SUMMARY:

Broadband is a significant innovation in communication technologies with diverse and impactful benefits such as creating jobs and transforming education. To stay competitive in a technologically advancing society, Henderson County is working to improve its deficient broadband infrastructure. As a county with both urban areas with high population density and rural areas with low population density the struggle for affordability, adoption, and deployment is multifaceted. Henderson County’s difficult mountain-related environmental challenges contribute to it having a lack of widespread connectivity despite multiple carrier offerings. Henderson County is a desirable place to live with increasing population growth, complete with leadership that moves the county forward without leaving the people of the community behind. However, as education opportunities, occupational development, and public services become increasingly technologically dependent, those on the wrong side of the digital divide will be left further behind.

Broadband internet is no longer a luxury, but an essential component to education and opportunity comparable in effect to a service utility. Homework is delivered online at a rate of 70%, and students with internet access are 6-8% more likely to graduate from high school. A 1% increase in broadband service adoption is associated with a 0.3% increase in employment. Closing this digital divide is a critical component to improving the quality of life for Henderson County citizens, particularly those transforming their opportunities through education.

The 2013-2017 American Community Survey estimates over 76% of Henderson County households have an internet subscription, but many of these subscriptions include service that does not meet current broadband metrics of 25 Mbps up and 3 Mbps down. Little information is available to address connectivity concerns at the local level. This study seeks to identify comprehensive information about broadband concerns of the community in order to increase availability, adoption, and inclusivity in an effort to catalyze broadband resources for the community.

ACKNOWLEDGMENTS:

The Henderson County Broadband Strategy Plan was a cooperative effort in the community. In particular, we acknowledge the efforts of the following people and organizations for their assistance and leadership in making Henderson County a more digitally equitable place:

**HENDERSON COUNTY BOARD OF COMMISSIONERS**
Grady Hawkins- Chair  
William Lapsley- Vice-Chairman  
Rebecca McCall  
J.Michael Edney  
Charles Messer

**COMMUNITY PARTNERS**
Henderson County Schools  
Britney Brady- Henderson County Partnership for Economic Development  
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Town of Fletcher  
City of Hendersonville

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BACKGROUND:

As a state, North Carolina does not currently allow local governments to treat broadband as a public utility; therefore, local and county governments have historically shied away from inserting themselves in the broadband discussion. Henderson County recognizes that adequate broadband service is essential to it citizens and economy; therefore, county officials have taken a more active role in recent years to entice competition and service offerings. In 2013 Phase I of the WestNGN initiative included the towns of Laurel Park, City of Hendersonville, and Fletcher. Phase I put out an RFP to assist the region in helping to bring a new provider by connecting some of the most population dense areas. Currently, (2019) North Carolina has been working to amend legislation and funding potential for areas to increase broadband resources in the state.

Henderson County leadership identified specific concerns regarding their broadband issues:

1. Improved Accessibility- Henderson County has identified several unserved/underserved areas of the county that are considered unserved or underserved that need improved connectivity.
2. Digital Inclusion/Homework Gap- Students being able to complete assignments and use broadband resources to further their education.
3. Public Safety- Communications for Emergency Management teams to take care of the health and well being of the community.
5. Healthcare- Provide excellent healthcare for the county through digital communications.

Henderson County is comprised of approximately 116,748 residents (286.1 people per square mile) with a median household income of $50,454. The county’s terrain is forested, and includes the Pisgah National Forest while traversed by the Blue Ridge Parkway. This includes the Great Craggy Mountains and the Blue Ridge Mountains and a section of the Eastern Continental Divide passes through it.

The State of North Carolina’s Broadband Infrastructure Office performed a state-wide survey as part of a comprehensive study that identified these issues as most important: expanding broadband access, increasing adoption and digital literacy for all citizens and businesses, and developing statewide policies that enhance availability. Further, the State study cites FCC reports that show North Carolina as ranking 9th in the nation in broadband deployment with an estimated 93 percent of NC households having access to broadband. The State report also indicates that 52 of North Carolina’s 100 counties have a deployment rate equal to or greater than the US average (90 percent); notably, 89 percent of North Carolina households without access live in sparsely populated areas. More specifically, the State also points out that the FCC’s estimate that seven percent of North Carolinians do not have access to adequate bandwidth speeds is likely too low. Henderson County is shown as having a broadband adoption rate of between 69% and 77% (as per a White House brief). The adoption rate is derived from factors including broadband availability, income, level of education, and whether one is elderly or disabled.

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RESEARCH FINDINGS:

Digital data and insight survey results exist at the state and national level, few represent locally led granular data. As a result, Henderson County decided to pursue participating in the WestNGN Phase II demand aggregation study facilitated by Land of Sky Regional Council in 2018/2019. The survey was broadly marketed and disseminated to the community, specifically targeted to some predicted underserved/unserved areas. The survey addressed questions related to the availability of services customers were able to acquire from local providers and identified common digital activities to which customers are most engaged.

SURVEY DEPLOYMENT:

- Survey link was sent home with every public school student
- Link to the digital survey were marketed to many non-profits and community partners
- Link to the digital survey was sent to higher education partners
- Link was distributed to industrial and commercial businesses in the county through economic development partners
- Flyers were placed around the county in public spaces
- County, city, and town governments marketed the link to the survey

These efforts resulted in 1,395 participants from the community representing 2.9% of Henderson County’s households. See Appendix A for full Henderson County survey results.

According to the survey 5.9% of the population reports not having internet access. Due to the nature of the content of the survey and participation it is expected that the percentage of unserved populations is over 18%.

Figures 1 and 2: 59% of Henderson County population respond by saying they do not have access to broadband. Due to the number of responses and the location of responses it is believed that the percentage of unserved people in Henderson County is much higher.

The more populated areas of Henderson County are where K-12 schools, libraries, public safety, and other community organizations generally have access to higher broadband speeds. Businesses and residents located outside of the town limits in the more rural sections report having unreliable service, service unavailable or too expensive, or no choice other than satellite.
Figures 3 and 4: 55% of Henderson County survey responses claim their service does not sufficiently meet their needs with the least satisfied customers in the more rural areas of the county.

Henderson County has been served by a traditional cable modem provider (Morris Communications) and AT&T. Fiber optic trunk cable has been constructed through the County (south from Asheville along US25 and east/west along US64). However, there are still large portions of the County that are underserved or unserved by terrestrial or wireless service. Connect America Phase II funds (CAF) have been accepted to construct broadband service in eastern, southern, and northwestern Henderson County. This effort will support the expansion of broadband access in the county. Moreover, as in all cases, further competitive broadband services would improve offerings and pricing throughout the county. A collaborative approach towards deployment of various technologies will help Henderson County meet the needs of its citizens.

**TABLE 1: Primary service providers for Henderson County**

<table>
<thead>
<tr>
<th>PROVIDER</th>
<th>SERVICE</th>
<th>BROADBAND SPEEDS (up to)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morris Broadband</td>
<td>Fiber optic cable cable modem</td>
<td>1 Gbps (1000 Mbps) 100 Mbps</td>
</tr>
<tr>
<td>AT&amp;T</td>
<td>Fiber optic cable DSL</td>
<td>1 Gbps (1000 Mbps) 100 Mbps</td>
</tr>
<tr>
<td>Spectrum</td>
<td>Cable</td>
<td>100 Mbps</td>
</tr>
<tr>
<td>Windstream</td>
<td>DSL</td>
<td>75 Mbps</td>
</tr>
<tr>
<td>Skyrunner</td>
<td>fixed wireless</td>
<td>32 Mbps</td>
</tr>
<tr>
<td>HughesNet</td>
<td>Satellite</td>
<td>25 Mbps</td>
</tr>
<tr>
<td>ViaSat</td>
<td>Satellite</td>
<td>30 Mbps</td>
</tr>
</tbody>
</table>

(Notes: 1. The information in the above chart was taken from broadbandnow.com (https://broadbandnow.com/North-Carolina/Hendersonville?zip=28792#show=business), 2. the Federal Communications Commission defines ‘broadband’ as 25 Mbps download and 3 Mbps upload, 3. the above table only captures organizations that have infrastructure in the County, and 4. the above named providers may not be able to serve all areas of the County.

As seen in the above chart, gigabit service is available, but predominantly only in more population dense areas.

NOTE: Within the framework of this document, cellular service is not being considered a satisfactory means of providing Internet service because it is most prevalent along transportation corridors and is not pervasive throughout the County.
RECOMMENDATIONS:

It is recommended that Henderson County consider short-term and long-term options for the expansion of coverage. Strong service offerings exist in metropolitan areas of Henderson County, but rural areas need improved access and sufficiency. Working with providers to remove barriers to deployment will greatly increase connectivity for Henderson County. Due to high variations in cost of deployment based on technology we are unable to determine a cost of deployment. In order to determine this cost a feasibility study would have to be completed for a specific project.

Options for local governments to consider that may accelerate broadband deployment include:

ACCESSIBILITY:

A. Host a provider meeting with the NC Broadband Infrastructure Office to present results, community assets, and vertical assets from the survey to both incumbent and potential new providers. Identify areas of the county that may have service sufficiency problems and opportunities for providers.

B. There are many groups in Henderson interested in improving the broadband issue. Forming a Henderson County broadband committee involving various stakeholders from the community to facilitate conversations regarding broadband issues. It is suggested that this team work to identify progress and deficiencies associated with broadband access for the county. This approach will ensure that county wide efforts are being addressed on a recognized platform with public input and visibility. It will also encourage less redundancy of programming, improve viability for future funding prospects, and improve the ability to leverage additional funding.

C. Adopting public policies that will lessen the cost of entry for new service providers, and, by offering county resources to said providers (for example, a “Dig Once” or “Build Once” policy or simplifying the permitting process - note that the State of North Carolina is considering implementing its own “Dig Once” policy- - for more information please see section 8 of North Carolina Governor Roy Cooper's Executive Order Number 91, dated March 14, 2019 - https://governor.nc.gov/documents/executive-order-no-91-establishing-task-force-connecting-north-carolina-promoting.).

D. Installation of strategically placed towers and connections all anchor institutions could be beneficial to help deploy additional fixed wireless assets to the community as well as increase public safety. By creating an RFP to access these resources new providers and incumbents can increase broadband offerings to the community.

Figures 5 and 6: Vertical Assets and Community Assets in Henderson County

E. Create public/private partnerships with private and/or nonprofit providers to extend services and increase adoption.

F. Continue to deploy and expand a County network for governmental use (including, for example, connecting government facilities via fiber optic cable and/or developing a public safety network) and allowing service providers to lease excess strands (lessening their investment) or by performing “joint builds” to lower deployment costs for everyone.
G. Work with providers to encourage extension of existing infrastructure, including new wireline providers, to capture more customers or improve existing services such as fiber to the home. In locations where some communities may have financial resources they may be able to individually incentivize a company to improve services in their area.

H. Utilize varying technologies such as fixed wireless and wireline to fill in the gaps of service to underserved sections of Henderson County.

**DIGITAL INCLUSION:**

Ideally every citizen who desires internet access would be able to receive it, but unfortunately there are gaps in coverage for various reasons.

Over 55% of survey respondents said their service did not meet their sufficiency needs and nearly 6% of survey respondents don’t have access at all. Henderson County may want to consider some digital inclusion activities to help meet the needs of the community. Of survey respondents answering they don’t have service, “cost of service” and “service availability” rank as the top barriers to internet adoption.

Figures 7 and 8: 59% of Henderson County survey responses respond by having no service and nearly 55% of responses say service does not meet their sufficiency needs.

Henderson County Schools already offer a 1:1 program for their students to have a device at home. The 2017 ACS data reports that over 85% of households have a computer. These devices will be better utilized with increased adoption rates and other digital inclusion activities for the community. Nearly 74% of survey responses reported someone in their household required to do school work or training tasks online.

Figure 9: 73% of survey responses claim someone in their household is required to perform educational tasks online.

To help alleviate cost burdens to communities the county may consider implementing additional low cost mobile service solutions and public access locations.

1. HotSpot-To-Go Programming- HotSpot lending programs assist with providing individuals access who can’t afford regular service or do not possess consistent broadband needs. These programs are often administered by libraries, schools, non-profits, or faith-based institutions and are available for determined periods of time for free, or at a low cost.
2. Implement low/cost mobile service solutions- School district, public agencies, and private facilities can create additional community wifi spots to provide better coverage for unserved/underserved communities. Examples of locations include: school buses, public transportation, community centers, parks, schools, libraries, churches, downtown districts, and businesses. Henderson County Library system owns and operates a traveling bookmobile that can serve as a roaming hotspot. Using this type of resource as a model could leverage better community connectivity.

3. In areas where broadband competition is viable encouraging competition in the market will help reduce cost barriers.

4. Help encourage private companies to offer low cost plans to qualified customers.

Additionally- the county may consider organizing and branding this initiative locally by creating a map of these public and private locations. Locations participating in the program can get a sticker for their window/front desk that indicates participation in helping the community make sure it has broadband resources. As high quality broadband is created and marketed to these locations residents will become more familiar with the services broadband offers. This may lead to an increased demand for service as the value placed on adequate broadband rises.

**ECONOMIC DEVELOPMENT:**

Henderson County is one of the metropolitan centers of Western North Carolina. As such it drives much of the region’s economic impact. The availability of secure, reliable, competitive, and sustainable broadband infrastructure is essential to meet citizens’ needs and is a powerful catalyst for job creation that drives economic modernization. Any business or industry, small to large, rural to urban, could benefit from access to broadband. Broadband access is especially important to small, rural, and home based businesses because it provides a global marketplace to their location.

Broadband access can reduce overhead costs through telecommuting. According to survey data nearly 23% of the population operates a home based business and 46% of the population telecommute for work.

Figures 10 and 11: Business needs and potential for economic growth would be strengthened by improved broadband resources in Henderson County. Figure 10 shows that over 22% of responses operate a home based business and over 46% say they currently telecommute to work.

Henderson County reports that current Economic Development sites are well covered with connectivity. Further deployment of broadband resources, redundancy, and multiple carrier options in Henderson County will increase its ability to develop more Economic Development sites and recruit more ED projects to the community. Improving fiber assets into more areas of the county will increase commercial viability.
EMERGENCY MANAGEMENT:

It is important for Emergency Management Teams to have the ability to communicate well in order to help manage calls in remote areas. Broadband plays a critical role in improving emergency communication systems. Upgrading broadband resources can aid in the prevention of emergencies and decrease response time in their event. Improvement will also make available a spectrum of new technologies to be utilized as avenues of communication when these situations transpire.

The creation of additional towers in the county could help improve access to both the resident and emergency responders, especially in rural areas where fewer towers exist. And, pursuant to North Carolina Governor Roy Cooper’s Executive Order Number 91, dated March 14, 2019 - https://governor.nc.gov/documents/executive-order-no-91-establishing-task-force-connecting-north-carolina-promoting - government agencies across the State will also be the beneficiaries of additional broadband infrastructure. Emergency management systems would be a beneficiary.

In more urban areas of the county there may be opportunities to look at SMART city technology to improve emergency response efforts.

HEALTHCARE:

Increasingly, healthcare options are accessible at one’s home and satellite sites. In order to support access to said services, a vibrant broadband connection is required. For example, the North Carolina Telehealth Network (“NCTN”, http://nctn.web.unc.edu/) supports eligible healthcare providers’ access to broadband services across the State through a Federal Communications Commission (“FCC”) program (the Healthcare Connect Fund). See https://www.fcc.gov/document/healthcare-connect-fund-fact-sheet for more information.

Quality broadband is a requirement for viability of telehealth opportunities in rural areas. According to the FCC, in order to support high definition video teleconferencing the required minimum broadband speed is 6 Mbps. Henderson County has a hospital and urgent care facilities, but bringing specialized care to the community via telehealth will increase overall health services.

1. Bring together healthcare stakeholders to discuss how broadband speeds can work to improve the health of the community.
2. Identification of strategic sites(such as community centers, business districts, etc) that co locate with other needed service offerings could help customer participation in a variety of resources.
3. Working with healthcare providers to create a pilot program to deploy telehealth service offerings.

FUNDING OPPORTUNITIES:

To support any recommendation, the County will need access to capital. The following groups may have grants available in support of broadband infrastructure deployment (note this list is not complete). Each respective group must be contacted to determine project eligibility:

1. USDA – please refer to footnote 2, There are community connect and reconnect grants available to eligible applicants. www.rd.usda.gov/programs-services/community-connect-grants
2. Connect America Funds (CAF) – CAF funds are available to providers in rural areas of Henderson County. See https://www.fcc.gov/consumers/guides/connect-america-fund-phase-ii-faqs for more information.
3. Appalachian Regional Commission (ARC) – The ARC has made funds available for rural broadband access projects. Transylvania County has participated in ARC funding for broadband. Currently, ARC projects need to be tied to Economic Development projects. www.arc.gov/program_areas/index.asp?PROGRAM_AREA_ID=18
4. The GoldenLEAF Foundation –GoldenLEAF has made funds available for economic development programs that include broadband telecommunications. www.goldenleaf.org
5. State of North Carolina – the Broadband Infrastructure Office, as authorized under S.L. 2018-5, is providing grants to private providers of broadband services to facilitate the deployment of broadband service to underserved areas of the State. The Growing Rural Economies with Access to Technology (GREAT) Grant program funds eligible projects only in Tier One counties. These funds are not presently available to Henderson County due to its status as a Tier Three county.
Henderson County officials may consider making their legislators and other state officials aware of this barrier for and work to remove elements of the program that make it inaccessible to counties like Henderson.

6. Implementation of leasing vertical and community assets to private companies could leverage additional funds to deploy additional broadband related resources to the community.

7. Building a philanthropic model of corporate and public dollars to address highest needs among different barriers to adoption will increase deployment and reduce digital inclusivity concerns for the county.

**CONCLUSION:**

Nearly 90% of survey responses from Henderson County indicate that they consider internet access to be as essential as other basic services such as water, sewer, and electricity. In another question regarding a scale of importance respondents registered importance of internet access at 91 out of 100. The value of these resources from the community are very high.

Figure 12: Over 89% of Henderson County survey responses say that they consider internet access to be an essential piece of infrastructure.

Due to the high cost of implementation of fiber resources there is no fast track to closing the digital divide for Henderson County, so helping improve connectivity access will require a collaborative approach among community partners. A better coordinated effort across the public, private, and non-profit sectors could significantly close the gap. Identification of highest priorities for the county could help play a role in leveraging funding from various resources to facilitate project implementation. This will likely require a comprehensive look at fiber, fixed wireless, and wifi/mifi improvements to close the digital divide countywide.

Telecommunication patterns follow a supply and demand model. Ensuring providers in the region know where the opportunities and issues are located are critical to improving connectivity. Through this project Henderson County, the North Carolina Broadband Infrastructure Office, and Land of Sky Regional Council now have this data to leverage private support to improve broadband resources.
**ATTACHMENT A:**
**BROADBAND SURVEY RESPONSES**

Does your household currently have Internet access?
5.9% of Henderson County residents claim they do not have access to Internet.

Why doesn’t your household subscribe to Internet services? (For those who do not have Internet access)
9.2% of Henderson County residents claim cost as the most significant barrier to internet adoption. 42.3% of the survey responses claim that services are unavailable at their home. (Survey respondents were able to check all that apply)

If you could access Internet service in your home what activities would be most important to you? Select all that apply
Henderson County residents claim Access to Educational Materials, Email, and General Browsing/Research as their top desired activities if they had access to the Internet.
What is the primary source of Internet service that you have at your house? (for those who do claim to have Internet access)

45.1% of survey responses claim to have Cable as their primary source of Internet. 27.5% of the responses claim DSL as their primary Internet source. Few responses came in as other sources such as satellite, fixed wireless, and fiber. Many people may not understand how their Internet service is delivered.

How much does your household pay each month for Internet service, including taxes and fees? If part of a bundle or package deal, please consider only the Internet portion of your monthly bill.

43.6% survey respondents spend an average of $50-74.99 each month on their Internet service. 27% claim to to pay $30-$49.99 and over 15% pay $75-$99.99.

Do you think your Internet service provider sufficiently meets the needs of your household?

Over 55% of survey responses from those who have Internet service claim the service does not meet their needs and over 8% aren’t sure.

Do you have any problems with the quality of your home Internet connection? Consider issues like service reliability, unacceptable speeds, service outages, etc. that occur during a typical month.

Over 80% of Henderson County survey responses claim that service disruptions are less than 8 hours per month and 11.7% claim there are no disruptions.
Please rate your level of satisfaction with your home service:
Over all Henderson County is most unsatisfied with Price/Value for services and Speed as Advertised. They are most satisfied with Service Reliability.

What would you like to improve about your Internet Service?
Consistent with the previous question nearly 73% of survey responses claim they would like for prices for the service provided to decrease, additionally customers expressed concerns about their speed and reliability.

Why haven’t you upgraded your residential service?
67% of the survey responses claim that they have not upgraded their service due to a lack of better options.

What activities do you do through your home Internet service?
Henderson County residents use the Internet for diverse reasons, basic activities such as email, research, entertainment, and social media rank among the most popular.
Does anyone in your household operate a home-based business?
32.9% of survey responses claim to operate a home-based business.

Does any member of your household telecommute or occasionally work from home from an outside employer?
46% of survey responses claim to telecommute to their jobs. Based on several open ended questions at the end of the survey, the option to work from home came up as something Henderson County residents would like to participate in.

Are any members of your household required to perform schoolwork or training tasks via the Internet?
76.9% of survey responses claim that someone in their household is required to perform schoolwork or training tasks.

How important is the Internet to your household?
On a scale from 1-100 Henderson County ranks the importance of Internet access as a 91.

Do you consider Internet access to be an essential service; much like water, electricity, and other utilities?
Henderson County feels very strongly (89.8%) that Internet access has become a basic utility.
ATTACHMENT B: MAPS

Henderson County, NC
WestNGN Broadband Survey Responses
Sufficiency of Broadband Service

Legend
Survey Response
- Hot Access
- No Access
- County Boundary

Henderson County, NC
WestNGN Broadband Survey Responses
Broadband Access

Legend
Survey Response
- Hot Access
- No Access
- County Boundary