

# Practical Approaches and Proposed Strategies for Measuring Selected Aspects of Community-Based Broadband Deployment and Use

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## Abstract

A series of studies of rural Florida community anchor institutions have concluded that existing national measurement practices for broadband penetration, adoption, and impact are often poorly defined, confusing, or inadequate to inform decisions about community broadband deployment and adoption. As a result, local broadband initiatives may be hindered by “measurement confusion.” We propose the Broadband Readiness Index (BRI) with a number of broadband readiness criteria to address this confusion and position local officials to better coordinate, deploy, and use broadband locally; demonstrate how improved high-speed broadband affects their communities over time; and sustain planning for continuous improvements of community broadband use.

*Keywords:* broadband penetration, broadband adoption, broadband measurement confusion, community broadband planning, broadband readiness index

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## Introduction

A series of recent studies conducted by the Information Use Management and Policy Institute (the Institute) at the Florida State University<sup>1</sup> revealed that local officials often found existing measures of broadband penetration, adoption, and impact confusing and impractical. This has hindered community broadband initiatives and resulted in investments with undocumented results. Realistic measurement options and solutions can alleviate local officials’ confusion about how to assess the broadband experience in their communities and at their community anchor institutions (CAIs), such as hospitals, libraries, and schools.

## Selected Literature Disusing National Measures and Reporting

As a selected literature review revealed, many factors contribute to broadband measurement confusion, such as different speed tests using different methodologies (Bauer, Clark, & Lehr, 2010; FCC, 2010; Horrigan & Satterwhite, 2010; OECD, 2010), fixed versus wireless broadband, internet service providers (ISPs) offering different levels of services in the same communities, varying levels of data granularity (Kolko, 2010), and even users’ computer capabilities (Beard, Ford, Spiwak, & Stern, 2010;

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Benton & Williams, 2009; Connected Nation, 2011; Flamm, Friedlander, Horrigan, & Lehr, 2007; Smith, 2010; Whitt & Lampert, 2009). As a result, many community leaders have a difficult time clearly articulating their current or future broadband needs (Mandel, Alemane, & McClure, 2012). Assessing broadband status is complicated when CAIs and local officials are unaware of all the issues confounding broadband measurement. If decision makers are unaware of available broadband options and misunderstand their communities' broadband needs, the communities they represent may have subpar broadband that will not meet their needs or assist their planning for the future.

### **Measuring Broadband Locally: An Example from Rural Florida Communities**

This presentation builds on the overall conclusion from the North Florida Broadband Alliance (NFBA) and the Florida Rural Broadband Alliance, LLC (FRBA) projects that the lack of standardized measurements and indicators for a number of key broadband activities results in contradictory, complicated, and erroneous information, especially for practical use by local decision makers (McClure, Mandel, Saunders, Alemanne, Spears, & Bishop, 2011a and 2011b). Without accurate community-based deployment and measurement information, community leaders will find it quite difficult to justify costs and applications or show the impact that high-speed broadband has on a community's health, education, economy, and overall quality of life. The purpose of the Broadband Readiness Index (BRI) is to help local community leaders understand how to measure broadband deployment and use to make informed decisions with regard to its adoption, deployment, and use.

The Institute conducted two concurrent needs assessments of broadband connectivity for the NFBA and FRBA projects in rural Florida. These projects shared a primary goal of bringing middle mile broadband infrastructure to Florida's three Rural Areas of Critical Economic Concern (RACECs). Each RACEC is comprised of 6 to 14 rural, economically depressed counties.<sup>2</sup> Each project included needs assessment, benchmarking, and onsite diagnostics, and employed a multi-method approach that included a web-based survey, focus groups, and onsite diagnostics at selected CAIs (Mandel, *et al.*, 2012).

The select literature review suggests that ambiguities and confusion with *national* measures of broadband deployment and use also causes ambiguities and confusion at the *community* level. Indeed, the study team found that local community leaders' eyes "glazed over" when detailing aspects of the *National Broadband Plan* about deployment, measurement, and related issues. The community leaders' concern was solving broadband problems in their communities, not measuring national broadband deployment, speed, or jobs creation. From the FRBA and NFBA findings, the Institute developed an approach for measuring broadband readiness, deployment, adoption, use, and outcomes at the *community* level. The first step is for communities to assess CAIs readiness to implement broadband technologies. This approach utilizes a BRI that measures readiness according to nine criteria. The intent is to provide a practical, straightforward set of strategies to assist local CAIs, other organizations, and community opinion leaders to better access, deploy, and use broadband throughout their communities. After the Institute field-tests and refines these approaches, committed groups of community leaders can employ these strategies to improve broadband deployment and use in their communities.

#### **Broadband Readiness Index**

The BRI is based on nine criteria that take into account different situational factors under which CAIs operate and are meant to assess the readiness of an institution to adopt and utilize broadband. The degree to which an institution meets each criterion is assessed according to a three-point scale: high, somewhat, or low ability. The index requires both publicly available data and data that must be obtained from individual CAIs. Each criterion is broken down further into unique qualifiers intended to better predict the likely readiness of broadband adoption in the CAI:

**Ability to change ISP.** The ability to change ISPs is a critical situational factor affecting whether a CAI can adopt a broadband connection through a newly built middle mile or last mile network, fiber-to-the-premises, broadband over power line, or any other higher-speed technology than that to which the CAI already subscribes.

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<sup>2</sup> The RACECs are depicted at <http://www.eflorida.com/FloridasFuture.aspx?id=2108>

**Available and trained IT staff.** Available and competent IT staff in a CAI enable the other members of the staff to focus on their own tasks, provide administration with a reliable reference for CAI capabilities and needs, and conduct research on new applications that may provide a higher quality of service to clientele.

**Existence and quality of internal network.** A CAI's internal network configuration is a major determining factor in its capability to adopt and fully utilize a broadband connection. Firewalls or poor configuration of workstation settings affect the ultimate speed of the connection reaching users and staff members as they complete tasks online.

**Age of network and desktop equipment.** The age of network and desktop equipment impacts a CAI's ability to fully utilize a broadband connection. Ideally, a CAI replaces equipment on a 3- to 5-year schedule, but often CAIs purchase new equipment when critical components fail.

**Sufficient funding.** Funding for IT can be a fundamental problem for many CAIs. Many note that they are barely able to cover current costs and are unable to pay additional fees to break a contract or pay more for higher connection speeds or service quality. The structure of a CAI's funding also influences how budgets are allocated. If the CAI receives technical support from a parent organization or funding primarily through grants, for example, it might not be able to allocate funds away from one area toward technology to buy new equipment in order to use new or upgraded broadband.

**Administrative leadership.** To successfully adopt broadband, CAI administrators must justify costs to boards and other governing bodies as well as to clientele. Sometimes administrators also must convince staff that using new technologies and changing current behavior are beneficial actions for the CAI.

**Existence and quality of IT plan.** To utilize broadband connections fully requires detailed short- and long-range technology planning. A high-quality IT plan enables a CAI to track past technology policy and equipment decisions and provides a reliable reference for administrators when confronted with contradictory information about services or equipment.

**Administrative and staff interest in new technology applications.** As previously stated, an administrator's leadership and ability to persuade governing boards, parent organizations, and clientele are critical factors when considering a CAI's readiness to adopt and utilize broadband. Fundamental for administrative leadership is an interest in finding new technology applications that facilitate new and improved service delivery methods. If the administration is thoroughly satisfied with the status quo, it is unlikely that it would be willing to put forth any significant effort to adopt broadband.

**Demand from service population.** Demand for innovative, high-quality services from a CAI's service population is a critical component for justifying any change in service delivery methods or allocation of funding toward new technology. If the service population is uninterested or even hostile to new service applications available through broadband, it is unlikely that a CAI will attempt to change its current service offerings or delivery methods.

## Conclusion

The BRI is proposed as a strategic approach that will improve successful community based broadband measurement, adoption, and deployment. The BRI is intended to be practical, easy to use, and comparable across different communities, and understandable to local decision makers. While the BRI has yet to be field-tested, it suggests broadband indicators and measures that community leaders can use to assess broadband readiness and monitor community broadband deployment and use. Indicators of broadband adoption and use in local communities include accessibility to the Internet, socio-economic development, and educational achievements. Finally, indicators of broadband applications include the availability of numerous service options, trends in use of e-government services, telemedicine, distance learning, and other broadband-enabled applications, and impacts on the community. There is a wide variety of possible metrics to measuring the impacts and outcomes of broadband, so "...a single model is unlikely to reveal all that should be explained about the impacts of broadband" (Holt and Jamison, 2009, p. 580). While the indicators proposed here may not be all-inclusive or measurable on a statewide or national level, they are applicable, reliable, and measureable indicators of broadband adoption in *communities*.

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