Research Plan: Development and Deployment of Broadband

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Deputy Executive Director Approval:	Initial:	Date:
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Purpose

Study the current status of broadband availability, deployment, and adoption in Tennessee, including the extent and quality of coverage, factors that affect the cost of deploying broadband (including incentives to increase deployment), tax policy, and barriers to expansion (including pole attachment rates and governmental requirements) by public and private providers. Evaluate best practices in other states. Recommend ways that Tennessee can increase access to broadband in the future.

Background

At the June 10, 2015, commission meeting, Chairman Mark Norris requested a comprehensive study of broadband in Tennessee. The Federal Communications Commission (FCC) defines broadband as "high-speed Internet access that is always on and faster than the traditional dial-up access." Broadband includes several high-speed transmission technologies such as digital subscriber line (DSL), cable modem, fiber, wireless, satellite, and broadband over power lines (BPL).

The FCC recently updated its broadband benchmark speeds to 25 megabits per second (Mbps) from the previous 4 megabits per second set in 2010, finding the older standard to be "dated and inadequate for evaluating whether advanced broadband is being deployed to **all** Americans in a timely way." The FCC's *2015 Broadband Progress Report* found that a significant digital divide still remains between urban and rural residents. Using the new standard, the FCC estimates that while only 4% of Tennessee's urban population lacks access to high-speed broadband, 45% of rural residents do not have access.

Industry and government reports rank Tennessee near the middle of the 50 states in broadband availability. Although availability of broadband access has improved significantly, many Tennesseans are not able to or choose not to take advantage of its benefits for various reasons, including lack of availability, inadequate speed, cost, and lack of digital literacy.

In 2005 the General Assembly passed Public Chapter 413 creating the Tennessee Broadband Task Force to "provide a baseline assessment of broadband deployment including, but not limited to . . . regulation, cost, access to facilities, and market competition." The task force completed its work in January 2007 and recommended policies that would promote access to broadband service for every home and business, promote competition among providers, and identify various efforts across the state to expand broadband deployment and usage. Because many of the providers considered broadband service information to be proprietary, the task force recommended that the state establish a public-private partnership to collect more specific information.

In response to the task force's recommendation, Connected Tennessee was established as a public-private partnership funded by a combination of state dollars through the Department of Economic and Community Development and grants from private foundations and the organization's community partners. The organization brought together interested parties from industry, government, and academia from 2007 through 2014. Funding for Connected Tennessee has now ended.

In 2009 when Congress passed the American Recovery and Reinvestment Act, Tennessee was positioned to undertake several broadband expansion initiatives and received about $235 million in broadband grants and loans.

In its February 2015 ruling granting the petition of the Electric Power Board of Chattanooga, Tennessee (EPB) requesting that the FCC preempt Tennessee statutory provisions that the EPB claimed were a barrier to broadband investment and competition, the FCC quoted from its 2015 Broadband Progress Report saying,

> Today, Americans turn to broadband Internet access service for every facet of daily life, from finding a job to finding a doctor, from connecting with family to making new friends, from becoming educated to being entertained. The availability of sufficient broadband capability can erase the distance to high-quality health care and education, bring the world into homes and schools, drive American economic growth, and improve the nation's global competitiveness. New technologies and services such as real-time distance learning, telemedicine, and higher quality video services are being offered in the market today and are pushing demand for higher broadband speeds.

Step 1. Define the Problem

How best to provide Tennessee's businesses, residents, and visitors with adequate connectivity to perform needed functions considering factors such as cost and price, market access, and barriers such as tax policy, government regulation, and digital literacy. As requested, staff will complete the following tasks as well as others identified in the course of this research:

- Identify gaps (e.g., urban, suburban, rural; business, government (including especially schools), residential) in the ***availability*** of high-speed broadband and the effect on

access to widely used applications (e.g., email, online business services (especially financial services such as banking, purchasing, and bill payment), video streaming) and on business service-provision and location decisions.

- Where high-speed broadband is available, determine ***how widely*** it has been ***adopted*** by business, government, and residential customers and to the extent it has not been, why. Identify effective means of promoting wider adoption.
- Compare (1) the ***cost to deploy*** high-speed broadband by type of broadband, geographic area, and customer and (2) the cost-effectiveness of actual and potential ***incentives*** to more widely deploy broadband.
- Identify ***broadband discounts*** provided to customers (such as the federal E-Rate program for discount service to schools and the Rural Health Care program) and determine their effectiveness in encouraging deployment and adoption of high-speed broadband.
- Identify actual and potential ***tax policies*** to encourage the deployment and adoption of high-speed broadband in Tennessee and elsewhere and determine their effectiveness.
- Identify and determine the effectiveness of efforts by state and local governments, in Tennessee and elsewhere, to ***streamline governmental requirements*** to encourage the deployment of high-speed broadband in unserved and underserved areas.
- Compare the ***pole attachment*** rates that broadband providers pay to municipal and cooperative electric providers in Tennessee to those approved by the FCC and by regulatory entities in other states and determine (1) the extent to which wider deployment of high-speed broadband is being encouraged or inhibited by rates in Tennessee and (2) the role the state should play in reducing high pole-attachment rates to encourage broadband deployment.
- Determine where, how, at what cost and how funded, ***municipal electric expansion*** of high-speed broadband is occurring in Tennessee, what the tax implications are for the utilities providing the service, how providing the service affects and interacts financially with other services provided by the utility, and what oversight exists at the state level for the services when provided by cities.

Step 2. Assemble Some Evidence

- Review past and present broadband legislation, statutes, and regulations.
    - Review committee hearings on related legislation and summarize comments and concerns of committee members, bill sponsors, and others.
    - Interview bill sponsors, proponents, and other stakeholders to determine what is driving this issue.
    - Review fiscal notes. Consult with Fiscal Review Committee staff and follow up with agencies to determine estimated cost and methods and rationale for the estimates.

- Review previous related reports addressing efforts at broadband expansion including the 2007 Broadband Task Force report, Comptroller's reports, and materials produced by Connected Tennessee.
- Interview legislators, state officials, local officials, industry experts and other stakeholders to determine historical information, present status, and broadband needs. These include, but are not limited to representatives of
    - Department of Economic and Community Development
    - Department of Education
    - Department of Finance and Administration, Office of Information Resources
    - Connected Nation/Connected Tennessee
    - Tennessee Telecommunications Association
    - Tennessee Cable Telecommunications Association
    - Tennessee Municipal Electric Power Association
    - Tennessee Electric Cooperative Association
    - Tennessee Valley Authority
    - Tennessee Emergency Communications Board
    - Tennessee Emergency Management Agency
    - Tennessee Regulatory Authority
    - Tennessee Municipal League
    - Tennessee County Services Association
    - Tennessee Public Television Council
    - Federal Communications Commission
    - Cellular Telephone Providers
    - Local Exchange Carriers
    - Internet Service Providers
- Convene a panel of stakeholders at the October 2015 commission meeting drawn from the above list to provide information to the Commission and answer questions.
- Review state statutory requirements governing the provision of broadband resources by public and private providers. Review history of these laws.
- Review applicable Attorney General's opinions.
- Determine how federal laws and regulations, including recent rulings by the Federal Communications Commission, affect states' efforts to expand broadband.
- Identify the speed and quality that can be provided by each broadband technology.

- Determine what speeds are required to access typical residential, business, educational, and government online services including video streaming.
- Determine what role broadband plays in decisions by businesses to locate or expand in Tennessee.
- Determine by geographic area how many Tennessee businesses, residents, and schools have access to high-speed internet, and at what cost, speed, and quality.
- Identify reasons that Tennesseans give for choosing not to subscribe to high-speed broadband service where available.
- Identify factors that affect the cost of deploying broadband for both public and private providers.
- Identify what broadband discounts are or could be provided to customers, such as the federal e-rate program for discount service to schools and the Rural Health Program.
- Identify incentives for provision of other kinds of utilities that might apply to broadband.
- Identify existing tax policies, tax credits and other incentives that encourage or impede deployment and adoption of high-speed broadband in Tennessee and elsewhere.
- Identify extent to which other utility customers may be subsidizing broadband customers when provided by the same entity.
- Review other states' initiatives for improving connectivity and overcoming barriers to expansion.
- Identify actions that local governments are taking that either encourage or inhibit the deployment of broadband including zoning ordinances, right of way and permitting costs, and fees.
- Identify how pole attachment rates are set in Tennessee and compare Tennessee's rates and rate-setting process to those of other states and the FCC's guidelines.
- Identify the current status of broadband services provided by municipalities including cost, funding sources, debt load, and number and location of customers served. Review the experiences of Covington and Morristown, two cities that were permitted to expand beyond their footprint as part of a pilot program.
- Review Tennessee's and other states' initiatives for both measuring and improving digital literacy.
- Review literature on broadband resources generally and seek the opinion of subject matter experts on the need for broadband access.

Step 3. Construct Alternatives

Alternatives will be based on

- current law,
- proposed changes in the current law, and
- any additional alternatives drawn from the research and analysis in Step 2.

Describe each alternative specifically enough to project outcomes in Step 5.

Step 4. Select Criteria

- Effectiveness at expanding availability and adoption of high-speed broadband in all parts of the state
- Cost to
    - state government
    - local governments
    - private providers
    - customers
- Estimate receptiveness of
    - state government
    - local governments
    - private providers
    - customers

Step 5. Project Outcomes

- Estimate cost
- Estimate effectiveness
- Evaluate questions of fairness

Step 6. Confront Trade-offs

- How will the differences between the current law and the other alternatives affect the customers, state and local governments, and private providers?
- What are the pros and cons of the potential solutions?

Step 7. Decide which alternatives to present to the Commission

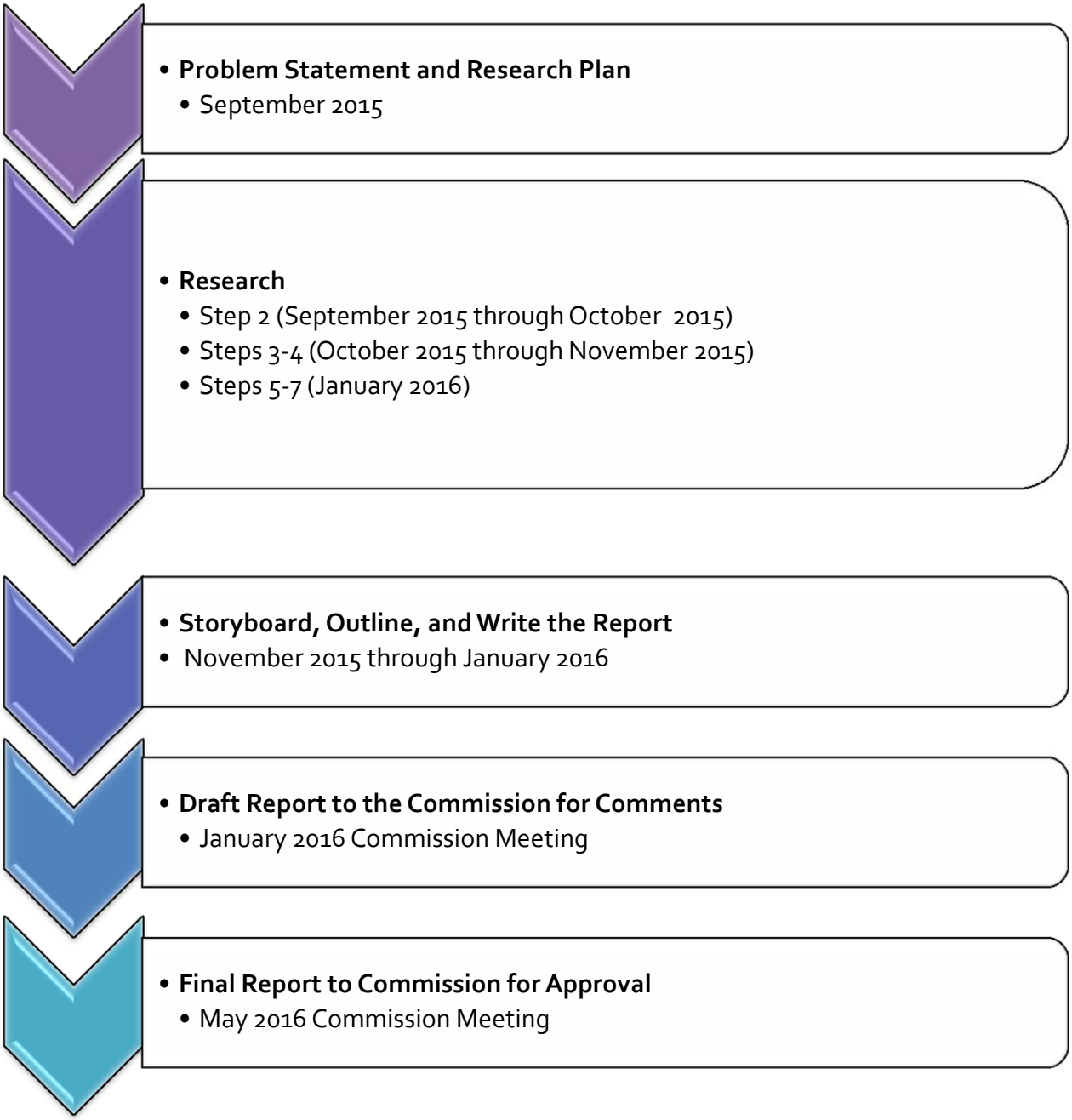
Based on the results of Step 6, choose the alternatives that most practically and realistically resolve the problem.

Step 8. Produce the Draft Report

Develop and present a draft for review and comment to the Commission

Revisit Steps 5 through 8.

- Respond to feedback from Commission regarding outcome projections, trade-offs, and selection of alternatives
- Revise and edit the draft to reflect comments of the Commission
- Submit final report to the Commission for approval


• Problem Statement and Research Plan
• September 2015
• Research
• Step 2 (September 2015 through October 2015)
• Steps 3-4 (October 2015 through November 2015)
• Steps 5-7 (January 2016)
• Storyboard, Outline, and Write the Report
• November 2015 through January 2016
• Draft Report to the Commission for Comments
• January 2016 Commission Meeting
• Final Report to Commission for Approval
• May 2016 Commission Meeting

Attachment—Specific Research Questions Posed by Chairman Norris

Availability:

- What is the current availability of high-speed internet access in Tennessee from all technologies, including but not limited to landline technologies, such as DSL, ADSL, Cable, Private Line, GPON, and fiber-based service as well as wireless technologies such as mobile broadband, fixed wireless, Wi-Fi and satellite?
- Are there gaps in the availability of broadband?
- If so, are these in rural or urban areas?
- Traditionally, high-speed broadband has been readily available for business, industries and schools. Is that still the case?
- What about residence consumers?
- What are the various broadband target speeds discussed by the FCC? What speeds are required to run typical residential and business applications, such as email, web surfing and video streaming?
- What role does broadband play in decisions by businesses to locate or expand in Tennessee?

Adoption:

- What percentage of Tennessee households, where broadband is already deployed, currently subscribe to high-speed internet access in Tennessee?
- Will increasing subscription rates (adoption) change the business model to encourage more private-sector deployment of broadband?
- What reasons do Tennessee residents give for choosing not to subscribe where high-speed broadband service is available?
- Are there programs in Tennessee and elsewhere today that encourage the adoption of broadband?
- Which are most successful?
- What are recommended ways Tennessee can increase digital literacy and adoption of existing broadband service?

Deployment incentives:

- What are the costs to providers to provide broadband?
- Are those costs different in cities, compared to rural areas?
- Has Tennessee or other states or local government entities created a funding mechanism to provide targeted financial incentives to encourage broadband providers to deploy broadband in specific underserved and unserved areas?

- If so, how successful are/were those programs in increasing deployment of broadband?
- How could that be replicated in Tennessee?
- What would be the costs?
- The FCC recently announced that it will provide $4.5 billion over the next six years, including approximately $210 million in Tennessee, for telephone companies to deploy broadband in underserved areas of Tennessee that the FCC has identified. How would state specific activities hinder or maximize that Federal funding?

Broadband discounts:

- Do local and state governments in Tennessee provide discounts directly to consumers to pay for broadband?
- Have other government entities provided funding or financial incentives paid directly to residents to increase the affordability of high-speed internet access to encourage adoption of existing broadband such as the federal E-Rate program for discount service to schools and the Rural Health Care program?
- If so, did that increase adoption and deployment of broadband?
- How could that be replicated in Tennessee? Should it?

Tax policy:

- Ten years ago, Sen. Bill Ketron introduced legislation to provide tax credits for companies to encourage broadband deployment. The bill didn't pass.
- Do other federal, state, or local government entities provide tax incentives, such as income tax credits, sales-tax exemptions, and property-tax exemptions for the purchase and installation of high-speed internet infrastructure by broadband providers to encourage broadband deployment?
- Have they been successful?
- Does Tennessee provide sales- and property-tax exemptions for the purchase and installation of broadband infrastructure?
- If not, how could those programs be replicated in Tennessee? What would be the costs?

Streamlined government costs:

- Have state or local government entities adopted efforts to streamline local government zoning and right of way and permitting costs, fees and red tape to encourage the placement of wireless broadband towers and other broadband infrastructure in the public right of way?
- Has Tennessee and local governments taken similar approaches?

- Are local governments in Tennessee taking any actions to inhibit the deployment of broadband? How could efforts to streamline broadband deployment be applied to Tennessee?

Pole attachment rates:

- In most states, the FCC sets pole attachment rates for commercial providers and has said high pole attachment rates can reduce broadband deployment. The FCC does not regulate poles for cities and cooperatives. More than 20 states regulate pole attachment rates for both commercial and municipal providers.
- How do the rates that broadband providers pay to municipal and cooperative electric providers in Tennessee to attach to their poles compare to the FCC rates?
- Are broadband providers paying more or less than in states where pole attachment rates are regulated? If it's more, how much more is it?
- What role should the state play in reducing high pole attachment rates to encourage broadband deployment?

Municipal electric expansion:

- As discussed in the Commission meeting last month, several members anticipated that the legislation sponsored by Senator Janice Bowling and Rep. Kevin Brooks (SB1134/HB1303) would likely be referred to TACIR for study in the 2016 session. Although the legislation doesn't specifically reference broadband, proponents of the bill (a variation of which has been introduced every year since 1999) say that removing the statutory limitation that prevents city-funded broadband networks from providing service outside their electric footprint will lead to increased rural broadband. Opponents of the bill are concerned that government expansion will allow cities to overbuild and cherry pick customers from the private sector, thereby inhibiting broadband deployment.
- With that in mind, what role could Tennessee's current city-owned networks play in deploying broadband to rural areas that do not have service provided by a private-sector provider? How many cities currently provide broadband?
- Have they all built out broadband service to all existing electric customers in their footprint?
- Two cities, Covington and Morristown, were part of a pilot program that allowed them to serve customers outside their footprint. Are these entities serving typically unserved rural broadband customers outside their footprint or have they deployed service overbuilding existing commercial providers?
- Are these city-funded networks using resources funded by the monopoly electric service? Does that affect electric rates?
- What is the debt load of existing government-owned networks? Who is responsible for that debt?

- What state agency provides oversight of these city networks?
- Do the current municipal networks pay sales tax when purchasing materials or network components used to deliver broadband?
- Do they pay property taxes to the local governments and F&E taxes to the State of Tennessee?