State Broadband Plan Progress Report

Joint Legislative Oversight Committee on Information Technology and the Fiscal Research Division

Department of Information Technology

December 1, 2015

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Legislative Request

This report is submitted pursuant to H97, Session Law 2015-241, which directed the State CIO to provide a report to the Joint Legislative Oversight Committee on Information Technology and the Fiscal Research Division on the development and implementation of the State broadband plan ("plan").

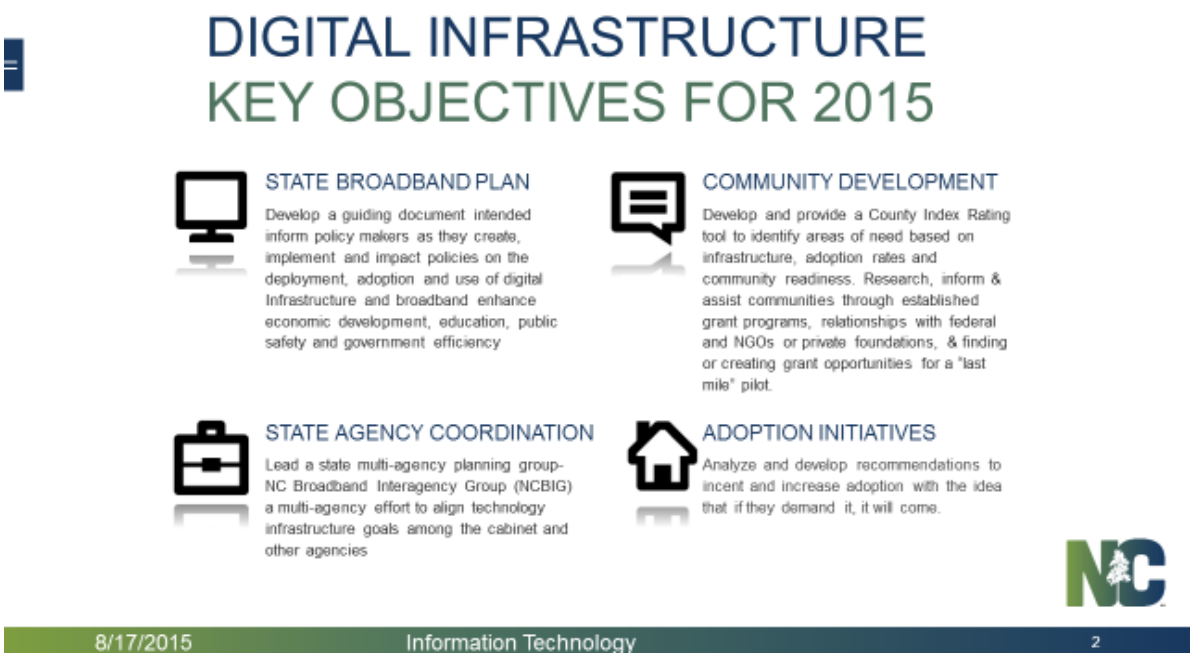
The full text of the legislation can be found in Appendix A.

Introduction

The State Chief Information Officer established the Broadband Infrastructure Office in 2015 as a statewide resource for broadband access, first responder communications, and classroom connectivity initiatives led by the State of North Carolina. In accordance with Session Law 2015-241, H97, the Broadband Infrastructure Office will develop a State broadband plan and will coordinate with other State agencies in order to maximize the effectiveness and efficiency of available resources.

The Broadband Infrastructure Office aligns NC Broadband, the statewide effort to expand high-speed Internet access, with the FirstNet public safety initiative for improved resource sharing across state agencies. The centralized and streamlined Office provides the opportunity to work across agencies and identify infrastructure development needs across North Carolina.

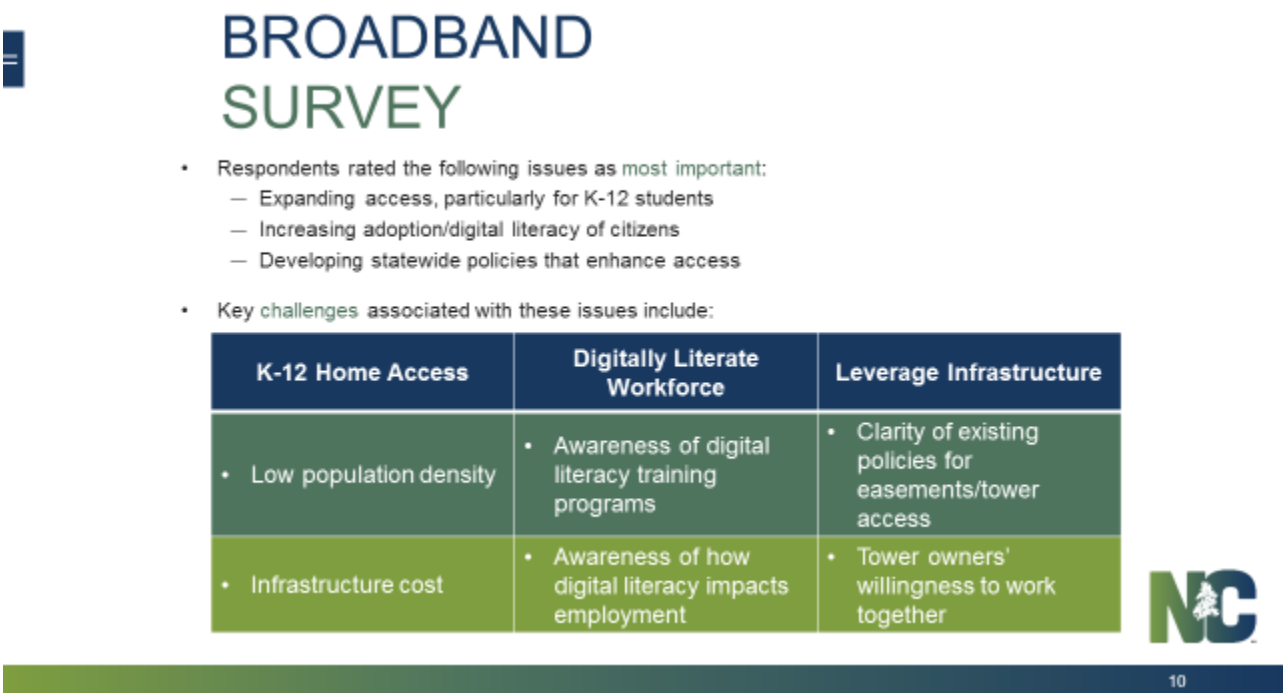
The Office's mission includes creating the nation's first giga-state by 2020, expanding broadband access to underserved communities, and supporting digital learning by extending Wi-Fi access to every classroom in the State. We also provide policy recommendations and guidance to government leaders and key stakeholders to foster digital infrastructure expansion, adoption, and use.



Current Work

In May 2015, the Broadband Infrastructure Office (BIO) released the NC LITE-Up (North Carolina Linking the Internet to Economically Underprivileged People), an 18-month research study designed to better understand Internet adoption barriers in low-income households. BIO will use the findings from this unique study, in part, to help with the development of the comprehensive statewide plan that will address broadband issues including adoption.

In August 2015, the Broadband Infrastructure Office conducted an online survey to better understand the challenges that impact continued deployment of broadband infrastructure and adoption of broadband technology in the State. The survey received more than 500 stakeholder responses, a response rate of almost 20 percent, from a diverse sample representing a mixture of populations and counties. We received at least one response from all 100 counties. The results of this survey provide a current catalogue of the challenges the state faces to achieving universal connectivity and adoption. These challenges will be presented to small working groups of stakeholders and experts that will help identify recommendations to be included in the state broadband plan.



BIO continues to actively reach out to State agencies to look for opportunities to utilize existing infrastructure and resources and identify ways to streamline permitting and approval processes. Working with the Departments of Transportation, Administration, Commerce, and Department of Public Safety we continue to look for and find assets, resources and opportunities to increase high-speed broadband access and adoption throughout the State.

We are developing a broadband index to rate each county based on availability, adoption and community readiness. This index, similar to a rating tool, will inform the plan and assist our office in determining which challenges and which solutions may be needed for individual counties. The data sets used to develop the index include current NTIA and FCC coverage maps, potentially FCC subscription data, state Citizen Surveys, the BIO stakeholder survey, and community engagement.

BIO is developing an on-line, interactive toolkit, to leverage our information, resources, and on-the-ground technical assistance advisors to help communities with planning. This toolkit will work in conjunction with the Index and the Plan.

Finally, we continue to work closely with more than a dozen counties and communities to provide technical and community planning assistance. This work includes developing goals, aggregating demand, developing asset surveys, and identifying funding sources. The technical assistance team also engages with Internet service providers to highlight unserved or underserved communities, work through technical solutions, and provide guidance on locating community-owned assets available to reduce capital costs. These efforts have resulted in bringing broadband for the first time to communities around the state, including most recently: Yancey, Mitchell, Polk, Graham, and McDowell Counties. Projects continue in various counties throughout the central and eastern parts of the state.

Early Findings

The story of broadband infrastructure in North Carolina is a good news story for most of the state. Many communities, typically in sparsely populated or economically distressed areas, however, continue to find themselves on the wrong side of the digital divide. The plan will focus on bridging this divide as well as positioning the state for the future.

Today, North Carolina boasts many unique broadband assets. The state is home to a non-profit middle-mile network connecting universities, schools, hospitals and libraries among other institutions. Several large cable and telecom companies such as Time Warner, AT&T, CenturyLink and Frontier, provide Internet connections to millions of residents. Google Fiber announced at the beginning of the year plans to offer service in the Charlotte and Triangle areas. Many mid-to-small providers, including NorthState, Carolina West Wireless, Pangaea, Wilkes, Greenlight, and others, have established themselves in less populated markets. All of our K-12 schools are connected to fiber and every classroom will be equipped for WiFi connectivity by 2018. The tele-health market continues to see success and expand.

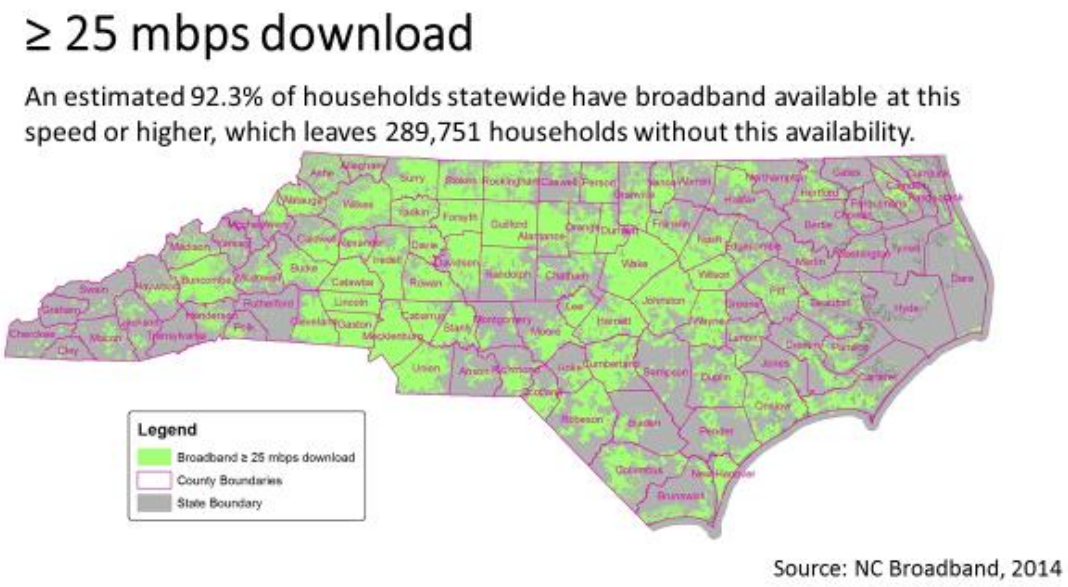
The State broadband plan will offer policy and planning recommendations that will leverage these assets to ensure universal access and connectivity. The speed at which technology evolves and the projected amount of data to be transferred in the near future will require significant infrastructure upgrades in our state. While almost 90 percent of the state has availability to the FCC threshold speeds of 25Mbps download/3 Mbps upload, less than 10 percent of the households have fiber to

the home. Most of the investments to upgrade infrastructure and expand cell or WiFi connectivity are taking place in urban areas. To continue to be a hub for technology and biotechnology innovation and to continue to attract manufacturing, knowledge-based businesses and improve our agricultural output, we will need to focus on upgrading existing infrastructure and investing in fiber and high-speed wireless infrastructure in the remote or sparsely populated areas of the state.

North Carolina leads the nation in many of the broadband categories mentioned above. Therefore, this plan will use data, stakeholder feedback, and experts to hone in on the most difficult challenges facing the state. For example, our research shows that despite availability, many communities are not adopting or utilizing high-speed Internet. We know increased adoption will drive the need for next-gen infrastructure. We have also found that community readiness or initiative, particularly in sparsely populated area, distinguishes those that have access to broadband and those that do not. The plan will address each of these challenges and offer recommendations to the General Assembly, local leaders and policy makers to overcome these challenges.

Availability: Broadband Deployment and Existing Infrastructure

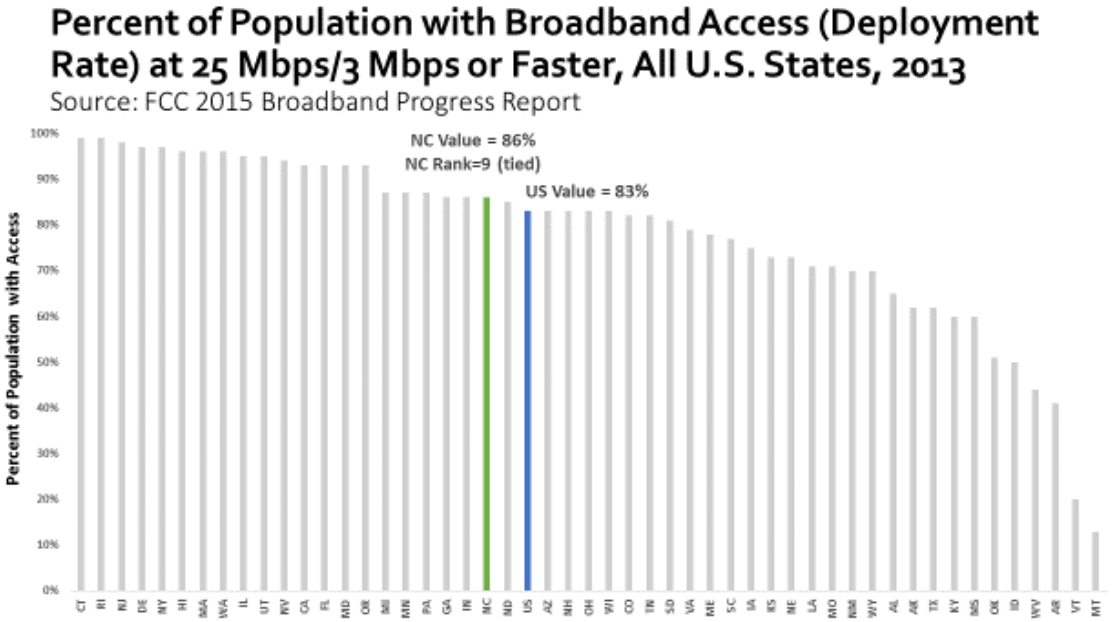
In January 2015, the FCC updated the recommended "availability" target speed threshold to 25Mbps (download)/3Mbps (upload) from the previous recommended benchmark 4Mbps (download)/1Mbps (upload).



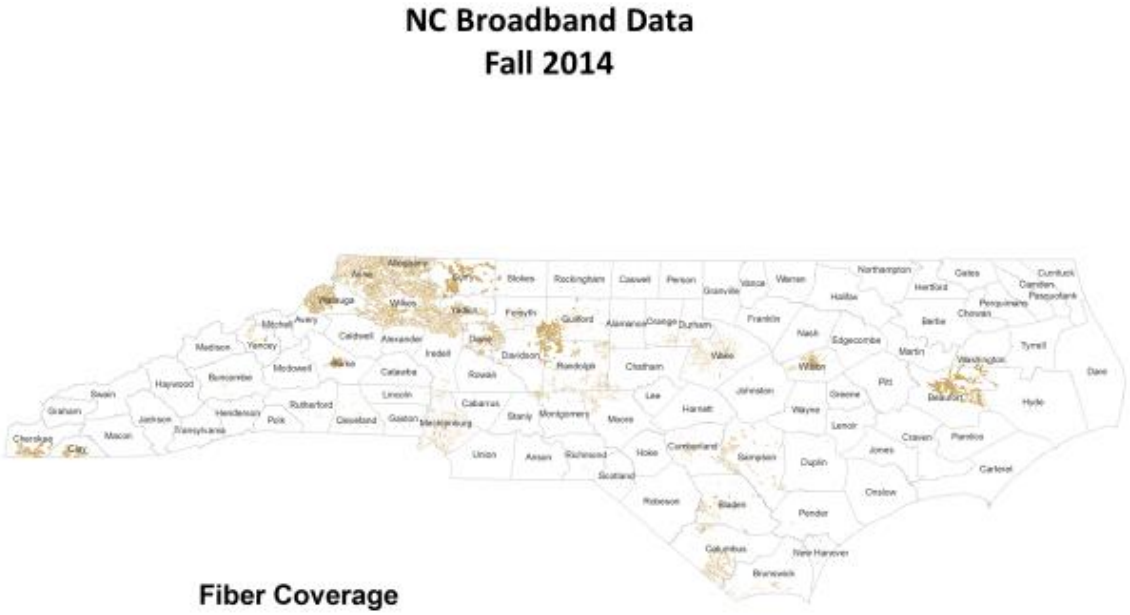
Source: NC Broadband, 2014

At the speed examined, North Carolina ranks 9th in the nation in terms of broadband deployment rate. Specifically, at 86 percent, North Carolina's broadband deployment rate is slightly above the U.S. average (83 percent), 13 percentage points behind the most covered state, Connecticut, and is

85 percent of the value of the highest-ranking state (Rhode Island), and is below that of all the comparison states except Colorado and Virginia.

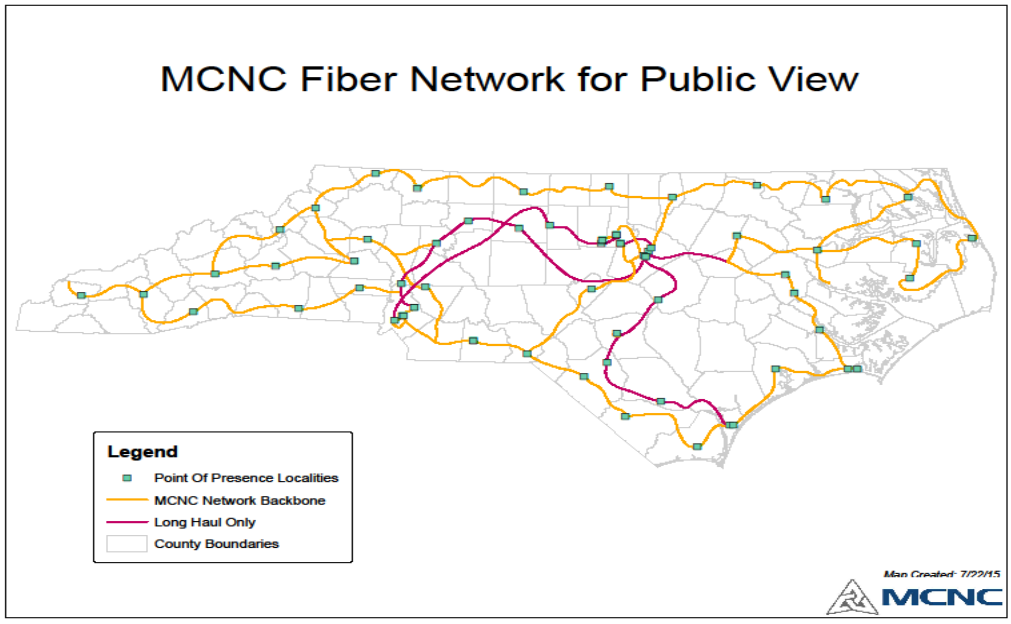


North Carolina ranks considerably lower, however, on fiber deployment. While fiber-to-the-home deployment has nearly tripled since 2013's Innovation Index to 9.3 percent from 3.9 percent, North Carolina's rank, 37th , remains lower than all peer states and is significantly less than the US average fiber-to-the-home deployment—24.96 percent.



North Carolina's adoption rate, 10 percent at the examined speed threshold, has increased from the 1.6 percent rate reported in the previous report in spite of the increase in speed threshold. However, North Carolina ranks 22nd out of 25—a lower rank than all peer states. Within North Carolina, 58 of the 100 counties have a household broadband deployment rate at the download speed examined, equal to or above the US average of 83 percent. Of the 42 North Carolina counties below the U.S. average, 19 have a deployment rate between 50 and 82 percent, and the remaining 26 counties have a deployment rate of less than 50 percent.

While standard metrics for middle-mile are difficult to obtain, North Carolina's major broadband providers do have significant middle-mile assets. In addition, North Carolina possesses a 2,600 mile long, contiguous open access middle-mile network that touches 82 of North Carolina's 100 counties. Operated by the nonprofit, MCNC, the dark fiber (fiber that is not being used) shares the conduit with a lit fiber optic backbone that serves the broadband needs of all K–20 public education institutions, most of K–20 private education and select research institutes, nonprofit healthcare providers, public safety and other anchor institutions. Almost half the strands of fiber are also available to broadband service providers to lease and serve consumers and businesses. Enterprises across all vertical markets (financial services, technology, healthcare, biotech, transportation, logistics, etc.) can also lease the fiber strands to build their own enterprise networks.



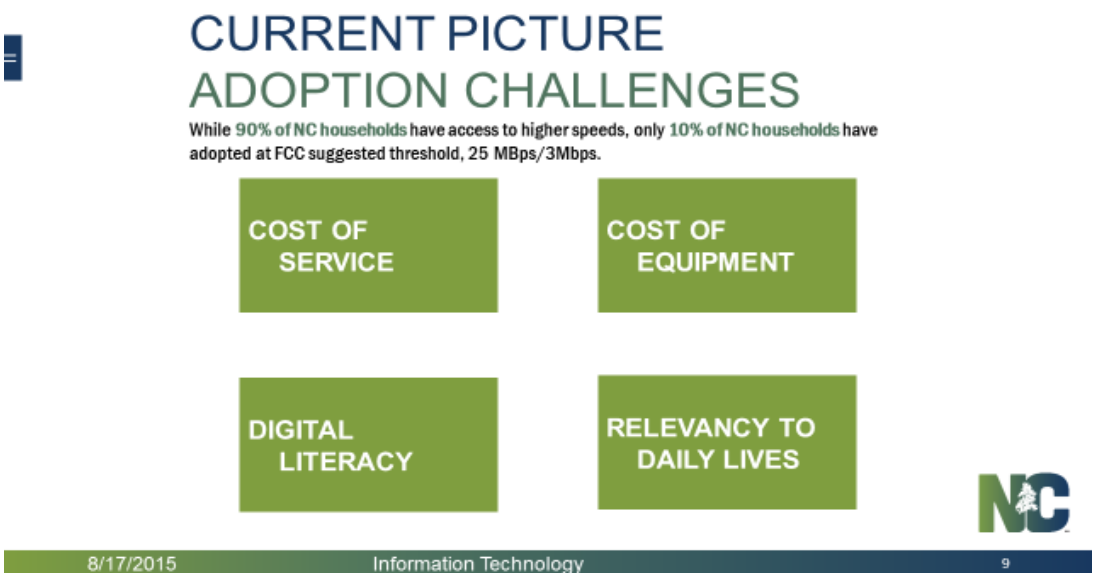
Adoption

While there is a continued need for access to high-speed Internet and infrastructure expansion, Broadband adoption in NC is lower than it should be given connectivity access across the state. While more than 90% of NC households have access to higher speeds, only 10% of NC households

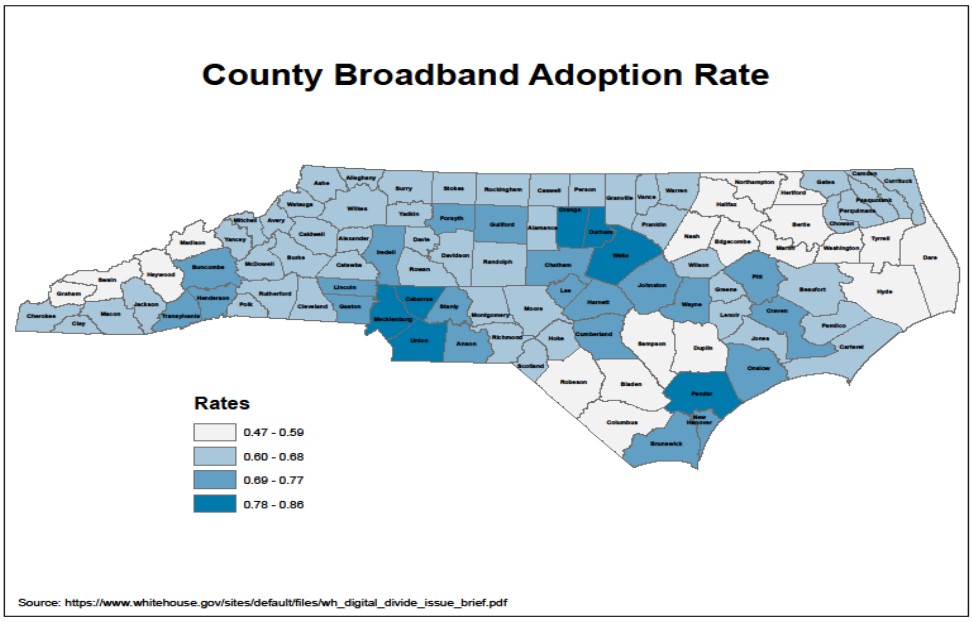
have adopted at Federal Communication Commission (FCC) suggested threshold, 25Mbps (download)/3Mbps (upload). Adoption is particularly low among low-income households. In 2013 only 47% of NC households with annual incomes under $15,000 adopted broadband.

We know there are four main barriers influencing broadband adoption, particularly among low-income households, including cost of service, real or perceived costs of computer, laptop or other devices, digital literacy, and the perceived relevancy of the Internet on daily lives.

Participants in the study became more fully active digital citizens and improved their digital literacy and broadband utilization for everyday casts. Once the connectivity was established, 85% of participants signed up for Internet services and 79% continued service after the study's subsidies ended.



Early research shows that as a State, we need to focus on increasing adoption rates. This is especially true in areas where we have found significant broadband infrastructure, including fiber, but low utilization. Aside from the economic barriers discussed above, we are finding that large numbers of certain populations, like the elderly, do not use the Internet. Often these groups do not see the benefits of being on-line. Therefore, digital learning and increased education of the services, such as telehealth, and benefits, such as driver's license renewal, are needed.

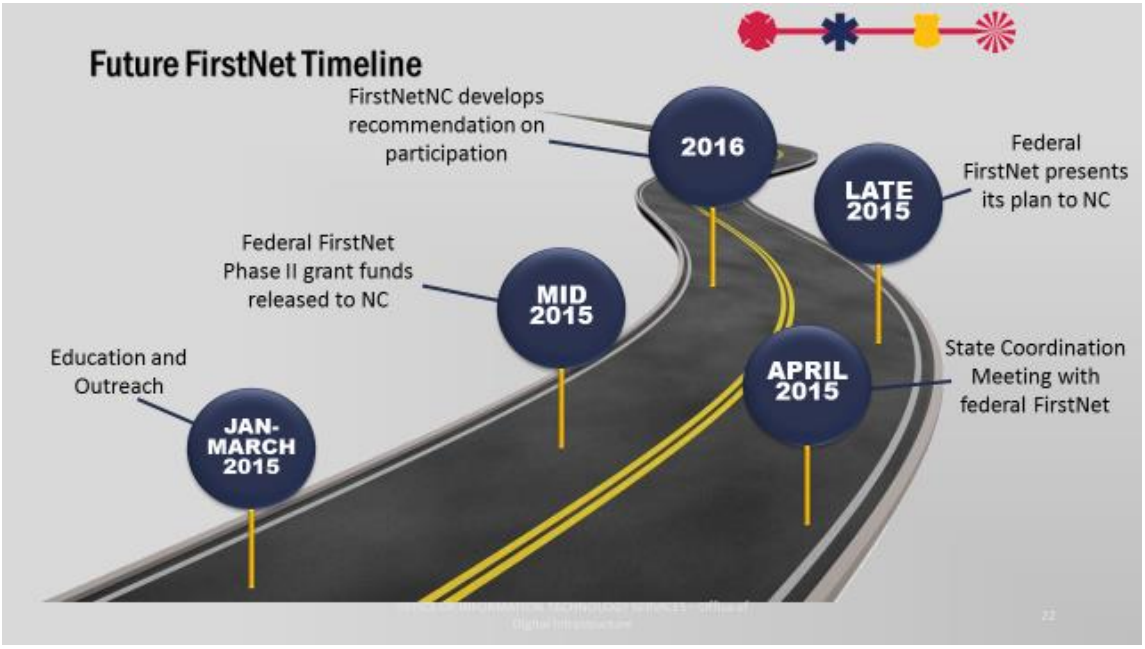


Identifying Challenges

The broadband survey issued to stakeholders across the state was intended to identify challenges to broadband deployment and adoption in NC. Respondents to the survey were asked to rate their opinion on the importance of specific broadband issues, such as "expanding access to broadband in NC." Secondly, respondents were asked to rate the extent to which they agreed that certain factors posed a challenge to resolving availability and adoption issues. For example, respondents rated the extent to which they agree that "The cost to deploy broadband infrastructure" affects connectivity using a 5-point scale.

Respondents rated expanding access, particularly for K-12 students, increasing adoption/digital literacy of citizens, developing statewide policies that enhance access as the most important issues. The survey also identified some key challenges associated with the issues, including K-12 home access, having a digitally literate workforce, and the need to leverage existing infrastructure.

The plan will also incorporate aspects of the national wireless data network, FirstNet. The FirstNet initiative for North Carolina, located within BIO, compliments and aids the work on the plan. We have worked with the federal FirstNet team to contemplate the use of the FirstNet network (with the objective of 100 percent coverage) by secondary users when not occupied by public safety or emergency responders. Remote communities or students without access at home may be able to use the frequency and bandwidth to connect to the Internet. This network could potentially have a significant impact in bridging the digital divide for underserved and unserved populations.



Currently we are providing technical and development assistance to several communities and counties throughout the state. The lessons learned from the communities that have successfully expanded broadband to their citizens will be captured in the plan.

Next Steps

We continue to gather, analyze and synthesize availability, adoption, and utilization data from sources to better inform the report's final recommendations. These sources include the FCC, the NC Department of Commerce's Citizen Survey, NTIA and other federal agencies, and private foundations (Pew, Benton, Brookings Institution among others). Much of this data will frame the current challenges to broadband deployment and adoption we face in North Carolina.

The next phases of planning and development of the State's broadband plan will involve engaging stakeholder groups' and state agencies' for assistance and participation. Currently we are developing a schedule of workshop meetings where BIO will engage stakeholders from a variety of areas to get specific feedback on strengths and weaknesses, challenges, and opportunities for improvement. Specific stakeholder groups include K-12/education, workforce development and small business, telemedicine, and State agencies. These meetings will begin in December and continue through March of 2016.

The information and feedback gathered in these meetings will inform the recommendations included in the plan. Recommendations, in part, will focus on how to better leverage existing infrastructure, streamlining state and local permitting and access to right-of-ways, methods for

fostering public-private partnerships, and creative approaches to funding. For example, in the near future the state may benefit from the federal government's broadening of existing grant programs, such as E-Rate and HUD community block grants, for broadband deployment. For economic development initiatives, the plan will consider how the state can leverage existing funds and incentives to support projects in disadvantaged communities.

Additionally, community leadership plays a key role in communities that enjoy universal high-speed, affordable broadband service. It will be the difference between the haves and the have-nots. Therefore, recommendations will consider what communities need to do to organize effectively.

Solutions will highlight successful methods to incentivize providers to expand, enhance, and lower costs. For example, all K-12 schools and community colleges have fiber to their doors. Providers bid to provide service. Communities can work more closely with schools and work to create incentives to leverage service to the broader community. Also, communities, partnering with private providers, could look at ways to use fiber to the school to establish wireless service from the school to the community.

Finally, the state needs to act as the convener, a thought leader and resource center to better direct projects or providers. Currently, BIO provides technical assistance team to be proactive and target communities in need. We need to continue to connect private providers, community leaders, state agencies, and funding sources to identify projects and collaborate to implement project plans.

The plan will be divided into chapters that will include:

- A brief history, current status of availability and general location of broadband infrastructure,
- Findings and analysis of the Availability challenges throughout the State,
- A study and analysis of Adoption challenges facing the State,
- An in-depth look at several key areas including economic development, workforce, telehealth, and the "homework gap" (students without access to Internet at home), and,
- Case studies to highlight successful deployment and strategies to support affordability, including potential partnerships and sources of funding to support the effort, and,
- Recommendations to lawmakers and community leaders that will specifically address the challenges identified and the means, methods and best practices for achieving state-wide access.

The target date for the completion of the State Broadband Plan is Spring 2016.

Appendix A

Session Law 2015-241, H97

STATE BROADBAND PLAN

SECTION 7.23.(a) The State CIO shall develop a State broadband plan that includes:

(1) Information regarding the availability and functionality of broadband throughout the State and an evaluation of the current deployment of broadband service.

(2) A strategy to support the affordability of broadband service as well as maximum utilization of broadband infrastructure, including potential partnerships and sources of funding to support the effort.

(3) Analysis of means, methods, and best practices to establish universal broadband access across the State.

In developing the State broadband plan, the State CIO shall coordinate with other State agencies in order to maximize the effectiveness and efficiency of available resources.

SECTION 7.23.(b) For the 2015-2017 fiscal biennium, by December 1, 2015, and then annually thereafter, the State CIO shall provide a report to the Joint Legislative Oversight Committee on Information Technology and the Fiscal