



**FLORIDA RURAL BROADBAND ALLIANCE, LLC (FRBA)
FLORIDA RURAL MIDDLE MILE NETWORKS –
NORTHWEST AND SOUTH CENTRAL REGIONS PROJECT:
BROADBAND NEEDS ASSESSMENT, DIAGNOSTICS, AND BENCHMARKING
OF SELECTED ANCHOR INSTITUTIONS**

FOURTH INTERIM REPORT

(November 1, 2010 – December 31, 2011)

December 31, 2011

Charles R. McClure, PhD <cmeclure@lis.fsu.edu>
Director, Information Institute and Francis Eppes Professor

Lauren H. Mandel
<lmandel@fsu.edu>
Research Coordinator, Information Institute

Jeff Saunders
<jds10g@my.fsu.edu>
Research Associate, Information Institute

Nicole D. Alemanne
<nalemanne@fsu.edu>
Research Associate, Information Institute

Laura I. Spears
<lib03@my.fsu.edu>
Research Associate, Information Institute

Bradley Wade Bishop
<wade.bishop@uky.edu>
Assistant Professor, University of Kentucky School of Library and Information Science

*The study team wishes to acknowledge the assistance of
Susan C. Thomas, Casey A. McLaughlin, Lynnsey K. Weissenberger, Karen Doster, and Sara Pierce.*

For

Rick Marcum and Gina Reynolds
Florida Rural Broadband Alliance, LLC

TABLE OF CONTENTS

| | |
|---|----|
| Project Purpose and Goals | 8 |
| Project Goals | 8 |
| Project Tasks | 9 |
| Data Collection Methods | 13 |
| Survey | 13 |
| Population and Sample | 13 |
| Survey Design | 14 |
| Survey Response Rate | 14 |
| Focus Groups | 14 |
| Sampling Frame | 15 |
| Sampling Methodology | 15 |
| Participant Recruitment | 16 |
| Focus Group Locations | 16 |
| Focus Group Protocol | 16 |
| Onsite Diagnostics | 16 |
| Sampling | 17 |
| Planning for and Collecting Data | 17 |
| Reporting | 17 |
| Data Analysis | 18 |
| Survey Findings | 18 |
| Introduction | 18 |
| Respondents | 19 |
| Existing and Future Broadband Uses and Applications | 22 |
| Year Anchors Obtained Service | 22 |
| Wi-Fi Availability | 23 |
| Uses of Broadband | 25 |
| Adequacy of Current Broadband to Meet Staff and User Needs | 28 |
| Perceived Economic Benefit of Increased Broadband Connectivity | 29 |
| Existing Bandwidth Purchased at the “Front Door” Compared to Workstation-Level Speeds | 30 |
| Connection Speed | 30 |
| Staff and Public Workstations | 35 |
| Current Cost for Anchor Institution Bandwidth | 37 |
| Internet Cost and Source of Funds | 37 |
| Vendor(s) Currently Supplying Existing Anchor Institution Bandwidth | 40 |
| Type of Connection and Internet Service Provider | 40 |
| Factors Affecting Anchor Institution Adoption of High-Speed Broadband | 41 |
| Increasing Speed and Obtaining Wi-Fi | 41 |
| Staff and Public Comfort with Broadband-Enabled Applications | 45 |
| Other Potential Concerns | 45 |
| Summary of Survey Findings | 46 |
| Focus Group Findings | 46 |
| Introduction | 46 |
| Respondents | 47 |

FRBA Broadband Needs Assessment: Fourth Interim Report

| | |
|---|----|
| Anchor Institutions' Existing and Future Broadband Uses and Applications | 49 |
| Internet Connectivity | 49 |
| Internet Connectivity Costs and ISP Contracts | 50 |
| Networks | 51 |
| Administrators' Understanding of Broadband Evaluation | 51 |
| Situational Factors and Issues Impacting Whether Anchor Institutions Obtain or Increase Broadband Capacity | 52 |
| Barriers/Enablers | 52 |
| Politics and Regulatory Issues | 54 |
| Availability of Trained IT Staff | 55 |
| Upgrading Physical Facilities for Broadband | 56 |
| Ways to Deploy and Configure the Middle Mile Network to Best Meet Anchor Institutions' Current and Future Needs | 56 |
| Education/Training Needs | 57 |
| Understanding a "Middle Mile" Project | 57 |
| Role of the FRBA | 58 |
| Additional Findings | 59 |
| Economic Development and Broadband Access and Availability | 59 |
| Disaster Planning and Recovery | 60 |
| Anchor Institution and County Broadband Planning and Development | 60 |
| Onsite Diagnostics Findings | 61 |
| Introduction | 61 |
| Participants | 62 |
| Existing Broadband Networks | 62 |
| Connection Speeds | 62 |
| Institution Size and Complexity of Network | 64 |
| Sophistication of Network Management | 66 |
| Situational Factors and Issues Impacting Anchor Institution Broadband Network Deployment | 67 |
| Administrative Leadership | 69 |
| Technical Expertise | 70 |
| IT Plan | 70 |
| Service Area Size | 71 |
| Funding | 71 |
| Ways That Anchor Institutions Can Improve Their Network Deployments | 71 |
| Education | 72 |
| Technical Knowledge and Views of Technology | 72 |
| Funding and Bureaucratic Structures | 72 |
| Educating Service Populations on the Importance of Broadband | 73 |
| Education on Practical Broadband Applications | 73 |
| Training | 73 |
| Planning | 74 |
| Summary of Onsite Diagnostics Findings | 75 |
| Integrating Survey, Focus Group, and Diagnostics Findings | 75 |
| Respondents and Participants | 75 |

FRBA Broadband Needs Assessment: Fourth Interim Report

| | |
|--|----|
| Connection Speed | 76 |
| Internet Connectivity Cost | 77 |
| Adequacy of Current Broadband to Meet Staff and User Needs | 77 |
| Staff Training and Public Education Needs | 78 |
| Perceived Economic Benefit of Increased Broadband Connectivity | 79 |
| Barriers and Enablers | 79 |
| Resources | 79 |
| Broadband and Technical Knowledge | 80 |
| Access to Broadband | 80 |
| Out-of-Date Network Hardware and Software | 81 |
| Equipment | 81 |
| Summary of Integrated Findings | 81 |
| Conclusions and Recommendations | 82 |
| Recommendations | 82 |
| Areas for Future Research | 82 |
| Community Impacts and Outcomes | 83 |
| Subscribership | 83 |
| Community-Based Broadband Planning | 84 |
| Anchor Institution vs. Residential Broadband Adoption | 85 |
| Comparing Data Between South Central and Northwest RACECs | 86 |
| Conclusions | 86 |

LIST OF TABLES

| | |
|--|----|
| Table 1: Key Activities, Status, and Time Line to Completion for all Project Tasks | 10 |
| Table 2: Three-County Areas | 15 |
| Table 3: Respondent's Job Title | 22 |
| Table 4: Comparison of Advertised Speed to Measured Speed at a Staff Workstation | 32 |
| Table 5: Comparison of Advertised Speed to Measured Speed at a Public Workstation | 32 |
| Table 6: Title of Person with Authority to Contract for Internet Services | 45 |
| Table 7: Comparison of Number of Workstations and Measured Workstation Speeds | 66 |
| Table 8: Percent of Survey Respondents/Focus Group Participants/Diagnostics Participants by Anchor Institution Type | 75 |
| Table 9: Percent of Survey Respondents/Focus Group Participants/Diagnostics Institutions by County | 76 |
| Table 10: Advertised and Measured Speeds (Survey) and Maximum and Minimum Observed Speeds (Diagnostics) | 77 |

LIST OF FIGURES

| | |
|---|----|
| Figure 1. Respondents by Type of Anchor Institution | 20 |
| Figure 2. Type of Anchor Institution Respondents by County | 21 |
| Figure 3. Year Respondents Obtained Internet Service | 22 |
| Figure 4. Year Respondents Obtained Internet Service by County | 23 |
| Figure 5. Institutions with and Without Wi-Fi by County | 24 |
| Figure 6. Availability of Wi-Fi to Staff and Public in Institutions with Wi-Fi | 25 |
| Figure 7. Applications and Tasks for Which the Public Uses the Internet | 25 |
| Figure 8. Staff Comfort with Internet-related Topics-Extremely/Very Comfortable (5 Point Scale) | 26 |
| Figure 9. Public Comfort with Internet-related Topics-Extremely/Very Comfortable (5 Point Scale) | 27 |
| Figure 10. Plans for Staff Training Within the Next Year by Topic | 27 |
| Figure 11. Plans for Public Training Within the Next Year by Topic | 28 |
| Figure 12. How Often Internet Speed Meets Staff Needs | 28 |
| Figure 13. How Often Internet Speed Meets Public Needs | 29 |
| Figure 14. Perceived Economic Benefit of Increased Broadband Connectivity | 29 |
| Figure 15. Advertised Speed at the “Front Door” | 30 |
| Figure 16. Advertised Speed at the “Front Door” by Type of Anchor | 31 |
| Figure 17. Advertised Speed at the “Front Door” by County | 33 |
| Figure 18. Actual Downstream Speed by County—Staff Workstation | 34 |
| Figure 19. Actual Downstream Speed by County—Public Workstation | 35 |
| Figure 20. Age of Staff Workstations (Based on Total Number of Reported Workstations) | 36 |
| Figure 21. Age of Public Workstations (Based on Total Number of Reported Workstations) | 36 |
| Figure 22. Total Annual Cost of Internet Service (All Institutions) | 37 |
| Figure 23. Total Annual Cost of Internet Service by County (All Institutions) | 38 |
| Figure 24. Source of Funds to Pay for Internet Service | 39 |
| Figure 25. Total Annual Internet Cost for Schools and Libraries After E-rate Discount | 39 |
| Figure 26. Respondents by Type of Internet Connection | 40 |
| Figure 27. Respondents by Internet Service Provider | 40 |
| Figure 28. Internet Service Provider by County | 41 |
| Figure 29. Interest in Increasing Connection Speed | 42 |
| Figure 30. Desired Internet Connection Speed | 42 |
| Figure 31. Plans to Obtain Wi-Fi | 43 |
| Figure 32. Obstacles to Obtaining Broadband or Increasing Speed-Extremely/Very Important | 44 |
| Figure 33. Obstacles to Instituting Wireless Service-Extremely/Very Important | 44 |
| Figure 34. Number of Representatives from Each County in FRBA Focus Groups | 48 |
| Figure 35. Number of Representatives from Each Anchor Institution Type in FRBA Focus Groups | 48 |
| Figure 36. Job Titles Held by Anchor Institution Representatives at FRBA Focus Groups | 49 |
| Figure 37. Broadband Barriers and Their Effect on Factors Contributing to Adoption | 54 |

FRBA Broadband Needs Assessment: Fourth Interim Report

| | |
|---|----|
| Figure 38. Minimum and Maximum Observed Internet Connection Speeds at Visited Anchor Institutions | 63 |
| Figure 39. Tier Grouping of Speed Test Results | 64 |
| Figure 40. Number of Workstations | 65 |
| Figure 41. Institutions that Centrally Manage Malware and Antivirus and That Store Back-up Data Offsite | 67 |
| Figure 42. Whether Anchor Institutions Have IT Staff, Control over Their IT Budget, and a Technology Plan | 68 |
| Figure 43. Importance of Broadband to the Institution | 69 |
| Figure 44. Ability to Function Without Internet Connection | 69 |
| Figure 45. Whether or Not Anchors Perceive Ongoing Technology Training as Important | 70 |
| Figure 46. Community-Based Broadband Planning Model | 85 |

**FLORIDA RURAL BROADBAND ALLIANCE (FRBA)
FLORIDA RURAL MIDDLE MILE NETWORKS – NORTHWEST AND SOUTH
CENTRAL REGIONS PROJECT:
BROADBAND NEEDS ASSESSMENT, DIAGNOSTICS, AND BENCHMARKING OF
SELECTED ANCHOR INSTITUTIONS:
FOURTH INTERIM REPORT**

The Information Use Management and Policy Institute (Information Institute)¹ at the Florida State University² has been conducting a number of activities in fulfillment of its award from the Florida Rural Broadband Alliance (FRBA)³ to conduct work in support of its \$23 million Rural Middle Mile Networks project. These activities are needs assessment, benchmarking, and onsite diagnostics at selected anchor institutions in the FRBA service area: the 8-county Northwest Rural Areas of Critical Economic Concern (RACEC),⁴ the 6-county South Central RACEC, and the City of Immokalee (Collier County).

This fourth interim report provides a summary of all needs assessment activities (November 1, 2010 – December 31, 2011), findings, recommendations, and conclusions for the needs assessment. This report is a comprehensive report that describes all data collection methods, data analysis, integration of the data collected via the three methods (web-based survey, focus groups, and onsite diagnostics), recommendations, and conclusions with regard to the needs assessment portion of the project.

PROJECT PURPOSE

The overall purposes of this needs assessment are to (1) inform the deployment and configuration of the middle mile network, (2) increase the successful deployment and use of broadband at the various anchor institutions in the 8-county Northwest RACEC, the 6-county South Central RACEC, and the City of Immokalee (Collier County), (3) insure that users of the various anchor institutions obtain high quality and up-to-date broadband services, (4) position the FRBA to better document the success of the project based on intended outcomes described in the original proposal to the National Telecommunications and Information Administration (NTIA), and (5) assist in obtaining additional funds for broadband expansion and economic development in the region.

PROJECT GOALS

Specific project goals related to needs assessment are:

- Describe the existing and future broadband uses and applications of the region's anchor institutions;

¹ <http://ii.fsu.edu>

² <http://www.fsu.edu>

³ <http://www.weconnectflorida.com/>

⁴ Since the inception of the FRBA project, Wakulla County has been added to the Northwest RACEC; however, Wakulla County is served by the North Florida Broadband Authority middle mile project and therefore, is not included in this study.

- Identify factors that affect the likelihood that anchor institutions will adopt high-speed broadband;
- Assist the middle mile network designers to deploy and configure the network such that it best meets the current and future needs of anchor institutions; and
- Obtain baseline data that can be used to justify and support additional broadband funding requests for the region.

Specific project goals for the onsite diagnostics portion of the project are:

- Describe the existing broadband networks currently deployed in the region’s anchor institutions;
- Identify situational factors and issues that impact how anchor institutions deploy their broadband networks; and
- Determine ways that the region’s anchor institutions can improve their network deployments to increase connection speeds at the workstation.

Specific project goals for the benchmarking portion of the project are:

- Describe the existing bandwidth being purchased at the “front door” and at the workstation-level for a sample of anchor institutions in the 14 county region;
- Determine the current cost for the bandwidth being purchased by anchor institutions;
- Identify the vendor(s) currently supplying the existing bandwidth for anchor institutions;
- Identify situational factors and issues that impact whether anchor institutions decide to obtain or increase broadband capacity;
- Obtain these benchmark data as of fall 2010 to demonstrate subsequent improvement in broadband capacity for anchor institutions in the region; and
- Obtain baseline data related to broadband connectivity and use that can be used to justify and support additional broadband funding requests for the region.

Accomplishment of these goals will directly assist the FRBA in accomplishing several project goals and objectives as outlined in their original proposal to NTIA.

PROJECT TASKS

This project had four main tasks (phases) for the needs assessment as follows:

- **Task 1: Detailed Project Tasking:** During the first phase of the study, the study team detailed project tasking and performed other organizational activities, all in consultation with the FRBA project liaison. This task included organizational activities in preparation for beginning data collection for the needs assessment phases of the project. See the First Interim Report for Task 1 activities and status.⁵

⁵ McClure, C. R., Mandel, L. H., & Gibson, A. N. (2010). *Florida Rural Broadband Alliance (FRBA) Florida Rural Middle Mile Networks – Northwest and South Central Regions Project: Broadband needs assessment, diagnostics, and benchmarking of selected anchor institutions: First interim report of project activities*. Tallahassee, FL:

FRBA Broadband Needs Assessment: Fourth Interim Report

- **Task 2: Data Collection:** During the second phase of the study, the study team conducted data collection activities that included a needs assessment and benchmarking survey, onsite diagnostics collection, and interviews and/or focus groups that followed up on the survey and collected data on situational factors and issues that impact anchor institutions’ awareness of and potential deployment of broadband networks. See the Second Interim Report for an overview of Task 2 activities and status.⁶
- **Task 3: Data Analysis:** During the third phase of the study, the study team analyzed, tabulated, and verified the various data collected in Task 2 using descriptive statistics, GIS mapping methodologies, and content analysis of primary themes. The third interim report delineated findings from each of the three methods (survey, focus groups, and onsite diagnostics).⁷
- **Task 4: Reporting:** During this task, the study team developed a fourth interim draft report (this report) that describes project activities, summarizes findings and identifies key issues from the needs assessment, and makes specific recommendations for middle mile network deployment and strategies to better meet the anchor institution broadband service needs. It is anticipated that key FRBA staff will review the draft and make comments and suggestions which will serve as input into the final fourth interim report. A member of the study team will be available to make an oral presentation to the FRBA if requested.

Reports of all previous tasks are available at <http://ii.fsu.edu/content/view/full/45135>. Table 1 shows the status of all needs assessment activities.

Table 1: Key Activities, Status, and Time Line to Completion for all Needs Assessment Tasks

| ACTIVITY | STATUS UPDATE | TIMELINE |
|---|---------------|--------------------------------|
| <i>Task 1: Detailed Project Tasking</i> | | |
| 1. Prepare for data collection activities – <ul style="list-style-type: none"> • Initiate development of contact list of selected anchor institutions. • Write letter that explains project details and importance to selected anchor institution participants. • Prepare to mail and/or email introduction letter to selected anchor institutions to introduce project. | Task complete | November 1 – December 31, 2010 |

Information Use Management and Policy Institute, College of Communication and Information, The Florida State University. Available at: <http://ii.fsu.edu/content/view/full/45135>

⁶ McClure, C. R., Mandel, L. H., & Gibson, A. N. (2010). *Florida Rural Broadband Alliance (FRBA) Florida Rural Middle Mile Networks – Northwest and South Central Regions Project: Broadband needs assessment, diagnostics, and benchmarking of selected anchor institutions: Second interim report of project activities*. Tallahassee, FL: Information Use Management and Policy Institute, College of Communication and Information, The Florida State University. Available at: <http://ii.fsu.edu/content/view/full/45135>

⁷ McClure, C. R., Mandel, L. H., & Gibson, A. N. (2010). *Florida Rural Broadband Alliance (FRBA) Florida Rural Middle Mile Networks – Northwest and South Central Regions Project: Broadband needs assessment, diagnostics, and benchmarking of selected anchor institutions: Third interim report of project activities*. Tallahassee, FL: Information Use Management and Policy Institute, College of Communication and Information, The Florida State University. Available at: <http://ii.fsu.edu/content/view/full/45135>

FRBA Broadband Needs Assessment: Fourth Interim Report

Table 1: Key Activities, Status, and Time Line to Completion for all Needs Assessment Tasks, continued

| ACTIVITY | STATUS UPDATE | TIMELINE |
|--|----------------------|--------------------------------|
| <i>Task 1: Detailed Project Tasking, continued</i> | | |
| 2. Begin development of survey methodology – <ul style="list-style-type: none"> • Decide whether to do a census (i.e., survey all institutions on the list) or use a sample (if there are more than 200 institutions); and • Create a professional-level account with Survey Monkey (http://www.surveymonkey.com), which will be used for the online survey. | Task complete | November 1 – December 31, 2010 |
| 3. Prepare to contact anchor institutions to develop a list of those interested in participating in the onsite diagnostics activities. | Task complete | November 1 – December 31, 2010 |
| 4. Begin development of sampling/selection methodology for interviews and focus groups that pulls a simple random sample of anchor institutions in each county, in which each institution in the county has the same probability of being chosen as does any other institution in the county. | Task complete | November 1 – December 31, 2010 |
| 5. Begin drafting measurement instruments – <ul style="list-style-type: none"> • Draft survey instrument; • Draft metrics for diagnostics assessment; and • Draft interview and focus group questions. | Task complete | November 1 – December 31, 2010 |
| 6. Prepare to produce survey – <ul style="list-style-type: none"> • Draft of Survey Monkey version; and • Draft of paper version. | Task complete | November 1 – December 31, 2010 |
| 7. Begin developing a project website – <ul style="list-style-type: none"> • Include sections for project information, data collection instruments, a self-diagnostics tool, and project reports; and • Load a link to the Survey Monkey survey on the site. | Task complete | November 1 – December 31, 2010 |
| 8. Work with FRBA liaison to fine-tune project tasking and data collection instruments. | Task complete | November 1 – December 31, 2010 |
| 9. Deliver first interim report that details completed project activities. | Task complete | December 31, 2010 |
| <i>Task 2: Data Collection</i> | | |
| 1. Conduct survey of anchor institutions – <ul style="list-style-type: none"> • Mail survey packet (including cover letter, informed consent form, and a paper version of the survey) to selected anchor institutions; • Track survey completions; and • Follow up with survey recipients by phone and/or email to encourage and aid in survey completion. | Task complete | January 1 – July 31, 2011 |
| 2. Conduct interviews and/or focus groups with representatives of anchor institutions in each county. | Task complete | February 1 – May 31, 2011 |
| 3. Conduct diagnostics analyses at selected volunteer institutions (on-site and via the self-diagnostics tool). | Task complete | March 1 – July 31, 2011 |
| 4. Deliver second interim report that details completed project activities. | Task complete | July 31, 2011 |

FRBA Broadband Needs Assessment: Fourth Interim Report

Table 1: Key Activities, Status, and Time Line to Completion for all Needs Assessment Tasks, continued

| ACTIVITY | STATUS UPDATE | TIMELINE |
|--|---------------|-------------------------------|
| <i>Task 3: Data Analysis</i> | | |
| 1. Analyze, tabulate, and verify survey data – <ul style="list-style-type: none"> • Use descriptive statistics to analyze survey responses; • Describe the existing and future broadband uses and applications of the region’s anchor institutions; • Describe the existing bandwidth being purchased at the “front door” and its availability at the workstation-level for the anchor institutions; • Determine the current cost for the bandwidth being purchased by anchor institutions; • Identify the vendor(s) currently supplying the existing bandwidth for anchor institutions; • Identify situational factors and issues that impact whether anchor institutions decide to obtain or increase broadband capacity; • Obtain baseline data related to broadband connectivity and use that can be used to justify and support additional broadband funding requests for the region; and • Use GIS methodologies to map metrics such as anchor institution broadband costs and connections speeds. | Task complete | October 1 – November 30, 2011 |
| 2. Analyze diagnostics – <ul style="list-style-type: none"> • Describe the existing broadband networks currently deployed in selected anchor institutions; • Identify situational factors and issues that impact how selected anchor institutions deploy their broadband networks; and • Determine ways that the region’s anchor institutions can improve their network deployments and use of broadband. | Task complete | October 1 – November 30, 2011 |
| 3. Analyze interview and focus group data – <ul style="list-style-type: none"> • Identify situational factors and issues that impact whether anchor institutions decide to obtain or increase broadband capacity; and • Describe factors that affect anchor institutions’ capacity to use broadband effectively. | Task complete | October 1 – November 30, 2011 |
| 4. Deliver interim report that details completed project activities. | Task complete | November 30, 2011 |
| <i>Task 4: Reporting</i> | | |
| 1. Develop draft fourth interim report – <ul style="list-style-type: none"> • Describe project activities; • Summarize findings and identify key issues from needs assessment; • Make specific recommendations for middle mile network deployment and strategies to better meet the anchor institution broadband service needs; and • Work with FRBA liaison to finalize fourth interim report. | Task complete | December 1-31, 2011 |

FRBA Broadband Needs Assessment: Fourth Interim Report

Table 1: Key Activities, Status, and Time Line to Completion for all Needs Assessment Tasks, continued

| ACTIVITY | STATUS UPDATE | TIMELINE |
|--|--|--------------------------------------|
| <i>Task 4: Reporting, continued</i> | | |
| 2. Develop 2-4 self-paced, online instructional modules regarding broadband and its importance – <ul style="list-style-type: none"> • Based on findings from activities 1-3, determine topics of the modules; • Develop the modules; • Pre-test the modules; • Modify modules (if necessary) based on feedback from pre-test; and • Roll out modules to FRBA anchor institutions. | Task complete | December 1-31, 2011 |
| 3. Deliver fourth interim report and make oral presentations of findings from needs assessment to FRBA staff and FRBA board of directors. | Report complete <i>Presentation TBD</i> | December 31, 2011 <i>Date TBD</i> |

DATA COLLECTION METHODS

Data collection activities included conducting a needs assessment and benchmarking survey, onsite diagnostics collection, and interviews and/or focus groups that followed up on the survey and collected data on situational factors and issues that impact anchor institutions’ awareness of and potential deployment of broadband networks.

Survey

A paper version of the survey was mailed to all 323 anchor institutions in the FRBA service area on January 28, 2011. Additional surveys were sent to 23 anchor institutions identified after the initial mailing, including rural county health departments. Also, one survey was returned from an institution to which the research team had not sent a packet. This brings the total to 347 anchor institutions surveyed for this project. Ultimately, 82 surveys were returned and analyzed during Task 3 (see below for more information on data analysis). More detail on the survey methodology follows.

Population and Sample

First, the project team developed a comprehensive list of all anchor institutions within the Northwest and South Central RACECs and the City of Immokalee. Because the total population was 323 institutions, the project team decided to invite all institutions in the population to participate in the anchor institution broadband survey. That is, we did not select a sample.

A paper version of the survey was mailed to all 323 anchor institutions in the FRBA service area on January 28, 2011. Additional surveys were sent to 23 anchor institutions identified after the initial mailing, including rural county health departments. Also, one survey was returned from an institution to which the research team had not sent a packet. This brings the total to 347 anchor institutions surveyed for this project.

Survey Design

The project team determined that the most cost effective method of conducting the survey would be to use an online survey. After some deliberation, it was decided to use Survey Monkey Professional software for the survey. The survey was designed to obtain data that would meet the numerous goals of this project with as few questions as possible so as not to overburden the anchor institution staff completing the survey; two formats were created, a paper format and the online format.

To facilitate and encourage survey completion, the project team sent a mailing to all the anchors in the populations including a cover letter explaining the project and why their participation was needed for data collection and a paper copy of the survey so they could collect their responses before logging into the online survey. The cover letter and survey were provided to FRBA previously, but additional copies can be provided to the FRBA upon request. The paper version also was available to institutions unable to complete the survey online. The project team sent follow-up e-mails to institutions that had not completed the survey every 2-3 weeks, and completed a round of reminder phone calls in March 2011, until the survey officially “closed” on April 30, 2011 (the survey actually remained open throughout the focus group and onsite diagnostics data collection periods so additional anchor institutions that participated in focus groups and desired an onsite diagnostic could complete the survey). Responses were tracked to ensure that the project team did not send reminder e-mails to institutions that had completed the survey.

Survey Response Rate

Ultimately, 82 anchor institutions completed the survey, a 25.4% response rate. Respondents represented a wide variety of anchor institutions. Survey data were analyzed using descriptive statistics and GIS mapping during Task 3, with findings reported in the Third Interim Report.

Focus Groups

The project team conducted five focus groups to gather qualitative data that provides more detail and insights into anchor institution broadband needs, barriers, and enablers. Five focus groups were conducted with representatives of various anchor institutions in multi-county areas (to obtain representation from all counties in the FRBA service area). More detail on the focus group and interview methodology follows.

The study team determined that the best way to leverage available resources was to conduct five focus groups, each covering a three-county area. Counties were combined into the area groupings based on geographic proximity in order to minimize travelling distances for participants; ultimately, this resulted in three focus groups serving three counties each, one focus group serving two counties, and one focus group serving three counties plus the City of Immokalee. In addition to determining these groupings, the study team identified one county in each of the multi-county areas as the optimal location to conduct the focus group, making the selection based on which county was located most centrally in the three-county area. Table 2

delineates the multi-county groupings, as well as the counties identified as most appropriate to host the focus groups.

Table 2: Three-County Areas

| Group | Counties | Host County |
|--------------|---|--------------------|
| 1 | DeSoto, Hardee, and Highlands | Highlands |
| 2 | Glades, Hendry, Okeechobee, and City of Immokalee | Glades |
| 3 | Gulf and Franklin | Gulf |
| 4 | Calhoun, Gadsden, and Liberty | Calhoun |
| 5 | Holmes, Jackson, and Washington | Washington |

Sampling Frame

The largest possible sampling frame for this project consisted of a list of the anchor institutions in the Northwest and South Central Florida RACECs and the City of Immokalee that was developed for survey recruitment; this list was refined (i.e., updated) while the survey was in the field.

At the end of the online survey, respondents were asked for permission to be contacted for a follow-up interview. Those who responded negatively were removed from the sampling frame for the focus groups and other follow-up data collection activities; approximately 60% of total institutions declined a follow-up interview. Note that institutions in the sampling frame that did *not* complete the survey were retained in the focus group sampling frame in the hopes of recruiting some institutions to both attend the focus groups and complete the survey.

Sampling Methodology

The use of multi-county areas for focus group sampling necessitated stratifying the frame by the county groups. A stratified sample is one in which records in the total sample are distinguished by relevant characteristics to create strata, and the records are then sampled from within the strata.⁸ The five multi-county areas were used as strata for this project, and samples were drawn from within each area.

The sampling frame was relatively small, with a maximum of 83 records per multi-county group before those who had refused a follow-up interview were removed. It was essential that focus group participants be drawn from the counties within each multi-county area. Therefore, a purposive sampling methodology was employed. Purposive sampling is a non-probability sampling method in which records are selected because they represent an important characteristic.⁹

⁸ Schutt, R. K. (2006). *Investigating the social world: The process and practice of research* (5th ed.). Thousand Oaks, CA: Sage.

⁹ Schutt, R. K. (2006). *Investigating the social world: The process and practice of research* (5th Edition). Thousand Oaks, CA: Sage.

Participant Recruitment

The records in the sampling frame fell into three types:

- Institutions that responded to the survey and agreed to be contacted for follow-up interviews;
- Institutions that responded to the survey and did *not* agree to be contacted for follow-up interviews; and
- Institutions that had not yet responded to the survey.

Institutions that refused to be contacted for a follow-up interview were removed from the sampling frame for the focus groups.

Of the remaining institutions, the most likely to agree to participate in the focus groups were those that responded to the survey and agreed to be contacted for follow-up interviews. These institutions were contacted first, with a goal of recruiting approximately 6-10 participants per focus group. Subsequently, institutions that had not responded to the survey were contacted as well. Reasonable attempts were made to recruit at least one participant per county and to recruit participants from a mix of anchor institution types.

Focus Group Locations

The project team initially scheduled five focus groups to be held in Calhoun, Glades, Gulf, Highlands, and Washington Counties. All five focus groups occurred in May 2011.

Focus Group Protocol

The focus groups followed a set protocol and a predetermined list of topics, which was developed from the focus group protocol and topics employed for the NFBA needs assessment; that list of topics had been modified twice (after the first round of focus groups and in preparation for the Rural Health Partnership focus group). The protocol included housekeeping-type activities, such as having participants sign in and complete nameplates, an introduction that explained what the project is about and the purpose of the focus group, and general information about recording and other procedures. The topics included general background on the participants and their institutions, participants' impressions of their institutions' current broadband and technology, impacts of broadband on regional economic development, and factors that affect broadband access and use in their institutions, among others. Each topic included several probing questions to elicit additional information. More detail on the protocol and questions can be provided to the FRBA upon request.

Onsite Diagnostics

Subsequent to survey and focus group data collection, the project team began conducting onsite diagnostics in select anchor institutions throughout the FRBA service area. Ultimately, 19 diagnostic sessions were conducted, representing schools, workforce boards, county

commissioners, county health departments, towns, community colleges, public libraries, and rural health clinics. More detail on the onsite diagnostics methodology follows.

The project team conducted onsite diagnostics and broadband connectivity assessments for select anchor institutions from the Northwest and South Central RACECs plus the City of Immokalee. The overall objectives of the onsite diagnostics were to accomplish the following:

- Describe the existing broadband networks currently deployed in the region's anchor institutions;
- Identify situational factors and issues that impact how anchor institutions deploy their broadband networks; and
- Determine ways that the region's anchor institutions can improve their network deployments to increase connection speeds at the workstation, and also improve network security and business continuity.

The methodology for conducting the onsite broadband benchmarking efforts was comprised of three phases: determining the sample, planning for and collecting data, and reporting.

Sampling

The first phase included a process for generating a pool of potential anchor institutions that qualified for the onsite diagnostics. This list was not limited to those institutions that had taken the FRBA Anchor Institution Broadband Survey prior to the onsite visit.

Planning for and Collecting Data

The second phase included documents that the anchor institutions needed to prepare and have ready prior to the onsite visits. Prepared documents pertained to network information, such as, but not limited to, network peak usage, workstation bandwidth speed tests, and a manifest of network equipment detailing age of computers and number of wireless access points throughout the network. Phase two also provided the assessment team with lists of potential interview questions and a template of diagnostic procedures. The onsite assessment team also provided the anchor institution with a care package of helpful information, tips, and resources regarding improving broadband quality at the institution.

Reporting

The last phase consisted of generating two kinds of reports. The first type of report was tailored to each anchor institution's onsite diagnostics results. This report was an overview of the findings for each individual anchor institution, and was provided to the individual institutions to fact check before Information Institute staff generated a final version of each report. The second kind of report will be an aggregate report of Northwest and South Central RACECs plus City of Immokalee anchor institutions with recommendations for addressing network issues and improving broadband quality; this will be compiled and written during Task 3 of the project.

In addition to the diagnostic team's report, anchor institutions have continuing access to the resources compiled on the FRBA project website (frba.ii.fsu.edu). Specifically, the project team created a section of the project website entitled Toolkit (frba.ii.fsu.edu/toolkit.html). Here, the project team provides a variety of self-help resources and recommendations to anchor institutions for improving their network, as well as information technology procedures and documentation. This section is updated frequently as the project team locates and prepares materials for inclusion in the Toolkit.

The specific onsite procedures and findings depended upon many situational factors, including but not limited to the following:

- Type and size of the anchor institution;
- Their information technology (IT) needs;
- Outside constraints such as security policies; and
- Organizational factors such as trained, available IT staff.

Additional detail on each phase and specific questions asked/protocol followed were provided to the FRBA.

DATA ANALYSIS

Survey Findings

Introduction

The survey finds that anchor institutions in the FRBA service area are facing a number of situational factors that affect their ability to deploy and use broadband Internet in an effective way. For example, while half of respondents report paying for advertised broadband Internet speeds greater than 5 megabits per second (Mbps),¹⁰ actual tested downstream speeds are vastly lower. And while the majority of respondents say that their Internet speeds meet staff and public needs most of the time or always, 70% of respondents indicate an interest in increasing their Internet speed. However, almost no institutions have plans to increase their speed, and half of respondents reporting that they would like to have higher Internet speeds say that they already have the maximum speed available to them, cannot afford to increase their speed, or do not have the technical knowledge to do so. The age of workstations in reporting institutions compounds this problem as older workstations tend to run at slower speeds, regardless of connection speed.

Staff and public comfort with broadband technology is another issue. Large portions of anchor institutions' staffs are reported to be comfortable with basic Internet and computer skills, but less than two-thirds are comfortable with advanced Internet skills such as searching for information and determining its accuracy. Very low percentages of the public are reported to be comfortable with even basic broadband-related skill sets. The largest percentage of institutions report no plans for staff or public training that would help improve these skills.

¹⁰ 1 Mbps is equal to about 1000 kilobits per second, or kbps.

Needs assessment and benchmarking project goals related to the description of broadband Internet in anchor institutions are the following:

- Describe the existing and future broadband uses and applications of the region's anchor institutions;
- Describe the existing bandwidth being purchased at the "front door" and at the workstation-level for a sample of anchor institutions in the 14-county region;
- Determine the current cost for the bandwidth being purchased by anchor institutions;
- Identify the vendor(s) currently supplying the existing bandwidth for anchor institutions; and
- Identify factors that affect the likelihood that anchor institutions will adopt high-speed broadband.

The following section reports survey findings on the current state of broadband Internet at anchor institutions in the context of those goals, with the addition of an introductory section that overviews survey respondents. Note that, although the FRBA service area includes two different RACECs (Northwest and South Central), data are reported for the entire FRBA service area as one entity and not for each RACEC individually.

Respondents

All types of anchor institutions are included in the population that responded to the survey. The top groups of respondents include schools and school districts (30.5%), city and county government entities (18.3%), law enforcement (15.9%), and libraries (14.6%) (Figure 1). The library category includes both library systems and branch libraries. Rural health clinics (3.7%), higher education institutions (4.9%), hospitals (6.1%), and other (6.1%) represent the anchor institution types with the lowest survey response rates.

In addition to representing all types of anchor institutions, survey respondents represent all of the counties in the FRBA service area (Figure 2). The institutions with the highest response rates (schools, government entities, law enforcement, and libraries) include respondents from the broadest ranges of counties. Jackson and Calhoun counties have the highest response rates (n=17 and n=10, respectively), while six or fewer respondents are located in each of the other counties.

FRBA Broadband Needs Assessment: Fourth Interim Report

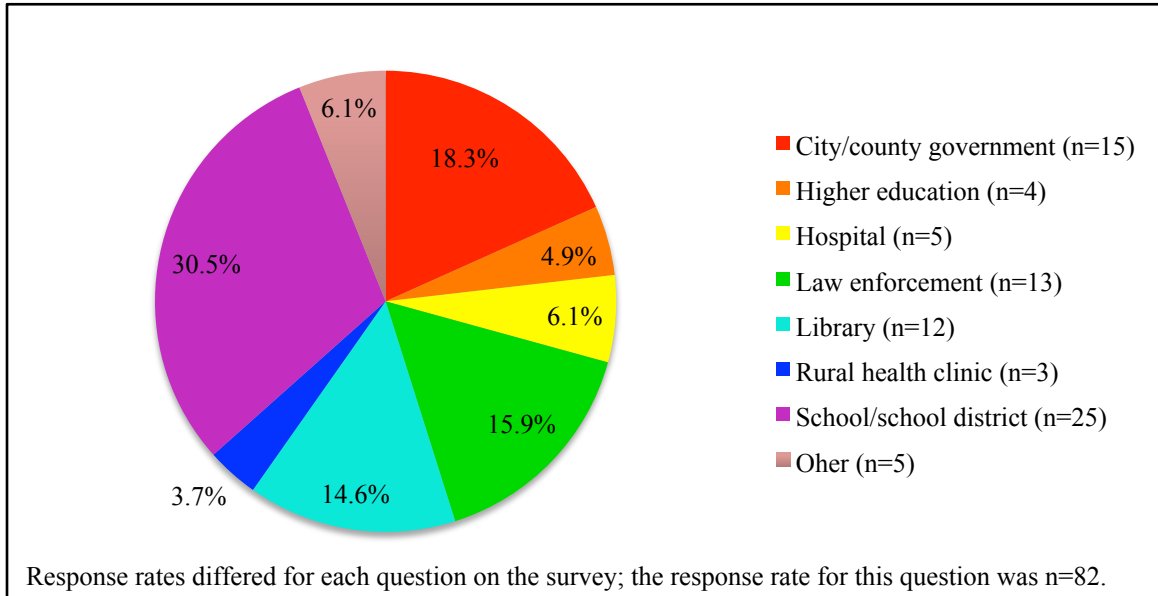


Figure 1. Respondents by Type of Anchor Institution

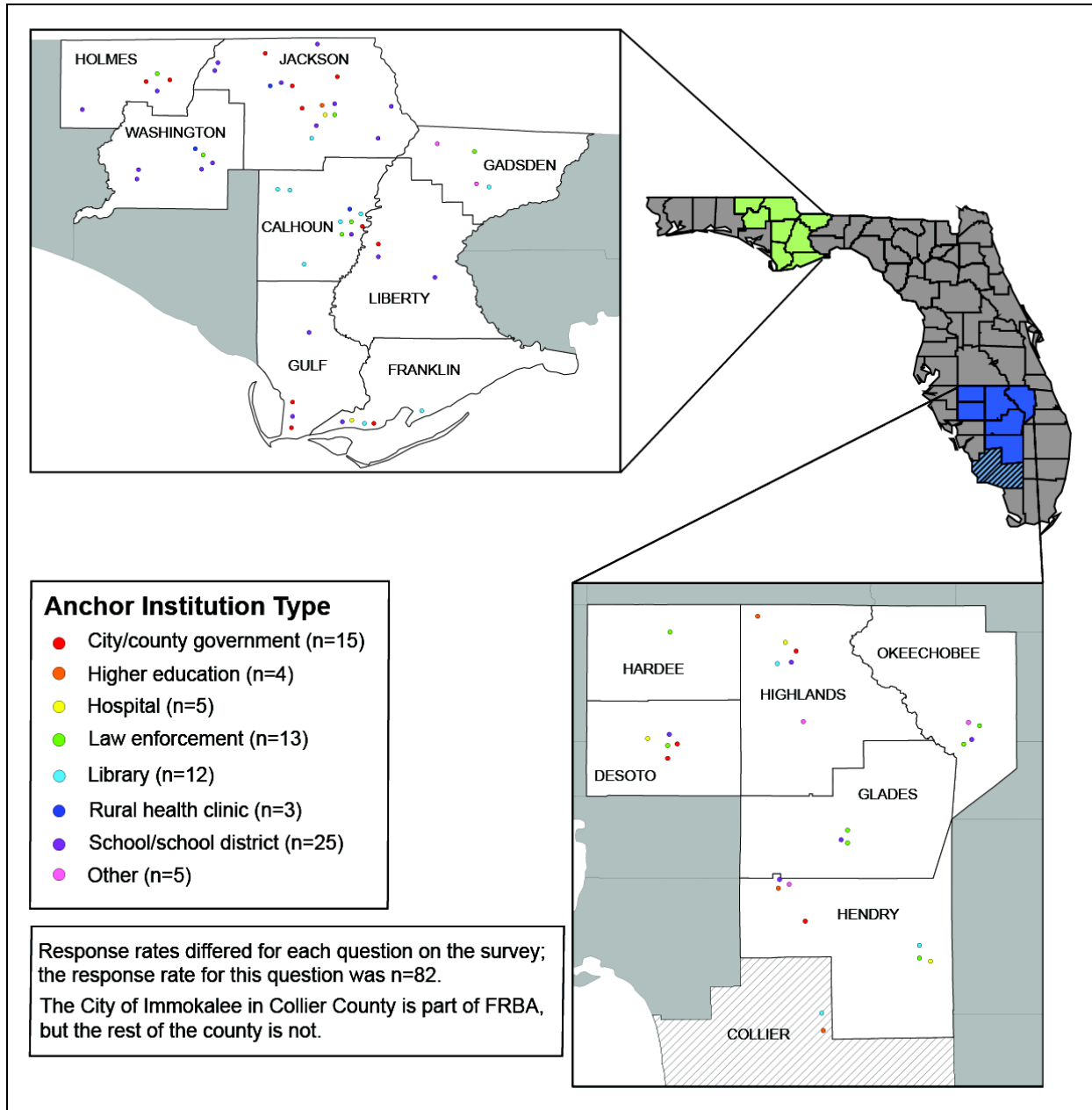


Figure 2. Type of Anchor Institution Respondents by County

Anchor institution representatives who completed the survey have a wide range of job titles (Table 3). Directors and managers constitute the largest group (45.0% including principal/assistant principal, administrator, director/interim director, library director, manager, president, mayor, commissioner, emergency management chief, manager/librarian, police chief, and sheriff). Many information technology (IT) staff also responded to the survey (26.3% including IT director, network manager, chief information officer, computer technician, and network specialist).

FRBA Broadband Needs Assessment: Fourth Interim Report

Table 3: Respondent's Job Title

| Title | n | % | Title | n | % |
|-------------------------------|----|-------|----------------------------|---|------|
| Network Manager | 11 | 13.8% | City/Town Clerk | 1 | 1.3% |
| Principal/Assistant Principal | 8 | 10.0% | Commissioner/BOCC | 1 | 1.3% |
| Operations Coordinator | 8 | 10.0% | Communications Supervisor | 1 | 1.3% |
| Director/Interim Director | 7 | 8.8% | Computer Technician | 1 | 1.3% |
| IT Director | 7 | 8.8% | Emergency Management Chief | 1 | 1.3% |
| Administrator | 5 | 6.3% | Lead Educator | 1 | 1.3% |
| Chief Information Officer | 5 | 6.3% | Manager | 1 | 1.3% |
| Network Specialist | 5 | 6.3% | Mayor | 1 | 1.3% |
| Police Chief | 5 | 6.3% | President | 1 | 1.3% |
| Library Director | 3 | 3.8% | School Librarian | 1 | 1.3% |
| Manager/Librarian | 2 | 2.5% | Sheriff | 1 | 1.3% |
| Purchasing | 2 | 2.5% | DMS Secretary | 1 | 1.3% |

Response rates differed for each question on the survey; the response rate for this question was n=80.

Existing and Future Broadband Uses and Applications

Year Anchors Obtained Service

A beginning point to looking at existing uses of broadband is to investigate when anchor institutions first obtained Internet connections. Survey respondents divide pretty evenly into the three categories of adopters: 31.2% can be considered early adopters, having acquired Internet in 1995 or earlier; 32.5% the early majority, having acquired Internet between 1996 and 1998; and 36.4% later broadband adopters, having acquired Internet connections in 1999 or later (Figure 3). The median year in which respondents obtained service is 1998, with service start dates reported from 1980-2010. Early adopters predominate in the northern FRBA counties and later adopters predominate in the southern FRBA counties (Figure 4).

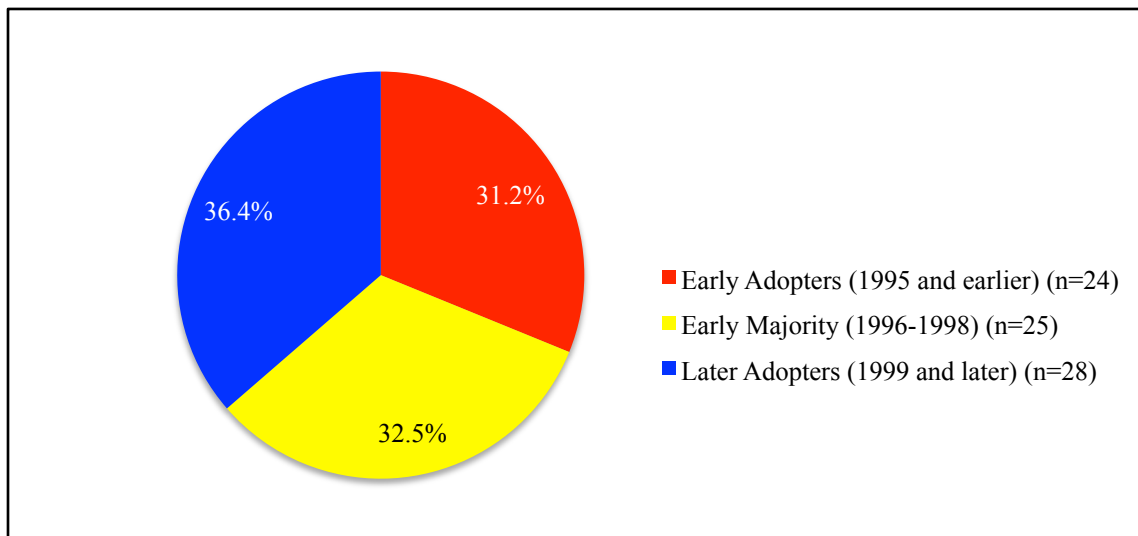


Figure 3. Year Respondents Obtained Internet Service

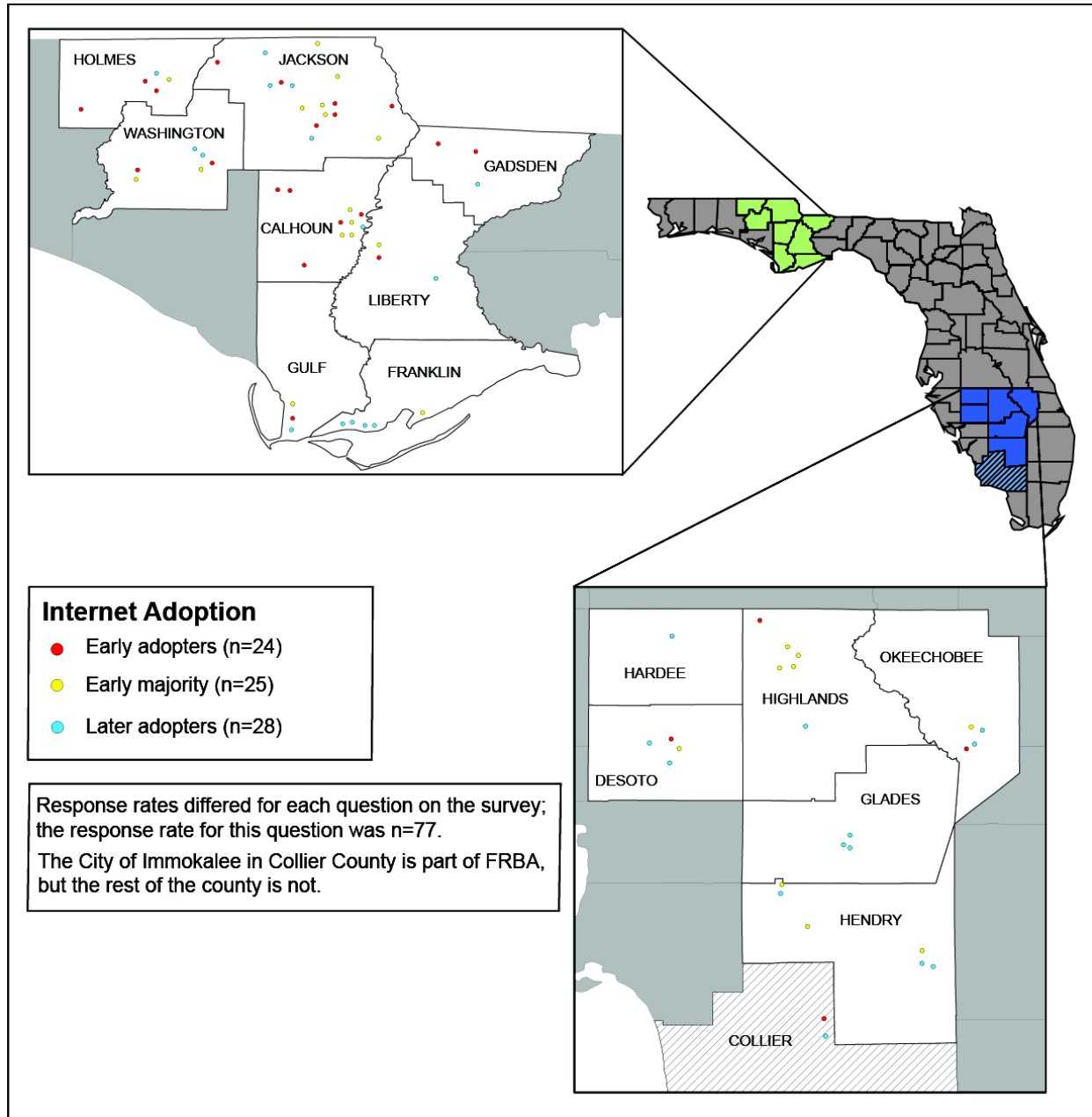


Figure 4. Year Respondents Obtained Internet Service by County

Wi-Fi Availability

In addition to looking at when anchor institutions first obtained the Internet, it is useful to know whether they offer Wi-Fi service on their broadband connections since sharing one connection for both landline and wireless Internet can degrade the speeds on both networks. The majority of institutions (70.8%) report having Wi-Fi networks, and the 29.2% of institutions that do not have Wi-Fi distribute fairly evenly in the northern and southern portions of the FRBA service area (Figure 5). In all counties, the majority or all of reporting institutions have Wi-Fi.

Nearly all of the anchor institutions reporting they have Wi-Fi service make it available to staff inside the building (96.1%), and 52.9% make it available to the public inside the building (Figure 6). The Wi-Fi umbrella covers areas outside the building for *staff* use in most cases but not for the *public*, with 52.9% of institutions reporting that staff and 33.3% reporting that the public can access the Wi-Fi network outside the building.

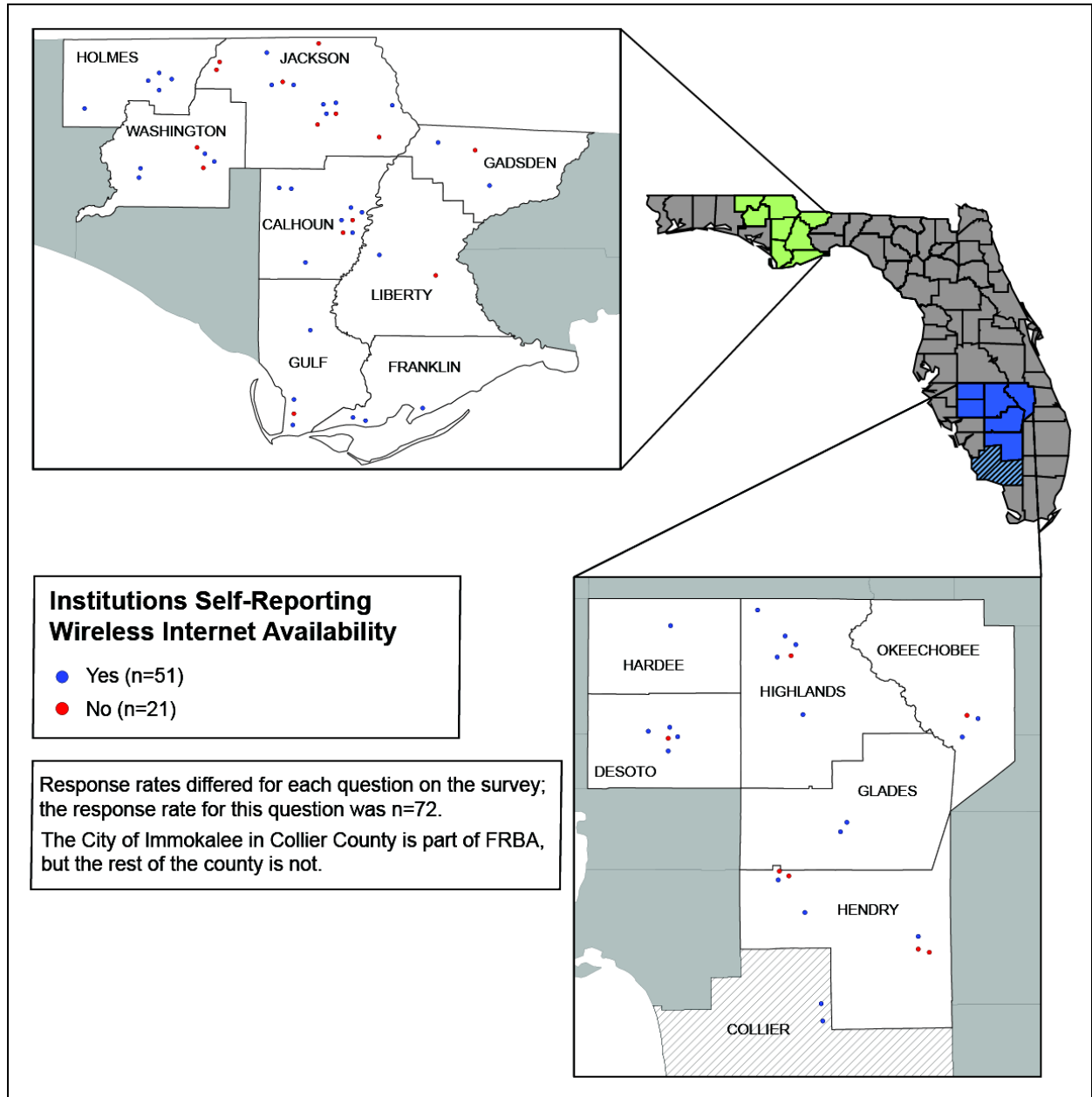


Figure 5. Institutions with and Without Wi-Fi by County

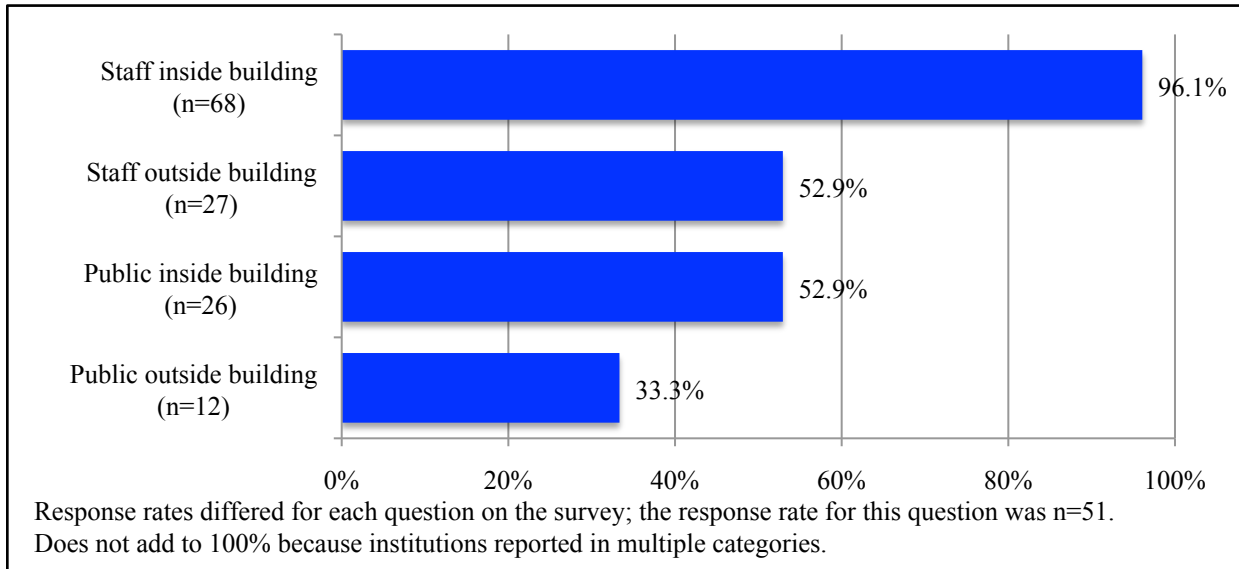


Figure 6. Availability of Wi-Fi to Staff and Public in Institutions with Wi-Fi

Uses of Broadband

Respondents identified the services for which the public uses broadband at their institution from a set list. Educational resources and databases (81.3%), email (71.9%), and e-government services (59.4%) dominate public use of the Internet at anchor institutions offering public Internet (Figure 7). Services for job seekers (56.3%), community information (53.1%), social networking (46.9%), and services to immigrant populations (46.9%) are also popular.

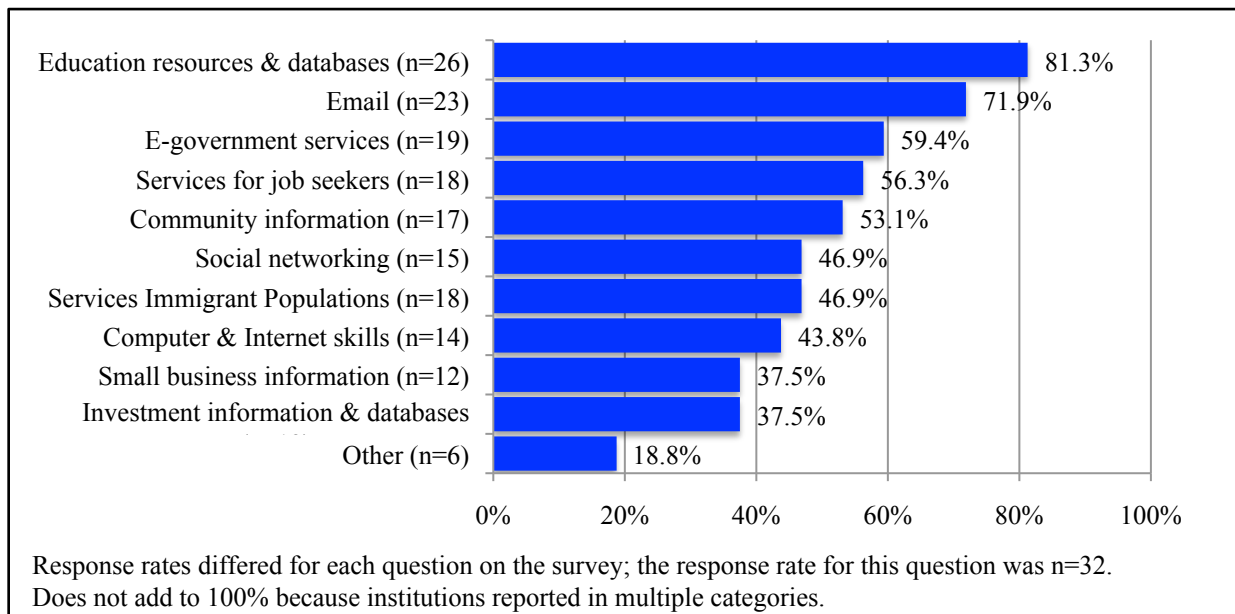


Figure 7. Applications and Tasks for Which the Public Uses the Internet

Examination of existing and future uses of broadband in anchor institutions must consider the degree to which the anchor institutions’ staffs and publics are comfortable with broadband and technology, as this may indicate future needs. Survey respondents assessed their staffs’ comfort level with a number of broadband-related skills on a 5-point scale ranging from Extremely Comfortable to Not at All Comfortable. Most institutions report that their staffs are extremely or very comfortable with basic computer skills such as using a mouse (83.3%), basic Internet skills such as getting online (81.9%), and basic email skills such as writing and sending email (77.8%) (Figure 8). The story is very different for basic broadband (31.9% of institutions reporting that their staffs are extremely or very comfortable with knowing what broadband is or its uses), advanced Internet skills such as searching for information and determining its accuracy (29.2% report staff are extremely or very comfortable), basic wireless (25.0% report staff are extremely or very comfortable with knowing what wireless is or its uses), advanced wireless (22.2% reporting staffs are extremely or very comfortable with skills such as configuring a network), and advanced broadband (11.1% reporting staffs are extremely or very comfortable with skills such as configuring an internal network). It should be noted that the last two skill sets are those at which the entire staff would not be expected to be proficient since those are likely the domain of IT staff.

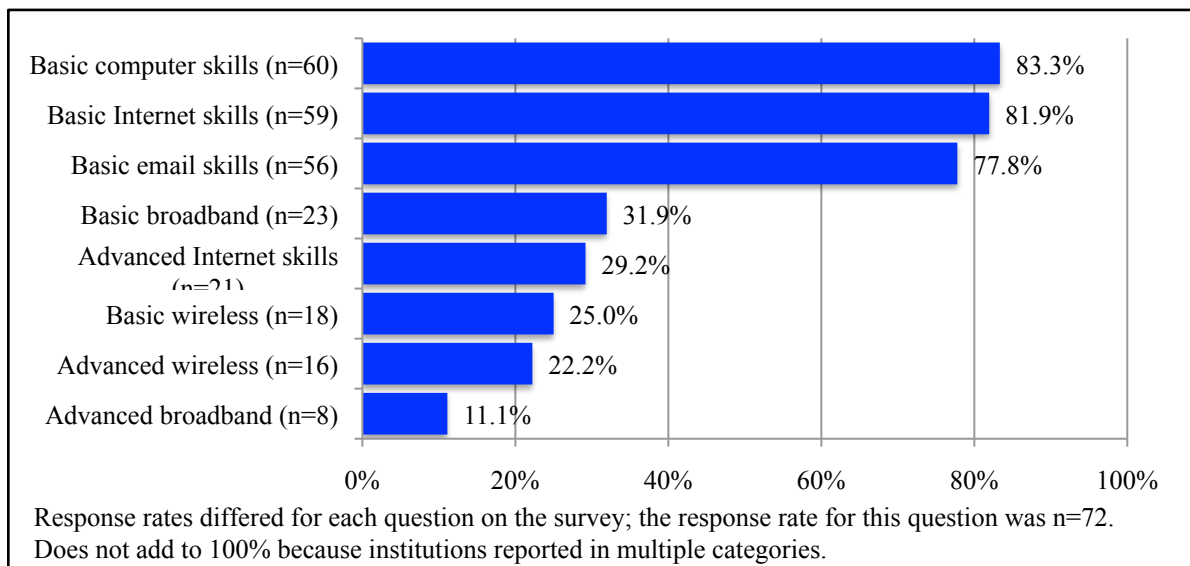


Figure 8. Staff Comfort with Internet-related Topics-Extremely/Very Comfortable (5 Point Scale)

In contrast, anchor institutions report that a fairly low percent of the rural public is comfortable with even basic skill sets such as basic Internet (44.4%), basic computer (42.2%), and even basic email skills (42.2%) (Figure 9). About a third of institutions report their public users are extremely or very comfortable with advanced Internet skills (31.1%). In contrast to these four skillsets, institutions report very low levels of public comfort with basic wireless, basic broadband, advanced wireless, and advanced broadband, with extremely low response numbers (n=5 or fewer) for these skills.

FRBA Broadband Needs Assessment: Fourth Interim Report

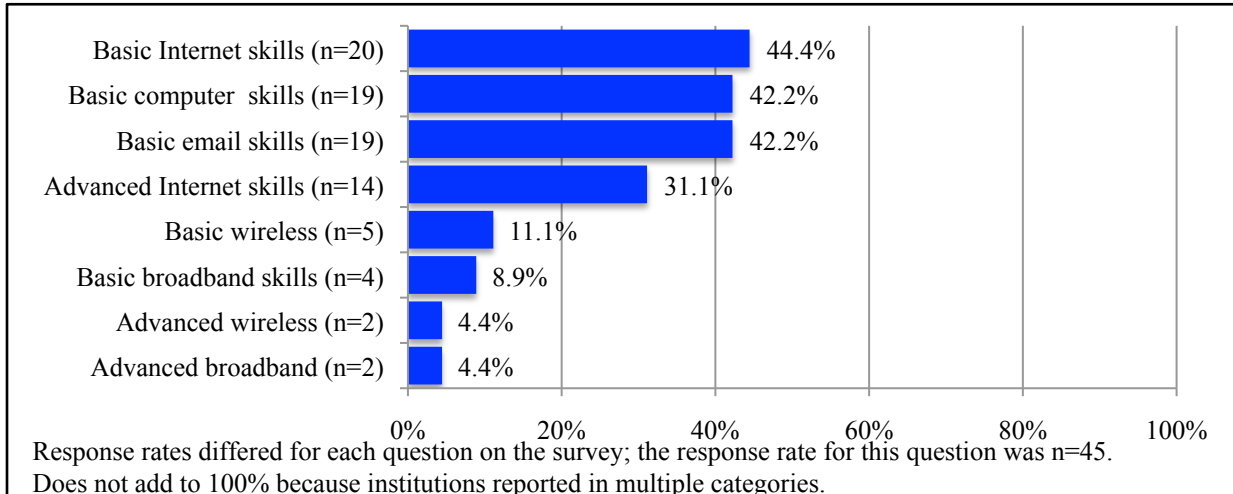


Figure 9. Public Comfort with Internet-related Topics-Extremely/Very Comfortable (5 Point Scale)

Given the broadband-related tasks already occurring at anchor institutions and the discussion about staff and public comfort levels with technology topics, it is important to consider what types of training anchor institutions are offering to their staffs and public users. The largest percentage of institutions reports no plans for staff training in the next year (52.9%), but about a quarter of institutions are planning some advanced Internet training for staff (Figure 10). There are almost no plans for advanced broadband training (5.7%), so staff comfort levels in this area may not rise in the near future. Little formal training is planned for the public on Internet and broadband topics (Figure 11).

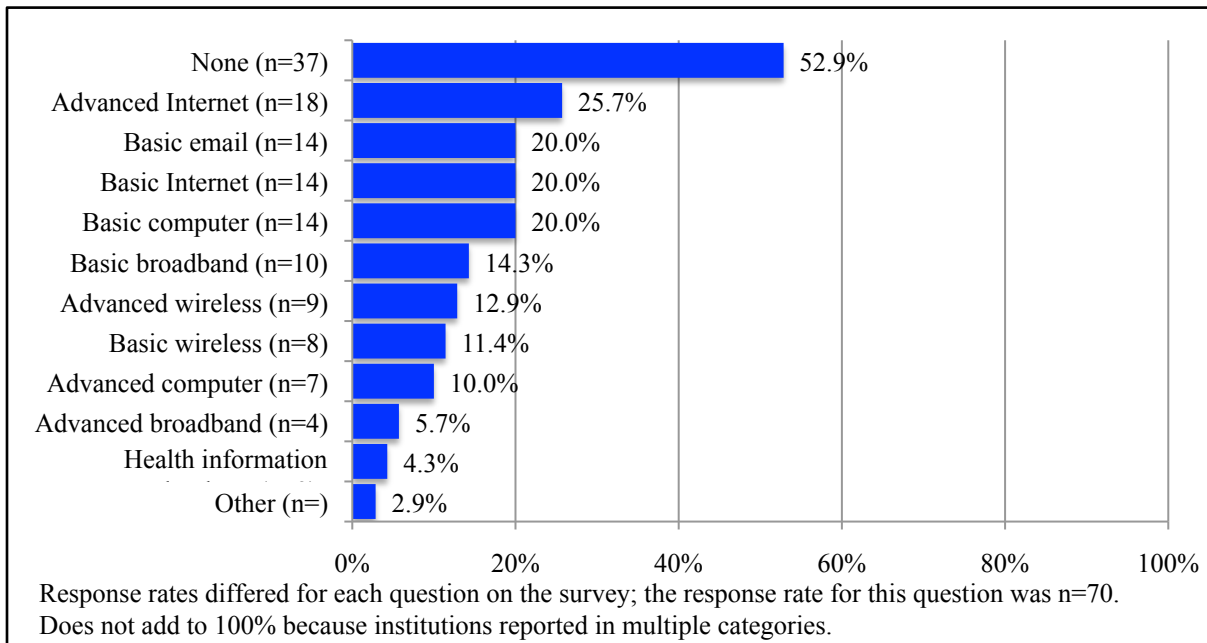


Figure 10. Plans for Staff Training Within the Next Year by Topic

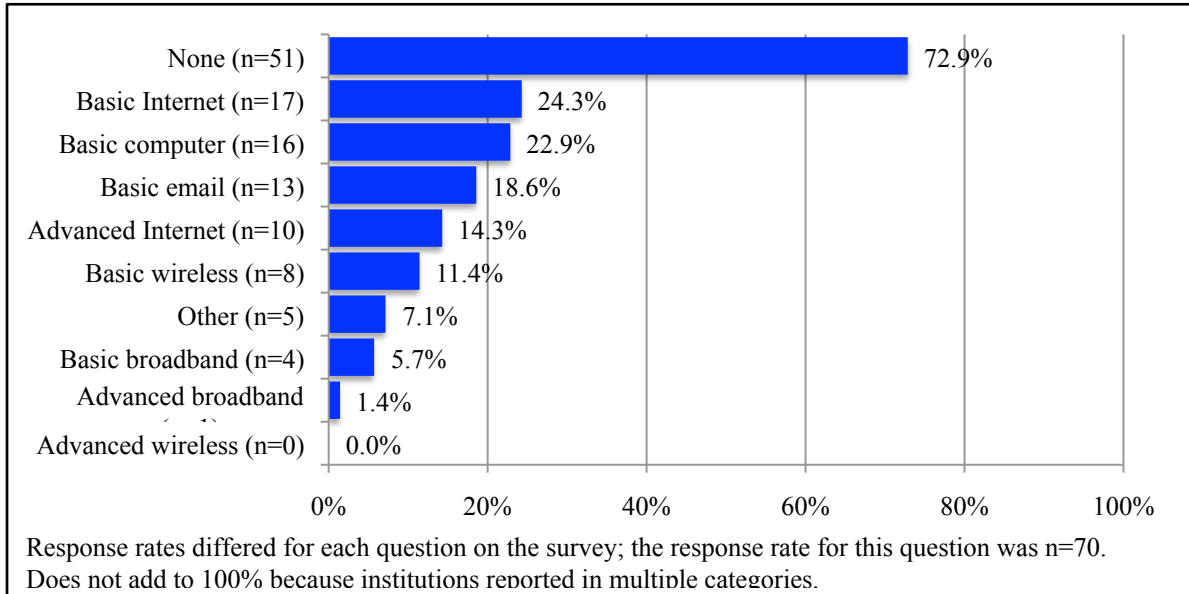


Figure 11. Plans for Public Training Within the Next Year by Topic

Adequacy of Current Broadband to Meet Staff and User Needs

The majority of respondents indicate that Internet speeds meet staff needs with Most of the Time (69.0%) and Sometimes (16.9%) (Figure 12). Relatively few respondents (8.5%) say that their broadband is always sufficient to meet staff needs. Only 4.2% say that their needs are rarely met and 1.4% report that their needs are never met, so anchor institutions’ Internet is meeting staff needs at least some of the time. The story for the sufficiency of broadband for meeting public needs is fairly similar, with 66.7% reporting that broadband is sufficient most of the time and 16.7% reporting that it is sufficient sometimes (Figure 13). Also, a small percentage (5.6%) report that their broadband rarely meets the public’s needs.

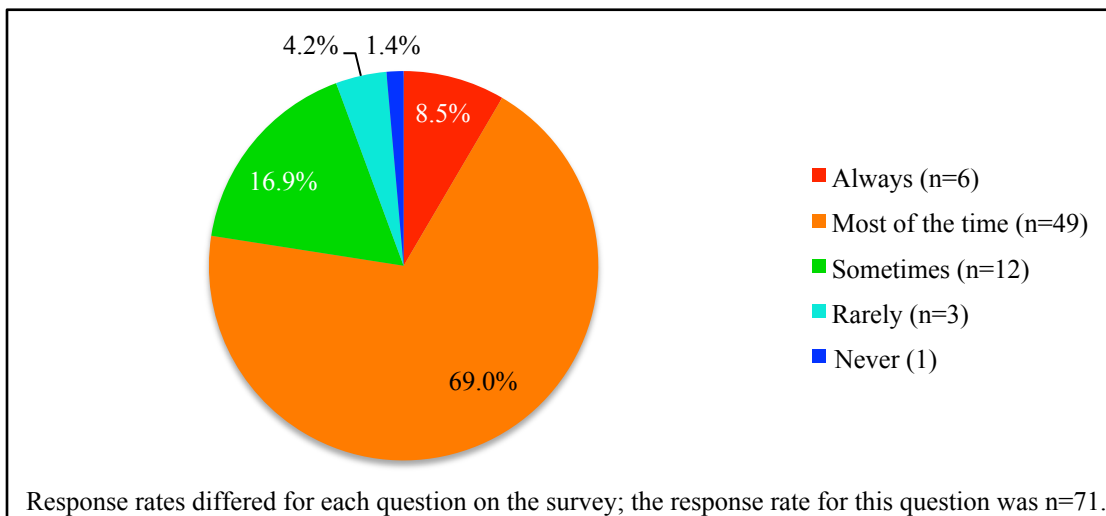


Figure 12. How Often Internet Speed Meets Staff Needs

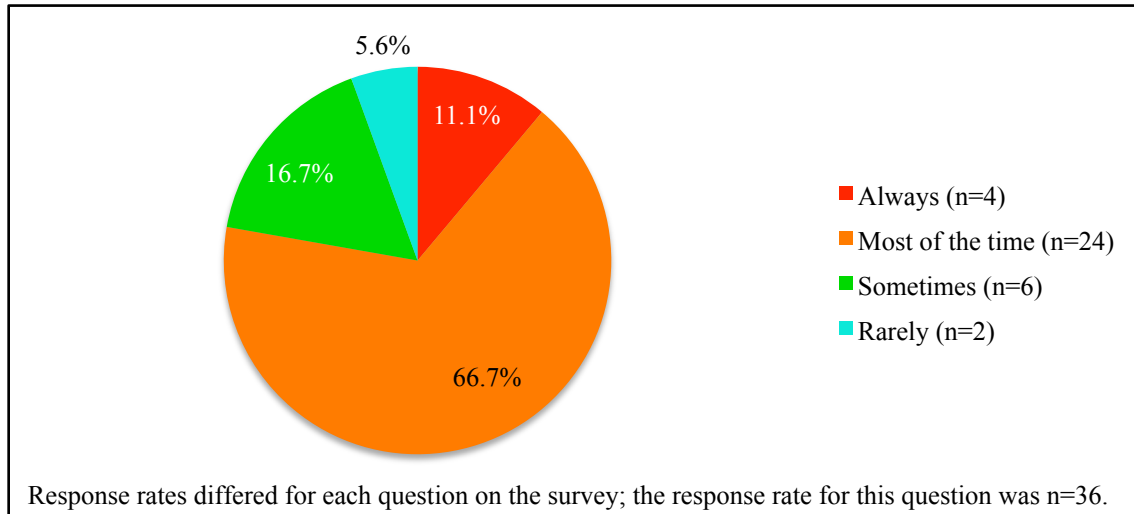


Figure 13. How Often Internet Speed Meets Public Needs

Perceived Economic Benefit of Increased Broadband Connectivity

The FRBA survey asked respondents to indicate the degree to which they perceived broadband connectivity to have economic benefits. The majority (61.2%) report that they perceive broadband connectivity to have a very high or high degree of impact on economic benefits (Figure 14). Relatively few respondents perceive a low degree (6.9%) or no degree (5.6%) of economic benefit from broadband connectivity.

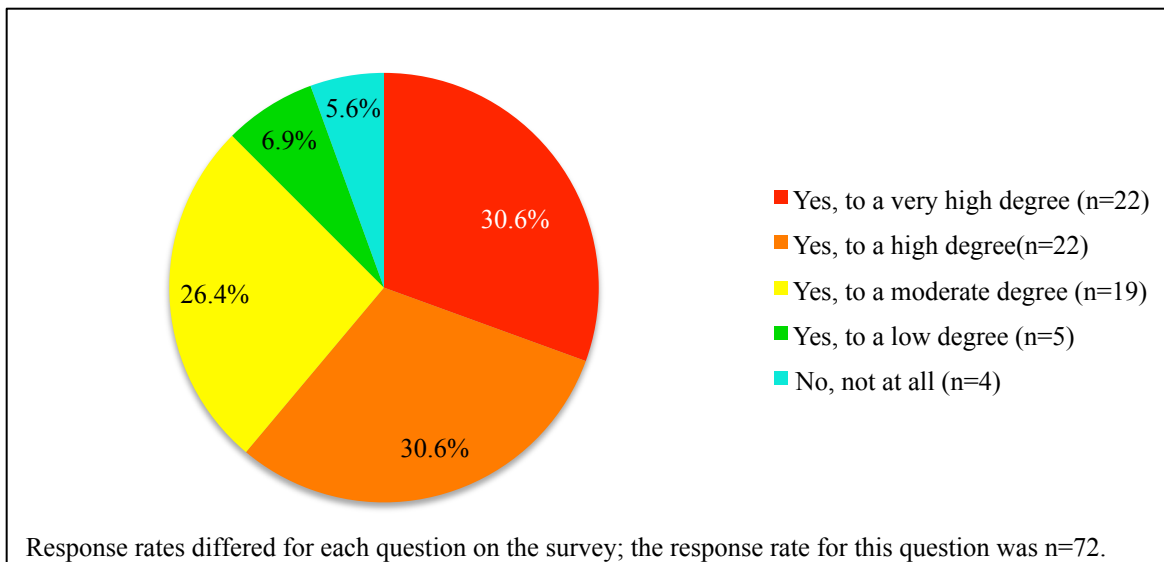


Figure 14. Perceived Economic Benefit of Increased Broadband Connectivity

Existing Bandwidth Purchased at the “Front Door” Compared to Workstation-Level Speeds

Connection Speed

More than half of institutions have advertised connection speeds in the range of 1.6-10 Mbps, with 20.3% reporting speeds of 1.6-5 Mbps and 30.4% reporting speeds of 5.1-10 Mbps (Figure 15). Slightly over 16% of institutions have advertised speeds at or below 1.5 Mbps; on the other hand, 32.9% have advertised speeds of 10.1 Mbps or greater. Law enforcement and rural health clinics are the only anchor institution types not to report advertised speeds greater than 20 Mbps, and city/county government, law enforcement, and rural health clinics were the only institutions reporting speeds of less than 1.5 Mbps (Figure 16). This indicates there is a wide range of speeds present in city/county governments as this category of anchor includes institutions in both the greater than 20 Mbps and less than 1.5 Mbps ranges, with equal numbers of city/county governments reporting speeds in each range (20.0% for each).

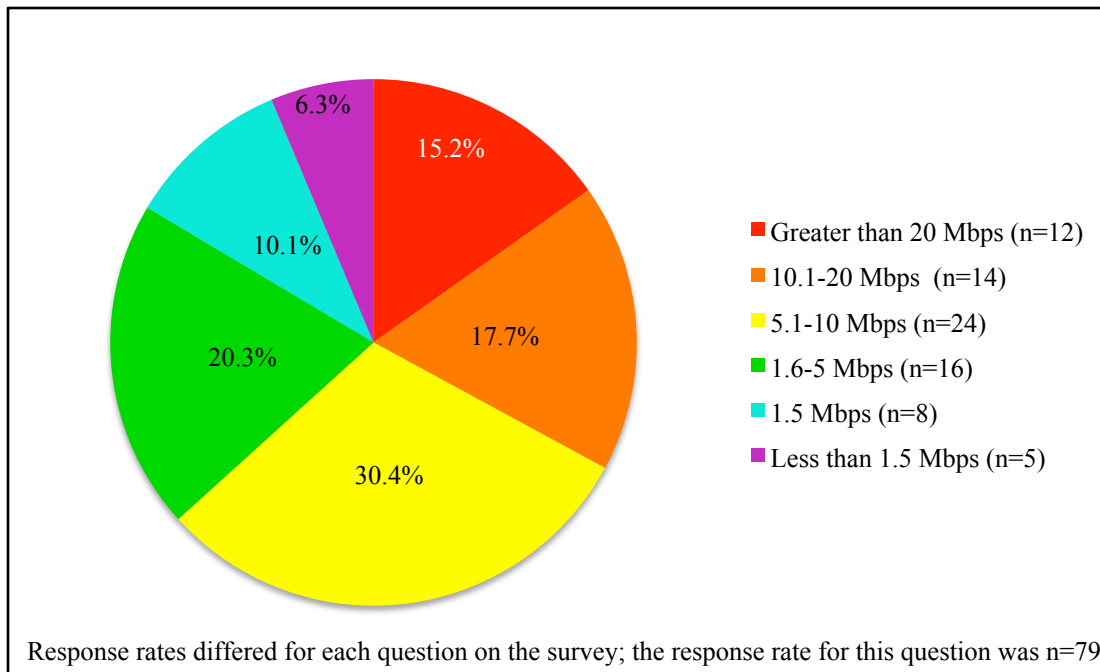


Figure 15. Advertised Speed at the “Front Door”

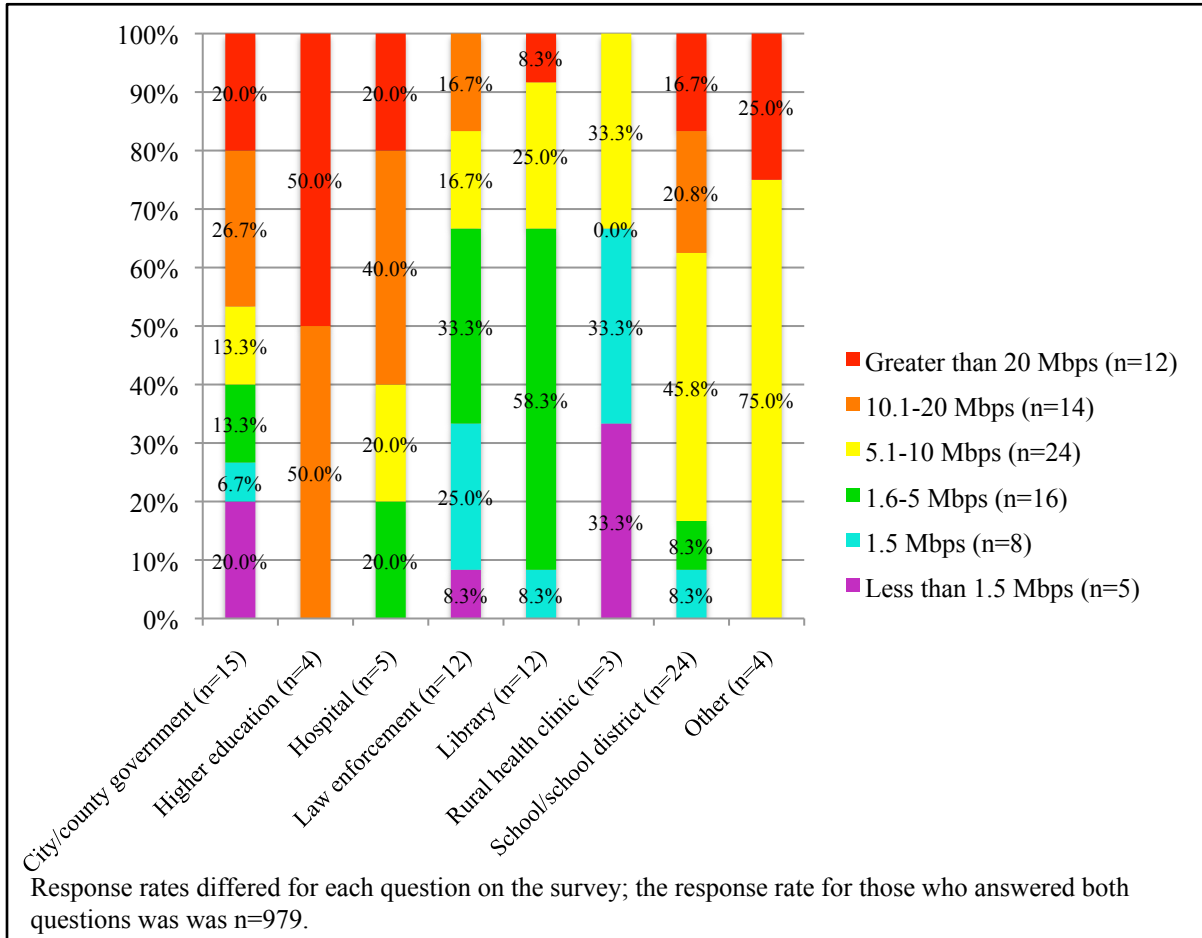


Figure 16. Advertised Speed at the “Front Door” by Type of Anchor

Respondents completed speed tests (using <http://speedtest.net/>) on one staff workstation and one public workstation per institution (for institutions that have public access workstations). Almost half (45.5%) of staff workstations have downstream speeds of 1.6-5 Mbps (Table 4). This is substantially higher than the percentage of institutions reporting advertised speeds in this range (20.3%). The comparison of actual speed to advertised speed displays the largest variations in the two highest speed categories: while 17.7% of institutions report an advertised speed of 10.1-20 Mbps, 9.1% report that downstream speed at a staff workstation, and while 15.2% report an advertised speed greater than 20 Mbps, 7.6% report that downstream speed at a staff workstation. These results indicate that many anchor institutions are not getting the advertised speed at the workstation level, particularly in the highest speed ranges. Upstream speed test results at staff workstations show an even larger disparity: 37.3% of respondents report a measured speed of 1.5 Mbps or lower compared to 16.4% who report an advertised speed of 1.5 Mbps or slower. Fewer than 20% of the anchors report their public workstations have downstream speeds greater than 5 Mbps (18.0%), 44.4% have downstream speeds at or below 1.5 Mbps, and 62.9% of all public workstations report upstream speeds at or below 1.5 Mbps (Table 5).

FRBA Broadband Needs Assessment: Fourth Interim Report

Table 4: Comparison of Advertised Speed to Measured Speed at a Staff Workstation

| | Less than 1.5 Mbps | 1.5 Mbps | 1.6-5 Mbps | 5.1-10 Mbps | 10.1-20 Mbps | Greater than 20 Mbps |
|---------------------------------|-----------------------|-------------|---------------|----------------|-----------------|----------------------------|
| Advertised Speed | 6.3% | 10.1% | 20.3% | 30.4% | 17.7% | 15.2% |
| Downstream at Staff Workstation | 9.1% | 1.5% | 45.5% | 27.3% | 9.1% | 7.6% |
| Upstream at Staff Workstation | 34.3% | 3.0% | 35.8% | 17.9% | 7.5% | 1.5% |

Table 5: Comparison of Advertised Speed to Measured Speed at a Public Workstation

| | Less than 1.5 Mbps | 1.5 Mbps | 1.6-5 Mbps | 5.1-10 Mbps | 10.1-20 Mbps | Greater than 20 Mbps |
|----------------------------------|-----------------------|-------------|---------------|----------------|-----------------|----------------------------|
| Advertised Speed | 6.3% | 10.1% | 20.3% | 30.4% | 17.7% | 15.2% |
| Downstream at Public Workstation | 3.7% | 40.7% | 40.7% | 3.7% | 11.1% | 3.7% |
| Upstream at Public Workstation | 33.3% | 29.6% | 25.9% | 7.4% | 3.7% | 33.3% |

Advertised speeds vary widely across the counties, but institutions in only half of the counties report speeds above 20 Mbps (Figure 17). Hardee County has no institutions reporting advertised speeds above 5 Mbps, but only one institution reported in Hardee County for this question. The speed story detailed above—lower actual speeds than advertised speeds—is true by county as well; Figures 17-19 show the difference in advertised speeds versus downstream speeds at staff and public workstations.

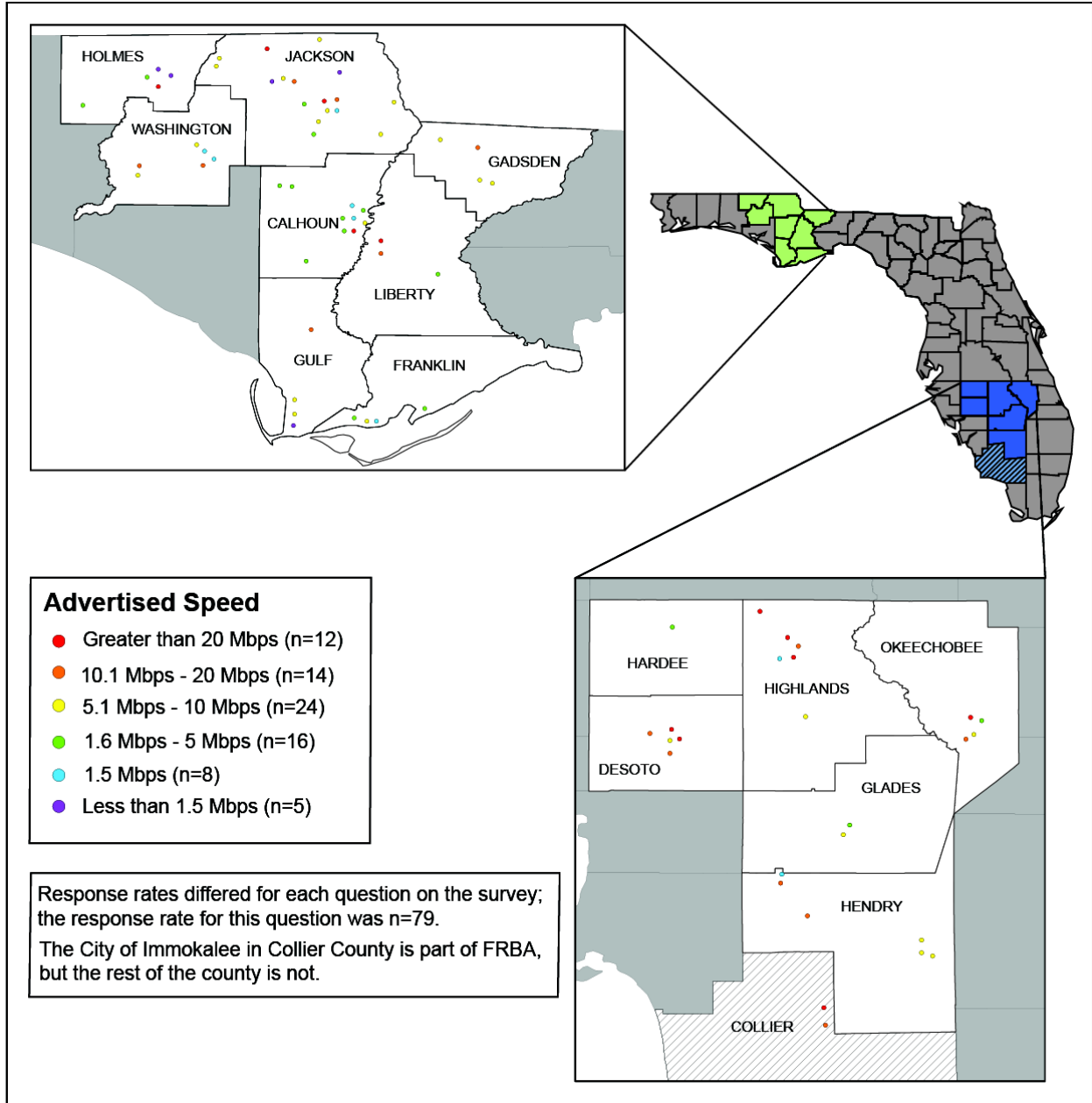


Figure 17. Advertised Speed at the “Front Door” by County

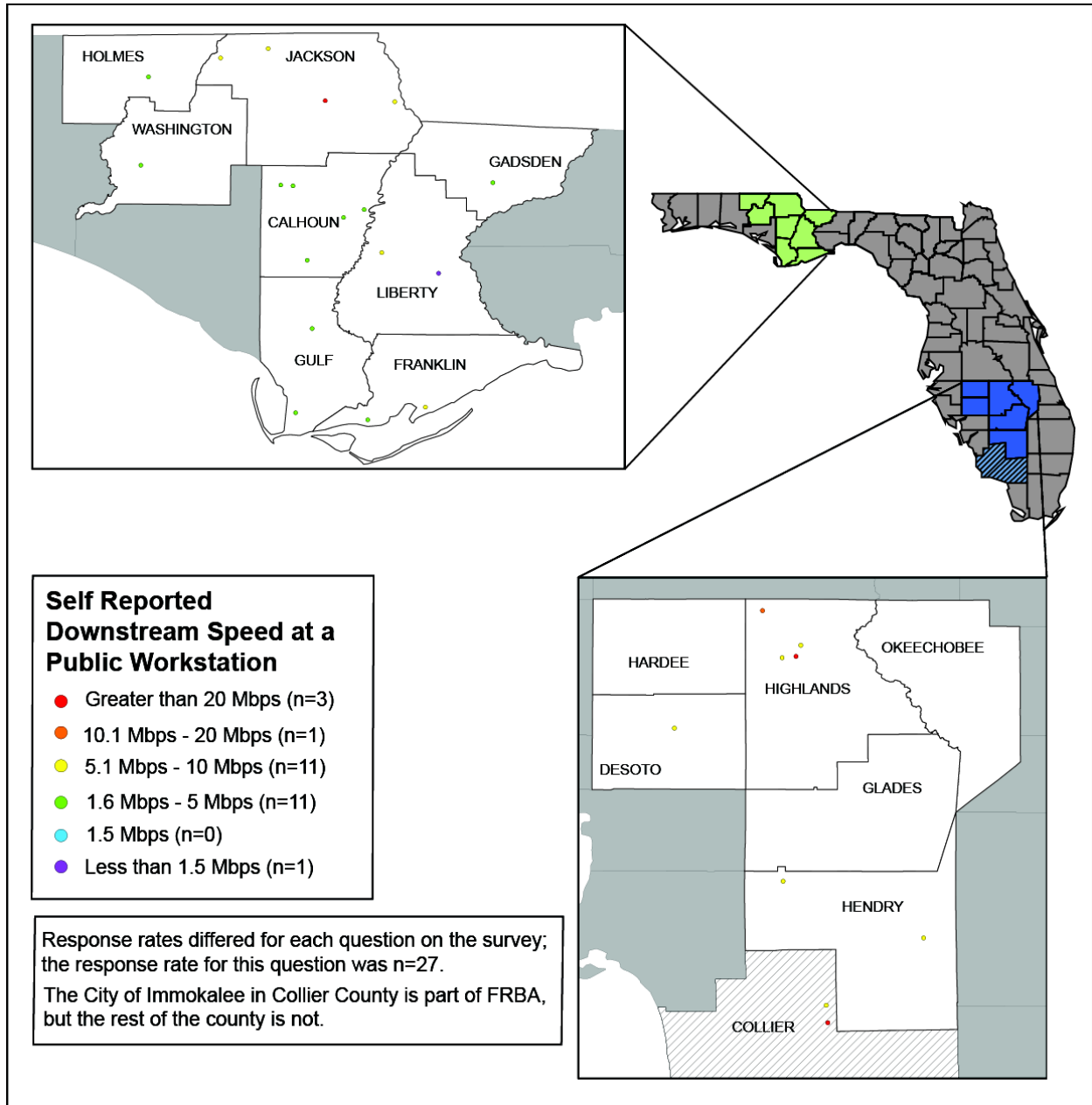


Figure 18. Actual Downstream Speed by County—Staff Workstation

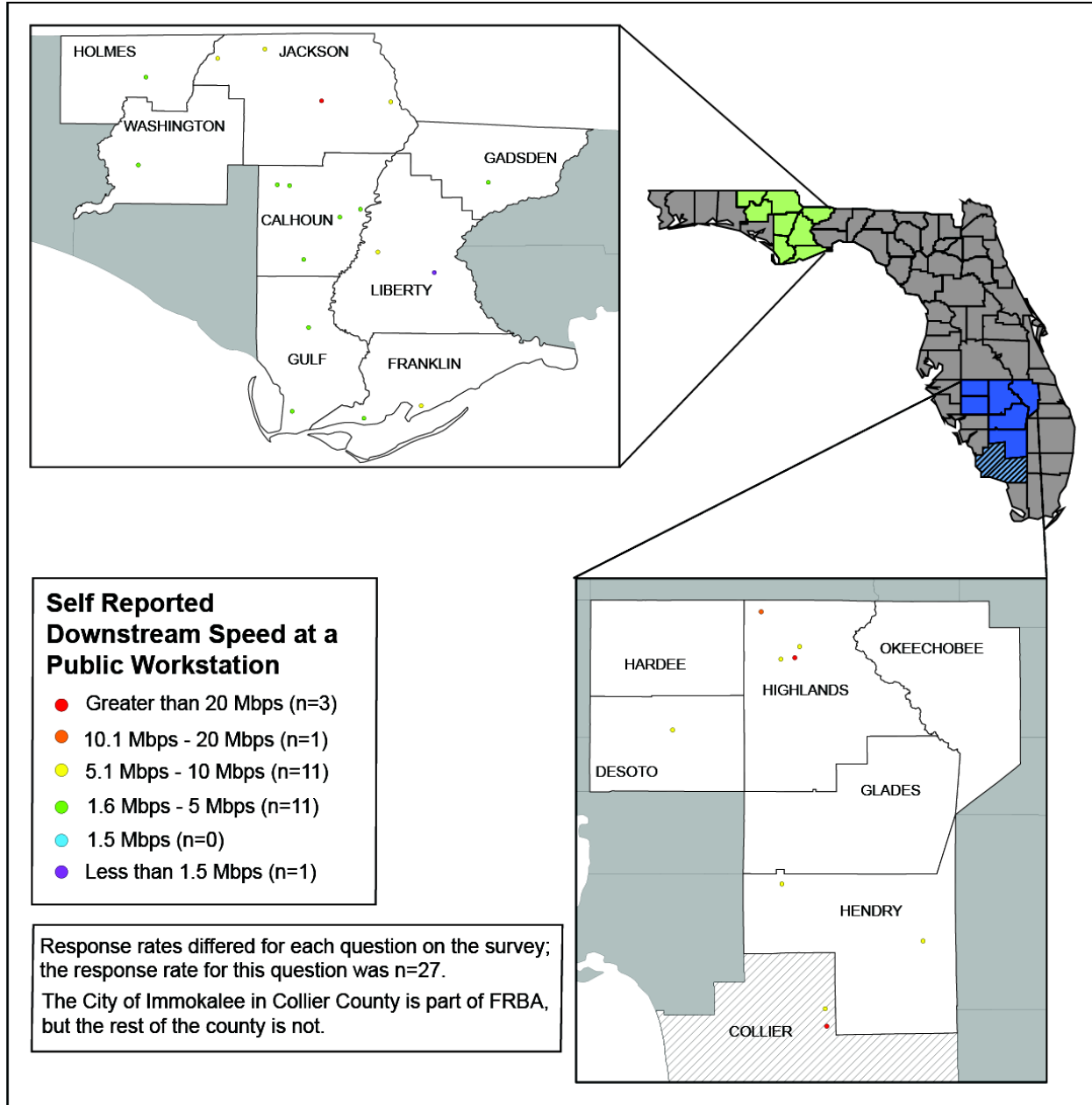


Figure 19. Actual Downstream Speed by County—Public Workstation

Staff and Public Workstations

In addition to having slower downstream and upstream speeds than advertised at both staff and public workstations, anchor institutions use relatively older computers. Over half (28.2%) of all staff workstations at reporting anchor institutions are 3-4 years old or over 4 years old (Figure 20). In contrast, 14.0% of reported staff workstations are less than a year old. Similarly to staff workstation age, public workstations that are 3-4 years old comprise over half (54.2%) of all public workstations in reporting institutions (Figure 21). However, about one-third (33.1%) of all reported public workstations are less than one year old.

FRBA Broadband Needs Assessment: Fourth Interim Report

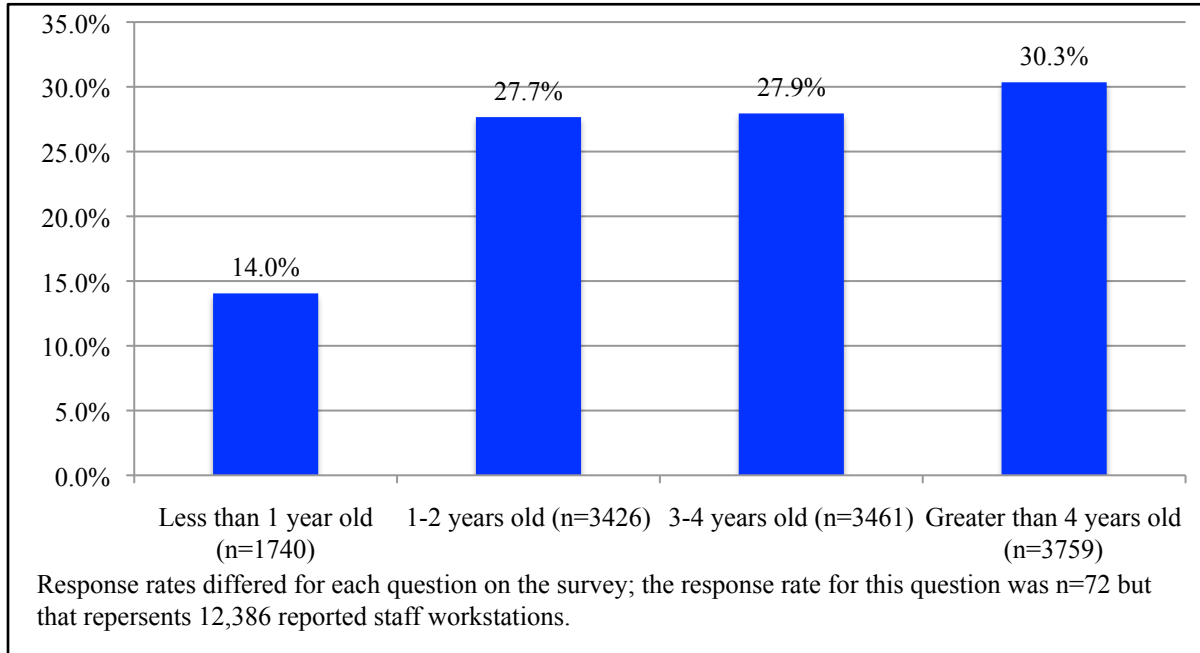


Figure 20. Age of Staff Workstations (Based on Total Number of Reported Workstations)

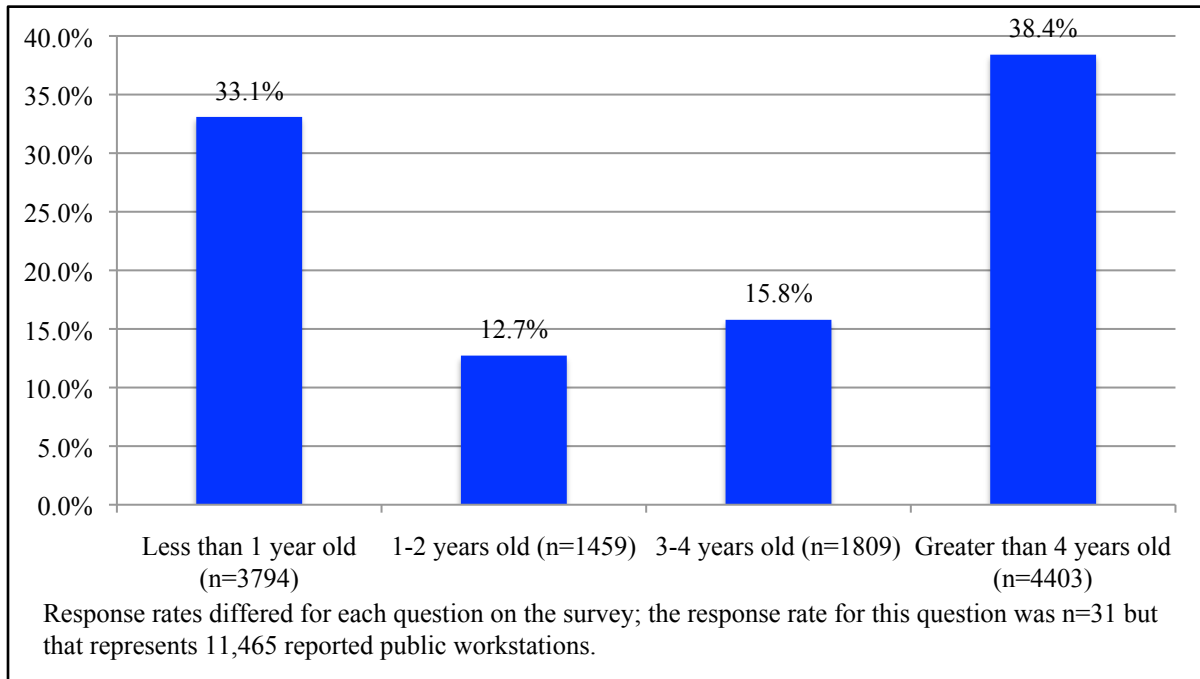


Figure 21. Age of Public Workstations (Based on Total Number of Reported Workstations)

Current Cost for Anchor Institution Bandwidth

Internet Cost and Source of Funds

Institutions are paying a wide range of costs for their Internet service. The majority (59.0%) pay more than \$5,000 per year (Figure 22). Two institutions report paying over \$50,000 per year, and 55.7% pay \$5,000-\$49,999 annually. The two institutions paying over \$50,000 annually are in DeSoto and Highlands Counties, both of which are in the southern portion of the FRBA service area (Figure 23). The median cost among all respondents is \$7,080 per year, with a range of \$500 to \$192,000 for annual Internet service charges. The majority of funds (56.4%) used to pay for Internet service come from institutions' own budgets, with county/regional (25.6%) and state (15.4%) budgets representing most of the balance (Figure 24).

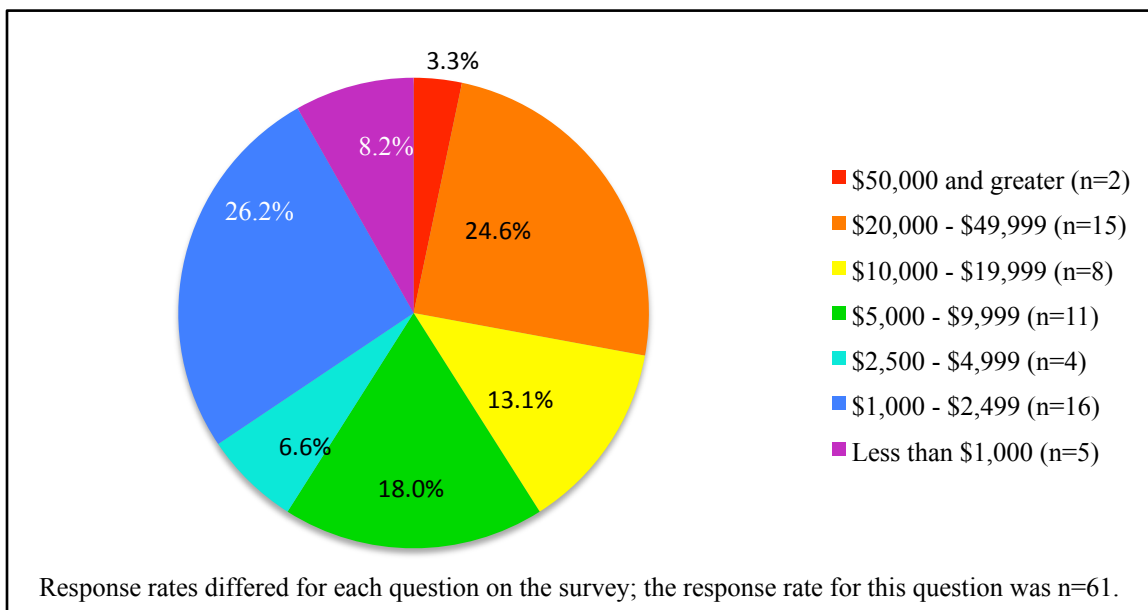


Figure 22. Total Annual Cost of Internet Service (All Institutions)

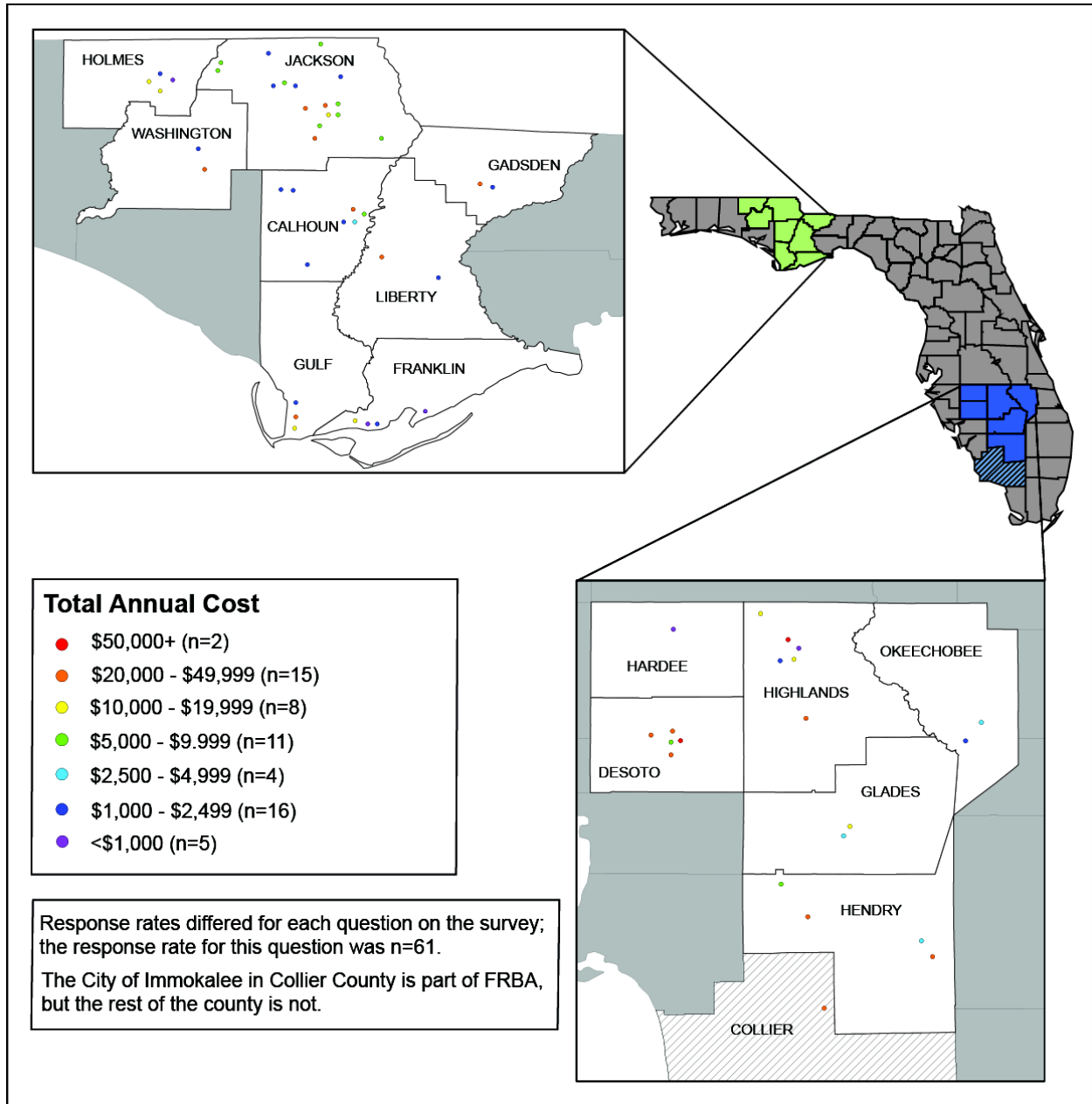


Figure 23. Total Annual Cost of Internet Service by County (All Institutions)

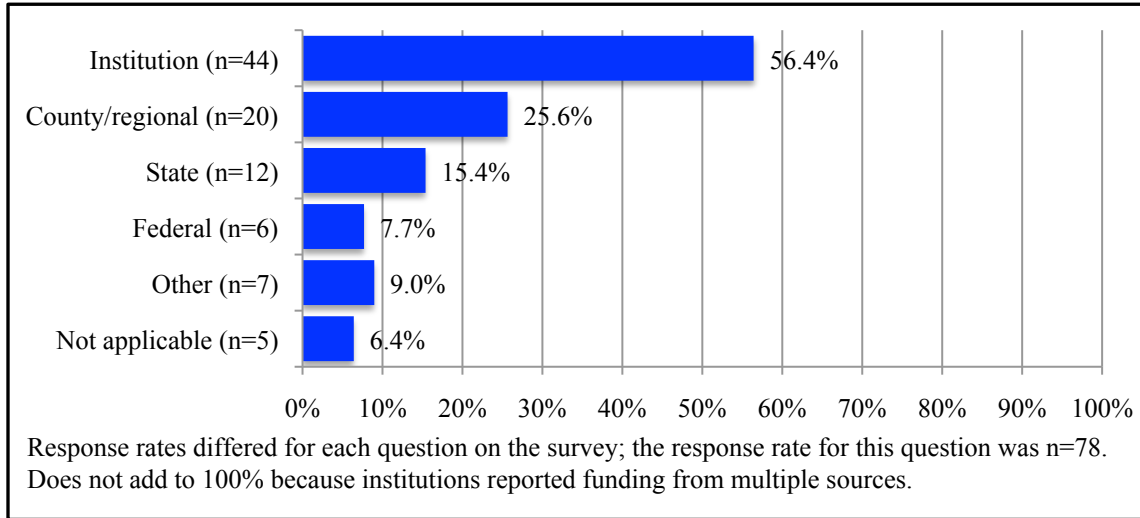


Figure 24. Source of Funds to Pay for Internet Service

Most schools and libraries (69.3) still pay \$5,000 or more per year after their E-rate discounts;¹¹ 23.1% pay less than \$1,000 (Figure 25). Even with a federal discount on their Internet costs, schools and libraries in FRBA still pay substantial annual Internet fees to their Internet Service Providers (ISPs)¹², which explains why the majority of all reporting institutions pay more than \$5000 per year. In fact, six schools and libraries pay \$20,000-\$49,999 per year *after* their E-rate discounts. It is not clear why schools and libraries in the FRBA service area pay such high fees after E-rate discounts.

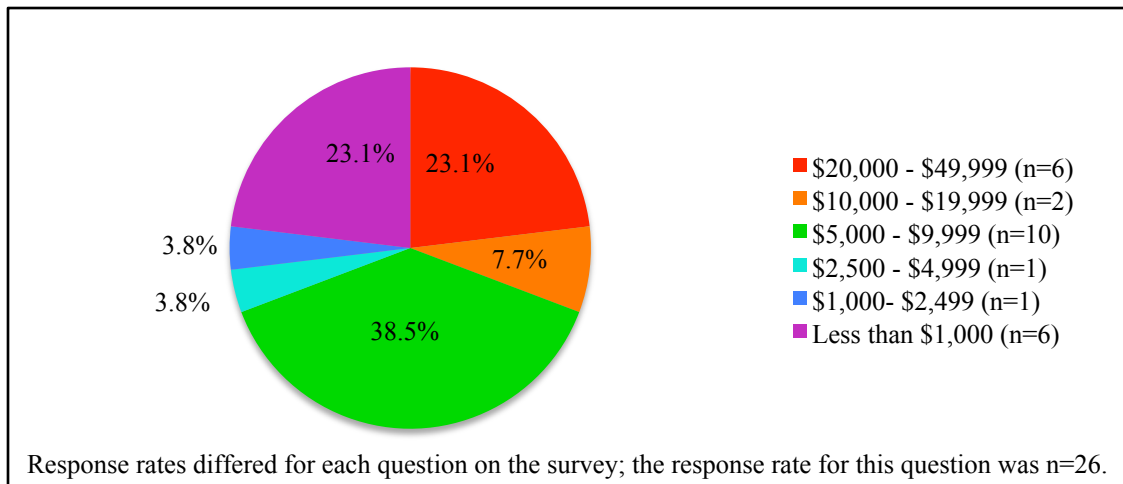


Figure 25. Total Annual Internet Cost for Schools and Libraries After E-rate Discount

¹¹ E-rate is a federal subsidy program for schools and libraries to obtain discounted telecommunications service, including Internet. Discounts are based on the percentage of the school age population receiving free or reduced lunch within the entire service population. For more information, see: <http://www.usac.org/sl/>

¹² An Internet Service Provider (ISP) is a company that provides the front-door connection to the Internet, such as AT&T, Comcast, and in Florida, the Department of Management Services. ISPs for the FRBA service area are discussed below.

Vendor(s) Currently Supplying Existing Anchor Institution Bandwidth

Type of Connection and Internet Service Provider

Slightly under half of respondents (46.8%) have fiber connections, followed by DSL (31.6%) and Ethernet (11.4%) (Figure 26). Respondents subscribe to a range of ISPs. The most frequently reported ISPs are Century Link (45.6%), followed by Fairpoint Communications (15.2%) (Figure 27). About 20% of respondents report being on the DMS state contract or with AT&T (10.1% each); both of these figures may represent AT&T subscribers given that AT&T is the provider on the state contract, in areas where AT&T offers service. The same percentage (6.3%) report subscribing to Comcast as report having a cable modem (Figure 26). The survey shows a regional distribution of ISPs. Century Link predominates in the southern portion of the FRBA service area, and Fairpoint Communications subscribers concentrate most in the northern portion of the FRBA service area (Figure 28).

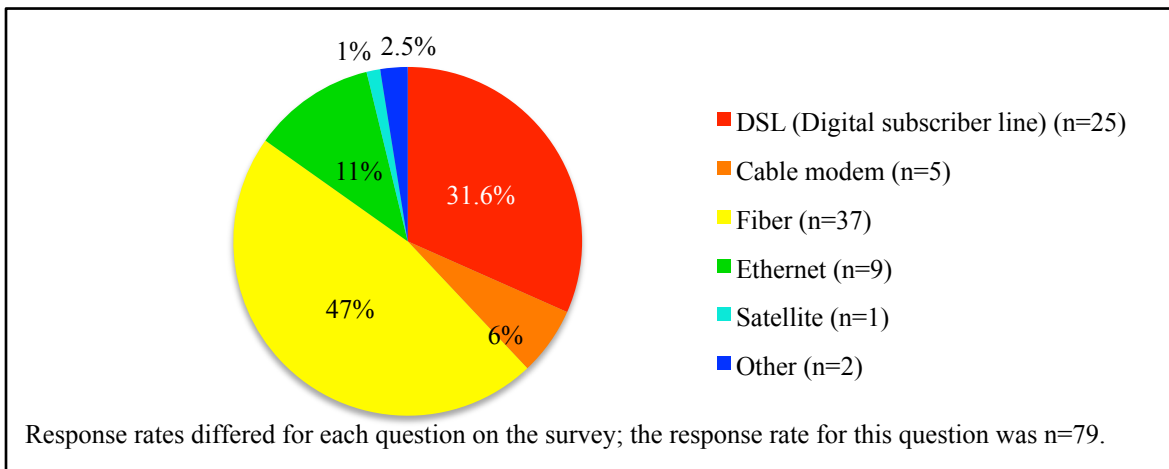


Figure 26. Respondents by Type of Internet Connection

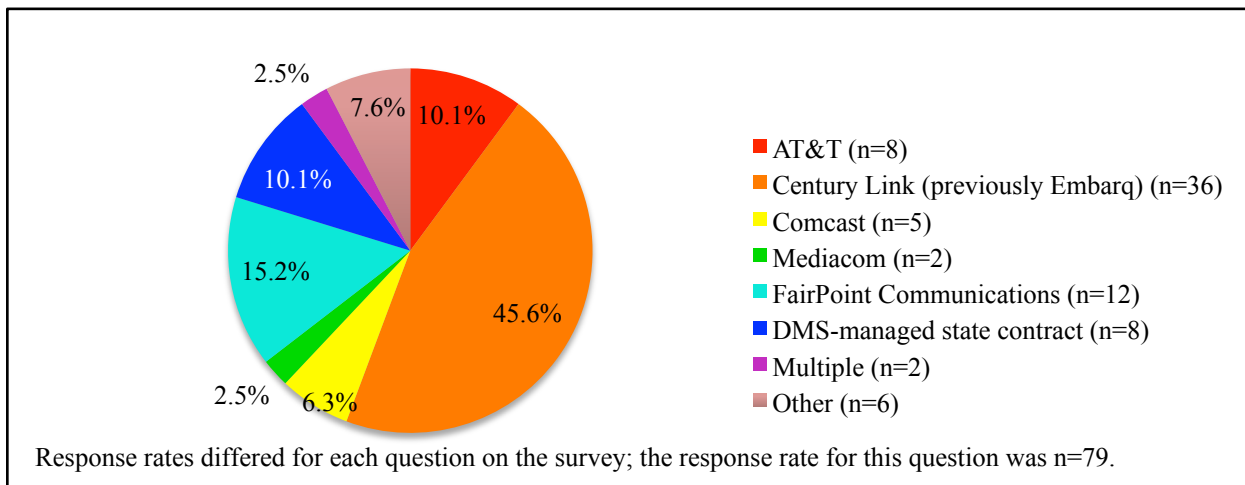


Figure 27. Respondents by Internet Service Provider

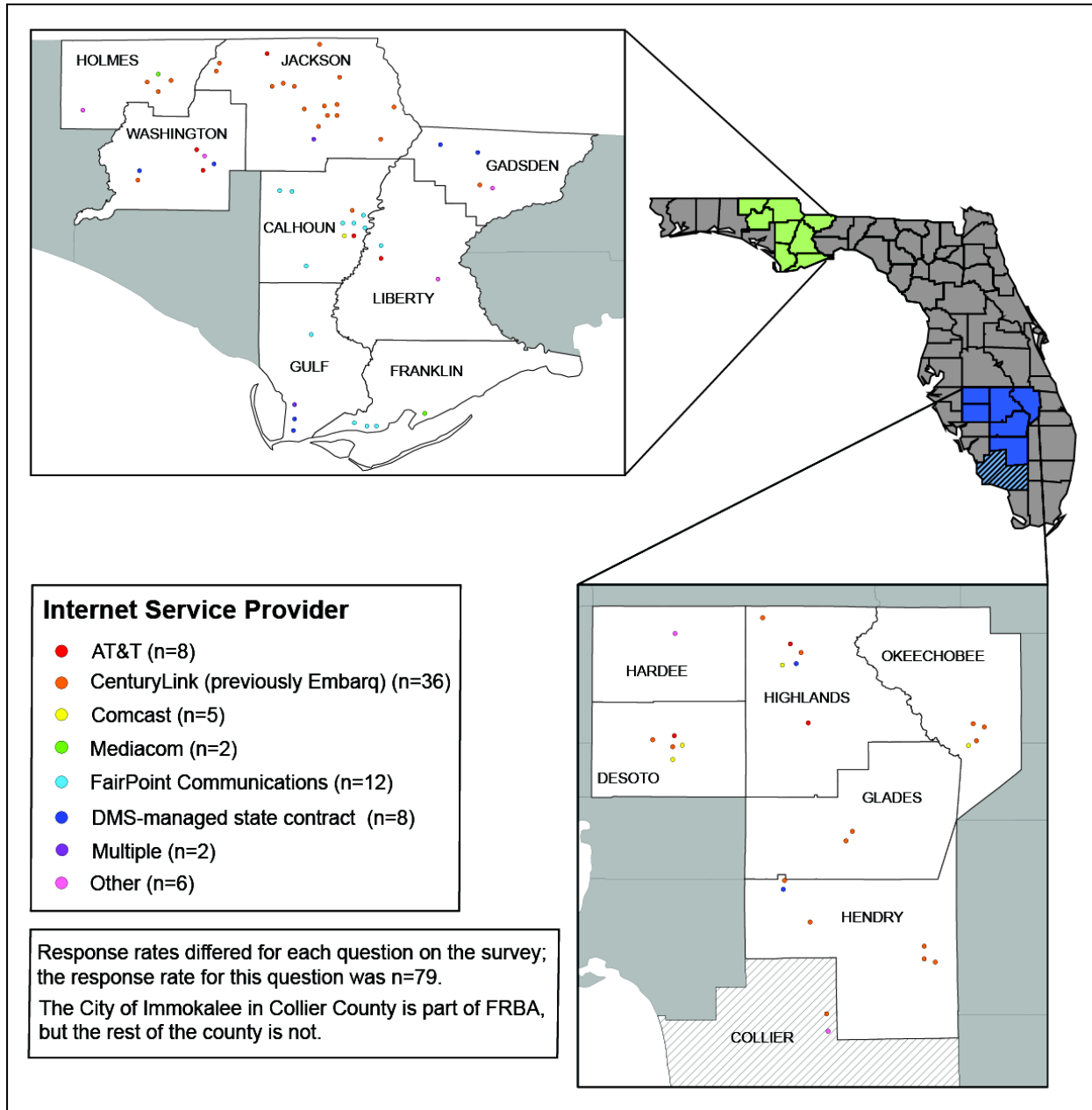


Figure 28. Internet Service Provider by County

Factors Affecting Anchor Institution Adoption of High-Speed Broadband

Increasing Speed and Obtaining Wi-Fi

Seventy percent of respondents indicate an interest in increasing their Internet speed (Figure 29), but only 7.1% have plans to do so. This question uncovers two major barriers to adoption of high-speed broadband Internet—28.3% of respondents cannot afford faster Internet, and 24.2% are currently at the maximum speed available to them. According to survey respondents, a lack of technical knowledge is not a driver in this decision. When asked what

speed they would like to have, 15.0% of respondents indicate their institutions' connection speeds already are sufficient (Figure 30), which is about half the number that lack interest in increasing their connection speed (29.3%) (Figure 29). On the other hand, 68.8% of respondents would like to have speeds above 10.1 Mbps (Figure 30).

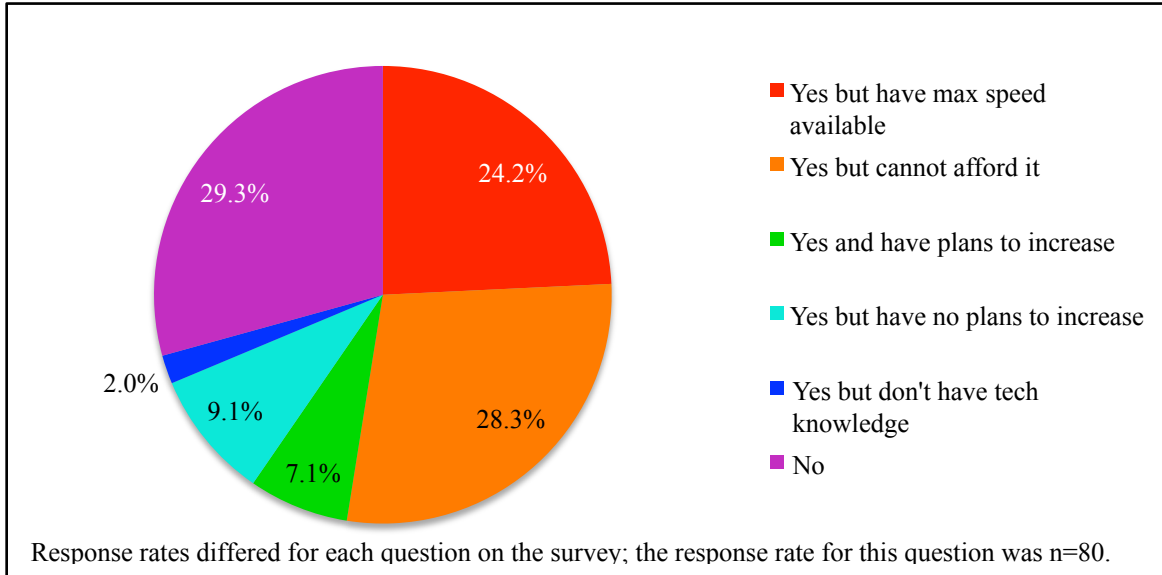


Figure 29. Interest in Increasing Connection Speed

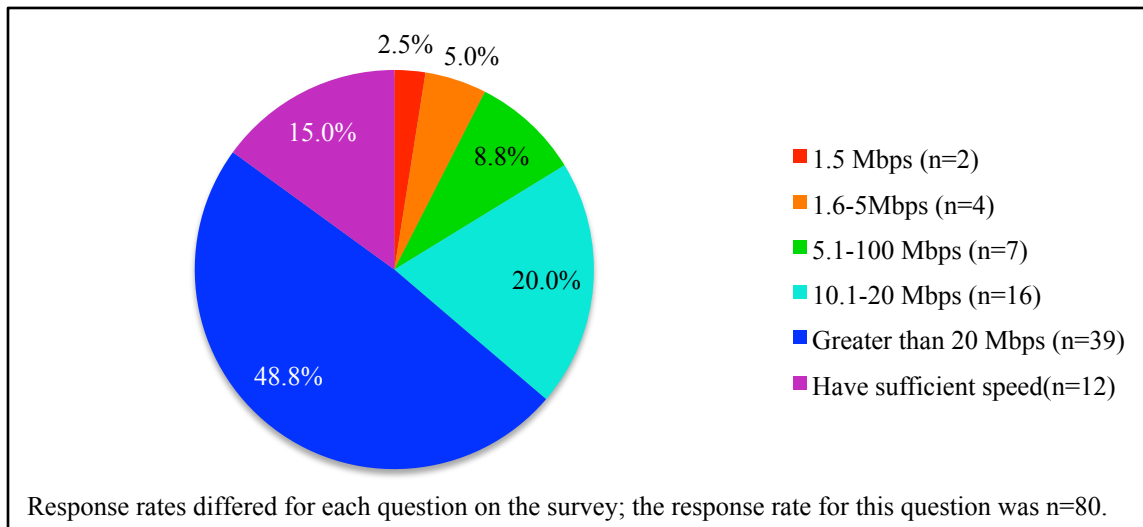


Figure 30. Desired Internet Connection Speed

Only 25.0% of those who don't have Wi-Fi (29.2% of respondents do not have Wi-Fi currently; see Figure 5) are planning to obtain it within the next year and 5.0% are planning to do so in more than 12 months (Figure 31). However, the majority of anchor institutions that do not have Wi-Fi currently have no intention of adding a Wi-Fi network (75.0%).

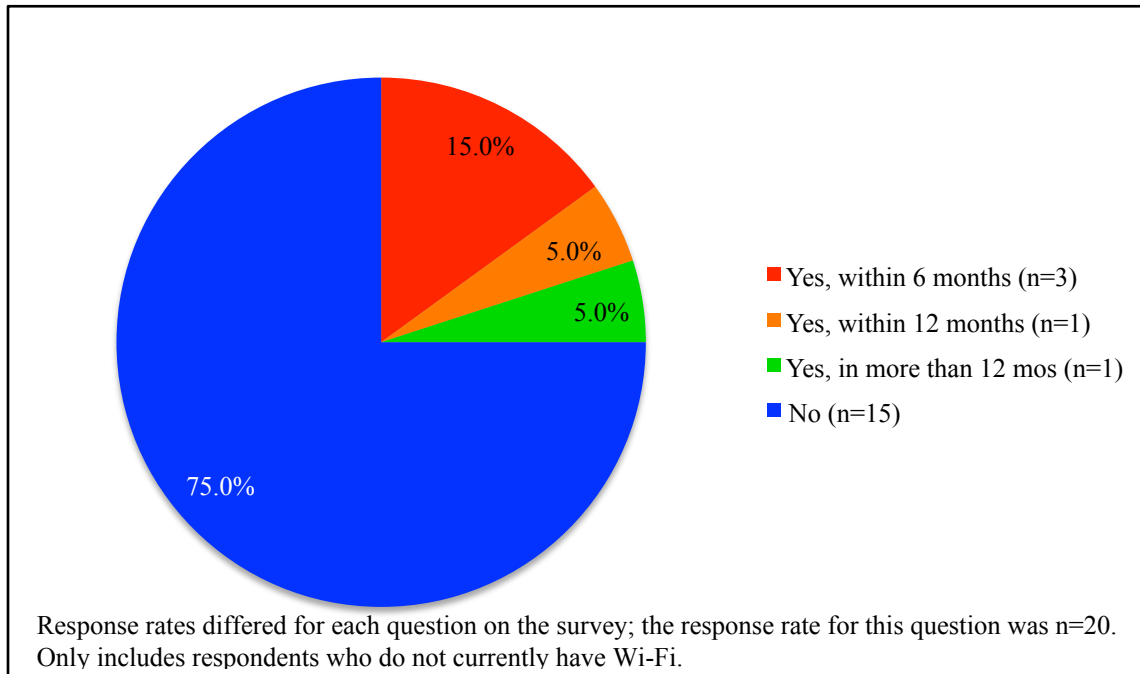


Figure 31. Plans to Obtain Wi-Fi

As noted previously, costs and availability are the largest obstacles to obtaining broadband and increasing speed, with 88.8% reporting Internet service cost as an extremely or very important obstacle, 80.0% of respondents indicating ongoing maintenance costs as an obstacle, and 72.5% of respondents reporting availability of specialized IT personnel (Figure 32). Also, technical issues and availability of ISPs are significant factors; 68.8% of respondents note that technical issues and 62.5% note that availability of ISPs are extremely or very important obstacles. While 72.5% of respondents noted issues with the availability of specialized IT personnel as an obstacle here (Figure 34), when asked about their interest in increasing Internet speed, only 2.0% replied that they would like to increase speed but lack the technical knowledge to do so (Figure 29). These are all significant barriers to the introduction of Wi-Fi as well as obtaining broadband and increasing speed (Figure 33).

FRBA Broadband Needs Assessment: Fourth Interim Report

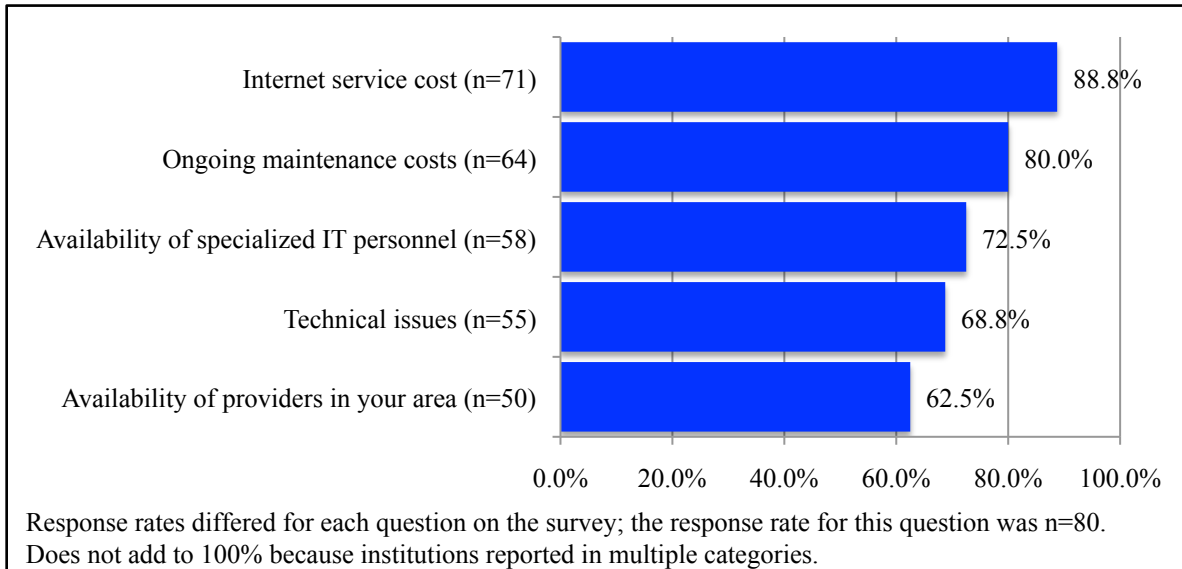


Figure 32. Obstacles to Obtaining Broadband or Increasing Speed-Extremely/Very Important

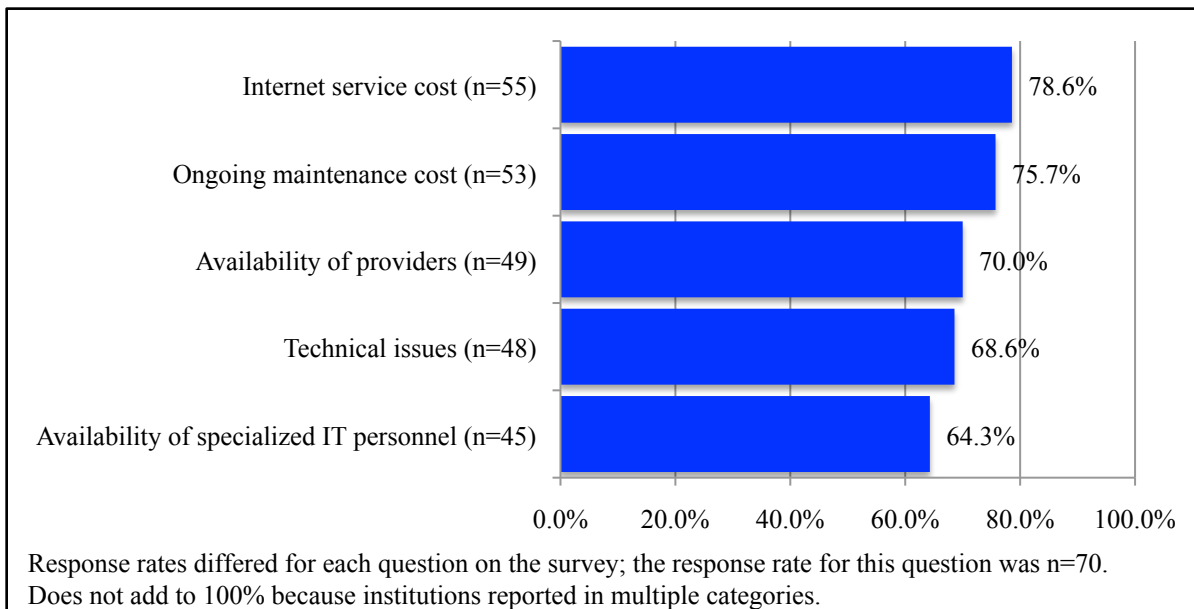


Figure 33. Obstacles to Instituting Wireless Service-Extremely/Very Important

The IT Director has authority to contract for Internet services in 9.3% of institutions (Table 6). However, in most cases, the person with such authority is an administrator of some sort. It is therefore unknown how much expertise decision makers have about broadband, its potential, and what kind of networks are needed to meet present and future needs of the staff and public.

Table 6: Title of Person with Authority to Contract for Internet Services

| Title | n | % | Title | n | % |
|---|---|-------|------------------------|---|------|
| Director/Interim Director | 8 | 10.7% | District Level | 2 | 2.7% |
| Commissioner/Board of County Commissioners | 7 | 9.3% | Library Director | 2 | 2.7% |
| IT Director | 7 | 9.3% | Network Specialist | 2 | 2.7% |
| Superintendent of Schools, Assistant/Associate Superintendent | 7 | 9.3% | Sheriff | 2 | 2.7% |
| Administrator | 5 | 6.7% | Board of Education | 2 | 2.7% |
| Network Manager | 5 | 6.7% | Manager/Librarian | 1 | 1.3% |
| Police Chief | 5 | 6.7% | President | 1 | 1.3% |
| Chief Executive Officer | 4 | 5.3% | DMS Secretary | 1 | 1.3% |
| City/County/Town Manager, County Administrator | 4 | 5.3% | Purchasing | 1 | 1.3% |
| Multiple | 3 | 4.0% | Operations Coordinator | 1 | 1.3% |
| Chief Information Officer | 2 | 2.7% | Board of Directors | 1 | 1.3% |
| City Clerk/Town Clerk | 2 | 2.7% | | | |

Response rates differed for each question on the survey; the response rate for this question was n=75.

Staff and Public Comfort with Broadband-Enabled Applications

The levels of staff and public comfort with broadband enabled applications and advanced Internet skill areas (Figures 8 and 9 above) are potentially inhibiting factors in the adoption of faster and more robust broadband Internet. As noted above, both staffs and public users of anchor institutions are not extremely or very comfortable with advanced wireless (22.2% of staff and 4.4% of public users) or broadband (11.1% of staff and 4.4% of public users), and few public users are extremely or very comfortable with basic wireless (11.1%), basic broadband (8.9%), or advanced Internet skills (4.4%). If the staff and public are unable to make use of the improved broadband, or are unaware of its potential to improve their work and private lives because of such, it may be less likely that they will express demand for broadband improvement.

In addition, if decision-makers are aware of the lack of skill level, they may be less likely to authorize broadband improvements on the basis that their staff and users will not utilize such improvements fully. Although respondents are aware of the skill level issues, there are few plans for training that would ameliorate the situation (Figures 10 and 11 above). It is unclear whether the lack of training plans is due more to resource issues (such as time and money) or simply an expression of a lack of expressed need for training. In either case, this is a clear barrier to adoption of higher speed broadband.

Other Potential Concerns

The fact that institutions are mostly self-funding for the Internet (Figure 24 above) can be a facilitator of broadband adoption because they may have greater control over their own budgets than over the availability and use of outside funds; however, this may be a barrier if budgets are not high enough to support faster broadband connections and expanded broadband services. The relative age of staff and public workstations—58.2% of staff workstations and 54.2% of public

workstations are 3 or more years old (Figures 20 and 21 above)—is a potential problem. Older computers may not be able to handle high-speed Internet connections efficiently, so improvements in broadband speed and capacity may not add materially to the day-to-day operations of anchor institutions or their public users.

Summary of Survey Findings

The results of this survey show a distinct need for improvement of broadband Internet and broadband support in the FRBA anchor institutions. True high-speed Internet service is a rarity among this group,¹³ broadband-related skill sets are not high, and many of the staff and public workstations are relatively old. However, the staffs of these institutions may not be aware of the extent of this problem or its potential ramifications given their lack of knowledge of advanced Internet and broadband topics. Very few respondents indicate that their broadband is insufficient for staff and public needs and there are few plans for improving broadband-related skill sets, despite the low speeds reported at staff and public workstations as compared to advertised speeds. Even where there is an awareness of the need for improvement, there may not be sufficient resources or support for such improvement—many respondents indicated a desire to increase their Internet speed, but almost none have plans to do so, possibly due to lack of funding, knowledgeable staff, or other resources.

Focus Group Findings

Introduction

While focus group participants anticipate eagerly the availability of the high-speed broadband that is to become available via the FRBA middle mile network, they raise a number of concerns and issues regarding their ability to connect to, deploy, manage, and use high-speed broadband. Findings suggest that participants believe someone (although it is unknown who) needs to address and resolve a host of infrastructure and support issues before they can take advantage of high-speed broadband. Some of these infrastructure support issues relate directly to particular concerns regarding out-of-date networks, hardware, and software at their anchor institutions; the need for a better understanding of what broadband is and why it is important; the role of the FRBA in assisting them; and other issues related to efforts such as how improved broadband access will, in fact, support local economic development.

The range of anchor institution support needs include ISP negotiation and management, education and awareness, broadband planning, promoting broadband availability, understanding current and future broadband applications, economic development techniques, and updating physical facilities, among others. Anchor institutions (and others) will need to address these concerns to obtain, deploy, and exploit high-speed broadband fully. The most pressing needs are for anchor institutions, either separately or in collaboration with other county or regional anchor institutions (or with others), to develop broadband plans. These plans need to succinctly describe and schedule a process for the anchor institution (with others) to take advantage of the high-

¹³ The FCC now defines broadband as 4 Mbps downstream and 1 Mbps upstream, which is still below the speeds recommended by Microsoft, Google, and others in their comments to the FCC with regard to a proposed definition of broadband.

speed broadband, which likely will cost significantly less than the broadband that is currently available. The plans will need to identify strategies related to awareness; education; network, hardware, and software development; collaboration; implementation of new broadband services; organizational impacts from broadband; economic development; and other topics.

Participants make it very clear to the study team that, while completing the middle mile project to make broadband more accessible and affordable is an important step, equally or more important is assistance to individual anchor institutions in accessing, deploying, and using the broadband to better meet staffs' and users' broadband needs. A number of participants are not aware of how they could, in fact, take advantage of higher speed and less expensive broadband due to restrictions placed on them by the very difficult financial situations in their anchor institutions.

A number of the needs assessment and benchmarking project goals related to the focus groups, such as:

- Describe the existing and future broadband uses and applications of the region's anchor institutions;
- Identify situational factors and issues that impact whether anchor institutions decide to obtain or increase broadband capacity; and
- Assist the middle mile network designers to deploy and configure the network such that it best meets the current and future needs of anchor institutions.

The following section reports focus group findings in the context of those goals, with the addition of an introductory section that overviews focus group respondents.

Respondents

The Information Institute study team conducted five focus groups sessions in the FRBA service area in May 2011 to better understand anchor institution broadband needs and issues. Overall, 28 participants representing multiple types of anchor institutions throughout the Northwest and South Central RACECs plus the city of Immokalee welcome the opportunity to connect to high-speed broadband at significantly reduced costs compared to what they currently pay. Focus group participants represent 12 of the 15 counties and the city of Immokalee (located in Collier County) in the FRBA service area (Figure 34) and a variety of anchor institution types (Figure 35). Also, participants hold myriad titles within their organizations (Figure 36). Study team members who conducted the focus groups obtained a significant amount of information, as each group included 5-7 participants and lasted, typically, an hour and a half. The themes of the discussions at the focus groups were similar, so the following section reports findings as a summary of all five meetings rather than on an individual, session-by-session basis.

FRBA Broadband Needs Assessment: Fourth Interim Report

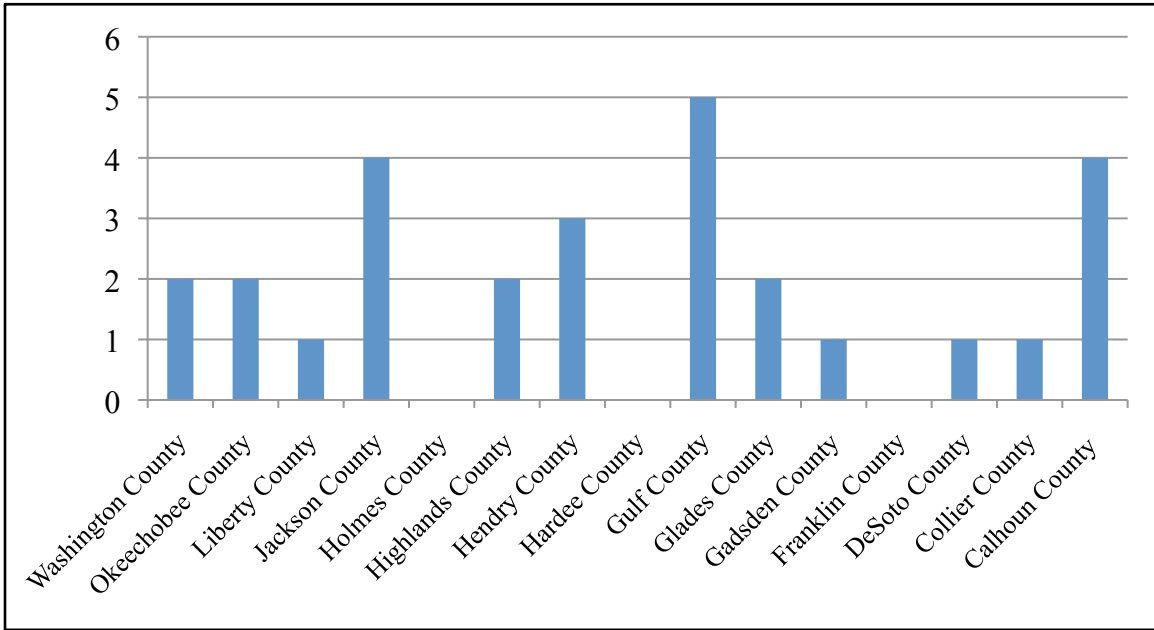


Figure 34. Number of Representatives from Each County in FRBA Focus Groups

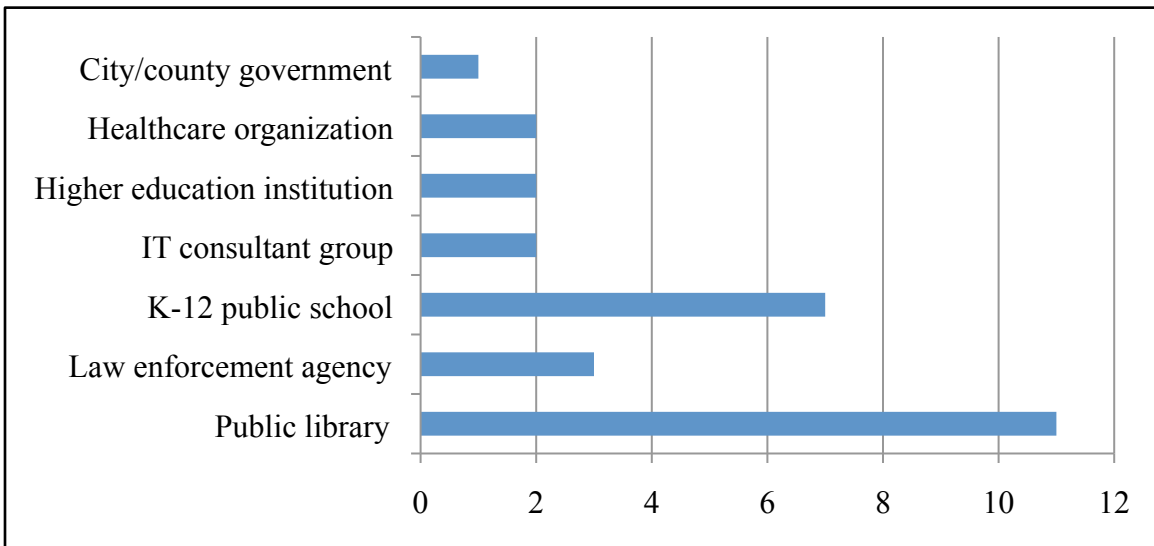


Figure 35. Number of Representatives from Each Anchor Institution Type in FRBA Focus Groups

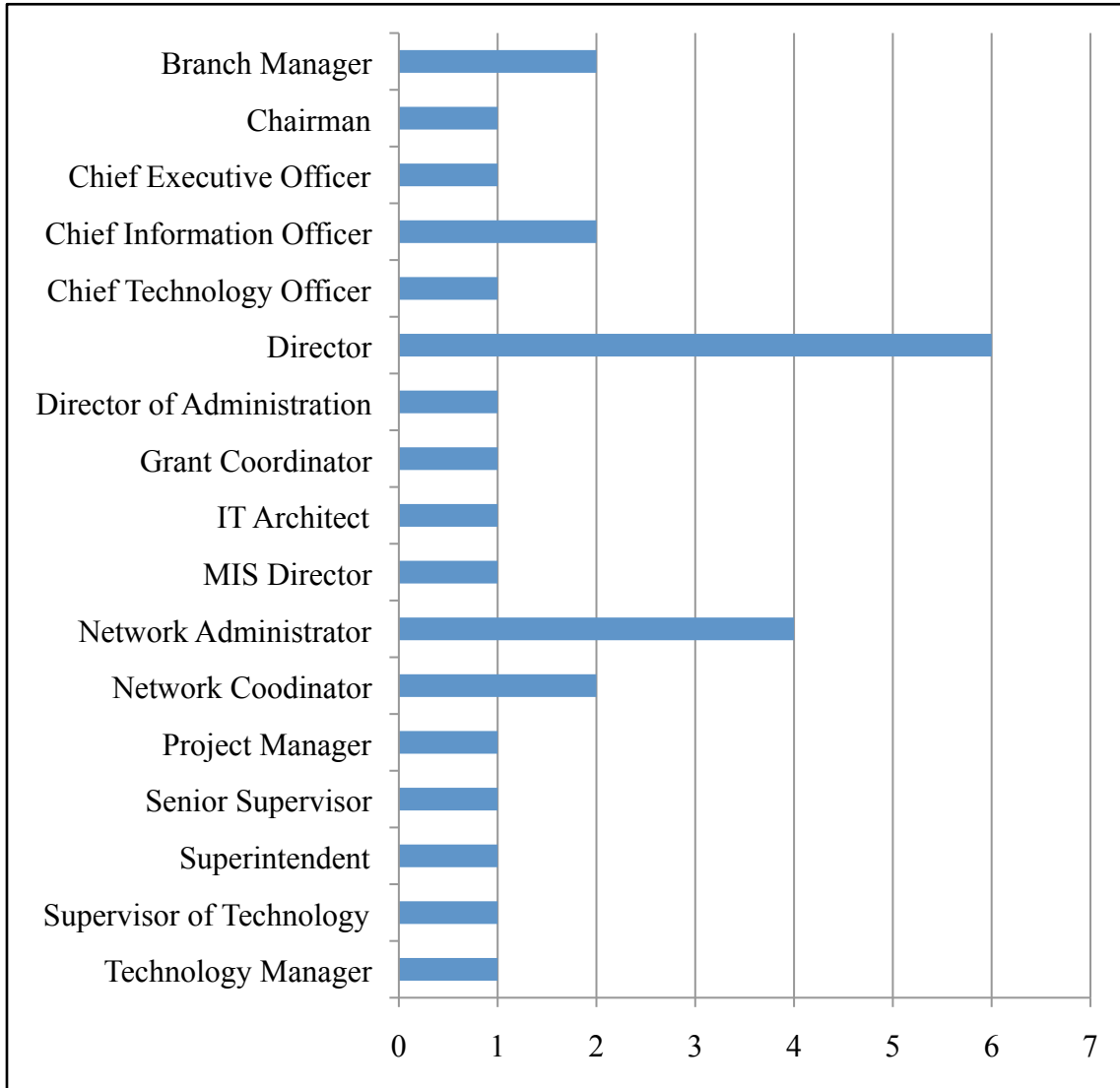


Figure 36. Job Titles Held by Anchor Institution Representatives at FRBA Focus Groups

Anchor Institutions' Existing and Future Broadband Uses and Applications

Internet Connectivity

Participants report a broad array of types of Internet connectivity from a range of ISPs at varying degrees of cost. Connections range from dial-up speeds, to 20 Mbps at the front door, to locations in selected counties where only an air card or satellite connection are possible because no ISPs make broadband connections available. Assessment shows a wide range of the quality and/or cost of broadband from the various ISPs. Most participants do not understand pricing structures for governmental units, other anchor institutions, and residences as there appear to be significant differences in pricing depending on which type of organization or residence is involved.

Participants have a number of horror stories regarding getting connected, negotiating contracts, obtaining reliable services, etc. One participant comments that he attempted to improve his institution's connection with another DSL connection line, but the ISP provided only one IP address that nullified an increase in speed. Others report there are parts of their counties where residents barely receive landline phone service and cannot get cable television connections, to say nothing of Internet connections. This raises a concern shared by many of the focus group attendees whose institutions have users who need to access services from their homes (e.g., hospitals, schools, libraries, cities and counties with e-government services): improved speeds to the institution will not mean anything without a concurrent adoption of residential, high-speed broadband.

Participants' define "sustainability" of any new or upgraded broadband connections largely in terms of obtaining the broadband initially at a cheaper cost than they pay now, but there is no real notion of finding extra resources to sustain better broadband if it were to cost more than what the anchor institution pays now. Many focus group participants doubt their institution's ability to sustain a broadband connection due to their poor network configuration and outdated equipment. The only factors that many participants could think of as possibly enabling sustained use of broadband are dramatically reduced cost and increased service quality.

Internet Connectivity Costs and ISP Contracts

One participant notes that, until recently, his institution could not pay for its current Internet connection due to lack of funding and the high cost of the connection. This point about cost is critical. Almost all respondents note that whatever they currently pay for Internet connection would be the maximum they could pay for any new or enhanced connections that might result from the FRBA middle mile project. The majority of the participants are under pressure to reduce ISP and broadband costs due to limited funding in their counties. Most agree that cost for broadband is the single most important factor that would determine the purchase of higher speed broadband. Every participant is interested in what the cost of broadband will be with FRBA and the initial cost estimates of \$75-\$150 are met with enthusiasm across the board, but many are skeptical of actually getting broadband at this price for a number of reasons.

Some county and municipal government representatives are uncertain as to the provisions of the state contract with AT&T and how the availability of that contract affects their access to other ISPs for obtaining high-speed broadband or how FRBA will impact the current system. Participants from schools and libraries are particularly interested in the news that the discounted rate will be available through the state contract with AT&T. Yet, many do not know how to navigate through appropriate channels to request more bandwidth and faster connection speeds.

A number of the library and school representatives do understand the E-rate program¹⁴ and its importance to the support and sustenance of broadband in their institutions, but others have no familiarity with the E-rate program. Participants from schools and libraries clearly understand that AT&T qualifies to provide E-rate discounts, and firmly assert they will not be able to use any connection that is not eligible for the E-rate discount. It is not as clear if other

¹⁴ For additional information regarding the E-rate program see: <http://www.usac.org/sl/>

institutional representatives, including some city/county officials, understand what the E-rate program is and its importance to schools and libraries. The news that FRBA will not be an eligible provider under the E-rate until the end of 2011 at the earliest complicates things for libraries, schools, and rural health clinics (which are covered under the Rural Health Care Pilot Program; RHCPP).¹⁵ The best case scenario is that FRBA becomes an eligible E-rate provider by November 2011 as that is when the institutions must submit their applications for E-rate. Schools, libraries, and rural health clinics then could start receiving the E-rate discount for FRBA-supplied broadband connections as early as July 2012.

Networks

Participants also report a broad range of internal organizational types of networks and configurations with various types of servers, routers, workstations, and other equipment. Depending on available resources and physical requirements, some counties have countywide networks and others do not. There is significant agreement that much of the network hardware is dated (i.e., three or more years old) and that this likely contributes to poor Internet connectivity. In addition, a number of participants are not technically oriented and have limited knowledge about their ISPs, Internet connections, or natures of their internal networks

Administrators' Understanding of Broadband

A number of the administrators in organizations represented by focus group attendees do not see the importance or need for improved broadband. One person notes that many of the administrators are former farmers and do not necessarily understand a need for better Internet connections. Administrative support is important for the sustainability of the network as counties struggle to maintain services once they are set up.

Evaluation

Participants normally describe their Internet connection as “good enough” for the services their institution provides. The question of exactly what constitutes “good enough,” however, is not easy for many participants to identify. Many are unaware of possible services and applications that broadband connections might provide if their institution did have a high-speed connection. Some believe they already have “good enough” bandwidth and “good enough” applications and do not see the need for ongoing institutional- and community-based evaluation of broadband connectivity and services.

Participants also identify the importance of evaluating their users' broadband needs as a basis for developing and deploying various broadband applications and services. They note, however, some concerns with such an effort:

- There are few resources available at the anchor institutions to identify the broadband needs of either institution staff or clientele in a systematic way;

¹⁵ Like E-rate, the Rural Health Care Pilot Program (RHCPP) is a federally funded subsidy program to provide discounted telecommunication service (including Internet) to rural healthcare institutions. For more information, see <http://www.usac.org/rhc-pilot-program/>

- If they were to ask staff or clientele what broadband services or applications they need, it is unlikely that they would have adequate knowledge to know what to request; and
- A number of participants state, quite frankly, that they do not know which broadband services and applications they could recommend for implementation.

Once again, the sense from a number of the participants is that they would need help in identifying which broadband services are needed *now* and how to prepare staff and/or clientele for *future* broadband services.

Some participants recognize the need for an ongoing data collection process to document and determine the degree to which anchor institutions improve, extend, or expand broadband connectivity and services. All are aware that similar to other organizational expenses, their administrations would require justification and accountability of broadband and broadband services. But data are not available from all North Central RACEC and Wakulla County anchor institutions to benchmark their existing broadband connections, services provided, speed, and cost because many do not know this information and either have not or are unable to report this data on the survey discussed above.

All the participants noted the importance for their institution to demonstrate the impacts, outcomes, increased productivity, benefits, jobs retained or added, and cost-savings, among other potential measures, resulting from subscribing to high-speed broadband. One participant comments that he would need ample examples of the way broadband will benefit his institution to even hope that its adoption would be approved. Other participants also note they currently operate off external funding sources and will need some kind of evaluation measures to obtain additional external funding for any kind of improvements. They are unclear, however, as to how to do this type of evaluation and who, specifically, would do it.

Situational Factors and Issues Impacting Whether Anchor Institutions Obtain or Increase Broadband Capacity

Barriers/Enablers

Broadband “barriers” and “enablers” are factors that either contribute to or limit the success with which individuals and organizations obtain, deploy, manage, and apply broadband. These factors can be demographic, technical, economic, political, or educational in nature and can originate within or external to an organization. From the focus group sessions, the study team identified a number of possible enablers that are likely to contribute to broadband success in anchor institutions, including:

- Individual knowledge of broadband, its use, how best to deploy it, and so on;
- Existence of a high-quality internal network within the anchor institution;
- Existence of new (er) equipment;
- Access to additional funding to support network/computer upgrades and/or upgraded broadband connectivity;
- Administrative leadership and support;
- Available and trained IT staff;

- Access to an ISP with inexpensive broadband connections;
- Ability to develop a strategic plan to obtain and deploy broadband – especially if that plan cuts across and leverages various anchor institutions in the county; and
- Interest and enthusiasm to experiment with and promote innovative applications of broadband.

A number of participants believe these are significant factors related to their organizations' success in broadband access, deployment, and use, but only few of these factors are present in their institutions.

The focus group sessions also indicate a number of possible barriers that are likely to limit the success of broadband access, deployment, and use in anchor institutions, including:

- Lack of resources;
- Limited knowledge/awareness about broadband and broadband applications and how best to deploy and use them;
- Failure to recognize innovative broadband applications and how to apply them for organizational effectiveness or improved services to clientele;
- Inability to contract successfully with ISPs;
- Difficulties in educating clientele (e.g., hospital patients, library patrons, county government services users, etc.) on how to use new broadband-based services successfully;
- Local elected officials (or others in positions of authority) who lack awareness of the potential for broadband deployment;
- Failed previous efforts to upgrade broadband availability and/or reduce its cost;
- Resistance to change;
- Organizational inertia;
- Old and out-of date network hardware and software; and
- Inability of various city/county or other anchor institutions to work together on broadband planning and economic development.

Many of the barriers participants identify ultimately relate to lack of resources and Figure 37 depicts how these barriers can affect five key factors contributing to whether or not an institution may be able to obtain or upgrade broadband connectivity.

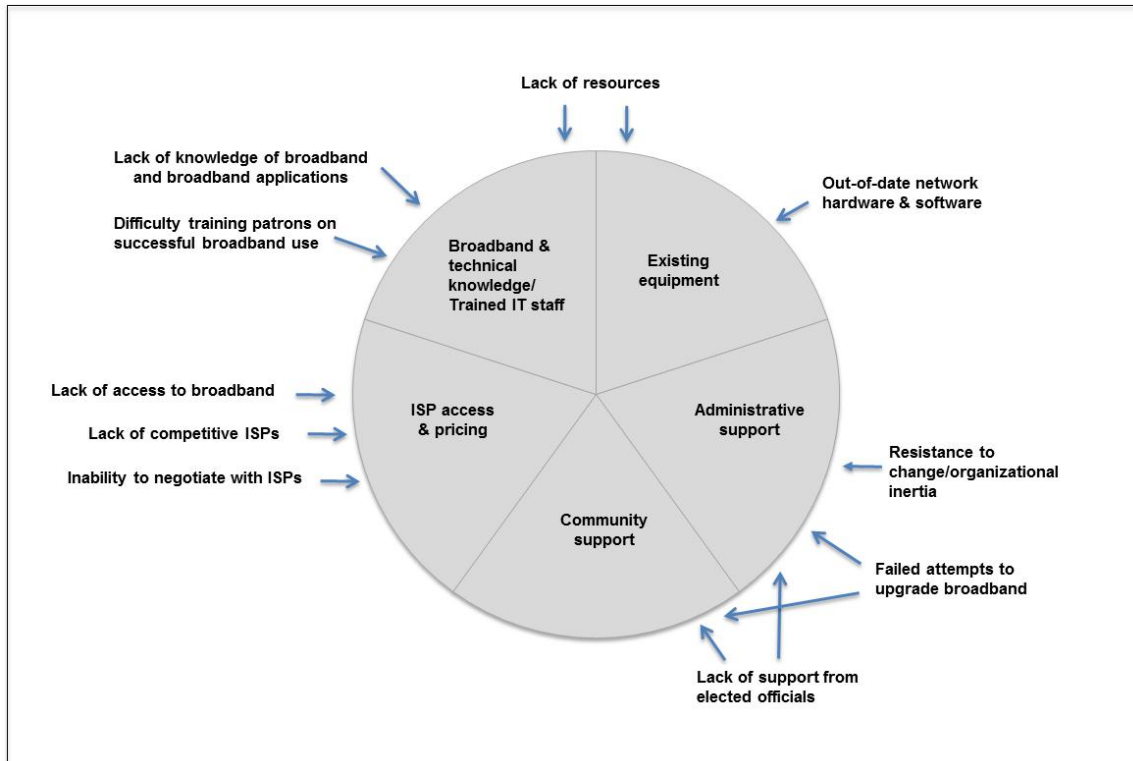


Figure 37. Broadband Barriers and Their Effect on Factors Contributing to Adoption

The lists of barriers and enablers above are likely only beginning lists, as they pertain only to Northwest and South Central RACEC and City of Immokalee anchor institutions. Moreover, a number of participants point out that some enablers and barriers likely will vary considerably depending on the nature of the organization, its staff members, its geographic location, and a host of other situational factors. In addition, participants note that anchor institution staffs and administrators may not understand specific strategies for maximizing enablers and minimizing barriers, thus, they welcome information on the need for specific training and/or procedures and strategies for maximizing enablers and minimizing barriers.

Politics and Regulatory Issues

A number of the focus group participants raise questions as to why ISPs have not made inexpensive high-speed broadband available to their communities or organizations already. There is some difficulty in understanding the different models of “open markets” and “competitive markets” versus a regulatory market, and that the FRBA project plans to rely on open and competitive markets to deploy broadband. Prior experiences of focus group participants with ISPs in their counties are not positive with regard to ISPs’ desire to provide easily accessible and affordable broadband (as one participant comments that his institution has to pay over \$400 a month for a T1 line).

Participants do understand that if ISPs still do not see a particular region of a county as “profitable” after deployment of the FRBA middle mile, the ISPs are unlikely to enter the

market. Many have questions as to what conditions would make “the last mile” competitive and profitable for ISPs. There is some concern that anchor institutions still might not use a new and innovative middle mile network built by the FRBA because of last mile connectivity problems and issues.¹⁶ Participants have little knowledge in, or interest about, the role of local, state, and national information/telecommunication policies regarding broadband deployment and use.

Focus group participants do not have a good understanding of the broader context of federal and state information policies and regulations that affect provision of broadband in the RACECs and the City of Immokalee (see, for example: Federal Communications Commission *National Broadband Plan*,¹⁷ *Telecommunications Act of 1996*,¹⁸ Florida Public Services Commission,¹⁹ etc.) and impact on broadband deployment to *participants’* anchor institutions. Ultimately, what participants want is easily accessed and affordable high-speed broadband at their institutions *now*.

Despite the limited interest in local, state, and federal telecommunications and broadband policies, there is much support for a “public broadband infrastructure” that everyone is *entitled* to access and use as a resident of the United States. Participants assure the study team that there is, indeed, a digital divide and most agree that this divide exists in *their* counties. There is considerable support for the idea of a public broadband infrastructure, but some participants are unclear if such a model is different than the FRBA competitive market approach or if the FRBA project will, in fact, reduce the digital divide given the many barriers that exist in their counties and organizations beyond the lack of a middle mile infrastructure.

From a number of the focus group sessions, there is the general sense that if one has not lived in these various rural counties, one really has no idea what it is like in terms of access (or lack thereof) to amenities and having high-quality services such as broadband. One participant from a sheriff’s department notes the need for redundancy for their Internet connection, which they currently lack as there is only one available ISP in the area and if that ISP goes down, the sheriff’s connection to squad cars also goes down. The sense is that people come through the county (and have done so for a number of years) talking about economic development or other “improvements” that will occur, but in fact, nothing much changes. Local issues are more about making a decent living and trying to keep kids from leaving the county than they are about broadband use.

Availability of Trained IT Staff

Participants worry that many local governments and other anchor institutions may not be able to take advantage of *any* “new and improved high-speed broadband” since they do not have (or only have inadequately) trained IT staff available to assist them with deploying broadband in their organizations. Participants recount numerous examples of being unable to use existing

¹⁶That FRBA received approval to be a “last mile provider” if no other ISP would serve a geographic area as a last mile provider does help participants to feel more assured that last mile issues could be resolved better.

¹⁷<http://www.broadband.gov>

¹⁸http://en.wikipedia.org/wiki/Telecommunications_Act_of_1996

¹⁹<http://www.psc.state.fl.us/utilities/telecomm/>

broadband, institutional connections and networks not working properly or at all, or trying to fix computer problems themselves when they know little to nothing about networks and computers.

Participants who have no countywide IT staff position are “jealous” of those counties that do have an IT person to help manage the broadband and internal networks. One school representative comments that they only have a contracted IT consultant who is available to them three days a week. Ultimately, as participants point out, there is no money available to hire an IT person for their institutions and if there were some funding available, it likely would not be enough to attract a qualified IT person. Finally, the issue of what constitutes a “qualified” IT person clearly differs among participants from different counties and anchor institutions. However, participants are skeptical that institutions will be able to retain quality employees.

Most participants agree that IT support during and after the time at which broadband connectivity increases is essential to the ultimate success of using broadband at their anchor institutions. One participant notes that it is a catch-22 because the county educates its students and then the students leave the county at the first opportunity. Another participant notes that his institution has spent the last few months trying to find an IT support person but no one has applied.

Upgrading Physical Facilities for Broadband

Some participants comment that physical facility issues at their anchor institutions would inhibit the deployment and use of broadband. Some of the concerns center on the following:

- Old buildings with many load-bearing thick concrete walls that are difficult to renovate;
- Inadequate electrical grids (and outlets) within the anchor institutions;
- Limited staff to assist clientele or other staff in how to use and take advantage of new broadband applications;
- Limited space for new or upgraded workstations to accommodate clients (in libraries or health departments, for example); and
- Old network equipment such as routers, servers, and cabling that cannot take advantage of high-speed broadband.

There are few specific strategies for how anchor institution participants would address these concerns, except the possibility of state or federal grants. None of the participants anticipate local resources being available soon to address these concerns with their physical facilities.

Ways to Deploy and Configure the Middle Mile Network to Best Meet Anchor Institutions’ Current and Future Needs

Few of the focus group participants spoke directly to the topic of physical configuration of a middle mile network, largely due to lack of knowledge necessary to comment on this topic. However, much discussion centered on other factors that could contribute to successful middle mile infrastructure deployment (i.e., deployment that results in increased subscribership). These factors—education/training needs, understanding what a middle mile project is, and the role of the FRBA—are discussed below.

Education/Training Needs

Participants are very much aware of the need for additional education and training related to broadband ISPs, contract negotiation, connectivity, deployment, internal network design and management, applications, use, planning and evaluation, and other topics. Indeed, the range of educational needs and training that participants and the study team identify also includes broadband marketing, uses of broadband for economic development, retooling organizations in terms of workflow to best leverage/exploit broadband, convincing governing boards that increased broadband at the workstation actually is needed, and more.

A number of participants comment on the contributions that the public library makes in their counties to provide a range of broadband, workstation, and software training. For some, the public library is the only place in the county where “free” training and one-on-one assistance for activities such as submitting online job applications can be obtained. But library staff note they are extremely hard-pressed to maintain such training and that, most likely, their institutions will have to cut back training with any additional budget cuts.

An interesting component of this awareness for education/training needs is the participants’ perceived importance of onsite and one-on-one education and training that would be most appropriate for their particular situation. Thus, many of the participants prefer a model of education/training that also includes consulting advice. While it is likely that a number of basic educational modules would be useful for many participants, during the discussions it became clear that the education/training needed for a library in Moore Haven would be quite different than that than that for an emergency management center in Gulf County. Moreover, participants point out that “they do not know what they do not know,” so there they might need training in their counties related to topics about which they currently are unaware.

Participants repeatedly asked study team members if we have a schedule for education/training; the topics being offered; who or what entity provides the education/training; when education/training opportunities will be available; and if they will be onsite, online, or through a combination of delivery platforms. Some participants doubt that online webinars would be acceptable as they may not have the bandwidth to participate and others indicate limitations on staff travel. This suggests that face-to-face trainings held in central locations also may be problematic for many anchor institutions’ staffs.

Understanding a “Middle Mile” Project

Many participants do not understand that there is first a connection to a trunk line (often owned by an ISP), then there is a connection from that trunk line to a location where other ISPs can compete to access that connection (could be fiber or WiMAX²⁰ towers), then there is a last mile connection to the actual organization (typically provided by a local ISP), and finally the “last foot” goes from the front door of the organization to individual workstations. The last foot connection is primarily the internal organizational network within the anchor institution.

²⁰ <http://www.wimax.com/general/what-is-wimax>

Some participants do not understand that while the FRBA focuses primarily on the middle mile, the FRBA became an ISP of last resort for areas where other ISPs refuse to enter a particular market/region. Participants recognize that the primary factor that likely determines if an ISP will enter a market is profitability. Thus, many are concerned that the middle mile project in and of itself may not “be enough” for ISPs to enter their region and for the ISPs to be profitable in offering the broadband service.

Some focus group participants are interested to know what incentives local governments, chambers of commerce, and other municipal entities might be willing to offer an ISP to make it more lucrative for them to enter a market. There is some concern that, in fact, local governments have little ammunition with which to bargain for such incentives. Ultimately, however, participants are clear that if ISPs, or some package of incentives for the ISPs, do not provide “cheap or better broadband,” they are unlikely to subscribe. In addition, it is not clear how “cheap” broadband has to be before a local anchor institution might think it “cheap enough” to subscribe. There is a sense that what one participant considers “cheap broadband” may be quite different than what another considers to be “cheap broadband.”

Role of the FRBA

There is some confusion regarding the exact roles, responsibilities, and activities of the FRBA, for example:

- Does the FRBA conduct education/training?
- Can the FRBA help anchor institutions find an ISP and can the FRBA be an ISP of last resort?
- Will the FRBA provide IT consulting/expertise in local organizations?
- Will the FRBA assist local governments in promotion and recruitment to attract new companies, retain existing jobs, and bring more jobs?
- How does the FRBA create, retain, and attract jobs at the county level? And are counties, in effect, “in competition” against other counties to get these jobs?
- How do local governments provide input to the FRBA on key issues?
- How does a “middle mile” network specifically affect anchor institutions’ actual access to better and cheaper broadband?
- Will completion of the middle mile project, in fact, result in more ISP competition?
- Who or what entity is available to assist local anchor institutions and agencies exploit and use the broadband, both in their organization and for overall county economic development?
- Which particular broadband services are needed or could be deployed to *best* benefit particular organizations or user groups (e.g., paying county bills online, telemedicine, interactive high speed video conferencing)?

While there are straightforward answers to a number of these questions, participants are not clear on what those might be. Indeed, one participant is surprised that there still will be a cost to subscribe to the FRBA’s broadband, having thought the connection would be free.

Additional Findings

In addition to the findings pertinent to the original goals of the study, the focus groups lead to several other emergent findings: the relationship between broadband availability and economic development, broadband and disaster planning and recovery, and broadband planning at the anchor institution and county levels. These topics are discussed below.

Economic Development and Broadband Access and Availability

A number of participants are not aware that an important component of the middle mile project is to promote economic development and to assist counties in becoming more competitive in attracting or retaining companies and jobs because of improved access to and reduced cost of broadband. Once they become aware of this issue as a result of participating in a focus group, participants want to know “what is the plan” and “who is in charge” for using broadband deployment and access to promote economic development.

Some participants are unclear how their county will convince a small start-up company to move there with its 20 jobs because of high-speed and inexpensive broadband. Participants point out that improved access to broadband with reduced cost is only one of a number of factors that will attract new jobs or related economic development. Other factors include:

- Schools;
- Governmental services;
- Recreation opportunities;
- Tax breaks;
- Accessibility to shopping, entertainment, and other amenities;
- Availability of a trained, knowledgeable, computer literate, and drug-free workforce; and
- Friendly and welcoming community members.

Many participants realize that the availability of high quality affordable broadband in the county or region is only a “qualifier” among a number of other factors that contribute to economic development. One participant notes that the local schools do not offer some classes and students have to take online classes from another school, as well as the importance of the Internet in developing an educated workforce in a small, isolated town. Not having good broadband is an immediate disqualifier for attracting/retaining companies and jobs in remote areas.

Participants recognize that there are a number of “models” that might promote economic development, such as:

- Expanding existing private-sector firms in the county that need more or faster broadband;
- Attracting companies (and jobs) to relocate to their county because of more or faster broadband;
- Making existing county workforce members available for remote (i.e., virtual) hiring with companies outside their county because of more or faster broadband; and
- Promoting new or start-up companies (including Mom and Pop home-based operations) because of the availability of more, faster, and cheaper broadband.

Most, however, are unsure how, exactly, they can promote these (or other) models, what resources are available to assist in the task, and who is responsible for leadership.

Overall, there is some skepticism about the role that faster and cheaper broadband could play in these rural counties. A number of participants do not understand how to market faster broadband for economic development, but they do know that there are many factors that affect rural economic development other than broadband, and that there is a general lack of resources in the county and in the state.

Disaster Planning and Recovery

At one focus group, a discussion occurred about the degree to which the FRBA network will support disaster planning and recovery. Participants are unclear as to which government agencies and what ISPs have what types of responsibilities for disaster planning and recovery related to broadband. Do key players include individual anchor institutions, middle mile providers (i.e., FRBA), emergency management offices, ISPs, other federal and state agencies, and/or others? Participants raise questions as to what kinds of redundancy will be built into the broadband network; how anchor institutions in a particular county will link to and or depend on networks outside their control; and how county governments can insure that someone will maintain broadband connectivity during a disaster such as a hurricane.

Anchor Institution and County Broadband Planning and Development

Typically, as a focus group progresses, participants become increasingly aware that to a large extent *they* are responsible for taking advantage of broadband use and deployment as a result of the FRBA middle mile project. Nonetheless, common questions are who do we go to for assistance in educating our staff, who can help us with connecting to the middle mile deployment, how do we use and deploy the broadband successfully in our organization (or governmental agency), and how do we promote our improved broadband to attract new jobs and for overall economic development.

The study team suggests that broadband deployment, use, and economic development may entail a local *planning process* that could result in a formal written plan. The process may have a number of steps, including:

- Additional broadband needs assessment of anchor and other institutions in their county;
- Broadband diagnostics for their institution/agency to determine the strengths and weaknesses of their existing broadband connection and network;
- Development of countywide vision and goals to leverage broadband use among the various anchor and other institutions and to develop a strategic plan;
- Assessment of broadband needs and services that could be provided to users and clientele;
- Obtaining regular and high quality IT staff assistance to update and maintain the broadband, network, and broadband services;

- Contracting with ISPs for high quality and inexpensive broadband through the middle mile network or elsewhere;
- Determination of how best to deploy broadband to the front door (or to the network) and then to the workstation;
- Accomplishment of future hardware and software upgrades and otherwise sustaining the broadband, services, and applications;
- Marketing and promoting the broadband for economic development; and
- Evaluation to justify/demonstrate accountability and show the impact/outcomes of the high-speed broadband on organizational and community measures.

However, it is unclear if participants have the resources and knowledge to successfully engage in such a process without some outside assistance.

Onsite Diagnostics Findings

Introduction

Each institution has specific issues, which were outlined in individual Summary Onsite Diagnostic Reports provided to each institution,²¹ but there are four universal needs for every anchor institution visited during this research:

- Updating the network and technology equipment,
- Education,
- Training, and
- Planning.

The level of need varies by institution; however, there is a general lack of understanding about what the uses of broadband are and why anchor institutions and rural areas need better Internet connections. The assessment team found that each institution's staff understood the need for regularly updating computer equipment and providing Internet access in general, but institutional decision-makers did not see the importance, availability, and application of more seamless, reliable, and faster connections.

Throughout all the counties in the Northwest and South Central RACECs and the City of Immokalee, education on the importance of broadband is the primary need. More specifically education on (1) how broadband could impact the local economy, (2) training on how to use broadband to better meet the anchor institution service populations' needs, and (3) the importance of strategic planning in adopting and utilizing broadband effectively, efficiently, and successfully. Training on the practical applications of broadband was identified as a critical factor for administrators needing ample justification for changing the status quo and for staff to assist patrons with broadband services. Well-developed planning was also identified to enable better preparation for broadband and increase communication among staff and patrons about practical technology applications. Without education, training, and planning, the populations in

²¹ To maintain confidentiality of the anchor institutions that participated in this research, these individual reports are not available and all findings detailed in this report are aggregated so that each individual institution's data remains confidential to that institution.

the Northwest and South Central RACECs and the City of Immokalee are extremely unlikely to adopt broadband in an efficient and timely manner.

Needs assessment and benchmarking project goals related to the onsite diagnostics portion of the project are the following:

- Describe the existing broadband networks currently deployed in the region's anchor institutions;
- Identify situational factors and issues that impact how anchor institutions deploy their broadband networks; and
- Determine ways that the region's anchor institutions can improve their network deployments to increase connection speeds at the workstation.

The following section reports onsite diagnostics in the context of those goals, with the addition of an introductory section that provides an overview of participating institutions.

Participants

The onsite diagnostics conducted by the Information Institute assessment team for the FRBA cover a broad range of anchor institutions that included 19 anchor institutions: public libraries (5), K-12 public schools (4), city or county governments (2), rural health clinics²² (2), workforce board (1), rural hospital (1), higher education institution (1), emergency management agency (1), and sheriff's office (1). These anchor institutions provide varying services for the different communities in which they are located.

Existing Broadband Networks

This section compares the current uses of broadband and technology deployment at the visited anchor institutions in three areas: current speeds reaching workstations, the institution's size and complexity of the network, and the level of sophistication of network management. Comparison of these three areas will illustrate any shared traits among institutions with broadband or without broadband.

Connection Speeds

Speed tests conducted at all 19 locations reveal a wide variety of speeds at the different institutions (see Figure 38). The highest speeds documented at the higher education institutions (51.97 Mbps) and rural health clinic 1 (17.80 Mbps) contrast greatly with the two lowest speeds at public library 5 (2.38 Mbps) and workforce board 1 (2.91 Mbps). The majority of institutions' speeds fell into the 4-6 Mbps range. Figure 39 shows the percentage of anchor institutions with workstation speeds in the categories used in the anchor institution survey: < 1.5 Mbps, 1.5 Mbps, 1.6-5 Mbps, 5.1-10 Mbps, 10.1-20 Mbps, and > 20 Mbps. The diagnostics team did not observe maximum speeds at or below 1.5 Mbps at any institutions receiving onsite diagnostics.

²² The staff at both rural health clinics were unavailable for a full diagnostic, however, speed tests were conducted.

FRBA Broadband Needs Assessment: Fourth Interim Report

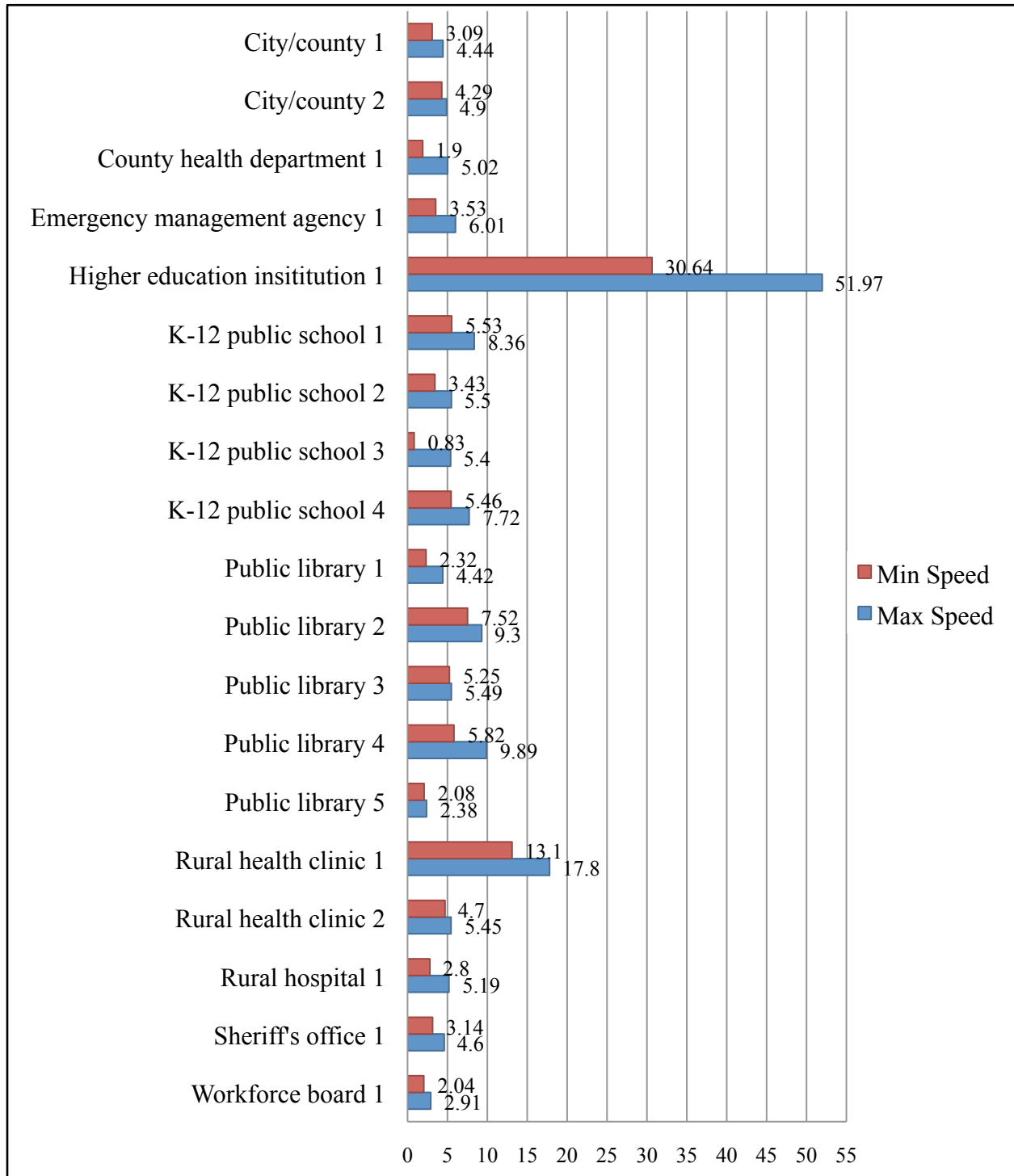


Figure 38. Minimum and Maximum Observed Internet Connection Speeds at Visited Anchor Institutions

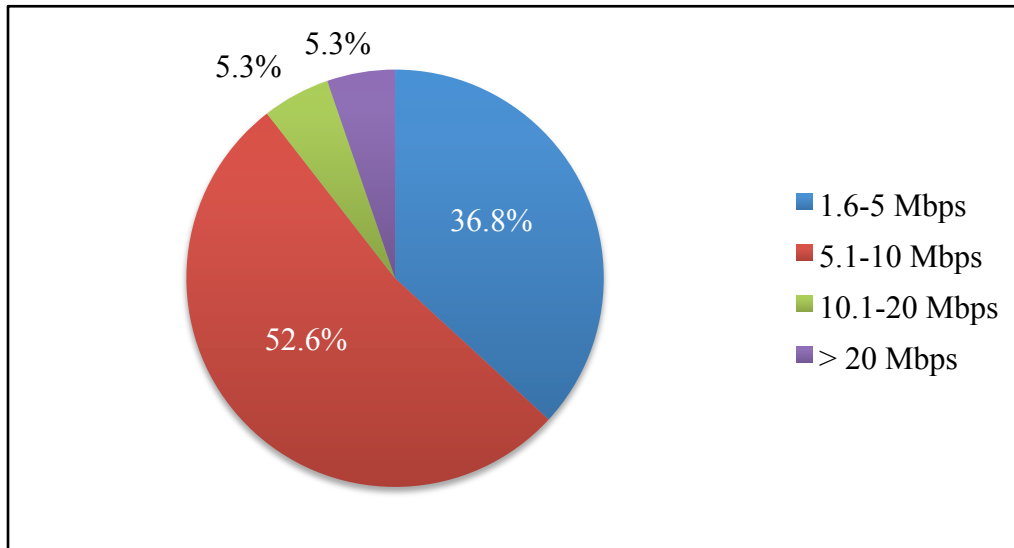


Figure 39. Tier Grouping of Speed Test Results

From both Figures 37 and 38, it is evident the majority of current connection speeds reaching individual workstations at the visited anchor institutions' fall somewhere between 4.1-6 Mbps. These data reveal that speeds for a majority of anchor institutions are in the middle range and that high-speed Internet is available in the FRBA service area. However, relatively few of the anchors that received onsite diagnostics have workstations running at speeds upwards of 10 Mbps, indicating that they are not at the highest available speeds.

Institution Size and Complexity of Network

The number of workstations at an institution gives an idea of the size, complexity, and strain placed on its network. Workstations include desktop computers hardwired into the network and portable notebook computers owned by the institution that could access the network connection. As with connection speeds, the disparity between the smallest institutions and largest is dramatic. The two city/county government offices visited have the smallest networks with only 4 workstations each (see Figure 40). Three of the four K-12 public schools and the higher education institution have the largest networks, each supporting over 500 workstations. The public libraries, emergency management agency, and one K-12 public school have 11-100 computers, and the rural hospital, workforce board, and sheriff office have 101-500 computers.

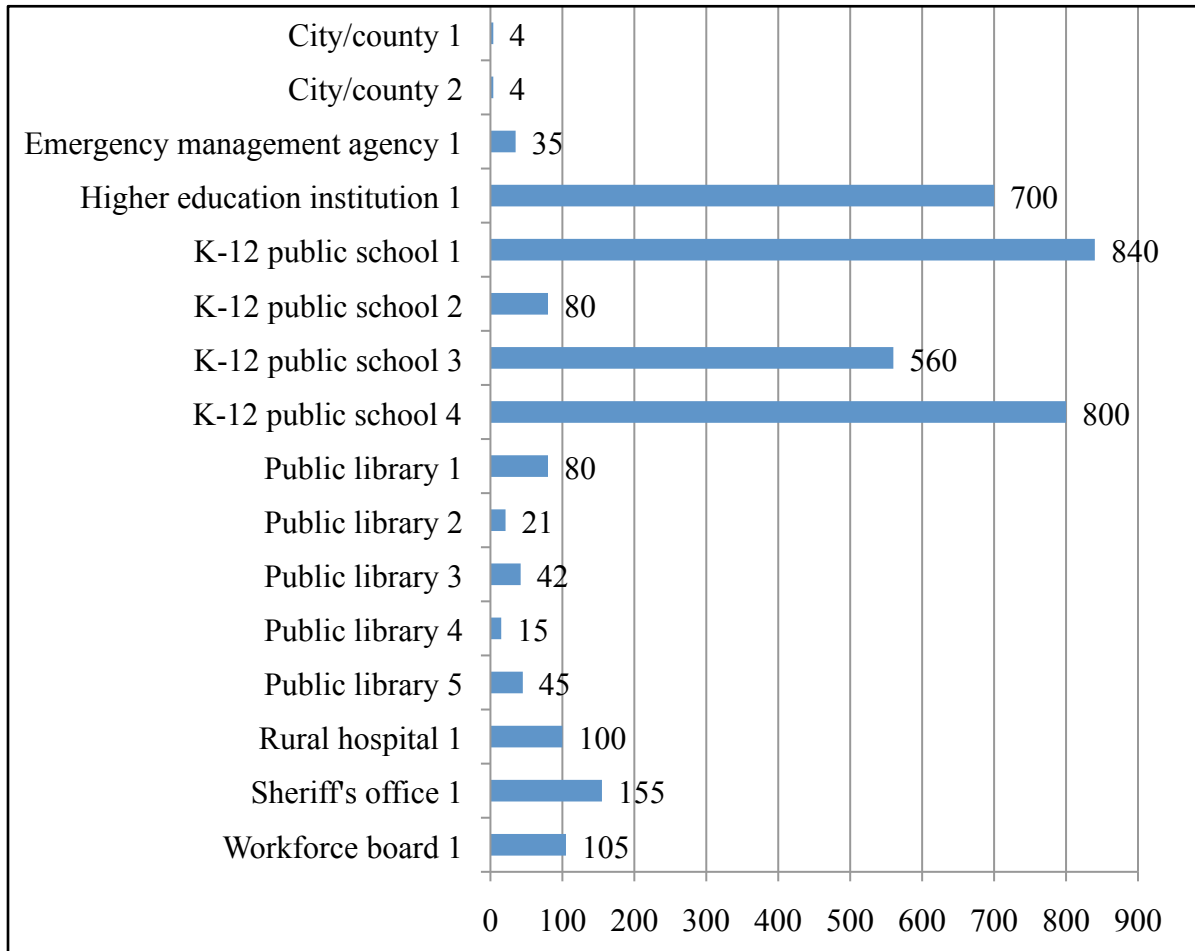


Figure 40. Number of Workstations

Comparison of the data in Figures 38 and 40 shows some correlation between an institution's size and network connection speed (Table 7; note that this table does not include the rural health clinics and county health department because information in the number of workstations was unavailable). The two city/county governments have 0-10 workstations (the smallest category) and observed workstation speeds of 1.6-5 Mbps (the smallest represented category), and these are the only institutions with 0-10 workstations. Also, the higher education institution has > 500 workstations and observed speeds in excess of 20 Mbps. However, two K-12 public schools also have > 500 workstations, and they have observed speeds in the 5.1-10 Mbps range. This indicates that there is not direct correlation between the number of workstations on a network and workstation speeds. Therefore, assuming institutions with a greater number of workstations will be more likely to adopt broadband is not supported by the data, although other factors likely impact this situations (e.g., K-12 public schools may not have the funding to support higher connectivity regardless of the size of their network).

FRBA Broadband Needs Assessment: Fourth Interim Report

Table 7: Comparison of Number of Workstations and Measured Workstation Speeds

| Workstation Speeds | Number of Workstations | | | |
|--------------------|--------------------------------|--|---|--|
| | 0-10 | 11-100 | 101-500 | > 500 |
| 1.6-5 Mbps | City/County 1 City/County 2 | Public Library 2 Public Library 5 | Sheriff's Office 1 Workforce Board 1 | ----- |
| 5.1-10 Mbps | ----- | Emerg. Mgmt. 1 K-12 Pub. School 2 Public Library 3 Rural Hospital 1 | ----- | K-12 Pub. School 3 K-12 Pub. School 4 |
| 10.1-20 Mbps | ----- | ----- | ----- | ----- |
| > 20 Mbps | | | | Higher Ed. Inst. 1 |

Sophistication of Network Management

The diagnostics team gathered several key indicators of the relative sophistication of the different institutions' network management. Well-developed and enforced network management policies and procedures provide evidence of technical knowledge and understanding of the possible need for better broadband. Figure 41 presents findings on the institutions visited that perform offsite storage of backed up data and centrally control malware on workstations. These indicators provide evidence on the level of sophistication at the visited institutions in relation to data continuity (offsite storage of backup data) and network security (centralized control of malware software).

The majority of institutions (68.4%; n=13) either do not perform offsite storage of data back-ups or do not know if their backup data is stored offsite (Figure 41). Offsite storage of back-up data provides greater protection of data from damage to or theft from an institutions' facility. The institutions that do not know whether offsite storage is performed or not (21.1% of visited anchor institutions; n=4) generally rely on outside IT consultant firms and some do not know whether back-ups to their data are performed at all. Less than half of visited anchor institutions (47.4%; n=9) do have some centralized control of malware and antivirus software, but the majority of institutions (52.6%; n=10) do not know or do not centrally manage their malware and anti-virus software. Only four institutions have offsite storage of back-up data and centrally managed malware and antivirus: higher education institution 1, K-12 public school 4, rural hospital 1, and workforce board 1.

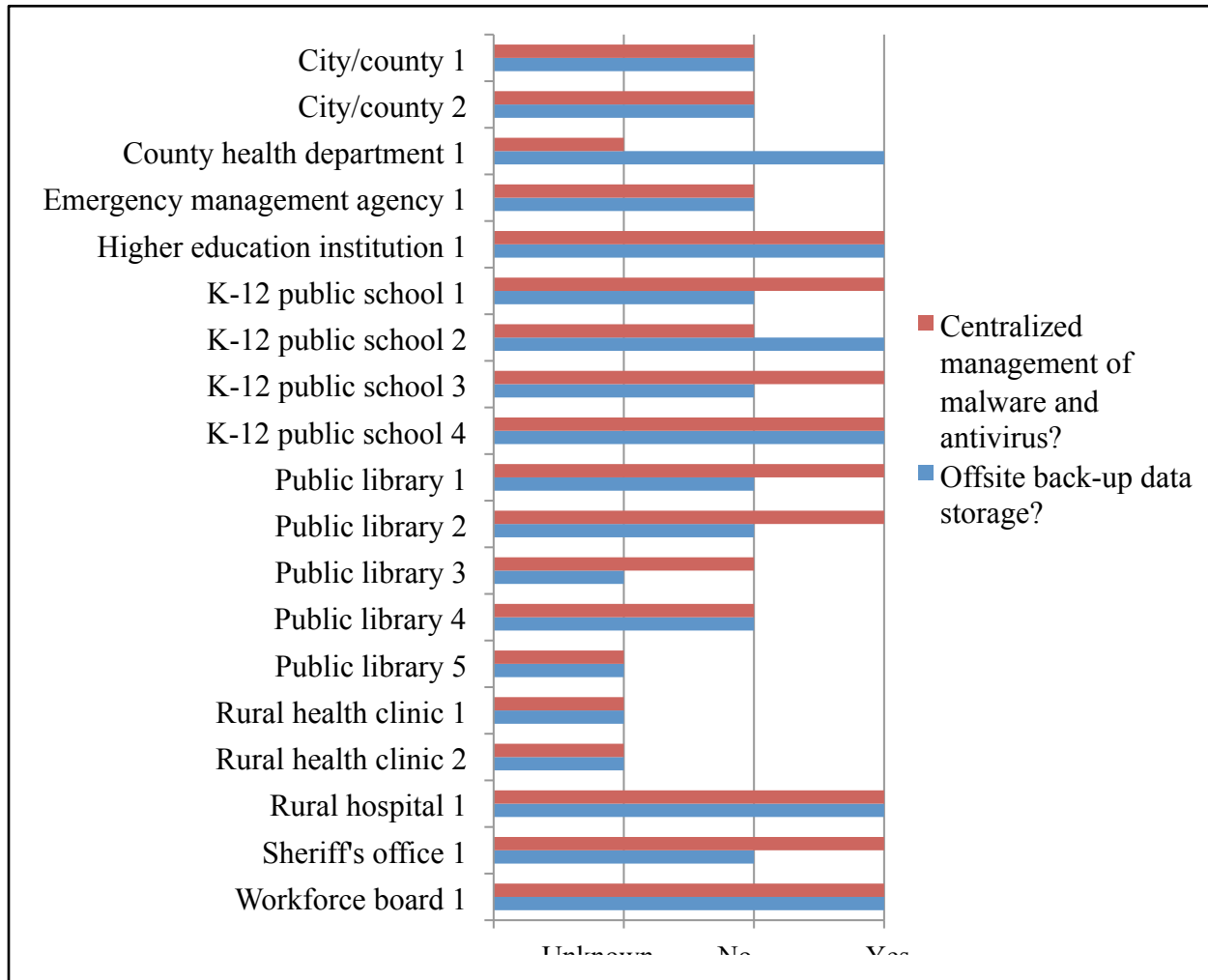


Figure 41. Institutions that Centrally Manage Malware and Antivirus and That Store Back-up Data Offsite

Situational Factors and Issues Impacting Anchor Institution Broadband Network Deployment

Each institution’s individual situation and issues greatly affect the way that institution manages and deploys its network. The presence of an onsite, dedicated IT staff,²³ control over the IT budget, and a technology plan denote the presence of an administration and staff that understand the importance of broadband and how to utilize it.

Only one institution, public library 2, has all three indicators: dedicated IT staff, control over the institution’s IT budget, and a technology plan (see Figure 42; note that full datasets for the rural health clinics were not available). The majority of institutions (n=10) have two of the three indicators, with six institutions having IT staff and a technology plan but no direct control over their IT budget. Four institutions have only one indicator (two have only IT staff only and

²³ Dedicated IT staff refers to IT staff assigned to one specific institution, as opposed to staff who are shared among multiple institutions in a consortium or other arrangement.

FRBA Broadband Needs Assessment: Fourth Interim Report

two have only a technology plan) and two institutions have no indicators: city/county 1 and city/county 2. The most common indicator is some type of dedicated IT staff, which is present in 68.4% of visited anchor institutions (n=13). The least common indicator is control over the IT budget, which is present in 21.1% of visited anchor institutions (n=4). These data show that even though the majority of institutions have staff that may understand the uses of broadband, the ability to change providers or upgrade connections may be limited by lack of control of the institution's IT budget.

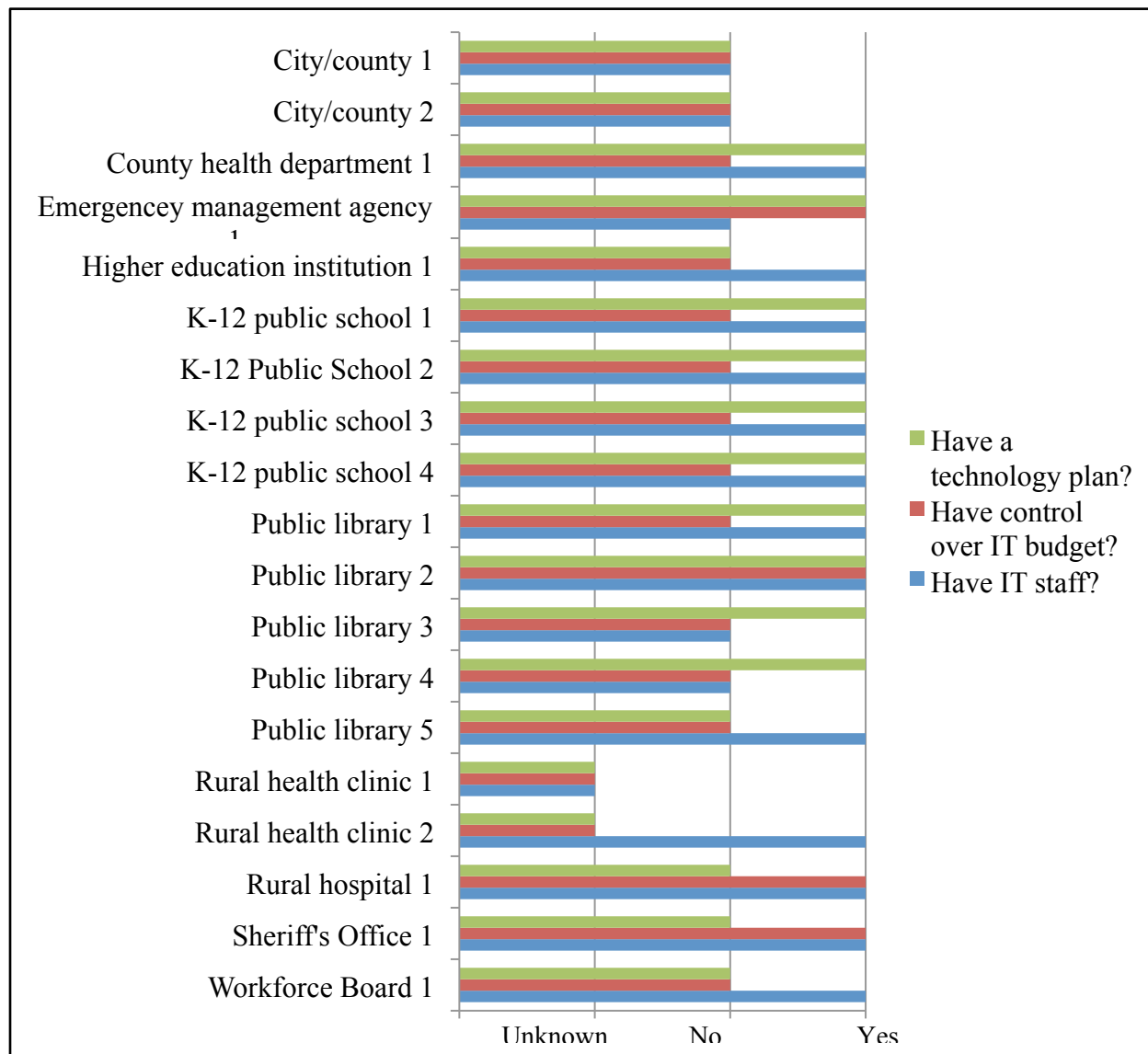


Figure 42. Whether Anchor Institutions Have IT Staff, Control over Their IT Budget, and a Technology Plan

Administrative Leadership

A critical component for any institution to adopt and use broadband is commitment from administrative staff and parent organizations to provide the best technology available. Without a strong and clear commitment from the administration, the situation is unlikely to improve. Justifying the improvement of connection speeds to administrative staff largely depends on the perceived need of the Internet to fulfill the institution’s mission or services to its users, and 79.0% (n=15) of visited anchor institutions report broadband as being highly important to their institutions (Figure 43). Also, a majority of institutions (63.2%; n=12) would not be able to function without Internet access (see Figure 44). However, an understanding of the importance of Internet access to the institution’s mission and services also depends on staff with the technical skills to utilize new broadband technologies, which is discussed in the next section.

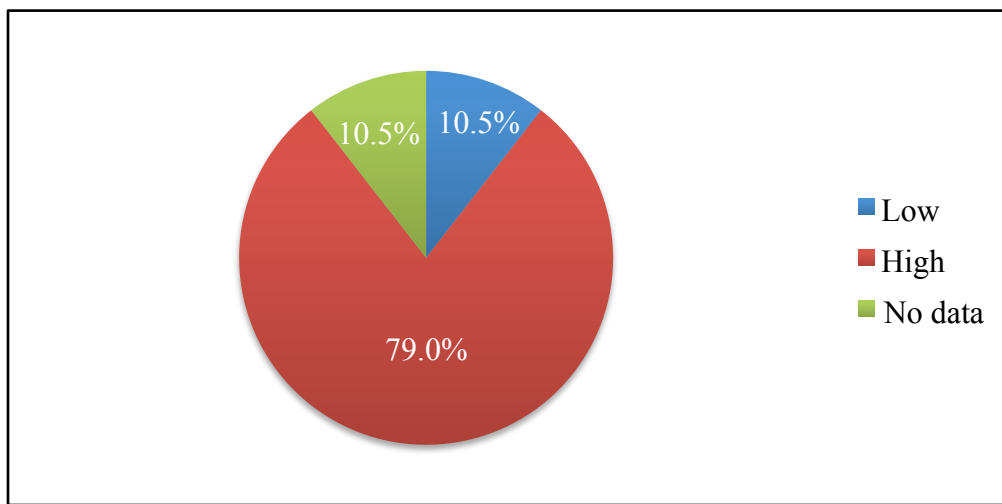


Figure 43. Importance of Broadband to the Institution

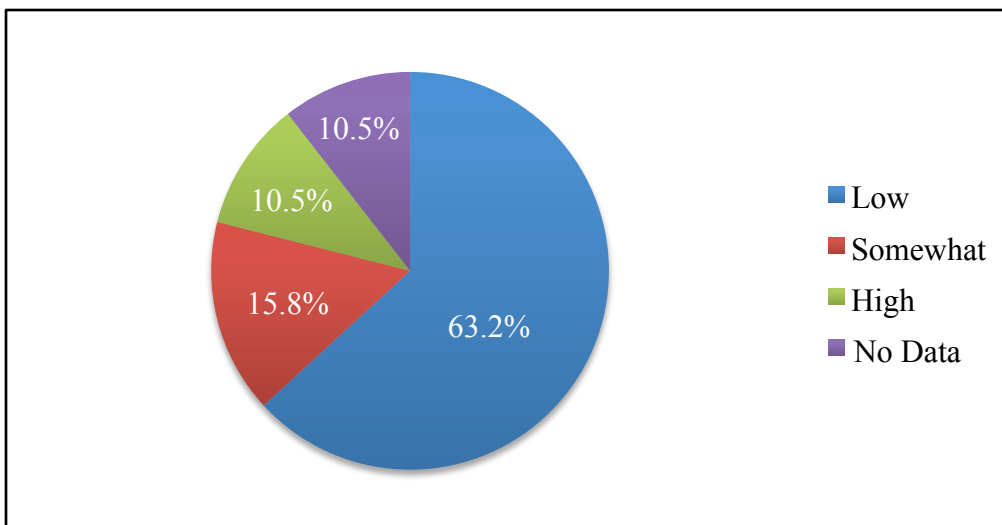


Figure 44. Ability to Function Without Internet Connection

Technical Expertise

While institutions that have their own IT staff who have a basic understanding of network management are more likely to perceive the need for broadband, actually developing applications for broadband requires ongoing technology training for all institution staff. The common perception that the current connection is “good enough,” will not change without knowledge about the applications requiring higher-speed broadband. The majority of institutions (55.6%; n=11) do not perceive ongoing technology training as important (see Figure 45). Without the staff and administrators learning new ways to utilize broadband applications, it is unlikely that IT staff members will be able to justify to administrators the costs of changing service providers or upgrading connection speeds.

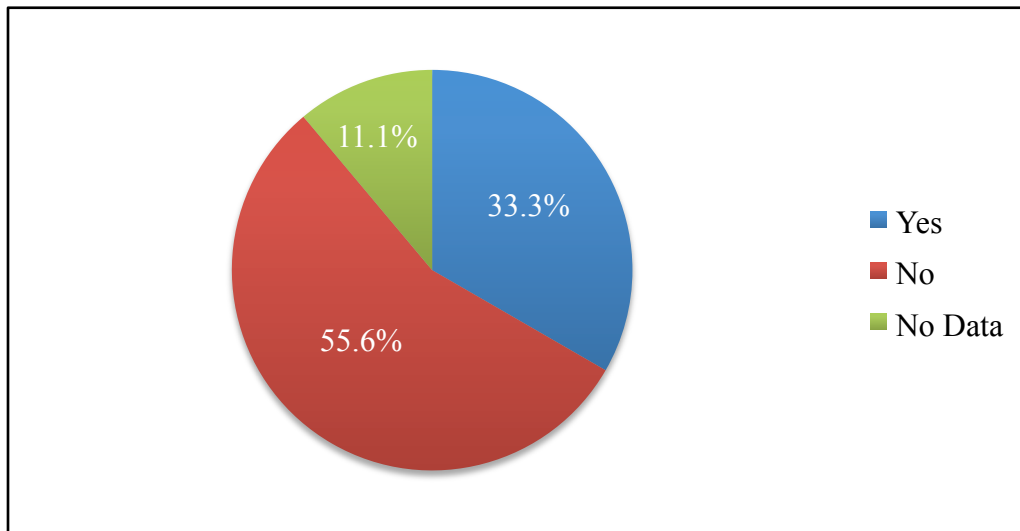


Figure 45. Whether or Not Anchors Perceive Ongoing Technology Training as Important

IT Plan

Technology planning is another critical component for an institution to adopt and utilize broadband successfully. A significant number of institutions visited have a technology plan of sorts (see Figure 42 above). Most of these institutions developed their plans to meet federal requirements for E-rate discounts for their connections. However, the federal government has dropped the requirement for an updated annual technology plan so it is unknown if these institutions will continue to participate in updating technology plans.

A technology plan is critical for maintaining clear statements of IT policies, procedures, replacement schedules, software license tracking, equipment inventories, and providing a point of reference for the institution when considering changing ISPs or vendors. One administrator expresses frustration over not knowing how much speed the institution really needs or if the ISP simply is trying to sell something. A technology plan provides a reference point and record of past experiences at the institution, enabling better continuity for technology practices. Outlining usage policies, maintenance routines, troubleshooting procedures, and succession processes also

enables greater end user autonomy and frees the IT staff to handle larger security and troubleshooting concerns.

Service Area Size

The geographic size and location of an institution's service area affects the likelihood of successfully adopting and utilizing broadband in a number of ways. Smaller service areas lead to institutions providing core essential services the community is familiar with and discourages introducing new services that may or may not be used by the community. For example, one of the small town governments that the diagnostics team visited cannot readily justify the expense of developing and maintaining GIS software and electronic records for residents that live within walking distance of the physical records. At institutions that currently have good broadband, such as the higher education institution, there is a lack of demand for broadband; for example, faculty do not use many online features made available to them. If there is no real demand for broadband from the service community, there is little reason for an anchor institution to provide services no one is likely to use.

Funding

Every visited anchor institution expresses a willingness to adopt and learn to utilize broadband connections, if the price is right and funding is available. The bottom line is that most institutions are currently struggling just to remain open as funding dwindles. The impact of decreasing budgets is a lack of suitable technology upgrade schedules resulting in tolerance of older equipment and slower connection speeds.

Many institutions do not have a separate IT budget or have to rely on parent organizations for technology funding. Technology more often than not is purchased on an "as needed" basis. For the public institutions, budgets must pass through approval processes, sometimes from multiple governing bodies. K-12 public schools rely heavily on revenue from the school district, which depends on property taxes that fluctuate from year to year. County health departments must navigate a complex bureaucratic structure for any changes to funding coming from the state. Even with administrative support, technical expertise, planning, and a service area where the demand for broadband is high, lack of funding is a major barrier to adoption of broadband.

Ways That Anchor Institutions Can Improve Their Network Deployments

The situational factors discussed above influence decision making at all the visited institutions. At each anchor institution, administrators and IT staff note the need for better education, training, and planning to amplify positive situational factors and alleviate negative factors. Without the education, training, and planning for all staff in the institution to understand the potential applications and uses of broadband, it is likely that the situational factors faced by individual institutions will trump abstract assurances of broadband's importance.

Education

Many of the visited institutions do not feel in control of their technology options. This feeling has a lot to do with the budget constraints under which each institution operates. Also impacting this feeling are four primary areas where greater education on broadband and broadband applications are needed and where greater understanding can enhance an institution's likelihood for adopting and utilizing broadband:

- Technical knowledge and indifference from staff toward new technology;
- Better understanding of diversified funding structures;
- Lack of demand for broadband-enabled services from the institutions' service populations; and
- Practical application of broadband connection speeds.

Each of these factors is discussed in more detail below.

Technical Knowledge and Views of Technology

At institutions without IT staff, there is a general lack of technical knowledge about connection speeds and applications of technology to daily tasks. At institutions with IT staff, a general reluctance on the part of the general staff to accept new technology discourages the IT staff from implementing new software programs or actively pushing for new equipment. Long-time staff are particularly resistant to any form of change. They do not see how incorporating more technology will enable them to perform their responsibilities better. For example:

- The sheriff's office IT staff notes a particularly negative perception of change in general;
- The IT staff at one of the K-12 public schools notes that most of the faculty generally embrace new technology but that long-term faculty members do not see much reason to change teaching methods they believe do not need improving; and
- The emergency management agency notes that attitudes toward embracing new technology vary by individual, but most staff are concerned only with what might help increase their efficiency in performing daily tasks.

Moreover, security protocols and procedures are seriously lacking at many institutions. This is largely due to a "it won't happen here" mentality that requires education for staff to understand what a cyber-attack implies.

Funding and Bureaucratic Structures

Most of the institutions receive their Internet connections from a parent organization. The majority of visited public libraries, for example, belong to consortia that help mitigate technology costs. In order to increase connection speeds or change ISPs, the majority of institutions will have to navigate through some kind of bureaucratic structure. For example, K-12 public schools will have to go to the state Department of Education and county health departments have to go through the state Department of Health to make changes in their ISPs,

connections, etc. Most administrators admit to a lack of knowledge about the way change ISPs or upgrade connections. Educating institutions on the steps needed for each to improve its connection speed is a critical component for successful broadband adoption.

Educating Service Populations on the Importance of Broadband

Providing education to the institution enables the institution to educate its service population. The visited public libraries all note the public's expectation that the library has quality equipment and technical expertise. Yet the libraries themselves are ill-equipped to handle the number of people seeking Internet access. One administrator notes that wait times for computer access can be several hours during peak usage times. Getting the public to understand that the transition of the Florida Comprehensive Assessment Test (FCAT) to an entirely web-based submission process will require schools to have more robust broadband connections to handle the large amounts of data is essential for the public to support the schools when they apply to school boards for additional technology funding. A more informed public also will provide greater incentives for ISPs to utilize the middle mile network to connect currently underserved communities, both for residential and anchor broadband connections.

Education on Practical Broadband Applications

The most critical need to spur broadband adoption is for education on the practical applications of broadband. For example, the sheriff's office network is quite good; however, the connection from the ISP is poor. Whenever the connection fails, officers in the field are unable to use the computers in their squad cars. This is a simplistic example of where there is a clear application for broadband speeds. Giving administrators, staff, and users examples of specific applications of broadband is a key component for any kind of education on broadband. City and county governments could show examples of GIS software used in interactive maps so that residents can provide property information to banks and real estate agencies and require broadband connections to work. With tangible examples of applications broadband moves from an abstraction to a tool used daily.

Training

There is a general need in most of the institutions for additional technology training for both IT and general (i.e., non-IT) staff. While the level of training required is unique to each institution, training needs can be categorized into levels of low, medium, and high in order to better organize and develop training programs:

- **Low level:** Institutions with mostly positive situational factors (i.e., enablers) do not require much training. Training for the higher education institution, most of the K-12 public schools, and the larger public libraries need focus only on increasing staff skillsets to better assist users with software features.
- **Medium level:** Institutions that rely on parent organizations for their IT staff but still have some level of technology support will require more training in routine planning, budgeting, and maintenance of networks. For example, the emergency management agency requires additional training on network security.

- **High level:** Institutions with no IT staff or poor communication with IT consultants, missions that do not explicitly involve technology, and historical underappreciation of the role of technology will require the most training. The city and county governments, both of which do not have IT staff, control over budgeting for IT expenses, or technology plans, are most in need of training of all types.

Based on these levels, training programs could be developed with varied modules that could be pieced together depending on the needs of the institution.

Despite the general need for additional training, most institutions do not perceive ongoing technology training as very important (see Figure 8 above). Staff that do request additional training typically do so for specific software, such as Microsoft Excel, but most institutions do not offer training for new software or programs the vendor unless provides it. An IT administrator at a K-12 public school notes that her school discontinued technology training classes due to faculty complaints that it limited their time for lesson planning. Busy schedules and limited funding for travel of any kind are the most common factors influencing limited training opportunities. Each institution expresses the need for any training to be online and flexible enough so staff can access the training whenever they have time available. Public libraries are the best equipped type of anchor institutions to address training shortfalls as they have training modules and resources provided by consortia.

Planning

Education and training of institution staff and communities requires a high degree of technical planning currently lacking at most of the visited anchor institutions. While the majority of visited institutions have technology plans, they include only whatever the technology plan requires in order for the institution to receive funding assistance (see Figure 5). The primary mission of the institution also largely affects the priority level the institution assigns to spending the time and resources to develop a technology plan.

The public libraries' and K-12 public schools' technology plans developed to receive E-rate discounts are examples of the benefits a technology plan brings to an institution. The libraries and schools tend to have better connection speeds, equipment, and more knowledgeable staff than institutions without plans. What these plans really lack, however, are contingencies in case of funding cutbacks. Institutions that do not have technology plans typically are in worse situations. The city and county governments, for example, have poor connections speeds, outdated equipment, no IT staff, and no plan for how to improve their situations.

The big exception to the rule of thumb that a technology plan correlates to more robust technology is the higher education institution; this institution lacks a plan but did has the fastest connection speed observed in all 19 visited institutions. IT administrators there note a lack of communication between the IT department and the faculty about technology applications that currently are underutilized. Even in institutions that already have high connection speeds, there still is a need for planning to outline technology goals and objectives, such as getting the staff to actually use the technology and resources that are available to them.

The big benefits of a well-developed technology plan are more consistent performance from the network, better communication among employees, greater continuity of operations, and the ability to outline strategies for increasing public awareness about broadband applications. Poor planning, however, is just as bad as no planning. Public libraries and K-12 public schools benefit from set requirements for their technology plans. City and county governments do not have state- or federally-determined requirements or guidelines for developing technology plans and will require some form of assistance or guidance to develop useful technology plans. Without clear technology goals or objectives outlined in a central plan, it is unlikely an institution will adopt broadband.

Summary of Onsite Diagnostics Findings

The preliminary findings from the onsite diagnostics reinforce the preliminary findings from the surveys and the focus group sessions. The needs assessment suggests that full adoption and utilization of broadband by anchor institutions will require a significant focus on educating both the institutions’ staffs and service communities on the benefits and applications of broadband and detailed planning to exploit broadband to its fullest capacity and benefit. Without education, training, and planning, the situational factors influencing the different institutions will inhibit broadband adoption and growth as each institution views other issues and problems, such as maintain or increasing current funding levels, as more critical priorities than better Internet service.

Integrating Survey, Focus Group, and Diagnostics Findings

Respondents and Participants

Overall, the two types of anchor institutions with the largest percentage of study participants are libraries and schools/school districts. Libraries represent the highest percentage of participants for both focus groups and diagnostics, and schools/school districts represent the highest percentage of participants in the surveys and second highest percentage for both the focus groups and the diagnostics (Table 8).

Table 8: Percent of Survey Respondents/Focus Group Participants/Diagnostics Participants by Anchor Institution Type

| Anchor Institution Type | Survey | | Focus Groups | | Diagnostics | |
|--------------------------------|---------------|----------|---------------------|----------|--------------------|----------|
| | n | % | n | % | n | % |
| City/county government | 15 | 18.3% | 1 | 3.6% | 2 | 10.5% |
| Higher education | 4 | 4.9% | 2 | 7.1% | 1 | 5.3% |
| Hospital | 5 | 6.1% | 1 | 3.6% | 1 | 5.3% |
| Law Enforcement | 13 | 15.9% | 3 | 10.7% | 1 | 5.3% |
| Library | 12 | 14.6% | 11 | 39.3% | 5 | 26.3% |
| Rural health clinic | 3 | 3.7% | 1 | 3.6% | 2 | 10.5% |
| School/school district | 25 | 30.5% | 7 | 25.0% | 4 | 21.1% |
| Other | 5 | 6.1% | 2 | 7.1% | 3 | 15.8% |

FRBA Broadband Needs Assessment: Fourth Interim Report

The research plan called for survey response from all FRBA counties and focus group and diagnostic participation from institutions representing all areas of the region. The study team achieved this goal (Table 9). However, the focus groups and diagnostics find that geographical location is less of an indicator that an institution will adopt broadband than the existence of an influential individual in that county who champions adoption. These issues appear to trump more traditional metrics such as population density or income and education level. The IT consultant representative in one focus group notes that, “We have county commissioners that don’t have a computer.” There is also “a lot of short-term thinking” with the current budget situation in which most counties find themselves and county governments do not seem eager to take a proactive approach to something that will have a long-term (but not necessarily short-term) benefit. A library representative also notes that she would, “have an easier time because of why my county council treats me. Their attitude is if we don’t hear from you there is not a problem and they let me do what I want.” She goes on to comment that it would not be the same case with someone else who has a different relationship with his/her board or county council.

Table 9: Percent of Survey Respondents/Focus Group Participants/Diagnostics Institutions by County

| County | Survey | | Focus Groups | | Diagnostics | |
|------------|--------|-------|--------------|-------|-------------|-------|
| | n | % | n | % | n | % |
| Calhoun | 10 | 12.2% | 4 | 14.3% | 1 | 5.3% |
| Collier | 2 | 2.4% | 1 | 3.6% | 1 | 5.3% |
| DeSoto | 5 | 6.1% | 1 | 3.6% | 1 | 5.3% |
| Franklin | 5 | 6.1% | 0 | 0.0% | 1 | 5.3% |
| Gadsden | 4 | 4.9% | 1 | 3.6% | 1 | 5.3% |
| Glades | 3 | 3.7% | 2 | 7.1% | 2 | 10.5% |
| Gulf | 4 | 4.9% | 5 | 17.9% | 2 | 10.5% |
| Hardee | 1 | 1.2% | 0 | 0.0% | 0 | 0.0% |
| Hendry | 7 | 8.5% | 3 | 10.7% | 1 | 5.3% |
| Highlands | 6 | 7.3% | 2 | 7.1% | 2 | 10.5% |
| Holmes | 5 | 6.1% | 0 | 0.0% | 1 | 5.3% |
| Jackson | 17 | 20.7% | 4 | 14.3% | 2 | 10.5% |
| Liberty | 3 | 3.7% | 1 | 3.6% | 2 | 10.5% |
| Okeechobee | 4 | 4.9% | 2 | 7.1% | 1 | 5.3% |
| Washington | 6 | 7.3% | 2 | 7.1% | 1 | 5.3% |

Connection Speed

The research measured workstation speed in both the surveys and diagnostics. Survey respondents used a free speed test²⁴ to measure speeds at a staff and a public workstation, while the diagnostic visits measured end-to-end speed (the speed of the connection from the ISP network server to the institution’s workstation). This means that the study team measured “total traffic carrying capability of a link or path in a network,”²⁵ or the best-case speed.

²⁴ <http://speedtest.net>

²⁵ Bauer, S., Clark, D., Lehr, W. (2010). *Understanding broadband speed measurements* (p. 9). Massachusetts Institute of Technology. Available at: http://mitas.csail.mit.edu/papers/Bauer_Clark_Lehr_Broadband_Speed_Measurements.pdf

Calculating top speed results for the two methods (staff workstation downstream speeds from the survey and maximum observed speed from the diagnostics) produces slightly different results. While the majority of staff workstations in the survey run at 5 Mbps or less, the largest percentage of anchor institutions in the diagnostics show speeds between 5.1 to 10 Mbps (Table 10). This may be due, at least in part, to the number of workstations measured—79 institutions report workstation speeds for the survey, but the study team conducted diagnostics at only 19 institutions, making the results much more of a snapshot of those institutions. In fact, over a quarter of workstations in the survey and a third of workstations in the diagnostics have dial-up level speeds of less than 1.5 Mbps.

Table 10: Advertised and Measured Speeds (Survey) and Maximum and Minimum Observed Speeds (Diagnostics)

| | <1.5 Mbps | 1.5 Mbps | 1.6-5 Mbps | 5.1-10 Mbps | 10.1-20 Mbps | >20 Mbps |
|---------------------------------|-------------------------|---------------------|-----------------------|------------------------|-------------------------|------------------------|
| <i>Surveys</i> | | | | | | |
| Advertised Speed | 6.3% | 10.1% | 20.3% | 30.4% | 17.7% | 15.2% |
| Downstream at Staff Workstation | 9.1% | 1.5% | 45.5% | 27.3% | 9.1% | 7.6% |
| Upstream at Staff Workstation | 34.3% | 3.0% | 35.8% | 17.9% | 7.5% | 1.5% |
| <i>Diagnostics</i> | | | | | | |
| Maximum Observed Speed | 0.0% | 0.0% | 31.6% | 57.9% | 5.3% | 5.3% |
| Minimum Observed Speed | 5.3% | 0.0% | 57.9% | 26.3% | 5.3% | 5.3% |

Internet Connectivity Cost

The focus group and diagnostics findings suggest that Internet connectivity cost is a key factor in broadband adoption for rural Florida anchor institutions. The survey participants report a wide range of costs, with the majority falling into two categories: \$1,000 to \$2,499 (26.2%) and \$20,000 to \$49,000 (24.6%) (see Figure 22 above). Data from the focus groups confirm that some institutions are paying very high rates; in addition, rates for the same speed can vary widely from institution to institution or across counties. For example, a rural health clinic participant reports paying \$4,800 per year for a 10 Mbps connection, while a library participant reports paying \$27,600 for the same speed. That is the highest amount mentioned in a focus group; the second-highest amount is the \$21,600 per year that a hospital is paying for a 3 Mbps connection.

These costs may be a ceiling for many anchor institutions. The focus group participant who says that whatever the monthly cost is for the connection, it is too expensive is not alone—28.3% of survey respondents say that they cannot afford faster Internet. This data makes clear why the focus group participants are under pressure to reduce costs and say that they would not be able to pay more for upgraded broadband connections.

Adequacy of Current Broadband to Meet Staff and User Needs

While 69.0% of survey respondents report that their Internet speed is adequate to meet *staff* needs most of the time and 66.7% said that it is adequate for meeting *public* needs most of the time, a fairly high number of respondents report that it is only adequate to meet staff and

public needs sometimes (16.9% and 16.7%, respectively; see Figures 12 and 13 above). The focus groups and diagnostics findings contextualize these results. Almost all of the diagnostics participants (88.2%) rate the importance of broadband to their organizations as high, and 70.6% rate their ability to operate without a broadband connection as low (17 of the 19 diagnostics institutions were asked these questions). Several focus group participants report serious problems with their connections, such as the library that lost its connection for two days. A hospital that lost its connection for eight hours reports that “nobody gave a flip” and several phone calls did not produce any action because, “the only person that knew how to fix the problem was at a conference.” A representative from a hospital’s rural health clinic outpost points out that their “ability to provide patient care is really dependent on the connection with our central office and records. With everything going paperless, if you don’t have a good enough speed you’re dead in the water.”

Staff Training and Public Education Needs

While survey respondents report that their staffs are extremely or very comfortable with basic computer, basic Internet, and advanced Internet skills (such as searching for information and getting online), the story is the opposite for basic and advanced broadband skills (such as what they are and their uses) and basic and advanced wireless skills (such as configuring a network; see Figure 8 above). This lack of technology skill sets is more pronounced for the end users of anchor institutions, with a fairly low percentage of respondents reporting that the public they serve are comfortable with even basic skill sets such as basic Internet and computer skills, including basic email skills (see Figure 9 above). Despite this apparent lack of technology skills, the largest percentage of institutions reports no plans for staff or public training in the next year (see Figures 10 and 11 above).

Information from the focus groups and diagnostics add context to these survey results. The institution’s mission and main service area have strong impacts on its emphasis on technology. The educational focus of libraries, K-12 schools, and higher education institutions means that they usually have an IT person, have an administration that wants to emphasize technology use, are part of larger professional organizations that provide technology training and planning, and are more likely to have staff who are well educated and hold a minimal level of experience with technology. The non-educationally focused institutions (such as city/county governments, health clinics, and law enforcement) typically do not have an IT person, or must share one with numerous other institutions, do not have an administration that views technology as particularly important, are not supported with technology training and planning services from their professional organizations, and do not tend to have staff who hold even a minimal level of experience or familiarity with technology. For example, a diagnostics participant notes that staff members must have training in the skills needed for their core responsibilities and that little attention is paid to any other type of training. Focus group and diagnostic participants note that easily available online asynchronous training for staff members would be extremely helpful. The financial situations of rural anchor institutions is a factor in this area as well, with representatives suggesting that any training programs that would be developed have to be cost-effective, by which they seem to mean free of charge to the institution.

Perceived Economic Benefit of Increased Broadband Connectivity

The survey respondents perceive broadband connectivity to have a very high or high degree of impact on economic benefits (see Figure 14 above). Focus group findings confirm this perception. A library representative comments that broadband is a deal breaker in trying to attract not only businesses to the area but also people who want to live outside of congested suburban and urban areas: “With an Internet connection you can order anything you need or work anywhere at home, but without it you just can’t really make an argument for anyone to move here.” However, the participants say that building broadband without addressing the urgent need for broadband-related training and education would not help economic development. An IT consultant comments that there has to be some kind of additional broadband application training and education, a sentiment echoed by other participants. Participants in multiple focus groups note the severe lack of workers who are trained for high-tech jobs, and the corollary problem of losing those who are trained because of a lack of opportunity: “Our young people get an education and go be IT professionals somewhere else because there is nothing to keep them here.” In fact, one focus group participant notes that his institution has been trying to hire an IT staff member but cannot get anyone to apply.

Barriers and Enablers

One of the key findings from the focus groups is a set of barriers and enablers that limit or contribute to anchor institutions’ success in obtaining, deploying, managing, and applying broadband. Figure 36 (above) details the full sets of barriers and enablers; this section collapses these factors into five categories:

- Resources;
- Broadband and technical knowledge (including trained IT staff and patron training);
- Access to broadband (including access to competitive ISPs and ISP pricing issues);
- Out-of-date network hardware and software; and
- Equipment.

The following section integrates survey, focus group, and diagnostics findings to bring context to these situational factors.

Resources

Survey respondents report that the majority of institutions are self-funding, with some receiving outside funding from county or regional entities, the state, and/or the federal government (see Figure 24 above; it should be noted that the majority of institutions the study team visited for onsite diagnostics report that their primary funding comes from the county, but these anchors represent only eight institutions). This means that resources are not always available for technology—28.3% of survey respondents report that they cannot afford faster Internet (see Figure 29 above). One diagnostics participant notes that while his administration is open to new technology, it is a challenge to budget for technology because the institution’s priorities focus on “mission critical services.” A school district diagnostic finds that there are no plans to purchase any new equipment or software in the near future. A city hall diagnostic notes

that the City Commission must approve all expenditures and that the commission does not perceive broadband as overly important for the city.

Funding is a complicated issue, especially for public institutions such as schools, libraries, and first responders. A library diagnostic makes this clear in the participant's note that the library must request money for technology upgrades and then the city would have to move the funds from other city services. A school representative at a focus group notes that the relative size of the district and whether or not it is part of a resource-sharing consortium affects its overall technology capability—this particular school is in a larger system that is “better off” than a smaller one when requesting money from the state.

Broadband and Technical Knowledge

The survey, focus groups, and diagnostics visits reveal a lack of technical knowledge among anchor institutions' staffs. Some institutions rely on outside IT consultants to bridge this gap, but this does not build internal technical expertise. The main service role of the institution plays a big part in its ability to provide technology training and the priority it gives such training. For example, education-oriented institutions (i.e., schools, libraries, and higher education) tend to suggest that they have a lot more resources for training than some other types of institutions. In contrast, a sheriff's department notes that, despite having an administration that purports to support IT initiatives, there is no real demand for training from the staff and the department does not have any resources for training. The diagnostics findings show that only 35.3% of institutions say that their organization perceives ongoing training as important.

Access to Broadband

Although 70% of survey respondents report an interest in increasing their connection speed, only 7.1% plan to do so (see Figure 29 above). The survey does indicate some of the problems related to this, including lack of funding to support an increase and institutions that already subscribe to the highest speed available in their area. The focus groups and diagnostic visits reveal another problem in this area—the majority of institutions report only one option for an ISP. The IT director for a hospital comments that CenturyLink is the only provider available and he has problems with its security protocols. On top of that, the ISP did not set up the connection properly initially and it took several weeks for him to get CenturyLink to fix the problem so that his institution could receive the full amount of bandwidth they pay for.

Several diagnostics participants note that they would like to bring in a second ISP for redundancy—reliability seems to be a problem, especially with DSL connections. One institution has two DSL lines in an attempt at redundancy but does not find that ideal. A sheriff's office has a slightly different type of supplier issue because of the need for squad cars to have Internet access. Their only option is to use Verizon air cards: “We've had good luck with it but it's limited.” In addition, bottlenecks, where all the connections for a certain county have to go through one location, are a real problem for all the institutions. For example, every connection in Glades County has to go through Labelle, creating a bottleneck that reduces speed and causes system crashes.

Out-of-Date Network Hardware and Software

The survey reveals a number of network hardware concerns. Almost 30% of reporting institutions do not have Wi-Fi networks, and only 18% of those institutions are planning on adding a network within the next year (see Figure 31 above). Respondents also report issues that could inhibit better networks. For example, almost 70% report that technical issues are an obstacle to obtaining broadband or increasing speed, and almost 60% of staff workstations are three or more years old. The diagnostics findings bring context to this situation through the metrics on administrative and staff understanding of broadband importance and utilization. Ten of 17 institutions have a technology plan and only four have control over their IT budgets, which limits their ability to upgrade technology. One diagnostic participant has a server that is very old, but avoids equipment upgrades unless they are absolutely necessary because the process of selecting new equipment is long and tedious, bidding is required, and the City Council has the ultimate decision-making authority.

Equipment

A focus group participant notes that she does not believe that the equipment at her library could really take advantage of a high-speed connection, and, even if there were room in the budget for buying new equipment, they do not have a process for selecting to what to buy: “Do we need new workstations? Or is it something else?” This library does not have staff members with the technical knowledge necessary to understand what impacts their workstation speeds, leaving the institution reliant on vendors—and “the vendors know it.” A diagnostics participant also comments on the dependence on IT consultants for recommendations on what equipment to replace and the selection of new equipment. The director of a library cooperative notes that any money for upgrades requires shifting funding away from other city services and that only happens if the library needs the upgrades desperately.

Summary of Integrated Survey, Focus Group, and Diagnostics Findings

Integrating the survey, focus group, and diagnostics data provides context for the findings of each method by combining the data in areas covered by multiple methods. The integrated analysis supports several findings from the individual methods. Although the diagnostics and surveys have slightly different speed test results, even the top speeds observed in the diagnostics do not exceed 10 Mbps for the majority of institutions (and the larger base of workstation connections measured in the survey find a much slower speed). Additionally, a relatively large percentage of institutions report that their connections are not always adequate to meet staff and public needs. However, most institutions would be unable to pay more for better and faster connections (connection costs were found to vary considerably in both the survey and the focus groups), even though the survey and focus group participants perceive broadband to be a very important factor for economic growth in these rural communities. In order to exploit any expanded broadband connections, many institutions will need to have better-trained staffs, but they currently are not planning on offering broadband-related training opportunities within the coming year. Finally, the barriers and enablers identified in the focus groups (such as resource- and equipment-related problems and lack of access to broadband) are confirmed by the survey and diagnostics findings.

CONCLUSIONS AND RECOMMENDATIONS

Recommendations

This report emphasizes two key recommendations, out of the many that the study team could offer. The study team chose these two because we believe them to be important, yet relatively easy to accomplish. First, it is clear from this research that building the middle mile network, in and of itself, will not guarantee anchor institution adoption of higher-speed broadband. Any effort to build out broadband in the FRBA service area must include a massive community awareness and instruction effort. The community awareness effort is necessary to explain to people what broadband is, why it is important, and how it matters to their daily lives in order to get them interested in broadband to begin. Then, instruction is necessary to teach them how to use broadband effectively to increase productivity (at work and home), open the door to new opportunities, and better their lives. The community awareness effort will occur, in part, through the community-based broadband planning extension of this project through the summer of 2012 (discussed more below in Areas for Future Research). As part of this project, the Information Institute developed two online, self-paced tutorials related to broadband—“Importance of Broadband” and “Regional Broadband Planning.” These tutorials are available at <http://tutorials.ii.fsu.edu>.²⁶

Second, the FRBA (or another entity in this region) should undertake to complete a comprehensive list of all broadband-related projects occurring in this region. This is necessary first to know what is going on that may impact adoption and use of the middle mile network and second to position the Northwest and South Central rural regions better to seek and obtain additional funding to continue broadband build-out and adoption efforts. Without such a listing, there might be duplication of efforts, which can dissuade funding agencies from providing additional dollars to help increase broadband awareness, availability, and use in the community.

Areas for Future Research

As with the innumerable possible recommendations stemming from the needs assessment, there are myriad possible for areas of future research building off this needs assessment. The Information Institute can provide a more comprehensive listing upon request, but for this report, the project team focuses on four main areas for future research: community impacts and outcomes, subscribership, community-based broadband planning (which the Information Institute will begin in January 2012), and comparison of anchor institution and residential broadband adoption. Each is discussed briefly below.

²⁶ As of this report, “Importance of Broadband” is up and running. “Regional Broadband Planning” will be available in a few weeks after it is finalized.

Community Impacts and Outcomes

Findings from this study, as well as studies by the University of Texas Telecommunications & Information Policy Institute (TIPI),²⁷ indicate that funding infrastructure projects does not automatically guarantee increased broadband adoption and utilization. Factors that can influence adoption and utilization (such as the enablers and barriers discussed above), and measures of whether and to what degree they occur, are needed in order to demonstrate the success of BTOP-funded projects such as the FRBA Florida Rural Middle Mile Networks Project. Basic evaluation metrics such as anchor institutions and homes passed by the new network do not measure the success of the projects in increasing broadband adoption and utilization, just broadband availability. The readiness of anchor institutions for exploiting middle mile investments is a particular concern, particularly since these infrastructure projects have received significant federal investment and since they represent a unique dimension in terms of ownership, structure, and genesis, compared to extant telecommunications infrastructure. Whether and to what extent anchor institutions are prepared to take advantage of new infrastructure remains to be seen, and can be understood only through research that investigates why some anchor institutions adopt and others do not, the degree to which this is so, whether and to what extent a BTOP (or other) broadband network project actually results in anchor adoption (as well as home adoption), and other issues.

Subscribership

As mentioned previously, just building the network does not guarantee subscribership, especially in economically depressed areas—such as the Northwest and South Central RACECs and City of Immokalee—where people and institutions seem to perceive other needs as more pressing than the need for higher speed broadband Internet. Even for the anchor institutions, bringing a broadband connection to their front door is just the first step. This research finds that inefficient and poorly designed network configurations severely compromise the speed and quality of many anchor institutions' broadband services at the workstation level; also, many staff members do not know the speed or quality of their front door broadband connections and do not understand the ways in which speed to the workstation can be degraded. Additional considerations that impact broadband adoption and use include educational and income levels, with broadband adoption more likely as education and income levels rise.²⁸ This is particularly concerning for the northwest and south central Florida regions, in which education and income levels are not on par with state (or national) averages. Understanding (and mitigating) these factors may prove invaluable to broadband build-out projects that otherwise may build a network that no one (or few people) ultimately utilizes.

²⁷ Cunningham, C., & Strover, S. (2009). Rural communities in the networked environment. In P. Golding & G. Murdock (Eds.), *Unpacking Digital Dynamics* (pp. 59-80). New York: Hampton; Oden, M., & Strover, S. (2004) *2004 update: Links to the future*. Washington, D.C.: Appalachian Regional Commission; see also Strover, S., & Oden, M. (2002). [*Links to the future: The role of information and telecommunications technology in Appalachian economic development*](#). Washington, D.C.: Appalachian Regional Commission; and LaRose, R., Gregg, J., Strover, S., Straubhaar, J., and Inagaki, N. (2008). *Closing the rural broadband gap: Final technical report*. Washington, D.C.: U.S. Department of Agriculture.

²⁸ Horrigan, J. B. (2010). *Broadband adoption and use in America: OBI working paper series no. 1*. Washington, D.C.: Federal Communications Commission.

Rural communities' readiness to exploit middle mile investments is a particular concern, especially since these infrastructure projects have received significant federal investment and since they represent a unique dimension in terms of ownership, structure, and genesis, compared to extant telecommunications infrastructure. Whether and to what extent rural communities are prepared to take advantage of new infrastructure remains to be seen. One area for future research would be to further investigate factors that spur broadband adoption and develop a model to help determine areas more likely to have a larger number of new or upgraded subscribers to broadband Internet. Such research would be of value to the FRBA and other ISPs as they determine which areas are more likely to see profitable returns on infrastructure investments.

Community-Based Broadband Planning

One of the findings from this needs assessment is the need for increased community awareness and community-based broadband planning in the FRBA region to better exploit and leverage the existing high-speed broadband existing now and that will soon be available to a greater extent in the near future. The Information Institute will work with the FRBA to pilot test a community-based broadband planning effort in two communities in the FRBA region (one each in the Northwest and South Central RACECs) and fine-tune that approach for future use in rural regions of Florida. From this research, the Information Institute has developed a draft community-based broadband planning model (Figure 41) that outlines what steps a community needs to undertake to plan for communitywide broadband deployment and adoption.

The goals of this community-based broadband planning effort following the above model are to increase community awareness of the importance and uses of high-speed broadband, demonstrate specific high-speed broadband applications, leverage existing broadband skills and knowledge within the community, encourage anchor institutions and residents to subscribe to or upgrade their broadband connections, and develop and implement a community-based broadband plan. Also, such a pilot test would enable refinement of the model through application in a real-world setting. Ultimately, the success of this community-based broadband planning effort will be the degree to which the community members that participate can better exploit the available and forthcoming high-speed broadband for a range of activities; that anchor institutions can use broadband to transform the way in which they operate; and the degree to which local government officials and others can improve residents' quality of life and the economic viability of their communities. Clearly, those rural communities in Florida that *could* accomplish these goals would be much more attractive as places to live, places to work, and places to attract others from communities that do not have such access to and use of high-speed broadband.

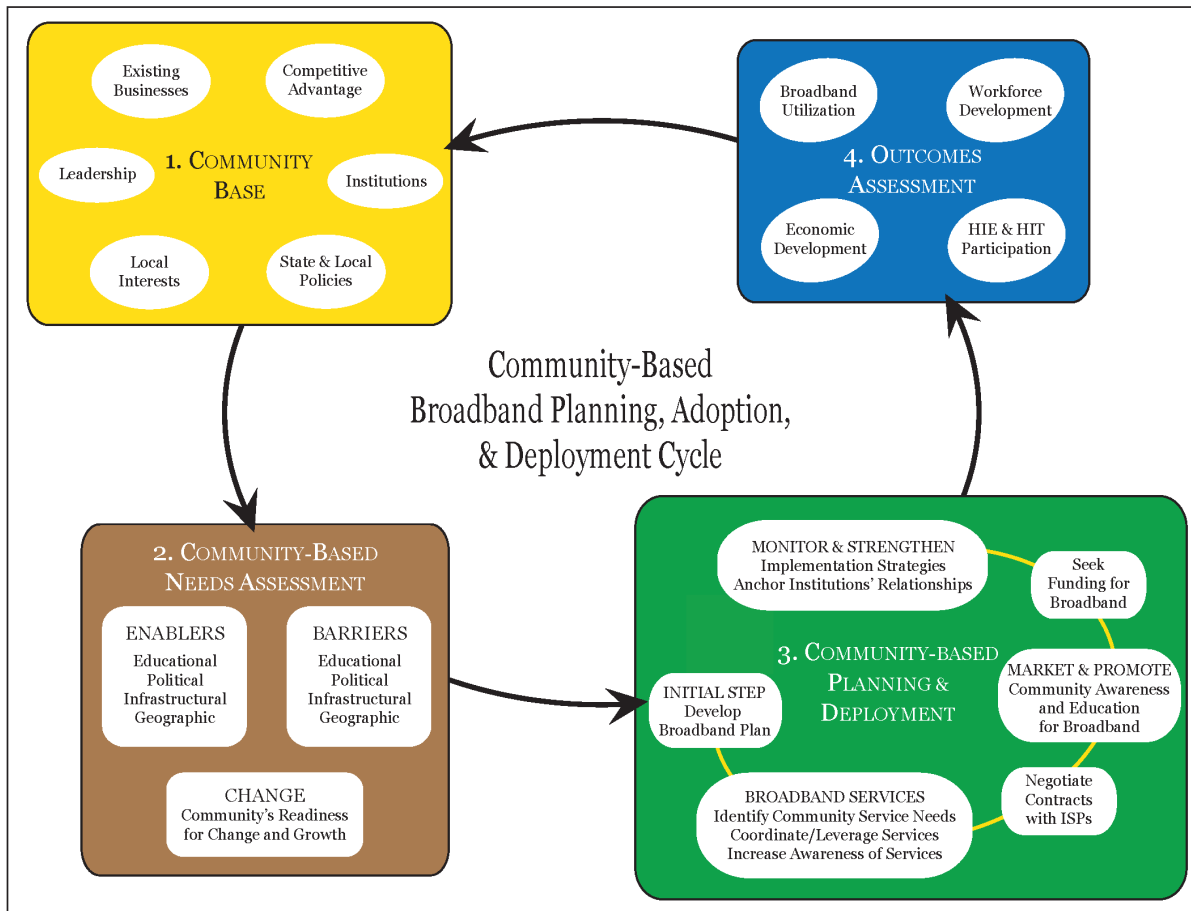


Figure 46. Community-Based Broadband Planning Model

Anchor Institution vs. Residential Broadband Adoption

Connect Florida’s 2011 Residential Broadband Adoption Survey (a telephone survey of residential subscribers) covers some different and some similar territory as the FRBA survey.²⁹ The Connect Florida survey is similar in its overall goals of measuring technology adoption and usage, asking questions about barriers to technology adoption, Internet cost, type of service, advertised download speed and comparison to actual speed, and reasons for subscribing to broadband. However, many of these data points cannot be compared directly to the FRBA results because the questions were worded differently on the two surveys.

While the study here focuses on anchor institutions, a valuable area for future research would be to integrate data regarding anchor institution broadband adoption and end user home broadband adoption rates. Such research might enable FRBA and other entities to better

²⁹ Connected Nation provided a data file to the Information Institute for analysis, but attempts to analyze that data in comparison to data gathered for the FRBA needs assessment largely were unsuccessful due to variations in the data points.

understand what make some communities more like to adopt broadband *as a whole* (i.e., anchor institutions and residential subscribers) versus other communities.

Comparing Data Between South Central and Northwest RACECs

Findings from this study indicate differences in broadband availability and use between the South Central and Northwest RACECs. Some of this may stem from geographic differences, particularly that the South Central RACEC is more geographically remote given its location in the Florida Everglades. Additional research into specific differences between the RACECVs and possible causes for those differences would be useful in tailoring broadband deployment plans to each RACEC. Also, having data unique to each RACEC could assist in developing strategies for economic development and increased broadband subscribership.

Conclusions

Overall, this project concludes that building the middle mile broadband network will not, in and of itself, solve access issues in the Northwest and South Central RACECs and City of Immokalee. There are several key barriers and enablers to adoption that must be addressed in addition to building the network, such as:

- Awareness levels of what broadband is and why it is important (among anchor institution staff, funding agencies, administrators, and end users);
- Technical expertise of staff (both general staff and IT staff);
- Funding and other resources available to upgrade broadband and expand broadband-enabled services; and
- General attitudes toward and levels of acceptance of technology and how it can enhance a community and its residents, among others.

In order for the new middle mile network to be successful in attaining subscribers and expanding broadband adoption in the region, these factors cannot be ignored. Rather, they must be addressed and confronted in order to facilitate a situation in which anchor institutions *and residents* of these counties want and are able to adopt high-speed broadband and then use it to better their services and lives. The extension of this project into the summer of 2012 with the community-based broadband planning portion of the project is an attempt to begin addressing these issues in the FRBA service area.