# III. Implementation of Demonstration and Access Projects

TIIAP funds are intended to fill gaps, to address unmet needs, and to bring about significant changes in targeted communities. This chapter addresses the range of activities that the 1994 and 1995 demonstration and access projects used to identify and address the needs of their target population. It includes an analysis of the goals that projects identified for themselves, a summary of the types of barriers that projects were designed to overcome, and a discussion of the implementation activities that projects used to achieve their goals.

## KEY FINDINGS

The goals, outcomes, and implementation strategies identified by the 1994 and 1995 demonstration and access projects were clearly responsive to the priorities identified by the program. In addition, the majority of projects reported meeting or exceeding their original implementation objectives.

**The community needs addressed by TIIAP projects were responsive to the program's funding priorities.** Three-quarters of the demonstration and access projects cited at least one of the following as being a "major" *community improvement goal* for their project: improve training and community learning opportunities (74.6 percent), and serve long-term telecommunications needs (73.9 percent). Planning projects, not surprisingly, placed an even stronger emphasis on serving long-term telecommunications needs (87.5 percent). These findings suggest that most projects were striving to help targeted end users take advantage of accelerating technological advances and/or stimulate broad-based community improvements.

**The barriers to access addressed by TIIAP projects were consistent with the program's emphasis on reaching the underserved.** The vast majority (89.6 percent) of demonstration and access projects were designed to overcome technological barriers in the community. In addition, consistent with the program's emphasis on reaching the underserved, over three-fourths of projects addressed geographic (e.g., rural isolation) or economic (e.g., extreme poverty) barriers.

**TIIAP projects successfully achieved their implementation objectives.** The 1994 and 1995 demonstration and access projects used a wide array of implementation activities to help achieve their community improvement goals. Across all application areas, the most common implementation activities were (1) providing information or services via the World Wide Web; (2) establishing an information service, resource center, or other centralized location for information exchange; and (3) establishing a network to provide community services. For nearly every strategy proposed, the majority of projects reported meeting or exceeding their original implementation objectives.

**Few of the 1994 and 1995 projects supported by TIIAP invested the staff or financial resources needed to collect valid and reliable impact data.** Some projects did collect information on system

usage and end-user satisfaction. However, the mail survey and case studies uncovered little evidence that these early projects obtained data that could be used to assess real progress toward their community change goals.

**Insufficient planning posed the greatest obstacle to implementation.** Projects reported a variety of obstacles that hindered projects' efforts to complete their implementation activities in a timely or effective manner. Across all 1994 and 1995 demonstration and access projects, the most common obstacles stemmed from underestimating the amount of effort and time required to complete project activities (68.9 percent). In addition, a substantial proportion of projects reported a lack of commitment on the part of partners and/or community stakeholders (46.7 percent), a lack of staffing (40.7 percent), or difficulty estimating the resources required to implement their planned network (40.0 percent). Interestingly, only one-quarter encountered incompatibility problems with their technology (26.7 percent) and/or found that the technology they were using had become obsolete (25.2 percent).

In some instances, the problems encountered by a project were serious enough to affect its ability to achieve its implementation objectives. For example, projects encountering extensive *planning problems* were more likely than other projects to report that they did not meet their implementation objectives for (1) integrating disparate communication systems, and (2) creating an interactive network for distance learning, teleconferencing, or telemedicine. In addition, projects encountering extensive *technology problems* were more likely than other projects to report that they did not meet their implementation objectives for (1) creating a network to refurbish and/or distribute donated computer equipment, and (2) establishing access sites for reaching the information infrastructure.

**Projects' emphasis on implementation issues overshadowed attention to community benefits.** Most respondents identified at least three distinct *long-term outcomes* that their projects were designed to achieve. However, an analysis of these responses suggests that many grant recipients tended to focus on whether an initiative had been successfully executed, as opposed to whether the initiative had helped to address a broader community problem.

## COMMUNITY IMPROVEMENT GOALS AND ANTICIPATED LONG-TERM OUTCOMES

The program's application guidelines for 1994 and 1995 required a clear explanation of (1) why a proposed project was needed, and (2) how the proposed technologies would enable a project to ameliorate a specific problem. These guidelines were intended to keep grant recipients focused on explicit community needs that would be addressed through the use of technology. This section identifies the range of broad goals and specific outcomes that were delineated by the 1994 and 1995 TIIAP projects.

### Community Improvement Goals

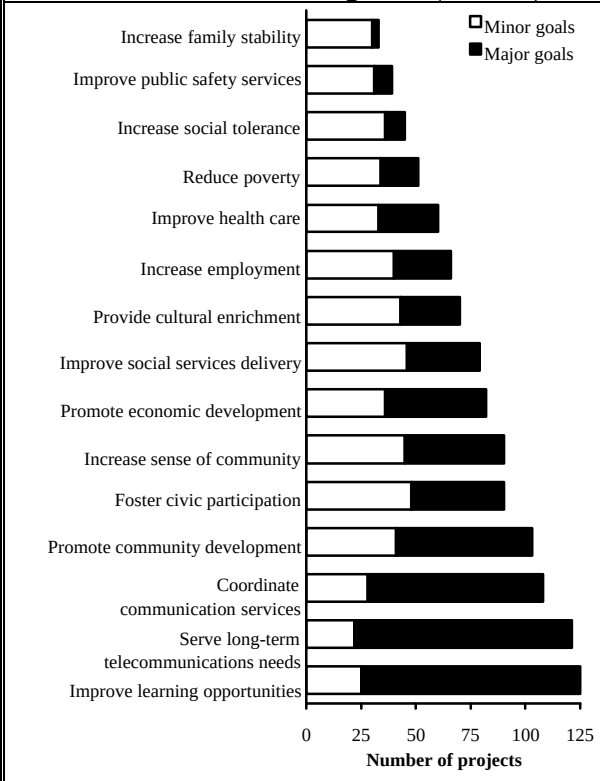
*Community improvement goals* refer to the broad needs that a project is intended to address (e.g., improving public safety services). Survey respondents were asked to use a list of broad objectives to identify their projects' "major" and "minor" community improvement goals.[6] All projects indicated at least one major and one minor goal for their projects, and most indicated four or five major goals and slightly fewer minor goals. As shown in Figure 3-1, the following were cited most frequently as being a *major* community

[6] Respondents could use "other" to describe community change goals that were not contained on the survey. In most cases, we were able to use the text provided by respondents to assign "other" responses to one of the forced-response options provided in the survey. For example, a project that wrote "improve literacy services" as a community improvement goal would have its response reclassified under "improve training and learning opportunities" for the purpose of the analysis.

improvement goal of demonstration and access projects:

- Improve training and learning opportunities (74.6 percent);
- Serve long-term telecommunications needs (73.9 percent);
- Coordinate community-wide information and communication services (59.7 percent); and
- Promote community development (46.3 percent).

**Figure 3-1**
**Types of community improvement goals established by TIIAP projects: 1994 and 1995 demonstration and access grants (n = 135)**




Source: 1998 mail survey of grantees.

The survey responses suggest that most 1994 and 1995 demonstration and access projects were striving to (1) prepare their communities to take advantage of accelerating technological advances, and (2) stimulate broad-based community improvements. Some TIIAP projects, however, identified more focused areas of improvement, such as improving the delivery of social, health care, or public safety services.

As would be expected, differences were found by application area. For example, the focus on training and learning was strongest in the ECLL and community networking projects (i.e., 96.2 percent of ECLL and 86.1 percent of community networking projects indicated "improve learning opportunities" as a major goal). In addition, "promoting community development" was identified as a major goal by over two-thirds (69.4 percent) of community networking projects; respondents in the remaining application areas were considerably less likely to list this as a major goal.

The case studies were also used to obtain more detailed information on the types of community improvement goals that demonstration and access projects identified for themselves. In some sites, project staff articulated the fit between an unmet need in their target community and the technologies that were ultimately implemented (e.g., placing computers in job service agencies to stimulate an increased employment). In others, project staff primarily focused on the broad benefits of introducing or expanding a given technology (e.g., placing computers in public libraries will increase citizens' access to the Internet). Exhibits 3-1 and 3-2 provide examples of case study sites that focused on the two community change goals cited most frequently in the mail survey, i.e., "improving learning opportunities" and "serving long-term telecommunications needs."

In general, planning grants also used the open-ended item on the mail survey to describe a wide range of goals. For example, several projects described goals aimed at increasing employment opportunities through training and dissemination of job information. Others indicated that they intended to increase communication between agencies, increase access to telecommunications technology, or promote economic development in inner-city and rural areas.

**Exhibit 3-1**
**Example of community improvement goal to improve training and learning opportunities**

**DISTANCE LEARNING AND LITERACY NETWORKS IN LOUISIANA**
**1994 Demonstration Project in ECLL**

The Distance Learning and Literacy Networks at Loyola University City College in New Orleans were designed to extend education and university services to underserved areas using advanced telecommunications technologies. To this end, the project had two primary outcomes: (1) to improve literacy services at 10 regional literacy coalition sites serving rural areas, and (2) to contribute to the improvement of the quality of health care in rural communities through a distance learning nursing program.

For the first area, a computer conferencing network was created to increase the efficacy of literacy providers serving rural parishes by linking them with each other and with the Lindy Boggs National Center for Community Literacy at Loyola University. This electronic network established vital communications linkages among literacy providers in 10 of the 23 public and private-sector literacy sites that participate in the coalition. It would further enable the sites to access up-to-date information on literacy methodology, grant information, and model programs.

For the second area, the project incorporated two-way audio and video conferencing into an already existing distance learning program. Project funds were used to expand the university's distance learning program by building a video classroom at Our Lady of Lakes Regional Medical Center an hour away, thereby enabling live interactive distance learning and distance conferencing with two existing video classrooms on the university campus. The video classroom and the computer, modem, and printer placed in each of the 10 hospital sites housing the off-campus nursing programs were designed to allow nearly 100 registered nurses enrolled in the programs to develop computer literacy and Internet research skills, as well as to provide access to e-mail and other computer-related software.

Source: 1998 case study.

## Long-Term Outcomes

Long-term outcomes are the specific, measurable data that are used to assess whether a community improvement goal has been achieved. For example, a project designed to improve public safety services might identify as one of its primary outcomes a reduction in car thefts. Survey respondents were asked to identify up to four tangible outcomes that their projects had used to measure progress toward the achievement of their community improvement goals. These outcomes were defined as being "a measurable change in the community that could realistically and logically be expected to result from the project."

Most demonstration and access survey respondents identified at least three distinct long-term outcomes for their project.[7] The majority of the outcomes reported represented strategic approaches or implementation objectives. For example, approximately one-third of the outcome statements focused on the provision of a particular information service or resource using information infrastructure (e.g., *Make the National Adoption Exchange accessible via the Internet).* Approximately 10 percent of the outcome statements focused on how their TIIAP-funded applications would make the information infrastructure accessible to a particular target population (e.g., *To bring Internet capabilities to rural area schools to allow equality with higher population areas*).

Approximately 10 percent of the outcome statements reflected the goal of enhanced collaboration, including establishing partnerships (e.g., *Increase collaboration among state agencies involved in literacy*), creating linkages between organizations (e.g., *Increase interactivity between CTI and Federation of CVM programs via e-mail*), and improving communications channels between disparate entities (e.g., *Enhance communication*

[7]Twelve of the 135 respondents did not list any long-term outcomes. Of the 123 respondents who completed the item, the average number of outcomes listed was 3.2.

*between professionals in workforce development through the use of technology*).

**Exhibit 3-2**
**Example of community improvement goal to serve long-term telecommunications needs**

**TRI-STATE NETWORK DEMONSTRATION PROJECT**
**1994 Demonstration Project in ECLL**

The Tri-State Network Demonstration Project in Mississippi had as its major goal to serve the long-term telecommunications needs in a region including parts of three southern states. The TIIAP demonstration grant was designed to significantly expand an interactive framework and technological infrastructure developed by the Tri-State Education Initiative, an educational initiative established by the National Aeronautics and Space Administration (NASA) to support the simultaneous advancement of the educational, economic, and social/cultural goals of the people of the region of Mississippi, Alabama, and Tennessee.

The Tri-State Education Initiative served a total of 30 school districts (5,600 teachers and 102,000 students) in the 9,800 square mile area. The grant was awarded to help alleviate rural isolation and a lack of telecommunications resources and infrastructure in the region. The primary outcome would be a community-based advanced telecommunications infrastructure that would support economic development efforts focusing upon one county and impacting the surrounding region. The physical network included an advanced telecommunications system that provided two-way interactive video communications, two-way interactive data communications, Internet connectivity, voice-based information services, and a gateway to all existing regional networks. The project also developed an interactive, wide area network to facilitate communications among four economic development areas: leadership, applied lifelong learning and training, physical resources, and socioeconomic opportunity.

Source: 1998 case study.

Approximately 20 percent of the outcome statements reflected changes that were expected to occur within a given community. For example:

- *Reduce the cost of providing social services to rural clients separated from services by "economic distance."*
- *Increase in the number of completed emergency assistance calls.*
- *Significant reduction in investigative time used for contacts. Detectives rapidly assess the status of contacts.*
- *Unemployment will decrease as people gain technology skills and use technology in employment.*

The remaining 30 percent of outcome statements were vaguely defined. For example,

- *Facilitate distance learning.*
- *Region will be less isolated.*
- *Improve delivery of math/science.*

Our analysis of responses to this open-ended item suggests that grant recipients were primarily concerned with whether their projects were going to be successfully implemented, as opposed to whether their initiatives would help to address broader community problems. This emphasis on implementation is not surprising, given that the 1994 and 1995 grant recipients were not required to delineate community-oriented outcomes in their application narratives.[8] Beginning in 1996, however, organizations applying for TIIAP funding had to "explain how the use of technology will contribute to the solution of the problem(s) they define, and they must relate the solution to clear and measurable outcomes or results" (TIIAP 1996 Guidelines for Preparing Applications). It will therefore be interesting to assess the types of

[8] Nor is this emphasis on implementation unique to TIIAP. Our work with other agencies indicates that grant recipients are often not experienced at thinking in terms of how to measure community changes that result from their interventions.

long-term outcomes that are identified by grant recipients from subsequent grant years.

## BARRIERS TO ACCESS

Respondents were asked to identify any barriers to using telecommunications technologies that their projects sought to address. Ninety percent identified at least one technological barrier. This emphasis on overcoming limitations in a community's technological infrastructure was consistently reported across the two project types and the five application areas (see Table 3-1). Exhibit 3-3 provides an example of the types of technology barriers that one project was designed to overcome.

Over three-fourths of survey respondents reported that their projects were designed to address geographic (e.g., rural isolation) or economic (e.g., extreme poverty) barriers (see Exhibits 3-4 and 3-5 for examples of case study sites that sought to overcome these obstacles). The high percentage of projects addressing geographic barriers was consistent across project types and application areas. However, public safety and health projects reported addressing economic barriers much less frequently (33.3 percent and 56.3 percent, respectively) than did the other three application areas.

**Table 3-1**
**Percentage of TIIAP projects addressing barriers to access, by application area: 1994 and 1995 demonstration and access grants**

| Barrier | Application area | | | | | Total (n = 135) |
|---|---|---|---|---|---|---|
| | Community networking (n = 36) | ECLL (n = 53) | Health (n = 16) | Public safety (n = 3) | Public services (n = 27) | |
| Technological | 97.2 | 90.6 | 87.5 | 66.7 | 81.5 | 89.6 |
| Geographic | 75.0 | 81.1 | 81.3 | 100.0 | 74.1 | 78.5 |
| Economic | 83.3 | 79.2 | 56.3 | 33.3 | 77.8 | 76.3 |
| Physical | 41.7 | 45.3 | 37.5 | 33.3 | 48.1 | 43.7 |
| Cultural | 41.7 | 41.5 | 25.0 | 0.0 | 33.3 | 37.4 |
| Linguistic | 27.8 | 13.2 | 12.5 | 0.0 | 18.5 | 17.8 |

Note: Respondents could select more than one item.
Source: 1998 mail survey of TIIAP grantees.

**Exhibit 3-3**
**Example of a project addressing technological barriers**

**LOS ANGELES FREE-NET**
**1994 Demonstration Project in Community Networking**

Prior to its TIIAP grant, the Los Angeles Free-Net (LAFN) consisted of a simple network with a single computer, 16 telephone lines, 14.4K modems, and a comserver with an Ethernet connection. Local toll-free dial-up access to LAFN was available only for residents in the Tarzana area, where the network equipment was housed; residents outside the local calling area were required to make a long-distance telephone call to connect to the network. Los Angeles County is served by two different telephone companies and has five area codes with more than 300 telephone exchanges. Toll calls (calls more than 12 miles) cost from 8 to 14 cents for the first minute and up to 11 cents for each additional minute. Such costs would make Internet and community computer access too expensive for schools and low-income users.

LAFN sought to develop a system by which users around the county could make local calls to the dial-up network. The TIIAP grant enabled the network to design and establish a frame-relay network with four external nodes at strategic locations throughout Los Angeles County. At each node, equipment was installed allowing residents near that location to make a local rather than a long-distance call to the node. Users transmit information via telephone to modems at the node, and those data are transmitted to the computer center. Data are sent from the computer back to the node and then back to the user's computer via the phone lines.

Source: 1998 case study.

**Exhibit 3-4**
**Example of a project addressing geographical barriers**

**OKLAHOMA DEPARTMENT OF COMMERCE**
**1995 Demonstration Project in Public Services**

A grant to the Oklahoma Department of Commerce was designed to overcome geographical barriers. According to the grant proposal submitted to TIIAP, telecommunications was seen as one of four critical strategies to "eliminate Oklahoma's principal disadvantages of distance and low population density." Prior to the ODOC TIIAP grant, there was little progress in developing the infrastructure necessary to bring Oklahoma close to achieving national technology goals.

The project was designed to award "mini-grants" to communities around the state to address the lack of Internet access in some the state's rural communities. As such, the broad goals of the project were to improve the quality of rural life, encourage rural economic development, increase awareness and use of telecommunications to deliver necessary services, and provide affordable access to technology through shared equipment.

The mini-grants were used by 33 rural communities to install community-access computers in various sites, such as cooperative extension offices, museums, and schools. These sites allowed rural residents free access to the Internet and training in using the systems. Users can now find information about agricultural and livestock concerns that previously would be answered through materials sent by mail in response to queries, resulting in lost treatment time.

Source: 1998 case study.

## IMPLEMENTATION ACTIVITIES

The 1994 and 1995 demonstration and access projects employed a wide variety of approaches to achieve their community improvement goals. Across all application areas, the most common implementation activities were (1) providing information or services via the World Wide Web; (2) establishing an information service, resource center, or other centralized location for information exchange; and (3) establishing a network to provide community services. For nearly every strategy proposed, the majority of projects reported meeting or exceeding their original implementation objectives.

**Exhibit 3-5**
**Example of a project addressing economic barriers**

**GRACE HILL NEIGHBORHOOD SERVICES**
**1994 Demonstration Project in Public Services**

The Grace Hill Neighborhood Services project in St. Louis was developed to strengthen and expand an existing service delivery network designed to address economic barriers to access. The Member Organized Resource Exchange (MORE) is a community-based network of services that can be exchanged like currency between neighbors. The MORE system allows neighbors to earn and save "time dollars" when they volunteer their services to one another or spend a MORE Time Dollar for each hour of service they receive or item they purchase.

Over one-third of residents in the service area have incomes at or below the poverty level. An additional 58 percent fall at or below 150 percent of the poverty level. Over 65 percent of residents in the service area have no health insurance. At the time of the application, the unemployment rate for the service area was 21.5 percent. The majority of the population in the service area is African American. Approximately 10 percent of the population is elderly.

The TIIAP grant was used to increase the number of neighborhood residents who would have easy access to the MORE system. Specifically, Grace Hill used TIIAP funding to (1) upgrade the capacity of the computers that are used to link residents with community services, and (2) increase the number of publicly accessible computer workstations in the low-income neighborhoods served by Grace Hill.

Source: 1998 case study.

This section describes the types of activities that were undertaken by individual application areas. It also provides information on three general approaches that were common to all application areas and summarizes the data collection and analysis activities that were used to assess projects. This section concludes with a discussion of factors that affected projects' ability to implement their project activities.

### Activities Conducted by Individual Application Areas

Survey respondents were asked to provide information on a range of activities and approaches that pertained to their field. This section describes the types of activities that were undertaken by <u>each</u> of the application areas and assesses the extent to which projects were able to successfully implement their proposed approaches.

**Community Networking and Public Services Projects.**[9] The majority of survey respondents in community networking and public services projects indicated that they used *at least one* of the following strategies (see Figure 3-2):

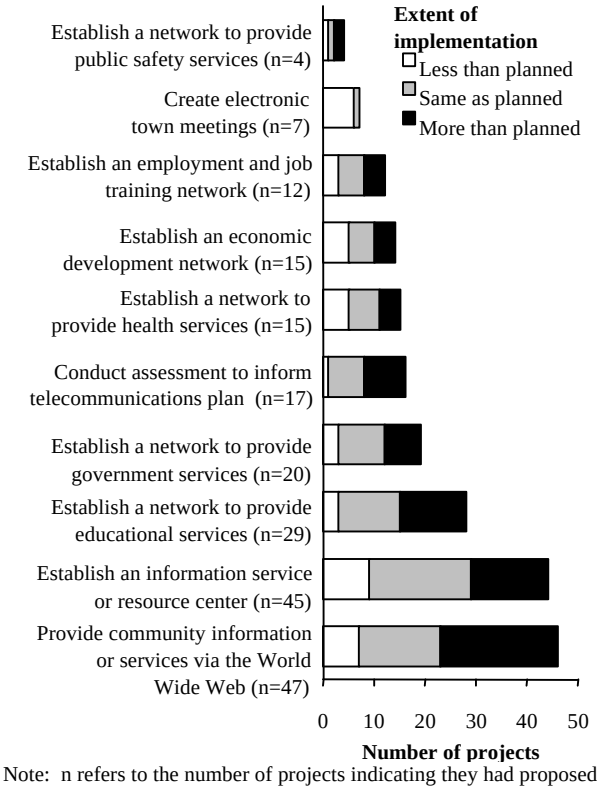
- Provide information or services to meet community needs via the World Wide Web (74.6 percent), and

[9] Community networking and public services projects used similar approaches to attain their community improvement goals. As such, this section provides a combined discussion of the activities undertaken by projects in these two application areas.

- Establish an information service, resource center, or other centralized location for information exchange (71.4 percent).

In addition, almost half of these projects (46.0 percent) proposed to establish a network to provide educational services. Exhibit 3-6 provides an illustration of steps taken by one case study site to use such a network to facilitate the accessibility and exchange of academic information in a rural community.

**Figure 3-2**
**Number of projects that proposed implementation strategies supporting community development goals and extent of implementation: 1994 and 1995 demonstration and access grants in community networking and in public services (n = 63)**




Note: n refers to the number of projects indicating they had proposed the strategy. Some row totals do not sum to the corresponding n because of nonresponse.
Source: 1998 mail survey of grantees.

For each of these strategies, over three-quarters of community networking and public services projects reported that they met or exceeded their implementation objectives. In fact, a considerable portion indicated that they exceeded their implementation objectives for providing information via the World Wide Web (48.9 percent),[10] establishing a network to provide educational services (44.8 percent), and establishing an information service (33.3 percent). A small proportion of projects did report that they failed to achieve their implementation objectives for the two primary activities (14.9 percent for providing information via the World Wide Web and 20.0 percent for establishing an information service).

There was only one rarely attempted implementation strategy for which a majority of projects failed to meet their objectives—six of the seven community networking and public services projects proposing to create electronic town meetings fell short of their objectives.

**Education, Culture, and Lifelong Learning Projects.** As shown in Figure 3-3, the vast majority of survey respondents in ECLL demonstration and access projects indicated that they used *at least one* of the following strategies:

- Provide educational information or services via the World Wide Web (84.9 percent);
- Establish a network to provide educational services (79.2 percent);
- Establish an information service or resource center (73.6 percent); and
- Integrate computer-based learning and network resources in classrooms and learning centers (71.7 percent).

[10] The finding that half of all community networking and public services projects exceeded their implementation objectives for providing information via the World Wide Web represents the highest success rate attained for any implementation strategy.

**Exhibit 3-6**
**Example of establishing a network to provide educational services**

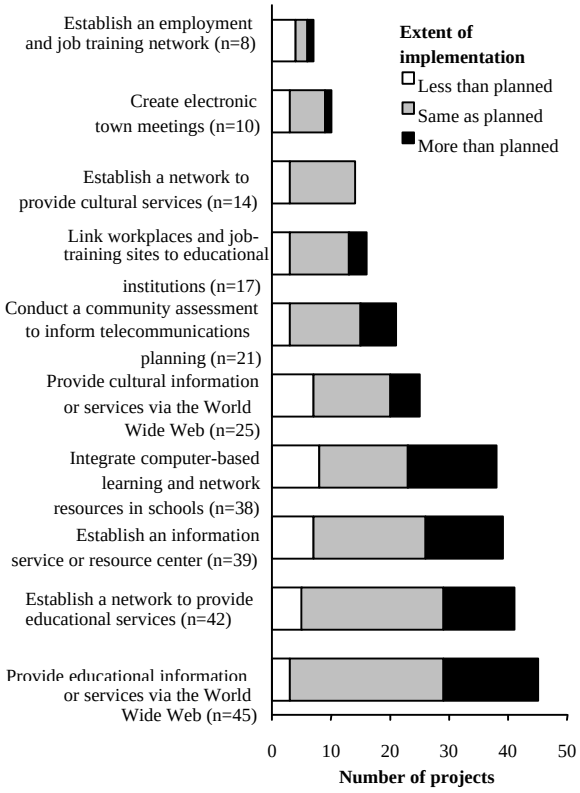
**QUALITY EDUCATIONAL SCHOLASTIC TRUST, INC. (QUEST)**
**1995 Access Project in ECLL**

The Quality Educational Scholastic Trust (QUEST) is a nonprofit corporation created to provide access to state-of-the-art technology to all schools within Berkshire County, Massachusetts, as well as provide students and teachers with the training and assistance that they need to take full advantage of those technologies. Each of the 15 school districts in Berkshire County committed to finance and build computer networks within the schools. According to the project's final report, 41 schools (39 public schools and 2 parochial schools) serving over 15,000 students and educators in Berkshire County received Internet connectivity through this project. All public secondary and middle schools have connectivity. Twelve of the county's 32 elementary schools are on line. In addition, the network server is being used by segments of the community other than the public schools. The county library system has put its entire library catalogue on the server and the Internet infrastructure has been extended to include private schools, parochial schools, and public school administration buildings within the county. Utilization of the Internet infrastructure was also expanded to the residents and businesses within the community via dial-in or dedicated access.

The Network facilitated the accessibility and exchange of academic information previously unavailable in rural and geographically isolated Berkshire County. It provided opportunities for the exchange of teaching expertise, professional development, and Internet use, to a population largely denied access because of fiscal and technical support barriers. These innovations helped make county students better prepared for college and the job market. They have also created an almost universal recognition among school principals and superintendents that Internet access is almost mandatory to maintain competitiveness. In addition, the use of Internet technology has also initiated an increase in the purchase and installation of hardware and software within the schools beyond original project plans. Consequently, the public image of the school systems has changed for the better because of providing schools with Internet access.

Source: 1998 case study.

**Figure 3-3**
**Number of projects that proposed implementation strategies supporting education goals and extent of implementation: 1994 and 1995 demonstration and access grants in ECLL (n = 53)**




Note: n refers to the number of projects indicating they had proposed the strategy. Some row totals do not sum to the corresponding n because of nonresponse.
Source: 1998 mail survey of grantees.

It should be noted that three of these activities (provide information via the World Wide Web, establish a network to provide educational services, and establish an information service) were also proposed by a majority of the community networking and public services projects.

For each of the four primary activities identified by ECLL projects, close to four-fifths of survey respondents reported that they met or exceeded their implementation objectives. In addition, 35.6 percent indicated that they exceed

**Exhibit 3-7**
**Example of a health-related project that exceeded expectations**

**NETWELLNESS**
**1994 Demonstration Project in Health**

NetWellness provides a level of quality and quantity of content beyond what was specified in the TIIAP grant proposal. It features expanded topic coverage, expanded resources to address those topics, and expanded involvement of experts in participatory as well as advisory roles. Exceeding their own expectations resulted from a variety of factors. The NetWellness organizers recognized early on that developing broad community involvement and solid political underpinnings would be critical to the success and this expansion of the project. By nurturing long-standing relationships with key state legislators, the NetWellness team was able to secure ongoing financial support from the State of Ohio to develop and continue the project beyond the close of the Federal grant period. NetWellness also developed collaborative synergy with key health and information organizations such as Cincinnati Bell Telephone and the Ohio Department of Administrative Services to provide direct access to NetWellness resources in public access sites. Project staff worked hard to nurture positive relations with partners and vendors by identifying clear incentives for vendors to help solve problems and documenting all agreements in an open, friendly fashion.

Another key to NetWellness' success was adherence to basic standards for the project's content and technical implementation wherever possible. An important issue in providing information from a variety of sources is the accuracy, completeness, and appropriateness of the material. To help ensure that the information provided meets these basic criteria, the NetWellness team developed a plan for the review of system content by teams of physicians, nurses, librarians with special health expertise, and other experts. Using a basic survey form, the experts would identify areas of weakness and, when necessary, resolve differences of opinion using standard protocols.

With respect to the technical side of the project, the NetWellness team committed themselves to relying on industry standards and market leaders for all hardware and software purchases rather than taking chances with unproven technologies. Standard protocols, software, and hardware enabled the project to adapt more nimbly to the evolution of the product marketplace and to become fully compatible with the University of Cincinnati's telecommunications infrastructure. Using multiple PCs as servers allowed the network to be more flexible and cost efficient as it grew and evolved.

Source: 1998 case study.

their implementation objectives for providing information via the World Wide Web (in fact, the failure rate for this activity (6.7 percent) was exceptionally low). A small proportion did report that they failed to achieve their implementation objectives for integrating computer-based learning and network resources in schools (21.1 percent) or establishing an information service (17.9 percent). In addition, there was one rarely attempted implementation strategy for which a half of projects failed to meet their objectives—four of the eight ECLL projects proposing to establish an employment and job training network fell short of their objectives.

**Health Projects.** There were 16 demonstration and access projects in the health application area. As shown in Figure 3-4, 13 projects (81.3 percent) proposed at least on the following activities:

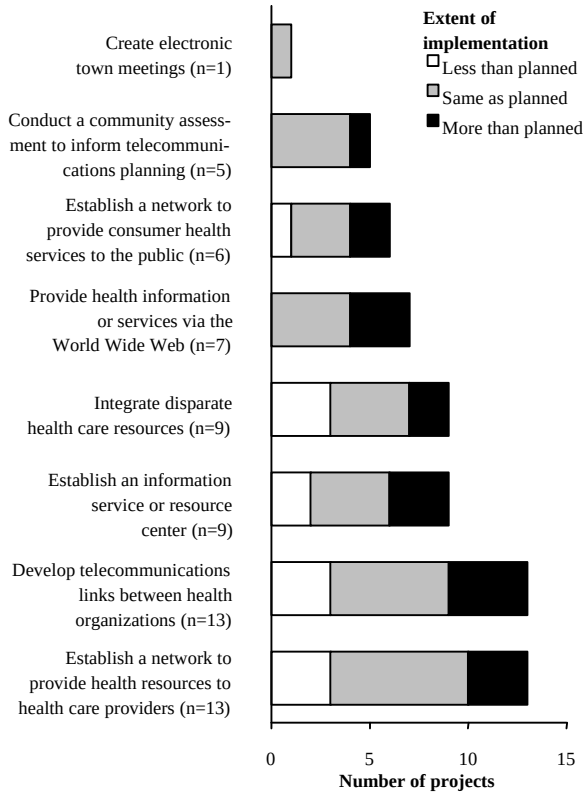
- Establish a network to provide health resources to health care providers; and

- Develop telecommunications links between hospitals, medical centers, and other health organizations.

In addition, over half (56.3 percent) of the health projects indicated that they used *at least one* of the following strategies: establish an information service or resource center, and integrate disparate health care resources.

Once again, the vast majority of projects indicated that they met or exceeded their implementation objectives. (Exhibit 3-7 provides an example from the case studies of a health project that exceeded its implementation objectives.) More than three-quarters indicated that they exceed their implementation objectives for establishing a network to provide health resources to health care providers (76.9 percent), developing tele-communications links between hospitals, medical centers, and other health organizations (76.9 percent), and establishing an information service or resource center (77.8 percent). However, three of the nine (33.3 percent) health projects failed to

**Figure 3-4**
**Number of projects that proposed implementation strategies supporting health goals and extent of implementation: 1994 and 1995 demonstration and access grants in health (n = 16)**




Note: n refers to the number of projects indicating that they had proposed the strategy. Some row totals do not sum to the corresponding n because of nonresponse.
Source: 1998 mail survey of grantees.

achieve their implementation objectives for integrating disparate health care resources.

**Public Safety Projects.** Only three of the four demonstration and access projects in public safety completed a mail survey. Each of these projects proposed to (1) develop telecommunications links between public safety organizations, and (2) establish a network for public safety professionals. In addition, two projects proposed to integrate disparate public safety resources. Two of the three projects met or exceeded their implementation objectives.

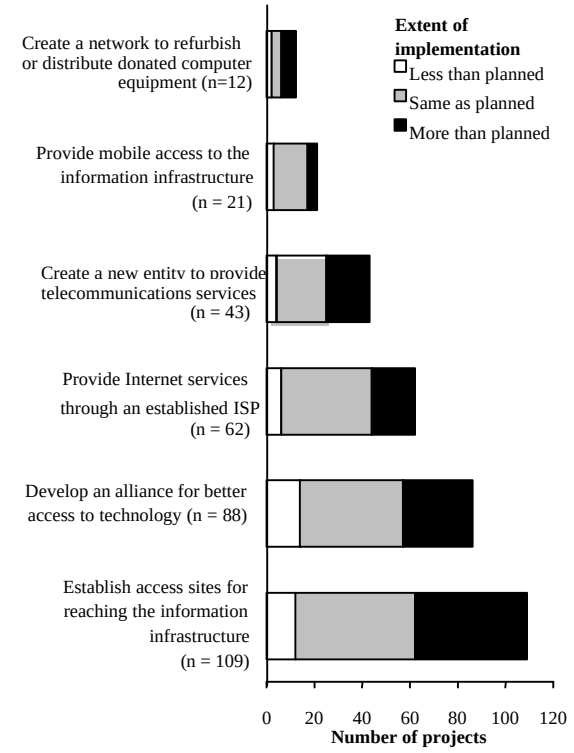
**Summary of Area-Specific Activities.** In every application area, providing information or services via the World Wide Web was one of the most frequently proposed implementation activities. Other commonly proposed activities across all application areas included establishing an information service or resource center and establishing a network to provide community services. For nearly every activity that projects identified, the majority of respondents indicated that they had met or exceeded their original implementation goals. Providing information via the World Wide Web was typically one of the more readily achieved objectives, with relatively few projects failing to meet anticipated implementation levels. This finding might be attributable to the rapid growth of the World Wide Web in the years when these projects were being implemented.

## Activities Conducted Across All Application Areas

Survey respondents were also asked to provide information on a range of activities and approaches that pertained to all fields. This section provides information on three general approaches that were common to all application areas (i.e., promoting access, training end users, and utilizing technology).

**Activities to Promote Access.** Across all application areas, most demonstration and access projects reported conducting activities designed to promote access to the information infrastructure (see Figure 3-5). In fact, four-fifths (80.7 percent) of all demonstration and access projects reported proposing to establish access sites for reaching the information infrastructure. This activity, which constituted the most frequently proposed implementation strategy across the five application areas, was also one of the most successfully implemented activities—a remarkable 43.1 percent of all projects proposing this strategy reported *exceeding* their implementation objectives.

**Figure 3-5**
**Number of projects that proposed implementation strategies promoting access and extent of implementation: 1994 and 1995 demonstration and access grants (n=135)**

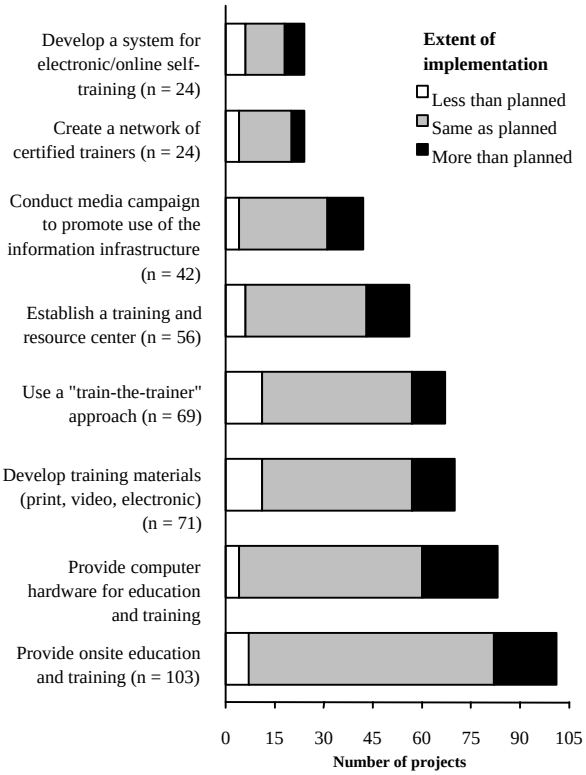



Note: n refers to the number of projects indicating that they had proposed the strategy. Some row totals do not sum to the corresponding n because of nonresponse.
Source: 1998 mail survey of grantees.

Almost two-thirds (65.1 percent) of demonstration and access projects proposed developing an alliance for better access to technology; one-third (32.9 percent) of these projects exceeded their implementation objectives. Finally, a significant proportion of projects proposed providing Internet services through an established Internet service provider (ISP) (45.9 percent) or creating an entity to provide telecommunications services (31.9 percent). Once again, almost all (91.0 percent) of these projects reported meeting or exceeding these two implementation objectives.

**Activities to Promote Education and Training.** Across all demonstration and access projects, the second most frequently proposed implementation strategy involved the provision of onsite education and training for end users of project equipment and resources (76.3 percent). As shown in Figure 3-6, projects reported considerable success in completing this activity (91.3 percent of respondents reported meeting or exceeding this implementation objective).

**Figure 3-6**
**Number of projects that proposed implementation strategies supporting training and extent of implementation: 1994 and 1995 demonstration and access grants (n=135)**



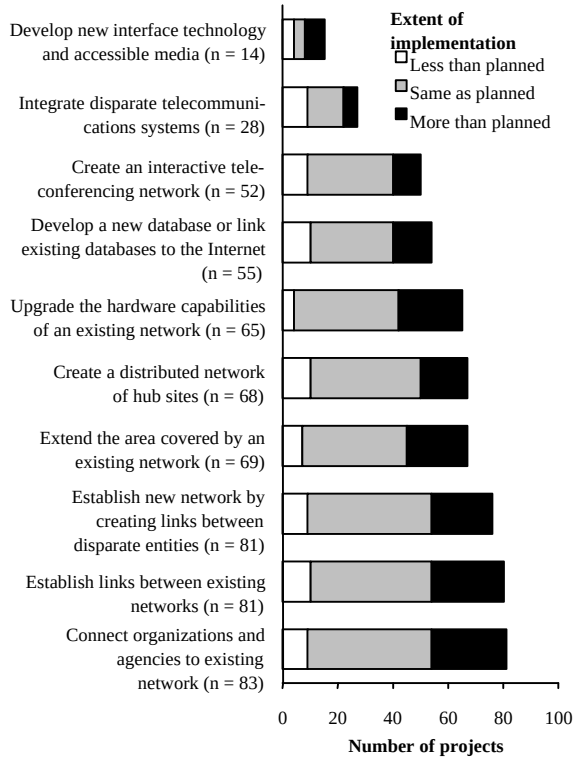

Note: n refers to the number of projects indicating that they had proposed the strategy. Some row totals do not sum to the corresponding n because of nonresponse.
Source: 1998 mail survey of grantees.

**Activities Involving Technology.** As shown in Figure 3-7, 8 of the 10 implementation activities addressed on the mail survey that involved technology were proposed by almost two-fifths of the access and demonstration projects. The most frequently cited activity (connecting organizations and agencies to an existing network) was identified by three-fifths (61.5 percent) of projects. Projects generally met or exceeded their implementation objectives for these activities (decreasing computer costs and improving hardware and software capabilities during the implementation period probably contributed to these high success levels). It should be noted, however, that there was one rarely attempted implementation strategy for which almost one-third (32.1 percent) of projects failed to meet their objectives—9 of 28 demonstration and access projects proposing to integrate disparate telecommunications systems fell short of their objectives.

## Activities to Evaluate Project Success

The TIIAP program has greatly enhanced its evaluation requirements since the 1994 and 1995 grant years. For example, projects applying for TIIAP funds in 1998 were given stringent guidelines on what must be included in their evaluation plans. However, in 1994, projects were provided little guidance as to what types of monitoring or evaluation activities they should conduct. The 1995 projects were only required to "present a clearly defined evaluation strategy that offers rational criteria for measuring the effectiveness of the project in reaching its goals during the grant award period and identifies specific evaluation instruments to be employed" (FY 1995 Notice of Availability of Funds). TIIAP did not identify specific aspects of evaluation that the strategy should address, nor did it require applicants submit an actual plan to implement the evaluation. As such, the projects and evaluations represented in this study occurred in a different program environment than that which exists today. With evaluation expectations different from today, we cannot hold 1994 and 1995 projects to the same standards. However, the findings are instructive in that they describe the methods that projects from the first two grant rounds used to assess the implementation and impact of their TIIAP-related activities.

**Figure 3-7**
**Number of projects that proposed implementation strategies involving technology and extent of implementation: 1994 and 1995 demonstration and access grants**




Note: n refers to the number of projects indicating that they had proposed the strategy. Some row totals do not sum to the corresponding n because of nonresponse.
Source: 1998 mail survey of grantees.

As shown in Table 3-2, 102 (75.6 percent) of the 1994 and 1995 demonstration and access projects reported in the mail survey that they had developed an evaluation plan. Among the 102 projects that developed evaluation plans, 72.2 percent reported that they fully implemented those

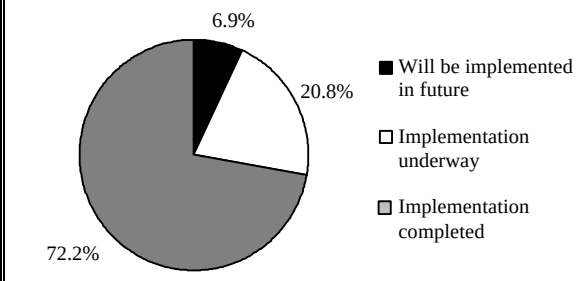
**Table 3-2**
**Number and percentage of TIIAP projects that developed an evaluation plan, by application area: 1994 and 1995 demonstration and access grants**

| Type | Application area | | | | | | | | | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Community networking | | ECLL | | Health | | Public safety | | Public services | | | |
| | Number | Percent | Number | Percent | Number | Percent | Number | Percent | Number | Percent | Number | Percent |
| Demonstration..... | 19 | 82.6 | 23 | 65.7 | 11 | 84.6 | 0 | 0.0 | 13 | 76.5 | 66 | 73.3 |
| Access..... | 11 | 84.6 | 12 | 66.7 | 2 | 66.7 | 1 | 100.0 | 10 | 100.0 | 36 | 80.0 |
| Total..... | 30 | 83.3 | 35 | 66.0 | 13 | 81.3 | 1 | 33.3 | 23 | 85.2 | 102 | 75.6 |

Note: Figures reported are estimates made at the time the survey was completed.
Source: 1998 mail survey of TIIAP grantees.

plans (Figure 3-8). About a fifth of the projects were still conducting evaluation activities at the time of the mail survey, and 6.9 percent had not begun their evaluation at that time (but expected to do so in the future). All of the projects that had developed evaluation plans reported that they had already conducted their evaluations or would conduct them in the near future.

**Figure 3-8**
**Extent to which evaluation plans have been implemented: 1994 and 1995 demonstration and access grants that developed evaluation plans (n = 107)**




Note: Percents may not add to 100 because of rounding.
Source: 1998 mail survey of grantees.

Among projects that conducted at least some evaluation activities, the vast majority had collected at least some study data (91.6 percent), had analyzed their data (88.5 percent), and had used their data to prepare an evaluation report (86.5 percent). Almost three-quarters (72.6 percent) reported using their evaluation results to improve project operations and services (see Table 3-3). However, these data were frequently of limited breadth and scope. As shown in Figure 3-9, most projects reported collecting information on end users' satisfaction (85.0 percent) and benefits (73.0 percent). Evidence from the case studies suggests that these data were often collected at the time that participants were using the system, and longer term impacts were not examined. For example, several of the sites visited had log-in sheets that requested users' feedback at the end of an online session. In some cases, these log-in sheets included basic questions about participants' characteristics and whether or not they were first-time users.

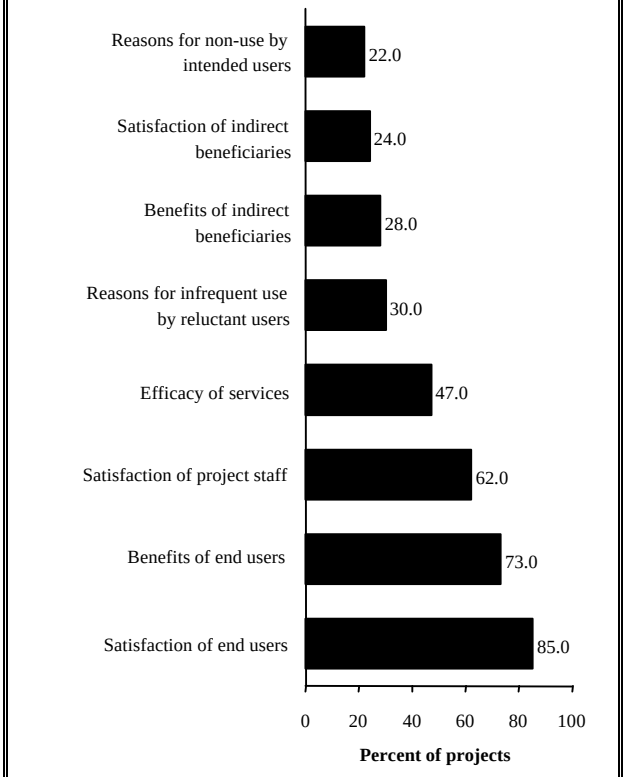
In addition, evidence from the mail survey suggests that most projects did not collect information that could be used to assess gaps in the types of services being offered. For example, only 30.0 percent of mail survey respondents who had implemented at least part of their plans were collecting data on reasons for infrequent use by reluctant users. Even fewer respondents reported collecting data on reasons for non-use by intended users (22.0 percent). These findings suggest that sites either did not view data on non-use as being critical to the success of their project, or that sites lacked the resources or expertise to undertake such an effort.

**Table 3-3**
**Percentage of TIIAP projects that accomplished key evaluation steps: 1994 and 1995 demonstration and access grants that developed an evaluation plan**

| Evaluation step | Yes | No | Not applicable |
|---|---|---|---|
| Indicators of success were identified | 91.6 | 5.3 | 3.2 |
| Techniques or approaches to measure the project's success were identified | 89.2 | 7.5 | 3.2 |
| Individuals to conduct the evaluation were identified | 83.2 | 11.6 | 5.3 |
| Evaluation data were collected | 91.6 | 5.3 | 3.2 |
| Evaluation data were analyzed | 88.5 | 8.3 | 3.1 |
| Evaluation reports were prepared | 86.5 | 11.5 | 2.1 |
| Evaluation results were used to improve project operations and services | 72.6 | 21.1 | 6.3 |

Note: Percents may not add to 100 because of rounding.
Source: 1998 mail survey of TIIAP grantees.

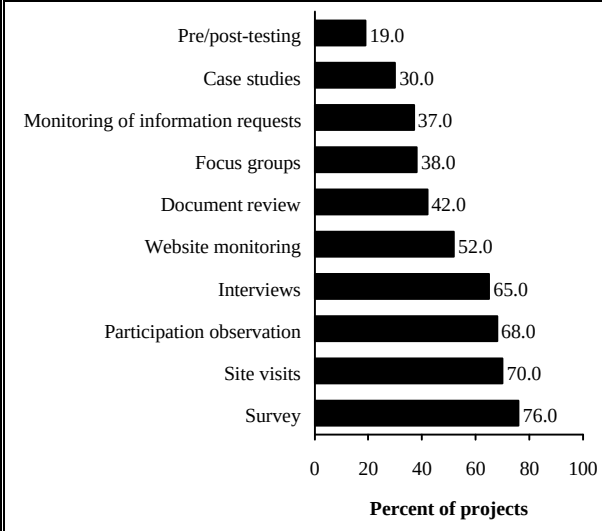
**Figure 3-9**
**Contents of data collected to evaluate TIIAP projects: 1994 and 1995 demonstration and access grants' evaluations (n = 100)**




Source: 1998 mail survey of grantees.

As shown in Figure 3-10, respondents that conducted evaluations reported using a variety of techniques to assess the success of their projects, including surveys (76.0 percent), site visits (70.0 percent), participant observation (68.0 percent), interviews (65.0 percent), and website monitoring (52.0 percent). Evidence obtained during the site visits suggests that many of the projects used these methods to assess users' satisfaction with a specific application (e.g., Internet access) or to make sure that a remote site had carried out its activities. Findings from the mail survey and case study suggest that more robust methods of evaluation, such as pre/post-testing and case studies, were used much less frequently by the 1994 and 1995 projects.

**Figure 3-10**
**Data collection methods used to evaluate TIIAP projects: 1994 and 1995 demonstration and access grants' evaluations (n = 100)**




Source: 1998 mail survey of grantees.

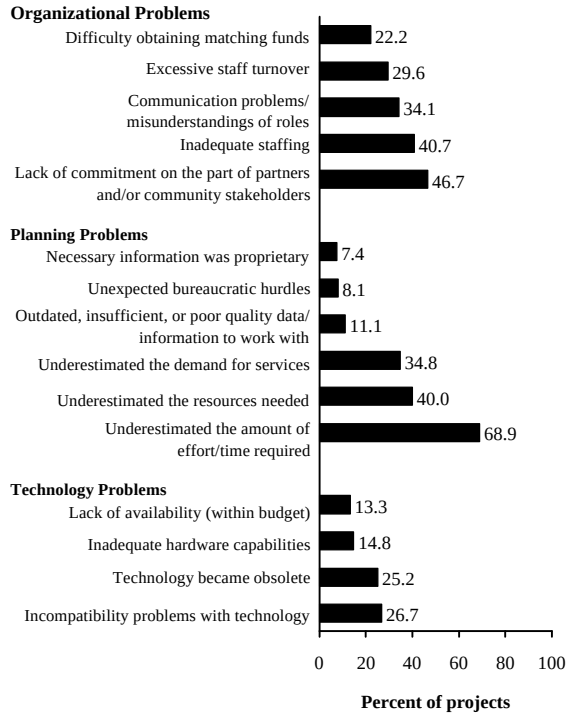
## Factors that Influenced the Extent of Implementation

Assuming that successful implementation of the activities developed for a given project will bring about the desired community improvements, it is important to understand the obstacles and impediments that prevent projects from achieving their implementation objectives and the factors that facilitate implementation. The survey and case studies were used to obtain information on the factors that influenced the extent of implementation.

**Problems Encountered.** The most frequently experienced difficulty during the implementation process, reported by over two-thirds (68.9 percent) of the 1994 and 1995 demonstration and access projects, stemmed from underestimating the amount of effort and time required to complete project activities (see Figure 3-11). In addition, a substantial proportion of projects reported a lack of commitment on the part of partners and/or community stakeholders (46.7 percent), inadequate staffing (40.7 percent), or difficulty estimating the resources required to implement their planned network (40.0 percent). Approximately one-third (34.8 percent) underestimated the demand for services (34.8 percent) and/or experienced excessive staff turnover (29.6 percent). The technology itself was, in general, reported to be a less daunting problem. In fact, several respondents provided unprompted comments on the survey about how rapid changes in available technology allowed them to provide better technological capabilities than had been planned. Still, about one-quarter of the projects experienced problems with technological incompatibility (26.7 percent) and technological obsolescence (25.2 percent).

We used chi-square analyses to examine whether there were differences in the patterns of problems encountered by projects according to four characteristics: project type (i.e., demonstration and access), application area, the length of the grant, and the size of the grant award.[11] These analyses found that projects with a grant period of fewer than 18 months were more likely to report problems stemming from a lack of available technology within the project's budget (25.7 percent) than were projects funded for a longer period (9.1 percent).[12] This finding suggests that projects on a tight schedule may not have had enough time to (1) conduct an exhaustive

**Figure 3-11**
**Percentage of TIIAP projects reporting implementation obstacles: 1994 and 1995 demonstration and access grants (n = 135)**




Source: 1998 mail survey of TIIAP grantees.

[11] To make comparisons according to the length of a project's grant period, 34 projects were classified as having a short grant period (17 months or less), 50 projects as having a medium grant period (18-20 months), and 49 projects as having a long grant period (21 months or more). To test for differences according to award size, 33 project were classified as having a small award ($3,000 - $149,999), 54 projects as having a medium award ($150,000 - $349,000), and 46 projects as having a large award ($350,000 – $1.7 million).

[12] ($\chi^2_{(2)}$=6.21, $p$<.05).

assessment of the hardware and software needed to implement their approach, or (2) assess the impact of any advances in hardware and software that might have occurred since the time of their TIIAP application. It will be interesting to examine whether there has been a reduction in this type of technology-related problem among subsequent TIIAP projects that have had, on average, longer grant periods.

The analysis of award size found that projects funded at over $350,000 were more likely to experience problems stemming from communication problems and a misunderstanding of roles (52.2 percent) than were projects funded at lower levels (25.0 percent).[13] In addition, we found that a higher proportion of demonstration projects (40.4 percent) than access projects (22.2 percent) encountered communication problems.[14] (This finding may be related to award size, since the average award amount for demonstration projects tended to be considerably higher than for access projects, $398,516 and $1,725,210, respectively.) These trends suggest that as projects become larger and more complex, a lack of clearly defined expectations can hinder ongoing implementation activities. Evidence from the case studies suggests that these problems are even more likely to occur when projects are required to bring on a considerable number of staff and partners to implement their approach. As is discussed in Chapter VI, one approach for minimizing communication difficulties is to establish written agreements at the outset of the project.

**Extent to Which Problems Hindered Implementation.** In some cases, the problems encountered by projects were serious enough to affect their ability to successfully complete their implementation objectives. To assess how these obstacles affected the success of the demonstration and access grants, we conducted a series of *t* tests to discern whether projects experiencing a large number of problems reported lower levels of implementation than did projects experiencing few problems.

Taken together, planning obstacles represented the most frequently encountered problem by TIIAP projects.[15] Our analyses found that projects encountering extensive planning problems reported lower levels of implementation for the following activities than did projects that encountered few planning problems:

- Integrate disparate telecommunications systems such as video conferencing with public broadcasting facilities ($t_{(1,25)}$=2.11, $p$<.05);
- Create an interactive network for distance learning, teleconferencing, or telemedicine ($t_{(1,48)}$=2.74, $p$<.05);
- Establish a new network by creating links between disparate databases, programs, agencies, or organizations ($t_{(1,77)}$=2.25, $p$<.05); and
- Develop an alliance for better access to technology ($t_{(1,84)}$=2.05, $p$<.05).

The first three of these activities involved technology, and the third was, in fact, the most frequently proposed of the 10 technology-related implementation activities. The fourth effect (i.e., develop an alliance for better access to technology) represented the second most frequently used strategy to promote access. The implication of these findings is that good planning, specifically developing realistic estimations of the amount of effort and resources required to

[13] ($\chi^2_{(2)}$= 6.22, $p$<.05).

[14] ($\chi^2_{(1)}$=4.40, $p$<.05).

[15] To assess repercussions of the five planning problems addressed on the survey, each of the 70 projects experiencing two or more planning problems was classified into a high problem group. In addition, each of the 64 projects experiencing one or no problems was classified into a low problem group. A series of 24 *t* tests was then conducted to compare the mean ratings for the two groups on each item addressing the extent of implementation for a given implementation strategy. There were six items addressing implementation activities to promote access to the information infrastructure. Eight items addressed implementation activities to support the training of end users, and 10 items addressed implementation activities involving technology.

implement a TIIAP project and of the demand for services, can help maximize the extent to which telecommunications networks are created and the development of formal collaboratives to promote access.

Organizational problems were also encountered by a substantial number of projects. A similar procedure was used to compare the extent of implementation among projects encountering two or more organizational problems and projects encountering one or no such problems. There were no significant differences in the mean ratings of the two groups for any of the 24 implementation activities, suggesting that organizational problems did not affect project implementation.

The final series of analyses was used to assess repercussions of the four technology-related problems addressed on the survey.[16] Results showed effects in the expected direction upon three implementation activities. That is, projects experiencing technology-related problems reported lower levels of implementation than did projects experiencing no technology problems for the following activities:

- Create a network to refurbish and/or distribute donated computer equipment ($t_{(1,10)}$=2.22, $p$<.05);
- Establish access sites for reaching the information infrastructure ($t_{(1,106)}$=2.21, $p$<.05); and
- Provide computer hardware needed to meet education and training needs ($t_{(1,80)}$=2.91, $p$<.01).

This findings suggest that although technology-related problems were the least frequently encountered class of problems, they can have a strong negative influence on the extent of implementation in several areas. For example, as mentioned above, technological obsolescence during the grant period was experienced by over one-quarter (25.2 percent) of the projects. A project that involved informational kiosks foundered before going defunct because of how quickly its technological strategy became outmoded. When the project was first conceived, the Internet was not readily accessible, and self-contained kiosks were viewed as a cost-effective mechanism for reaching a large segment of the region's population. The advent of the Internet, however, made it difficult for project staff to justify continued support for the expensive kiosks (see Exhibit 3-8 for a more complete description of this project).

The first two effects involve implementation activities to promote access, the second of which was the most frequently proposed implementation strategy in any of the four areas of implementation examined on the mail survey. Over 80 percent of all demonstration and access projects proposed to establish access sites for reaching the information infrastructure. The final effect reported above was the strongest effect to be found in each of the three series of *t* tests and involved the second most frequently proposed implementation strategy to support training of project end users. The implication of these findings is that efforts to avoid using technology that may become obsolete or incompatible with the industry standards may ultimately pay off for a great many TIIAP projects in terms of maximizing the ability to provide training and access sites for the targeted end users.

[16]Each of the 60 projects experiencing at least one technology problem was classified into a high problem group, and each of the 73 projects experiencing no problems was classified into a low problem group. A series of 24 *t* tests was again conducted to compare the mean ratings for the two groups on each implementation strategy.

**Exhibit 3-8**
**Example of a project that was terminated due to technological obsolescence**

One project designed electronic information kiosks to provide citizen access to government information and services, but with the advent of the Internet, the kiosks were quickly outdated.

The Internet proved superior to the information kiosks in several ways. First, residents could access the same information from their homes or businesses. People lacking access to a computer were often able to access the Internet at their local public library. As hits on websites increased, agencies with few hits on the kiosk system lost interest in the initiative. Second, people living outside of the area could access information. This would allow, for example, truckers to obtain any necessary permits before they transported hazardous materials through the area. Third, modifying websites required considerably less time and money than the kiosks. The cost of maintaining the ISDN lines that linked the kiosks with the host organization was very expensive (approximately $100,000 per year).

In addition, while some components of the kiosk system were designed to be updated on a daily or weekly basis (e.g., job listings), others segments were conceived as being updated on a less frequent basis (e.g., unemployment compensation and university admission policies). The project eventually was faced with updating a great deal of the information first placed in the system. For information that was designed to be updated regularly, there was no problem; however, the more permanent fixtures of the system proved much more difficult to change. The process of revising some informational segments was lengthy and costly (as much as $30,000 for some changes). Since the kiosks emulated a television screen instead of a computer, an interactive "hostess" helped users navigate the system by explaining the choices on the screen and video was interspersed with written information. These features, designed to improve the "friendliness" of the system, also made it more costly and difficult to make even the simplest of changes (e.g., updating a campground's telephone number). This high cost was due to a combination of factors, including the process of interweaving video and text, and the need to hire the same actress who played the hostess (wearing the same clothes and hairstyle) to read the revised scripts. As the project progressed, agencies eventually decided to focus their resources on maintaining and updating their websites. This, in turn, created a situation in which Internet information was up to date, while corresponding information on the kiosk was outdated. As discrepancies between the two information mediums intensified, it became more difficult for project staff to assert that the kiosk system should be maintained.

Source: 1998 case study.