

Application for Federal Assistance SF-424

Version 02

* 1. Type of Submission:

- Preapplication
- Application
- Changed/Corrected Application

* 2. Type of Application:

- New
- Continuation
- Revision

* If Revision, select appropriate letter(s):

* Other (Specify)

* 3. Date Received:

08/14/2009

4. Applicant Identifier:

5a. Federal Entity Identifier:

* 5b. Federal Award Identifier:

State Use Only:

6. Date Received by State:

7. State Application Identifier:

8. APPLICANT INFORMATION:

* a. Legal Name:

Rural Economic Development Center, Inc.

* b. Employer/Taxpayer Identification Number (EIN/TIN):

56-1552375

* c. Organizational DUNS:

085300486

d. Address:

* Street1:

4021 Carya Drive

Street2:

* City:

Raleigh

County:

Wake

* State:

NC: North Carolina

Province:

* Country:

USA: UNITED STATES

* Zip / Postal Code:

27610-2914

e. Organizational Unit:

Department Name:

Division Name:

The e-NC Authority

f. Name and contact information of person to be contacted on matters involving this application:

Prefix:

Ms.

* First Name:

Jane

Middle Name:

Smith

* Last Name:

Patterson

Suffix:

Title:

Executive Director, The e-NC Authority

Organizational Affiliation:

* Telephone Number:

919-250-4314

Fax Number:

919-250-4325

* Email:

jpatterson@e-nc.org

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9. Type of Applicant 1: Select Applicant Type:

M: Nonprofit with 501C3 IRS Status (Other than Institution of Higher Education)

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

* Other (specify):

*** 10. Name of Federal Agency:**

Department of Commerce

11. Catalog of Federal Domestic Assistance Number:

CFDA Title:

*** 12. Funding Opportunity Number:**

0660-ZA29

* Title:

Recovery Act - State Broadband Data and Development Grant Program

13. Competition Identification Number:

Title:

14. Areas Affected by Project (Cities, Counties, States, etc.):

All 100 of North Carolina's counties

*** 15. Descriptive Title of Applicant's Project:**

North Carolina Broadband-Rigor in Mapping (NC BRIM)

Attach supporting documents as specified in agency instructions.

Add Attachments

Delete Attachments

View Attachments

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16. Congressional Districts Of:

* a. Applicant

* b. Program/Project

Attach an additional list of Program/Project Congressional Districts if needed.

Add Attachment

Delete Attachment

View Attachment

17. Proposed Project:

* a. Start Date:

* b. End Date:

18. Estimated Funding (\$):

* a. Federal	<input type="text" value="3,157,931.00"/>
* b. Applicant	<input type="text" value="719,252.00"/>
* c. State	<input type="text" value="0.00"/>
* d. Local	<input type="text" value="0.00"/>
* e. Other	<input type="text" value="99,290.00"/>
* f. Program Income	<input type="text" value="0.00"/>
* g. TOTAL	<input type="text" value="3,976,473.00"/>

* 19. Is Application Subject to Review By State Under Executive Order 12372 Process?

- a. This application was made available to the State under the Executive Order 12372 Process for review on
- b. Program is subject to E.O. 12372 but has not been selected by the State for review.
- c. Program is not covered by E.O. 12372.

* 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes", provide explanation.)

Yes No

21. *By signing this application, I certify (1) to the statements contained in the list of certifications** and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)

** I AGREE

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

Authorized Representative:

Prefix: * First Name:

Middle Name:

* Last Name:

Suffix:

* Title:

* Telephone Number: Fax Number:

* Email:

* Signature of Authorized Representative: * Date Signed:

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*** Applicant Federal Debt Delinquency Explanation**

The following field should contain an explanation if the Applicant organization is delinquent on any Federal Debt. Maximum number of characters that can be entered is 4,000. Try and avoid extra spaces and carriage returns to maximize the availability of space.

BUDGET INFORMATION - Non-Construction Programs

SECTION A - BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		Total (g)
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	
1. Planning		\$	\$	434,799.00	116,449.00	551,248.00
2. Mapping				2,723,132.00	702,093.00	3,425,225.00
3.						
4.						
5. Totals		\$	\$	3,157,931.00	818,542.00	3,976,473.00

SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY				Total (5)
	(1) Planning	(2) Mapping	(3)	(4)	
a. Personnel	\$ 85,567.00	\$ 1,029,164.00		\$	\$ 1,114,731.00
b. Fringe Benefits	23,982.00	301,696.00			325,678.00
c. Travel		14,000.00			14,000.00
d. Equipment					
e. Supplies		18,000.00			18,000.00
f. Contractual	316,985.00	1,341,758.00			1,658,743.00
g. Construction					
h. Other	22,000.00	77,313.00			99,313.00
i. Total Direct Charges (sum of 6a-6h)	448,534.00	2,781,931.00		\$	\$ 3,230,465.00
j. Indirect Charges	102,714.00	643,294.00			746,008.00
k. TOTALS (sum of 6i and 6j)	\$ 551,248.00	\$ 3,425,225.00		\$	\$ 3,976,473.00
7. Program Income	\$	\$		\$	\$

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SECTION C - NON-FEDERAL RESOURCES

(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e) TOTALS
8. Planning	\$ 77,467.00		\$ 9,794.00	\$ 87,261.00
9. Mapping	239,549.00		65,844.00	305,393.00
10.				
11.				
12. TOTAL (sum of lines 8-11)	\$ 317,016.00		\$ 75,638.00	\$ 392,654.00

SECTION D - FORECASTED CASH NEEDS

Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	\$ 1,562,431.00	\$ 400,728.00	\$ 312,486.00	\$ 302,366.00
14. Non-Federal	\$ 392,654.00	\$ 117,796.00	\$ 78,531.00	\$ 58,898.00
15. TOTAL (sum of lines 13 and 14)	\$ 1,955,085.00	\$ 518,524.00	\$ 391,017.00	\$ 361,264.00

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT

(a) Grant Program	FUTURE FUNDING PERIODS (YEARS)			
	(b) First	(c) Second	(d) Third	(e) Fourth
16. Planning	\$ 2,400.00	\$ 55,232.00	\$ 2,400.00	\$ 55,232.00
17. Mapping	474,543.00	473,694.00	480,656.00	477,231.00
18.				
19.				
20. TOTAL (sum of lines 16 - 19)	\$ 476,943.00	\$ 528,926.00	\$ 483,056.00	\$ 532,463.00

SECTION F - OTHER BUDGET INFORMATION

21. Direct Charges:	3,230,465.00
22. Indirect Charges:	746,008.00
23. Remarks:	

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Project Abstract

The North Carolina Broadband Rigor in Mapping (NC BRIM) project proposes to utilize an innovative, multi-modal approach to collect comprehensive and accurate state-level mapping data. This will ultimately lead to highly accurate state-level broadband maps, which will be vital toward the development and maintenance of a national broadband map. The planning component of the project focuses on statewide initiatives designed to encourage broadband availability, uptake and use by North Carolina's citizens and businesses. Full project details are contained within the executive summary and narrative section of the application package.

The work in the initial year (2001) of the e-NC Authority demonstrates that, currently with roughly the same staff as 2001-2002, the e-NC Authority can complete successfully the proposed workload that is laid out in this federal grant application. In addition to this federal grant application of \$3,157,931, there will be anticipated unobligated funding available to meet non-match operational expenditures of \$2,343,248.

Executive Summary – North Carolina Broadband – Rigor in Mapping (NC BRIM)

Since 2001, the e-NC Authority has acted on its legislative mandate to develop and maintain a map that depicts that status of broadband availability in the state (http://www.e-nc.org/ARRA_Underserved/NC_Underserved_rural_CB081009.pdf). The map evolved over time from a static, county-based representation that was updated annually to its current interactive format. Today, this broadband map provides users with information on the availability of DSL, cable-modem and wireless broadband services at the address level in a GIS-based searchable format. While advances in the technology used to develop, display and update the map have made it more generally useful, problems in the collection and verification of underlying provider-supplied information continue to limit its true value. Inconsistencies in the type, accuracy, completeness and currency of information supplied by some providers make it difficult to determine with sufficient confidence true levels of connectivity access. If using the current approach, it will be extremely difficult to meet the objectives specified in the Broadband Data Development Program for semi-annual submission of comprehensive and granular updates to populate a national broadband map.

The e-NC Authority (through its fiscal administrator, the N.C. Rural Economic Development Center) respectfully requests a grant of \$2,723,132 from the National Telecommunications and Information Administration (NTIA) to test and validate an alternative approach to broadband data collection through a highly structured experimental protocol. Matching in-kind contributions of \$702,093 (20.5 percent) have been identified. Promising third-party Web-enabled data mining methods will develop and deliver a map and underlying data to the NTIA by Nov. 1, 2009. Data collected using this method will be augmented with wireless access data gathered using GIS-based technology and field sampling. Results will be tested and validated through comparisons between two approaches that are more conventional: new or existing data supplied by providers, and data collected directly from citizens and businesses through telephone surveys and/or field census that will begin in the fourth quarter of 2009. Monthly meetings between the e-NC Authority and its corporate, university and nonprofit partner organizations will facilitate information exchange and assessment.

Expert outside evaluators skilled in mathematical modeling will join partnering organizations and the e-NC Authority in spring 2010 to evaluate the results of this experiment. They will recommend an optimal method or combination of methods the state will use to supply data to NTIA going forward. Representatives of the NTIA and FCC will be invited to participate in this data confab. At a minimum, NC BRIM will improve the state's broadband map. Realistically, it may provide a national model for acquisition of connectivity data that is accurate, current, comprehensive and verifiable through a process that is transparent, expedient and cost effective.

Both the process employed and the data collected through March 2010 will directly enhance capacity at state and local levels to plan BTOP initiatives to encourage broadband availability, uptake and use by citizens and businesses. It will complement an extensive middle-mile request being submitted by MCNC and facilitate a request that the e-NC Authority will submit to the NTIA and FCC to pilot an adaptation of the Lifeline/Link-Up programs to provide broadband. Support would also be provided to establish a high-level North Carolina Broadband Innovation Group (NC BIG) to engage government and private sector leaders in efforts to optimize broadband planning and investments.

The –NC Authority requests for mapping \$2, 723,132 in federal dollars that will be matched in-kind with \$702,093 from the e-NC Authority for a total mapping project costs of \$3,425,225.

The Need for Better Information

The connectivity vision for North Carolina is this: adequate universal access and sound policies to ensure on-going investments that will develop and deliver innovative applications and services at competitive speeds and bandwidth to tech-savvy end users. This is the vision that will deliver sustainable competitiveness in the 21st century. The need to stimulate realization of this vision is critical – North Carolina is being slammed by record-setting budget deficits that reflect a 20+ percent decline (more than \$4 billion) in state revenues over the past fiscal year. The state is further stressed by high population growth fueled by an influx of economic refugees: North Carolina currently ranks tenth in population with projections that it will rank as seventh within 15 years. In June 2009, the state had the nation's seventh highest unemployment rate at 11.2 percent.

The N.C. General Assembly had the foresight to recognize early on that broadband Internet had to be part of the strategy to move the state forward. During the last 8 years, the state has invested more than \$9.27 million in efforts to connect rural North Carolina and expand the use of broadband Internet. This sum was augmented with \$30 million donated by a nonprofit, MCNC, \$2 million from private foundations and \$2 million in grants from federal agencies. Telecommunication providers worked cooperatively with the e-NC Authority to make high-speed Internet services available to North Carolina citizens, particularly those in rural areas where challenges to broadband access are many. Despite significant progress, recent citizen surveys found that overall broadband uptake by North Carolina citizens residing in rural counties is only 34 percent¹. Preliminary research conducted by the e-NC Authority since February 2009 reveals that 6 of the state's 100 counties contain unserved (Exhibit 1) and 60 have underserved (Exhibit 2) census blocks and that all of these 66 counties are rural. Rural connectivity challenges in North Carolina are truly significant; more than 49 percent of the state's citizens live in rural counties, making North Carolina home to the second largest number of rural citizens in the country.

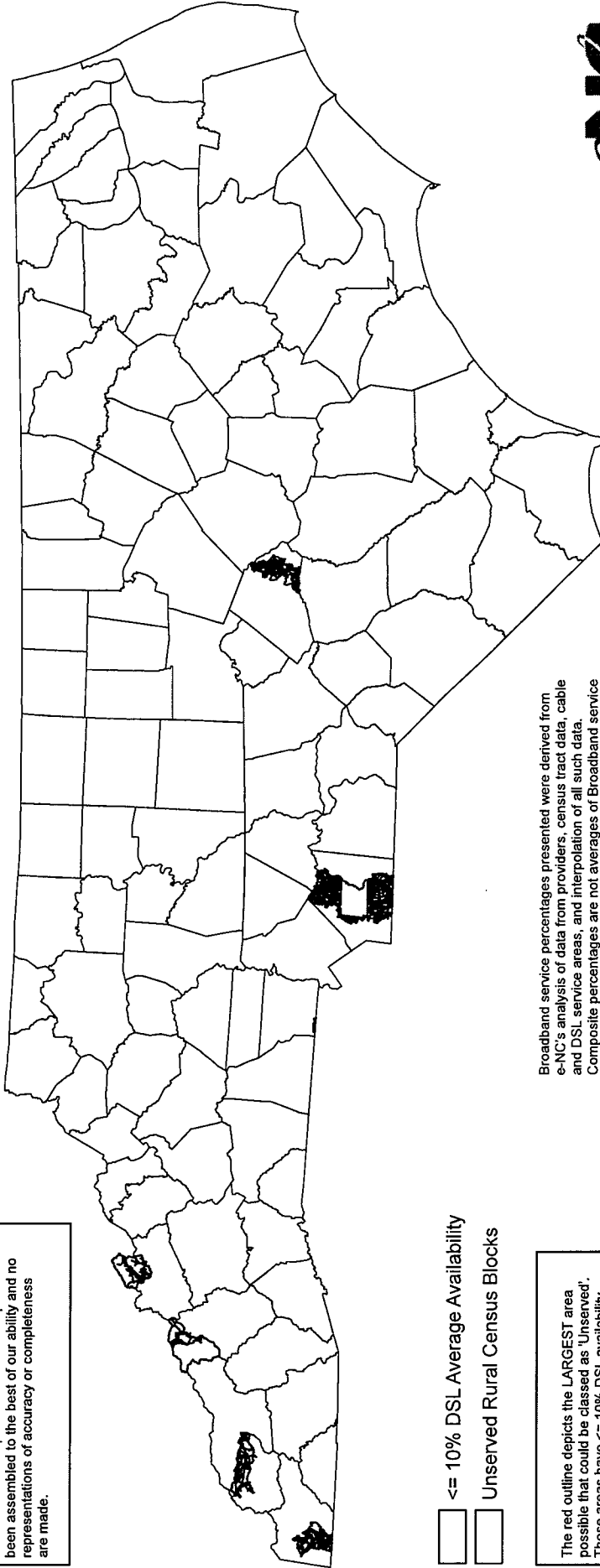
Progress has been significant but the need to make further investments in broadband infrastructure, and in planning and demand stimulating programs, must be made to reach vulnerable populations that are not yet online is pressing. It is in the public's best interest that state and federal broadband investments be based on information that is complete, verifiable and current, and that the methods used to obtain that information be rigorous, transparent and reproducible. The e-NC Authority has designed an 8 month research and development effort that is the core activity of the broadband mapping request detailed in the following sections. Please note that specific aspects of the project workplan and partnership agreements are not finalized.

¹ North Carolinians Online Tracking Home Computers and Internet Access in North Carolina Citizens Surveys 1999 to 2008. November 2008. Dr. Ken Wilson, East Carolina University. Accessed at www.e-nc.org

North Carolina Unserved Rural Census Blocks <=10% DSL and Without Cable Modem Service

The information has been collected by the e-NC Authority as a convenience to parties who have interest in applying for ARRA Broadband grants.

The information represented on this map has been assembled to the best of our ability and no representations of accuracy or completeness are made.



- <= 10% DSL Average Availability
- Unserved Rural Census Blocks

The red outline depicts the LARGEST area possible that could be classed as 'Unserved'. Those areas have <= 10% DSL availability. Census Blocks that have some cable modem service or that are not fully contained within the red outline were removed.

The Rural/Non-Rural definition was then applied to the set to get the final result.

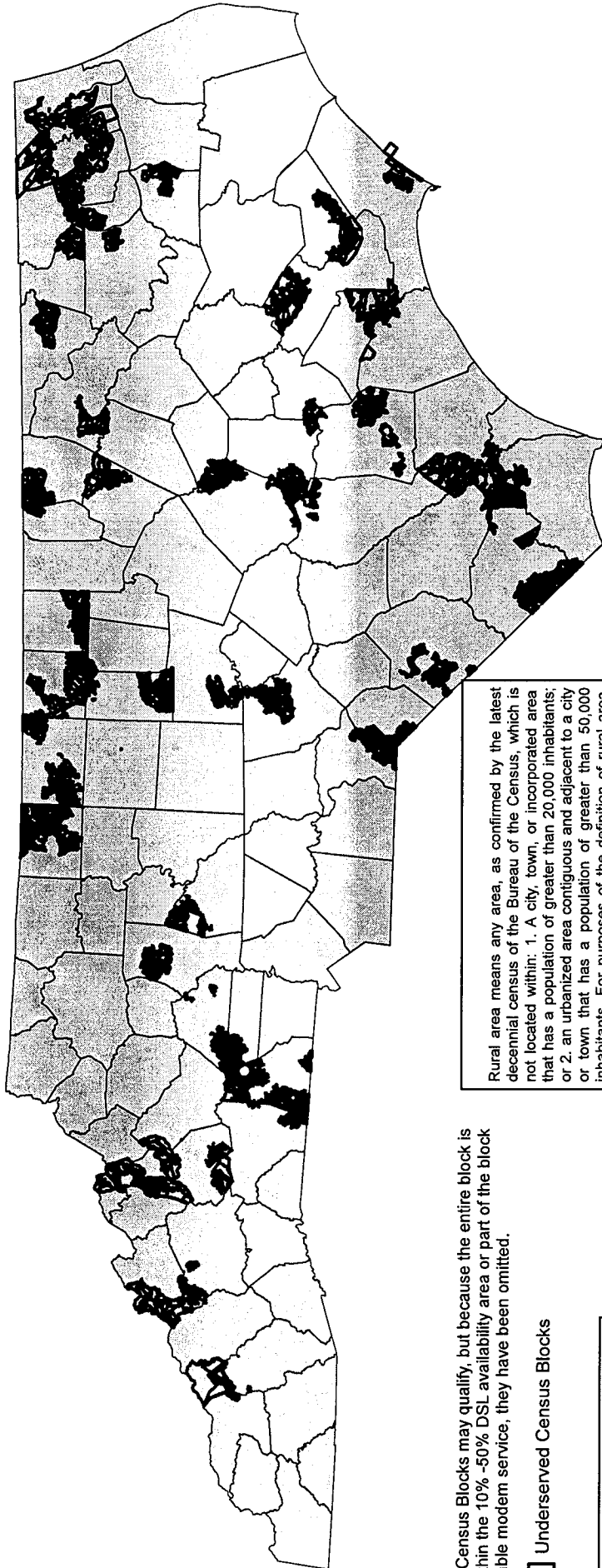
Broadband service percentages presented were derived from e-NC's analysis of data from providers, census tract data, cable and DSL service areas, and interpolation of all such data. Composite percentages are not averages of Broadband service providers' percentages. Composite percentages are affected by overlapping service areas, population and housing reporting data, geographical variations and other variables.

Data current as of December 31, 2007.



8/10/09

Underserved Rural Census Blocks 10% - 50% DSL and Without Cable Modem Service



Other Census Blocks may qualify, but because the entire block is not within the 10% - 50% DSL availability area or part of the block has cable modem service, they have been omitted.

□ Underserved Census Blocks

The information has been collected by the e-NC Authority as a convenience to parties who have interest in applying for ARRA Broadband grants. The information represented on this map has been assembled to the best of our ability and no representations of accuracy or completeness are made.

Rural area means any area, as confirmed by the latest decennial census of the Bureau of the Census, which is not located within: 1. A city, town, or incorporated area that has a population of greater than 20,000 inhabitants; or 2. an urbanized area contiguous and adjacent to a city or town that has a population of greater than 50,000 inhabitants. For purposes of the definition of rural area, an urbanized area means a densely populated territory as defined in the latest decennial census of the U.S. Census Bureau.

Broadband service percentages presented were derived from e-NC's analysis of data from providers, census tract data, cable and DSL service areas, and interpolation of all such data. Composite percentages are not averages of Broadband service providers' percentages. Composite percentages are affected by overlapping service areas, population and housing reporting data, geographical variations and other variables.

Data current as of December 31, 2007.



1. **Data**

(a) **Data Gathering**

NC BRIM is designed to optimize the broadband data collection and mapping process employed by the e-NC Authority. The method employed since 2002 has involved informed manipulation of data supplied directly to the e-NC Authority by broadband service provider companies. Results obtained thusly have been validated at the margin by results extrapolated from consumer surveys that were part of the semi-annual N.C. Citizens Online study conducted by Dr. Ken Wilson, professor at East Carolina University. Data gathered is used by the e-NC Authority in meeting its legislative mandate to provide annual broadband status reports to the N.C. General Assembly and to guide the e-NC Authority in the strategic allocation of limited broadband infrastructure incentive funds that it managed toward the most unserved/underserved communities.

Description of existing data collection methodology – The e-NC Authority has gathered high-speed Internet access data (HSIA) from all telcos and cable companies in North Carolina since 2002. Fixed wireless data has also been collected but not included in calculations because it was unreliable. Satellite companies would not provide data. The e-NC Authority has posted on its Web site an annual 100 County Report (2002 through 2007) that names the providers serving each county, their area of service and a composite percentage of cable/telco HSIA for each county. The e-NC Authority utilizes data that companies provide to the FCC on the required 477 forms as baseline information for the state’s broadband map. While some providers were consistently forthcoming, others proved increasingly reluctant to provide the requested data, despite the e-NC Authority having agreed to terms of non-disclosure. As a result, the existing data collection process has become an extremely labor- and time-intensive endeavor yielding results that are often incomplete and difficult to verify. The e-NC Authority welcomes the opportunity presented by NTIA through the State Broadband Data Program (SBDP) to explore new options for improving all aspects of North Carolina’s broadband mapping efforts.

Promising alternative data sources – The e-NC Authority has identified two promising approaches to obtaining high-value broadband data that we propose to test over the first 8 months of the project: (1) Web-enabled data mining, and (2) radio wave propagation models for existing mobile and fixed wireless broadband. Both methodologies utilize innovative technologies and proprietary processes that will deliver high-value results, as demonstrated in preliminary data capture experiments. Both methodologies have the advantage of not requiring the input of providers, thus avoiding the compliance and delay issues that have impeded previous collection efforts. At this point, it appears possible that the full spectrum of data specified in Appendix A, Technical Appendix of the SBDP NOFA could be satisfied using one or both of the methods.

Research Protocol – NC BRIM will identify, test and validate an optimal methodology to gather and verify North Carolina broadband data. Data collected through three distinct modalities – technology-enable independent market data, provider-supplied market data, and consumer-provided empirical data will be compared head-to-head and cross-validated. Research faculty at four leading academic institutions will assist the e-NC Authority in evaluating the results of these various modalities against the content and timing requirements of the FCC and NTIA. The methodology employed to extract data for each modality and the milestones for the proposed

evaluation are described below. The flow of activities in the project work plan is captured in the timeline that is found in *Section 3. Expedient Data Delivery*.

Independent technology-enabled data collection

(1) Leading-edge **Web-enabled data mining** techniques will be applied to extracting data sets that reveal information needed to satisfy NTIA's specified data mapping requirements. Companies under consideration for this initiative have years of experience providing telcos and cable companies with strategic intelligence reports about their competitors. This solution is inherently provider neutral and accountable in that it involves complex proprietary "deep Web crawling" algorithms. This technique, in conjunction with comprehensive telecom omnibus survey research, will capture all provider data². The e-NC Authority will work directly with the selected data mining company to ensure that the information obtained meets state and national mapping requirements. Data from a first pull will be used to satisfy the Nov. 1, 2009 delivery goal, with both the process and product of this approach carefully evaluated and refined over coming months to ensure that the final data set delivered to NTIA on or before Feb. 1, 2010 is complete and accurate.

(2) **Radio wave wireless propagation** studies using proprietary models will be used to identify regions in the state that are unserved or underserved by fixed and/or mobile wireless Internet services. The model will use high spatial resolution Digital Elevation Models derived from statewide Light Elevation and Ranging (LIDAR) and empirical formulas to capture the effect of natural terrain, vegetation, vegetation interference and the behavior of radio waves in space. All geospatial data sets will be converted to the WGS 1984 geographic coordinating system. An assessment and validation of the model will be accomplished through signal strength data collected from drive tests and field sampling subjected to statistical analysis, in order to both calibrate and determine the overall accuracy of the modeling process. The nature of the methods and results will be provided through metadata using the Federal Geospatial Data Content (FGDC) standards.

Provider-supplied market data – The e-NC Authority will communicate with all providers in the state about the national broadband mapping effort and the role that the e-NC Authority, acting on behalf of the state, has in supplying broadband service information to the NTIA over the next 5 years. Providers will be encouraged to voluntarily submit requested data directly to the e-NC Authority. Appropriate arrangements will be made and agreements reached regarding the treatment of confidential information, in compliance with state laws (see *Section 1(d) Data Security and Confidentiality*), and the requirements noted in the filing of the Broadband Mapping NOFA in the Federal Register.

² For example, the data mining approach should deliver the following fields of information on each provider in the state: market, company, offer id, offer brand name, monthly charge, setup charge, additional promotional value standard monthly charge, standard setup charge, term commitment, downstream speed, upstream speed, e-mail accounts, Web storage (MB), virus protection, firewall, parental controls, pop-up blocker, spam filter, 24/7 customer support and offer notes.

Consumer-Supplied Data – Empirical citizen and business consumer data will be obtained through an extrapolated census in select counties and through an online survey and data analysis platform, both of which can capture information from citizens and businesses.

(1) **Extrapolated census** – This will be a multi-partner initiative that actually serves several purposes within the broader North Carolina broadband stimulus strategy. The e-NC Authority conducts regular statewide citizen surveys that query people on the availability of computers and the Internet in their homes and communities, and about their attitudes and usage characteristics of the Internet (see the description in the Planning Narrative that accompanies this document). Although these surveys do not target businesses, they can serve as a model for survey efforts that will be part of the data gathered to validate the mapping methodologies. From previous citizen surveys, the e-NC Authority has learned that carefully crafted stratified random sampling is a cost-effective means of gathering usable information. Dr. Ken Wilson, a faculty member at East Carolina University who designed and managed four preceding citizen surveys, will join Dr. Nick Didow of the Kenan Institute for Private Enterprise at UNC-Chapel Hill in creating a survey instrument and a stratified random sample design. The sample will be comprised of a small number of counties whose collective profiles along a specified spectrum of attributes³ adequately mirror the profile of the state as a whole. Intensive sampling results from these counties will be extrapolated to the entire state, using established statistical techniques. Information from this census will inform the various components of the state's broadband planning efforts.

Three regional nonprofits engaged in community and economic development will be recruited as partnering local survey centers. A local team leader and seven surveyors will be hired for 8 and 6 weeks, respectively for each location, creating at least 24 much-needed jobs in counties with double-digit unemployment. Work-study students and displaced workers will be targeted for these positions. This effort will provide support for the nonprofits and build market research capabilities in regions that lack a major research university presence.

(2) **E-Solutions online survey and data analysis** – Tentative agreements are being explored with potential corporate partners specializing in econometric analysis and broadband network deployments. These firms have proprietary benchmarking survey and data analysis platforms to collect data directly from individual businesses, organizations, institutions and households. Private data collected directly from users is the most robust method for developing relative analysis of broadband uses and benefits. Results from businesses are often the missing element that this data pull will overcome. This effort and its broader applications in planning initiatives is described more fully in the attached

Technical Advisory Group (TAG) – Principals from each partnering organization and contractor will join the e-NC Authority and the evaluators in a monthly virtual meeting to facilitate project coordination and information flow. The e-NC Authority will ask representatives from the state's Center for Geographical Information, Geographical Information Coordinating Council, MCNC and others with a vested interest in broadband networks to join the group. This core group will advise the e-NC Authority through the data gathering and analysis portions of the

³ . For example, the sample will be carefully constructed to accurately reflect the rurality, ethnic diversity, age, education, income, employment, telephone service and industry mix characteristics of the state overall,

project. TAG will transition in composition and focus to provide support to regional planning efforts as the overall mapping and planning project moves into the second year.

Data Confab – In April 2010, the e-NC Authority will convene a summit discussion of NC BRIM. Principals from each partnering organization and contractor will join the evaluation team and the e-NC Authority in a robust shake down session to evaluate the relative merits of the various data gathering methods used in the preceding months. The evaluators will have all results in advance of this meeting and will be prepared to lead the discussion. This discussion will roll into a process for developing a recommend best practice of gathering broadband mapping for North Carolina. The e-NC Authority will invite program officers and principals from the NTIA and FCC to attend the summit and participate in discussions.

Project Evaluation –Four individuals with strong knowledge of research design, data analysis and modeling and broadband deployment issues in North Carolina have tentatively agreed to consult with the e-NC Authority in the assessment of NC BRIM results. They include Dr. Edward Feser, professor and head of Urban and Regional Planning and professor of Agricultural and Consumer Economics at the University of Illinois-Champaign-Urbana, Dr. Nick Dominic, a specialist in mathematical modeling at UNC-Charlotte, Dr. Anthony Esterline of the School of Engineering at N.C. A&T State University and Dr. Ken Wilson will of East Carolina University. This expert team will work with the e-NC Authority to finalize the research design, will participate with the Technical Advisory Group in the data confab in April where NC BRIM results will be analyzed and will contribute to development of the final recommendations and project report that will be submitted to the NTIA in July 2010.

(b) Accuracy and Verifiability

One of the major problems with the mapping efforts to date has been the inherent difficulty of verifying data accuracy reported by providers and inconsistent definitions of service among the different categories of providers, e.g., cable companies and telcos. Compliance with requests for data vary widely among the individual providers and the time required to obtain the data can mean that it is obsolete before it is imported to the map. NC BRIM focuses on testing promising methods of data acquisition that bypasses providers to obtain some, or possibly all, of the mapping information required by NTIA. A three-pronged approach that is described in Section 1 (a) Data Gathering, will be used to obtain at least the following five distinct data sets: (1) Web-enabled data mining; (2) GIS-enabled wireless propagation studies that will be internally-validated by field studies and surveys; (3) empirical business and community anchor data obtained directly from end-users; (4) empirical citizen end-user data obtained directly through statistically-valid survey sampling; and (5) provider data obtained directly through their online input to the e-NC Authority's *Service Provider Update* application or in response to regular information update requests. These data will be used to develop maps that will undergo a rigorous examination of data gathering methodology by the NC BRIM Technical Advisory Group and four independent evaluators that are expert in the fields of database design and analysis, predictive mathematical modeling, econometrics and statistical interpretation during March and April 2010.

