State Broadband Plan Progress Report

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

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Contents

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").

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 Research Division.

State Broadband Plan

In June 2016, Governor Pat McCrory continued building on his commitment to increase access to affordable high-speed internet across North Carolina through the release of the State Broadband Plan, *Connecting North Carolina*. https://ncbroadband.gov/sbp

As Governor McCrory said, "We have made significant progress to improve North Carolina's broadband infrastructure and increase access for affordable high-speed internet, especially for small businesses and in our classrooms. This plan will build on our progress and further position North Carolina as a leader in ensuring that our infrastructure meets our growing demand."

The plan was a collaborative effort—feedback was gathered from more than a dozen stakeholder listening sessions, discussions with nearly 80 subject matter experts and a survey of 3,500 local leaders. The plan outlines recommendations for **North Carolina** to increase internet access focusing on:

- Incentivize investment in next generation, future-proof infrastructure and reduce barriers to deployment
- Create community-based adoption and utilization programs and initiatives
- Expanding access for K-12 students at home
- Facilitate integration of broadband into economic development strategies
- Recognize and leverage the influence telehealth technologies' have on household broadband adoption and use
- Enhance public safety and first responder connectivity by continuing the pursuit of a state-wide, interoperable data network and the Next-Generation 911 initiative

Summary & Recommendations

The following is an excerpt, with updates, from the Executive Summary of *Connecting North Carolina* without graphs and complete list of recommendations. The full report and a summary can be found at https://ncbroadband.gov/sbp

High-speed internet may be the most significant innovation of the late 20th century. It's benefits-from creating jobs to transforming education-are profound.

North Carolina's broadband internet infrastructure is robust. The state leads the nation in developing, leveraging, and utilizing broadband-enabled technologies to help children learn and stimulate economic development. The existing infrastructure positions the state to create a 21st century prepared workforce, increase small businesses' efficiency and effectiveness, and enable new healthcare technologies and service models. Faster, more reliable connectivity allows first responders and law enforcement to access data that could save lives and increase safety.

However, broadband's benefits are not evenly dispersed and a digital divide, or "a gulf between those who have ready access to the internet and computers,"[1] and those that don't, is growing. Many communities, typically in sparsely populated or economically-distressed areas lack access to infrastructure or affordable service. Additionally, broadband adoption—the proportion of citizens subscribing to internet service—is low in NC given the rate of broadband availability in the state and contributes to the widening digital divide.

This divide, new technologies, user demand,[2] and greater reliance on internet access, necessitates ongoing infrastructure upgrades within our state. The state needs to take a strong leadership role in this policy arena to ensure aggressive, consistent deployment and investment.

Time for a Plan

This plan answers the charge by the North Carolina General Assembly to assess the current status of broadband availability and use across the state, analyze the best methods and means to "establish universal access," and offer strategies to achieve universal access.

A thorough analysis of current deployment, access, and adoption was completed using available data from state and federal resources and feedback from community leaders and stakeholders. In keeping with the statutory requirement, the plan's recommendations are informed by subject matter experts, providers, state agencies, local leaders, and stakeholders representing various populations and industries.

The majority of the recommendations are state budget-neutral. The few that require funding identify a funding source, typically an established private, federal, or state loan or grant fund.

Current Status

Availability: broadband deployment and existing infrastructure

These recommendations and the implementation strategies build upon the current state of broadband deployment and adoption. NC's broadband deployment rate (tied with FL) ranks slightly above the U.S average (93 percent) and is the highest deployment rate among southeastern states.[3] Providers continue to invest in expanding infrastructure in NC as evidenced by NC's seven percent increase in deployment rates between 2013 and 2014.

The counties with low deployment rates are areas with low population density. Only one percent of the households without access are in urban areas.

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[1] "Oxford Dictionary, digital divide definition," accessed March 15, 2016. http://www.oxforddictionaries.com/us/definition/american_english/digital-divide.

[2] Cisco Visual Networking Index: Forecast and Methodology, 2014–2019 White Paper. May 2015. http://www.cisco.com/c/en/us/solutions/collateral/service-provider/ip-ngn-ip-next-generation-network/white_paper_c11-481360.html (accessed February, 2016).

[3] Federal Communications Commission (FCC). 2016 Broadband Progress Report, Appendix E. Washington D.C.: 2016. https://www.fcc.gov/reports-research/reports/broadband-progress-reports/2016-broadband-progress-report (accessed January, 2016).

In our last progress report we reported that North Carolina's broadband deployment rate ranked 9th in the nation. Although that ranking has not changed, expansion continues in most urban areas. The state's 100 service providers have upgraded their networks or improved their service offerings to residents over the past year. The upgrades and expansions are likely attributed to increased competition and increasing demand for faster internet service.

From 2014 to 2015 the expansion of NC households with access to 25Mbps/3Mbps (megabits per second), the Federal Communications Commission (FCC) threshold for broadband, was flat. Speed offerings are increasing, but in areas with existing access to 25Mbps/3Mbps.

But even with increased deployment, North Carolinians access to next-generation networks lags behind the national average. According to a recent report from the Fiber to the Home Council, the national fiber deployment rate is 16 percent. Fiber-to-the-home deployment in NC nearly tripled between 2013 and 2015 from 3.9 percent to 9.3 percent, particularly in urban areas like Mecklenburg, Wake and Guildford Counties. *See Appendix A, Maps.*

Another area of concern is sufficient competition, which drives innovation and affordability, in many areas of the state. According to data collected by the FCC from internet providers, almost 90 percent of census blocks have at least two providers that deliver speeds of at least 10 Mbps/1 Mbps. At higher speeds, however, the number of providers drops significantly. Nearly 48 percent of all census blocks have only one provider offering 25 Mbps/3 Mbps (the FCC threshold for "broadband"). And 30 percent of census blocks have no providers offering that speed threshold.[4]

In North Carolina, we see a similar dynamic. Most census blocks, including those in urban area, have one to two residential internet service providers (excluding mobile wireless providers).

There are few areas of the state lacking adequate competition that have deployed next-generation infrastructure and made access affordable. Driving this are telephone cooperatives and small, regional providers. Most of those providers relied on federal grants.

Access for Businesses

Working with the NC Department of Commerce and the Economic Development Partnership we find that most large businesses relocating to the state have not found it difficult to access broadband infrastructure. Typically, businesses are willing to fund the cost of connection because these customers are high-value, low-risk.

Small businesses, particularly those in sparsely populated areas, struggle to attract providers. It is estimated that over 75 percent of all businesses employ under 20 people. Because many counties and municipalities believe next-generation infrastructure is key to economic growth and development, they have begun self-initiated efforts to forge public-private partnerships or to recruit new providers.

[4] http://arstechnica.com/information-technology/2016/08/us-broadband-still-no-isp-choice-for-many-especially-at-higher-speeds/

Adoption: subscribing to and using internet applications

Adoption and use of broadband services continues to increase state-wide. Using data from the 2015 American Community Survey conducted by the US Census Bureau we know that the state-wide internet subscription rate for both wireline and wireless service is 73.9 percent of households. This is up from 72.0 percent in 2014. Eleven counties, all less populous, fall below that rate.

According to provider-submitted data to the FCC, approximately 16 percent of NC households adopted at the suggested threshold of 25 Mbps (download)/3Mbps (upload) in 2015. Comparing this rate with the subscription rate suggests most residents subscribe at speeds below this threshold.[5]

North Carolina has one of the lowest adoption rates in the country. Adoption is particularly low among low-income households. In 2013, only 47 percent of NC households with annual incomes under $15,000 adopted broadband.[6]

Because adoption is a key indicator of use, it is inextricably linked to universal access. Usage enhances consumer demand, which drives deployment and investment, and drives further innovation and economic development. Adoption rates directly affect broadband's social benefits, namely a better educated and informed citizenry.

Affordability: the cost of internet access for customers

Research from UNC-Chapel Hill's Center for Public Technology (CPT) suggests that the cost per gigabit of service is decreasing in NC. According to the 2016 report titled, "Golden LEAF Rural Broadband Initiative Evaluation," the price per gigabit of broadband service NC households receive has consistently decreased since the CPT began collecting data on household subscription prices in 2010. In short, subscribers pay approximately the same amount per month but receive faster speeds than they received last year or five years ago. (See *Connecting North Carolina* for more details.)

Part of this phenomenon may be explained through increased competition in densely populated areas. Even more expensive, higher-speed services in a region helps reduce the cost of lower speed services.[7]

However, as noted above, both nation-wide and in North Carolina there is a lack of competition in many areas, most rural.

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[5] Interestingly, the state-wide rate for wireline subscriptions is 37.3percent of households up from 29.7percent in 2014. Forty-three less populous counties fall below that rate. Mobile subscriptions are 36.6percent of households with 13 less populouscounties falling below that rate. This is an increase from 27.9percent in 2014. Approximately 5.7percent of North Carolinians reported having only a mobile subscription with 59 counties (49 less populous) at or above this rate. This is down slightly from 6.0percent in 2014. Fiber to the home connections represented 2.7percent of state-wide subscriptions. Remarkably, 24 of the 29 counties at or above that rate were rural counties. This is a state-wide increase from 2014 (2.5percent) and 2013 (2.0percent).

[6] Wilson and Powers. "Digital Technology and Internet Access Trends in North Carolina: 1999-2013." 2014.

[7] http://www.analysisgroup.com/uploadedfiles/content/insights/publishing/broadband_competition_report_november_2016.pdf

A Look at the Market

The three predominate factors fueling the state's broadband growth are a growing economy, population increase, and a business-friendly regulatory environment.[8] Increased competition, particularly where a third provider enters the market, providers have upgrade networks, offered faster speeds for the same price, and lowered subscription costs.

Technology advancements, particularly in the wireless medium, will go a long way towards bridging the digital divide. Advancements like 5G cellular networks together with small cell technology will significantly reduce deployment costs for providers while providing high-speed connections for customers. These technologies may not be available for another five years.

Business models are evolving just as quickly as technology.[9]

Not too long ago telephone providers provided voice services, cable companies provided video services, and cellular providers provided mobile phone services and the world was neat and tidy. The internet and the myriad of ways to connect to the internet has up ended this model.

More and more cable customers are cutting the cord—ditching their cable TV service.[10] They are opting for internet service-only services. They'll buy the TV they want from applications or media content providers, ie: Netflix, Hulu. Live TV can be found on other applications like SlingTV.

Telephone companies and other internet service providers are buying media content providers. And infrastructure owners are consolidating, for example, CenturyLink announced it is buying Level 3—a large fiber optic network.

What does this all mean? The industry is moving towards the commoditization of fiber optic and wireless networks. All in preparation for going wireless to meet the increase in mobile device use (fn: Pew) and avoid the costly deployment of cables and supporting infrastructure.

For law and policy makers it can also be confusing. Laws at the federal, state and local levels are antiquated or out of date for accommodating the deployment of next-generation infrastructure. Most of these laws or regulations involve the difference between telephone and cable services.

In the broadband medium, these distinctions are no longer relevant. Telephone and cable providers now provide video, internet and voice services. These services are provided over various infrastructure

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[8] At this time, per NCGS, broadband as a service is not regulated by the Public Utilities Commission, cable franchises are issued statewide, and local permitting fees are capped at cost of service with limited exception.

[9] http://www.nytimes.com/2016/11/02/technology/daily-report-a-25-billion-fiber-merger.html?partner=rss&emc=rss&_r=0&mc_cid=fbdf361403&mc_eid=3f2ad7d4ed

[10] http://www.dslreports.com/shownews/Despite-Megamerger-Charter-Still-Bleeding-Video-Subscribers-138261?mc_cid=9cbb5a7474&mc_eid=3f2ad7d4ed

or mediums: copper lines, coaxial cable, fiber optic cables, fixed wireless, cellular wireless, and satellite.

These distinctions can affect access to right-of-ways and contractual relationships with municipalities. Next-gen infrastructure, like fiber optic cable, is flexible. It can be used for a number of different applications: data, video, voice. It backhauls cellular or fixed wireless networks. It is used in the energy industry for meter monitoring and by municipalities for traffic signaling and street light monitoring.

Because of its capacity and flexibility, it should not be classified as telephone or cable or energy or anything else. Instead, it should be classified as infrastructure. Allowing counties and municipalities to invest in and build out this infrastructure is essential to the expansion of broadband throughout the state.

The state needs to take a strong leadership role in this policy arena to ensure aggressive, consistent deployment and investment to accommodate new technologies, increasing demand, and next-generation networks. The state's laws and rules impacting internet services evolved through a patchwork or piecemeal approach to resolving specific issues telephone or cable providers were facing. A comprehensive statutory and regulatory overhaul updating current laws and rules is needed.

The Plan

State and local government leaders can impact the broadband ecosystem by encouraging competition and empowering communities to act. By updating laws and policies, and designing policies to incentivize adoption in sectors the government heavily influences, lawmakers can foster both the supply-side and the demand-side. The plan recognizes:

- Increased competition drives innovation, affordability, and the deployment of future-proof infrastructure.
- The specific issue areas addressed in the plan include: K-12 education, economic development, telehealth, and public safety.
- In areas where competition is lacking, empowered and engaged communities form more equitable partnerships with private sector internet service providers (ISPs).
- Communities can lower deployment costs by better leveraging existing infrastructure, easing access to right-of-ways and poles to facilitate path creation, and investments in next-generation infrastructure.
- Community-based adoption and utilization programs help drive demand.
- Federal, state and private loans and grants offer untapped funding for infrastructure, planning, and adoption initiatives, including subsidies for low-income households.

Objectives & Summary of Recommendations

The final recommendations were informed by subject matter experts, providers, and stakeholders. While compiling research and recommendations from stakeholders, two consistent themes emerged:

1. Communities that plan and have 'skin in the game' impact deployment and affect adoption; and,
2. Where competition is lacking, communities will need to partner with private-sector entities and ISPs to expand affordable options.

With these themes in mind, the recommendations offer ways for state and local leaders to foster an ecosystem that supports the expansion of access and increased adoption at the community and state level.

The plan's overarching goal is for every North Carolinian to have affordable access to broadband service—wireline or wireless—if they so choose, by June 2021. The following objectives support these goals:

- Increase the percentage of households with access to fiber optic cable to 50 percent by June 2021
- Increase the percentage of households with access to broadband to 100 percent by June 2021
- Increase household adoption rates to over 60 percent by June 2021[11]
- Affordable access to the internet outside of school for 100 percent of K-12 students by June 2021
- Ensure high-speed internet access is available at all libraries by 2020 (currently just over 50 percent)
- A state-wide model for the development and deployment of local, community-based digital literacy programs

In this summary document, readers will find the plan's recommendations organized into six groups: broadband availability, broadband adoption, the K-12 homework gap, economic development, telehealth, and public safety. For more data, information and context the full report can be found at: https://ncbroadband.gov/sbp

The plan's recommendations specifically support the achievement of these goals. While not interdependent, they are interrelated and build on one another.

Implementation

The best laid plans remain mere ideas unless they're adopted and thoughtfully implemented. To achieve the goal of ensuring every North Carolinian has affordable access to broadband service, if they choose, by June 2021, collaborations and shared responsibility for implementation is required. Building this plan was a collective effort. The responsibility for implementing the plan will also require a team-based approach.

As the plan's author and resource-hub for broadband in the state, the Broadband Infrastructure Office (BIO) within the Department of Information Technology will monitor implementation and report on the plan's progress. This includes partnering with agencies or entities that should take the lead adopting and carrying out the recommendations.

Successful implementation also relies upon strong leadership by those who directly impact the broadband ecosystem: the executive branch, the General Assembly, state agencies, non-profits, and broadband service providers.

[11] At whatever is the current definition of broadband in 2022.

BIO's Technical Assistance team will continue to work with NC's counties and communities using a proven process to expand and enhance access. Recognizing that a one-size-fits-all approach does not work, BIO will rely heavily upon county and municipal governments, the Councils of Governments, and community leaders to partner with BIO to tailor solutions for their communities.

Broadband Infrastructure Office

The State Chief Information Officer established the Broadband Infrastructure Office in 2014 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.

Our mission is to provide policy and strategy guidance and recommendations to community and state leaders on ways to enhance high-speed internet access for global competitiveness, education, public safety, health care, and government efficiency. We partner with willing communities to provide on-the-ground technical assistance specifically aimed at expanding broadband deployment and adoption.

Key Objectives for 2016

1. **State Broadband Plan**-Recommendations specifically to enhance economic development, education, public safety and government efficiency in North Carolina.
    a. Publish the plan - COMPLETED
    b. Implement and promote the plan-UNDERWAY
2. **Implement the plan with our community partners** – Proactive tech assist team; divide state into COGs; pilot projects-UNDERWAY
    a. Funding - Grant opportunities-research, inform and assist communities through:
        i. partnership with the DOC Rural Division
        ii. Relationships with federal and NGOs or private foundations
        iii. Finding or creating a grant opportunity for a “last mile” pilots: FTTH for NSLP students
3. **Adoption**-analyze and develop recommendations to incent and increase adoption with the idea that if they demand it, it will come (find or create a grant opportunity to fund this initiative). Hire DL expert using private foundation sponsorship to support 2-yr chair at State Librarian’s office
4. **Lead a state multi-agency planning group-NC Broadband Interagency Group (NCBIG)** a multi-agency effort to align technology infrastructure goals among the cabinet and other agencies.
5. **Expand Outreach**: Last year we worked with almost two dozen counties or communities to help them create public-private partnerships to expand broadband in their communities. This year we plan to contact all 100 counties. With additional Technical Assistance Team members (increasing from 2.5 FTE to 4 FTE) in FY17/18, we will double partnership initiatives. With additional team members we’ll also dedicate one FTE to work with counties to advise and help with funding projects. These additional members will also help us increase our technical advice and consulting role with state agencies and local governments.

6. **FirstNet**: Continued representation of the state's interests as well as the interests of first responders and emergency management personnel during the vendor selection process and the development of the state plan.

Key Accomplishments

Technical Assistance Team

The Broadband Infrastructure Office has three technical experts to help communities as an on-the-ground resource providing information on broadband availability and adoption issues, technical assistance, and facilitating discussions with broadband providers. The technical expert provides models for county leaders and economic developers to aggregate demand, leverage assets and reduce barriers to attract providers, and to identify potential broadband funding opportunities.

The Technical Assistant Team partners with willing communities to develop local objectives and plans in order to:

- Understand current broadband availability
- Locate unserved and underserved businesses and residents
- Identify assets relevant to broadband deployment
- Build partnerships with broadband service providers; and
- Identify opportunities to leverage assets, reduce barriers and help make the business case

In 2016 the TA Team added two staff members creating a three-person team allowing us to divide the state into thirds. Staff members held 178 meetings in communities, met with approximately 1,000 local leaders and citizens, and created or engaged with 22 county broadband planning committees, working groups or task forces.

Engagements led to approximately 1,000 additional connections (customers receiving broadband services).

Partnerships

We continue to reach out to other federal, state and private agencies to develop partnerships that support our mission and objectives.

We partnered with the Appalachian Regional Commission (ARC) to develop and administer an approximately $300,000 grant program to establish and support WiFi networks in 10 rural communities, benefiting 415 small businesses and local tourism initiatives. BIO also supported an ARC initiative to build a 'broadband planning toolkit' to be used by local communities.

We have begun an effort with the Friday Institute to capture better data on the 'homework gap.'

We continue to work with the NC Department of Commerce to support broadband projects through the Community Development Block Grant fund, which the NCGA de-obligated $1.25 million for broadband projects.

In collaboration with the State Librarian, BIO is working to leverage the E-Rate program to upgrade connectivity for libraries. This includes a state-wide survey to collect key data and a working group to develop a consortium, similar to one created for schools, to leverage purchasing power. We are also creating a state-wide Digital Literacy and Equity Advocate within the State Librarian's office to develop adoption and digital literacy strategies and work with local communities to implement those strategies.

BIO continues to support the US Department of Commerce, National Telecommunications and Information Administration's community planning toolkit by providing information and advice, including attending a workshop in Washington, DC.

Outreach Efforts

Our website continues to be a valuable source of information for our customers. Since we began tracking in February 2016, we have had more than 8,700 visits to our website with the majority of that traffic visiting our blog, which includes guides, how-to's, grant information, updates, news and information. Our key sources for traffic include search and social which is typical of a content marketing campaign like ours.

We sent 24 emails to our state and local leaders and stakeholders email list totaling in 100,149 outbound contacts. Our average open rate is 18.54percent. In the last year, we have sent more than 700 tweets, leading to more than 113,000 impressions of our content. Finding that many of our stakeholders use Facebook, and to further our reach, we recently established a Facebook page.

In October, we began a direct mail campaign, informing those that we serve about our office's offerings. We sent more than 700 envelopes with a letter from our office to county commissioners and municipal leaders. As a result, we have seen an incremental increase in the number of inbound requests for support.

Our office will continue to engage communities through our Technical Assistance Team. To assist policy makers and leaders we will assign plan recommendations and develop metrics for charting progress. We will also engage these leaders on changes that can be made to state law that will empower communities. Finally, we will prioritize improved data collection and publication.

FirstNetNC

In 2016, FirstNetNC, the state's outreach and education initiative for the federal First Responder Network Authority (FirstNet), briefed approximately 1,800 public safety and industry partners about the FirstNet Program. Additionally, FirstNetNC produced an educational video and disseminated over 36,000 digital and printed information products. The FirstNetNC office also gathered additional tower site data for potential use by the FirstNet industry partner.

FirstNetNC has worked closely with the North Carolina NG911 effort and with several federal agencies with a North Carolina presence (DoD, DHS, and US DoJ).

The FirstNetNC Office provided guidance to pilot projects being advanced by first responder agencies in Carteret, Cumberland, and Orange Counties. North Carolina is the first state to demonstrate Band

14 in-building communication coverage – as well as the first State to demonstrate small cell Band 14 capabilities – leading the way in cellular technology for Emergency Responders.

Next Steps and Conclusion

Today the issue isn't just one of access, which, of course, is still a problem. We also find many areas are underserved--they aren't getting the bandwidth to realize the benefits of high-speed connectivity: economic development, increased home values, quality of life, educational opportunities, and telehealth. Our concerns are not solely with what exists today, but where the state will be in five years. The speed at which technology evolves and the projected amount of data flow will require significant infrastructure upgrades in our state.

We know that the less populous areas of North Carolina continue to lack adequate broadband access. These challenges also exist in communities in or near more populous areas. Many providers haven't rolled out next-generation infrastructure in these areas because they lack a business case to justify investment. Most national providers rely on population density to justify deployment.

Other areas of the state have substantial topographical challenges. For example, drilling through the granite found in the western regions of the state is difficult. It is cost prohibitive to provide wireline infrastructure to these communities.

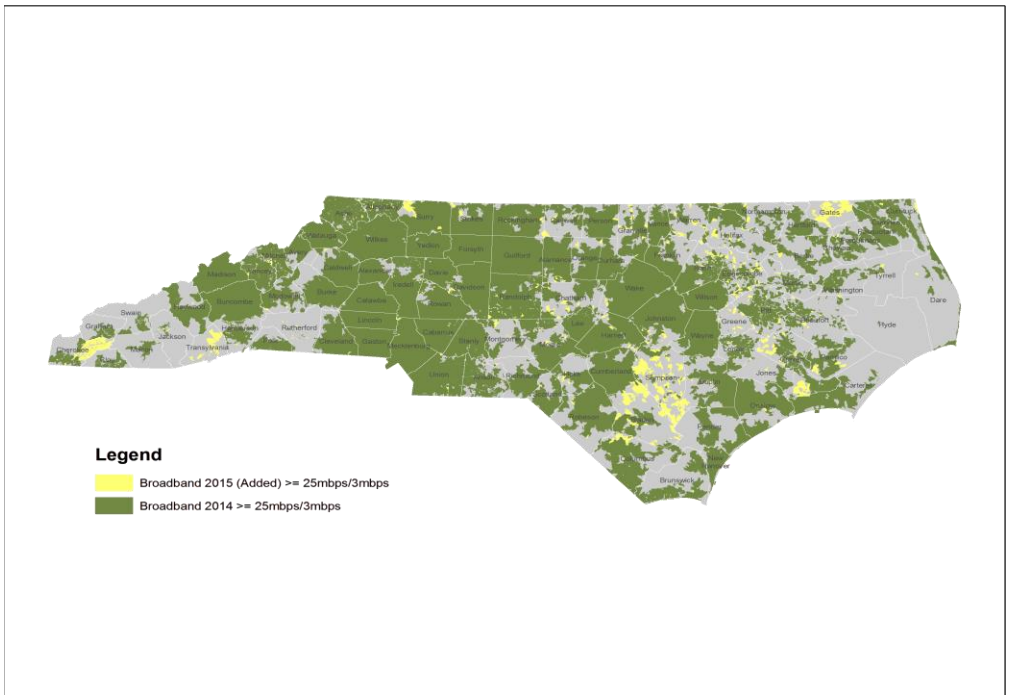
These challenges can be, and have been, overcome by communities who take action and plan.

Our experience finds that an active and engaged community is the most vital element in overcoming these challenges. Without leadership at all levels, from the individual citizenry, to the business owners, to the economic development team to the elected officials, a community will have a difficult time developing and implementing a plan focused on greater access.

Policy-makers supporting community engagement and activism to improve their communities must continue to scrutinize and amend laws and regulations that inhibit both competition and deployment of next-generation infrastructure. Providers' business plans should not be a surrogate for the state's policy. A true level playing field would open up state-wide investment and deployment to a greater number of entities and organizations.

Appendix A

Broadband Access Growth 2014-2015



Fiber to the Home Growth 2014-2015