

**DEPARTMENT OF COMMERCE**

**National Telecommunications and Information Administration**

**DEPARTMENT OF AGRICULTURE**

**Rural Utilities Service**

<b>Joint request for information: American Recovery and Reinvestment Act of 2009 Broadband Initiatives</b>	<b>Docket No. 090309298-9299-01</b>
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**COMMENTS OF THE BENTON FOUNDATION AND THE  
UNIVERSITY OF ILLINOIS AT URBANA CHAMPAIGN  
GRADUATE SCHOOL OF LIBRARY & INFORMATION SCIENCE  
ON  
MEASURING THE SUCCESS OF THE  
BROADBAND TECHNOLOGY OPPORTUNITIES PROGRAM**

## Executive Summary

We carried out research on the 1994-2005 Technology Opportunities Program in cooperation with NTIA itself. Preliminary findings from this research offer two implications for BTOP.

1. At the onset, NTIA should establish a digital data repository that enables a research team to generate and share findings on BTOP’s projects in real time, using repurposed, high quality administrative data.
2. Also at the onset, NTIA should ask carefully crafted questions in applications and grantees’ quarterly reports that take into account what TOP demonstrated about the sustainability of technology use in unserved, underserved, and vulnerable populations.

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*Attachment A: Towards the global measurement of the information society: a US-China comparison of national government surveys*

## I. Introduction

Pursuant to the Joint Request for Information and Notice of Public Meeting released by the National Telecommunications and Information Administration (NTIA) and the Rural

Utilities Service (RUS) on March 10<sup>th</sup> 2009, the Benton Foundation<sup>1</sup> and Kate Williams – Assistant Professor, University of Illinois at Urbana Champaign Graduate School of Library and Information Science – hereby submit these comments.

Kate Williams (PhD University of Michigan, MBA University of Chicago) began work with NTIA in 2004 when she proposed to preserve, archive, and study the records of the Technology Opportunities Program (TOP, 1994-2005). In partnership with NTIA, she extracted physical and electronic data about TOP's 606 funded projects and carried out staff interviews. She has also completed preliminary research on TOP that informs these comments.<sup>2,3,4,5,6</sup> Her overall focus is local communities in the information revolution: how people and organizations adopt and use digital tools, and what sustains that use. Her research is informed by theories of social capital (that is, resources available through social networks).

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<sup>1</sup> The mission of the Benton Foundation is to articulate a public interest vision for the digital age and to demonstrate the value of communications for solving social problems. Benton is a longtime supporter of research on universal service and the potential of high-speed Internet connections for improving Americans' lives.

<sup>2</sup> Williams, K., R. Bizonet, J. Hill, U. Arnold, and G. Kenney. (2006) *Finding aid for Technology Opportunities Program Data Archive, 1994-2005*. University of Michigan Special Collections Library. <http://tinyurl.com/topfindingaid>

<sup>3</sup> Williams, K. (2007) "Community informatics memory as archive: Assembling and using the records of the Technology Opportunities Program (USA), 1994-2005" in *Constructing and Sharing Memory: Community Informatics, Identity and Empowerment*, G. Johanson and L. Stillman, editors. Cambridge, England: Cambridge Scholars Press. <http://tinyurl.com/prato2007>

<sup>4</sup> Williams, K. (2007) "Memory and archives in community informatics: Assembling and using the records of the U.S. Technology Opportunities Program, 1994-2005" TOP Bulletin (University of Illinois GSLIS) 1. <http://hdl.handle.net/2142/5139>

<sup>5</sup> Williams, K. (2007) "Using the TOP Data Archive to study human resilience: How community-based organizations used social networks and information technology for hurricane recovery" TOP Bulletin (University of Illinois GSLIS) 2. <http://hdl.handle.net/2142/5140>

<sup>6</sup> Williams, K. (2009) "Preliminary findings from the 1994-2008 Technology Opportunities Program" *CI Lab Note* (University of Illinois GSLIS) 11. <http://www.ideals.uiuc.edu>

The American Recovery and Reinvestment Act (Recovery Act) requires that Broadband Technology Opportunities Program grant recipients report quarterly on the recipient's use of grant funds and progress in fulfilling the objectives of the grant proposal.<sup>7</sup> NTIA may establish additional reporting and information requirements<sup>8</sup> and must establish appropriate mechanisms to ensure appropriate use and compliance with all terms of any use of funds.<sup>9</sup> NTIA must also create and maintain a fully searchable database, accessible on the Internet at no cost to the public, that contains at least a list of each entity that has applied for a grant under this section, a description of each application, the status of each such application, the name of each entity receiving funds made available pursuant to this section, the purpose for which such entity is receiving such funds, each quarterly report submitted by the entity pursuant to this section, and such other information sufficient to allow the public to understand and monitor grants awarded under the program.<sup>10</sup>

## **II. Findings from Research on the Technology Opportunities Program**

In previous study of TOP, Williams found that:

1. Digital data flow is needed to enable useful, timely research that helps inform practice and guarantee success. NTIA should establish at the onset a digital data repository that enables a research team to generate and share findings on BTOP's projects in real time, using repurposed, high quality administrative data. This entails:

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<sup>7</sup> Section 6001(i)(1).

<sup>8</sup> Section 6001(i)(2).

<sup>9</sup> Section 6001(i)(3).

<sup>10</sup> Section 6001(i)(5).

- a) A permanent data archive establishing an unbroken information chain linking applicants, grantees, NTIA, researchers, and the public.
  - b) Carefully designed questions for applicants and grantees that generate good data.
2. The sustainability of broadband use in unserved, underserved, and vulnerable populations depends on two things: 1) mobilizing local social capital (local leaders, local networks, and direct technology provision to community members), and 2) particular configurations of technology detailed below in section IV, question 2. From the onset, NTIA should ask questions of both applicants and grantees that address these key elements of sustainable broadband use.

### **III. A Robust Data Repository Enabling Information Flow Between Applicants, Grantees, NTIA, Researchers and the Public**

The fully searchable online BTOP database required by the Recovery Act should enable research to proceed alongside of BTOP rather than afterwards, as was the case during TOP. A multipurpose, multiuser database would serve as a data archive and allow researchers to study and help guide ongoing programs and inform oversight.

Administering the broadband stimulus spending will generate data that can be simultaneously repurposed as research data as long as it is stripped of personal information, following statutory regulations associated with research and with all federal programs. In this way, management data can be swiftly used (in combination with other datasets as well) to help understand what the program is accomplishing and even make adjustments as needed.

It is important to have the data structures in place to do this before the grantmaking starts, because that is when the most essential data (applications, grantee quarterly reports) starts to flow. From the start this requires explicit data-sharing agreements with applicants and grantees.

The data archive we envision would have several aspects. Phase 1 data would include:

- Applications, quarterly reports, and all attachments
- Data sharing agreements between NTIA and projects, between NTIA and a repository and research team; public use protocols
- Questions linked to key indicators for tables and trends over time
- Indicators linked to BTOP outcomes, especially sustainable broadband use

Once Phase 1 is implemented, Phase 2 data would include:

- Existing relevant datasets<sup>11</sup> linked for analysis
- Survey data collected monthly from front line project staff as well as those served by BTOP

The data archive itself would:

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<sup>11</sup> For example, from the US Census.

- Collect, preserve, and disseminate digital content securely
- Relying on proven digital repository practices<sup>12</sup>
- Offer different modes and levels of access, for NTIA, grantees, researchers and the public (with adjustments for instance to protect individual privacy)
- Use open standards for data formatting to preserve access over time

Research results and tools would entail:

- Findings provided directly, quickly, frequently to NTIA, grantees, public
- Tools to conduct research on BTOP data, including data selection tools, GIS mapping, statistical work, content analysis, and social network analysis

#### **IV. Asking the Right Questions**

Rich answers and data will emerge from a combination of numerical questions, narrative questions, and documentation, which could take the form of audio, video, images, presentation slides, or text. Events, achievements, and milestones should be documented. Addresses should be provided for ready combination with other spatial data such as US census data.

For baseline information about a project and its community, NTIA should require applicants to answer certain questions in the application and additional more detailed

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<sup>12</sup> See the Fall 2008 issue of *Library Trends*, “Institutional Repositories: Current State and Future,” edited by Sarah L. Shreeves and Melissa H. Cragin. <http://www.ideals.uiuc.edu/handle/2142/10667>

questions in a startup report required of all grantees. (For example, to list relevant community institutions in the application and then to detail each institution's board membership/affiliation, mission, number of staff, and annual budget in a startup report)

Three overarching questions (numbered 1 through 3 below) can be broken down and translated into some combination of short narrative and numerical questions.

**1. What are the critical resources for sustainable broadband use in unserved, underserved, and vulnerable communities?** What social capital (resources available through social ties) is involved, what approaches to broadband use? To what extent is the social capital internal or external to the community? How do the resources flow?

- Does the project rely on social ties within a community to accomplish its goals rather than ties between communities? Within-community ties (i.e. strong ties, bonding social capital) tend to be more durable for sustaining technology.
- Does the project identify and train local leaders who can then reach and teach others? Mobilized local leadership is associated with bonding social capital.
- Does the project provide technology directly to community members themselves rather than to people who serve the community? Direct provision is a third measure of social capital.

**2. How does NTIA, and how do the BTOP grantees, measure how the population is advancing in the use of broadband?** The Current Population Survey measures individual and household IT use. Other surveys measure institutional IT use. But to regain international leadership as a digital society, we need community-level IT use data that affirms progress at the social and not only the individual level. To start such trend data collection, we need a set of community-level metrics.

- Does the project involve social places to use broadband and related technologies? These are basic to any social sector that relies on IT, as for instance when students use a computer lab that affords collaborative work and learning, or workers rely on shared specialized facilities in addition to their own desktops or laptops. Public computing centers (libraries included) tend to engage low income populations at a higher rate than other people.<sup>13</sup>
- Does the project focus on training and/or applications, or just on building broadband infrastructure? The preliminary findings from TOP affirm earlier work<sup>14</sup> that indicates that only providing infrastructure or equipment is insufficient for use. Posing a precise question to grantees will be helpful here: how many subscribers in your area are signed up for broadband service?

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<sup>13</sup> This has been indicated by the data collected by the Current Population Survey at the behest of NTIA beginning in the mid 1990s and continues to be the case. See for instance, Mossberger et al. (2003) *Virtual Inequality: Beyond the Digital Divide*, Georgetown University Press.

<sup>14</sup> See for instance the much-referenced study reported in Orlikowski, Wanda J. (1992): Learning from Notes: Organizational Issues in Groupware Implementation. In: Mantel, Marilyn and Baecker, Ronald M. (eds.) *Proceedings of the 1992 ACM conference on Computer-supported cooperative work* November 01 - 04, 1992, Toronto, Ontario, Canada. pp. 362-369.

**3. What are the outcomes for broadband use in communities?** Once the BTOP data is combined with other data sets, it will be possible to ask if this shows up in capital flows, labor markets, population diasporas, eGovernment, quality of life, for instance health, education, etc.

In addition to the implications from TOP, a recent Williams and Yan study<sup>15</sup> of national IT survey questions in the United States and China recommends addressing nine topics in all surveys of technology use. Questions on these topics could be addressed to individuals and organizations in communities:

- Frequency of use: how often do you use broadband?
- Place of use: where do you use broadband?
- Uses: how do you use broadband?
- Devices: What hardware/software do you use?
- Connecting: What other connections do you use besides broadband?
- Ownership: What hardware/software do you use?
- Attitude: What is your attitude towards broadband?
- Discourse: Do you know what <various broadband terms> mean?
- Identity: Are you a netizen, that is, are you conversant in use of the broadband-enabled Internet)

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<sup>15</sup> Williams, K., and H. Yan. “Research Note: Towards the global measurement of the information society: a US-China comparison of national government surveys,” submitted to *First Monday*. (Attachment A)

## V. Conclusion

In sum, we urge NTIA and RUS to attend to the quality of the data collected from grantees by demanding that applicants and grantees answer carefully constructed questions. We furthermore urge NTIA and RUS to put in place a state-of-the-art data archive/repository and facilitate its use by researchers as well as others. The broadband provisions of ARRA are enabling the construction of infrastructure which will transform our nation's economy and culture in ways we cannot yet see. With carefully collected and accessible data such as NTIA and RUS can assemble, then reliable and verifiable research will help us understand and navigate this exciting and necessary transformation.

Respectfully submitted,

By: /s/ Charles Benton

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