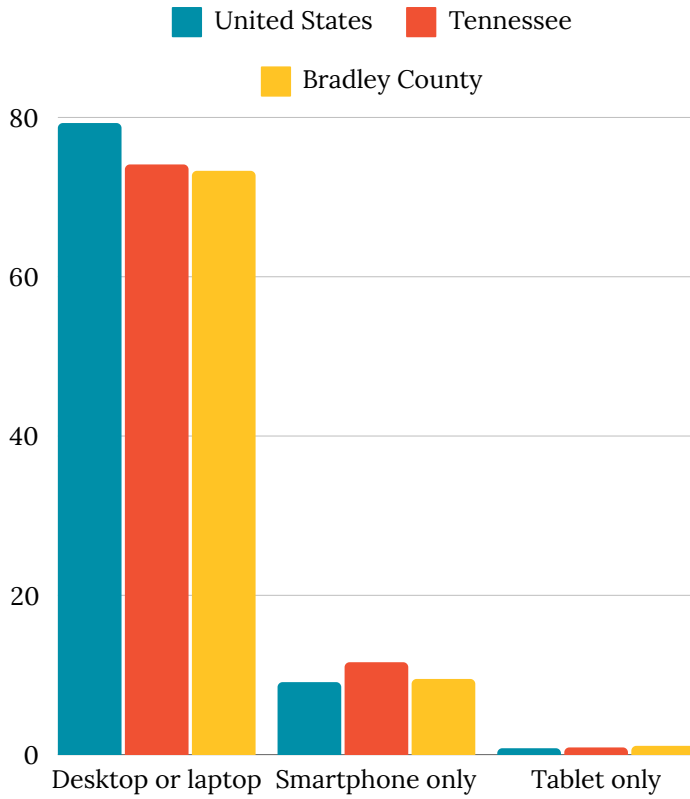


HOUSEHOLDS WITH NO INTERNET (PERCENTAGE)

- 0-6
- > 6-12
- > 12-21
- > 21-34

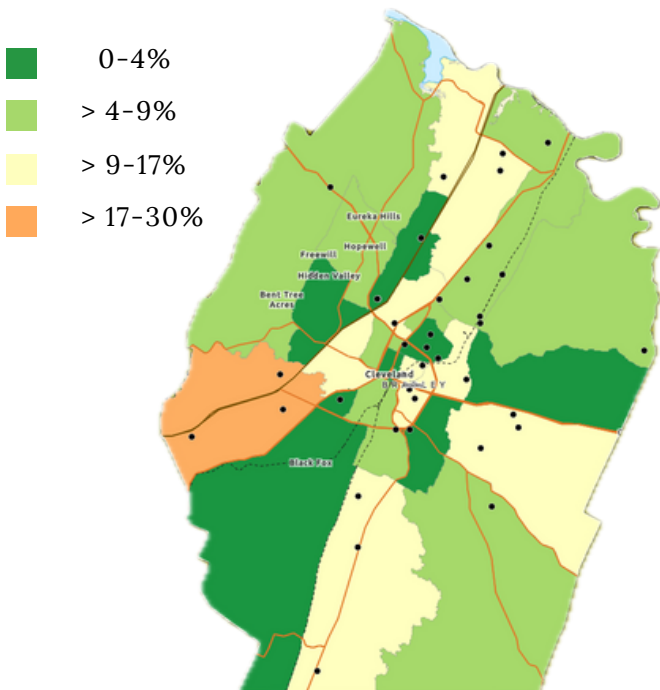


⁷⁸ U.S. Census Bureau. "Types of Computers and Internet Subscriptions." American Community Survey, ACS 5-Year Estimates Subject Tables, Table S2801, 2022

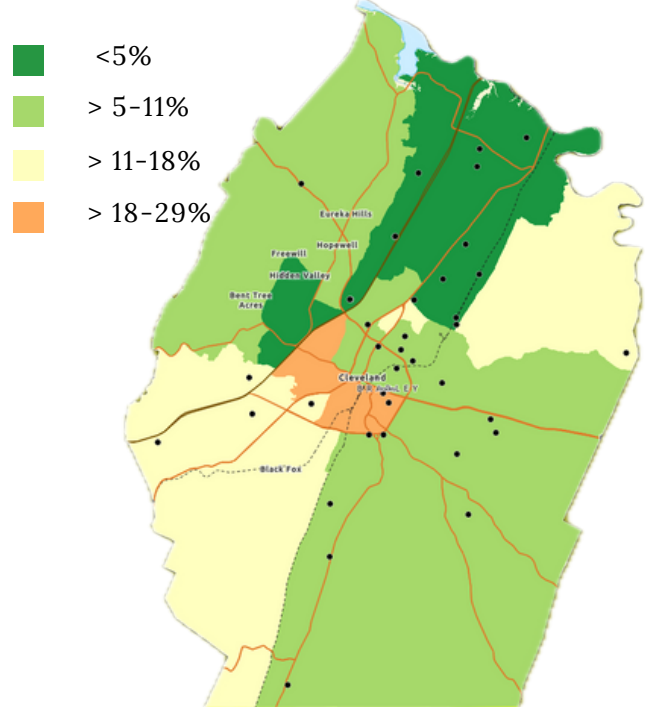


Device Access	Percentage per Household
Number of Total Households	41,340
Households without a Device	7.6%
Households with One or More Devices	92.4% ⁷⁹
Households with a Desktop or Laptop Computer	73.3%
Households with a Smartphone	85.6%
Households with Only a Smartphone	9.5%
Households with a Tablet	62.6%
Households with Only a Tablet	1.1%

HOUSEHOLDS WITH NO DEVICE



HOUSEHOLDS WITH ONLY SMART PHONE

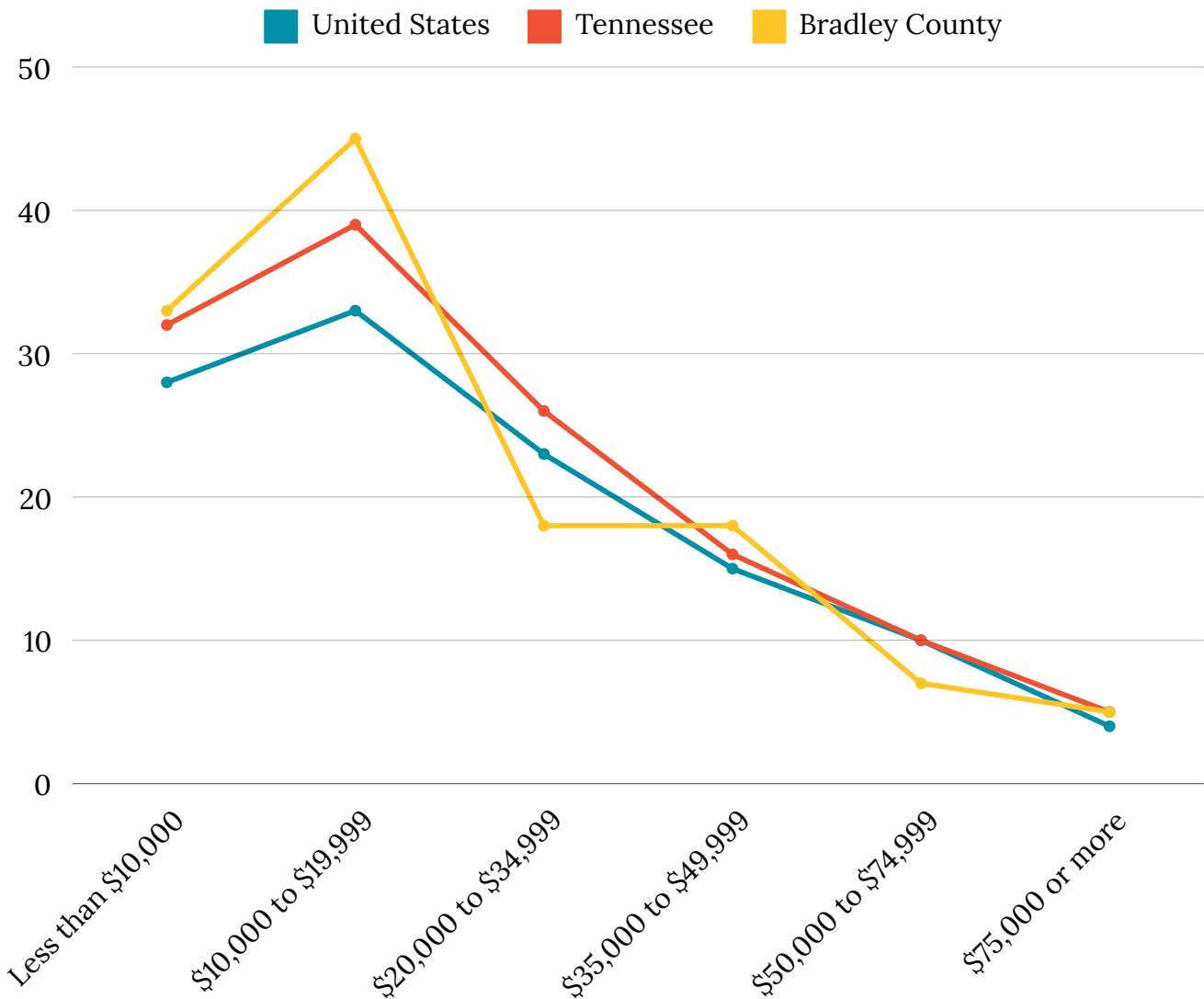


⁷⁹ U.S. Census Bureau. "Types of Computers and Internet Subscriptions." American Community Survey, ACS 5-Year Estimates Subject Tables, Table S2801, 2022

Observations

Based on the internet usage and median household income information of the Bradley County, the following observations can be made:

- For incomes less than \$20,000 the ability to subscribe to an internet service is at risk. However, the most vulnerable are those who make between \$10,000-19,999.
- As salary brackets increase, the percentage of households without internet subscriptions decrease, showing a direct relationship to the affordability of internet services.
- Bradley County's device ownership and broadband subscription rates are in line with state percentages. However, there is a slight gap when comparing household income and residents' internet adoption at lower income levels.
- According to the Living Wage calculator, the average household monthly cost for both internet and mobile subscriptions are \$175/month in Bradley County⁸⁰ based on a household with two adults working and one child, or \$2,102 annually.



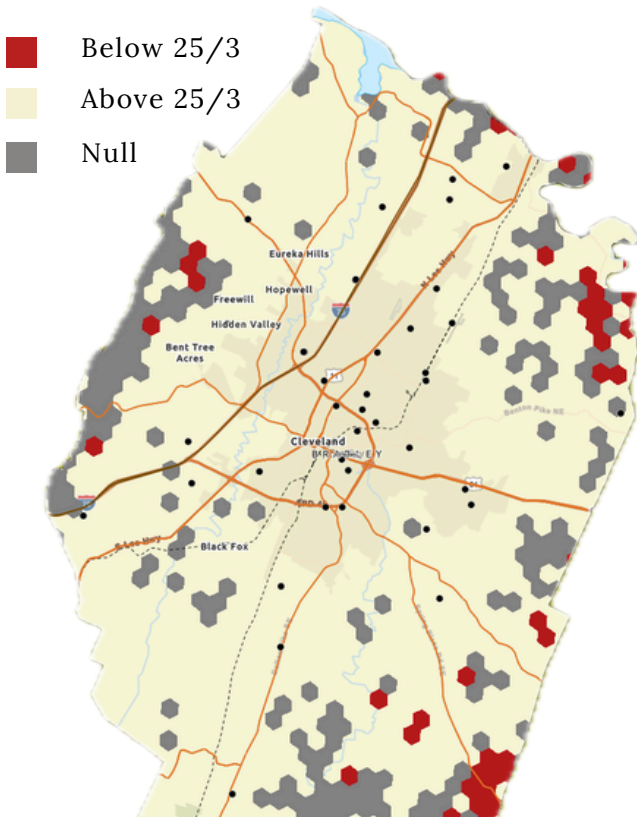
⁸⁰ Living Wage Calculator

Statement of Connectivity Need

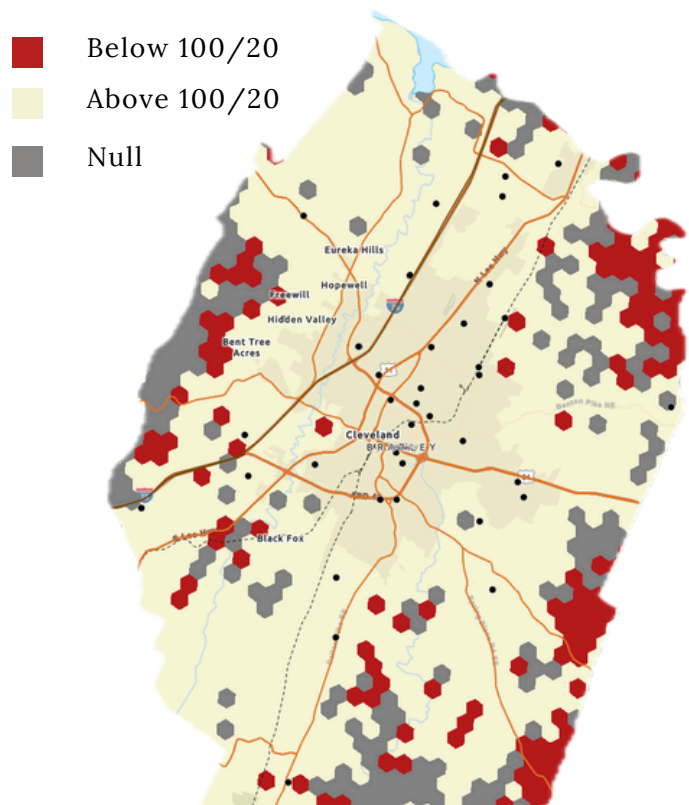
Fiber is considered the fastest, most durable, and reliable broadband technology, offering the potential for high symmetrical download and upload speeds. Symmetrical download and upload broadband speeds best provide robust, reliable, and fast service. Speeds below 100/20 Mbps service are considered underserved; speeds below 25/3 Mbps service are considered unserved. It is of critical importance for broadband expansion projects to utilize fiber to achieve high speed, symmetrical internet and Bradley County is committed to supporting projects that utilize fiber for buildout.

The following broadband speed map is based on the FCC Broadband Deployment data representing the highest ISP-reported speed per census block. According to the FCC data, the following areas are considered underserved, unserved, and areas eligible for grant based funding awards.

CLAIMED SPEED - UNSERVED



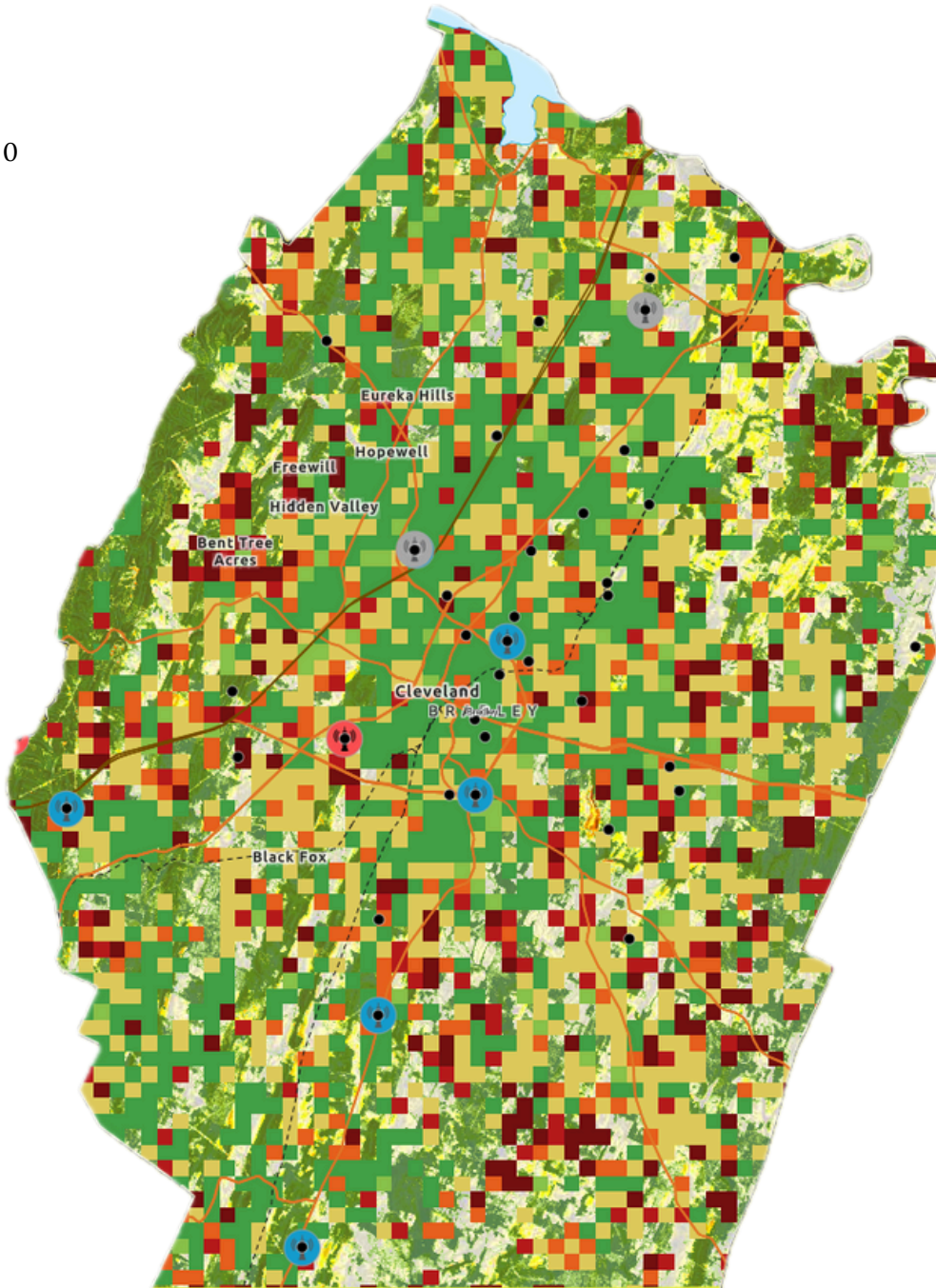
CLAIMED SPEED - UNDERSERVED



The lack of registered vertical structures in areas with poor speed tests and which are designated unserved/underserved make future expansions limited with the potential for slope and tree canopy interference. Consideration should be given to Bradley County's future growth plans and current zoning to identify implementation potential.

SPEED TESTS

- >200
- >100-200
- >50-100
- >25-50
- >10-25
- 0-10





DIGITAL EQUITY



Introduction and Vision for Digital Equity

Bradley County has developed a vision for achieving Digital Equity through increased broadband access as shown below:

Problem Statement

For the past six years, Bradley County has been actively working to expand internet access throughout the area, though there are still gaps in coverage that need to be identified and addressed.

Vision Statement

The vision for Bradley County is a fully connected community where every resident has access to reliable, affordable internet, along with the tools and skills needed to unlock opportunities for educational growth, economic prosperity, improved health, and access to essential services. This vision will foster a more resilient, prosperous community, creating an environment where the workforce can thrive, infrastructure can support continued growth, and local industries can succeed.

Mission Statement

Bradley County aims to ensure that all residents have access to the five key elements of digital connectivity:

1. Affordable, reliable internet access at home and within the community.
2. Access to affordable computing devices and the means to maintain them.
3. Opportunities to learn and apply digital skills for personal and professional growth.
4. Resources and knowledge for safe and responsible online engagement.
5. Accessible online government and community resources for individuals of all abilities.

Values

These values embody Bradley County's vision for the future, guiding broadband strategy, policy decisions, infrastructure development, and digital equity initiatives:

- Preserve the area's unique character and quality of life while managing future growth.
- Ensure access that is safe, secure, and beneficial for all users.
- Develop infrastructure that is both adequate and scalable, keeping pace with growth in a cost-effective manner, and ensuring availability across the entire county.
- Foster progress through strong public-private partnerships.

Broadband Infrastructure Relationship

Bradley County is not interested in funding competition between providers. Bradley County's priority is to fill gaps in areas that do not currently have access to broadband. Bradley County has worked closely with VEC on previous grant opportunities, but will welcome partnerships from other internet service providers (ISPs) as well, to provide affordable coverage, through public-private partnerships. A public-private partnership consists of a private company who is responsible for the build out and management of the network, which includes maintaining control and regulatory oversight, with partnership from the community such that public interest and private expertise are combined.

Public-private partnerships are needed as Bradley County and the City of Cleveland have aligned on a strategy for urban growth. The existing development regulations are based on sewer and water utilities and the limitations on development in areas without these services (example of one unit per five to seven acres) such that broadband expansion in those areas require partnership across sectors.⁸¹

Alignment with Existing Goals

Bradley County's digital equity vision, mission, and values support and are aligned with the following existing goals⁸² from the Bradley County Comprehensive Plan:

- Provide a future land use plan that helps to preserve area character and quality of life while managing growth, which includes effectively managing development pressure in rural and agricultural areas of the county to maintain low-density character.
- Provide a transportation system which is safe and efficient for all users, and ensures that adequate transportation and utility infrastructure is in place in conjunction with development, expanding access to digital opportunities by foot, bicycling, and public transportation.
- Provide adequate and timely utilities and public facilities relative to the location and timing of growth in the most cost effective manner possible.
- Provide high quality facilities and services in coordination with land use and transportation plans.

⁸¹ Bradley County Comprehensive Plan

⁸² Bradley County Comprehensive Plan

These goals express the desire to have an intentional land use plan such that essential services, to include broadband, are accessible to existing and future development, while preserving the area's natural assets, rural and agricultural areas, to maintain areas of low-density. Bradley County recognizes the limitations that rural areas face with lack of access and the need for reliable transportation, to include public transportation and pedestrian systems, to access public resources. Broadband expansion needs to work in coordination with the growth of utilities and public facilities to ensure adequate coverage. The management of growth and development of policies in Bradley County should be conducted in a way to respect the community's value of private property rights and responsibilities. Additionally, fiscal responsibility is a priority for residents of Bradley County, and administration decisions should work to maintain the low-tax environment as well as private driven initiatives rather than government led approaches to community development.

Based on community values established in the Joint Strategic Plan for Bradley County, the City of Cleveland, and the City of Charleston, the following goals⁸³ are aligned with the digital equity vision, mission, and values:

- Bradley County will grow and develop efficiently relative to the cost and timing of providing infrastructure and public facilities.
- Infrastructure and public facilities that meet defined level-of-service standards will be provided concurrent with new growth and development.
- Bradley County will enjoy a growing, diverse, and balanced economy that provides equitable benefits to all segments of the population.
- A strong local economy and a diversified tax base will help position the local government to generate the revenues necessary to finance infrastructure and public facilities in a fiscally responsible manner.
- A variety of transportation choices will be available to Bradley County residents and businesses, including safe and efficient roads, safe and welcoming bicycle and pedestrian facilities, and public transportation options.
- A balanced range of quality housing choices will be available to meet the needs of the full life cycle of ever changing demographics.
- Sensitive natural and cultural resources will be preserved and protected, and viewed as positive assets of the community that contribute to a sustainable future and a high quality of life.
- New growth and development will have a quality and character that promotes community livability, quality of life, and sustainable communities.
- Existing communities and neighborhoods will be valued, strengthened, supported, and enhanced.

⁸³ BCC 2035 Joint Comprehensive Plan

Additionally, Bradley County's goals are also aligned with the State of Tennessee's Digital Equity priorities and goals:

- Identify needs and barriers
- Address affordability
- Provide digital skills and technology support opportunities
- Access to devices that are appropriate for use (such as laptops and tablets to leverage opportunities online)
- Awareness of online safety and privacy

Bradley County's top priority for digital equity is identifying barriers for covered populations and developing broad but achievable goals to address those barriers. Bradley County recognizes the need to design strategies that guide the implementation of these activities with measurable objectives to monitor progress that align with the State's priorities while still representing the needs of the individual communities that make up this county. The digital equity barriers identified determine the goals that the county forms and the aligned strategies and objectives to support those goals. The implementation plan is reliant on federal and state funding opportunities which align with these goals.

Planning Process Summary

Thrive Regional Partnership coordinated with Bradley County to identify gaps and opportunities and compile this Digital Connectivity Plan. Bradley County and any subsequent partners will be responsible for implementing the respective strategies to achieve its vision.

Community Digital Equity Asset Mapping

As part of Bradley County's Digital Equity planning process, a Digital Equity Asset Inventory was taken, consisting of the following:

- Organizations running digital skills programs
 - Public library
 - Senior center
 - Schools (K-12 and higher education)
- Organizations serving covered populations
 - University agricultural extension program
 - Health department
 - Community Support Programs
 - Veterans services
- Anchor institutions
 - Library
 - Schools (K-12 and higher education)
 - Police/Fire station
 - Cultural center
- Community Resources
 - Chamber of Commerce
 - Emergency management
 - Parks and recreation

Asset Mapping Tool Development, Data Collection, and Dissemination

To develop the Digital Equity Asset Inventory, Bradley County followed the steps below:

1. Consulted a variety of national and state templates for the asset inventory
2. Adapted a framework provided by Connect Humanity
3. Conducted a community survey which included a question on community resources
4. Reached out to organizations and community anchor institutions for in-depth conversations in regards to the work being done and barriers they face (see Appendix)

Throughout the Digital Equity planning process, Bradley County leveraged partnerships with Thrive Regional Partnership and the local media, Cleveland Daily Banner and Mix 104.1 FM WCLE, to assist with gathering asset data and promoting awareness of the Digital Equity Community Survey and Asset inventory. Thrive Regional Partnership contributed by identifying digital equity barriers for priority populations, assisting with community engagement convenings, and being actively involved with the writing of the plan.

Bradley County developed a comprehensive strategy for disseminating the Asset Inventory within the community. Methods utilized by the Bradley County, include, but are not limited to:

- Publishing content on Bradley County's website
- Targeted social media campaign
- Public engagement session for information sharing
- Local media publicity, both newspaper and radio

A copy of the Bradley County's Digital Equity Asset Inventory is available in the Appendix of the Connectivity Plan with detailed descriptions of the resources, needs, and impacts of each of the community anchor institutions and resources listed in this plan. This is not intended to be a static asset inventory. The resources listed are those which were uncovered during the research portion of writing this plan but are not exhaustive. The intent is for the asset inventory to continue to grow as a list of resources, to capture the work being done in the county, and to provide a list for potential future collaborations and partnerships. As the needs of Bradley County continue to be identified, this asset inventory will help to close the gaps through resource sharing and collaboration.

Meaningful Community Engagement

Identify Priority Populations

Based on the demographic and internet usage of Bradley County, the following covered groups have been identified as priority populations most at risk for being impacted by the digital divide:

- Low income
- Individuals with a disability
- Aging population (60 years old and older)
- Rural residents

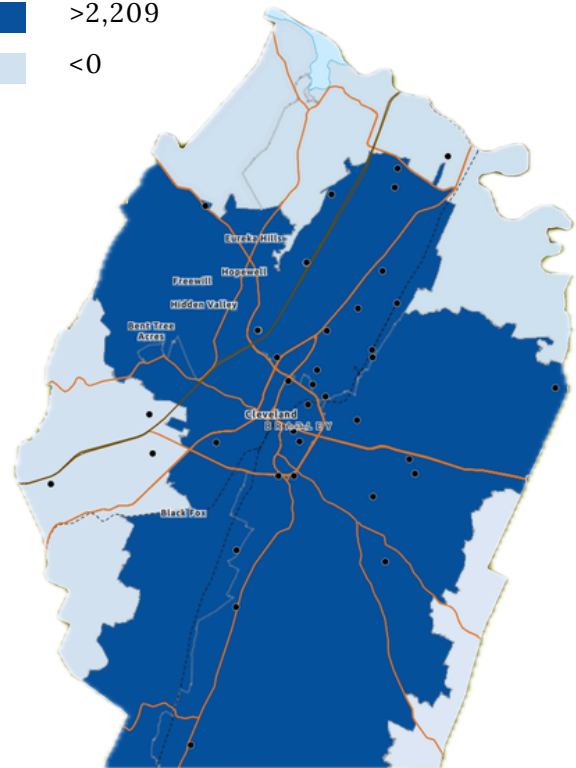
Affordability

The area identified as the Central City Area has the lowest median household income in Bradley County according to the Central City Area Plan. This is attributed to the aging housing stock, the presence of multi-family housing units that are part of the Housing Choice Voucher Program, and the majority of the Cleveland Housing Authority’s public housing units. This area has higher rates of unemployment compared to the City of Cleveland and higher percentage of population without a vehicle⁸⁴. The need for alternative means of transportation, such as public transit and non-motorized networks for biking or walking, is key to accessibility for digital opportunities.

The following map shows enrollment in the now defunct Affordable Connectivity Program (ACP) (darker blue), revealing the large majority of the county participating in the program for assistance in the affordability of broadband subscriptions. Affordability needs to be a priority for Bradley County along with access.

ACP (COUNT)

- >2,209
- <0



⁸⁴ Central City Area Plan

Stakeholder Engagement and Collaboration

As part of an inclusive Digital Equity planning process, Bradley County understands that it must work collaboratively and partner with Community Anchor Institutions to ensure that identified priority populations in the community are engaged, during both the planning and implementation phases, to achieve equitable internet for all of Bradley County.

In order to continue to enhance digital services in the future, Bradley County will have to build the capacity to utilize participation, feedback, and data from each of the covered populations to measure efficacy and progress toward meeting digital equity and to complement overall State Digital Equity goals.

Community Resource	Organization Description	Covered Populations Served
<u>Bradley County Health Department</u>	Health Services	Individuals with disabilities, language barriers, low income, ethnic or racial minorities
Bradley County Schools	Enabling education for 10,000+ students across elementary, middle and highschool	Individuals with disabilities, language barriers, low income, ethnic or racial minorities, rural
Cleveland/Bradley Chamber of Commerce	Workforce Development	Youth, low income
<u>Cleveland Bradley County Public Library</u>	Connecting Bradley County with digital resources	Aging, individuals with disabilities, veterans, language barriers, low income, ethnic or racial minorities, rural
Cleveland State Community College	Community College with presence in five counties, to include Bradley County	Veterans, individuals with disabilities, language barriers, low income, ethnic or racial minorities, rural
<u>Cleveland-Bradley County Office of Emergency Management & Homeland Security (EMA)</u>	Provide emergency response services	Aging, incarcerated, individuals with disabilities, veterans, language barriers, low income, ethnic or racial minorities, rural

Community Resource	Organization Description	Covered Populations Served
<u>Lee University/Encore Program</u>	Serve 340 Encore students (60 years old and older) annually of a traditional student population of 4,000	Aging, veterans
<u>Museum and Cultural Center at Five Points</u>	History museum and arts organization with 12-16 rotating exhibits each year	Aging, individuals with disabilities, veterans, language barriers, low income, ethnic or racial minorities, rural
<u>Salvation Army</u>	Community resource for those who are unhoused and for youth	Youth, low income
<u>Senior Activity Center at Bradley Cleveland Community Services Agency</u>	Programming and lunch for 60 years old and older	Aging, veterans, individuals with disabilities
<u>United Way of the Ocoee Region</u>	Community resource organization	Aging, individuals with disabilities, veterans, language barriers, low income, ethnic or racial minorities, rural
<u>UT Extension Office</u>	Meeting Bradley County where they are at, working with kindergarten to 95 years old	Aging, individuals with disabilities, veterans, language barriers, low income, ethnic or racial minorities, rural
<u>Veterans Services</u>	Assist veterans, dependents, and spouses to include those whose spouse is deceased	Veterans, aging

Create Outreach and Engagement Plan

Bradley County understands that it must utilize a variety of outreach strategies and methods to facilitate participation and engagement from the community. Bradley County values the feedback, engagement, support and buy-in from the community, to include partners who represent the covered populations that are most impacted by the digital divide.

As a result of Bradley County’s Digital Equity planning process, the following Outreach and Engagement Plan is recommended for continued and future work:

Component	Description	Key Activities	Status	Progress Monitoring
Needs Assessment	Assess the digital equity needs of the target communities	Conduct surveys and focus groups	Completed	Annual needs and opportunities updates
Stakeholder Mapping	Identify key stakeholders and partners for collaboration	Identify local nonprofits, government agencies, and community organizations involved in digital equity and engage in discussions	Completed	Annual program updates
Community Engagement	Engage the community to understand their specific challenges and needs	Host community meetings to gather input	Completed	Continual engagement needed to monitor effectiveness of implementation

Component	Description	Key Activities	Status	Progress Monitoring
Digital Literacy Programs	Develop and implement digital literacy programs	Partner with libraries and community centers to offer workshops	Future Action	Annual impact updates
Device Distribution	Ensure access to affordable devices for underserved populations	Establish partnerships with community resources for enabling device access	Future Action	Annual impact updates
Broadband Expansion	Work on improving internet access in underserved and unserved areas	Partner with ISPs to extend coverage; Set up public Wi-Fi hotspots	Ongoing	Annual updates
Private Sector Engagement	Collaborate with businesses for support and partnership	Reach out to local companies for sponsorship and support; Organize corporate volunteer programs	Future Action	
Progress Monitoring	Continuously track and evaluate progress	Collect data on key performance indicators; Adjust strategies based on results	Future Action	Align with county and state goals to measure impact
Community Outreach Events	Host community events to promote digital equity	Organize workshops and awareness campaigns	Future Action	

Conduct Community Survey

Bradley County has developed a Digital Equity Community Survey to seek direct feedback from county residents to capture needs, unique challenges, and recommended engagement strategies to increase broadband access and adoption. The Community Survey was posted online through the Bradley County website.

To conduct the Digital Equity Community Survey, Bradley County utilized the Community Engagement Session to inform the questions that should be addressed to capture the community's challenges in regards to broadband access. The survey was posted on the county website on Friday, November 8, 2024. The survey ended November 25, 2024. Collectively, the Digital Equity Community Survey reached 14 respondents/participants. It is acknowledged that while there are not enough responses for qualitative analysis, the survey still gives voice to the community and to residents. It is also acknowledged that a more targeted effort of covered populations and further engagement sessions with the community, as well as a longer survey window, may have increased respondents/participants. The survey was distributed in person at the Cleveland Bradley County Public Library and Senior Activity Center at Bradley Cleveland Community Services Agency, however, no responses were received. Future surveys are recommended to continue to gauge the challenges the community is facing and what they believe should be prioritized.

The Digital Equity Community Survey consisted of the following questions:

Name:

Zip code:

Do you consider yourself a part of any of the following populations? (Select all that apply)

- Aging Individual (60 and older)
- English Language Learner
- Individual with a Disability
- Low Income Household
- Racial/Ethnic Minority
- Recently Incarcerated Individual (within the last 6 months)
- Rural resident
- Veteran
- I do not consider myself a member of any of these population
- Other

Why do you think it is important for your community to be digitally connected?

What are your barriers to accessing the Internet? Please select your top three reasons.

- I do not have internet access at my home
- I do not have reliable internet at home
- I cannot afford to pay for a monthly internet subscription
- I do not have access to a laptop, desktop computer, or tablet
- I do not know how to use the internet safely
- I do not know where to go for help when using digital devices or services online
- I do not face any barriers to accessing the internet
- I do not have adequate speeds (above 100 Mbps download/20 Mbps upload)
- Other

What types of devices, if any, do you have at home to connect to the Internet? (Please select all that apply)

- Desktop
- Laptop
- Smartphone
- Tablet
- I do not have any of these devices in my home
- Other

What are you interested in learning more about? (Please select all that apply)

- Public wi-fi locations
- Internet affordability
- Learning how to use a computer or device
- Digital skills training
- Purchasing a discounted device
- Public locations for using a device
- None
- Other

What would you like to see prioritized in our Digital Connectivity Plan?

I'd like to receive updates about the Bradley County Connectivity Plan and the Appalachian Digital Accelerator program.

If you selected "Yes" above, please share your email address.

COMMUNITY SURVEY RESPONSES

“Our world is an increasingly digital community. High quality internet access is the modern day utility equivalent to electricity in previous centuries. It is a necessity, not a luxury, and contributes to the widening gap between rural and urban workforce development. ”

- Bradley County Resident

When asked “Do you consider yourself a part of any of the following populations?”

46% of respondents did not associate themselves as a covered population, 38.5% identified as aging, 15.4% as a rural resident, 7.7% as racial or ethnic minority, and 7.7% as English language learner.

When asked “Why do you think it is important for your community to be digitally connected?”, responses spoke to the increasing necessity of operating online and the requirements to be connected to participate in many sectors of life. Whether it is for safety, staying informed, the workforce, education, and using basic services like banking and paying bills.

When asked “What are your barriers to accessing the Internet?”, four respondents selected I do not face any barriers, four respondents selected I do not have reliable internet at home, two respondents selected they cannot afford internet, and two selected they do not have adequate speeds. Among other answers received were: I do not know where to go for help when using digital devices or services online, our speed is half of what we pay for, I don't have choice, and I have access but it's not always reliable.

When asked “What types of devices, if any, do you have at home to connect to the Internet?” all of the respondents had a smartphone, 71% had a laptop and 71% had a tablet, and 50% had a desktop computer. Other devices included a smart TV and gaming console.

When asked “What are you interested in learning more about?” 78.6% of respondents said internet affordability, 21.4% digital skills training and also purchasing a discounted device, other responses included: public WiFi locations, learning how to use a computer, and new options for ISPs.

When asked “What would you like to see prioritized in our Digital Connectivity Plan?” the majority of answers spoke about affordable and reliable service for all of the county. Other themes included more options, fiber access, and better speeds.

In general, the Digital Equity Community Survey responses indicated the following themes and trends:

- Affordability is a top priority for residents
- Fiber service was mentioned numerous times and shows alignment with the County's goal for focusing on fiber implementation
- Rural areas are facing disproportionate lack of public services but should receive the same connectivity as urban areas
- High quality internet should be a public utility service

Carry-out Community Engagement Activities

In addition to the Digital Equity Community Survey, Bradley County engaged and will continue to engage the local community to obtain feedback and encourage participation in the digital equity plan development process and implementation.

Community Engagement Activities for Digital Equity	Description	Objective/ Outcome	Date/Time	Location/Venue
Community Meeting	Held a town hall-style meeting	Shared information on internet access and gathered feedback	June 17, 2024	Cleveland, TN
Stakeholder Roundtable	Convene key stakeholders	Discuss strategies and partnerships	Future potential	
Community Webinar	Host an online information session as needed	Raise awareness and educate community members	Future potential	Youtube
Public Awareness Campaign	Launch a digital equity campaign through various platforms	Raise awareness and promote educational resources	Future potential	
Focus Group Discussions	Organize small group discussions as needed	Gather in-depth insights and suggestions	Future potential	

“We cannot give all students the same opportunity because when they leave school, you cannot control their access.”

- Scott Webb, Instructional Technology Supervisor, Bradley County Schools

Aggregate Community Engagement Findings

The following key findings and observations resulted from the community engagement process:

- Most organizations recognize the value and impact of public-private partnerships. There is a willingness to partner, however it requires organized efforts across sector.
- Affordability is a more challenging problem to solve for, yet one that is needed for Bradley County residents.
- Engagement with residents of Bradley County is strongest when meeting individual covered populations where they are at, rather than programs that require outreach.
- Many of the Community Anchor Institutions do not have the connectivity needed to provide expected services and to function to their full potential. These must be upgraded to have minimum 1 Gb connectivity.



Photo Courtesy: Museum and Cultural Center at Five Points

Understanding Barriers to Digital Equity

Bradley County’s Digital Equity planning process has contributed to its understanding of unique barriers to achieving digital equity across a wide range of covered populations. The table below summarizes the respective unique barriers for each of the covered populations present in the community:

<p>Individuals who live in low income households</p>	<p>Even if infrastructure is accessible, affordability is a barrier to internet subscription. Often those who live in low income do not have the ability to access resources as easily and face more barriers than other income brackets. Individuals are faced with compromises between device or access and other necessities.</p>
<p>Aging individuals</p>	<p>Digital skills and cybersecurity training are needed in an increasingly online age to provide access to tele-health and additional benefit services in an area with limited transportation options. As individuals age and mobility decreases, the ability to connect is of increased importance.</p>
<p>Veterans</p>	<p>Services and benefits are increasingly only available online and navigation is difficult.</p>
<p>Individuals with disabilities</p>	<p><u>Adaptive technology</u> resources are needed to bridge gaps to meet individual needs.</p>
<p>Individuals with a language barrier</p>	<p>Access to online resources and services in languages other than English to enable easier navigation and equity in resource accessibility. Online educational tools and courses for assistance with learning English.</p>
<p>Individuals who are members of a racial or ethnic minority group</p>	<p>Social ties and connection with family and friends in a county with very few minority groups.</p>
<p>Individuals with low levels of literacy</p>	<p>Additional online educational resources which can improve educational outcomes and opportunities as well as provide access to increased job opportunities.</p>
<p>Individuals who primarily reside in a rural area</p>	<p>No service or unreliable service combined with high pricing limit options for those in rural areas to participate in small businesses, remote work, and e-commerce.</p>

Developing Implementation Strategies

Existing Programs

Based on the unique barriers to achieving Digital Equity identified in the previous section, Bradley County identified the following existing programs that address the respective needs/barriers of the applicable covered populations. Many programs target and address multiple covered populations. We acknowledge this is not a comprehensive list of the work and resources in Bradley County. This is a starting place for capturing the work already being done and will need to continue to be developed and evolved. More information is included in [the Appendix](#).

Community Resource	Organization Description	Types of Services
Bradley County Health Department	Health Services	Support Resources, WIC Smart app, benefits, family planning, telehealth
Bradley County Schools	Enabling education for 10,000+ students across elementary, middle and highschool	Device access, WiFi, Digital Skills Training, Adaptive Technology, ESL app, Virtual School environment, Technical support
Cleveland Bradley County Public Library	Support for those who have technological needs	Book mobile with WiFi, Hotspot lending, WiFi, Device access, Digital Skills Training, Support Resources
Cleveland State Community College	Empowering students and supporting the community	WiFi, Digital Skills Training, Technical Support, Device Access, Device loaners
Lee University/Encore Program	Continued education for those 60 and older	WiFi, Digital Skills Training, Device Access
Museum and Cultural Center at Five Points	Cultural and historical connection	Virtual connection to museum and digital collection, WiFi
Salvation Army	Support services	WiFi, Technical support
Senior Activity Center at Bradley Cleveland Community Services Agency	Programming and connection for those 60 and older	WiFi, Digital Skills Training, Device Access

Community Resource	Organization Description	Covered Populations Served
United Way of the Ocoee Region	Community resource agency	Resource support, Device access, WiFi access
UT Extension Office	They go to the client, meeting them where they are at and supporting the needs of the individual	Resource support, Digital skills training, Device access, WiFi access
Veterans Services	Resource support	Digital navigation

There are numerous programs targeting the aging population with basic computer classes as well as more advanced and topic specific courses. As a county, programs targeting individuals with disabilities and individuals with language barriers or English learners were strong in the school system, yet were not discovered for those between the ages of 18–60. As there is a growing population of both Ukrainian and Russian speakers, as well as Spanish, programs targeting these language populations is recommended. The library, United Way, and the UT Extension office are strong resources for the general public and for programming that can meet the needs of covered populations. Whereas the library is known for providing a safe and welcoming environment for all who come, the UT Extension Office is able to go into the community to where the population exists to provide classes and programming. The library, although central to Bradley County, is able to go to the edges of the county where many gaps in infrastructure exist through the Book Mobile. In addition to the library’s plans for providing wireless internet on the Book Mobile, hotspots are available for three week loans. The Book Mobile is an extension of the library. It is a physical arm that is able to go out into the community and provide similar services and resources.

Device loaner programs have been largely unsuccessful in Bradley County and have encountered more challenges. Device access needs further research along with expanding device access and awareness programs to ensure all residents in Bradley County have the ability to access a computer. Programs such as Tech Goes Home are viable options for providing both digital skills training and device access.

New Programs/Resources

In addition to the existing programs detailed on the previous page, Bradley County identified areas where new digital inclusion resources and programs could be funded, developed, and implemented to meet the needs of the respective covered populations. These are potential programs that could be implemented, should funding be made available.

Community Resource	Resource Description	Types of Services
<u>Bradley County Fire Rescue</u>	Internet access	Need better connectivity, Access in all 13 stations, Dedicated fiber lines
Bradley County Health Department	Public internet access, Digital skills training	WiFi connectivity for guests, Partner for hosting digital skills classes
<u>Bradley County Parks and Recreation</u>	Community engagement and inclusivity	Public WiFi connectivity, Streaming capabilities for athletic games
Bradley County Schools	Partnership for broader reach	Partners such as Tech Goes Home during Digital Citizen Week to offer parents access to digital skills training and devices, expand Technical Support to offer assistance to the public
<u>Bradley County Sheriff's Office</u>	Connectivity	Need modems or jetpacks installed in vehicles for reliable service and connectivity for emergency response, Direct line run between 911 center and Sheriff's Office
Cleveland/Bradley Chamber of Commerce	Public internet access, Digital skills training	WiFi connectivity, Digital skills training for workforce development
Cleveland Bradley County Public Library	Upgrade and expand broadband	Need 1 Gb symmetrical minimum to provide services, WiFi and digital skills training on Book Mobile
Cleveland State Community College	Upgrade broadband, Expand current program	Need 1 Gb symmetrical minimum to provide services and streaming capabilities, conduct assessment of current system for further access point upgrades, expand Technical Support to offer assistance to the public
Lee University/Encore Program	Basic digital skills training, Device access	Including basic computer 101 classes and expand device access to be available outside of classes
Museum and Cultural Center at Five Points	Digital skills training, Device access, Upgrade broadband	Need funding for targeted covered population digital skills training, Upgrade staff computers, Assessment of broadband service and increasing bandwidth and speeds

Community Resource	Resource Description	Types of Services
Salvation Army	Digital skills training, Device access	Digital citizenship classes for parents on responsible technology use for youth, Digital skills training and device access
Senior Activity Center at Bradley Cleveland Community Services Agency	Continue digital skills training	Continued funding of Tech Goes Home to enable more classes and device access
United Way of the Ocoee Region	Public internet access, Digital skills training	Public WiFi, Digital skills training, Adaptive technology access
UT Extension Office	Digital skills training, Device access	Partner with other community resources to offer digital skills training and device access
Veterans Services	Digital skills training	Resource support and workforce development training

Many future programs are limited by funding opportunities and others by infrastructure limitations. The Bradley County Health Department services low income individuals and households. They currently do not have the funding to provide public WiFi access for clients who visit their offices. However, they are asked nearly everyday if it is available. As they are a trusted partner in the community, their offices are a potential place to provide device and internet access as a service offering. Chris Duggan believes that there is an opportunity for inclusiveness amongst those with disabilities through connectivity at the public parks and recreation areas. The Book Mobile, with increased funding, could provide digital skills training out in the community along with device access. The Salvation Army has lockers for those who are unhoused to store goods, and device access and skills training would complement their current services.

Partnerships between community service providers in Bradley County would help inform how to best service and target digital skills training for covered populations, such as how UT Extension Office can utilize their programming to support the clientele that are part of the Bradley Health Department or Veterans Services. As the UT Extension Office already has developed a curriculum for teaching digital skills they are an excellent resource in the community and can broaden their impact through increased partnerships. The school system is one of the foundational resources in a community and has visibility into the needs of many households in the community. Working with the school, partners can help to meet those gaps in accessibility to ensure all students have the same opportunities, whether in school or at home, in regards to educational attainment.

State-Aligned Digital Opportunity Evaluation Plan

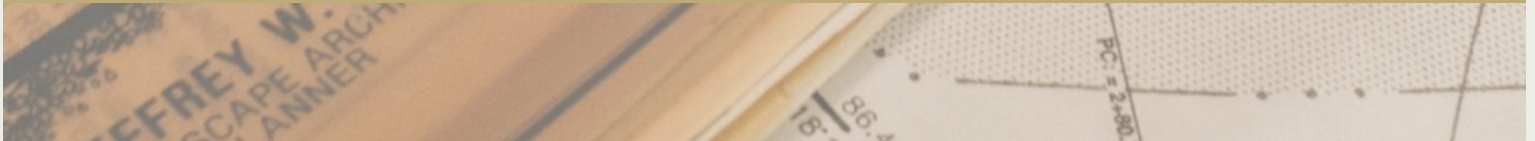
Bradley County understands the importance of alignment of the community's Digital Connectivity Plan to the State of Tennessee Digital Opportunity Plan, requiring the County to:

- Track progress towards achieving Digital Equity and Opportunity:
 - Bradley County does not currently have the capacity to monitor and measure advancements in achieving digital equity and would need to establish a process to assess and document progress towards achieving plan goals. This is a recommendation in the implementation plan.
 - Continue to convene stakeholders and communities to develop partnerships and strategies to address the unique needs of the County.
- Demonstrate how progress furthers State priorities:
 - Bradley County's Digital Connectivity Plan will align with and contribute to the broader priorities, objectives, and goals of the State to advance digital equity.
 - The Digital Connectivity Plan will serve to magnify the current efforts of the County and the State.
- Continually evolve the Digital Connectivity Plan as a dynamic strategic plan that serves as a guiding document for Bradley County in making decisions about identified broadband deployment projects and digital skills training.
 - Bradley County, based on capacity, will need to communicate success stories and best practices
 - Bradley County, as capacity allows, will continue to create awareness of the broadband availability and affordability needs and opportunities

As Bradley County implements its Digital Connectivity Plan, it will need to measure impact and progress toward addressing the unique challenges and barriers to affordability, access, and adoption faced by covered populations, along with the county as a whole. To assist in these efforts, a Digital Equity Evaluation Plan Template has been provided in the [Appendix](#) of this document for county leadership to reflect on their progress toward addressing these respective barriers. It is recommended that Bradley County continue to expand this practice throughout the implementation phase of this plan.

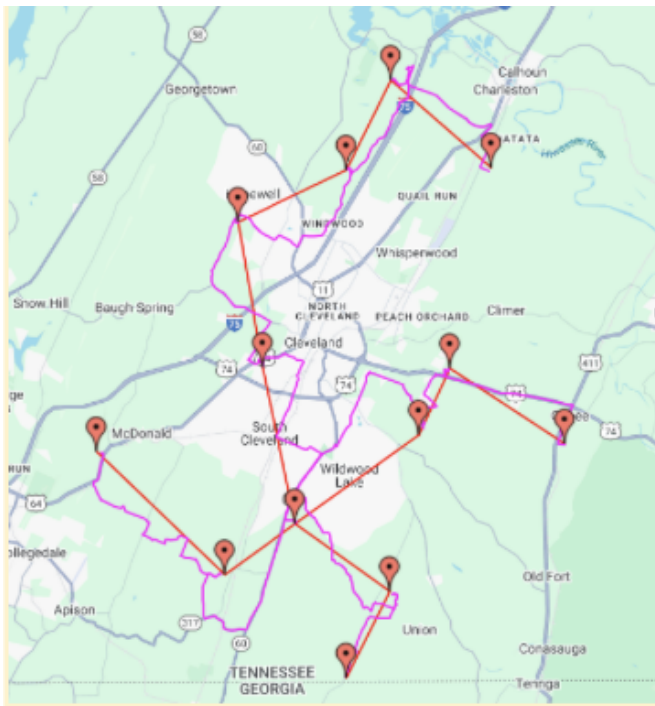


BROADBAND INFRASTRUCTURE



Service Area GIS

The Connect Humanity Project Team coordinated with stakeholders from Bradley County to collect Geographic Information System (GIS) data to create financial modeling for last-mile broadband networks connecting residents and businesses. The fiber backbone route in the image below displays what such a network would entail.



Additional GIS maps were obtained, analyzed, and utilized by Breaking Point to develop the design, technical details, and specifications of the proposed network infrastructure:

- Maps generated by town/county/state GIS mapping office
- Base map of project area to include boundaries, subdivisions, parcels and street centerlines
- To the extent available, maps of existing infrastructure including water, sewer and conduits
- To the extent available, existing fiber infrastructure in the Community
- To the extent known to the public or from providers willing to share
- To the extent known, already-funded broadband expansion projects in the community (confirm any overlap with the proposed project area)
- Vertical infrastructure, such as towers, water towers, tall buildings/rooftops
 - In some rural areas this could include grain silos, some larger barn rooftops or other privately owned structures
- Address list for all homes and businesses
- Planned/phased broadband expansion routes
- Rights-of-way and easements
- Broadband Serviceable Location Fabric data points from the FCC

Network Architecture and Deployment

Building a Fiber to the Home (FTTH) Network is a complicated process with many stages. The following section of the Community Connectivity Plan describes the life cycle of a project at a high level and what it should look like for Bradley County if they pursue a model that would require ownership or partnership:

- **Feasibility Study/Community Assessment/Broadband Plan - *Current Status***
- **Engineering and Fundraising**
- **Construction in Right of Way (ROW)**
- **Marketing/Education/Sign Up Customers**
- **Drop Placement and Installation**
- **Operations and Customer Service**

The **Feasibility Study/Community Assessment/Broadband Plan** provides an overview of the community, including basic demographics, the current Internet Service Providers (ISP) or Wireless Internet Service Providers (WISP), and the costs and tiers of the services they provide. The plan may also include the download and upload speeds of the packages being offered (this has not been completed as part of the Bradley County Community Connectivity Plan).

To obtain this data, Bradley County will need to engage with the community for attaining speed test data, feedback on how they feel about their current services, and what they would like to see in a future network (this has not completed as part of the Community Connectivity Plan). Symmetrical download and upload speeds are important for the future technologies being deployed across multiple platforms. The only technology that can deliver this is fiber all the way to the physical home or business location. Fiber to the Node (FTTN) only brings fiber to the road outside of the home or the curb of the business; a coax cable is needed for connection to the home, including the drop and electronics, that only cable operators can provide. Understanding the specific market in Bradley County will better inform planning and implementation for coverage needs.

The Feasibility Study/Community Assessment/Broadband Plan stage should also provide a high level design of the network regardless of if it is a fiber, wireless, or coax network. This will provide the data needed to build an initial financial model. These models (examples are found in the Financial Plan section) can be very complex and require expertise to ensure all models and avenues are considered for how to deploy a network.

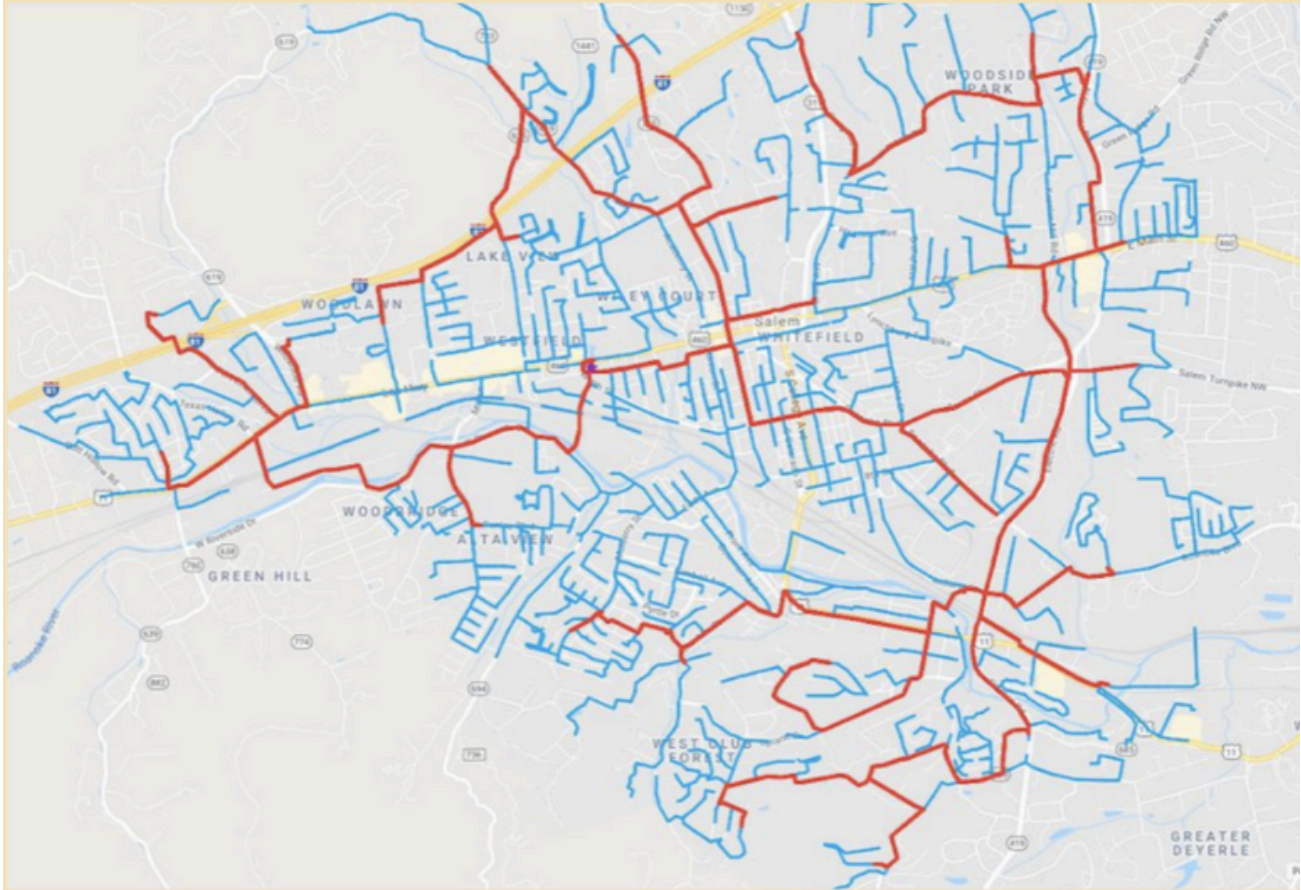
A business plan is recommended, in collaboration with the community partners, to enable a strategic path for connectivity. Some examples of typical architectures and ownership models are listed below:

- **ISP and WISP Fully Owned and Operated** – This model includes a local ISP or WISP owning all infrastructure and electronics while providing full services to the end user.
- **Open Access Network** – This model can have sub levels of modeling but overall is similar to an airport where the operator owns the physical infrastructure (like the terminals and runways) and then multiple ISPs or WISPs use it to provide services (like the different airlines taking off and landing each day) which gives the end users multiple choices for providers.
- **Municipally Owned Network and Service Provider** – The local municipality can create an entity either for profit or non-profit to build a new network and deploy services as a utility based model. This could then be funded through municipal bonds or other means outside philanthropic, debt or equity.
- **Public, Private, Partnership (P3)** – In this model there is a partnership between the local municipality and an ISP or WISP. For example, the municipality might own a dark fiber middle mile network (connecting all the anchor institutions and providing diversity and redundancy into the network) and leases them to a private provider that owns and builds the last mile or part of the network into the neighborhoods. The provider also owns the electronics to light the dark fiber and eventually provides service to the end user. There are many ways to build a P3 that might be as simple as providing expedited permitting for a small revenue share. Thinking outside the box is valuable, similar to the Open Access Model.

An area should be identified to be targeted for initial deployment once the Engineering and Fundraising has been completed. Following the Feasibility Study/Community Assessment/Broadband Plan is the **Engineering and Fundraising** stage, with both engineering and fundraising being completed in parallel. Depending on the final business plan, the capital stack to deploy the network could look different for every project. Completing detailed design and engineering will allow the improvement of the initial assumptions and cost projections made during the high level design. Engineering will continue through the building stage.

Starting with a detailed design, using Fiber Management Software (FMS), will allow the creation of a bill of materials, splice locations, and the full connectivity of the network. This step would include creating sample permit drawings for entities that will need to approve the infrastructure to be built in the ROW. In addition, a pole application process should be completed for any aerial work that will need to be done. Both permits in the underground environment and pole attachments for any aerial work in the project area will better determine timelines and costs that can be extrapolated across the entire project area.

EXAMPLE FMS DESIGN:



The detailed FMS design will help create the final capital (capex) costs needed to complete the project, which is typically very expensive and time consuming. The capex for a fiber network deployment includes the complete engineering work for the entire project area, construction in the ROW with conduit, vaults, fiber, splicing, cabinets and electronics in the underground environment, or make ready work (getting a pole ready for a new attachment), strand placement, cable lashing and splicing in the aerial environment. This is the infrastructure that passes each home, business or “demand point” which could be a potential subscriber on the network. Investors call this *cost per household passed* and it helps determine the type of capital that can be obtained to complete the project. This cost can range from \$600 (high density) all the way up to \$10,000 (low density/extremely rural) cost per household passed and is calculated across all the demand points to come up with an overall cost to build the project. Bradley County should take into consideration the future land use plan to ensure the financial modeling accounts for the limitations for density of areas as well as potential future density.

The take rate is estimated at this stage and typically ranges from 30% to 50% for deployments. This could be conservatively estimated, based on the rural or urban environment, and aligned with Bradley County’s values, but also the competitive nature of the incumbent ISPs or WISPs. This number is calculated as *success based capex*: the truck rollout to the demand point as well as the drop placement from the ROW onto private property to the premise and terminates at an Optical Network Terminal (ONT). The electronics (router and extenders) and installation in the home are completed and included in this price as well. Typical success based capex ranges from \$600 – \$1,000+ depending on various factors. The overall capex for the ROW build and success based capex are typically the starting point for fundraising. A strategy should then be built based on the overall model selected. Note: the initial operations of the network cost would also be included until the project brings in enough subscriber revenue to cover operating costs.

During the Engineering and Fundraising stage, (unless everything is done in house which is not typical), a selection process for partners and vendors would begin through a Request for Proposals (RFP) and would include but is not limited to an Engineering firm, Electronics provider, ROW Construction Sub-Contractor, and Materials Vendor. Once initial Engineering and Fundraising is completed and funds are raised, the **Construction Phase** can start. Engineering will continue creating permits and work prints for the areas needing to be built for full connectivity throughout the Construction Phase. The selected partners will complete this work underground by trenching, plowing, directional boring or micro-trenching conduits and vaults, then pulling fiber through splice locations or into a Multiport Serving Terminal (MST), where the future drop will be connected to. Alternatively, the work can be completed aerially through *make ready* (dependent on the pole owners requirements) which require bucket trucks to place strand, anchors and guys in order to lash the fiber into splice locations and MSTs. This is completed throughout the project area, passing all the demand points, which have been established during the design stage. Demand points should be connected to service as the network is being built to ensure the network generates revenue and the overall planned operating costs are not exceeded. During the Construction phase, the main router and electronics which will *lite* the network are placed and built based on interconnection points and a central office, co-location space, or Fiber Distribution Hub (FDH) cabinets, which are located throughout the network. Some easements, or co-locations with partners, will need to be completed based on the architecture selected for the network.

Before the Construction Phase, and ongoing through the initial stages of the project, even after the network and the services to be provided have begun, **Marketing, Education and Customer Sales** must be at work. Marketing and selling can be outsourced to a partner, or done in house, and includes marketing, such as website creation and maintenance, direct mailers, billboards, commercials, and sales, such as door to door, or other means, to sell the future internet services being offered and which are already available. For a community with a Digital Equity and Inclusion (DEI) department, partnership with local advocacy groups is recommended to educate the community on what the network can do and the opportunities it can provide - from online learning, to workforce opportunities, to healthcare. Additional potential partnerships include working with ISPs to create Experience Centers, or Education Centers, around the services that can be provided. As in all of these phases and sub-phases, this should be structured differently based on the community of Bradley County and the local unique needs. ISPs utilize an Operations Support System (OSS) for managing potential and current customers and a Business Support System (BSS) that directs customers through signup to paying the monthly service bill. This software should be selected early in the process, as it can take up to 6 months for implementation, while integrating into the other software tools used to build the network.

A customer can sign up for service once the ROW work is completed, tested and posted to as-builts in the Fiber Management Software (FMS) being used, which will initiate the **Drop and Installation** stage. This also can be subcontracted out to a partner (or done in house if capacity allows) and has significant potential for local workforce development. Completing the drop placement and in home or business installation is long term work that will continue as long as the network is in operation. During the previous stages, a workforce development program should be created for the Drop and Installation needs, unless utilizing a company that specializes in this phase of the network deployment. Usually done in two different truck rolls, the *drop* is built by trenching or boring a small drop cable from the Multiport Service Terminal (MST) to the Optical Network Terminal (ONT) at the side of the home. The fibers are spliced together to the network and back to a card at a *co-location space* or Fiber Distribution Hub (FDH) for the given service area (which is tested to insure proper light and data loss is minimal). Another truck roll is completed to connect an ethernet cable to the ONT that would then be connected to the router to provide WiFi throughout the home or business at the speed package selected by the customer. Testing is completed and any other services are installed or set up, such as smart home packages or tele-health services. The customer will then have a portal setup in the OSS/BSS system that will enable them to change or add services while also paying the monthly recurring bill.

After customers begin receiving service, the **Operations and Customer Service** stage is initiated, which will include monitoring the network for physical and cyber security threats. Selecting partners for this type of work is very important and should be initiated by the Electronics partners established. A team should be on call for any damage that occurs to the network (examples of such are cable being cut or damage during other construction) according to the Service Level Agreements (SLA) which should specify the amount of time an outage or damage should be repaired within. Monitoring to prevent cyber threats can also be established through a Network Operations Center (NOC) by a RFP process. A call center for regular hours and after hours must be set up (or outsourced) for customers to call with issues or questions, for assistance in signing up for service, as well as many other items. It is typical for ISPs and WISPs to establish a local call center during the day and outsource after hours. However, this is an opportunity for increased workforce jobs and the local community should seek to meet this need. Planning costs should include network electronics upgrades and new greenfield subdivision expansions, in addition to recurring fees the network must pay to run 24/7. These items should be modeled both organizationally but also financially for proper network planning.

Environmental, Historical, and Cultural Preservation Requirements

Bradley County must comply with certain environmental, historical, and cultural preservation requirements when federal funding is being utilized to deploy broadband network infrastructure.

Before the commencement of any new construction activities, Bradley County (or their partner) will complete all applicable environmental screening, including those outlined in the National Environmental Policy Act (NEPA), the National Historic Preservation Act, the Endangered Species Act, and other applicable environmental regulations.

Work Plans for Implementation and Operation

Proposed Model and Next Steps:

After completing the online analysis, financial projections to rollout a complete fiber network, and meeting with all project stakeholders, Bradley County will need to establish a partner ISP in the area and create a P3 structure.

It is recommended a Request for Information ('RFI') or Request for Proposals ('RFP') be sent. This request to gauge interest in what an ISP would be willing to offer regarding a strategic partnership to get fiber or a hybrid network deployed to all residents and businesses in the Bradley County service area will allow a finalized buildout plan to be created. The feedback will begin negotiations of what a final P3 might look like. The ISP will benefit from the support of the local community in grant funding opportunities, such as BEAD. This could include in-kind contributions, physical infrastructure for wireless or wireline leases, or alternative solutions. The RFI or RFP should dictate all of Bradley County's needs in regards to both physical and digital connectivity. It is suggested to start with a pilot project, as has been done previously with VEC, as it allows all parties to establish proper working relationships before expanding the scope of a project. Workforce development and other factors should be considered when putting together the RFI or RFP. Consultants can help with these next steps. Bradley County can offer a range of partnership options that are in compliance with State regulations, such as offer leasing for infrastructure (if there is an interest in managing a conduit or dark fiber network that leases to the partner ISP selected after the RFI and/or RFP process is completed). Bradley County can also offer grant support for joint applications, letters of support, or in kind contributions such as permitting assistance, pole attachment and make ready support, co-locating electronics both inside and outside, locating or sharing office space for workers, or structuring a call center area.

Technology Risks

Cybersecurity Risk Management Plan

The table below outlines key components of a cybersecurity risk management plan:

Component	Description	Responsible Parties	Timeline
1. Risk Identification	Identifying potential cybersecurity risks	Cybersecurity Team, IT Department, Stakeholders	Ongoing
Threat Analysis	Identifying current and emerging threats	Cybersecurity Team, Threat Intelligence	Ongoing
Asset Inventory	Listing all critical assets and data	IT Department, Data Owners	Ongoing
Vulnerability Assessment	Identifying weaknesses in systems and software	IT Security, Vulnerability Management	Regular Scans
2. Risk Assessment	Evaluating the impact and likelihood of risks	Risk Assessment Team, IT Security	Periodic Review
Impact Analysis	Assessing potential damage to assets and data	Risk Assessment Team, Business Owners	Periodic Review
Likelihood Analysis	Estimating the probability of risks occurring	Risk Assessment Team, IT Security	Periodic Review
3. Risk Mitigation	Developing strategies to reduce or mitigate risks	Cybersecurity Team, IT Security	Implementation
Controls Implementation	Implementing security controls and measures	IT Department, Cybersecurity Team	Ongoing
Incident Response Plan	Developing a plan to respond to security incidents	Incident Response Team, IT Security	Ongoing

Component	Description	Responsible Parties	Timeline
4. Risk Monitoring	Continuously monitoring the security landscape	Cybersecurity Team, IT Security	Ongoing
Threat Intelligence	Keeping abreast of evolving threats and vulnerabilities	Cybersecurity Team, Threat Intelligence	Ongoing
Security Audits and Assessments	Conducting periodic security audits and assessments	Internal/External Auditors	Regular Audits
5. Risk Review and Reporting	Periodically reviewing risk status and reporting	Risk Assessment Team, IT Security	Periodic Reports
Risk Register Updates	Updating the risk register with new findings	Risk Assessment Team, IT Security	Periodic Review
Executive Summaries	Providing executive summaries of the risk landscape	Executive Team, Stakeholders	Periodic Reports
6. Training and Awareness	Educating staff and stakeholders on cybersecurity	IT Security, HR Department	Ongoing Training
Employee Training	Providing cybersecurity training to employees	IT Security, HR Department	Regular Training
Stakeholder Communication	Keeping stakeholders informed about cybersecurity	IT Security, Communications Team	Ongoing Updates
7. Incident Response Testing	Conducting regular incident response drills	Incident Response Team, IT Security	Periodic Testing
Scenario Planning	Simulating cybersecurity incidents for preparedness	Incident Response Team	Regular Drills
Post-Incident Evaluation	Evaluating incident responses for improvement	Incident Response Team, IT Security	Post-Incident

Supply Chain Risk Management Plan

The table below outlines key components of a supply chain risk management plan:

Component	Description	Responsible Parties	Timeline
1. Risk Identification	Identifying potential supply chain risks	Supply Chain Team, Suppliers	Ongoing
Supplier Risk Assessment	Assessing suppliers for vulnerabilities	Supply Chain Team, Procurement	Periodic Review
Demand and Supply Variability	Analyzing potential disruptions in demand and supply chains	Forecasting Team, Supply Chain Team	Ongoing
Geopolitical and Environmental Risks	Identifying geopolitical and environmental factors affecting the supply chain	Risk Assessment Team, Supply Chain Team	Ongoing
2. Risk Assessment	Evaluating the impact and likelihood of risks	Risk Assessment Team, Supply Chain Team	Periodic Review
Impact Analysis	Assessing potential damage to the supply chain	Risk Assessment Team, Business Owners	Periodic Review
Likelihood Analysis	Estimating the probability of risks occurring	Risk Assessment Team, Supply Chain Team	Periodic Review
3. Risk Mitigation	Developing strategies to reduce or mitigate risks	Supply Chain Team, Procurement	Implementation
Diversification of Suppliers	Expanding the supplier base to reduce dependency	Supply Chain Team, Procurement	Ongoing
Inventory Management	Maintaining safety stock to manage supply disruptions	Inventory Management Team	Ongoing
Alternative Sourcing Strategies	Establishing backup sourcing options	Supply Chain Team, Procurement	Implementation

Component	Description	Responsible Parties	Timeline
4. Risk Monitoring	Continuously monitoring the supply chain	Supply Chain Team, Suppliers	Ongoing
Supplier Performance Tracking	Monitoring and measuring supplier performance	Supply Chain Team, Procurement	Ongoing
Demand Forecasting	Updating forecasts based on market changes	Forecasting Team, Supply Chain Team	Ongoing
5. Business Continuity Planning	Developing a plan to maintain operations during disruptions	Business Continuity Team, Supply Chain Team	Implementation
Continuity Plans	Creating detailed continuity plans for various scenarios	Business Continuity Team	Ongoing
Communication Strategies	Establishing communication protocols during disruptions	Crisis Communication Team	Ongoing
6. Risk Review and Reporting	Periodically reviewing risk status and reporting	Risk Assessment Team, Supply Chain Team	Periodic Reports
Risk Register Updates	Updating the risk register with new findings	Risk Assessment Team, Supply Chain Team	Periodic Review
Executive Summaries	Providing executive summaries of the supply chain risk landscape	Executive Team, Stakeholders	Periodic Reports
7. Supplier Collaboration	Building collaborative relationships with key suppliers	Supply Chain Team, Key Suppliers	Ongoing
Supplier Audits and Assessments	Conducting supplier audits and assessments for compliance and risk mitigation	Supply Chain Team	Regular Audits
Joint Business Continuity Planning	Collaboratively developing business continuity plans with key suppliers	Supply Chain Team, Key Suppliers	Ongoing

Construction Risks

Cost Overruns

Bradley County can mitigate cost overruns with respect to the deployment of its proposed project(s) through the following steps:

1. Bradley County, or its partner, should send out Requests for Proposals which include unitized pricing from at least three (3) vendors to complete the Construction work.
2. From these responses, selections should be based on the best all around vendor, with guardrails around pricing based on the final contracts and work orders that will be assigned with the allocated budget. Change orders should generally not be allowed.
3. Change orders can be approved based only if fitting within the overall budget and fundraising that would be completed to date.

Additional Risks

There are many additional risks associated with the deployment of a broadband project that will involve participation and partnership at all stages of work. The earlier meetings or other planning exercises occur, the easier it will be for the project to maintain both timeline and budget. This can include but is not limited to: make ready engineering and construction, political understandings and alignment, permitting, and right of way. Choosing the correct partners and working with the right people that lead each department will be critical, in addition to the other physical risk mitigations which are mentioned in [Next Steps and Recommendations](#).



FINANCIAL PLAN

Capital Cost Estimates

Based on the completion of the Breaking Point study and feedback from Bradley County, the following financial model was created which would serve possible BEAD eligible areas. The model includes building out a full network that services all residents that do not have access to fiber. The model is based on early assumptions and partnering with an ISP would improve accuracy.

BEAD Eligible Locations Financial Assumptions

Opportunity	Bradley County, TN
Total Households	2,245
Total Businesses	0
Median Household Income	\$63,659
Estimated Mileage to Build	183
Aerial %	70%
Underground %	30%
Aerial Mileage	128.1
Underground Mileage	54.9
Engineering Per Foot	\$1.50
Underground Cost Per Mile Labor	\$115,000
Underground Cost Per Mile Materials	\$26,950
Aerial Cost Per Mile Labor	\$24,870
Aerial Cost Per Mile Materials	\$18,750
Make Ready Per Mile	\$25,450
Months to Complete ROW	24
Estimated Take Rate	50%
Months to Take Rate	36
Drop and Splicing Cost	\$600.00
Installation Cost	\$200.00
Estimated Engineering Start Date	9/1/2024
Estimated Make Ready Start Date	1/1/2025
Estimated Construction Start Date	3/1/2025
Time to First Customer	6/1/2025
Homes Per Mile	12
Home Passed Per Month	94
ARPU	\$65.00
Total Homes Receiving Service	1123
Greenfield growth post take rate	1%
Churn	1%

Revenue and Operations

Financial Model

BEAD Eligible Locations Financial Model

The following pages display the Annual Balance Sheet representing the network if delivered by a single ISP to only BEAD qualifying areas over a 10 year period.

	2024 (Yr 1)	2025 (Yr 2)	2026 (Yr 3)	2027 (Yr 4)	2028 (Yr 5)	2029 (Yr 6)	2030 (Yr 7)
Capital Expense FTE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Capital Expense Office and Development	\$ 4,500	\$ 146,585	\$ 148,435	\$ 149,349	\$ 149,349	\$ 149,349	\$ 149,349
Capital Expense Construction in ROW	\$ -	\$ 6,179,224	\$ 7,415,069	\$ 1,235,845	\$ -	\$ -	\$ -
Success Based Capex(1)	\$ -	\$ 168,375	\$ 449,000	\$ 449,000	\$ 283,658	\$ 8,123	\$ 8,171
CapEx	\$ 4,500	\$ 6,494,184	\$ 8,012,503	\$ 1,834,194	\$ 433,007	\$ 157,471	\$ 157,520
Cumulative Total CapEx	\$ 4,500	\$ 6,498,684	\$ 14,511,187	\$ 16,345,380	\$ 16,778,388	\$ 16,935,859	\$ 17,093,379
Annual Income Statement	2024	2025	2026	2027	2028	2029	2030
Subscription Revenue	\$ -	\$ 30,401	\$ 279,690	\$ 571,540	\$ 833,536	\$ 880,599	\$ 885,897
Capex to Opex							
Cost of Goods	\$ 4,818	\$ 35,440	\$ 38,312	\$ 36,547	\$ 50,193	\$ 44,302	\$ 58,931
Gross Margin	\$ (4,818)	\$ (5,039)	\$ 241,378	\$ 534,992	\$ 783,343	\$ 836,297	\$ 826,966
GM%	n/a	-17%	86%	94%	94%	95%	93%
Selling	\$ -	\$ 90,226	\$ 163,542	\$ 168,542	\$ 119,566	\$ 75,000	\$ 65,000
General	\$ -	\$ 1,250	\$ 1,250	\$ -	\$ 2,500	\$ -	\$ 2,500
EBITDA	\$ (4,818)	\$ (96,515)	\$ 76,586	\$ 366,451	\$ 661,277	\$ 761,297	\$ 759,466
EBITDA %	n/a	-317%	27%	64%	79%	86%	86%
Depreciation	\$ 19	\$ 120,685	\$ 508,546	\$ 793,340	\$ 829,756	\$ 842,528	\$ 850,403
Profit / (Loss)	\$ (4,836)	\$ (217,200)	\$ (431,960)	\$ (426,889)	\$ (168,480)	\$ (81,231)	\$ (90,936)
Profit / (Loss) %	n/a	-714%	-154%	-75%	-20%	-9%	-10%

Revenue and Operations

Financial Model Continued

	2031 (Yr 8)	2032 (Yr 9)	2033 (Yr 10)	Total
Capital Expense FTE	\$ -	\$ -	\$ -	\$ -
Capital Expense Office and Development	\$ 149,349	\$ 149,349	\$ 149,349	\$ 1,344,961
Capital Expense Construction in ROW	\$ -	\$ -	\$ -	\$ 14,830,137
Success Based Capex(1)	\$ 8,221	\$ 8,270	\$ 8,320	\$ 1,391,138
CapEx	\$ 157,569	\$ 157,619	\$ 157,669	\$ 17,566,236
Cumulative Total CapEx	\$ 17,250,949	\$ 17,408,567	\$ 17,566,236	\$ 17,566,236
Annual Income Statement	2031	2032	2033	Total
Subscription Revenue	\$ 891,227	\$ 896,589	\$ 901,984	\$ 6,171,462
Capex to Opex				\$ -
Cost of Goods	\$ 54,147	\$ 65,025	\$ 71,649	\$ 459,365
Gross Margin	\$ 837,080	\$ 831,564	\$ 830,335	\$ 5,712,098
GM%	94%	93%	92%	93%
Selling	\$ 75,000	\$ 70,000	\$ 70,000	\$ 896,875
General	\$ -	\$ 1,250	\$ 1,250	\$ 10,000
EBITDA	\$ 762,080	\$ 760,314	\$ 759,085	\$ 4,805,223
EBITDA %	86%	85%	84%	78%
Depreciation	\$ 858,280	\$ 866,159	\$ 874,041	\$ 6,543,756
Profit / (Loss)	\$ (96,200)	\$ (105,845)	\$ (114,957)	\$ (1,738,534)
Profit / (Loss) %	-11%	-12%	-13%	-28%

ISP Investment and Return

Based on the Assumptions shown above an overall investment is needed of ~\$16 million and achieving positive EBITDA (Earnings before interest, taxes and depreciation) beginning in 2026 (Year 3), cashflow positive in 2028 (Year 5), and fully returning principal investment needed and being cumulative cash flow positive in ~31 years based on limited growth and conservative expenses.

Full Network for Partner ISP Assumptions

The Financial Model assumes the ISP will be responsible for all tasks including the ones mentioned in the Broadband Infrastructure section. The high level numbers displayed here would need to be finalized during the engineering phases with the selected partner from the RFI and/or RFP. These costs can be adjusted to a specific pilot project area and these numbers are an example to demonstrate a build out for fiber connectivity to all residents.

The financial snapshots on the following pages were created using the design metrics from this Connectivity Plan and Breaking Point’s study, along with historical unit pricing from past experience and industry standards. Both the BEAD Eligible Locations and Full Network for a Partner financial models were created using conservative estimates in order to successfully demonstrate what a network might cost to build in Bradley County and the possible revenue streams which would accompany them.

Opportunity	Bradley County, TN
Total Households	21,724
Total Businesses	0
Median Household Income	\$63,659
Estimated Mileage to Build	538
Aerial %	60%
Underground %	40%
Aerial Mileage	322.8
Underground Mileage	215.2
Engineering Per Foot	\$1.50
Underground Cost Per Mile Labor	\$110,000
Underground Cost Per Mile Materials	\$26,950
Aerial Cost Per Mile Labor	\$24,870
Aerial Cost Per Mile Materials	\$18,750
Make Ready Per Mile	\$21,560
Months to Complete ROW	36
Estimated Take Rate	50%
Months to Take Rate	48
Drop and Splicing Cost	\$700.00
Installation Cost	\$200.00
Estimated Engineering Start Date	11/1/2024
Estimated Make Ready Start Date	2/1/2025
Estimated Construction Start Date	4/1/2025
Time to First Customer	7/1/2025
Homes Per Mile	40
Home Passed Per Month	603
ARPU	\$65.00
Total Homes Receiving Service	10862
Greenfield growth post take rate	1%
Churn	1%

Full Network Build Out Financial Model

This following is an Annual Balance Sheet displaying a network operated by a single entity or ISP but with multiple ISPs using the network to provide service to the end user. In this modeling, no businesses are shown as receiving service as those are more difficult to predict based on this phase of the project. Bradley County should participate, based on the P3 structure identified, at certain levels of the business plan as described in the Broadband Infrastructure section. This participation would adjust some of the assumptions and change the overall balance sheet.

	2024 (Yr 1)	2025 (Yr 2)	2026 (Yr 3)	2027 (Yr 4)	2028 (Yr 5)	2029 (Yr 6)	2030 (Yr 7)
Capital Expense FTE	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Capital Expense Office and Development	\$ 3,000	\$ 150,305	\$ 164,873	\$ 174,387	\$ 174,387	\$ 174,387	\$ 174,387
Capital Expense Construction in ROW	\$ -	\$ 11,953,284	\$ 15,937,712	\$ 15,937,712	\$ 3,984,428	\$ -	\$ -
Success Based Capex(1)	\$ -	\$ 1,108,829	\$ 3,801,700	\$ 3,801,700	\$ 2,401,033	\$ 66,863	\$ 67,266
CapEx	\$ 3,000	\$ 13,212,418	\$ 19,904,285	\$ 19,913,799	\$ 6,559,848	\$ 241,250	\$ 241,653
Cumulative Total CapEx	\$ 3,000	\$ 13,215,418	\$ 33,119,702	\$ 53,033,501	\$ 59,593,350	\$ 59,834,600	\$ 60,076,253
Annual Income Statement	2024	2025	2026	2027	2028	2029	2030
Subscription Revenue	\$ -	\$ 147,090	\$ 1,853,329	\$ 3,971,419	\$ 5,872,738	\$ 6,213,387	\$ 6,250,770
Capex to Opex							
Cost of Goods	\$ 4,818	\$ 45,440	\$ 48,312	\$ 36,547	\$ 70,193	\$ 44,302	\$ 78,931
Gross Margin	\$ (4,818)	\$ 101,649	\$ 1,805,017	\$ 3,934,871	\$ 5,802,545	\$ 6,169,086	\$ 6,171,839
GM%	n/a	69%	97%	99%	99%	99%	99%
Selling	\$ -	\$ 367,542	\$ 888,875	\$ 903,875	\$ 873,875	\$ 677,583	\$ 195,000
General	\$ -	\$ 3,750	\$ 3,750	\$ -	\$ 7,500	\$ -	\$ 7,500
EBITDA	\$ (4,818)	\$ (269,643)	\$ 912,392	\$ 3,030,996	\$ 4,921,170	\$ 5,491,502	\$ 5,969,339
EBITDA %	n/a	-183%	49%	76%	84%	88%	95%
Depreciation	\$ 3,000	\$ 13,212,418	\$ 19,904,285	\$ 19,913,799	\$ 6,559,848	\$ 241,250	\$ 241,653
	\$ (7,818)	\$ (13,482,060)	\$ (18,991,893)	\$ (16,882,803)	\$ (1,638,679)	\$ 5,250,252	\$ 5,727,687
Profit / (Loss)							
Profit / (Loss) %	\$ 6	\$ 208,712	\$ 1,116,832	\$ 2,112,343	\$ 2,898,436	\$ 2,985,194	\$ 2,997,266
	\$ (4,824)	\$ (478,355)	\$ (204,440)	\$ 918,653	\$ 2,022,734	\$ 2,506,308	\$ 2,972,073
	n/a	-325%	-11%	23%	34%	40%	48%

FINANCIAL PLAN

	2031 (Yr 8)	2032 (Yr 9)	2033 (Yr 10)	Total
Capital Expense FTE	\$ -	\$ -	\$ -	\$ -
Capital Expense Office and Development	\$ 174,387	\$ 174,387	\$ 174,387	\$ 1,538,886
Capital Expense Construction in ROW	\$ -	\$ -	\$ -	\$ 47,813,136
Success Based Capex(1)	\$ 67,670	\$ 68,077	\$ 68,487	\$ 11,451,626
CapEx	\$ 242,057	\$ 242,464	\$ 242,874	\$ 60,803,648
Cumulative Total CapEx	\$ 60,318,310	\$ 60,560,774	\$ 60,803,648	\$ 60,803,648
Annual Income Statement				
	2031	2032	2033	Total
Subscription Revenue	\$ 6,288,378	\$ 6,326,212	\$ 6,364,274	\$ 43,287,598
Capex to Opex				\$ -
Cost of Goods	\$ 54,147	\$ 75,025	\$ 81,649	\$ 539,365
Gross Margin	\$ 6,234,231	\$ 6,251,187	\$ 6,282,625	\$ 42,748,233
GM%	99%	99%	99%	99%
Selling	\$ 225,000	\$ 210,000	\$ 210,000	\$ 4,551,750
General	\$ -	\$ 3,750	\$ 3,750	\$ 30,000
EBITDA	\$ 6,009,231	\$ 6,037,437	\$ 6,068,875	\$ 38,166,483
EBITDA %	96%	95%	95%	88%
CapEx	\$ 242,057	\$ 242,464	\$ 242,874	\$ 60,803,648
EBITDA - CapEx (free cashflow)	\$ 5,767,174	\$ 5,794,973	\$ 5,826,001	\$ (22,637,165)
Depreciation	\$ 3,009,358	\$ 3,021,470	\$ 3,033,603	\$ 21,383,221
Profit / (Loss)	\$ 2,999,873	\$ 3,015,967	\$ 3,035,273	\$ 16,783,262
Profit / (Loss) %	48%	48%	48%	39%

Full Network Investment and Return

Based on the assumptions shown above, an overall investment needed of ~\$51 million is projected and achieving positive EBITDA (Earnings before interest, taxes and depreciation) beginning in 2026 (Year 3), cash flow positive in 2029 (Year 6), and fully returning principal investment needed and being cumulative cash flow positive in ~14 years, based on limited growth and conservative expenses. Bradley County, or stakeholders that chose to participate in the partnership with an ISP, could receive revenue sharing, discounted services for anchor institutions, or digital equity training and workforce development.



NEXT STEPS & RECOMMENDATIONS

Environmental, Historical, and Cultural Preservation Considerations

Bradley County has intentionally and strategically developed future land use recommendations that impact how broadband infrastructure can be implemented.

- Forest and agricultural residential areas expect low-intensity development with up to four units per acre in areas that have access to utilities.
- Bradley County has identified areas for future employment where commercial or industrial uses would be best positioned and can accommodate spread of development in a manner that is still sensitive to the surrounding communities and environment, reducing unnecessary negative impact on the area. These areas are recommended around roadways that can accommodate freight traffic. Commercial uses are recommended in outlying areas of the county with floor-area ratios between 0.20 and 0.25 according to the Joint Comprehensive Plan (the ratio of a building's floor area to the size of the land on which it is built). Industrial areas are encouraged to have floor area ratios of 0.15 to 0.25 and are typically over 30 acres.
- Natural Conservation areas include those along the ridge lines, slopes, hilltops and floodplains and are 10 acres or more. New developments should be reviewed for potential impact on natural resources.

- Public areas (which include community centers, government buildings, and educational facilities) should be determined by the population count (to include projected populations) and the locations determined should be based on the services needed.
- Rural residential areas are limited to northern and southern corridors and act as a transition area between dense urban areas and agricultural areas. The average lot is five or more acres and the expectation will be that urban utility services, such as sewer, are not available, which also will impact broadband expansion.
- Low density single family residential areas are between 0.5 to two acres; medium density single family residential range from 0.16 to two acres and is recommended for the City of Cleveland's urban growth boundary area.
- Low density residential neighborhoods are for areas adjacent to the City of Charleston or unincorporated neighborhoods in the southeast, with neighborhood areas ranging from two to eight units per acre; high density neighborhoods are recommended adjacent to the City of Cleveland's southeast boundary with four to twelve units per acre⁸⁵. For all cluster developments, underground utilities are required⁸⁶.
- Other development categories are village mixed-use, low density neighborhood mixed use, medium density community mixed use, and high density regional mixed use.

⁸⁵ Bradley County Comprehensive Plan

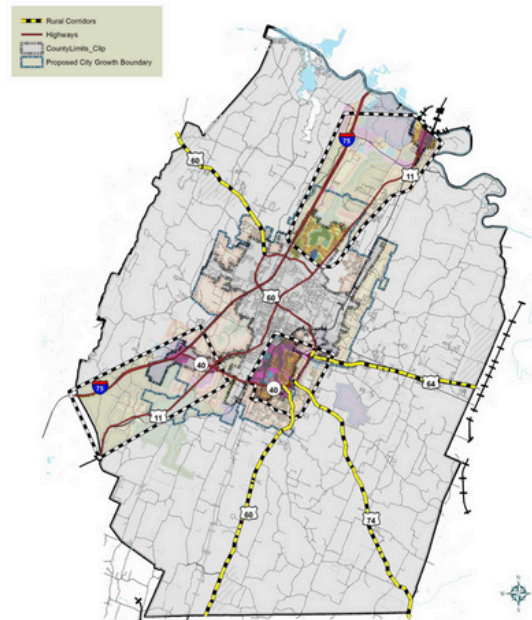
⁸⁶ Residential Development Guidelines

NEXT STEPS & RECOMMENDATIONS



The Northern Corridor (encompassing part of the City of Cleveland and unincorporated Bradley County and the entire City of Charleston) is expected to be made up of rural, village mixed use, and neighborhoods. As the Northern Corridor is largely low-density, sidewalks and bicycle connections are generally not available, making access to digital resources limited to those with vehicles and the ability to use them. The City of Charleston has greenway trails for improving pedestrian connectivity within the city and northeast portion. The ridge and valley topography, in addition to lack of connecting roads in the area, may limit connectivity⁸⁷. The Central City Area was identified in the 2035 BCC Joint Strategic Plan as an area for reinvestment. However, several areas are prone to flooding and are part of the regional drainage pattern. Additionally, utilities and services are restricted due to terrain in the southern and eastern area⁸⁸. In the Southern Corridor Area, a proposed urban service boundary has been established to preserve rural character⁸⁹ in which the sewer would not service homes to maintain low density

development, ultimately having an impact on how broadband expansion can reach those areas effectively. The Southern Corridor is largely rural in landscape, composed of agriculture, outdoor recreational opportunities, and environmental treasures that define its character. Similar to the rest of the county, ridgelines run north and south throughout the area. There are planned transportation route improvements that, if implemented, would increase development in the Southern Corridor and provide opportunities for broadband expansion. The McDonald area has been identified as the most likely for targeting growth and expansion by the Southern Corridor Area Plan⁹⁰.



The rural corridor areas identified are considered having roadways that are prime for future development. These include: Dalton Pike, Spring Place Road, Waterlevel Highway, Georgetown Road, and South Lee Highway. The Joint Comprehensive Plan recommends that in these areas coordination is needed for phased utility and service expansion, which could include broadband expansion.

⁸⁷ Northern Corridor Area Plan

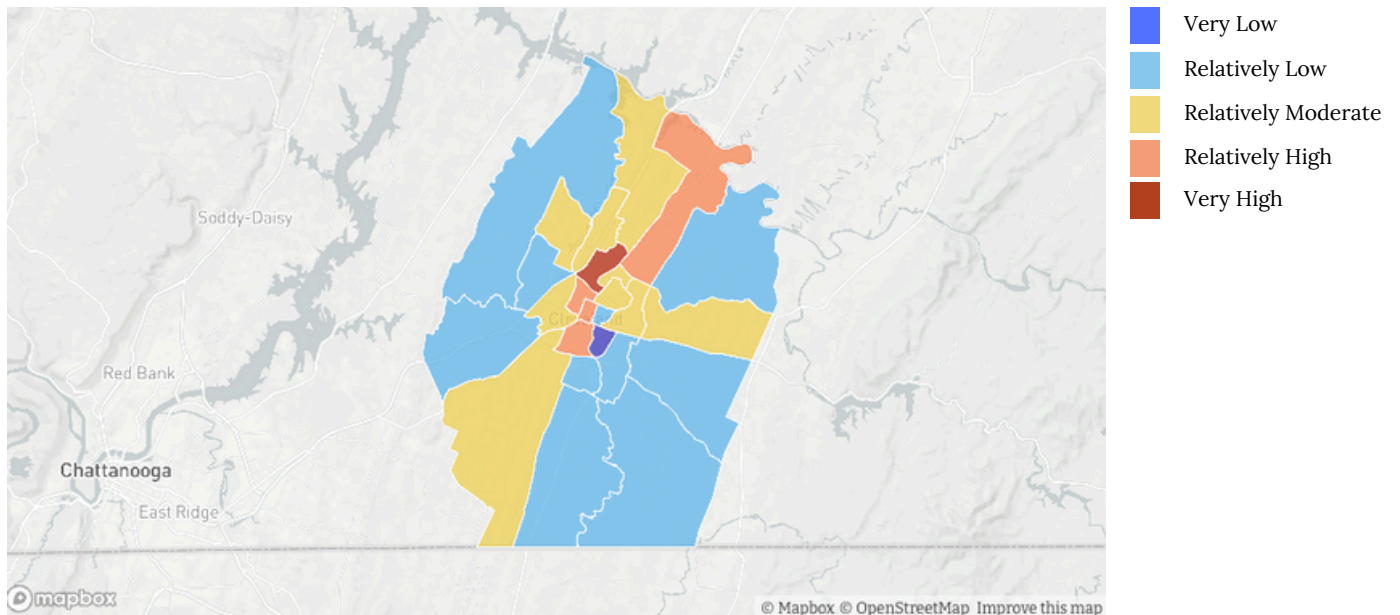
⁸⁸ Central City Area Plan

⁸⁹ Bradley County Comprehensive Plan

⁹⁰ Southern Corridor Area Plan

Climate Risk Mitigation Strategies

According to the Center for Rural Innovation’s Broadband Climate Risk Mitigation Tool⁹¹, Bradley County’s overall hazard risk percentile is 74%. The top five primary natural hazards identified across the county include lightning, earthquake, tornado, riverine flooding, and ice storms. The full Broadband Climate Risk Mitigation Report can be found in the [appendix](#) of this report.



As noted in the Tract Hazard Risk Score Map (above), five census tracts rise above the rest when assessing the average economic loss for a community in dollars resulting from natural hazards each year. These tracts encompass the areas of North and South Cleveland including downtown, Burlington Heights and Sequoia Grove, as well as the city of Charleston.

⁹¹ Broadband Climate Risk Mitigation Tool

Initial Hazard Screening and Potential Damage

Aerial: Structure stress, structural failure, fire damage, electrical short-circuit conditions, grid power failure, equipment damage

Buried: Structure stress, structural failure, electrical surge or short-circuit, grid power failure, equipment damage

Wireless: Structure stress, structural failure, service disruption, fire damage, electrical surge or short-circuit conditions, grid power failure, equipment damage

Aerial Mitigation Strategies

Flood Protection: Avoid constructing infrastructure in flood-prone areas, where feasible, and ensure proper drainage systems around poles or other components. Use Uninterrupted Power Supply (UPS) systems for backup power and generators for larger installations to maintain service during weather disruptions.

Wind and Structural Resilience: Use equipment rated for significant wind stress, such as composite or steel poles, and heavy-duty cable brackets where appropriate. Clear tree limbs and vulnerable structures from critical infrastructure. Whenever possible, bury cables to avoid damage from high winds. Harden essential network facilities, like hubs or central offices, to withstand destructive winds.

Lightning and Surge Protection: Install lightning arrestors, grounding wires, and surge protectors to safely manage energy from strikes and voltage surges. Ensure cables include a properly rated grounding conductor to prevent damage from electrical storms.

Ice and Snow Load: Use materials designed to handle the added weight of ice accumulation, and adhere to National Electrical Safety Code (NESC) standards for clearance around transmission lines. Regularly clear tree limbs from nearby infrastructure to prevent ice-related damage. Backup power systems, including UPS and generators, are critical during severe winter events.

Earthquake Preparedness: In earthquake-prone areas, use materials and installation techniques that provide flexibility and durability to withstand seismic activity. Backup power should be ensured in all essential network facilities.

Buried Mitigation Strategies

Flood Protection: Utilize materials such as waterproof conduits and fiber with water-resistant components (e.g., gel-filled cables) to protect against flooding. Avoid burying infrastructure in areas prone to erosion or washouts, and consider replacing underground installations with aerial infrastructure in high-risk flood zones.

Power Backup: Equip underground facilities with Uninterrupted Power Supply (UPS) systems to mitigate power loss during flooding or other emergencies. For larger control buildings, consider using generators to ensure continued operation during extended outages.

Electrical Surge Protection: Install surge protectors and use cables with properly rated grounding conductors to safeguard against voltage surges. These measures help protect buried infrastructure from electrical damage caused by power fluctuations.

Ground Shifting & Freeze Protection: In areas where freezing temperatures can lead to ground shifting, use materials and construction techniques designed for extra durability and flexibility to minimize the risk of damage. Backup power systems, including UPS and generators, are essential in maintaining uninterrupted service during these conditions.

Earthquake Resilience: In earthquake-prone areas, select materials and techniques that provide additional flexibility and durability to withstand seismic activity. Keep in mind that underground damage can be more unpredictable and harder to repair than aerial damage, making resilient design and power backup systems critical.

Wireless Mitigation Strategies

Flood Protection: Avoid constructing wireless base stations in flood-prone areas when possible. Ensure proper drainage around the base of towers and poles to prevent water damage. Equip installations with Uninterrupted Power Supply (UPS) systems to maintain service during power outages, and consider generators for larger facilities like data centers. For remote locations, alternative power sources, such as solar panels, can provide reliable backup power.

Wind and Structural Resilience: Utilize reinforced towers, antennas, high-strength equipment brackets, and enclosures to withstand significant wind stress. Keep tree limbs and other vulnerable structures clear from wireless infrastructure to prevent wind-related damage. Point-to-point connections should use high-strength brackets to avoid misalignment caused by strong winds. UPS systems and generators can provide critical backup power during windstorms.

Lightning and Surge Protection: Install lightning arrestors and grounding wires to safely transfer strike energy to the ground and protect against electrical surges. Backup power systems like UPS and generators should be in place to ensure wireless base stations and access points remain operational during outages.

Ice and Snow Load: Use materials designed to handle the extra weight of ice buildup on towers and antennas, and consider equipment enclosures with heating elements to prevent ice accumulation. Backup power, via UPS or generators, is essential to maintain service in harsh winter conditions.

Earthquake and Hail Resilience: In areas prone to earthquakes or hail, use materials and techniques with extra durability and flexibility to prevent damage. Ensure that all wireless base stations and access points have backup power options, including UPS and generators. Solar panels or other alternative power sources are beneficial for remote installations.

Implementation Strategies and Digital Equity Act Measurable Objectives

For Bradley County to achieve digital opportunity the following framework is being used:

- Targeted impact on covered populations
- Collaborate and strengthen partnerships
- Build on existing achievements and collaborations
- Prioritize data and information gathering
- Smart growth for lasting impact

The result being connected, resilient, prosperous communities where the workforce thrives, infrastructure can support the growth needed, and industries can succeed. Digital connectivity has the potential to increase the flow of capital in the county along with contributing to the maintenance of health, supporting education, information sharing, and the arts. Additionally, for a community to thrive, there must be a care of the souls, and community as a whole. Bradley County is seeking to identify where connectivity can be strengthened and where it needs implementation to achieve the thriving of the residents and industries.

Bradley County's Digital Connectivity Plan includes the following potential implementation strategies to address the needs of the covered populations in the community. These are suggestions and recommendations of the work that needs to be done to close the digital divide that exists in Bradley County. However, these strategies are only possible through partnership and collaboration across sectors.

The primary finding and recommendation is to create a Director of Community Development or Director of Broadband role for Bradley County who will further assess and develop a roadmap for addressing the digital divide in Bradley County.

Broadband Access Expansion

Objective - Increase the availability of affordable high speed internet access.

- Reconvene the Broadband Initiative Ad hoc Committee to address issues with reliability and accessibility
- Partner with ISP's such that through federal funding, broadband access is available to all unserved and underserved locations (less than 100/20 Mbps) and 1 Gb to Community Anchor Institutions
- Expand public WiFi hotspots throughout the county based on areas that lack access due to affordability, as well as in all county buildings
- Develop a county resilience strategy in regards to broadband connectivity, to include dedicated fiber lines for all emergency response services
- Measure annually the work in closing the digital divide to continue to refine strategies to include monitoring reliability issues, track quality of internet, and associated costs

Digital Literacy Programs

Objective - Improve digital literacy and technology skills among underserved populations.

- Create awareness campaign of the resources available in the community
- Collaborate with library and community centers in funding opportunities to expand digital literacy programs throughout the county
- Survey residents to target digital literacy programs and identify proficiencies
- Targeted outreach to covered populations to include storytelling of the impact digital literacy has had on residents of Bradley County

Awareness and Use of Cybersecurity and Online Privacy Tools

Objective - Empower individuals, organizations, and communities to protect their digital assets, personal information, and online activities from cyber threats and privacy breaches.

- Promote cybersecurity awareness through Bradley County social media and website
- Implement cybersecurity training program as funding opportunities allow

Community Technology Hubs

Objective - Establish community centers equipped with technology resources.

- Support and expand the technology hubs for the aging population such as through the Senior Center

Online Accessibility and Inclusivity of Public Resources and Services

Objective - Ensure everyone has the same opportunity to engage with public resources and services online to increase civic participation.

- Awareness campaign of the Digital Connectivity Plan and the opportunities available to include hosting community meetings, engagement sessions, stakeholder roundtable discussions, and community webinars
- Assessment of county government websites and services to identify opportunities to improve accessibility and usability
- Conduct focus groups and surveys to assess the digital equity needs of the community and to continue to develop strategies
- Create WiFi mapping to provide public WiFi awareness
- Create a Director of Community Development or Director of Broadband position in the county to lead the future strategy and implementation of broadband expansion and digital equity
- Consider establishing a data insight hub to collect, analyze and present data from various sources to provide insight to residents and stakeholders

Availability and Affordability of Consumer Devices

Objective - Ensure access to affordable devices and software.

- Continue to partner with programs such as Tech Goes Home to provide low cost devices and the skills for how to use it
- Build a device eco-system through funding ownership programs, loaner, retrofit/refurbish/upgrading computer labs

Public-Private Partnerships

Objective - Foster collaboration between government, businesses, and nonprofits.

- Work collaboratively to ensure priority populations are engaged and aware of digital equity opportunities
- Communicate success stories, impact of community resources, and best practices across the county
- Collaborate creatively across industries to solve for affordability burden for the residents of Bradley County

As part of private-public partnerships, Bradley County already became a Broadband Ready Community which required that a single point of contact be appointed, which is the Mayor's Office. The County does not have ordinances and does not pass ordinances like municipalities. To continue in this work of being a Broadband Ready Community it is recommended that the County partner with the City of Cleveland and the City of Charleston to work toward:

- Implementing policies that would enable ISP's to lay conduit during sewer and water expansion projects or to work with future developments and urban sprawl to implement broadband projects
- Streamline permitting in regards to broadband expansion

Bradley County recognizes that much of the work needing to be done will require partnership and collaboration across sectors. There are many strategies that will need to be developed to meet the needs of the population of Bradley County. There needs to be accountability from ISPs in regards to services provided. It is not enough to provide internet if it is not quality internet - reliable and affordable.

Closing the digital divide will take work in stages. With the current funding opportunities, Bradley County is prioritizing supporting fiber broadband expansion to unserved and underserved communities. However, Bradley County recognizes that accessibility is also based on affordability. As there are limited federal resources available for subsidizing subscriptions, other means will need to be pursued to help residents of Bradley County who cannot afford subscribing to broadband services, such as expanding public WiFi access points in rural and low income areas.

Further work that is outside Bradley County's capacity relates to resilience work. Evaluating the broadband infrastructure and planning for major outages and monitoring disruptions to make sure the impact to the county is minimized requires partnership with ISP's. Additionally, the expectation is Bradley County's broadband network footprint will only increase and scalability is a consideration, with future increases in bandwidth demands and load balancing requirements.

Construction Process Improvements

Cost Overruns

To best advocate for taxpayers and residents, Bradley County should request that internet service providers seeking their support make efforts to mitigate cost overruns with respect to the deployment of the proposed project(s). The County could, for example, require that:

- All contractors must have operating history and are extensively vetted by the Project Team.
- Contractors will have performance requirements and penalty payments will be assessed for projects behind schedule.
- Letter of credit required from contractor for non-performance.
- Insurance required for each project and liquidated damages tied to performance.

Make-Ready Delays

The examples below describe how Bradley County can work with service providers to mitigate make-ready delays with respect to the deployment of the proposed project(s).

- Engage with utility companies early to secure approvals and align schedules, preventing conflicts and unexpected delays.
- Conduct site surveys and use professional engineering services to identify and address potential make-ready issues before construction starts.
- Advocate for One-Touch Make-Ready (OTMR) policies, allowing a single contractor to perform all necessary work, reducing the need for multiple crews.
- Develop contingency plans for critical project segments and maintain clear communication with stakeholders to manage expectations and promptly address concerns.

Permitting, Licensing, Authorizations, and Approvals Delays

The examples below describe how Bradley County can potentially help mitigate permitting delays (particularly railroads and federal lands) with respect to the deployment of its proposed project(s).

- Initiate discussions with local, state, and federal permitting agencies early in the planning process to understand requirements, timelines, and potential challenges.
- Assist service providers with preparing and submitting complete, accurate permit applications with all required documentation and ensure compliance with regulations to avoid back-and-forth revisions.
- Identify and utilize any available expedited or priority permitting programs for broadband infrastructure projects to shorten approval timelines.
- Assign a dedicated team member to maintain regular follow-ups with permitting agencies, track application statuses, and address any issues promptly to keep the process moving forward

Planned Public Works

The examples below describe how Bradley County can coordinate Dig Once opportunities with ongoing and planned public works projects (i.e., opening of roads, right-of-way, or easements) to avoid delays:

- Establish partnerships with local governments, utility companies, and transportation agencies to align broadband deployment with planned infrastructure projects, such as roadwork or utility upgrades.
- Develop a shared project schedule that outlines upcoming construction activities in the area. This will help identify opportunities to coordinate trenching or conduit installation with other projects to minimize excavation needs.
- Attend local and regional planning meetings to stay informed about upcoming infrastructure projects and advocate for the inclusion of broadband conduit installations in those plans.
- Establish a system for receiving notifications about planned excavations and roadwork, allowing the project team to proactively coordinate Dig Once opportunities with relevant stakeholders.

Implementation Logistics and Requirements

Bradley County's strategy for broadband expansion and adoption involves a dynamic, multi-phase approach to enhance digital connectivity and equity across the county. Rather than focusing on a single project, the county is exploring several initiatives that will be executed in partnership with service providers and external support teams.

Funding Strategy and Remaining Gaps

Bradley County understands that funding gaps exist and additional grant funding will likely be required to support the financial sustainability of the broadband network infrastructure projects necessary to connect all homes, schools, and businesses. Bradley County is encouraged to explore a combination of federal and/or state grant funding, ISP match, local match, and financing options.

The table on the following page provides a structured framework for planning and executing a broadband partnership and financing structure. It is essential to tailor these components to the specific needs and circumstances of the broadband project and community in question.

Match and Letter of Credit

Bradley County understands that accessing federal broadband grant opportunities such as the NTIA's BEAD program will require a minimum 25% match and an additional Letter of Credit in the amount equal to 25% of the federal grant request. Any potential ISP grant application partner for the BEAD program will also require a Letter of Credit. The NTIA recently announced a waiver⁹² granting flexibility to the Letter of Credit requirement, allowing certain subgrantees to utilize credit unions, performance bonds, and reduction of Letter of Credit/Performance Bonds upon completion of milestones.

Funding Ecosystem Assessment

Broadband Grant Assessment

The Broadband Grant Assessment can be used as a guide and reference when pursuing existing public, private, and philanthropic grant opportunities and accompanies Bradley County's Connectivity Plan as a separate attachment.

Acronyms

DHS - FEMA Department of Homeland Security
- Federal Emergency Management Agency

FCC - USAC Federal Communications
Commission - Universal Service Administrative
Company

USDA-RD United States Department of
Agriculture - Rural Development

USDOC-EDA United States Department of
Commerce - Economic Development
Administration

USDOC-NTIA National Telecommunications
and Information Administration

USDHUD United States Department of Housing
and Urban Development

⁹² BEAD Letter of Credit Waiver

NEXT STEPS & RECOMMENDATIONS

Component	Description	Key Stakeholders	Financing
1. Project Objectives	Define the goals and objectives of the broadband project	Government Agencies, Private Partners, Community	Grants, Public Funds, Private Investments
2. Partnership Formation	Identify key partners and their roles in the project	Government Agencies, ISPs, Infrastructure Providers	Public-Private Partnerships, Joint Ventures
Public Sector	Government agencies responsible for regulation, funding, and oversight	Local, State, and Federal Government	Grants, Bonds, Public Funds
Private Sector	Internet Service Providers (ISPs), infrastructure providers, and technology companies	ISPs, Infrastructure Providers, Technology Companies	Private Investments, Loans, Equity
Community Engagement	Involvement of the local community and organizations	Community Groups, Nonprofits, Local Businesses	Community Contributions, Grants
3. Financial Planning	Develop a financial plan for the project	Financial Analysts, Project Managers	Grants, Loans, Bonds, Equity
Budget Allocation	Allocate funds for infrastructure, operations, and maintenance	Project Managers, Financial Analysts	Public Funds, Grants, Loans
Revenue Generation	Identify revenue streams, such as subscription fees and service charges	Finance Team, ISPs	Subscription Fees, Service Charges
4. Funding Sources	Identify sources of funding for the project	Funding Agencies, Private Investors	Grants, Loans, Equity
Government Grants	Federal, state, or local grants for broadband infrastructure	Government Agencies	Government Grants
Public Bonds	Issuing municipal or revenue bonds for project financing	Finance Team	Public Bonds
Private Investments	Attract private investors for equity or debt financing	Private Partners, Investors	Private Investments, Loans
5. Revenue Sharing Agreements	Establish agreements for revenue sharing among partners	Government Agencies, Private Partners	Revenue Sharing Terms
Risk Allocation	Define how risks and liabilities are shared among partners	Legal Team, Partners	Risk Allocation Terms

NEXT STEPS & RECOMMENDATIONS

Component	Description	Key Stakeholders	Financing
6. Project Governance	Define the governance structure for decision-making and oversight	Governing Board, Project Manager	Governance Structure
Steering Committee	A committee overseeing the project's progress and compliance	Steering Committee Members	Decision-Making Protocols
Project Manager	Appoint a project manager responsible for day-to-day operations	Project Manager	Reporting, Execution
Reporting and Monitoring	Implement mechanisms for progress reporting and performance monitoring	Project Manager, Oversight Team	Reporting Framework
7. Risk Mitigation Strategies	Develop strategies to mitigate project risks	Risk Management Team	Risk Mitigation Plans
Contingency Plans	Create contingency plans for unexpected events	Risk Management Team	Contingency Plans
Insurance	Purchase insurance to cover potential losses	Risk Management Team	Insurance Policies
8. Performance Metrics	Define key performance indicators (KPIs) for the project	Project Manager, Oversight Team	KPIs and Measurement Metrics
Broadband Accessibility	Measure the percentage of the population with access to broadband	Oversight Team	Coverage Percentage
Service Quality	Monitor the quality of broadband services provided	ISPs, Oversight Team	Service Level Agreements (SLAs)
9. Review and Adaptation	Establish a process for project review and adaptation	Steering Committee, Project Manager	Review Schedule, Adaptation Strategies

Preparing for Grant Funding Opportunities

Based on previous experience working with other communities regarding the development of funding applications, it is recommended that several studies and narratives be completed prior to applying for federal grant funding opportunities. Each of these documents are required by the funding agencies in order to satisfy various programmatic and federal requirements and their completion ahead of time provides greater flexibility for Bradley County when considering multiple avenues of funding the proposed network solution.

Below are several studies that are uniform requirements for seeking federal funding:

- Preliminary and Final Engineering Feasibility Report (EFR)
 - The Preliminary and Final EFR is the document that is utilized by the funding agencies to understand the needs and existing conditions of the community and the proposed solution to address those needs. The EFR includes an overview of the project's scope, size, cost and alignment with the communities' priorities (i.e. closing the Digital Divide, economic development, workforce development, etc.). Typically, funders will accept a Preliminary EFR during the grant application phase and once funding is awarded, the agency will provide comments based on their review to finalize the document. Prior to the release of funding for construction, most funding agencies will require the EFR to be approved to ensure project feasibility.

- General Application Information
 - Depending on the nature of the grant, applicants are required to provide some general application information including a project description, stakeholders involved, documenting public and business support, anticipated economic impact, alignment with the agency and grant programs goals and objectives, project schedule, and proposed equipment.
- Proforma
 - Federal agencies typically request a proforma that projects fiscal expenditures (planning/design, construction, and operations) and revenue over a long-term period, 10 – 20 years, etc., to understand the financial sustainability of the project.

- Environmental Narrative
 - To satisfy National Environmental Policy Act requirements, applicants seeking federal funding must provide information to the funding agency regarding the project's potential impact on the environment. Since a variety of federal regulations exist, such as the Clean Water Act, Clean Air Act, Endangered Species Act, etc. it is important for the applicant to document how the proposed project impacts the environment. For projects that are located in environmentally sensitive areas such as wetlands, brownfields, preservation areas, etc. it is critical that the applicant document how the project will not negatively impact the environment. Typically, the federal funding agency will review the Environmental Narrative/Questionnaire to determine if any additional studies are required prior to issuing a Finding of No Significant Impact (FONSI). If additional studies are required such as Archeological, Air Quality, or Geotechnical surveys, the federal funding agency will require that these be completed prior to issuing a FONSI and beginning construction activities. Additionally, the federal funding agency may require coordination with other federal agencies (i.e. United States Army Corps of Engineers, Fish and Wildlife, Department of Interior, etc.) for their respective reviews prior to issuing a FONSI.

Through past experience applying and obtaining financial assistance, communities who have the proper engineering and technical information required to apply completed ahead of time are most prepared, confident, and competitive when seeking grant funding. Often, federal agencies only provide between 45 - 60 days for application submission which leaves very little time to begin these studies and assessment while the application period is open. If Bradley County is strongly interested in seeking grant funding to address its broadband infrastructure and accessibility gaps, it is recommend that these efforts are conducted as soon as possible to be prepared and ready for future funding opportunities.

Additionally, prior to applying for grant funding, it is strongly recommended that Bradley County coordinate closely with the Tennessee State Broadband Office and other key stakeholders to ensure that the proposal is aligned with State planning efforts and to include Bradley County's needs with respect to project costs to reach unserved and underserved areas. It is also important to note that partnerships with related stakeholders can possibly strengthen potential applications for funding, however more weight is given to partnerships that have been formally established prior to applying for funding. Lastly, due to the varying amount of local matching funding required to pursue these opportunities, it is suggested that Bradley County identify sources and amounts of matching funding to determine the respective capacity to secure grant funding.

Historical Financials

Bradley County understands the importance of demonstrating strong financial capacity and ability to sustain broadband network infrastructure investments. Bradley County is prepared to demonstrate its financial strength and stability by providing audited financial statements for the previous three fiscal years. Additionally, if Bradley County partners with an ISP partner to pursue joint network investment opportunities such as grants, the respective entity will also be expected to provide audited financial statements at the time of a grant application.



APPENDIX

Glossary of Terms

Affordable Connectivity Program (ACP) - the Affordable Connectivity Program is a now defunct FCC benefit program that helped households afford broadband access. The benefit provided a discount of up to \$30 per month toward internet service for eligible households and up to \$75 per month for households on qualifying Tribal lands. Eligible households could also receive a one-time discount of up to \$100 to purchase a laptop, desktop computer, or tablet from participating providers if they contributed more than \$10 and less than \$50 toward the purchase price.

Adaptive Technology - a form of assistive technology which is specifically designed for people with a disability.

Aerial Fiber (Aerial Installation) - installed on poles.

Assistive Technology - term used for assistive products and services; may be used to help or improve functioning or participation of an individual. Assistive technology may be used by aging population or people with disabilities.

Asymmetrical - upload and download speeds do not match.

Bandwidth - the maximum amount of data that can pass through a network connection at any time. Bandwidth is measured by speed in Megabits per second (Mbps) and Gigabits per second (Gbps).

Base Monthly Price - cost of the plan before any additional charges and fees are included (such as rentals for modems or taxes).

Broadband - high capacity transmission technology that sends data, voice, and video across long distances and at high speeds. Examples of broadband infrastructure are coaxial cables, fiber optic cables, wireless, and satellite.

Broadband Accessibility - access to the internet. Those who do not have access are classified as unserved or underserved.

Broadband Equity, Access And Deployment Program (BEAD) - \$42.45B federal grant program available to states and territories for closing the availability gap (infrastructure) of broadband.

Broadband Serviceable Locations (BSL) - geographic coordinates of all structures where a broadband connection can be installed (residential and commercial locations).

Cable Internet - broadband Internet access that uses the infrastructure of cable television networks to provide Internet services .

Capex - abbreviation for Capital Expenditure.

Capital stack - structure for understanding sources of capital needed and how the structure influences the potential return on investment.

Census Unit - census count of housing units in a census block (the smallest level of geography designated by the US Census Bureau).

Census Population - census count of total population in a census block.

Coaxial Cable (Coax) - type of cable used to transmit data such as the internet, video and voice communications.

Community Anchor Institutions - an entity such as a school, library, health clinic, health center, hospital or other medical provider, public safety entity, institution of higher education, public housing organization, or community support organization that provides access to broadband service to covered populations, including, but not limited to, low income individuals, unemployed individuals, children, the incarcerated, and aged individuals.

Computing Device - either a computer or a phone that is enabled with access to the internet.

Covered Populations - defined in the Infrastructure Investment and Jobs Act, Section 60301 et seq. (Digital Equity Act of 2021) as: individuals who live in covered households (those whose income from the most recent year is not more than 150% of the poverty level), aging individuals (60 years and older), incarcerated individuals (other than individuals who are incarcerated in a Federal correctional facility), veterans, individuals with disabilities, individuals with a language barrier, including individuals who are English learners and have low levels of literacy, individuals who are members of a racial or ethnic minority group, and individuals who primarily reside in a rural area.

Cybersecurity - the safe use of the internet to prevent against a cyberattack (any intentional effort to steal, disable, or harm data or a device through the unauthorized access to the physical device or the network it is using).

Dark Fiber - unlit fiber network that is installed but does not have traffic running through it.

Digital Connectivity - when people and communities are able to access and use affordable, high speed, reliable internet to meet their needs.

Digital Divide - the gap between people who have access to affordable, reliable Internet service, and the skills and computers or phones needed to use it, and those who do not have access.

Digital Equity - individuals and communities are able to fully participate in the society and economy of the United States digitally.

Digital Equity Act (DEA) - \$2.75 billion in federal funding to promote digital inclusion and equity as part of the Infrastructure Investment and Jobs Act.

Digital Literacy - the ability to use technologies to find and communicate information, requiring both cognitive and technical skills.

Digital Navigators - trained community members whose role is to assist other community members with support with connectivity, devices, and/or digital skills.

Digital Opportunity - all individuals and communities have the resources to access the internet, including broadband infrastructure, affordable internet service, access to a device, and digital literacy skills.

Digital Skills - requires both knowledge and technical skills to use the internet to meet the needs of an individual. Essential digital skills include but are not limited to: turning on a device, knowing where to go on the device to access the internet, understanding the information that can be found through the use of the internet, connecting to a safe and secure internet connection, ability to browse the internet, and understanding how and why it is important to keep personal information safe and secure online.

Download Speed - how quickly data is pulled from a server to your computer. The download speed will be advertised first when listed by your service provider. Download is usually faster since the expectation is that most people are using their internet for web browsing, streaming videos, and downloading content.

DSL - technology that uses copper wire telephone lines to provide connection to the internet.

Expected Annual Building Loss - the average economic loss to buildings in dollars resulting from natural hazards each year.

Fiber - a fiber optic cable is made up of bundles of hair-thin strands of very pure glass or plastic. Data passes over them in the form of light pulses created by lasers. Data can travel farther and faster on fiber than on copper wires with much less loss of data.

Fiber-to-the-premises - connection of a fiber optic cable to a home or building.

Fixed Broadband (fixed wireless as opposed to mobile wireless) - data is transmitted between two fixed antennas using radio waves. Unlike Wi-Fi, the radio beams need to be narrow for optimum strength with antennas being installed high such as on the roof of buildings since line of sight is necessary and signal can degrade if blocked by tree canopy or buildings.

H3 Geospatial Indexing - a hierarchical geospatial index. Geospatial indexing is a database storage and retrieval system based on geographic location that enables identification of objects or data located within a geographic region.

Hazard ratings - provided in one of five qualitative categories describing the geographic area's Expected Annual Building Loss values in comparison to all other communities at the same geographic level. Rating categories range from "Very Low" to "Very High":

- Very High: 80th to 100th percentiles
- Relatively High: 60th to 80th percentiles
- Relatively Moderate: 40th to 60th percentiles
- Relatively Low: 20th to 40th percentiles
- Very Low: 0th to 20th percentiles

Historic Building Loss Ratio - a natural hazard consequence factor that represents the estimated percentage of the exposed building value expected to be lost due to a natural hazard occurrence. Arizona State University's SHELDUS loss data is used to calculate Historic Loss Ratio for most hazard types.

Infrastructure Investment and Jobs Act (IIJA) - federal bill to provide funding for infrastructure projects.

Internet Service Providers (ISP's) - a company that provides subscribers with access to the internet.

Last mile - connecting the individual customer's home or business from the middle mile network.

Low latency - describes the reaction time of the connection - the delay between a request for data and the response to that request. A low latency (fast ping) means a more responsive connection. Latency generally is measured in milliseconds (ms).

Middle Mile - the infrastructure that enables the connection between the last mile, or the home/business connection, and the Internet network that supplies the broadband service.

Mobile Network (Mobile wireless Internet) - accessed via smartphones. Data is transferred between cell phone towers.

Network - shared connection between computers provided through utilizing the same source of broadband connection.

National Telecommunications and Information Administration (NTIA) - part of the U.S. Department of Commerce and is the Executive Branch agency that is responsible for advising the President on telecommunications and information policy issues. NTIA is the administering entity for the BEAD and DEA programs.

Qualified Opportunity Zone - federal designation for an economically distressed community which is eligible for preferential tax treatment.

Rural Digital Opportunity Fund (RDOF) - \$20.4 billion fund for rural homes and businesses that lacked broadband service.

Satellite - internet connection delivered by satellites orbiting. Ideal for remote areas where other technology is not practical.

Server - a centralized computer that sends and receives requests to other computers through a shared network providing information.

Social Determinants - factors that influence health outcomes. They are a set of conditions that shape the conditions of life for a resident.

Speed - measurement of how quickly data can pass through a network connection, measured by Megabits per second (Mbps) or Gigabits per second (Gbps).

Speedtest - measures a connection in Mbps, or megabits per second, which is what a broadband plan should use to describe the speed so it can easily compare.

Symmetrical - the upload and download speeds match.

Take Rate - percentage of those subscribing to a service divided by the number of people who could take the service.

Top ISP - FCC provider name for the provider with the top technology and speed in a census block.

Top Tech - technology provided by the top provider in a census block.

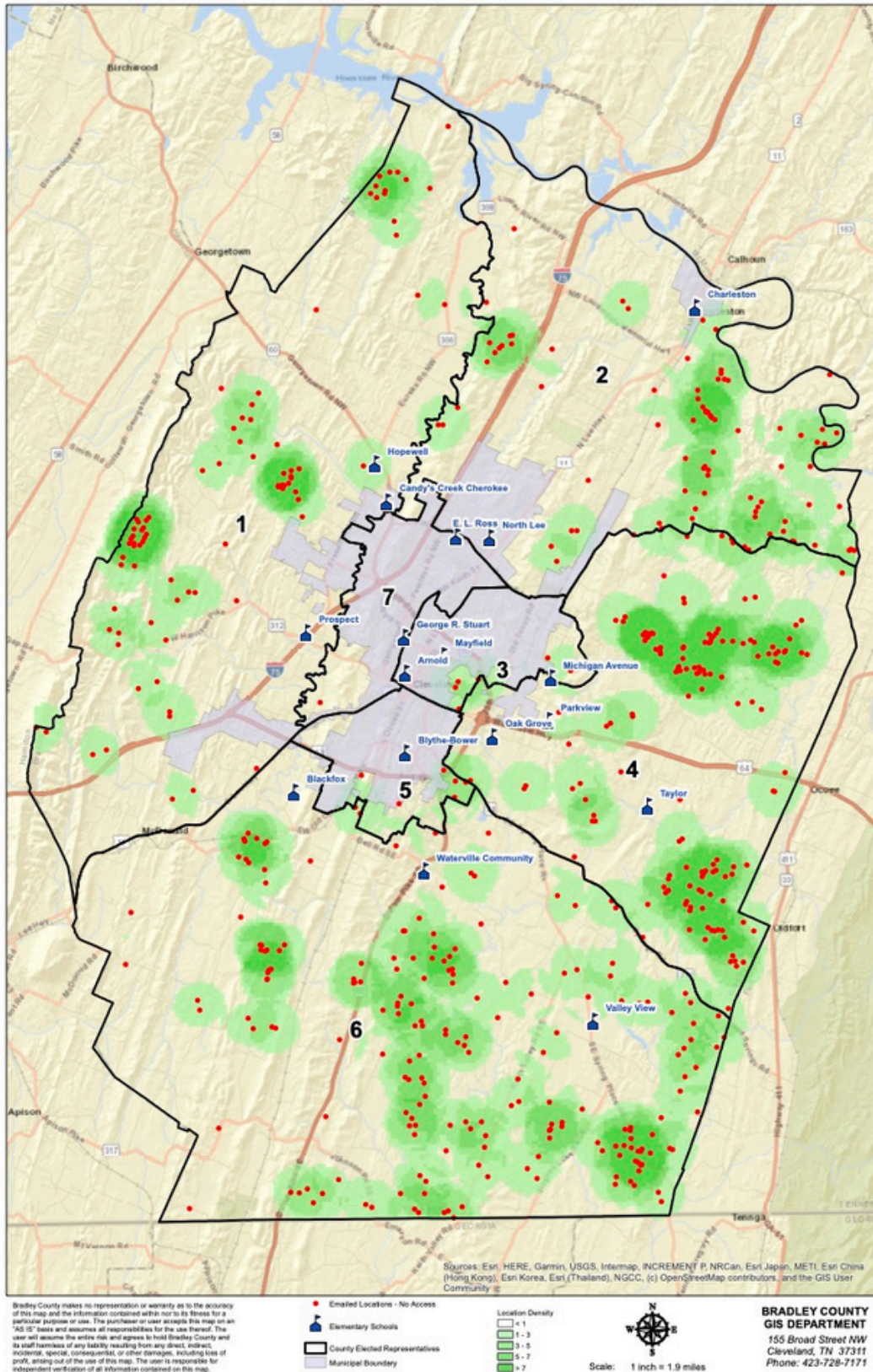
Underserved - as defined in BEAD, an underserved location is a broadband serviceable location reflected on the FCC's Broadband DATA Map that is lacking access to reliable broadband service with speed of at least 100 Mbps for downloads and 20 Mbps for uploads.

Unserviced - as defined in BEAD, an unserved location is a broadband serviceable location reflected on the FCC's Broadband DATA Map that has no access to broadband service or reliable broadband service with speed of at least 25 Mbps for downloads and 3 Mbps for uploads.

Upload speed - how quickly data is sent from a computer to a server. This is necessary for video calls, sending large files by email, or for sending a video to someone by WiFi enabled text.

WiFi - a local area network that is wireless and allows a computer or device to connect to the Internet. The router which transmits the WiFi to devices must be connected to the network with cables or wires.

Previous Mapping of Unserved/Underserved Locations in Bradley County



ISP Service per Technology Type

ISP	Tech Type	Total Census Units	Total Square Mile	Claimed Mbps Download Speed	Claimed Mbps Upload Speed
Xfinity	Cable Modem	31	0.73	1200	35
Charter Communications Inc	Cable Modem	12,503	105.15	1000	35
AT&T Inc	DSL	128	3.05	100	20
AT&T Inc	DSL	8	0.08	75	20
AT&T Inc	DSL	137	3.74	50	10
AT&T Inc	DSL	79	2.57	25	5
AT&T Inc	DSL	33	2.09	10	1
Windstream Georgia Communications, LLC	DSL	1	0.14	10	1
EPB	Fiber	639	9.78	25000	25000
AT&T Inc	Fiber	22,564	61.53	5000	5000
Twin Lakes	Fiber	610	12.31	2000	1000
AT&T Inc	Fiber	5,948	54.01	1000	1000
Charter Communications Inc	Fiber	748	24.61	1000	500
Charter Communications Inc	Fiber	499	6.25	1000	35
VERIZON	Licensed Fixed Wireless	29	2.03	300	20
T-Mobile US	Licensed Fixed Wireless	160	3.71	100	20
VERIZON	Licensed Fixed Wireless	74	1.38	50	5
T-Mobile US	Licensed Fixed Wireless	210	7.59	25	3
AT&T Inc	Licensed Fixed Wireless	70	3.89	10	1

Community Anchor Institutions and Resource Inventory

*“Unlimited possibilities but limited
resources”*

- Willie Thomas, Vice President of Student
Affairs, Cleveland State Community College

The following is a narrative of organizations, community anchor institutions, and resources that exist in Bradley County. This is not an exhaustive list, yet gives insight into the resources available and the role connectivity plays. Summaries of the services the following resources offer can be found in the Developing Implementation Strategies section.

Bradley County Fire Rescue

Daily there are twenty three full time staff and ten to fifteen volunteers on shift between thirteen locations. Every emergency response call has to have a report run, requiring the use of the internet. The Fire Rescue cannot run reports without the internet as the reports have to be submitted to the State of Tennessee online. They handle approximately 3,700 calls a year. The internet is also needed for training, general administration, and communication requirements. Internet service needs improving. They have three different internet subscriptions. Of the thirteen stations, only eight have internet and for the five that do not, the team has to go to one of the other stations to access the internet. On average, trainings are 500 hours per year with a quarter of them having to be conducted online. When the station has a large training, there could be up to 80 people from EMS and 110 from their department, requiring increased bandwidth. There is WiFi, but is password protected.

Bradley County Health Department

Located in the City of Cleveland, the Bradley County Health Department provides health care services for those who are uninsured, have fallen through the cracks, and are not eligible for other assistive healthcare access such as Medicaid or Medicare. The Health Department provides primary care service along with immunizations and the Women’s, Infants, and Children (WIC) program. They currently do not have fiber, but are supposed to be receiving it. WIC, which is for families with children 0-4, utilizes a WIC Smart app for participants to complete lessons online. The introduction of the app has contributed to the success rate of completion of the program. There are checkpoints that require certification to continue to receive benefits. These benefits can be issued over the phone and family planning and refills can be conducted through tele-health. The Health Department faces a high no show rate due to unreliable transportation. Access to the internet and a device can help to bridge the gap with tele-health.

Bradley County Parks and Recreation

The Bradley County Parks and Recreation does not currently have internet infrastructure to provide public WiFi access. According to Chris Duggan (Athletic Coordinator, Bradley County Parks and Recreation), connectivity would provide valuable safety and security for the parks along with accessibility. Currently, the Parks and Recreation Department has to drive across the county to unlock bathrooms for event rentals. Enabling connectivity would allow for door access controls, saving valuable time and resources, as well as security cameras, for the monitoring and safety of areas throughout the county. Security cameras enable liability coverage and to deter breaking and entering and vandalism. Currently, they have issues with these and the mere fact of being watched is a deterrent to such actions. The County has all the necessary gear but the main barrier is the cost of upgrading from 4G to 5G due to the 911 surcharges that would be implemented and are grandfathered in for their current 4G plan.

Bradley County Schools

The Bradley County School System utilizes 1:1 devices to ensure everyone has equitable access while at school. Adaptive technology and language apps are used to meet the individual needs of each student. The ESL program has grown from four teachers to eighteen teachers between 2020 and 2024, with Spanish, Ukrainian, and Russian being the primary language needs. COVID brought to light the need for WiFi access and establishing adequate bandwidth. The school system uses 10GB point to point connections within the schools and has the necessary bandwidth for 10,000+ students and teachers across the county with access points in all rooms. Having internet access is essential for the schools, as many pockets exist in the community where access is difficult, especially for lower income families, and with some students having no access.

It is essential for students to have reliable technology. Buses are equipped with WiFi (not all but the majority). However, the school system has moved away from issuing loaner hotspots and only use them in specific situations. As a school system, the Internet is in almost everything they do now. The vast majority of phones and intercoms are online. It is essential for the day to day operations and functioning of the schools. The school system has six innovation specialists whose role is to integrate technology into the curriculum, to include state required computer science requirements. Computer science class is mandatory and is a nine week class. Students need one full credit before graduation such as coding. The school offers CTE programs such as electronic repair, cybersecurity, etc and in-house repairs by students occur onsite of broken devices. The highschools have tech teams with a tech lead, yet the goal is to empower the students to perform the repairs. Elementary schools even have tech support. Each school is different and is based on the needs of that school. The PIE Innovation Center, a multi-purpose facility, houses the virtual school, along with IT and instructional technology courses and all chromebook repairs. The virtual school meets students where they are and provides education in a virtual environment with 100-150 students in 6-12 grades. System wide iPads are used for K-1, which stay on campus, and grades 2-12 receive computers that can travel home. Each classroom has interactive panels with touchscreen capabilities. The school system is trying to get parents resources. Parent night and Digital Citizen Week are great opportunities to help "onboard" parents.

Bradley County Sheriff's Office

The Bradley County Sheriff's Office is almost entirely dependent on internet connectivity for their emergency response. They are connected to both the data center and 911 centers which are able to give officers routing information with live calls. Previously the Sheriff's Office had coax with Charter Spectrum and it was generally reliable, but they have since moved to fiber, which is much more reliable, especially as they have dedicated fiber lines. Overall, Charter has proved to be a good partner and has worked to resolve any issues they have with connectivity. However, the Sheriff's Office has never quite had the 1 Gb speed (more like 900 download) connection that they are supposed to.

Currently, their officers in the field use hotspots on their phone. The Sheriff's Office has researched installing a jetpack, or some sort of modem, into the vehicles as there are always issues with cell phones and lack of service. Lack of service hampers the ability to be efficient in response while connectivity allows for fastest routing instead of an officer's knowledge of the area. The Sheriff's Office is using technology to eliminate gaps in response time. The connection between the 911 center and their officers is critical. If a link in the chain breaks, they are vulnerable. Internet in the vehicles is of top priority. Without internet, their officers simply just are not prepared. Connectivity helps aid in investigations and feeds information quickly for officers to stay informed.

The Sheriff's Office has a back up circuit in case of a downed line and their VPM with firewall are reliable. Security has to be reliable on both ends. Ideally, a direct line would connect their office to the 911 center. There is a cybersecurity training at orientation and once a year they cybersecurity information. Email is the biggest potential threat but they do not manage that. Email is managed through the County.

Cleveland/Bradley Chamber of Commerce

The Chamber houses tourism, economic development, workforce development, and a manufacturer association. They work closely with the education system to provide opportunities for partnership and programming. The BEST program is an example - schools and businesses are partnered in a mutually supportive relationship. These look different for every partnership depending on the needs and community. Currently there are 59 businesses and 26 schools participating. It is a requirement to be a member of the Chamber to participate as a business. The Chamber organizes annual events such as job shadowing for high school juniors, mock interviews for seniors, and an annual CET month long challenge.

Everything the Chamber does is connected to the internet - their work would come to a standstill without access. The Chamber is preparing to launch a database and software program that will be open to the public for market research called "Size Up". The Chamber does not provide public WiFi. However, if events occur that require WiFi, there is a password protected guest WiFi.

Cleveland Bradley County Public Library

The Cleveland Bradley County Public Library is a community anchor institution that serves the technology needy - any and all in need. As a community anchor institution (CAI), they provide internet access, device access, digital skills training, and hotspot loaners. Free classes and resources are available to their patrons (free for residents and a fee for those outside the county). They offer beginner technology classes taught by their staff as well as programs through Tech Goes Home. Anyone 18 and up can take the class. Staff will help patrons if there are issues and need help using a computer and there are staff in every department that know how to use a computer. There are around 50 computers spread out throughout the library. WiFi is free and open 24x7 and extends to the parking lot. Most people know you can access the internet from the safety of your own car and that the library is a safe place to come for the internet. Hotspots are available to be checked out for seven days (three weeks on the Book Mobile). There are seventeen in use and they stay checked out. The library stopped offering device loaners as they had too many issues with damaged, broken, and stolen equipment. However, youth services do still offer launchpads/tablets that can be taken home but only to those who are in good standing with the library and have a working email and cell phone number. The tablets in the children's library are loaded with games that can be used. The library proctors exams at no charge as well as provides printing services for a fee. There is a database available for the sole purpose of job searches.

The Cleveland Bradley County Public Library connects people with digital resources. The library is for everyone - those who are homeless, traveling through the area, for residents in the county and for those who simply want a change of scenery - sometimes people just need to get out of their house. There are regulars who come in daily. Older adults who grew up without devices come to the library for things like printing since they don't need a printer at home and it is not feasible to keep electronics at home. Libraries are known for their access for all people. People come because they know it is there and available.

The Cleveland Bradley County Public Library's internet is reliable for the most part. There is a bridge from the main building to the History branch and there has not been any issue in having enough bandwidth or speeds. They estimate approximately thirty patrons at a time use computers or devices on a busy day, along with staff computers, who are using the same network. However, they recognize that the expectation is that they offer top speeds since residents have them at home. They believe they should be an information hub with resources that display cutting edge technology. The State of Tennessee, as part of BEAD, is prioritizing CAs having 1 Gb symmetrical. Currently, the library in Bradley County does not have 1 GB but are on the list for fiber expansion by Cleveland Utilities; however, it is estimated to not be until 2026. Currently they utilize Spectrum and it serves their main building and the History branch. They also have a Book Mobile and the goal is to offer wireless internet on it. Right now they offer hotspots on the Book Mobile and it provides access to people who cannot get into town along with daycares, the veterans home, Head Start, and a Forest school. They are able to go to the edges of the county with the Book Mobile. The Book Mobile is an extension of the library, a physical arm that is out in the community. They want patrons to get the same experience that they would get if they went to the library in Cleveland.

Cleveland State Community College

As a community anchor institution, Cleveland State Community College's boundaries are not limited to Bradley County, reaching across five counties. And they face inadequacies with WiFi across these five campuses. Simply, the counties, to include Bradley County, need high speed internet but lack the necessary infrastructure. Hotspots do not work in all areas and students do not have the WiFi they need. In Bradley County, they recently rewired the entire network and that has dramatically improved their service but still it is far from where they need it to be. There are balance issues with bandwidth, such that the campuses have to be mindful of things such as where streaming is possible and how it would be in conflict with other needs on campus. They are looking for ways to address this inadequacy. **Information has to be accessible and accessible where people are at. Connectivity makes information more accessible.**

There is WiFi access across the parking lot and it is open 24x7. 90% of courses have a hybrid component. It is a critical component to transition to hybrid for today's students. As part of the educational programming offered, there are computer science courses, cloud computing, and soon, cybersecurity. IT repairs are free of charge along with troubleshooting for students, by students. The library has loaners and computer labs on every campus.

Cleveland-Bradley County Office of Emergency Management & Homeland Security (EMA)

Emergency response happens at the speed of connectivity. The Cleveland-Bradley County Office of Emergency Management & Homeland Security (EMA) utilizes an emergency response notification tool that includes both emails and texts to share updates and information with the residents of Bradley County during an emergency situation. Currently there are 30,000 voluntary subscribers. Before utilizing this, the department had to share information door to door or by posting leaflet flyers around neighborhoods. In 2011, they had to make homemade billboards with leaflet flyers that were posted around neighborhoods, but now with the advances in internet, it is much easier to communicate, provided people have access to service, as was evident with the recent North Carolina and East Tennessee flooding. With social media and this tool, EMA is able to share information quickly and effectively throughout the community. They still utilize a relationship with the news channel to share information in advance of bad weather and work with the news channel to sign residents up for emergency notifications. The impact goes beyond storm events to other emergencies such as when used to locate residents. Within an hour of sending out alerts, they are typically able to locate individuals. They also utilize a disruption tool that allows them to send out messages locally (e.g. Amber Alerts) to all numbers.

Overall, EMA has reliable internet. Yet, they do have bandwidth issues when they have a full house, causing their internet to crash. Currently they use Charter as a backup but are considering switching to Starlink in the future. Their 911 center is entirely fiber based but they do still have some copper lines that AT&T is converting. They use these lines in emergency response to talk to the State of Tennessee. They have a satellite phone that has back up if the internet goes down that enables a connection with the State. They are preparing to move to a new location and it is still to be seen what issues might occur. However, they assume they will use Cleveland Utilities for fiber. Daily, there are roughly twenty employees in the building, with six 24x7 at the 911 center. They work remotely onsite with phones in an emergency situation. They need reliable internet and also need a working website. There is no public WiFi but they do offer a guest WiFi and share the password for those in need.

Lee University/Encore

Programming for 60 years old and older. For Lee University, the Encore Program is an act of community service. As a university, they love to bring the aging population to campus for the diversity and richness of experience it creates. Participants are able to take two classes per semester for \$25/semester. These are in person only, but the program is looking at online options as they have received considerable interest from those outside of Bradley County and the Cleveland area. Participants get access to the Recreation Center, sporting events, concerts, theater, and a parking pass. The program roughly serving 340 Encore students annually of a traditional student population of 4,000. Attendance policies are at the discretion of the professor and classes are pass/fail. The primary purpose is the class – the students who are part of the program want to learn and are eager to attend. Programming ranges from traditional college class as well as Encore specific courses. Technology classes are popular such as working in Canva and how to use social media. These classes have high computer use and requires the student to have access to equipment or a device. Any class that requires supplies will be paid by the student. Among the classes taught are basic Word and Microsoft classes but not general Comp 101. The university is considering teaching iPhone 101 in the future. Any class that requires a computer can access the computer lab during the class but it is not for personal use. Cybersecurity classes are not currently offered. Knowledge is the biggest obstacle for this population – knowledge of how to use devices. Encore classes change semester to semester. Currently the program is funded through Lee University but they are looking at grant opportunities as well. Classes are offered throughout the day to enable participation no matter the situation. Encore students can connect to the university's guest WiFi network. Enrollment has been mostly word of mouth. Once a semester they run an ad in the newspaper. The program is starting to target other covered populations through social media, recognizing adapted technology and language barriers are areas that they can focus on.

Museum and Cultural Center at Five Points

A community resource whose reach is to all populations in Bradley County, the mission and vision of the Museum and Cultural Center at Five Points is to be as broad as possible, with a focus on the diverse population in Bradley County. The museum has worked hard to provide inclusive programs that reach the minority population of Bradley County, such as the Indigenous and African American populations. The scope of their mission is to be both a history museum and an arts organization with 12-16 rotating exhibits each year, such as the upcoming Sneaker Head exhibit, and in a couple of years, Crafting Sanctuaries. The museum has a digital collection which is currently undergoing a revamp. The online exhibit is geared toward teachers, museum members for research purposes, and those who are homebound or living in assisted living facilities to enable a way to tour the museum from their home.

During covid, the museum tried offering virtual tours but their internet is not fantastic and the connectivity issues they faced with streaming prohibited it. They tried live zoom presentations with school libraries but the connection was terrible between the two facilities. Ideally they would have teachers be able to call from a classroom to talk with the students about special topics in class over zoom. The museum does use streaming services when they host free special programs and usually post on facebook and sometimes Youtube. For example, the Rotary streams their weekly meetings, yet there are bandwidth issues.

The museum needs connectivity for streaming, zoom meetings, and speed of internal research. Their communication abilities are impacted and computers are slow. They do not have sufficient internet currently even after having upgraded plans. However, fiber is supposedly going to be available in the future. The museum does have public WiFi that they allow museum guests to access and during special events they extend to the courtyard and the outer areas of the grounds. They have a private secured network for staff. When the internet is down, telephones are impacted, as well as ticketing and the point of sale system. They could be open, as they are donation based and could still run the museum, but general operations would be impacted.

The museum is discussing options with the Enterprise Center and Tech Goes Home and are considering hosting digital skills classes. However, their ability to host programs such as Tech Goes Home faces both staffing and funding limitations. Funding is always an issue with non-profits. Less than 8% of their operating budget comes from the County and City of Cleveland. They also receive funding from donations (to include the entrance fee), grants, event rentals (to include bar service and catering), and their gift gallery. The Museum and Cultural Center at Five Points is an important resource for the community but funding is always the limiting factor. Keeping tech a priority is difficult, as donors usually want to fund an exhibit, not new computers (which they need).

Salvation Army

The Salvation Army is a faith based inclusive movement meeting needs of those in Bradley County, in Jesus' name, without discrimination. The programming is for friends without homes, youth, young adults and adults of all ages. As an organization, they provide showers, meals, and lockers for those who live on the street and work to resolve the root causes of why. Their youth program operates in Cleveland three nights a week and provides programming for character building, music, and the arts. They work in a five mile radius of their address in the inner city.

If their internet shuts down, their office shuts down. Even their phones are connected to the internet. They offer WiFi 24x7 and many programs function through the internet, such as their Angel Tree. Many of the kids who participate in their youth programming do not have internet access and being able to provide them access is important. Applications for bell ringers require applying online and their staff has to sit with many who have difficulty navigating the application process online.

Director Ruthie Forgey shared on her dream list of programs would be to offer parenting courses for appropriate technology use for kids. The programming would include: how to make homes not so dependent on devices, how to set boundaries with children, and the impacts of technology to childhood development. Additionally, the older adults they work with would benefit from programming on how to use technology. However, staffing demands make it difficult to implement classes and funding is needed.

"Technology is going to be part of their world, but I do not want it to be their main world." - Dir. Ruthie Forgey

Senior Activity Center at Bradley Cleveland Community Services Agency

Targets the population 60 years old and older. The Senior Activity Center offers WiFi and device access, with three computers onsite. Membership fee is \$20/year and \$1.50/day to eat lunch. They currently are offering digital skills programming with Tech Goes Home which started December 13th. The class, which serves ten learners, filled quickly and shows there is a demand for this type of programming. They also offer the following programs: Gospel Singing, Sit Down Volleyball, Bingo, Bridge, Oil Painting, Line Dancing, Etc.

United Way of the Ocoee Region

The United Way of the Ocoee Region, operating in both Polk and Bradley Counties, strives to create a community where everyone has the opportunity for a better tomorrow. Covering very rural areas with limited internet access in Bradley and Polk Counties, the United Way analyzed local and state data to identify the most pressing issues, finding for 2024 the focus of needs being: stable housing, access to quality child care, access to quality healthcare, and mental health and substance abuse. In 2023, they served over 36,000 residents in the Ocoee region, from homeless individuals to families living paycheck-to-paycheck. As an organization, their four leading goals are to break the cycle of poverty, meet immediate basic needs, give children equal chances, and to build pathways to a healthy community. Their work begins with understanding the evolving needs of the community. The data they compile guides their funding and allocation process, which includes funding local non-profit programs and developing internal programming to address the critical needs identified. Other areas of growing need are transportation, domestic violence, and the elderly and aging population. In 2024, the United Way of the Ocoee Region worked across 35 agencies and 41 nonprofit programs.

The United Way of the Ocoee Region uses connectivity for communication and social media as well as their phone system. They also use it in many of the services they offer to the community to include the "Housing United" program, with the goal of helping to stabilize housing. Connectivity is crucial for searching for and applying for housing. In today's world, it is hard to find housing without connectivity, with many applications only available online. The Ocoee Connection hotline is a resource the community can use when dealing with housing insecurity. The United Way of the Ocoee Region welcomes residents into their office to use their internet and apply for housing. They are available to assist with signing up for housing as well as offering assistance for those who need help paying utilities. They have computers and iPads and host Housing United workshops as there is a short window for applying before units are filled. Responsiveness is key for securing housing, as the waiting list is quite long and many of the population live in short term hotels. According to their "ALICE" data (Asset Limit Income Constrained Employed), a family of four in Bradley County need \$79,382. \$64,000 is considered survival. 76% of families of four in Bradley County fall into the survival category.

Currently, their office has adequate speed and reliability, with a staff of thirteen.

UT Extension Office

Clients are kindergarten to 95 years old. Whether it is a student, parent or producer, all applications are now online and many need assistance in applying. In the UT Extension Office's experience, over 50% of producers do not have an email address, let alone know how to fill out applications online. The UT Extension Office purchased iPad's and have them set up in the conference room for Ag Enhancement applications. They receive their internet from UT and cannot function without it. They are funded by both the State and County.

The UT Extension Office wanted to be more central and accessible so moved to the PIE Innovation Center, where they have guest WiFi clients can use. Their agents are not meant to be in the office though; they go to the client. When they had previously tried to host classes at their location, they simply didn't get the response needed. They have found success when they go to the individual, when they meet them where they are at. The team uses hotspots in the field but they do not have enough for all team members.

Many of the people that they work with simply do not have internet or devices. Additionally, digital skills are lacking. The Family Consumer Science Agent holds classes on digital skills training. They teach classes such as Excel, Powerpoint, workforce prep, job and interview skills, as well as digital literacy. All teaching material comes from UT. They see the impact that when people are able to get scholarships, apply for jobs, it boosts their confidence. They can apply for equipment. It results in a better quality of life through education and resources. They are really successful once relationships are established. Relationship building is foundational to their work.

Veterans Services

Located in the courthouse in Cleveland, Veterans Services is there to assist veterans, dependents, and spouses (to include those whose spouse is deceased). They are serving more than just veterans; they are serving the families. In 2023, they served 2,350 veterans. Their support includes help filing claims for benefits, pensions, and navigating the VA system. Generally, they serve an older population who have more difficulty with digital navigation, acting as a digital navigator or technical support. They do not offer assistance with skills training, rather one on one assistance as needed. Veterans can file their own claims online, but those who come into the Veterans Service office have needs (such as no computer or lack of digital skills) which can be met through support and assistance. As they are located in the courthouse, they use the County's internet and do not have issues with connectivity.

Additional Resources:

Additional community resources identified in Bradley County in the research and writing of this plan include but are not limited to:

- City Fields - serving overlooked and underserved communities
- The Caring Place - connecting residents to resources
- Cleveland Housing Authority
- Southeast Tennessee Local Workforce Development Board
- Cleveland Family YMCA

Digital Equity Asset Inventory

Asset Category	Description	Key Resources	Population Served	Availability
1. Internet	Physical resources supporting access			
Public Wi-Fi	Locations with public Wi-Fi access	Cleveland Bradley County Public Library, Cleveland State Community College, Museum and Cultural Center at Five Points, Salvation Army	Public	24x7
Wi-Fi Access	Locations with internet access	Bradley County Schools, Lee University/Encore Program, Senior Activity Center, UT Extension Office	Member/student	During hours of operation
Hotspot Loaner	Locations for hotspot access	Cleveland Bradley County Public Library	Patron	7 day rentals (3 weeks on Book Mobile)
2. Devices	Availability of computing devices			
Computer Labs	Community or organization-owned computer labs	Senior Activity Center at Bradley Cleveland Community Services Agency, Cleveland State Community College, Lee University/Encore Program	Member/student	During hours of operation
Device Loan Programs	Programs offering device loans to underserved individuals	Cleveland State Community College	Student	During hours of operation
Desktop Computers	Ability to access 1:1 device use	Cleveland Bradley County Public Library	Patron	During hours of operation
Laptops	Ability to access 1:1 device use	Bradley County Schools, United Way	Student/Public	24x7, During hours of operation
Tablets	Ability to access 1:1 device use	Bradley County Schools, Cleveland Bradley County Public Library, UT Extension Office, United Way	Student/Public	During hours of operation
Adaptive Technology	Adapted device access	Bradley County Schools	Student	During hours of operation

Digital Equity Asset Inventory

Continued

Asset Category	Description	Key Resources	Population Served	Availability
3. Training & Support	Programs and resources for digital literacy training			
Digital Skills Programs	Digital literacy training and resources	Bradley County Schools, Cleveland Bradley County Public Library, Cleveland State Community College, Lee University/Encore Program, Senior Activity Center	Student/Member	During hours of operation
Online Learning Platforms	Platforms for online courses and resources	Bradley County Health Department, Bradley County Schools	Student/Clients	During hours of operation
Technical Support	Availability of technical support for digital issues	Bradley County Schools, Cleveland Bradley County Public Library, Cleveland State Community College, Salvation Army, , Veterans Services	Student/Member	During hours of operation
Digital Instructors	Trained individuals or volunteers providing instruction	Bradley County Schools	Student	During hours of operation

Community Survey Responses

Community Survey Responses

Digital Equity and Inclusion Community Survey Detailed Response

Survey Period: November 8-25, 2024

Total Responses: 14

Survey Purpose: To assess the digital connectivity needs and challenges within the community and gather input on potential solutions

Areas received responses from zip codes: 37312, 37323, 37336

Why do you think it is important for your community to be digitally connected?

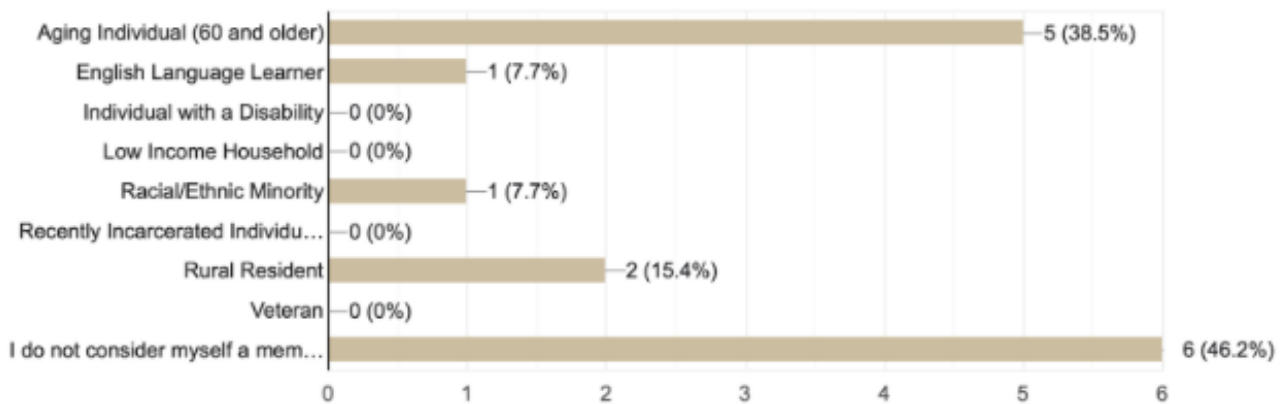
- Safety
- Security
- Access to information
- Participation in life
- Paying bills, banking, etc
- Collective knowledge
- Lack of cell service and need for connection
- Requirement of services, for education and remote workforce
- Economic growth
- Means of communication
- Entertainment

What would you like to see prioritized in our Digital Connectivity Plan?

- Affordable and reliable internet for all residents
- Rural connectivity
- Fiber service in all of the county
- Options for ISP
- Increased speed
- Internet as utilities
- Smart city integration
- Public WiFi in downtown, parks and commercial zones
- Digital literacy programs

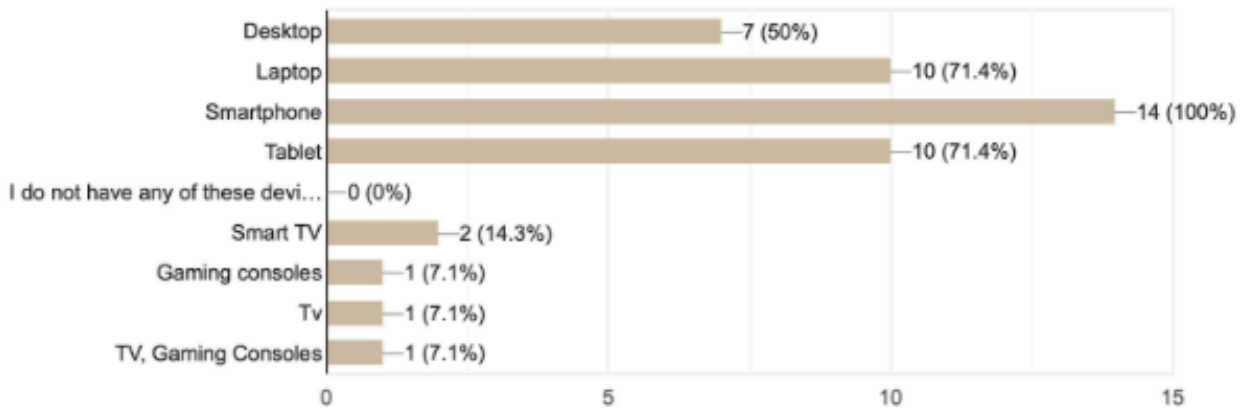
Do you consider yourself a part of any of the following populations? (Select all that apply)

13 responses



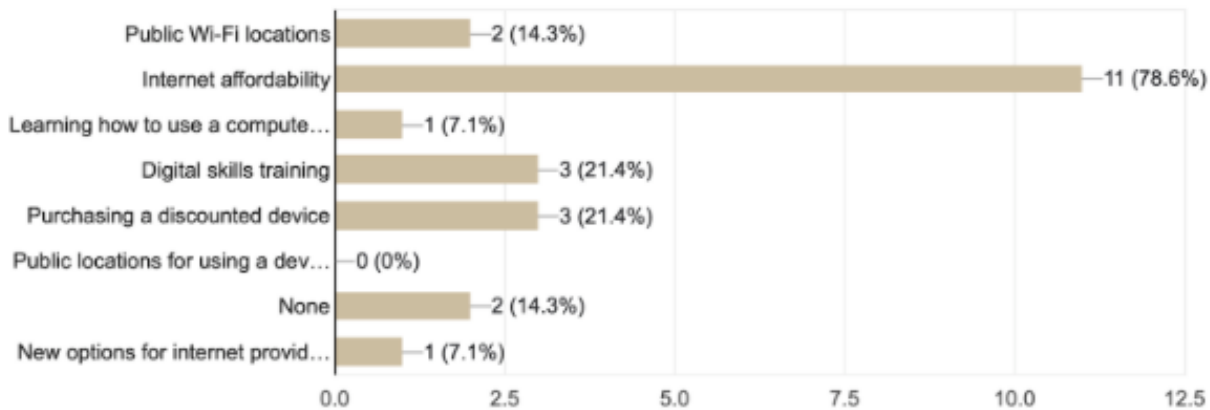
What types of devices, if any, do you have at home to connect to the Internet? (Please select all that apply)

14 responses



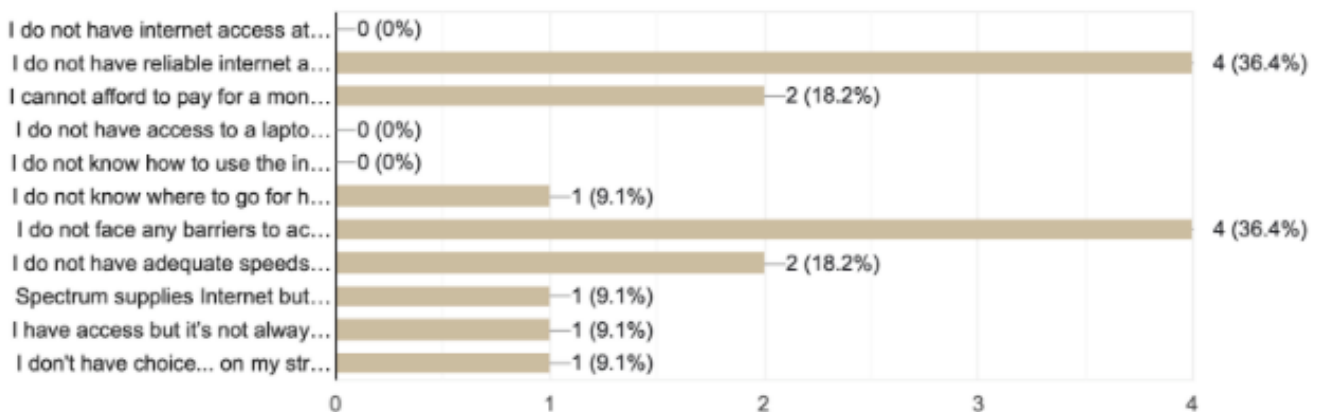
What are you interested in learning more about? (Please select all that apply)

14 responses



What are your barriers to accessing the Internet? Please select your top three reasons.

11 responses



Bradley County, TN

Geographic identifier: 47011

Overall hazard risk percentile is

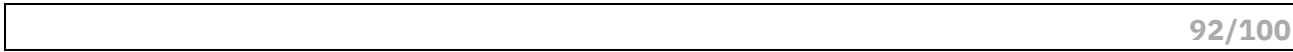
Relatively High (74/100)



Primary natural hazards

Risk scores are national percentile ranks derived from Expected Annual Building Loss estimates in the National Risk Index. Expected Annual Building Loss represents the average economic loss for a community in dollars resulting from natural hazards each year. [Click here to read more about how Expected Annual Loss scores are calculated.](#)

Lightning



Earthquake



Tornado



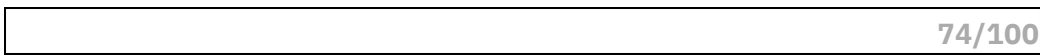
Riverine Flooding



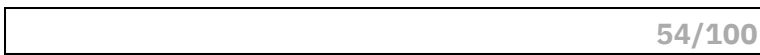
Ice Storm



Hail



Strong Wind



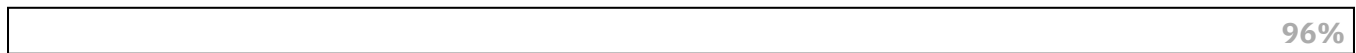
Broadband access

"25/3" and "100/20" are broadband speed profiles denoting internet connections with download/upload speeds of 25 Mbps/3 Mbps and 100 Mbps/20 Mbps, respectively. The former is considered the minimum threshold for broadband service by the federal government, suitable for basic online activities, while the latter offers faster speeds, supporting more bandwidth-intensive tasks like video streaming.

Fiber access refers to internet connectivity provided through fiber-optic cables, utilizing light signals to transmit data at incredibly high speeds, resulting in reliable and efficient connections.

Broadband serviceable locations are residential and business locations (or structures) in the U.S. where fixed broadband internet access service is or can be installed.

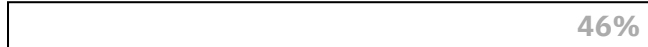
Percent of locations with access to **25/3**



Percent of locations with access to **100/20**



Percent of locations with access to **fiber**

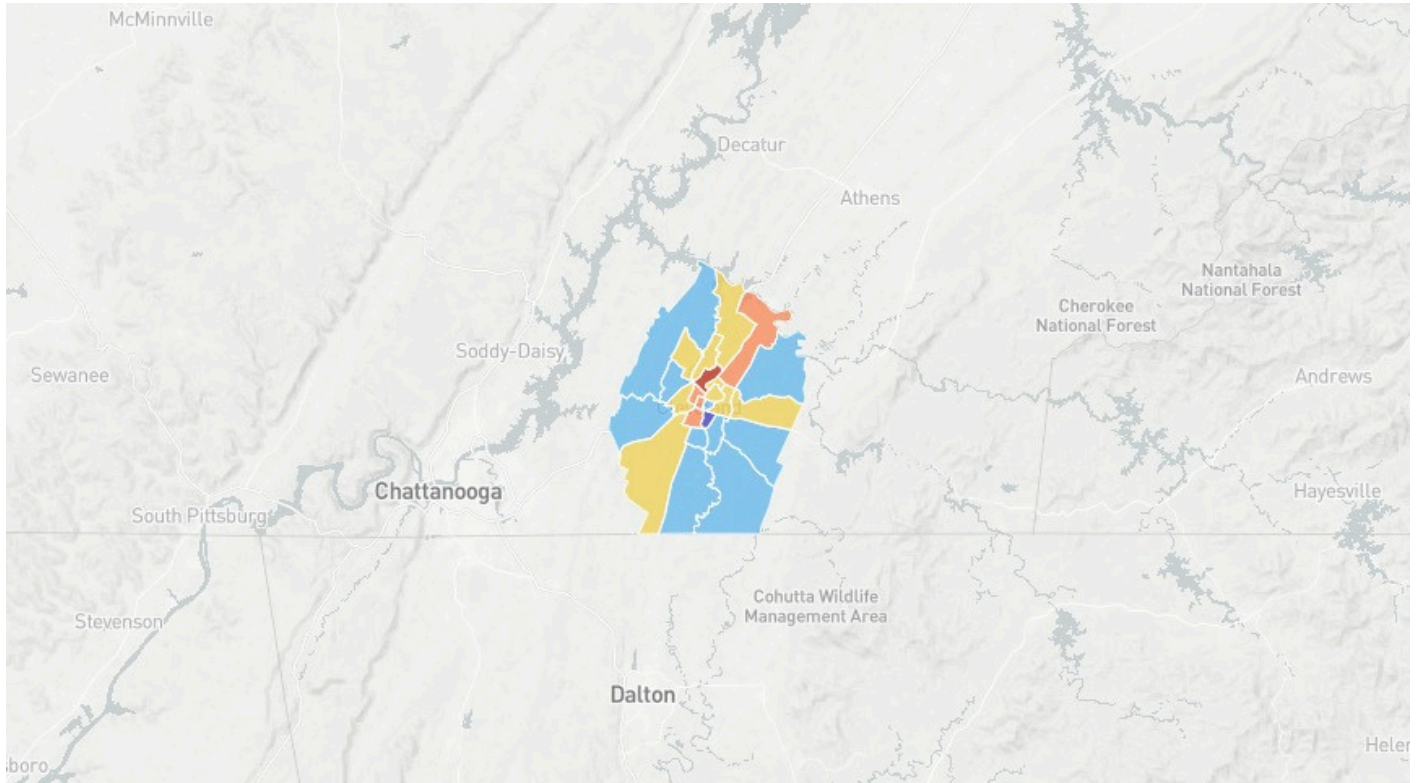


Explore tract hazard risk and broadband access

Click on a tract below to view detailed risk and broadband data

Hazard risk score 25/3 access 100/20 access Fiber access

Very Low Relatively Low Relatively Moderate Relatively High Very High



© Mapbox © OpenStreetMapImprove this map

[Download map data](#)

About our application: Broadband Climate Risk Mitigation Tool

Welcome to the Broadband Climate Risk Mitigation Tool, a web application designed by the Center on Rural Innovation to help communities and organizations make informed decisions about broadband deployment while considering natural hazard risks. Our tool combines hazard risk data with broadband access information so communities can maximize the resilience and effectiveness of their broadband infrastructure projects funded under the Broadband Equity Access and Deployment (BEAD) program.

The challenge: Weather- and climate-related risks to broadband networks

Broadband networks play a critical role in connecting communities and fostering economic growth. However, networks face numerous challenges posed by extreme weather. Wildfires, extreme temperatures, flooding, tornadoes, hurricanes, and other weather-related events can disrupt and damage broadband infrastructure, leading to service outages and hindering emergency response efforts. Since retrofitted and new infrastructure for broadband might be expected to have a lifetime of 20 years or more, entities applying for BEAD funding must account not only for current risks but also for the changing climate and increased frequency of extreme weather events.

Our solution: Informed decisions for resilient broadband deployment

The Broadband Climate Risk Mitigation Tool provides entities with a comprehensive set of resources to evaluate and address weather- and climate-related risks during broadband infrastructure planning and deployment. Our application enables the following:

1. **Initial hazard screening and identification:** Identifies which geographic areas require an initial hazard screening for current weather-related risks. By inputting location data, users can assess potential hazards affecting the proposed broadband infrastructure. Hazard risk and broadband access data are overlaid so that users can identify hazard risks in areas with the greatest broadband need.
2. **Mitigation strategies:** From selecting appropriate technology platforms to adopting alternative siting and redundancy measures, the tool offers high-level recommendations to safeguard broadband assets.

Data sources

1. **FCC:** Broadband Data Collection (BDC) provides information about the internet services available to broadband serviceable locations (BSLs) across the country.

As part of the BDC, all ISPs must file data with the FCC twice a year on where they offer mass-market Internet access service using their own broadband network facilities. Our tool uses BDC data last updated on July 25, 2023.

2. **FEMA:** The National Risk Index (NRI) is a measure of the relative risk of natural hazards for each county and census tract in the United States. In our application, we focus on the NRI's Expected Building Loss estimates as a proxy for broadband infrastructure vulnerability. The source includes data on natural hazards, social vulnerability, and community resilience.

Key terms

- **Expected Annual Building Loss** is the average economic loss to buildings in dollars resulting from natural hazards each year. [Click here to learn more about how Expected Annual Loss is calculated.](#)
- **Risk scores** are national percentile ranks derived from Expected Annual Building Loss estimates.
- **Historic Building Loss Ratio** is a natural hazard consequence factor that represents the estimated percentage of the exposed building value expected to be lost due to a natural hazard occurrence. Arizona State University's SHELDUS loss data are used to calculate Historic Loss Ratio for most hazard types.
- **Annualized Frequency** is the expected frequency or probability of a hazard occurrence per year.
- **Building Exposure** is defined as the dollar value of the buildings determined to be exposed to a hazard. The maximum possible building exposure of a geographic area (census block, census tract, or county) is its building value as recorded in Hazus 6.0.
- **Hazard ratings** are provided in one of five qualitative categories describing the geographic area's Expected Annual Building Loss values in comparison to all other communities at the same geographic level. Rating categories range from "Very Low" to "Very High."
 - Very High: 80th to 100th percentiles
 - Relatively High: 60th to 80th percentiles
 - Relatively Moderate: 40th to 60th percentiles
 - Relatively Low: 20th to 40th percentiles
 - Very Low: 0th to 20th percentiles

Questions?

To learn more, reach out to us at broadband@ruralinnovation.us

Support

Development of this tool was made possible with support from Connect Humanity.



Org Name	Source	Funder Description / Mission	Org Type	What geographies do they fund? (The fund only in one state, portion of a state, a few states, all Appalachia, all Do they fund broadband or security related initiatives?)	Funding Areas (in case you're exploring opportunities to state, a few states, all Appalachia, all Do they fund broadband or security related initiatives?)	Website	Funder Location (ST/Opportunities)
Invest Appalachia	AFN	We believe in new economic opportunities for Central Appalachia. Healthy, resilient, and equitable communities are possible across the region. We see the region's unique cultural, environmental, and human assets as the foundation for a new economic future. We are broadly shared local wealth. Mission-oriented investors, entrepreneurs, community organizations, and local leaders must work together to advance lasting and inclusive economic growth and prosperity. We are committed to play a leadership role and providing the support and resources that are needed to bring this vision to life. By providing flexible capital and advisory services to small businesses, non-profits, and farms, Partner Community Capital (PCAP) catalyzes environmentally and socially responsible business development and wealth creation in rural, minority, and low-wealth communities.	Collaborative impact investment platform	Central Appalachia	Clean energy, community health, creative placemaking, food & agriculture	https://investappalachia.org/	WV
Partner Community Capital	AFN	Partner Community Capital (PCAP) catalyzes environmentally and socially responsible business development and wealth creation in rural, minority, and low-wealth communities.	CDFI	Central Appalachia and the Southeast, West Virginia, and the Appalachian regions of Maryland, Ohio, Kentucky, Tennessee, Virginia, South Carolina and Georgia	Economy, Equity, Environment	https://partnercap.org/	WV
Partner Community Capital	Appalachian Community Capital	Partner Community Capital™ is a small business loan fund that supports entrepreneurs who are creating jobs and businesses in under-served communities in central Appalachia and the Southeast.	CDFI 501(c)(3)	Central Appalachia and the Southeast		www.partnercap.org	WV
Community Heart & Soul	AFN	Community Heart & Soul™, a nonprofit organization, builds stronger, healthier, and more economically vibrant small cities and towns across the United States through the Community Heart & Soul model, a resident-driven process of community development. We are committed to what we love most about our community, what future they want for it, and how to achieve it.	Non-profit	small cities and towns across the United States		https://www.communityheartandsoul.org/	VT
National Science Foundation Employees Association	Foundation Center	NSF was established in 1950 by Congress to: Promote the progress of science. Advance the national health, prosperity and welfare. Secure the national defense.	Independent federal agency	all 50 states and U.S. territories	Discovery and Innovation, Partnerships, Infrastructure, Education,	https://www.nsf.gov/	VA
Hampton Roads Ventures, LLC	Appalachian Community Capital	Hampton Roads Ventures (HRV) is a Rural Community Development Entity committed to attracting private investment capital into innovative economic community development projects primarily in severely distressed rural areas. Utilizing New Markets Tax Credit (NMTC) financing, HRV provides financing and advisory services to rural communities and providing low-income residents with access to quality jobs; affordable, nutritious food; and comprehensive healthcare and wellness services. Working closely with local businesses and community leaders, HRV identifies investment opportunities that will serve as a catalyst for additional private sector investment and development.	Rural Community Development Entity	Alabama, Florida, Georgia, Idaho, Illinois, Kentucky, Louisiana, Mississippi, Missouri, Nebraska, New Mexico, North Carolina, Ohio, Oklahoma, Tennessee, Texas, Virginia, Washington, DC		www.hamptonroadsventures.com	VA
LIFT Fund	Appalachian Community Capital	LIFT Fund's mission is to provide credit and services to small businesses and entrepreneurs who do not have access to loans from commercial sources and to provide leadership and innovation in the micro-lending industry.	CDFI, CDC	Alabama, Arkansas, Florida, Georgia, Houston, Kentucky, Louisiana, Mississippi, Missouri, Nebraska, Oklahoma, South Carolina, Tennessee, Texas		www.liftfund.com	TX – serving selected Appalachian states
Appalachian College Association	AFN	Provides resources for collaborative programs that exceed what a single campus can accomplish by enhancing our students' educational experiences and ensuring optimal use of institutional resources.	Non-profit consortium of 33 liberal arts institutions	Georgia, Kentucky, North Carolina, Tennessee, Virginia, and West Virginia.	Helping students at certain colleges in Appalachia	https://www.acaweb.org/home	TN
Lyndhurst Foundation Inc	Foundation Center	The Lyndhurst Foundation invests in collaborative endeavors that improve the well-being and vitality of people, places, and natural systems in the Chattanooga region through strategies that support equitable, inclusive, and sustainable outcomes.	Grant-making Foundation	A tri-state, sixteen-county region including and surrounding Chattanooga and portions of the Tennessee, Mississippi, and Upper Coosa River watersheds.	Access & equity, arts & culture, conservation, parks & recreation, Urban design & development	http://www.lyndhurstfoundation.org	TN
Tennessee Arts Commission	AFN	The mission of the Tennessee Arts Commission is to cultivate the arts for the benefit of all Tennesseans and their communities. Our vision is a Tennessee where the arts flourish in every community.	State Government	TN	Art	https://artscommission.org/	TN
Tennessee Department of Economic and Community Development	Foundation Center	We believe in high expectations, low debt and a pro-business regulatory environment. Tennessee is proud to offer the highest quality of life in the South. Our state and local tax burdens are among the lowest in the country, and our state budget operates with a healthy surplus rather than a deficit.	State Government	TN		https://tnced.com/	TN
Innovate Fund	AFN	The Innovate Fund has a passion for bringing transformation to struggling areas across South Carolina.	Community Development Entity	SC, NC, TN, GA	Operating businesses, community facilities, real estate development (mentions projects that are transformative to the community so could include more)	https://theinnovatefund.com/	SC
North American Catholic Educational Programming Foundation Inc	Foundation Center	NACEPF's broadband service, religious and educational programming, and advocacy efforts aim to support education at every level from early childhood through adult education. Our state and local tax burdens are among the lowest in the country, and our state budget operates with a healthy surplus rather than a deficit.	501(c)(3)	National		http://WWW.NACEPF.NET	RI
Richard King Mellon Foundation	Foundation Center	Since 1947, the Richard King Mellon Foundation has funded visionaries with bold ideas to advance prosperity in Southwestern Pennsylvania, and environmental conservation across the United States.		National	The Foundation has six funding programs: Economic Mobility, Health & Well-Being, Organizational Effectiveness, and Social Impact Investments.	http://WWW.RKMFF.ORG	PA

APPENDIX H

Org Name	Source	Funder Description / Mission	Org Type	Where geographies do they fund? The state, a few states, all of Appalachia, also they fund broadband or connectivity related initiatives?	Funding Areas (in case you're exploring opportunities to combine your DE or broadband efforts)	Website	Funder Location (STO) opportunities
Ford Foundation	Foundation Center	Across eight decades, our mission has been to reduce poverty and injustice, strengthen democratic values, promote international cooperation, and advance human achievement.	Private foundation	International	Yes	http://www.fordfoundation.org	NY
Job Foundation	Foundation Center	The Job Foundation helps people who have been denied power to build it, so they can change unjust systems and create a more democratic, inclusive, and sustainable society.	Foundation	"Exclusively supports U.S.-based grantees"	Yes	http://www.jobfoundation.org	NY
Park Foundation Inc	Foundation Center	We are dedicated to advancing a more just, equitable, and sustainable society and environment.	Non-profit partner	National	Yes	http://www.parkfoundation.org	NY
Grow America (formerly National Development Council)	Appalachian Community Capital	Founded as a national nonprofit in 1949, Grow America formerly NDC, has worked for over half a century fulfilling its mission to increase the flow of capital for investment in low-income communities. We direct capital to support the development and preservation of affordable housing, the creation of jobs through training and small business lending, and investment in social infrastructure.	CDFI	National	No*	https://growamerica.org/about-us/	NY
Institute Capital	Appalachian Community Capital	The National Institute of Minority Economic Development strengthens the asset bases of diverse populations through investments in their communities, creating an environment in which race, gender, and geography are no longer a barrier to prosperity.	501(c)(3) Public Charity	National	No*	www.theinstitute.org	NC
Appalachian Community Fund	AFN	Appalachian Community Fund provides resources and support to grassroots groups and community-based organizations working for social, economic, racial and environmental justice in Central Appalachia.	Non-profit Grantmaker	Appalachian counties of Tennessee, Kentucky, Virginia, and/or West Virginia. For organizations based outside the region, the proposal must include a plan for how the Appalachian portion of the work	No	https://appalachiancommunityfund.org/	N/A
National Rural Health Leadership Foundation	AFN	The association's mission is to provide leadership on rural health issues through advocacy, communications, education and research.	National nonprofit	Rural communities	No*	https://www.ruralhealth.us/	N/A
Nature Conservancy	AFN	We are dedicated staff, scientists, and members advancing efforts in land, water, and wildlife conservation in more than 70 countries and territories.	Nonprofit	International	No	https://www.nature.org/about-us/	N/A
Primary Care Development Corporation	AFN	PCDC strengthens communities and builds health equity through strategic primary care investment, expertise, and advocacy.	Nonprofit	National	No*	https://www.pcdc.org/	N/A
Rural LISC	AFN	With residents and partners, Rural LISC supports resilient and inclusive rural communities as great places to live, work, and innovate. Rural LISC strives to identify priorities and opportunities and deliver the most appropriate support to meet local needs. We achieve this through integrated strategies and programs focused on five pillars of rural development: Community Development, Housing, and Infrastructure, Workforce Development, Housing, and Disaster Solutions.	Nonprofit	Rural communities (National)	Yes	https://www.lisc.org/rural/	N/A
United States Institute of Museum and Library Services	Foundation Center	The mission of IMLS is to advance, support, and empower America's museums, libraries, and related organizations through grantmaking, research, and policy development.	Independent agency of the US	National	"Support broad-based efforts to provide museums, libraries, and archives with resources to advance digital access and inclusion."	https://www.imls.gov	N/A
Best Buy Foundation	Foundation Center	The Best Buy Foundation™ funds organizations that strengthen the communities we serve. Our primary focus is building brighter futures for teens through tech, whether through digital literacy, career training, or entrepreneurship/ youth- and technology-focused initiatives. We also have regional priorities to promote vibrancy in our hometown communities of Minneapolis-St. Paul and Seattle.	501(c)(3)	National	Yes	https://www.bestbuyfoundation.org/	MN
Mid Atlantic Arts Foundation	AFN	Mid Atlantic Arts serves as a creative and financial partner for artists and presenters looking to create innovation throughout the region, the nation, and beyond.	Nonprofit	International	No	https://www.midatlanticarts.org/	MD
United States National Institute Of Standards And Technology	Foundation Center	All 50 states and U.S. territories	Agency of the United States Department of Commerce	National	Yes	http://www.nist.gov/	MD
United States National Institutes of Health	Foundation Center	NIH's mission is to seek fundamental knowledge about the nature and behavior of living systems and the application of that knowledge to enhance health, lengthen life, and reduce suffering.	Agency of the United States	National	Yes	https://www.nih.gov/	MD
Chorus Foundation	AFN	The Chorus Foundation works for a just transition to a regenerative economy in the United States. We support communities on the front lines of the old, extractive economy to build new bases of political, economic, and cultural power for systemic change.	Foundation	National	Yes	https://chorusfoundation.org/	MA

APPENDIX H

Org Name	Source	Funder Description / Mission	Org Type	What geographies do they fund? (The fund only in one state, portion of a state, a few states, all of appalachia, also do they fund broadband or connectivity related initiatives?)	Funding Areas (In case you're exploring opportunities to combine your DE or broadband efforts)	Website	Funder Location (STO) opportunities
Mary Reynolds Balboock Foundation	AFN	The Babcock Foundation's mission is to help people and places move out of poverty and achieve greater social and economic justice	Foundation	Alabama, Arkansas, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Virginia and West Virginia.	Developing cross-region networking. Giving direct support to artists & communities. Using arts & culture to heal & restore. Reviving & developing infrastructure. Sharing narratives about Appalachians.	https://mrf.org/	
Mylan Charitable Foundation Waymakers collective	AFN AFN	No Public Website We strive to create creative practice, land, livelihoods, and dialogue across neighborhoods and disciplines. We envision an Appalachia that supports the joy, imagination, and hopes of our artists, activists, and culture bearers.	Radical grantmakers	Appalachia	Developing cross-region networking. Giving direct support to artists & communities. Using arts & culture to heal & restore. Reviving & developing infrastructure. Sharing narratives about Appalachians.	No Public Website https://www.waymakerscollective.org/	

State-Aligned Digital Opportunity Evaluation Plan Template

Outcomes	Impact	Progress
Economic and Workforce Development	[Insert narrative describing how the community's Digital Equity Plan has impacted the State's economic and workforce development goals, objectives, and plans].	[Insert narrative describing the Bradley County's progress towards addressing the State's priorities, i.e., not started, on-going, in progress, complete, etc.]
Education Outcomes	[Insert narrative describing how the community's Digital Equity Plan has impacted the State's educational goals, objectives, and plans].	[Insert narrative describing the Bradley County's progress towards addressing the State's priorities, i.e., not started, on-going, in progress, complete, etc.]
Health Outcomes	[Insert narrative describing how the community's Digital Equity Plan has impacted the State's health-related goals, objectives, and plans].	[Insert narrative describing the Bradley County's progress towards addressing the State's priorities, i.e., not started, on-going, in progress, complete, etc.]
Delivery of Other Essential Services	[Insert narrative describing how the community's Digital Equity Plan has impacted the State's essential services goals, objectives, and plans].	[Insert narrative describing the Bradley County's progress towards addressing the State's priorities, i.e., not started, on-going, in progress, complete, etc.]

Speed Tests

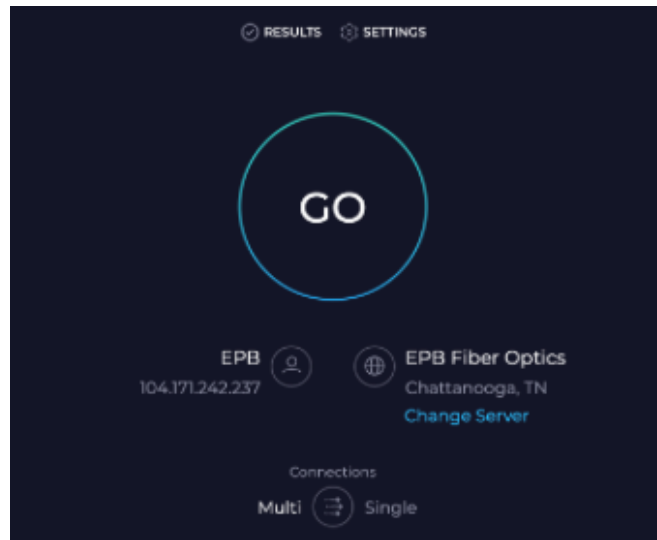
Why are speed tests important: Speed tests provide measurements that reflect the quality of service – the speed and performance of the internet provided. Internet performance is about connection – “low latency” for gaming, high-quality video streaming (such as watching movies on Netflix or Hulu), upload speeds for video calls (like facetime or over zoom), and download speeds for fast page load times while browsing online.

Suggested website (app) for speed tests: Ookla (<https://www.speedtest.net/>)

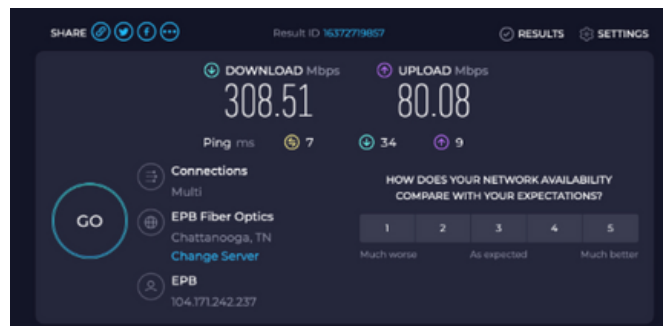
What is happening during a test: While the test is being run, multiple “requests” to multiple services are sent to check your connection. The Speedtest app determines your device connectivity strength based on the success of these requests.

Speedtest by Ookla will “ping” nearby servers and choose the server with the lowest response time (the shortest time between sending and receiving a response to the server). The server with the lowest response time is considered closest. For more information you can visit the support page at [speedtest.net](https://www.speedtest.net).

How to perform a speed test: Go to <https://www.speedtest.net/>. Click or tap on the “GO” button (not “start” or “click here” as these are advertisement buttons). It will take a few seconds until your download and upload speeds have been analyzed. The download speeds will run first, followed by the upload speeds.



The circle around the Go button is color coordinated to signal whether your device is online or not. A blue/green circle indicates you are connected. A yellow circle means that something is not working as it should. A red circle means you are most likely disconnected. You will be able to take a speedtest with either a green or yellow circle. If you are on a mobile device, such as a cell phone, and have a red circle, you will need to search for a better signal before taking the test. If you have a red circle on a WiFi or fixed broadband, such as with a computer, that means there is an issue with your internet connection.



Bandwidth

What is bandwidth?

The network bandwidth describes the maximum capacity of a network connection in a given amount of time. Bandwidth is not a measure of network speed although it is represented by the number of bits, kilobits, megabits, and/or gigabits that can be transmitted per second.

Why does it matter?

The larger the bandwidth, the more data can be sent or received at the same time. The higher the bandwidth, the higher the cost of a network connection. That means if your plan is for up to 250 Mbps it will be less expensive than 1 Gbps will cost you. Understanding your bandwidth needs are important for selecting the right network plan and only paying for what you need.

How do speed and bandwidth differ?

Speed is the rate at which data can be transmitted while bandwidth is the capacity for that speed. Speed is how quickly the data is transmitted while bandwidth is the amount of data over a set amount of time.

How does your bandwidth impact your connection?

Multiple devices that are connected on the same network share the same bandwidth. Some devices or uses require larger bandwidth and can “hog” the bandwidth. Bandwidth impacts speed on multiple devices.

Calculate what you need:

1. How many devices do you have in your home that share a network (ex smart tv, computer(s), smart phone(s))?
2. How are these devices being used (ex: tvs streaming videos or a computer used for web browsing)?
3. Determine the bandwidth requirements of these devices using the above diagram as a guide.
4. If multiple devices are performing the same use, multiply the number of devices by the bandwidth requirements
5. Add all the bandwidth requirements together

Connect Humanity Data Sources

Source Name	Source Type	Source Description	Data Collected & Analyzed	Purpose
Federal Communications Commission (FCC)	Public	Federal Agency responsible for implementing and enforcing America's communications law and regulations (Federal Communications Commission (2022). About the FCC. Available at: https://www.fcc.gov/about/overview)	FCC Form 477	Determine broadband incumbents and technology penetration
BroadbandNow & BroadbandSearch	Private	Online databases of internet service options available in a given area (BroadbandNow (2022). About BroadbandNow's Team. Available at: https://broadbandnow.com/about ; Broadbandsearch (2022). About. Available at: https://www.broadbandsearch.net/about)	Advertised internet service offerings including providers, speed, price and technologies	Determine broadband speed and corresponding price
FiberLocator	Private	Online telecommunications database of fiber infrastructure (FiberLocator (2022). Resources: Available at: https://www.fiberlocator.com/)	Existing fiber infrastructure in the County	Define metro fiber networks (regional level - middle mile; local level - last mile) to evaluate network redundancy. Define long haul fiber networks (national level) to be leveraged by the County to connected middle mile

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