Evaluation Report

Telecommunications and Information Infrastructure Assistance Program

1994 and 1995 Grant Years

Study Conducted by
Westat

for
U.S. Department of Commerce
National Telecommunications and Information Administration

Evaluation of the Telecommunications and Information Infrastructure Assistance Program for the 1994 and 1995 Grant Years

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NOTE: Any views, findings, conclusions, or recommendations expressed in this report are those of the authors, and do not necessarily represent the official views, opinions, or policy of the U.S. Department of Commerce.

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Executive Summary

This report presents the findings of an evaluation of the U.S. Department of Commerce's Telecommunications and Information Infrastructure Assistance Program (TIIAP). Administered by the National Telecommunications and Information Administration, TIIAP is designed to help communities make use of new and emerging technologies. The evaluation study was designed to assess the activities and achievements of the first grant recipients, those receiving funding in FY94 and FY95.

The results presented here provide a comprehensive look at the impacts of the TIIAP investment, in terms of the nature and degree of the effects on the organizations implementing the projects, other organizations that were involved with the projects, the individuals and communities that were served by the projects, and the specific value added by the TIIAP funds. By targeting areas where telecommunications has been problematic (e.g., because of geographic or economic barriers), the activities supported by TIIAP have both increased access to a variety of technology-based services and enhanced collaborations within and across a variety of communities.

OVERVIEW OF THE TELECOMMUNICATIONS AND INFORMATION INFRASTRUCTURE ASSISTANCE PROGRAM

Under the direction of the U.S. Department of Commerce's National Telecommunications and Information Administration (NTIA), TIIAP began in 1994, a year when information technology was on the verge of an unprecedented expansion. TIIAP provides matching grants to a wide range of nonprofit organizations—schools, libraries, hospitals, public safety entities, and state and local governments—to make use of innovative technologies. A major goal is to bring these technologies and their benefits to persons in the inner-city and rural areas and to other groups that have difficulty accessing the information infrastructure. The program has the following objectives:

- To increase awareness in the public and nonprofit sectors of the National Information Infrastructure (NII) and its benefits;
- To stimulate public and nonprofit organizations to examine the potential benefits of investments in the NII;
- To provide a variety of model NII-related projects for public and nonprofit organizations to follow;
- To educate the public and nonprofit organizations about best practices in implementing a variety of NII-related projects; and
- To help reduce disparities in access to, and use of, the information infrastructure.

TIIAP funds projects that intend to improve the quality of, and the public's access to, education, health care, public safety, and other community-based services. Grants may be used to purchase equipment for connection to networks, including computers, video-conferencing systems, network routers, and telephones; to buy software for organizing and processing all kinds of information, including computer graphics and databases; to train staff, users, and others in the use of equipment and software; to pay staff salaries; and to purchase communications services, such as Internet access. Grant recipients are also

expected to evaluate the projects and disseminate their findings.

Since its inception, TIIAP has generated tremendous interest. Between 1994 and 1998, the program received more than 5,300 applications, requesting $2.1 billion, from across the country. Over the same period, TIIAP has awarded 378 grants in 50 states, the District of Columbia, and the U.S. Virgin Islands. Across these 378 projects, approximately $118 million in Federal grant funds have been matched by more than $180 million in non-Federal funds. In line with project goals, a significant portion of TIIAP funding has gone to rural regions, where telecommunications has the power to create new opportunities for geographically isolated communities and their residents.

The program currently has five application areas (community networking; education, culture, and lifelong learning (ECLL); health; public safety; and public services) and three grant categories (access, demonstration, and planning). Access grants help communities increase their capacity to access the information infrastructure. Special emphasis is placed on increasing the access of traditionally underserved populations and narrowing the gap between the information haves and have-nots. Demonstration grants help projects use telecommunications and the information infrastructure to solve problems within their communities. Special emphasis is placed on developing successful models that could be replicated by other communities. Planning grants enable communities to develop strategic plans for improving the telecommunications and information infrastructure in a particular area.

One of the unique characteristics of TIIAP is that despite its brief history, the program has evolved considerably since its inception in 1994. First, the program has made several changes to its funding categories. During its first year, the program funded two types of projects: demonstration and planning. In 1995, the program began funding access projects as well. Over time, however, access and planning projects have been de-emphasized. Second, the distribution of projects among the primary application areas has changed, e.g., the number of public safety projects has increased while the number of ECLL projects has decreased. Third, the average length of grants has increased. Fourth, the standards for project acceptance have become more stringent. For example, there is an increased emphasis on involving the underserved rather than simply serving them; increased emphasis has been placed on the use of the information infrastructure to solve community problems, as opposed to building the infrastructure itself; and increased importance has been placed on projects' plans for evaluation and dissemination. Finally, TIIAP has increased its own dissemination efforts and improved the quality of the quarterly data that are collected from projects.

STUDY OVERVIEW

In 1997, TIIAP initiated a series of activities intended to produce a broad-based external evaluation of the use and impact of these grants. Although considerable anecdotal information already existed, program managers felt that it was important to conduct an independent assessment of the program's implementation and impact.

This report presents findings from a study, conducted in Federal fiscal year 1998, of the 206 projects that received TIIAP funding in 1994 and 1995. The study used several data collection strategies to assess projects' implementation and impact:

- A comprehensive document review of the applications and quarterly progress reports submitted by the 206 projects funded in 1994 and 1995.
- A mail survey of the 206 projects funded in 1994 and 1995. The response rate to this survey was 92.4 percent.
- Case studies of 25 TIIAP projects funded in 1994 and 1995. The sites that were visited

represented a cross-section of all projects funded in the program's first 2 years.

The evaluation was conducted by Westat, a Rockville, Maryland, research and consulting firm.

SUMMARY OF FINDINGS

Characteristics of Grant Recipients and Project Partners

While the 1994 and 1995 TIIAP grants were provided to a wide variety of organizations, we found that education and community organizations represented the two most common categories of grant recipients. Education organizations also represented the most common category of partner organizations.

A wide variety of organization types served as grant recipients. Overall, two-fifths of access and demonstration grant recipients were education organizations, including institutions of higher education (23.7 percent) and K-12 schools or school systems (13.7 percent). In addition, just over one-third were community service organizations, including social service agencies (24.4 percent) and libraries (6.1 percent).

TIIAP projects involved multiple partnerships. Grant recipients in demonstration and access projects established new (or continued existing) partnerships with an average of 3.4 organizations[1] (the number of organizations that grant recipients informally collaborated with was likely much higher). Over three-quarters of the projects partnered with at least one educational organization—generally a higher education institution (33.1 percent) or K-12 school or school system (27.8 percent). In addition, a significant proportion of projects (60.9 percent) formally collaborated with at least one private sector entity. In fact, almost one-quarter (23.4 percent) of all demonstration and access partnerships were with private sector organizations. Grant recipients in planning projects partnered with an average of 3.7 organizations. Of the 177 partners listed, 27.7 percent were educational organizations, 24.3 percent were government organizations, and 23.7 were community organizations.

The primary contributions of project partners involved human resources. While demonstration and access partners assisted in a variety of ways, their primary contribution was providing personnel (60.2 percent of projects), intellectual capital (59.3 percent), or space or facilities (48.1 percent). Education partners tended to provide the broadest array of contributions. Not surprisingly, private sector partners were most likely to provide equipment, equipment discounts, and reduced rates for services. The most common contribution among planning partners was providing intellectual capital (64.4 percent).

Establishing and maintaining partnerships was a valuable, yet demanding, activity. Findings from the survey and case studies suggest that projects can take some pragmatic steps to strengthen their partnerships, including (1) identifying partners who are truly committed to the project; (2) establishing clear written agreements delineating all roles and responsibilities; and (3) communicating with all project partners on an ongoing basis.

Implementation of Demonstration and Access Projects

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.

[1] It should be noted that this average number is somewhat lower than what might be expected from anecdotal information obtained during the site visits. We cannot say for sure why this occurred. One possibility is that the burden of reporting detailed information on each partner organization caused some respondents to limit their answers to this item.

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.

Accomplishments and Impacts of Demonstration and Access Projects

Many programs perceived technological achievements to be their primary accomplishment. Others identified community improvements that resulted from their technological achievements. When survey respondents were asked to identify their project's single most important outcome, just over half of the projects used this open-ended item to describe a *technological* achievement (e.g., "provided a technology backbone for the community and region"). The remaining projects used this open-ended item to describe a *community impact*.

Successful demonstration and access projects shared a set of common traits. First, across all application areas, successful projects addressed community change goals that would benefit the greatest number of community residents. Second, they tackled community problems that were specific, well defined, and easily addressed through technological innovations. Third, they involved community stakeholders who were in a position to bring about the types of changes needed to resolve their problems. Conversely, projects addressing complex social issues that are influenced by factors beyond the control of the stakeholders (e.g., reducing poverty) generally reported less success in achieving their community change goals.

TIIAP projects successfully reached underserved community segments. Ninety (90.2) percent of the 1994 and 1995 demonstration and access projects provided benefits to disadvantaged and underserved community segments. Nearly two-thirds of the projects reached end users (65.2 percent) and indirect beneficiaries (61.4 percent) who lived in rural areas. The percentage of projects impacting people living in geographically isolated areas and people living in conditions of extreme poverty were nearly as high (59.8 percent and 59.1 percent for end users and 57.6 and 66.7 percent for indirect beneficiaries, respectively). Not surprisingly, end users tended to be concentrated (e.g., in a single community, in one or two adjacent counties in a state), while indirect beneficiaries were more dispersed (e.g., all counties in a state).

The magnitude of impact for TIIAP projects was extensive. The demonstration and access projects estimated that they provided services to over 10 million end users. The number served by individual projects ranged from a minimum of 15 to a maximum of 5 million (for a health demonstration project). The majority of projects, however, reported serving between 400 to 20,000 end users. In addition, the number of end users impacted was found to be associated with the length of a project's grant period, implying that funding projects for a longer duration to ensure that they have adequate time to get up and running may pay off in terms of the number of end users who are ultimately impacted.

The TIIAP projects strengthened organizational partnerships. Over half (52.7 percent) of projects reported that the grant recipient's relationship with its partner organizations changed as a result of the project. Among projects reporting a change, over 90 percent indicated that they had forged stronger and expanded working relationships with and among their partner organizations. In many cases, these organizations have continued to share information and work closely on the continuation of the project. Additionally, a number of projects reported new joint ventures that were direct outcomes or expansions of the TIIAP project.

Over 80 percent of TIIAP projects disseminated information about their initiatives. Most notably, projects reported responding to almost 79,000 unsolicited requests from outside organizations. In addition, they provided written materials to over 335,000 organizations (although some of these materials may have been designed to describe the project to potential end users, as opposed to other organizations). A significant number of organizations (5,489) received project information through site visits or tours. There was a fairly strong correlation between the length of the grant period and the number of dissemination recipients, suggesting that funding projects for a longer duration increases a project's dissemination activities.

TIIAP projects have promoted the diffusion of innovative applications of information infrastructure. Most projects (85.9 percent) and all of the community networking demonstration projects considered their TIIAP projects worthy of replication. In addition, over two-thirds (69.6 percent) "strongly" or "moderately" agreed that their project innovations provided a "marked advantage" over alternative ways of providing similar services; three-quarters (75.6 percent) indicated that their innovations were easily documented and, therefore, could be easily communicated to others; and just over two-thirds (68.9 percent) indicated that their project innovations could be easily implemented by others with a reasonable amount of effort and expense. Furthermore, one-third (34.2 percent) of respondents indicated that they knew of other organizations that had used information about their TIIAP-related activities to undertake similar ventures. These respondents cited over 80 specific organizations that had adopted ideas from their projects.

Federal funding has been crucial to the success of these initiatives. Three-fourths (75.2 percent) of projects reported that they probably never would have been implemented without the support they received from the TIIAP program (the remaining 24.8 percent indicated that they would have been implemented using alternate funding sources). In addition, projects that received a larger TIIAP award appeared to be less likely to perceive that they would have been able to obtain alternative funding.

Sustainability and Project Expansion

Nearly 90 percent of the 1994 and 1995 demonstration and access projects were still in operation at the time of the mail survey. Specifically, 53.3 percent were still in full operation; 17.0 percent were serving a function that had changed, grown, or expanded; 11.1 percent were serving fewer end users than intended; and 8.1 percent were providing a limited range of services.

Lack of maintenance funding was the chief threat to project sustainability among demonstration and access projects. Respondents in the 37 demonstration and access projects that were no longer operating at full capacity (or had ceased operating entirely) were asked to identify the factors responsible for the decrease in their projects' activities or scope. Nineteen of these projects ceased or cut back project operations due to a lack of funding for ongoing maintenance of the project operations or systems. Many of these projects also reported that personnel and staffing problems (15 projects) and technological obsolescence (13 projects) inhibited sustainability.

Almost four-fifths of the 1994 and 1995 planning projects indicated that their telecommunications plan had been partially or fully implemented at the time they completed the mail survey. The remaining 11 planning projects indicated that they were still working to secure the necessary funding, personnel, or partners needed to implement the plan (10.4 percent), or that their plan had not been implemented and no steps were being taken to initiate implementation (6.2 percent).

Nearly two-thirds of demonstration and access projects had expanded to serve additional end users beyond those targeted in the proposal. These projects have not only increased the numbers of persons being served and the numbers of access sites and nodes for their wide area networks, many also have taken advantage of the Internet's capabilities to dramatically broaden the service area covered by their projects. The total dollar amount of additional equipment or resources that were leveraged in connection with these expansions was over $93 million. The majority of projects leveraged funds in the range of $100,000 to $1 million. Our analyses found that projects funded for 21 months or longer were more likely to have expanded to serve additional end users than were projects funded for a shorter duration. In addition, demonstration projects were more likely than access projects to have expanded to serve additional end users.

Nearly two-thirds of demonstration and access projects had generated spin-off activities that provide additional services not included in the TIIAP proposal. The dollar amount for additional equipment or resources that was leveraged in connection with these spin-off activities was approximately $41 million. The majority of projects leveraged spin-off funds in the range of $300,000 to $700,000.

Most demonstration and access projects were able to secure funding for a broad array of operating expenses. The three most frequently cited ongoing operating expenses for which funding was secured were access lines (75.6 percent), maintenance and upgrades (65.2 percent), and personnel and contractual salaries (61.5 percent). In addition, several of the site visit projects reported that they secured funding by becoming revenue generators, e.g., began collecting user fees for website development or training.

SUMMARY AND CONCLUSIONS

The results of this evaluation show that the TIIAP program is achieving its mission to improve the nation's knowledge of and access to the information infrastructure. And we found that the fundamental strength of the program is that it readily adapts itself to a wide variety of contexts and purposes. The 1994 and 1995 TIIAP projects helped to change the way in which millions of end users and other beneficiaries access information and services. This evaluation has identified five key areas in which the program has made important impacts:

- The TIIAP program supported a considerable number of projects that enabled disadvantaged and underserved communities to gain access to the information infrastructure. Examples of the tangible benefits realized by residents of these communities include increased access to (1) cutting-edge medical technologies; (2) up-to-date employment listings within and across communities; (3) a wide range of government and community services; (4) educational and reference materials from prestigious institutions; and (5) up-to-date news and information from around the world.
- The TIIAP program has also enabled a considerable number of public and nonprofit agencies to dramatically change the way in which they interact with their clients. These improvements often enhanced the capacity of organizations to serve the general public. They also enabled these agencies to dramatically increase the number of citizens receiving a wide range of social services.
- The TIIAP program has helped to expand the universe of teachers and learners of all ages. In some cases, this has occurred because TIIAP-supported projects exposed educators to valuable new information resources and curriculum materials. In others, TIIAP has enabled teachers to embrace innovative strategies such as interactive learning. In still others, TIIAP has enabled educational

institutions (at all levels) to use distance learning to expand the geographic horizons of traditional classrooms.

- The TIIAP program helped to foster increased collaboration at both the local and global levels. In some cases, these continued collaborative efforts have focused exclusively on technology-related issues. In others, partnerships forged by TIIAP have proliferated into such non-technology areas as long-range business and community planning.
- Finally, and perhaps most important, TIIAP has demonstrated the value of investing relatively modest amounts of Federal seed money in innovative technology applications. Evidence from the mail survey and case studies suggests that most of the projects needed TIIAP's financial support to proceed beyond the conceptual phase. The high success rate among the 1994 and 1995 grant recipients (as measured by the range of impacts and the proportion of projects still in operation after Federal funding had expired) suggests that TIIAP invested wisely.

The evaluation also found two main areas where the 1994 and 1995 TIIAP projects would have benefited from additional technical assistance:

- The TIIAP program funded a number of projects that lacked a long-term vision of how their technologies would eventually benefit the community. Some projects adopted a given technology before first conducting a needs assessment to weigh alternative options. In some of the projects we visited, this resulted in the development of a technology that was either not needed or severely underutilized. The experience of these projects suggests that grant recipients should not implement a given technology before first completing an extended planning phase that includes a comprehensive community needs assessment.
- Few of the 1994 and 1995 projects supported by TIIAP collected outcome 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 how their activities benefited the greater community. For example, few projects systematically collected data on how TIIAP-supported activities contributed to narrowing the gap between the technology haves and have-nots. A lack of outcome data weakens a project's ongoing capacity to assess ways in which it can better serve its clients. It also hinders the Federal government's ability to document the full impact of its investment in new and emerging technologies.

As stated previously, it is important to note that the TIIAP program has since taken a series of important steps to address these two issues. Specifically, the program has revised its application and evaluation procedures to ensure that grant recipients (1) clearly identify a set of community change goals and corresponding long-term outcomes at the outset of their projects, and (2) develop and implement a robust evaluation plan that enables projects to systematically assess progress toward their community change goals. The program has also enhanced the data collection requirements imposed on all grant recipients and expanded its oversight of individual projects. As part of this effort, TIIAP will soon be initiating an online collection system that will require grant recipients to identify and assess progress toward a series of measurable outcomes. Taken together, these steps should further enhance the program's capacity to monitor the activities of individual projects, to identify promising practices, and to target projects in need of technical assistance.

It is also important to note that program staff have used the successes and mistakes of previous grant recipients to inform the development and implementation of future projects. The findings of this study suggest that such technical assistance

is especially needed in the following areas: (1) setting goals; (2) using evaluation data to improve program effectiveness; (3) conducting and using needs assessments; (4) identifying effective strategies for allocating staff and financial resources; (5) developing realistic implementation schedules; and (6) identifying practices for sustaining projects beyond the TIIAP grant period. In addition, TIIAP staff can perform an important function by helping grant recipients remain informed of new and emerging technologies.

The diversity of projects supported by TIIAP provides the program with a powerful opportunity to inform the next generation of innovative telecommunications applications. Many of the lessons learned by the 1994 and 1995 projects are included in Chapter VI of the report.

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I. Introduction

OVERVIEW OF THE TELECOMMUNICATIONS AND INFORMATION INFRASTRUCTURE ASSISTANCE PROGRAM

In 1994, the U.S. Department of Commerce's National Telecommunications and Information Administration (NTIA) initiated the Telecommunications and Information Infrastructure Assistance Program (TIIAP). The program was established at a time when many of the online services we now take for granted, such as using search engines on the World Wide Web, were unavailable or difficult to access. For example, in 1994 the Internet had 30,000 domain-names and 2.2 million hosts. In contrast, by 1998, the Internet had well over 1.3 million domain-names and over 30 million hosts.

Larry Irving, Assistant Secretary of Commerce and Director of the National Telecommunications and Information Administration, stated in late 1997,

> The Digital Revolution differs in an important way from the Industrial Revolution. During the Industrial Revolution, different countries moved from agrarian to industrial economies at different times. Today, almost every nation is experiencing the digital revolution. China and India and Botswana are making the transition to an information economy as well as the U.S. and Germany and Australia. Telecom and information infrastructure, services, and products are the key to economic development and success for virtually every nation.

Program Purpose and Structure

The TIIAP program is designed to provide matching grants to a wide range of nonprofit organizations—schools, libraries, hospitals, public safety entities, and state and local governments—to make use of innovative technologies. A primary purpose is to bring these technologies and their benefits to inner-city and rural areas, and other groups that have difficulty accessing the information infrastructure.[1] The program has the following objectives:

- To increase awareness in the public and nonprofit sectors of the National Information Infrastructure (NII) and its benefits.
- To stimulate public and nonprofit organizations to examine the potential benefits of investments in the NII.
- To provide a variety of model NII-related projects for public and nonprofit organizations to follow.
- To educate public and nonprofit organizations about best practices in implementing a variety of NII-related projects.
- To help reduce disparities in access to, and use of, the information infrastructure.

[1] The TIIAP program defines "information infrastructure" as telecommunication networks, computers, other end-user devices, software, standards, and skills that collectively enable people to connect to each other and to a vast array of services and information resources.

Grants are used to fund projects that intend to improve the quality of (and the public's access to) education, health care, public safety, and other community-based services. Grant recipients can use their awards to (1) purchase equipment for connection to networks, including computers, video-conferencing systems, network routers, and telephones; (2) buy software for organizing and processing all kinds of information, including computer graphics and databases; (3) train staff and others in the use of equipment and software; (4) purchase communications services, such as Internet access,[2] and (5) pay staff salaries.

To create a synergy of funding among public and nonprofit entities, TIIAP requires grant recipients to obtain matching funds from partner organizations. Specifically, TIIAP provides up to 50 percent of the total project cost (in some cases, the program will support up to 75 percent of program costs).

Since its inception, TIIAP has identified a variety of application areas that define the program's funding priorities.[3] For the purposes of this report, all of the 1994 and 1995 projects were assigned to one of the following application areas that were in use in the 1998 fiscal year:

- **Community Networking.** This application area focuses on multi-purpose projects that enable a broad range of community residents and organizations to communicate, share information, promote community economic development, and participate in civic activities. These projects typically involve multiple stakeholder organizations that wish to link services, reduce duplicative record-keeping, simplify and/or expand end-user access to a variety of information resources, engage in initiatives that would not have been possible without networking technologies, or provide information across various application areas within a specific geographic region.
- **Education, Culture, and Lifelong Learning (ECLL).** Projects in this application area seek to improve education and training for learners of all ages. They can also provide cultural enrichment through the use of information infrastructure in both traditional and non-traditional settings. Examples of strategies used by ECLL projects include integrating computer-based learning and network resources in the classroom; forging stronger links between educators, students, parents, and others in the community; linking workplaces and job-training sites to educational institutions; using distance learning networks to provide educational training in remote areas; and enriching communities by delivering online informational, educational, and cultural services at public libraries, museums, and other cultural centers.
- **Health.** Projects in this application area seek to use the information infrastructure to enhance the delivery of health and home health care services and the performance of core public health functions. Examples of strategies used by health projects include improving the care and treatment of patients in their homes; developing telemedicine systems that offer extended medical expertise to rural or underserved urban areas; improving communication between health care providers and patients; improving treatment of patients in emergency situations; and developing networks for disease prevention and health promotion.
- **Public Safety.** Projects in this application area seek to increase the effectiveness of law enforcement agencies, emergency, rescue, and fire departments, and other entities involved in

[2] TIIAP does <u>not</u> support projects that are designed to (1) construct or augment one-way networks; (2) enhance or expand the internal communication needs of a single organization; or (3) replace or upgrade existing facilities. Nor does TIIAP support projects whose primary purpose is to develop content, hardware, or software, or to provide training on the use of the information infrastructure. TIIAP will, however, support projects that include elements of content development, training, and hardware and software development so long as they are integral to a broader strategy for using the information infrastructure to address community problems.

[3] In its first year, for example, the program indicated that "Funding under TIIAP will be awarded to support projects that most effectively enhance economic opportunity, the provision of education, culture, health care, public information, library, public safety, social services, or other efforts to meet public needs; and that support the further development of a nationwide, high-speed, interactive infrastructure, incorporating the widest variety of information technologies."

providing safety and crisis prevention services. Examples of strategies used by public safety projects include facilitating the exchange of information among public safety organizations (in one community or across multiple regions); providing information in a timely manner to "first-response officials" (e.g., police officers, emergency medical technicians, firefighters); helping public safety agencies provide community outreach services; developing innovative ways to share scarce spectrum resources; increasing the safety and security of children; and reducing domestic violence.

- **Public Services.** Projects in this application area aim to improve the delivery of services to people or organizations with a range of social service needs, e.g., housing, child welfare, food assistance, and employment counseling. Examples of strategies used by public services projects include using information technology to promote self-sufficiency among individuals and families; developing networks that facilitate coordination and collaboration among public and/or community-based organizations; using electronic information and referral services to provide information on a variety of community-based or government services; making public agencies more accessible and responsive to community residents; and using geographic information systems to assess demographic trends.

In addition, during the 1994 and 1995 fiscal years, the program had three grant categories: access, demonstration, and planning.

- **Access.** These grants, initiated in 1995, help communities increase their capacity to access the information infrastructure. Special emphasis is placed on increasing the access of traditionally underserved populations and narrowing the gap between the information haves and have-nots.
- **Demonstration.** These grants help projects use telecommunications and the information infrastructure to solve problems within their communities. Special emphasis is placed on developing successful models that could be replicated by other communities.
- **Planning.** These grants enable communities to develop strategic plans for improving the telecommunications and information infrastructure in a particular area.

Since its inception, TIIAP has generated tremendous interest. Between 1994 and 1998, the program received more than 5,300 applications, requesting $2.1 billion, from across the country. Over the same period, TIIAP has awarded 378 grants in 50 states, the District of Columbia, and the U.S. Virgin Islands. Across these 378 projects, approximately $118 million in Federal grant funds have been matched by more than $180 million in non-Federal funds. In line with project goals, a significant portion of TIIAP funding has gone to rural regions, where telecommunications has the power to create new opportunities for geographically isolated communities and their residents.

Program Changes

One of the unique characteristics of TIIAP is that despite its brief history, the program has evolved considerably since its inception in 1994. The most visible of these changes have been in its funding categories. During its first year, the program funded two types of projects: demonstration and planning. In 1995, the program began funding access projects as well. Over time, however, access and planning projects have been de-emphasized. The distribution of projects among the primary application areas has also changed over time. For example, the number of public safety projects has increased, while the number of ECLL projects has decreased. In addition, as discussed previously, the application areas have been consolidated into five broad areas.

With time, the standards for project acceptance have become more stringent. For example, in fiscal year 1998, successful proposals had to meet the following criteria:

- Make explicit the connections between community problems, solutions, and the outcomes the project is proposing.
- Emphasize the use of the information infrastructure to solve community problems, as opposed to building the infrastructure itself.
- Focus on *involving* underserved communities, rather than simply *serving* the underserved.
- Explain the project's potential to serve as a model for other communities and organizations to follow.

In addition, successful applicants had to describe the design of the project's evaluation, a plan for implementing the evaluation, and the resources to be allocated to evaluation. This design had to address "the evaluation questions; the methodological approach for answering the evaluation questions; how data will be collected; how the data will be analyzed; and how the evaluation findings will be reported and disseminated" (FY 1998 Notice of Availability of Funds). Moreover, project evaluations had to be linked directly to problems, solutions, and anticipated outcomes identified in the proposal. Finally, documentation plans were required to include methods and procedures for collecting data, such as demographic and background information on the population(s) served, activities, and outreach.

TIIAP has made a variety of policy and procedural changes as well. For example, the average length of grant periods has increased over time—in large measure to allow grant recipients more time to implement their projects. In addition, since 1996 (when agency-wide spending restrictions were lifted), NTIA has used site visits to dramatically increase its level of onsite grants monitoring. The program has increased its dissemination efforts by supporting annual conferences for former, current, and potential grantees. Program materials have taken on a more technical assistance function, and program staff actively assist projects with lessons learned by previous grant recipients. In addition, TIIAP has also developed a series of handbooks to assist grant recipients and TIIAP Program Officers and staff to better understand their responsibilities.

Finally, TIIAP is taking steps to improve the quality of the quarterly data that are collected from projects. An electronic Performance Reporting System is being developed that will enhance the capacity of grant recipients and program officers to collect, analyze, and use data constructively. As part of this effort, the program will conduct evaluation workshops to assist grant recipients with their project evaluations.

STUDY OVERVIEW

In 1997, TIIAP initiated a series of activities intended to produce a broad-based external evaluation of the use and impact of these grants. Although considerable anecdotal information already existed, program managers felt that it was important to conduct an independent assessment of the program's implementation and impact. This report presents findings from a study of the implementation and impact of the 206 projects that were funded in the program's first 2 years of operation, fiscal years 1994 and 1995. These program cycles were considered by NTIA to have been in operation long enough to warrant an evaluation. The purpose of the study is to assess the effects that the funded projects are having at the local level and, over the long term, at the national level. The information obtained from this study is also intended to provide a basis for program improvements and to lay the groundwork for continued and improved collection of program data in future years. The broad evaluation questions addressed by this study are summarized below.

- To what extent are the projects accomplishing their implementation objectives?
- What are the factors at the Federal level and at the local project level that influence the extent of implementation?
- Are the needs of end users being met?
- How are projects changing the way organizations provide services and how individuals work?
- How are the individuals and families served by projects affected?

- Are these changes temporary or likely to be sustained?
- What are some of the important contextual differences in projects that need to be taken into account in tailoring a project within a particular site?
- What difference have Federal grants had in the creation, scale, and scope of projects?
- Where project goals have been surpassed, what factors or unexpected opportunities served to enhance project impacts?
- To what extent are the projects accomplishing their evaluation objectives?
- To what extent are the projects accomplishing their dissemination objectives?
- Are the projects receiving requests for information or technical assistance from organizations planning similar activities?
- What is the nature and extent of any spillover benefits to organizations and communities not directly served by the projects?
- Are demonstration projects, in particular, achieving their objectives as replicable models and strategies for other communities and nonprofit sectors to follow?

Characteristics of 1994 and 1995 TIIAP Projects

The study universe included all projects funded by TIIAP in 1994 and 1995. As shown in Table 1-1, these 206 projects received TIIAP funding during the period covered by this study. Of this number, one-third (34.5 percent) were designated as ECLL. The remaining projects were designated as follows: community networking (25.7 percent); public services (24.8 percent); health (12.1 percent); and public safety (2.9 percent). In addition, half (50.5 percent) of the awards in 1994 and 1995 were made to demonstration projects, while approximately one-quarter were made to planning (27.2 percent)[4] and access (22.3 percent) projects.

The average grant award amount for the 1994 and 1995 projects was $283,837 (see Table 1-2). Demonstration grants were, on average, funded at considerably higher levels than access or planning grants. In addition, the average health project received more TIIAP funding than projects in any of the other application areas.

STUDY METHODOLOGY

The evaluation was conducted by Westat, a Rockville, Maryland, research and consulting firm. The primary data collection strategies used in the development of this report are described below.

- **Document Review.** A comprehensive document review of the applications and quarterly progress reports submitted by the 206 projects funded in 1994 and 1995 was conducted in autumn 1997 to develop a preliminary database that could be used to assess broad program trends. It was also used to inform the development of the mail survey and case study protocols.
- **Mail Survey.** A mail survey was conducted in summer 1998 to assess the implementation and impact of the 206 projects funded in 1994 and 1995. Two different versions of the survey questionnaire were developed and used in the study. Version A (Appendix B) focused on implementation issues and outcomes and was completed by demonstration and access projects. Version B (Appendix C) focused on planning issues and progress toward implementation and was completed by planning projects. Each version of the survey was further customized to reflect the unique settings, populations, and problems of interest to projects in the five different application areas by tailoring the response options for selected items.

[4]The study collected data for projects in all three application areas. However, because the TIIAP program has de-emphasized planning grants, this report primarily focuses on demonstration and access projects.

Table 1-1
Numbers of TIIAP awards, by application area: 1994 and 1995

Type	Application area					Total
	Community networking	ECLL	Health	Public safety	Public services	
Demonstration	25	39	17	3	20	104
Access	14	18	3	1	10	46
Planning	14	14	5	2	21	56
Total	53	71	25	6	51	206

Source: TIIAP award database.

Table 1-2
Mean TIIAP award amount, by application area: 1994 and 1995

Type	Application area					Average across application areas
	Community networking	ECLL	Health	Public safety	Public services	
Demonstration	$414,794	$361,427	$474,757	$179,135	$418,596	$398,516
Access	188,868	181,493	156,302	221,600	145,812	175,210
Planning	133,310	133,111	131,745	78,058	210,490	160,090
Average across project types	280,761	270,790	367,940	152,520	279,418	283,837

Source: TIIAP award database.

The survey response rate for the 198 eligible projects was 92.4 percent.[5] It is important to note that almost all of the projects for which a survey was completed were no longer receiving grant monies at the time of the data collection. As shown in Table 1-3, the response rate was strong for all project types and application areas (although health projects had a slightly lower response rate—76.0 percent—than the other application areas). As shown in Table 1-4, the average grant amount for the 183 survey respondents totaled $277,168. In addition, the two (of three) public safety demonstration projects that responded to the survey were funded at a substantially lower average amount ($58,037) than for the entire universe of public safety demonstration projects ($179,135).

- **Case Studies**. Site visits were conducted throughout the first 6 months of 1998 in 25 of the projects funded by TIIAP in 1994 and 1995. The purpose of these visits was to obtain more detailed information about the experiences of a sample of grant recipients. The sites that were visited represented a cross-section of all projects funded in the program's first 2 years. Specific site selection criteria included geographic region, target area, project application area, project category, and size of award (see Appendix A for a more

[5] Eight projects were deemed ineligible for the survey because their funding was terminated prior to completion. One of the eight ineligible cases was an access project that was terminated prior to implementation due to insufficient personnel and resources to carry out the proposed activities. Two of the eight ineligible cases were demonstration projects—one of these was terminated midway through the grant period when the grant recipient organization folded and the other did not accept the award due to insufficient personnel and resources to carry out the proposed activities. The remaining five ineligible cases were planning projects—one of these was terminated and funds withdrawn midway through the grant period when the grant recipient organization failed to institutionalize the proposed initiative, while the remaining four did not accept the award due to a lack of interest among the organizations involved.

complete description of the case study methodologies).

STRUCTURE OF THE REPORT

The remainder of this report provides findings from the evaluation study. The results are organized as follows:

- Chapter II—Characteristics of Grant Recipients and Project Partners
- Chapter III—Implementation of Demonstration and Access Projects
- Chapter IV—Accomplishments and Impacts of Demonstration and Access Projects
- Chapter V—Sustainability and Project Expansion
- Chapter VI—Lessons Learned
- Chapter VII—Summary and Conclusions

Table 1-3
Numbers of survey respondents, by application area: 1994 and 1995 grants

Type	Application area					Total
	Community networking	ECLL	Health	Public safety	Public services	
Demonstration	23	35	13	2	17	90
Access	13	18	3	1	10	45
Planning	12	12	3	1	20	48
Total	48	65	19	4	47	183

Source: 1998 mail survey of TIIAP grantees.

Table 1-4
Mean TIIAP award amounts among survey respondents, by application area: 1994 and 1995 grants

Type	Application area					Average across application areas
	Community networking	ECLL	Health	Public safety	Public services	
Demonstration	$411,821	$370,778	$403,526	$58,037	$407,143	$385,916
Access	186,089	181,493	156,302	221,600	145,812	174,103
Planning	118,358	149,545	151,586	114,676	218,514	169,887
Average across project types	277,319	277,518	324,711	113,087	271,274	277,168

Source: 1998 mail survey of TIIAP grantees.

II. Characteristics of Grant Recipients and Project Partners

In this chapter we describe the organizations involved in developing and implementing the 1994 and 1995 TIIAP projects. These organizations include the direct grant recipients' partners that assumed primary responsibility for project management and administration, and the partner organizations that provided support for the project within the community.

KEY FINDINGS

While the 1994 and 1995 TIIAP grants were provided to a wide variety of organizations, we found that education and community organizations represented the two most common categories of grant recipients. Education organizations also represented the most common category of partner organizations.

A wide variety of organization types served as grant recipients. Overall, two-fifths of access and demonstration grant recipients were education organizations, including institutions of higher education (23.7 percent) and K-12 schools or school systems (13.7 percent). In addition, just over one-third were community service organizations, including social service agencies (24.4 percent) and libraries (6.1 percent).

TIIAP projects involved multiple partnerships. Grant recipients in demonstration and access projects established new (or continued existing) partnerships with an average of 3.4 organizations (the number of organizations that grant recipients informally collaborated with was likely much higher). Over three-quarters of the projects partnered with at least one educational organization—generally a higher education institution (33.1 percent) or K-12 school or school system (27.8 percent). In addition, a significant proportion of projects (60.9 percent) formally collaborated with at least one private sector entity. In fact, almost one-quarter (23.4 percent) of all demonstration and access partnerships were with private sector organizations. Grant recipients in planning projects partnered with an average of 3.7 organizations. Of the 177 partners listed, 27.7 percent were educational organizations, 24.3 percent were government organizations, and 23.7 were community organizations.

The primary contributions of project partners involved human resources. While demonstration and access partners assisted in a variety of ways, their primary contribution was providing personnel (60.2 percent of projects), intellectual capital (59.3 percent), or space or facilities (48.1 percent). Education partners tended to provide the broadest array of contributions. Not surprisingly, private sector partners were most likely to provide equipment, equipment discounts, and reduced rates for services. The most common contribution among planning partners was providing intellectual capital (64.4 percent).

Establishing and maintaining partnerships was a valuable, yet demanding, activity. Findings from the survey and case studies suggest that projects can take some pragmatic steps to strengthen their partnerships, including (1) identifying partners who are truly committed to

the project; (2) establishing clear written agreements delineating all roles and responsibilities; and (3) communicating with all project partners on an ongoing basis.

GRANT RECIPIENT ORGANIZATIONS

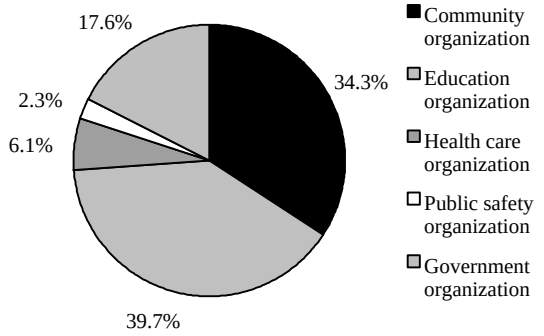
State, local, and tribal governments, colleges and universities, and nonprofit entities are eligible to apply for TIIAP funds; individuals and for-profit organizations are not. Grant recipients are responsible for ensuring that matching funds are provided toward the total project cost. During the 1994 and 1995 program years, the criteria for reviewing applications included not only an assessment of the merits of the proposed project, but also an assessment of the applicant's experience and expertise as they relate to the organization's ability to bring the project to a successful conclusion.

Types of Organizations Receiving TIIAP Awards

To a large extent, the types of organizations receiving TIIAP awards in 1994 and 1995 reflect the focus of projects themselves. For example, each of the three public safety demonstration and access projects surveyed was managed by a public safety organization—two law enforcement agencies and one professional association (Table 2-1). And all eight health care organizations receiving TIIAP awards managed projects in the health application area. Four of these were hospitals or clinics, two were medical schools, one was a public health agency, and the last was a nonprofit health association.

Figure 2-1 shows the distribution of 1994 and 1995 demonstration and access grants by type of organization serving as the grant recipient.

Figure 2-1
Distribution of 1994 and 1995 demonstration and access grants, by type of organization (n=135)



Source: 1998 mail survey of TIIAP grantees.

Education organizations served as grant recipients more frequently than any other organization type (39.7 percent). The vast majority of these organizations were higher education institutions (23.7 percent) and K-12 schools or school systems (13.7 percent). The remaining education organizations to serve in this capacity were educational consortia and nonprofit agencies providing educational services and resources. These 52 grant recipients were more likely to manage projects in the ECLL application area (62.7 percent) and less likely to manage projects in the public services area (14.8 percent).

Community organizations were the next most frequent type of grant recipient (34.4 percent). The 45 organizations in this category were composed predominantly of nonprofit public service agencies, although eight libraries, two museums, two community development organizations, and one public television station were included here as well. These types of organizations were most likely to manage projects in community networking (11.5 percent) and in public services (11.5 percent). They were less likely to manage projects in ECLL (9.9 percent) or health (1.5 percent).

A somewhat lesser number of TIIAP awards were granted to government agencies (17.6 percent). The 23 grant recipients in this category included 10 state agencies, 6 city or municipal agencies, and a varied assortment of other institutions, agencies, and commissions. Their oversight was relatively equally distributed among public services, community networking, and ECLL projects (5 to 6 percent).

Table 2-1
Organizational representation among grant recipients, by application area: 1994 and 1995 demonstration and access grants

Organization type	Application area					Total (n = 131)
	Community networking (n = 34)	ECLL (n = 51)	Health (n = 16)	Public safety (n = 3)	Public services (n = 27)	
Education organizations	**12**	**32**	**4**	**0**	**4**	**52**
Higher education institution or consortium	9	16	3	0	3	31
K-12 school or school system	3	14	1	0	0	18
Adult education organization	0	1	0	0	0	1
Nonprofit local education agency	0	1	0	0	0	1
Educational television network	0	0	0	0	1	1
Community organizations	**15**	**13**	**2**	**0**	**15**	**45**
Social service agency	11	4	2	0	15	32
Library	2	6	0	0	0	8
Museum or other cultural entity	0	2	0	0	0	2
Community development organization	2	0	0	0	0	2
Media organization	0	1	0	0	0	1
Governmental organizations	**7**	**6**	**2**	**0**	**8**	**23**
State government agency	0	4	2	0	4	10
Other government entity	3	2	0	0	1	6
City or municipal government	3	0	0	0	2	5
County government agency	0	0	0	0	1	1
Tribal government	1	0	0	0	0	1
Health care organizations	**0**	**0**	**8**	**0**	**0**	**8**
Hospital	0	0	3	0	0	3
Medical school	0	0	2	0	0	2
Clinic, medical center, or specialized practice	0	0	1	0	0	1
Public health agency	0	0	1	0	0	1
Professional association	0	0	1	0	0	1
Health maintenance organization	0	0	0	0	0	0
Public safety organizations	**0**	**0**	**0**	**3**	**0**	**3**
Law enforcement agency or department	0	0	0	2	0	2
National public safety association	0	0	0	1	0	1

Source: 1998 mail survey of TIIAP grantees.

Exhibit 2-1
Example of a cross-sector grant recipient

LOS ANGELES FREE-NET
1994 Demonstration Project in Community Networking

The Los Angeles Free-Net provides an interesting organizational structure and example of cross-sector work conducted by TIIAP grant recipients. The grant recipient organization was the Los Angeles Free-Net Division of the H.O.P.E. Unit Foundation, an organization offering counseling and education for people with cancer, housed at the Encino-Tarzana Regional Medical Center in Encino, California.

LAFN is staffed almost entirely by volunteers. The three key personnel involved in the TIIAP project are the president and founder, who is a clinical professor of medicine and chief of staff of the hospital, the operations director, who is a physicist and entrepreneur, and a computer scientist and technology consultant. Additionally, a retired aerospace engineer designed the physical setup of the modem rack and is currently writing the program to monitor system usage. A retired teacher has a broad role in the LAFN that includes content management, infrastructure maintenance, and training. A senior citizen coordinates the LAFN mentors, registrars, and other volunteer staff, and moderates the user suggestion box. A physician serves as medical advisor and webmaster for LAFN's Health and Medical Interest Center, managing content and ensuring that the information provided is valid, current, and accurate. A community college instructor serves as education advisor and webmaster for LAFN's Education and Lifelong Learning Interest Center.

In addition to these key LAFN staff members, 6 volunteers handle registration for new users; 12 webmasters are responsible for creating and maintaining the LAFN interest centers with extensive involvement from the users; 66 LAFN users serve as volunteer mentors, responding to user requests for technical assistance and occasionally making visits to users' homes to provide onsite assistance; and approximately 50 moderators oversee the activities of the various LAFN newsgroups.

Source: 1998 case study.

Some patterns also emerged among the types of grantee organizations and the types of projects they ran. Six of the eight health care organizations receiving grants managed demonstration projects, suggesting that exploring new and improved ways to deploy information infrastructure is a greater concern among health care organizations than is increasing access to information. The opposite pattern of priorities was evident among nonprofit public social service agencies, one of the community organizations considered. A comparatively high proportion (34.1 percent) of the access projects were managed by this type of organization, suggesting a greater need to provide basic connections to information infrastructure, as opposed to developing unique and innovative approaches to doing so.

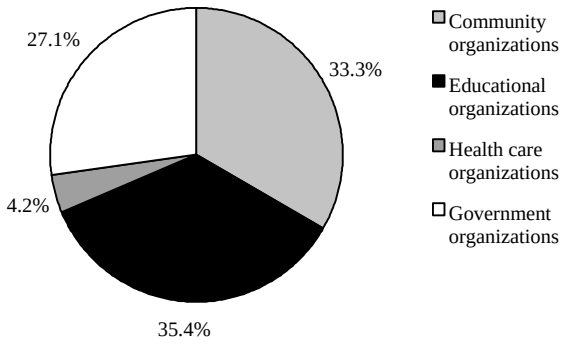
This division into specific sectors masks the fact that in some cases the staffing and organization of the projects showed strong cross-sector representation. The Los Angeles Free-Net is an example of this combining of social service workers, educators, scientists, and community members and physicians. Exhibit 2-1 describes this project in greater detail.

Planning projects had a similar distribution of grant recipients by organization type (Figure 2-2). Over one-third of planning grants were awarded to educational institutions, with 20.8 percent going to higher education institutions. Community organizations received 33.3 percent of planning grants, with 10.4 percent going to nonprofit organizations. About one-fifth (20.8 percent) of the planning grants went to state government agencies.

We found in our case study sites that grant recipients generally had experience with technology projects prior to their TIIAP grant. Several were in existing computer services departments in K-12 school systems, universities, cities, or state offices and were responsible for providing, maintaining, and monitoring computer services, including local and wide area networks, training services, and/or data processing. However, many of these had little Web experience

since the Internet was as not widely available or used in 1994 when many of the projects began.

Figure 2-2
Distribution of 1994 and 1995 planning grants, by type of organization (n = 48)



Source: 1998 mail survey of TIIAP grantees.

Two of the access and demonstration case study sites were also previous TIIAP grantees. The Oklahoma Department of Commerce and the Jefferson County (Kentucky) Public Schools had received TIIAP planning grants. Both used funds to develop infrastructure plans, conduct research on what telecommunications needs should be addressed, and determine what systems could be used.

PARTNER ORGANIZATIONS

In accordance with the TIIAP's emphasis on widespread community involvement, grant recipients are encouraged to establish partnerships with diverse sectors of the community that will complement their own talents and resources and actively contribute to the planning, implementation, and long-term sustainability of the project. Partner organizations may provide advice, leverage financial support, and serve as community advocates for the project.

Types of Organizations Serving as Project Partners

Demonstration and access projects were asked to list all organizations that served as partners in their TIIAP project. Survey respondents listed 457 partners, or an average of 3.4 partner organizations per project (the number of organizations that grant recipients informally collaborated with was likely much higher). Consistent with our findings about grant recipient organizations, the most frequently represented type of organization to serve as a project partner to the 1994 and 1995 TIIAP projects were education organizations. Over three-quarters (76.7 percent) reported having one or more educational institutions as a partner. A total of 135 K-12 schools, school systems, colleges, universities, and other education organizations were reported as project partners (Table 2-2). In contrast to the patterns that emerged in our examination of grant recipient organizations, a greater number of government agencies than community organizations served as partners to TIIAP projects.

It should be noted that this average number is lower than what might be expected from anecdotal information obtained during the site visits. We cannot say for sure why this occurred. One possibility is that the burden of reporting detailed information on <u>each</u> partner organization may have caused some respondents to limit their answers to this item.

Although for-profit organizations are not eligible to receive TIIAP funds, they do serve an important partnership role in many projects. Nearly 61 percent of the demonstration and access respondents reported forming at least one private sector partnership. Of the 457 total partner organizations listed on the mail surveys, 107 (23.4 percent) were organizations from the private sector.

As shown in Table 2-3, the average number of partners for planning grants was 3.7, slightly more than reported for demonstration and access.

Table 2-2
Percentage of TIIAP projects reporting partnerships with community organizations and total number of partners involved: 1994 and 1995 demonstration and access grants

Organization type	Percentage of projects (n = 133)	Total partners
Education organizations	**76.7**	**135**
K-12 school or school system	27.8	58
Higher education institution	33.1	55
Other education entity	12.0	17
Adult education organization	3.8	5
Early childhood organization	0.0	0
Private sector organizations	**60.9**	**107**
Other private entity	24.1	46
Private foundation or institute	9.0	17
Independent telephone company	6.8	15
Regional Bell operating company	9.8	13
Media organization	7.5	11
Cable company	3.8	5
Governmental organizations	**55.6**	**89**
State government agency	19.5	31
City or municipal government	15.0	24
County government agency	10.5	17
Other government entity	9.0	15
Tribal government	1.5	2
Community organizations	**51.9**	**86**
Nonprofit organization or entity not listed elsewhere	20.3	35
Library	18.8	28
Community development organization	6.0	10
Other community organization or entity	3.8	7
Museum or other cultural entity	3.0	6
Health care organizations	**18.0**	**34**
Hospital	6.0	14
Clinic, medical center, or specialized practice	3.0	7
Public health agency	5.3	7
Medical school	2.3	3
Health maintenance organization	0.8	2
Other health care entity	0.8	1
Public safety organizations	**3.0**	**6**
Law enforcement agency or department	1.5	4
Fire and rescue agency or department	0.8	1
Emergency agency or department	0.8	1
Other public safety entity	0.0	0
Total	100.0	457

Note: Respondents could select more than one item. Details may not add to totals because of rounding.
Source: 1998 mail survey of TIIAP grantees.

Table 2-3
Organizational representation among grant recipients and project partners: 1994 and 1995 planning grants (n = 48)

Organization type	Number of grant recipients	Percentage of projects reporting partnerships	Number of project partners
Education organizations	**17**	**56.3**	**49**
Higher education institution	9	43.8	30
K-12 school or school system	1	12.5	10
Other education entity	7	14.6	9
Early childhood organization	0	0.0	0
Adult education organization	0	0.0	0
Community organizations	**16**	**50.0**	**42**
Nonprofit organization or entity not listed elsewhere	5	16.7	14
Other community organization or entity	5	18.8	11
Community development organization	1	8.3	9
Library	4	12.5	8
Museum or other cultural entity	0	0.0	0
Public broadcasting station	1	0.0	0
Governmental organizations	**13**	**50.0**	**43**
State government agency	10	29.2	22
Other government entity	1	14.6	8
City or municipal government	0	10.4	5
Tribal government	2	8.3	5
County government agency	0	6.3	3
Health care organizations	**2**	**10.4**	**10**
Hospital	0	6.3	6
Other health care entity	2	14.6	2
Clinic, medical center, or specialized practice	0	2.1	1
Public health agency	0	2.1	1
Medical school	0	0.0	0
Health maintenance organization	0	0.0	0
Public safety organizations	**0**	**0.0**	**0**
Law enforcement agency or department	0	0.0	0
Fire and rescue agency or department	0	0.0	0
Emergency agency or department	0	0.0	0
Other public safety entity	0	0.0	0
Private sector organizations	**0**	**37.5**	**33**
Other private entity	0	14.6	12
Media organization	0	14.6	8
Private foundation or institute	0	10.4	5
Independent telephone company	0	10.4	5
Regional Bell operating company	0	6.3	3
Cable company	0	0.0	0
Total	**48**	**100.0**	**177**

Source: 1998 mail survey of TIIAP grantees.

Fewer planning grant recipients partnered with education organizations (56.3 percent) and private sector organizations (37.5 percent). Of the 177 partners, 27.7 percent were education organizations, 24.3 percent were government organizations, 23.7 percent were community organizations, 18.6 percent were private sector organizations, and 5.6 percent were health organizations.

Contributions of Partner Organizations

Partner organizations contribute to TIIAP projects in many ways (Table 2-4). Their primary contributions involved human resources. A majority of partner organizations (60.2 percent) provided personnel who assumed a specific, ongoing staff assignment throughout the project period. A slightly smaller majority of partner organizations also provided expertise or intellectual capital on an as-needed basis outside the parameters of a formalized staff position (59.3 percent).

Partner organizations often provided capital and material resource contributions as well. Each of the five capital or material resource contributions addressed on the mail survey was reported to have characterized one-third or more of all partnerships. Examples of material resources contributed by project partners include equipment, office space, equipment facilities, and data access. Capital contributions included monetary contributions for operational expenses, as well as equipment discounts and in-kind or reduced rates for services.

As also shown in Table 2-4, different types of partner organizations tended to contribute to TIIAP projects in unique ways.

- Education organizations tended to provide the broadest array of contributions; as a group, their extent of involvement was above average for every type of contribution examined on the survey.
- Private sector organizations were the least likely type of organization to provide personnel, space or facilities, or data access and the most likely to provide equipment, equipment discounts, and reduced rates for services. The most frequent contribution they made was technical expertise (see Exhibit 2-2).
- Government organizations, on the other hand, were the least likely to provide equipment, equipment discounts, and reduced rates and appeared to be in the best position to provide discretionary funding.

Table 2-4
Percentage of partner organizations providing contributions to the project, by organization type: 1994 and 1995 demonstration and access grants

Contribution	Types of organizations						Total (n = 457)
	Health care (n = 34)	Education (n = 135)	Public safety (n = 6)	Government (n = 89)	Community (n = 86)	Private sector (n = 107)	
Provided personnel	70.6	65.9	33.3	59.6	73.3	41.1	60.2
Provided expertise or intellectual capital	55.9	61.5	0.0	56.2	68.6	56.1	59.3
Provided space or facilities	73.5	55.6	83.3	38.2	66.3	22.4	48.1
Provided in-kind or reduced rates for services	41.2	47.4	16.7	36.0	37.2	51.4	43.3
Provided funding	38.2	40.0	33.3	44.9	37.2	38.3	39.8
Provided equipment or equipment discounts	29.4	40.7	16.7	22.5	27.9	47.7	35.2
Provided data access	32.4	37.8	83.3	31.5	47.7	18.7	34.1

Note: Respondents could select more than one item.

Source: 1998 mail survey of TIIAP grantees.

- Community organizations were more likely to provide both personnel and expertise than were any other type of organization. They also provided space and facilities to a higher than average extent.
- Health care organizations provided both personnel and physical space or equipment facilities to a unique extent.
- Of the six public safety organizations reported as project partners, none provided expertise or intellectual capital, whereas five provided space and data access.

Exhibit 2-2
Example of a partner providing technical expertise

QUALITY EDUCATIONAL SCHOLASTIC TRUST (QUEST)
1995 Access Project in ECLL

In many cases where partners provided personnel, it was because they had technical expertise. For example, in western Massachusetts, a TIIAP project established a wide area network (WAN) to bring Internet and other technology services to school and college sites throughout the county. The grant recipient, Quality Educational Scholastic Trust (QUEST), is a nonprofit corporation whose purpose is to provide access to state-of-the-art technology to all schools within Berkshire County and to provide students and teachers with the training and assistance that they need to take full advantage of those technologies. As a prior business partner to QUEST, the Lockheed Martin Corporation facility in Pittsfield agreed to assume a major role in design and technical activities for the network, essentially working as part of the project staff. Lockheed Martin technical staff oversaw and maintained the technical data needs of the infrastructure, such as subnet addresses, domain-name server addresses, IP addresses and authorized user IDs, for all sites. Lockheed Martin's technical service contributions included quarterly seminars for faculty from throughout the county and onsite visits to individual schools as needed.

Source: 1998 case study.

For the most part, planning partners' contributions followed similar trends as demonstration and access partners. A smaller percentage of planning than of access and demonstration partners provided contributions in all but one category. In fact, 9 to 18 percent fewer planning partners provided contributions of personnel, reduced rates, funding, and equipment. And more planning partners than access and demonstration partners (64.4 percent compared to 59.3 percent) provided expertise or intellectual capital. These differences would be expected since planning projects in general did not require space, equipment, or reduced rates, but they did need expertise in developing their plans.

Partners provided several types of reduced rates, including those for ongoing connection costs as well as those for contracted services such as wiring, website development, and user support. For example, Project InterLinc in Lincoln, Nebraska, developed public access through building an infrastructure and providing access to hardware, as well as building websites supporting the delivery of government and related services to Lincoln and Lancaster County residents. Several project partners were major contributors to the overall success of Project InterLinc. NAVIX, the Internet service provider (ISP) for InterLinc terminals, offered a 50 percent reduction in their ISP rate for 18 months during a 3-year contract, which amounted to approximately $44,000 of an in-kind donation. Another key partner was Information Analytics, a computer consulting firm that offered technical support for building websites at a 20 percent reduction in rates for Project InterLinc.

Generally, partner organizations did not receive financial compensation for their contributions to the project. Only about one-third of the partner organizations were reported to have received payment as a subrecipient of TIIAP funds, an arrangement that occurred most often with the community organization partners (51.2 percent) and least often with the private sector partners (18.7 percent). Twenty-six percent of planning grant partners were subrecipients of TIIAP funds.

There are clearly factors other than financial ones driving the TIIAP partnerships. In fact, the majority of partnerships (62.7 percent) represent the continuation of a working relationship that existed prior to the TIIAP collaboration.

Selecting and Working with Partners

An open-ended question on the survey allowed project directors to provide the reflections and advice on how best to establish and work with partnering organizations. The comments offered are extremely interesting and provide some useful guidance for TIIAP and future grant recipients. Loudly and clearly, the respondents stressed the importance of establishing clear written agreements with partners that laid out in concrete terms expectations and responsibilities; making sure that these agreements are worked out upfront as part of the planning process; and keeping open and frequently utilized ongoing communication. Project directors also stressed the importance of having partners with real enthusiasm and personal investment in the outcomes who are truly committed to the project. As we will note in later chapters, failure of partners to meet their commitments posed problems for many projects. Some recommendations from the project directors on working with partners are presented below:

- *Clarify intentions; have written agreements.*
- *Have a clear ideal of where all concerned are at the beginning of the project and at checkpoints along the way, and be sure that there is a understanding of the common goals that are central to a focused project.*
- *Identify partners with similar missions/goals, keep communication lines open, get total buy-in; clarify roles and responsibilities of all partners.*
- *Identify roles, responsibilities, and accountability early in the process.*
- *Be sure that contributions and benefits are documented; share the credit for success broadly.*
- *Make it a win/win situation.*

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

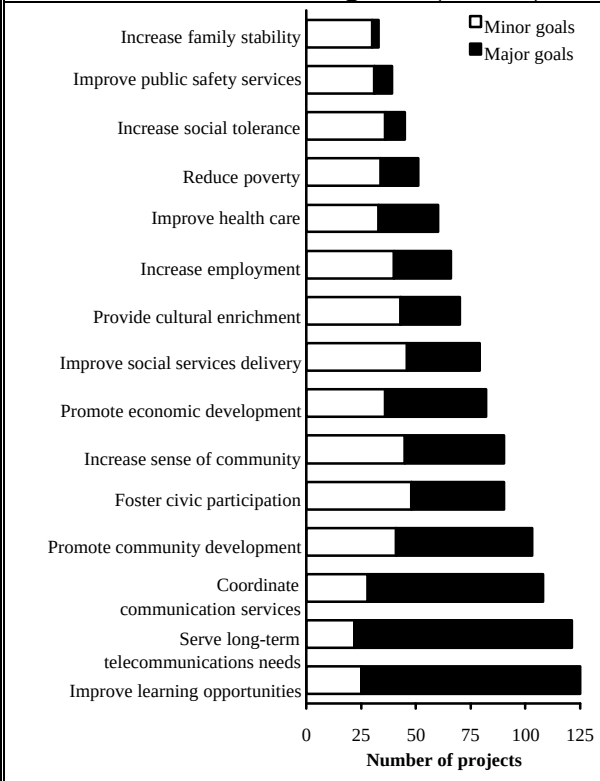
Community improvement goals refer to the broad needs that a project is intended to address (e.g., improving public safety services). Survey respondents were asked to use a list of broad objectives to identify their projects' "major" and "minor" community improvement goals.[6] All projects indicated at 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):

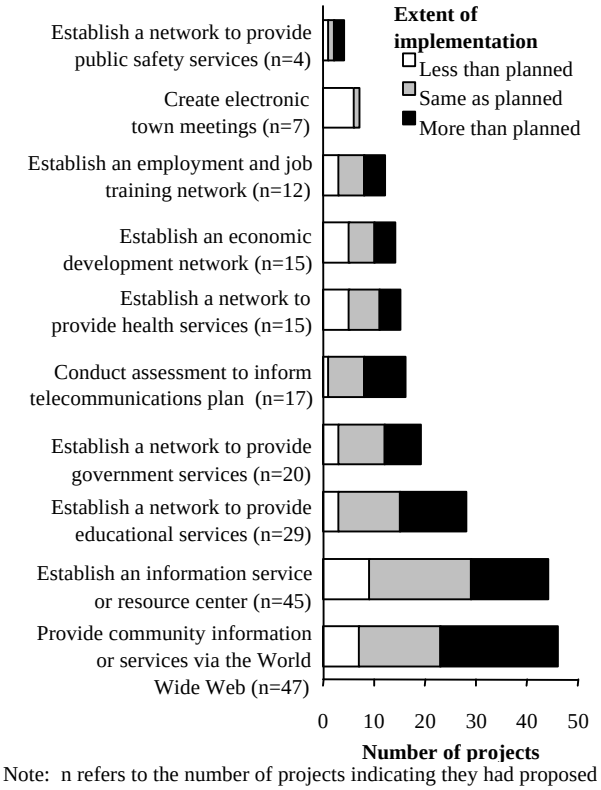
- Provide information or services to meet community needs via the World Wide Web (74.6 percent), and

[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

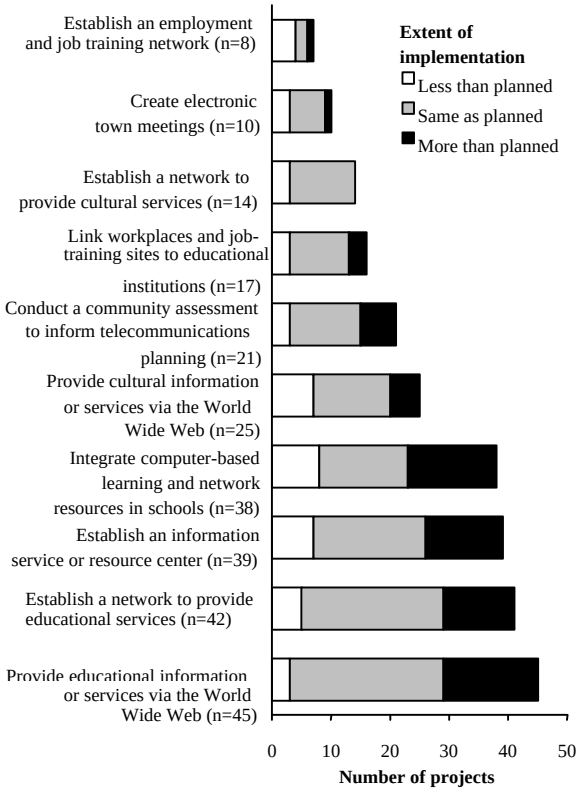
QUALITY EDUCATIONAL SCHOLASTIC TRUST, INC. (QUEST)
1995 Access Project in ECLL

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:

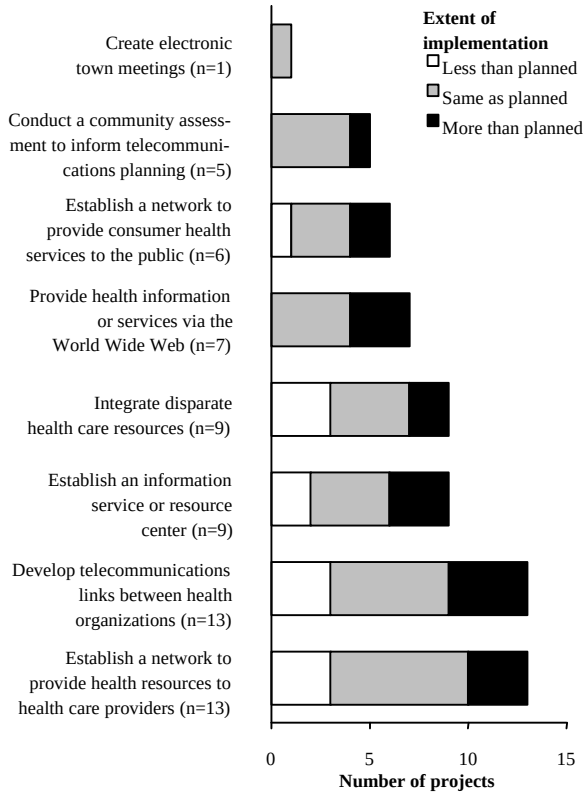
- Establish a network to provide health resources to health care providers; and

- 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.

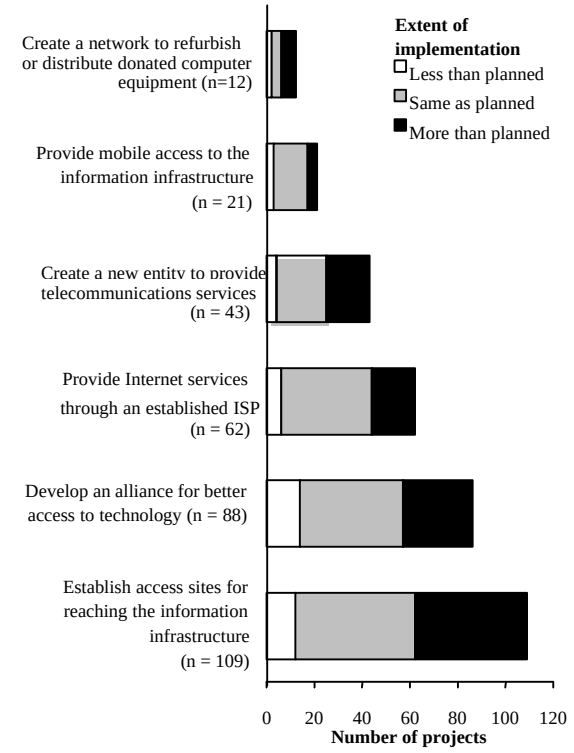
Summary of Area-Specific Activities. In every application area, providing information or services via the World Wide Web was one of the most frequently proposed implementation activities. Other commonly proposed activities across all application areas included establishing an information service or resource 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)

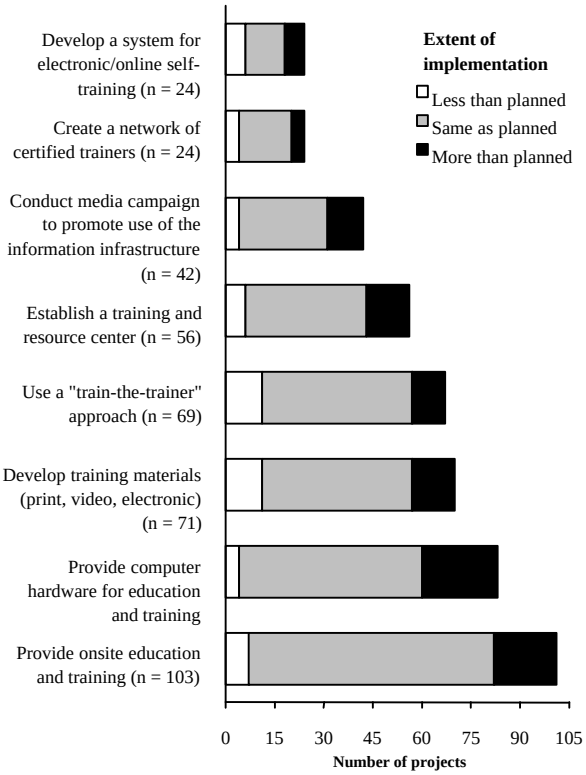


Note: n refers to the number of projects indicating that they had proposed the strategy. Some row totals do not sum to the corresponding n because of nonresponse.
Source: 1998 mail survey of grantees.

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)



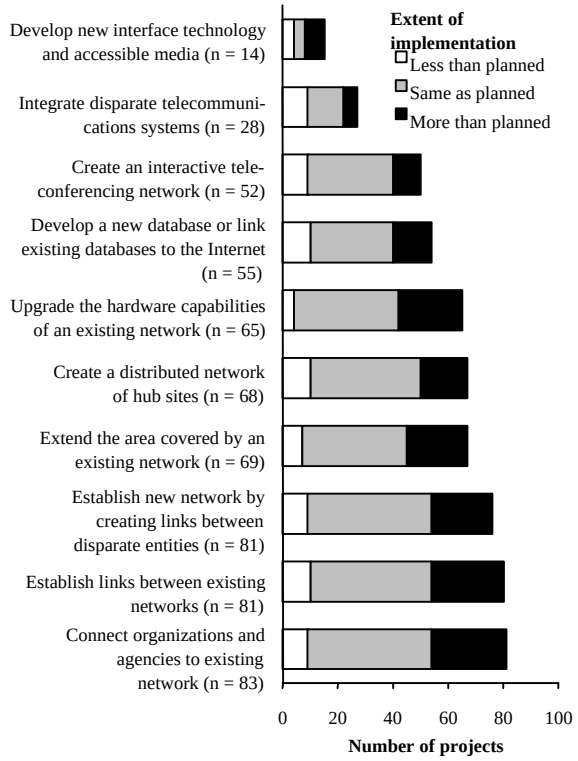
Note: n refers to the number of projects indicating that they had proposed the strategy. Some row totals do not sum to the corresponding n because of nonresponse.
Source: 1998 mail survey of grantees.

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

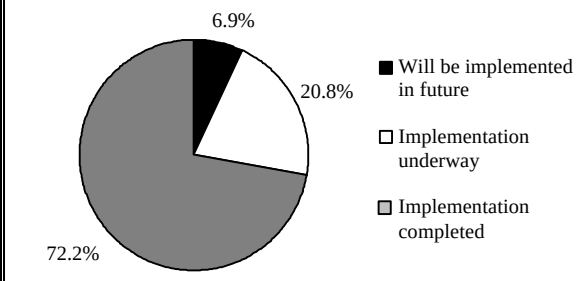
Table 3-2
Number and percentage of TIIAP projects that developed an evaluation plan, by application area: 1994 and 1995 demonstration and access grants

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.

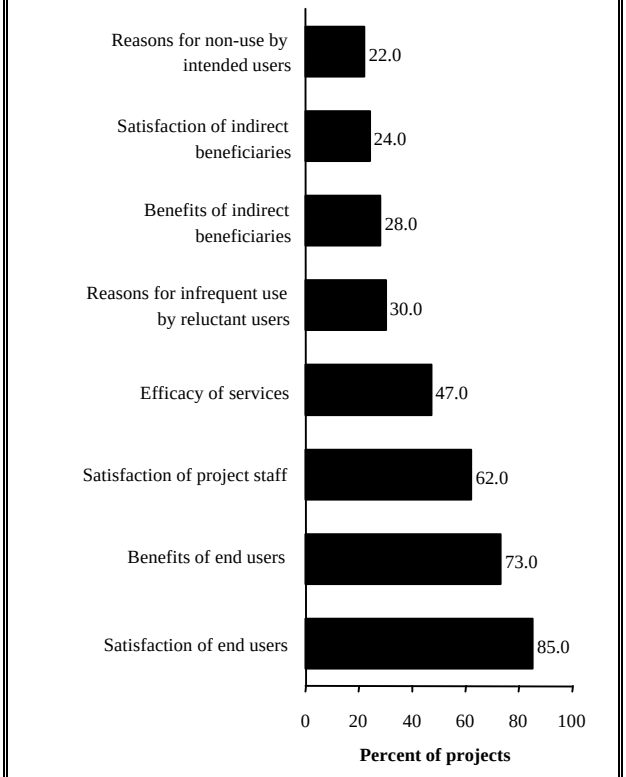
In addition, evidence from the mail survey suggests that most projects did not collect information that could be used to assess gaps in the types of services being offered. For example, only 30.0 percent of mail survey respondents who had implemented at least part of their plans were collecting data 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.

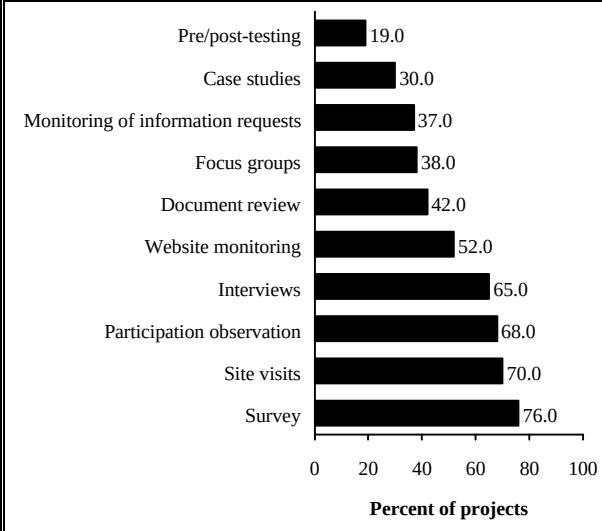
Figure 3-9
Contents of data collected to evaluate TIIAP projects: 1994 and 1995 demonstration and access grants' evaluations (n = 100)



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.

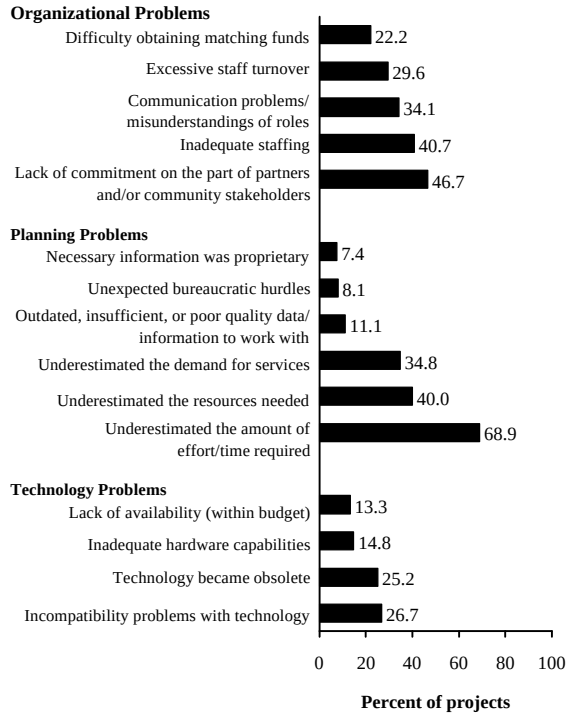
Factors that Influenced the Extent of Implementation

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.

IV. Accomplishments and Impacts of Demonstration and Access Projects

The ultimate test of the merit of TIIAP-supported networks is whether the communities being served benefit. This chapter describes the most significant outcomes of the demonstration and access projects funded in 1994 and 1995. Specifically, it addresses the types of impacts on direct end users, on the overall community, and on the organizations administering the projects. It also discusses those areas in which TIIAP projects exceeded or fell short of achieving their goals. The chapter concludes by assessing the impact of TIIAP support on the initiatives.

KEY FINDINGS

Many programs perceived technological achievements to be their primary accomplishment. Others identified community improvements that resulted from their technological achievements. When survey respondents were asked to identify their project's single most important outcome, just over half of the projects used this open-ended item to describe a *technological* achievement (e.g., "provided a technology backbone for the community and region"). The remaining projects used this open-ended item to describe a *community impact*.

Successful demonstration and access projects shared a set of common traits. First, across all application areas, successful projects addressed community changes goals that would benefit the greatest number of community residents. Second, they tackled community problems that were specific, well defined, and easily addressed through technological innovations. Third, they involved community stakeholders who were in a position to bring about the types of changes needed to resolve their problems. Conversely, projects addressing complex social issues that are influenced by factors beyond the control of the stakeholders (e.g., reducing poverty) generally reported less success in achieving their community change goals.

TIIAP projects successfully reached underserved community segments. Ninety (90.2 percent) of the 1994 and 1995 demonstration and access projects provided benefits to disadvantaged or underserved community segments. Nearly two-thirds of the projects reached end users (65.2 percent) and indirect beneficiaries (61.4 percent) who lived in rural areas. The percentage of projects impacting people living in geographically isolated areas and people living in conditions of extreme poverty were nearly as high (59.8 percent and 59.1 percent for end users and 57.6 and 66.7 percent for indirect beneficiaries, respectively). Not surprisingly, end users tended to be concentrated (e.g., in a single community, in one or two adjacent counties in a state), while indirect beneficiaries were more dispersed (e.g., all counties in a state).

The magnitude of impact for TIIAP projects was extensive. The demonstration and access projects estimated that they provided services to over 10 million end users. The number served by individual projects ranged from a minimum of 15 to a maximum of 5 million (for a health demonstration project). The majority of projects, however, reported serving between 400 to 20,000

end users. In addition, the number of end users impacted was found to be associated with the length of a project's grant period, implying that funding projects for a longer duration to ensure that they have adequate time to get up and running may pay off in terms of the number of end users who are ultimately impacted.

The TIIAP projects strengthened organizational partnerships. Over half (52.7 percent) of projects reported that the grant recipient's relationship with its partner organizations changed as a result of the project. Among projects reporting a change, over 90 percent indicated that they had forged stronger and expanded working relationships with and among their partner organizations. In many cases, these organizations have continued to share information and work closely on the continuation of the project. Additionally, a number of projects reported new joint ventures that were direct outcomes or expansions of the TIIAP project.

Over 80 percent of TIIAP projects disseminated information about their initiatives. Most notably, projects reported responding to almost 79,000 unsolicited requests from outside organizations. In addition, they provided written materials to over 335,000 organizations (although some of these materials may have been designed to describe the project to potential end users, as opposed to other organizations). A significant number of organizations (5,489) received project information through site visits or tours. There was a fairly strong correlation between the length of the grant period and the number of dissemination recipients, suggesting that funding projects for a longer duration increases a project's dissemination activities.

TIIAP projects have promoted the diffusion of innovative applications of information infrastructure. Most projects (85.9 percent) and all of the community networking demonstration projects considered their TIIAP projects worthy of replication. In addition, over two-thirds (69.6 percent) "strongly" or "moderately" agreed that their project innovations provided a "marked advantage" over alternative ways of providing similar services; three-quarters (75.6 percent) indicated that their innovations were easily documented and, therefore, could be easily communicated to others; and just over two-thirds (68.9 percent) indicated that their project innovations could be easily implemented by others with a reasonable amount of effort and expense. Furthermore, one-third (34.2 percent) of respondents indicated that they knew of other organizations that had used information about their TIIAP-related activities to undertake similar ventures. These respondents cited over 80 specific organizations that had adopted ideas from their projects.

Federal funding has been crucial to the success of these initiatives. Three-fourths (75.2 percent) of projects reported that they probably never would have been implemented without the support they received from the TIIAP program (the remaining 24.8 percent indicated that they would have been implemented using alternate funding sources). In addition, projects that received a larger TIIAP award appeared to be less likely to perceive that they would have been able to obtain alternative funding.

RESPONDENTS' PERCEPTIONS OF THEIR PRIMARY OUTCOMES

The survey provided demonstration and access respondents the opportunity to describe, in their own words, the single most important outcome that resulted from their TIIAP projects. As might be expected, our analysis of patterns and common themes resulted in two primary outcome categories: (1) technology-related achievements, and (2) impacts on project end users and indirect beneficiaries.

Technological Achievements. Just over half of respondents discussed their project's major outcome in terms of technological achievements. Many, nearly 20 percent of the overall sample, described the creation or expansion of a network

or technological infrastructure upon which universal access to electronic services, particularly the Internet, could be delivered. For example:

> *Provided a technology backbone for the community and region.*
>
> *Increased access to telecommunications equipment and services.*
>
> *Provided Internet access to 95 percent of classrooms in district and 100 percent of buildings in school district.*

A slightly smaller proportion of respondents specifically discussed access to technology in terms of improving the disparities between the technology haves and have-nots. These responses indicated that traditionally underserved populations, such as the citizenry in rural or geographically isolated areas and Indian reservations, gained equal access to technology as a result of the TIIAP project.

Other respondents, roughly 10 percent of the overall sample, indicated that providing resources and information via technology was their project's most important outcome. They cited the creation of comprehensive databases, online services, and educational information that end users could access through the TIIAP-supported networks. For example, some respondents highlighted the importance of using technology as a tool to improve learning opportunities, while others indicated that the construction of a website was their greatest accomplishment. One project for example, cited the following as its most important achievement:

> *An award-winning, bilingual consumer health site visited by 400,000 people monthly*.

Most of the remaining respondents that focused on technological achievements combined categories to describe how they provided information to traditionally underserved populations. For example:

> *Providing equal access to online library, state and nonprofit information for all parts of the state, particularly rural areas*.

Community Impacts. The second major category of outcomes, identified by just under half of the respondents, involved community impacts. There was considerable variation, however, in both the extent of these impacts and the specific community segments that were identified as directly or indirectly benefiting from TIIAP-related activities. Many of these outcomes were described as broad assertions about the perceived benefits of project activities. For example:

> *Widespread statewide cooperation toward meeting consumers' health information needs.*
>
> *Training high school students so that they can obtain technology jobs in MS once they graduate.*
>
> *The seed of community revitalization has begun to sprout in a historically depressed community.*

Our review uncovered two themes among about the sources of community impacts: (1) collaboration and communication (see Exhibit 4-1 for an example of a project that changed the ways people communicate), and (2) improved delivery of services. Descriptions of outcomes relating to collaboration often emphasized the establishment of regional or statewide networks and the strengthening of partnerships:

> *The statewide network for juvenile justice agencies to share information.*
>
> *Widespread statewide cooperation toward meeting consumers' health information needs.*

Exhibit 4-1
Example of a project that changed the ways people communicate

MOBILE COMMUNITY HEALTH INFORMATION NETWORK
1995 Access Project in Health

The technology TIIAP projects used has greatly enhanced the ways people communicate. For example, the Mobile Community Health Information Network (MCHIN) is a high-speed computer communications network linking professionals in community health clinics to the University of South Alabama (USA) wide area network. USA utilizes an integrated health care delivery system of hospitals, outpatient clinics, primary and specialty physicians, and a medical college. During the grant period, 132 health care users and 134 USA physicians and staff were connected to MCHIN.

The project brought major changes in how many of the physicians on the network access medical information and research; it provided physicians and staff with access to Internet information resources such as the National Library of Medicine. Several of the physicians interviewed during the site visit mentioned the importance of these resources in helping them communicate to patients and work more efficiently. For physicians at more remote sites, the network improved how efficiently they could get medical information. Another rural clinic is using Internet services to find definitions, treatment plans, medication information, and patient information handouts in Spanish.

The technology of the MCHIN project ultimately benefited the patients of the physicians on the network. The people served by the clinics are poor and relatively underserved. Because of the network, physicians were able to work more efficiently and could provide easy-to-understand information about conditions. One of the rural clinics was able to enroll several cancer patients in research programs as a result of listings on the Internet.

Source: 1998 case study.

Quick, efficient, inexpensive communications between 26 nonprofit community development organizations in a 4-state region.

Descriptions of outcomes relating to improved delivery of services frequently emphasized how target populations benefited from modernized equipment or streamlined administrative procedures. For example:

Quality home health visits can be delivered at $35 per visit versus $90 for face-to-face visits and hospitalizations reduced. Admission to nursing homes delayed.

The TIIAP grant channeled into a CDC grant, which lead to the development of the Michigan childhood immunization registry.

A set of online resources for learning network members was created.

The TIIAP helped neighbors to become self-sufficient by providing the tools for getting resources and information without waiting until someone refers them to needed resources and dissemination information. The TIIAP did not achieve this directly but supplied the tools that helped make it happen. Ability to access information and disseminate it.

High schools in rural areas are able to offer advanced courses via distance learning. Rural populations in need of advanced education programs have access locally.

All four major medical centers are pursuing telemedicine program.

Exhibits 4-2 and 4-3 provide examples of case study sites that were able to provide services to a greater number of beneficiaries after making TIIAP-supported improvements to their service delivery mechanisms.

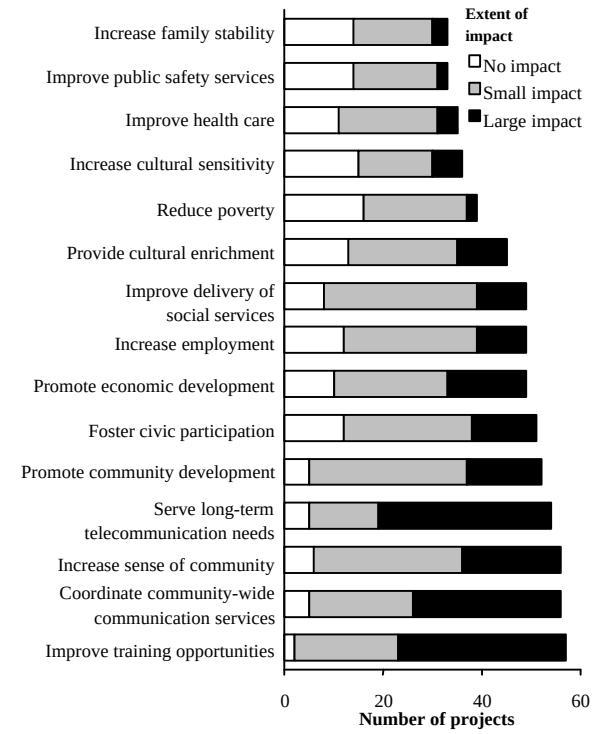
COMMUNITY IMPROVEMENT IMPACTS

In addition to identifying their single most important outcome, survey respondents were asked to (1) indicate which community change goals were applicable to their project, and (2) rate their projects' success in achieving applicable community improvement goals. Because certain community improvement goals are only applicable to projects in a particular field, our discussion is divided among four categories of TIIAP application areas.

Impacts Among Community Networking and Public Services Projects[17]

Survey respondents were provided a list of 15 community improvement goals that pertained to these two application areas. Almost all respondents cited at least one of the following as being an applicable community change goal: improve training and learning opportunities (90.5 percent), coordinate community-wide communication services (88.9 percent), increase sense of community (88.9 percent), serve long-term telecommunication needs (85.7 percent), or promote community development (82.5 percent). Even the two *least* frequently cited goals (i.e., increase family stability, improve public safety services) were identified as being applicable by over half (52.4 percent) of the respondents. This suggests that the demonstration and access projects in these two application areas were designed to achieve a wide range of community change goals.

Figure 4-1
Extent of impact for community improvement goals: 1994 and 1995 demonstration and access grants in community networking and in public services (n = 63)



Note: No impact rating is reported when a specific goal is not applicable for a given project.

Source: 1998 mail survey of grantees.

As shown in Figure 4-1, larger impacts were generally reported for the more commonly pursued goals, and smaller impacts were reported for less common goals. For example, a majority of demonstration and access projects reported large impacts for the following goals:[18]

- Serve long-term telecommunication needs (64.8 percent);

[17] Projects in the community networking and public services application areas are generally working toward similar objectives. We have therefore combined our discussion of the community improvement impacts for these two application areas.

[18] Survey respondents had the option of indicating that a given community improvement goal was not applicable to their project. The results provided throughout this section pertain only to those respondents who indicated that the goal was applicable to their project.

Exhibit 4-2
Example of a project that changed the ways information is accessed and transmitted

SAFETYNET—NEW HAMPSHIRE
1995 Access Project in Public Services

The technology used in the SafetyNet-NH project revolutionized the client intake process in New Hampshire. It increased client access to benefits. One of the advantages to switching to the electronic system from the paper intake process was that the online questionnaire included some questions that intake workers were not previously asking. The program was well paced and asked questions in a logical sequence. Some intake workers reported that interviewing clients using the new system generated more responses than they got by conducting interviews face to face.

The computerized application process also helped intake workers learn about other issues that may be relevant to the clients' welfare. For example, rather than only asking questions required to complete an energy assistance application, intake workers used the online system to collect additional information that may highlight other problems the client is having. One major advantage is that intake workers can collect information about an entire family at the same time.

The software has been able to provide enhanced case management capabilities and more advanced data reporting mechanisms than previously existed. For example, the old system could not provide data breakdowns, generate reports, or produce letters. The new system can provide data breakdowns by a client's sex, age, and income level.

Prior to the online system, intake workers had to rely on their memories to determine client eligibility for programs. The new system prevented intake workers from forgetting about possible sources of assistance and eased concerns of senior intake staff members that junior staff members lacked the knowledge or experience to know about every possible program for which a client could be eligible. It has not changed the role of intake workers, but it has made their work much easier, more effective, and more customer friendly.

Source: 1998 case study.

- Improve training and learning opportunities (59.6 percent); and
- Coordinate community-wide information and communication services (53.6 percent).

In addition, a significant proportion of respondents reported that their TIIAP project had "no impact" for the following four goals:

- Improve the effectiveness of public safety services (42.4 percent);
- Increase family stability (42.4 percent);
- Increase cultural sensitivity and social tolerance (41.7 percent); and
- Reduce poverty (41.0 percent).

It is interesting and encouraging to note that the goals for which the projects claimed the greatest success were both the most frequently pursued and the most likely to affect a broad spectrum of the community. To a large extent, these goals were also ones for which the projects could be expected to have some substantial chance of effecting change. That is, one would predict that TIIAP-supported activities would have a greater chance of improving training and learning opportunities than of increasing social tolerance.

Three sets of chi-square analyses were conducted to test for differences in the extent of impact across project type, length of the grant period, and award amount. These analyses uncovered no significant findings.

Exhibit 4-3
Example of a project that changed the ways benefits are delivered

COMANCHE COUNTY MEMORIAL HOSPITAL
1994 Demonstration Project in Health

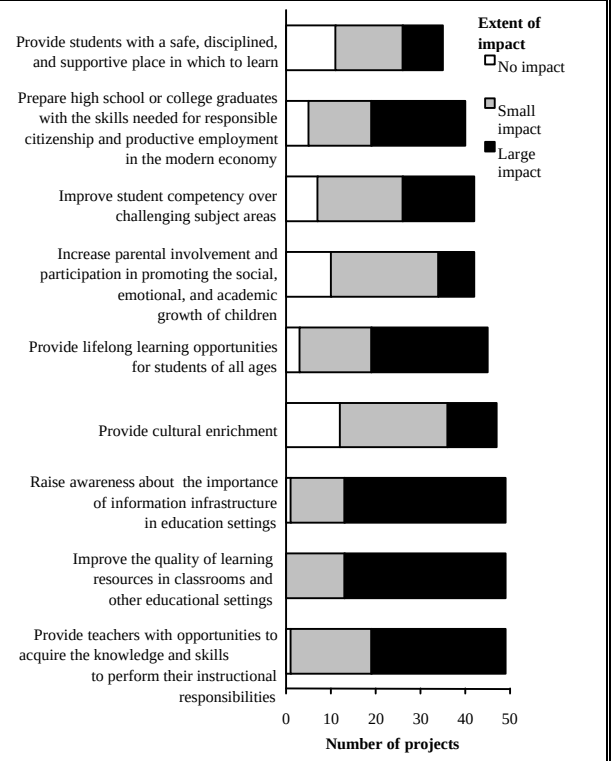
The rural telemedicine project in Lawton, Oklahoma, developed new ways for doctors to deliver medical services to their patients. Frequently, rural physicians must make diagnostic and therapeutic decisions with limited previous exposure or experience with a patient's problem

To provide effective decision support, telemedicine provides e-mail, Internet access, and various hardware and software. These technologies enhance patient care in the rural setting by improving information access for rural physicians and providing specialist interpretation in several hours instead of 3 to 5 days. With the teleradiology system, rural hospitals can scan, send films, and receive typed interpretations on the same day. Emergency readings can be obtained usually within 30 minutes from the time films are sent. Telecardiology, or remote cardiac monitoring, is also possible at three rural sites to support the rural physician and ease the patient's burden.

The qualitative improvement in rural life was illustrated through stories about the people that this system helped. Patients in rural communities can "see" a cardiologist or attend diabetes education classes without having to miss a day of work or drive long distances to an urban health care facility. Thus, people could be treated in their own communities without the stress and expense of being transported to an urban hospital for care. For example, a person in need of speech therapy after a tragic accident received treatment via a videoconferencing link between CCMH and a rural hospital. Other stories included those of patients that were saved from the burden of having to travel for x-rays and cardiac monitoring. Telemedicine in rural areas has been a vital link between rural well-being and quality health care.

Source: 1998 case study.

Figure 4-2
Extent of impact for community improvement goals: 1994 and 1995 demonstration and access grants in ECLL (n = 53)



Note: No impact rating is reported when a specific goal is not applicable for a given project.

Source: 1998 mail survey of grantees.

Impacts Among ECLL Projects

Survey respondents were provided a list of nine ECLL community improvement goals (see Figure 4-2). Not surprisingly, almost all ECLL demonstration and access respondents cited at least one of the following goals as being applicable to their projects:

- Improve the quality of learning resources in classrooms and other educational settings (92.5 percent);

- Provide teachers with opportunities to acquire the knowledge and skills needed to perform

their instructional responsibilities (92.5 percent);

- Raise awareness about the importance of information infrastructure in education settings (92.5 percent); and

- Provide cultural enrichment (88.7 percent).

However, there was considerable variation in the level of success that ECLL projects had in attaining these four goals. Three-quarters (73.5 percent) reported large impacts for two of these goals: providing teachers with opportunities to acquire knowledge and skills, and raising awareness about the importance of information infrastructure in education settings. A smaller proportion (61.2 percent) reported large impacts regarding their efforts to improve the quality of learning resources in classrooms, while less than one-quarter (23.4 percent) reported large impacts as a result of their efforts to provide cultural enrichment (in fact, 25.5 percent of respondents who cited this as an applicable goal reported no impacts).

Several other findings are worth noting here. Almost four-fifths (79.2 percent) of respondents cited increasing parental involvement as being an applicable goal for their project. Only 19.0 percent of these respondents reported large impacts for this goal, while 23.8 percent reported no impacts. In addition, one-third (31.4 percent) of respondents who indicated that their projects were designed to provide students with safe learning environments reported no impacts. A possible explanation for the differing successes in meeting these goals may be the degree to which a given end result falls within an educational institution's sphere of influence. For example, the two goals with the greatest impact involve working with school staff who are directly accountable to the educational settings in which they work. The three goals with the least impact involve entities outside a school's direct control—parents, cultural artifacts and experiences, and the community setting. Parental involvement is notoriously difficult to bolster. Access to museums and other cultural institutions is often limited by time, distance, and finances. And a school can hardly be held responsible for the neighborhood in which it is situated. Nonetheless, these findings suggest that future technology projects that elect to tackle these goals would likely benefit from the experiences of the early TIIAP projects that did report large impacts in these areas.

Three sets of chi-square analyses were conducted to test for differences in the extent of impact across project type, length of grant period, and award amount. No statistically significant differences were found.

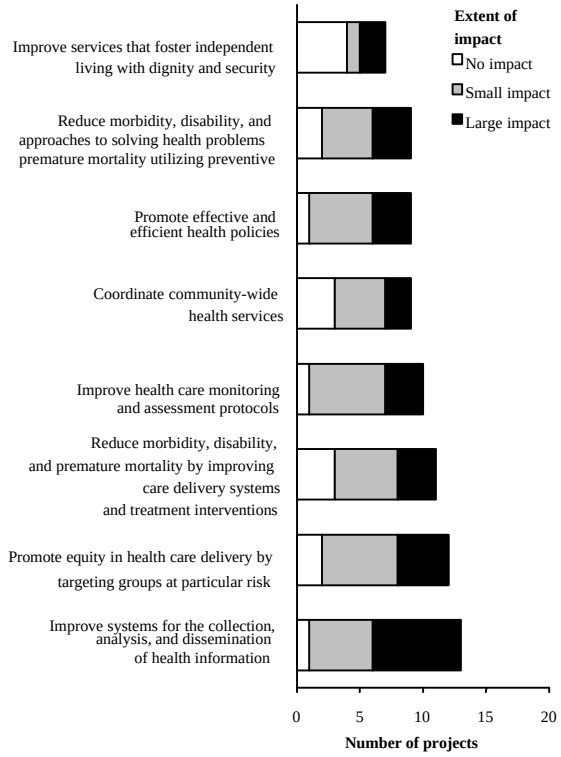
Impacts Among Health Projects

The community improvement impacts reported for the 16 health projects were, in general, weaker than the impacts reported for the other application areas (see Figure 4-3). And for the most part, the highest impacts in this area were reported for the more commonly pursued goals. The strongest community impacts by far among health projects were reported for improving systems for the collection, analysis, and dissemination of health information (81.3 percent). This was the most commonly pursued goal and also the goal most dependent on telecommunications and information technologies. Large impacts were reported on this goal for seven (53.8 percent) of the applicable projects.

Among health projects, the weakest community impacts were reported for the least commonly pursued goal. Four of the seven applicable projects (57.1 percent) reported that no impact occurred with respect to improving services that foster independent living with dignity and security.

There were too few health projects to conduct valid comparisons across project type, length of grant period, or award amount.

Figure 4-3
Extent of impact for community improvement goals: 1994 and 1995 demonstration and access grants in health (n = 16)



Note: No impact rating is reported when a specific goal is not applicable for a given project.
Source: 1998 mail survey of grantees.

Impacts Among Public Safety Projects

The three public safety projects in our sample reported community improvement impacts for a set of community improvement goals specific to their application area. All three projects reported attempting to prevent and deter crime, fire, accidents, and other threats to public safety. In addition, all three projects reported small impacts on the prevention and deterrence goal cited previously. Only once did a project report that no impact had been made toward attaining a particular goal: coordinating community-wide public safety services.

Impacts on End Users and Other Community Members

As explained in the application guidelines for the 1995 program year, "Since the success of the NII will depend on both its accessibility and the value it offers to end users, projects supported by the TIIAP must demonstrate a high degree of attention to the needs, skills, and working conditions of the targeted end users." With this directive in mind, this section uses data from the mail survey and the case studies to describe the geographic distribution, the socioeconomic characteristics, and the numbers of individuals who were direct end users of the information infrastructure supported by TIIAP.

Beyond the immediate benefits on those individuals directly involved with project equipment and resources, TIIAP projects have the potential to stimulate broad, indirect benefits on the larger community by improving access to information, improving public services, and reducing disparities. Consequently, this section also examines the impacts of projects on indirect beneficiaries within the broader community.

Disadvantaged and Underserved Populations Affected by TIIAP Projects

The application guidelines from 1995 heavily stress the importance of "reducing disparities in access to and use of the National Information Infrastructure." To this end, the survey obtained information on the extent to which projects provided benefits to disadvantaged or underserved community segments, either as end users or as indirect beneficiaries. We found that the vast majority (90.2 percent) of TIIAP projects did, in fact, serve to advance populations that had limited access to information infrastructure. The survey also obtained information on the specific types of disadvantaged populations that were served by the 1994 and 1995 demonstration and access projects.

As shown in Table 4-1, rural areas were targeted most frequently by TIIAP projects. Nearly two-thirds of the demonstration and access projects reached end users (65.2 percent) and indirect beneficiaries (61.4 percent) in rural areas. However, the percentages of projects benefiting people living in geographically isolated areas and people living in conditions of extreme poverty were nearly as high (59.8 percent and 59.1 percent for end users and 57.6 and 66.7 percent for indirect beneficiaries, respectively). Two other disadvantaged groups, Indian tribes and residents of Mexican-border communities, were reached much less frequently. This is not surprising, however, given that members of these two groups live in distinct geographic locations. The more frequently served groups are, conversely, more pervasive across the country. Exhibits 4-4 through 4-7 provide examples from the case studies of projects that served underserved community groups.

Exhibit 4-4
Example of a project serving geographically isolated communities

QUALITY EDUCATIONAL SCHOLASTIC TRUST, INC.
1995 Access Project in ECLL

Berkshire County, Massachusetts, is an isolated county with many small communities. The county extends from the Connecticut border to the Vermont border. It is bounded on the west by New York State, and its eastern and western terrain is mountainous, thus forming an effective barrier from the larger metropolitan areas in the northeast. The Berkshire Mountains make travel hazardous during the winter months and preclude network technologies relying upon the line of sight. Consequently, exposure to educational resources and technology advances is severely restricted for students and faculty in the county. Prior to the TIIAP award, Berkshire County's technical infrastructure was rudimentary. The nearest Internet point of presence was Springfield, Massachusetts, about 50 miles east of Pittsfield. Because of the rurality of the area, the geographic isolation, and the discouraging economic situation, communication among students in the county was difficult and their ability to access information resources such as the libraries of larger universities or cities was restricted. The project accomplished its goal to connect 40 public schools and colleges, comprising over 15,000 students and educators, to the Internet and to each other, thereby reducing the isolation that has traditionally hampered schools in the county and providing a wealth of educational resources and opportunities previously unavailable.

Source: 1998 case study.

Table 4-1
Percentage of TIIAP projects benefiting underserved community groups as end users and indirect beneficiaries: 1994 and 1995 demonstration and access grants (n = 135)

Community segment	End users	Indirect beneficiaries
Rural	65.2	61.4
Geographically isolated	59.8	57.6
Extreme poverty	59.1	66.7
Inner city	47.7	48.5
Limited English speaking	42.4	55.3
Disabled	42.4	48.5
Illiterate	34.1	50.8
Tribal	23.5	29.5
Mexican-border communities	4.5	4.5

Note: Respondents could select more than one item.

Source: 1998 mail survey of TIIAP grantees.

There were no major differences between demonstration and access projects in the extent of impact on disadvantaged community groups. Only one trend emerged across the five application areas, that is, health projects were less likely to include the following groups as end users: people living in extreme poverty (28.6 percent of health projects), limited English speaking people (21.4 percent), and disabled people (14.3 percent). This may reflect the fact that a higher proportion of end users in health projects were physicians or medical technicians who were performing highly intricate functions.

Geographic Regions Affected by TIIAP Projects

Survey respondents were also asked to designate the geographic region that best described the distribution of their projects' end users and indirect beneficiaries. Not surprisingly, end users

tended to be concentrated (e.g., in a single community), while indirect beneficiaries were more dispersed (e.g., all counties in a state). Specifically:

- About two-fifths (40.2 percent) of projects reported that their end users spanned two or more counties in a single state. These end users were about equally likely to be from two or more adjacent counties, two or more non-adjacent counties, or all counties within a state. In addition, about one-third (34.4 percent) of projects reported that their indirect beneficiaries spanned two or more counties in a single state. However, unlike end users, indirect beneficiaries were most likely to come from all counties in within a state.

Exhibit 4-5
Example of a project serving people living in poverty

LEADERSHIP, EDUCATION, AND ATHLETICS IN PARTNERSHIP (LEAP)
1994 Demonstration Project in ECLL

Leadership, Education, and Athletics in Partnership (LEAP) in New Haven demonstrated how electronic communications could be made accessible to low-income communities and community-based youth organizations. The project was designed to develop technology leadership and expertise within and through the youth center, in order to engage the youth that these centers serve in the use of electronic communications in meaningful ways. Housed in an after-school and summer program for 500 low-income African American and Latino children aged 7 through 14, the program developed and implemented curricula focused on electronic communications and emerging computer technologies. The TIIAP project and Plugged In, a partner youth organization across the country, conducted a collaborative Internet exercise, a "virtual road trip," to demonstrate how the Web could be used as a teaching tool and to engage students from the two locations in the same project. Low-income youth and their communities were served through these two programs and eight others the project worked with around the country.

Source: 1998 case study.

- Over one-quarter (28.0 percent) of projects reported that their end users were concentrated in a city, town, or county. A somewhat smaller proportion (21.6 percent) indicated that their indirect beneficiaries resided in a single community.

- Only 15.0 percent of projects reported that their end users were located in two or more states. A somewhat higher proportion (19.2 percent) indicated that their indirect beneficiaries spanned two or more states. Project end users were equally likely to be from 2 or more adjacent states, 2 or more non-adjacent states, or all 50 states. Project indirect beneficiaries, on the other hand, were much more likely to come from all 50 states.

- Few projects (15.2 percent for end users and 19.2 percent for indirect beneficiaries) reported that their region of impact was limited to a single metropolitan area, i.e., a central city and its adjacent counties.

- Only six projects (4.6 percent) reported that their end users came from two or more countries. One of these projects involved the U.S. and Mexico, another involved the U.S. and Canada, and the remaining four reported that project resources were used globally via the Internet. A slightly higher, but still small, proportion of projects (8.8 percent) reported that their indirect beneficiaries resided in two or more countries.

Public services projects were most likely to indicate that their end users and indirect beneficiaries resided in two or more states (34.6 percent and 33.3 percent, respectively). In addition, projects in this application area were less likely to designate their region of impact as being single city, town, or county (14.8 percent for end users and 7.4 percent for indirect beneficiaries).

Magnitude of Impact

A key indicator of a TIIAP project's impact is the number of individuals who become end users of

project equipment or resources. Unfortunately, it can be difficult for survey respondents to quantify the precise number of end users (especially since grant recipients were not required to keep track of the number of individuals directly and indirectly affected by their projects). One basic problem is that TIIAP expects projects to provide safeguards to protect the privacy of end users. While this is an important and worthy expectation, it makes it difficult compile the data needed to monitor who is using project equipment. In addition, absent a program requirement, the majority of projects are not going to devote scarce resources to maintaining an ongoing and unduplicated count of individuals using TIIAP-supported resources.[19]

Exhibit 4-6
Example of a project serving tribal communities

OKLAHOMA DEPARTMENT OF COMMERCE
1995 Demonstration Project in Public Services

The Oklahoma Department of Commerce's mini-grants project that provided funding to communities to build their local infrastructure through multiple public access sites included several tribal groups. Overall, TIIAP funds supported 16 mini-grants (another 17 were funded by Southwestern Bell but organized under the same TIIAP project). Many of these communities include sizable tribal populations, and the two communities visited during the site visit had taken steps to expand Internet access to local tribal members. The Chickasaw Nation took a lead role in managing one of the projects and conducted a variety of outreach activities, such as articles in their newsletter and information booths at community events, to inform community members about the project.

Source: 1998 case study.

[19] This is especially true in cases where equipment is housed in a public setting. Keeping an accurate count of end users in a public library, for example, often requires a large investment of time by project staff. Furthermore, the implementation of burdensome monitoring requirements may be counterproductive if these procedures discourage potential users who are reluctant, rushed, or simply value their privacy.

An entirely different set of monitoring difficulties comes into play with Web-based project resources. Although it is a fairly simple matter for a project to purchase or develop software to monitor the number of hits received at a particular website, it is not possible to determine the number of different people who have accessed a given site.

Despite these difficulties, it is important to get a sense of the overall magnitude of a project's impact. Survey respondents were asked to estimate the approximate number of end users who had been directly served by their TIIAP project up until the time of the survey.[20] In total, the 126 TIIAP projects from 1994 and 1995 that responded to this survey item estimated that they had served over 10 million end users. The number of end users served by an individual project ranged from a minimum of 15 to a maximum of 5 million (for a health demonstration project). The majority of projects, however, reported serving between 400 to 20,000 end users.

To gain an understanding of the relative magnitude of impact across the two project types and three largest application areas,[21] a two-way analysis of variance test was conducted.[22] The results of the two-way analysis of variance showed no differences in the numbers of end users reported across the five application areas. Surprisingly, a one-way analysis of variance found no difference in the number of end users served to date by 1994 and 1995 projects.

Finally, Pearson product-moment correlation coefficients were calculated to determine whether there was a relationship between the number of end users served and either the size of the grant

[20] The mail survey was conducted in summer 1998, meaning that the 1994 projects received their awards 3 ½ - 4 years prior and the 1995 projects received their awards 2 ½ - 3 years prior.

[21] There were too few projects in the health or public safety application areas to include them in the analysis.

[22] As part of this analysis, the number of end users reported for each project was first transformed using a logarithmic function because the extremely high numbers of end users reported by several projects would have erroneously biased the analyses.

award or the length of the project period. There was no correlation between size of award and number of end users, which indicates that projects funded at higher levels do not necessarily serve greater numbers of people. There was, however, a small but significant correlation between the length of the grant period and the number of end users impacted (r=0.21, p<.01).[23] This suggests that funding projects for a longer duration to ensure that they have adequate time to get up and running may pay off in terms of the number of end users who are ultimately impacted.

Types of Community Segments Affected by TIIAP Projects

Survey respondents were also asked to indicate whether their end users and indirect beneficiaries were consumers or providers of information or services in each of the following community segments: community services, government agencies, public safety, education, and health care. For each applicable community segment, respondents were further requested to estimate the numbers of end users and indirect beneficiaries for several distinct categories:

- **Education Community.** As shown in Table 4-2, four-fifths (80.6 percent) of projects reported that they provided services to the education community. While this trend was evident for the two largest application areas (community networking and ECLL), it did not hold for the remaining areas. Within the education community, far more students than school faculty and staff were given access to project equipment and resources—over 300,000 K-12 students and over 200,000 higher education students in total. It is interesting to note that fewer people benefited indirectly than directly from the project. This pattern of impact did not occur for any other community segment.

Table 4-2
Percentage of TIIAP projects benefiting key community segments, by application area: 1994 and 1995 demonstration and access grants

Community segment	Application area					Total (n = 135)
	Community networking (n = 36)	ECLL (n = 53)	Health (n = 16)	Public safety (n = 3)	Public services (n = 27)	
Education	91.7	95.8	37.5	0.0	73.1	80.6
Community service	88.9	58.8	50.0	0.0	92.6	71.4
Government	69.4	46.9	62.5	66.7	80.8	62.3
Health	38.9	17.6	93.3	0.0	30.8	34.4
Public safety	27.8	6.1	26.7	100.0	30.8	21.7

Source: 1998 mail survey of TIIAP grantees.

[23] Although the number of end users reported by 1994 projects is slightly higher than for 1995 projects because they have been in operation for an additional year, the average grant period (i.e., the number of months from receipt of award to the funded project's end date) was essentially the same for projects from each program year—18-20 months.

Exhibit 4-7
Example of a project serving Mexican-border communities

PROJECT NETMOBILE
1995 Demonstration Project in ECLL

The NETmobile project located near the Mexico border in Edinburg, Texas, in the Rio Grande Empowerment Zone, a four-county, 1,000 square mile region with a population of about 30,000. The Empowerment Zones were created through Federal legislation to allow selected areas to receive additional assistance and benefits and to become laboratories for innovation. The zone has at least 50 percent of the population below the poverty level and a 30 percent unemployment rate. Each county ranks at the bottom of almost every socioeconomic indicator, with more than 35 percent of residents living below the poverty level. The official unemployment rates range from 17 to 23 percent, and the average educational attainment level is only grade level 6.7. Within the designated Empowerment Zone areas lie "colonias," or rural ghettos, in which people live in absolute poverty, without running water, electricity, or garbage disposal. In this environment, the NETmobile was able to help students in the region find a way out.

Overall, the NETmobile enabled students to use technology not previously accessible to them. Some teachers had students use the Internet to access information on college and universities; other schools had students learn about different careers through the Internet. For example, through COSTEP, a nonprofit organization that provides financial aid assistance for students and is the fiscal agent for the state's Empowerment Zones, students were able to get closer to attending college. Students at every high school in an Empowerment Zone receive software developed by the U.S. Department of Education that enables them to complete and submit Federal Assistance for Student Financial Aid applications through the Internet. However, most high schools in the Empowerment Zones do not have adequate Internet capabilities to fully utilize the financial aid software. The NETmobile has been employed at COSTEP's request to visit high schools in the local Empowerment Zone and help students apply electronically for financial aid. The electronic application procedure reduces the time required for processing the financial aid forms from approximately 6 weeks to 10 days.

Source: 1998 case study.

- **Community Services.** Almost three-quarters (71.4 percent) of projects reported benefiting providers and consumers of community services. This finding was especially strong among public services projects, 92.6 percent of which reported serving end users from this community segment. The number of end users reported for patrons of libraries and museums was far higher than that for any of the other 12 categories of community services populations and, in fact, was the highest among all 39 categories addressed within any of the five community segments. Over 3.5 million patrons of libraries, museums, and other cultural organizations were reported to be end users of project equipment and resources.[24] The number of indirect beneficiaries reported among providers and consumers of community services, about 60 million, was also the highest number reported for any community segment.

- **Government Agencies.** A majority (62.3 percent) of projects reported benefiting end users in government agencies. The total number of end users impacted for each group within this category was relatively small, ranging from about 250 tribal government officials to about 11,500 city or municipal government officials. However, projects estimated that approximately 5.5 million indirectly benefited from improved government services. This ratio of indirect beneficiaries to end users was by far the highest for any community segment. ECLL projects were the least likely to directly involve government personnel as end users of equipment or resources.

- **Health Care.** One-third (34.4 percent) of projects reported benefiting health care consumers or providers. These projects reported a total of 4,000 end users (most of

[24] It is likely that some respondents provided estimates of the number of registered patrons at a library site that houses project equipment rather than the number of people who have actually used the equipment.

Exhibit 4-8
Example of a project that benefited an entire community

TRI-STATE NETWORK DEMONSTRATION PROJECT
1994 Demonstration Project in ECLL

Perhaps the most important indicator of the success and the impact of the Tri-State Network Demonstration Project in Starkville, Mississippi, is the tremendous level of community support that was garnered in an initially reluctant population. Community members became involved in all aspects of the project. The educational aspects of the project in particular should establish lasting impacts on the county's teachers and students. And the economic development supports and resources developed through the project have encouraged local industry to take advantage of worldwide commercial opportunities available via the World Wide Web and encourage businesses and industries to locate in the area. Overall, the project's impact will be widespread, encompassing education, industry, and community development.

Through the Tri-State Resource Center (TSRC) and under the direction of the Mississippi Department of Economic and Community Development (MDECD), economic development was a major thrust of the project. The TSRC provided assistance to businesses and industries within the region in a variety of ways. These included providing technical support and expertise in 1) simple and complex networking, 2) a wide range of telecommunications technologies, 3) integrated facility management, 4) the Internet and World Wide Web access, 5) Web/homepage development, and 6) strategic planning.

The TSRC's primary efforts centered on supporting and enhancing existing regional economic development infrastructures. A unique "electronic incubation" concept was developed by the TRSC team that created a virtual business incubator to foster the development of new small businesses within the region. The central focus of the electronic incubator was to jump-start individuals within the region to venture into businesses that took advantage of the telecommunications network.

It is important to note that several new technology-related small businesses were spawned in the region as a result of the impact of this project. Computer sales climbed dramatically after the network was installed. Over 300 personal computers were sold to county residents in a 3-month time frame. In addition, three new ISPs and one new computer retailer were initiated.

Source: 1998 case study.

whom were patients receiving health care services) and 50,000 indirect beneficiaries. The modest number of health-related end users and indirect beneficiaries is due, in large measure, to the relatively small number of TIIAP health projects.

- **Public Safety.** Less than one-quarter (21.7 percent) of the projects provided benefits to the public safety community. Virtually all of the 750,000 public safety end users were recipients of law enforcement services.

Exhibit 4-8 provides an example of a project that benefited multiple segments within one community.

IMPACTS ON GRANT RECIPIENTS AND PROJECT PARTNERS

Aside from the many impacts on communities and users, TIIAP projects changed the ways grant recipients conduct their businesses. In many of the case study sites, project staff indicated that they are able to communicate better both internally and externally. Several indicated that their businesses or staff had expanded. Most often, project staff learned something more about the technologies they were using or the information to which they were providing access (Exhibit 4-9). Exhibit 4-10 describes how the partner's of one project benefited from the project.

Staff members in projects also benefited. One of the problems many projects faced was staff turnover. This is in large part due to the labor market for highly skilled high-tech workers. While staff turnover is a problem for the TIIAP projects, it can also be a benefit for their staffs. Many took knowledge and skills they acquired through the TIIAP projects and went on to paid full-time positions in high-tech companies. But, as described in Exhibit 4-11, many who did not leave were able to reap benefits too.

Relationships Between Grant Recipients and Partners

Over half (52.7 percent) of the survey respondents reported that their relationship with partner organizations changed as a result of the project. Over 90 percent of these respondents reported stronger and expanded working relationships with and among partner organizations. In many cases, the organizations continue to share information and work closely on the continuation of the project. For example, according to one respondent organization:

> *There is an ongoing increase in interactions among the network sites as the interrelationships strengthen. Colleagues are becoming resources to each other, and the technical assistance requested from colleagues is more clearly defined and indicative of continuing site development.*

In many other cases, new joint ventures were initiated, many of which were direct outcomes or expansions of the TIIAP project, as shown in this statement:

> *We work together more intimately. They now conduct workshops for us, provide technical support, and are willing to expand the project. They have included us in other grants such as the Eiffel grant and will include us in future grants. We also have attended and conducted panel discussion groups at Teachers College.*

In a smaller number of these cases, the TIIAP project was a catalyst for the formalization of partner relationships through the establishment of a consortium or a nonprofit organization to coordinate activities, purchase resources, or pursue funding opportunities (see Exhibits 4-12 and 4-13 for examples).

While most projects were optimistic about having continuing relationships with their partners, a few respondents did offer some cautionary notes. For example, the following responses illustrate that the future of some partnerships was still undecided.

Exhibit 4-9
Example of a grant recipient that gained increased knowledge about its field as a result of the TIIAP grant

SAFETYNET—NEW HAMPSHIRE
1995 Access Project in Public Services

The Children's Alliance of New Hampshire was funded to implement a statewide electronic benefits access program to screen clients against Federal, state, and local eligibility requirements after conducting a needs assessment that analyzed access to public and private benefits. In order to develop the electronic screening system, staff researched and summarized the eligibility criteria for the programs that would eventually be included on the system. There were several problems in determining eligibility requirements for each local, state, and Federal program. Initially, Community Action Programs and other local agencies did not want to release eligibility requirements or application forms. They were concerned about client confidentiality issues. In other cases, programs had eligibility requirements that were based on nonmonetary measures. For example, the criteria for developmental disability programs were based on cognitive measures rather than financial criteria. When the project received the initial set of program descriptions from various state and local agencies, the project director realized they were too poorly written to be used for the electronic system and had to be rewritten and verified. Once a program was added to the electronic system, staff still had to track changes in requirements or programs. This research work increased the Children Alliance's knowledge of the welfare system and technology issues, as well as providing them with valuable contacts at the state and local levels. It also gave the organization more credibility.

Source: 1998 case study.

During the project operation, there was a greater degree of interaction.

We hope it will continue in the development of our local Internet system. We are not sure how it will turn out.

PROJECT REPLICATION AND DISSEMINATION

Two important objectives of TIIAP are to (1) identify potentially promising practices that can inform the practical application of future technological innovations, and (2) disseminate information about TIIAP-supported approaches to other communities that want to enhance their use of the information infrastructure. As such, an important outcome of any TIIAP project is the extent to which its approach is eventually replicated or adapted by other communities. This section addresses the extent to which projects viewed their activities as being worthy of replication, as well as the extent to which projects were able to disseminate information about TIIAP-related approaches to other outside organizations.

Exhibit 4-10
Example of a project's partners benefiting from their TIIAP grant experiences

PROJECT INTERLINC
1995 Access Project in Community Networking

Two of the project partners from Project InterLinc in Lincoln, Nebraska, Aliant Communication and Information Analytics, both of which provided reduced rates in services, were able to expand. Although Aliant had previously established itself as a telecommunications company in the Lincoln area with the explosion of the Internet, InterLinc helped establish a client base, especially in the rural area. Project InterLinc increased Aliant's opportunities to provide new services to the growing population of Internet users. InterLinc's success also assisted Information Analytics as they continued to grow in the Lincoln area. Since 1985, they had been contracting with the city government and had previously established a partnership with Aliant. As part of the project, the company had the opportunity to build products that would later be marketed for other projects. The growth of the company also allowed the company to bring on new staff. The media attention and advertisements provided on InterLinc websites were added benefits for the project partners.

Source: 1998 case study.

Replication and Innovation

As shown in Table 4-3, 85.9 percent of 1994 and 1995 demonstration and access projects (and all of the community networking demonstration projects) considered their TIIAP projects worthy of replication. This finding was corroborated by our own observations at the case study sites.

Mail survey respondents were also asked to rate the quality of their innovations. As shown in Table 4-4, 69.6 percent of projects "strongly" or "moderately" agreed that their project innovations provided a "marked advantage" over alternative ways of providing similar services. Further, 75.6 percent of projects indicated that their innovations were easily documented and, therefore, could be easily communicated to others. Just over two-thirds (68.9 percent) indicated that their project innovations could be easily implemented by others with *a reasonable amount of effort and expense*. It is important to note that some of the case study respondents indicated that their projects' success was tied to a unique combination of factors (e.g., an existing cadre of partners with the necessary technical skills and strong support among influential stakeholders). As such, they cautioned that the absence of these critical factors might have thwarted their own efforts (and, hence, the efforts of other sites that attempt to replicate their approach).

Table 4-3
Number and percentage of TIIAP projects considered worthy of replication, 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	23	100.0	33	94.3	10	76.9	1	50.0	13	76.5	80	88.9
Access	10	76.9	13	72.2	3	100.0	1	100.0	9	90.0	36	80.0
Total	33	91.7	46	86.8	13	81.3	2	66.7	22	81.5	116	85.9

Source: 1998 mail survey of TIIAP grantees.

Table 4-4
Projects' ratings of innovation: 1994 and 1995 demonstration and access grants

Innovation item	Strongly agree	Moderately agree	Neither agree nor disagree	Moderately disagree	Strongly disagree	Not applicable
The innovation brought about by this project provides a marked advantage over alternative ways to provide similar services	44.2	28.7	16.3	5.4	3.9	1.6
The advantages of the innovation introduced in this project are easily documented, demonstrated, and communicated to others	38.0	41.1	12.4	7.0	0.8	0.8
Project equipment and resources are not threatening or intimidating to use	39.5	34.1	10.1	11.7	3.9	0.8
The project's innovation makes the information infrastructure easier to understand and use than it would be otherwise	40.6	25.8	22.7	3.1	3.1	3.9
The innovation brought about by this project can be easily implemented by others with a reasonable amount of effort and expense	40.3	31.8	13.2	11.7	3.1	0.0

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

Dissemination

Dissemination Activities. Most (80.7 percent) of the mail survey respondents reported that they had shared information about their projects with other organizations.[25] As shown in Table 4-5, projects reported responding to almost 79,000 unsolicited requests for information or technical assistance. This is an important finding, since it suggests that TIIAP-supported projects were generating considerable interest among other organizations seeking to replicate or adapt their approach.

In addition, projects reported providing tours or technology demonstrations to almost 5,500 organizations. The case studies provided some rich examples of projects that had taken steps to disseminate information to other organizations. One site, Grace Hill, has traditionally placed considerable emphasis on disseminating

[25]For all but two of the dissemination channels contained on the survey, approximately 10 percent of respondents indicated that they did not know the number of organizations or individuals receiving TIIAP-related information. For the remaining two categories (Internet website, listserv) approximately 15 percent of respondents indicated "don't know" as their response.

information about its services to organizations outside of the St. Louis metropolitan area. Throughout the project, Grace Hill hosted tours (an average of four to five per month) for government officials, university students, professors, social service agencies, and international visitors. The tours, designed to inform other projects that want to replicate the Grace Hill approach, are led by "neighborhood ambassadors" who benefited from the program that TIIAP supported.

Table 4-5
Number of organizations receiving project information through key dissemination channels: 1994 and 1995 demonstration and access grants (n = 135)

Dissemination channel	Number of organizations
Internet website	40,200,570
Listservs, newsgroup, or electronic bulletin board	10,106,828
Casual Internet correspondence	924,153
Article, report, or other written publication	335,307
Casual conversation	325,797
Marketing efforts and advertising	116,265
Responses to unsolicited requests	78,895
Meeting, conference, or other event	31,856
Technology fairs, job fairs, or other community events	11,680
Site visits, tours, or technology demonstrations	5,489

Source: 1998 mail survey of TIIAP grantees.

The survey also found that TIIAP-supported projects provided written materials to over 335,000 organizations (although some of these materials may have been designed to describe the project to potential end users, as opposed to external organizations). Some projects developed academic papers about their TIIAP projects, activities, and outcomes. For example, NetWellness published or presented papers in over 20 journals or conferences, including the 9th World Congress on Medical Informatics in Seoul, Korea, *Healthcare Demand & Disease Management*, *Journal of the American Medical Informatics Association*, the Annual Conference on Rural Datafication, and the Finding Common Ground Conference at Harvard University, among others. Over 25 articles have appeared newspapers, including the region's two largest newspapers, the *Cincinnati Enquirer* and the *Kentucky Enquirer*.

Finally, over 50 million organizations received information about TIIAP-related activities via an Internet web site or through other electronic communications (e.g., listservs, newsgroups, electronic bulletin boards). However, this finding should be used with caution, and several caveats are worth noting. First, this figure is inflated by a few projects that reported millions of organizations received information via the Internet. In fact, approximately 85 percent of projects that reported disseminating information via the Internet indicated that they reached fewer than 1,000 organizations through this approach. Second, this figure likely includes results from outreach activities that were designed to inform potential end users about the project (as opposed to dissemination activities designed to help other projects looking to replicate the project's approach). Third, this figure likely includes individuals who were "surfing the net" and, therefore, may not have actually stopped to read the information.

Surprisingly, across all dissemination categories, there was no difference in the extent of dissemination reported by the 1994 and 1995 projects. To gain an understanding of the extent of project dissemination across the two project types and three largest application areas,[26] a two-way analysis of variance test was conducted.[27] The results of the two-way analysis of variance showed no differences in the numbers of dissemination

[26]There were too few projects in the health or public safety application areas to include them in the analysis.

[27] The total number of organizations that received information and/or technical assistance from each project was first transformed using a logarithmic function because the extremely high numbers of organizations reported by several projects may have erroneously biased the analyses.

recipients reported by projects of different type or application area. Nor were any interactions between these two variables found. In addition, Pearson product-moment correlation coefficients were calculated to determine whether there was a relationship between the number of organizations reached and either the size of the grant award or the length of the project period. There was no correlation between size of award and number of dissemination recipients, which indicates that projects funded at higher levels did not necessarily reach greater numbers of people. There was, however, a fairly strong correlation between the length of the grant period and the number of dissemination recipients (r=0.30, p<.01). This suggests that funding projects for a longer duration to ensure that they have adequate time to get up and running improves the extent of a project's dissemination activities.

Impact of Dissemination Activities. Just over one-quarter (38 projects, or 28.1 percent) of 1994 and 1995 demonstration and access projects indicated that an outside organization had taken steps to replicate or adapt their approach. Survey respondents in these 38 projects identified an average of 2.47 outside organizations (or a total of 94 organizations) that had adopted ideas from their projects. Exhibit 4-14 provides an example of a health project that is actively helping others replicate the project. In addition:

- One project (Loyola University City College in New Orleans) cited an association that applied for a 1998 TIIAP planning grant to design a collaborative telecommunications network based on the activities of the 1994 demonstration project. The association learned about the TIIAP project from a paper the grant recipient presented at a conference. The network would be planned to facilitate communication among a group of colleges around the country. At the time of site visit, the 1994 grant recipient was taking a lead role in developing the proposal.

- Grace Hill is currently working with the United Neighborhood Centers of America (UNCA), a national organization of settlement houses and neighborhood centers, to provide other social service agencies around the country with software and training about the MORE Time Dollar system. UNCA is in the process of securing funding for the training. In addition, the Annie E. Casey Foundation has written a "how-to" manual for implementing similar neighborhood programs. The Foundation has also underwritten the costs of allowing staff and neighbors from other cities to spend several days at Grace Hill to learn about replicating the system.

- Charlotte's Web staff have worked with numerous community networks around the country, including La Plaza de Taos in Taos, New Mexico, and Tincan in Spokane, Washington. For example, project staff has shared ideas with La Plaza de Taos about

Exhibit 4-11
Example of a project whose staff benefit from their work

LOS ANGELES FREE-NET
1994 Demonstration Project in Community Networking

The Los Angeles Free-Net is a volunteer-run organization, and much of its success is directly attributable to the dedication and enthusiasm of its volunteers. Over 142 volunteers work on all aspects of the project from overall management and technical infrastructure design to user registration and technical assistance and newsgroup moderators. These volunteers report that they are motivated to work with the network primarily by the intrinsic rewards their assistance offers. They feel that they are providing a worthwhile community service, and they recognize that the assistance they provide is critical to the network's success. Many volunteers further report that the intrinsic rewards of their efforts have increased as the network expanded its service and became a more significant and widely regarded community resource.

Source: 1998 case study.

Exhibit 4-12
Example of a project with beneficial partnerships

TRI-STATE NETWORK DEMONSTRATION PROJECT
1994 Demonstration Project in ECLL

A beneficial part of the Tri-State Network Demonstration Project at Mississippi State University (MSU) was the establishment of ties by MSU to the Smithsonian, NASA, and the U.S. Department of Education. The continuation of these ties and the development of future projects with these agencies has been an added benefit from the project. The positive working relationship between these Federal organizations and MSU helped to break down existing barriers typically encountered when states deal with Federal entities. The cooperative nature of this project allowed the state government to maintain creative control of the project while using Federal partners as advisors and mentors.

The project's relationship with the Smithsonian Institution's National Museum of Natural History has led to several additional collaborative endeavors. As part of the educational component of the project, eight middle school teachers were selected to participate in the Smithsonian's Natural Partner's Initiative. The teachers were brought to the museum to acquaint them with the various resources of the National Museum of Natural History and provide the background for curriculum development for four modules that would utilize the Smithsonian's resources and could be accessed by the teachers within the region and across the nation. The modules are being developed with the support of a grant made possible by the Bell South Foundation and represent spinoffs from the Tri-State Network Demonstration Project.

In addition to the relationships with Federal entities, the TIIAP initiative also strengthened ties between MSU and the Tishomingo County Special Municipal Separate School District. Tri-State Project staff from MSU were involved in the development of the district's 1996-97 Educational Technology Plan. Tri-State staff members helped the school district understand the capabilities of existing technology, incorporate Tri-State Network Project plans into the school system's Technology Plan, and recognize the need for additional electronic access including the requirements for additional phone lines.

Source: 1998 case study.

expanding networks and developing public access sites. They have also provided Tincan with technical advice about network operations, business management, rates and fees, and best practices for providing services.

This finding suggests that the TIIAP program is meeting its goal of funding projects that can inform the implementation of future technological innovations. Given TIIAP's recent efforts to promote best practices among its grant recipients (and to encourage grant recipients to share such information with other outside organizations), it will be interesting to examine whether this average continues to grow as the program matures.

IMPACT OF TIIAP SUPPORT

Survey respondents were asked to hypothesize what would have happened if their project had not received Federal funding through the TIIAP program. Three-fourths (75.2 percent) of projects believed that they would have never been implemented without the support they received from the TIIAP program (the remaining 24.8 percent indicated that they would have been implemented using alternate funding sources). While these findings were consistent across the five application areas, our analyses suggest that projects receiving a larger TIIAP award appeared to be less likely to believe that they would have been able to obtain alternative funding[28] (see Figure 4-4). This finding probably reflects the fact that projects receiving larger grants perceived they would have had difficulty obtaining a similar amount of financial support from another source. Exhibit 4-15 describes a project that was able to expand its services and scope due to TIIAP funding and would not have been able to do so otherwise.

[28] ($\chi^2_{(2)}=7.82$, $p<.05$).

Exhibit 4-13
Example of a partnership impacting the community

GREATER KALAMAZOO TELECITY – USA
1995 Demonstration Project in Community Networking

Greater Kalamazoo TeleCITY created a partnership that includes Pharmacia-UpJohn Corporation, MCR Industries, and Galesburg-Augusta High School. TeleCITY, MCR Industries, and students from the Galesburg-Augusta High School are working together to recycle used 386 and 486 computers donated by the Pharmacia-UpJohn Corporation. Students and handicapped clients of MCR complete a refurbishment process, which includes:

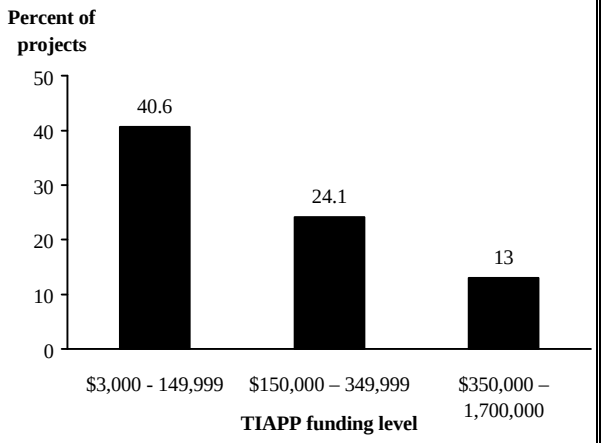
- Disassembling, cleaning, and removing identification tags from the donated equipment;
- Checking basic operating cards and deactivating network systems;
- Formatting hard disks and installing Windows 3.1;
- Installing customized basic shareware programs; and
- Purchasing and installing additional used hardware.

TeleCITY assists with technical training and software issues, as well as distributing the reconditioned equipment. Distribution of the recycled equipment includes donations to community centers for the underserved and senior citizens, grants to economically disadvantaged individuals who successfully complete TeleCITY computer classes, and sales to the general public through secondhand vendors.

Re-deploying used computers provides learning opportunities for local students, incentives for members of underserved populations to learn and utilize computer skills, and revenue for TeleCITY. During its first month, the partnership successfully reconditioned over 100 computers, monitors, and printers. During the second and third quarters of 1997, they recycled 400 more. Many of these computers have network cards and were set up in clusters at neighborhood housing centers. Anticipated revenue, after expenses, is approximately $5,000 per month. This will help to sustain the project as well as aid many community members.

Source: 1998 case study.

Figure 4-4
Percentage of respondents who believe their TIIAP projects would have been implemented in the absence of Federal funding: 1994 and 1995 demonstration and access grants (n = 135)



Source: 1998 mail survey of TIIAP grantees.

Among the small number (33) of demonstration and access projects that believed they would have been able to obtain alternative funding, almost two-thirds (63.6 percent) believed that they would have reached significantly fewer people if they had not received TIIAP funding. An equally high percentage believed that project implementation would have been substantially delayed. And an even higher percentage (84.8 percent) felt that the range of services offered by their projects would have been dramatically reduced in the absence of Federal support. As is discussed in the next chapter, evidence from the survey and case studies also suggest that without TIIAP, projects would have been hindered in their efforts to expand to reach additional end users, to generate spin-off activities, and to serve as models for replication in other communities.

Exhibit 4-14
Example of a project worthy of replication

NETWELLNESS
1994 Demonstration Project in Health

Staff of the University of Cincinnati Medical Center's NetWellness health information website indicated that their project represents an excellent model for other Web-based information services. To promote use of their model and enable other organizations to benefit from their efforts, NetWellness administrators freely offer the software that was developed for the TIIAP project. This commitment to serve as a model is already showing signs of success. Project leaders in conjunction with the Medical Library Association developed a continuing education course titled Developing a Consumer Health Network. Thirty-four medical librarians attended the 1-day course on May 24, 1997, at the University of Cincinnati Medical Center. Since the course has ended, the NetWellness administrators who conducted the course have continued to exchange information with attendees from University of Arkansas and the Oregon Consumer Health Alliance who are attempting to replicate portions of the NetWellness model. In fact, project leaders were invited to the University of Arkansas in 1997 to give a formal presentation about NetWellness and consumer health for the medical group at the university. Also, the State Library of Ohio has adopted many features of the NetWellness model as it begins to develop a statewide online community network called FamilyLink. The content of FamilyLink will be locally driven to provide a wide range of community resources, including NetWellness, to communities throughout the state.

Source: 1998 case study.

Exhibit 4-15
Example of a project that expanded its services as a result of TIIAP funding

COMANCHE COUNTY MEMORIAL HOSPITAL
1994 Demonstration Project in Health

TIIAP funding allowed Comanche County Memorial Hospital to buy telemedicine equipment such as remote cardiac monitoring and video-conferencing equipment, which expanded its services beyond what it otherwise would have been able to provide. Other funds from the state via the Oklahoma Telemedicine Network (OTN) tended to be used only for teleradiology and line fees. Indeed, the combination of the two funding streams (TIIAP and OTN) likely created a synergy that fed telemedicine into the region much faster than would have occurred without the funds. Although teleradiology would have been available to rural hospitals through OTN funds, other telemedicine features such as telecardiology, teletherapy, and continuing medical education may not have come to fruition if not for TIIAP funds.

Source: 1998 case study.

V. Sustainability and Project Expansion

As described in Chapter IV, replicability and the ability to serve as a model for others were two of the key criteria the TIIAP program placed on projects in 1994 and 1995. Implicit in these criteria are fiscal and system viability, as well as projects' ability to scale up. In this chapter, we assess the extent to which the 1994 and 1995 projects were able to secure ongoing funding and expand their reach, as well as factors that hindered their efforts to maintain services after the grant period had ended.

KEY FINDINGS

Nearly 90 percent of the 1994 and 1995 demonstration and access projects were still in operation at the time of the mail survey. Specifically, 53.3 percent were still in full operation; 17.0 percent were serving a function that had changed, grown, or expanded; 11.1 percent were serving fewer end users than intended; and 8.1 percent were providing a limited range of services.

Lack of maintenance funding was the chief threat to project sustainability among demonstration and access projects. Respondents in the 37 demonstration and access projects that were no longer operating at full capacity (or had ceased operating entirely) were asked to identify the factors responsible for the decrease in their projects' activities or scope. Nineteen of these projects ceased or cut back project operations due to a lack of funding for ongoing maintenance of the project operations or systems. Many of these projects also reported that personnel and staffing problems (15 projects) and technological obsolescence (13 projects) inhibited sustainability.

Almost four-fifths of the 1994 and 1995 planning projects indicated that their telecommunications plan had been partially or fully implemented at time they completed the mail survey. The remaining 11 planning projects indicated that they were still working to secure the necessary funding, personnel, or partners needed to implement the plan (10.4 percent), or that their plan had not been implemented and no steps were being taken to initiate implementation (6.2 percent).

Nearly two-thirds of demonstration and access projects had expanded to serve additional end users beyond those targeted in the proposal. These projects have not only increased the numbers of persons being served and the numbers of access sites and nodes for their wide area networks, many also have taken advantage of the Internet's capabilities to dramatically broaden the service area covered by their projects. The total dollar amount of additional equipment or resources that were leveraged in connection with these expansions was over $93 million. The majority of projects leveraged funds in the range of $100,000 to $1 million. Our analyses found that projects funded for 21 months or longer were more likely to have expanded to serve additional end users than were projects funded for a shorter duration. In addition, demonstration projects were

more likely than access projects to have expanded to serve additional end users.

Nearly two-thirds of demonstration and access projects had generated spin-off activities that provide additional services not included in the TIIAP proposal. The dollar amount for additional equipment or resources that were leveraged in connection with these spin-off activities was approximately $41 million. The majority of projects leveraged spin-off funds in the range of $300,000 to $700,000.

Most demonstration and access projects were able to secure funding for a broad array of operating expenses. The three most frequently cited ongoing operating expenses for which funding was secured were access lines (75.6 percent), maintenance and upgrades (65.2 percent), and personnel and contractual salaries (61.5 percent). In addition, several of the site visit projects reported that they secured funding by becoming revenue generators, e.g., began collecting user fees for website development or training.

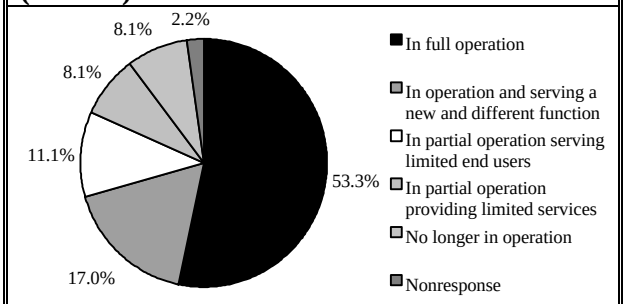
STATUS OF PROJECTS AT THE TIME OF THE MAIL SURVEY

Demonstration and Access Projects

As shown in Figure 5-1, the vast majority (89.5 percent) of demonstration and access projects were still in operation at the time they completed the mail survey. Specifically:

- Over half (53.3 percent) were still in full operation;
- Just under one-fifth (17.0 percent) were serving a function that had changed, grown, or expanded considerably from that outlined in the original proposal (see Exhibit 5-1 for an example of a case study project that is serving an expanded role);
- Just over one-tenth (11.1 percent) were providing the full range of services, but to fewer end users than intended; and
- Just under one-tenth (8.1 percent) were serving the full scope of end users, but providing a limited range of services (see Exhibit 5-2 for an example of a case study project that is providing a limited range of services).

Figure 5-1
Current status of TIIAP projects: 1994 and 1995 demonstration and access grants (n = 135)

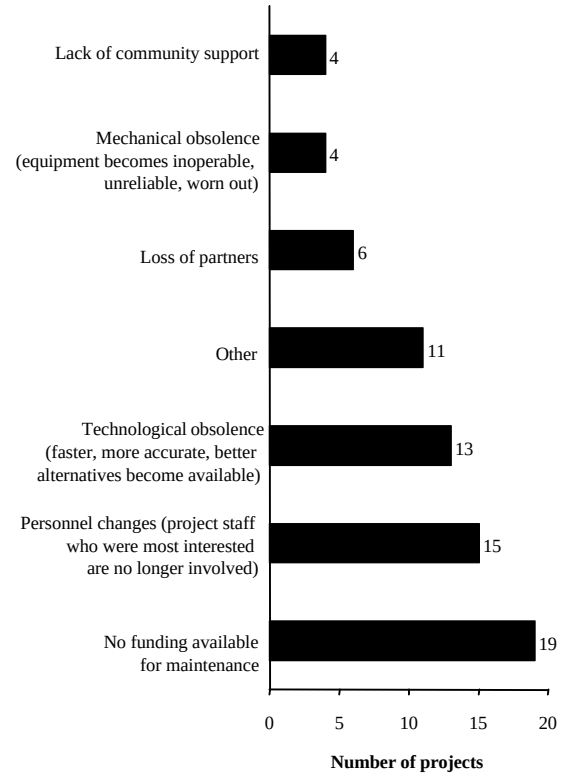


Note: Percents may not add to 100 because of rounding.
Source: 1998 mail survey of TIIAP grantees.

The remaining projects had ceased operation by the time the mail survey was administered. Exhibit 5-3 provides an example of a case study site that had ceased operations due to technological obsolescence.

Respondents in the 37 projects that were no longer operating at full capacity (or had ceased operating entirely) were asked to identify the factors responsible for the decrease in their projects' activities or scope. As shown in Figure 5-2, 19 projects cited a lack of funding for the ongoing maintenance of the project operations or systems, 15 projects cited personnel changes, and 13 projects cited technological obsolescence, i.e., the availability of faster or more accurate technology. Only 6 projects identified loss of partners as a contributing factor, while only 4 projects cited mechanical obsolescence or lack of community support.

Figure 5-2
Number of TIIAP projects reporting impediments to full operation: 1994 and 1995 demonstration and access grants no longer operating at full capacity (n = 37)



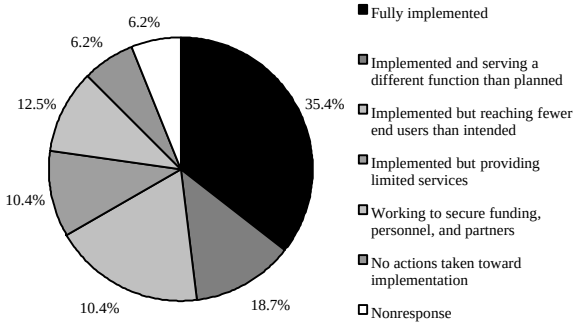
Source: 1998 mail survey of TIIAP grantees.

Planning Projects

As shown in Figure 5-3, almost four-fifths (77.0 percent) of 1994 and 1995 planning projects indicated that their telecommunications plan had been partially or fully implemented at time they completed the mail survey. The remaining planning grants indicated that they had not yet implemented their telecommunications plan. Specifically:

- Over one-third (35.4 percent) indicated that their telecommunications plan had been fully implemented;
- Almost one-fifth (18.7 percent) indicated that their plan had been partially implemented to provide the full range of services but was reaching fewer end users than intended;
- Over one-tenth (12.5 percent) indicated that a revised version of their plan had been implemented and was serving a function that was considerably different from what had originally been envisioned;
- One-tenth (10.4 percent) indicated that their plan had been partially implemented to provide the full scope of end users with a limited range of services;
- One-tenth (10.4 percent) indicated that they were still working to secure the necessary funding, personnel, or partners needed to implement the plan; and
- Another 6.2 percent indicated that the plan had not been implemented, and that no steps were being taken to initiate implementation.

Figure 5-3
Current status of telecommunications plans developed by TIIAP projects: 1994 and 1995 planning grants (n = 48)



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

Respondents in the 25 planning projects that had not fully implemented their telecommunications plans were asked to identify the factors responsible for the decrease in their projects'

activities or scope. As shown in Table 5-1, 16 projects (64.0 percent) cited a lack of funding, 12 projects (48.0 percent) indicated that the required personnel had not been secured, 11 projects (44.0 percent) cited time constraints, and 8 projects (32.0 percent) indicated that the required partners had not been secured.

Securing Ongoing Funding

As shown in Table 5-2, the 1994 and 1995 demonstration and access projects were able to secure funding for a broad array of operating expenses. The three most frequently cited ongoing operating expenses for which funding was secured were access lines (75.6 percent), maintenance and upgrades (65.2 percent), and personnel and contractual salaries (61.5 percent). In addition, just over half (51.9 percent) reported ongoing training costs, suggesting that projects have been able to maintain mechanisms for continuing to expand the number of end users (or to continue to increase the knowledge of existing end users). For example, two of the case study sites have maintained their efforts to use training to expand the number of end users who benefit from project-related activities. Charlotte's Web trains 25 new volunteers each month to create Web pages. In Grace Hill, neighborhood residents continue to receive training in how to use computers to access the MORE Time Dollar Exchange.

Exhibit 5-1
Example of a project that is serving an expanded role

SAFETYNET—NEW HAMPSHIRE
1995 Access Project in Public Services

While no longer located within the original grant recipient organization, the SafetyNet-NH project has continued through the Technology Partnership, a coalition of networks that provided part of the initial match for the grant. The Technology Partnership also became a long-term mechanism to support SafetyNet-NH beyond the demonstration project. Throughout New Hampshire, service providers and the New Hampshire Department of Health and Human Services (NHDHHS) are committed to building on the accomplishments made during the demonstration project. The project director, now at the Community Health Institute, will continue to work on the electronic benefits system as project director to the Technology Partnership to ensure that an information infrastructure is created that will link the community-based organizations to the data warehouse operated by NHDHHS. The Technology Partnership is also providing funding to the regional networks to develop intranets that will support regional data sharing and coordination of efforts. When this linkage is realized, it will mark the beginning of statewide electronic data transfer and an end to the centralized system of applying for state-sponsored financial assistance.

Source: 1998 case study.

Table 5-1
Number of TIIAP projects reporting impediments to full implementation: 1994 and 1995 planning grants that have not been fully implemented

Obstacle	Total
Lack of available funding	16
The required personnel have not been secured	12
Time constraints	11
The required partners have not been secured	8
The technology specified in the plan has become obsolete	5
Lack of community support	4
Lack of interest on the part of the grantee organization	2
Other	5

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

Evidence from the case studies suggests that projects' corporate partners are also being used as a source of ongoing funding. For example, maintenance and expenses for upgrading facilities was provided to the NETmobile in Edinburg, Texas, by its partner, Hughes Electronics Corporation. Hughes donated the satellite dish, personal earth station, maintenance support, and satellite transmission time for the duration of the project. They have continued their support as NETmobile goes into its fourth year of operation and have also provided numerous resources that enabled the NETmobile to remain operable beyond the grant period. Hughes is currently

Table 5-2
Percentage of TIIAP projects that secured ongoing funding for operating expenses: 1994 and 1995 demonstration and access grants (n = 135)

Operating expense	Yes	No	Not applicable	Nonresponse
Access lines	75.6	10.4	4.4	9.6
Maintenance and upgrade or hardware, software, and other equipment items and facilities	65.2	21.5	3.0	10.4
Personnel and contractual salaries	61.5	21.5	5.9	11.1
Training costs	51.9	23.7	12.6	11.9
Travel expenses	40.0	31.9	15.6	12.6
Physical plant	37.8	23.0	26.7	12.6
Depreciation expenses	29.6	34.1	25.2	11.1
Data subscriptions	25.9	31.1	28.9	14.1

Source: 1998 mail survey of TIIAP grantees.

providing an average of $60,000 to $80,000 a year to support the project. The structure, frame, and power supply for the NETmobile trailer have continually been improved to accommodate changing expectations of the NETmobile. They upgraded the computers from 486s to Pentiums, installed a new satellite feed horn, and continued to provide free satellite time. According to the project director, the university would not be able to continue to operate the NETmobile without the support from Hughes.

Exhibit 5-2
Example of project providing a limited range of services

LEADERSHIP, EDUCATION, AND ATHLETICS IN PARTNERSHIP
1994 Demonstration Project in ECLL

The Leadership, Education, and Athletics in Partnership (LEAP) project in New Haven, for example, was unable to maintain its National Youth Center Network (NYCN) due to a lack of funding. NYCN was a group of organizations that created an interactive database of over 200 youth organizations and resources with the purpose of exchanging best practices, successes, and other experiences in youth work. The national network required staff time and other resources in organizing and maintaining communication lines.

At the end of the grant period, staff limited the project to one of the two services of the original TIIAP project. Without further funding for NYCN from the original grant partner, LEAP staff decided that continuing and expanding the LEAP program, a group of computer learning centers for low-income youth, was a better use of scarce funds. Thus, while NYCN was not sustainable, LEAP has opened new computer centers and begun partnerships with local schools that will expand access to more students and their parents.

Source: 1998 case study.

Approximately two-thirds of mail survey respondents indicated that they had secured ongoing funding for personnel and contractual salaries. Findings from the case studies suggest that, in some instances, local governments have been a source of this ongoing funding. For example, the director of Project InterLinc approached the city and county governments for continued project funding. The city allocated money to help pay for administrative costs, which included the project director and webmaster, and a full-time assistant. In addition to administrative costs, project funding continued to support Internet connection for the sites. Project staff hope this will be a long-term commitment by the government, but the possibility of funding continually changes as the political environment changes in Lincoln, Nebraska. An encouraging sign of the sustainability of the project is the new Government Access and Information Committee made up of elected officials and others who act as a steering committee for the project.

Several of the site visit projects indicated that they also secured funding by becoming revenue generators. Exhibit 5-4 provides an example of one project that collects a nominal users fee to remain viable. Other steps taken by project to ensure that they remain operational beyond the TIIAP grant period are described below.

- **Build and Strengthen Partnerships.** Charlotte's Web continues to work on a number of different projects with miscellaneous funders. Two current projects involve work with law enforcement. One, with the Council of Governments, enables police chiefs, particularly those in the rural counties outside of Charlotte, to use private e-mail communication. The other, funded by the U.S. Department of Justice, in partnership with the Charlotte-Mecklenburg Police Department and the University of North Carolina at Charlotte, will establish a statewide community policing institute that will provide training with credit value.

- **Transfer Ownership to Communities, Access Sites, or Users.** Berkshire County's QUEST project's efforts to sustain the countywide education network have primarily involved shifting the project's management and strategic direction decisions away from QUEST and toward the schools. The main goal has been to maximize the use of the infrastructure that has been implemented to date. During the project, schools had to pay only their telecommunications costs for Internet connectivity and any costs incurred for internal infrastructure. With the grant's conclusion, QUEST started billing schools to cover the difference between any operating revenue generated by fundraising activities and current operating expenses. The schools agreed to assume this portion of the service.

- **Upgrade Hardware or Network Capabilities to Ensure Technological Viability.** Grace Hill undertook various hardware and system upgrades since the end of the grant period in order to sustain it. The project's plans for the future focused on increasing the number of residents who knew about and participate in the MORE Time Dollar Exchange. In an effort to further expand residents' access, Grace Hill is seeking to acquire three vans that would be equipped with personal computers. These vans would then be used to introduce computers, the MORE Time Dollar Exchange System, and all associated activities to residents who are unable or reluctant to visit the existing computer workstations. Project staff are also in the process of reprogramming the system so that Grace Hill's services can be made available on the Internet.

Exhibit 5-3
Example of a project that ceased operations due to technological obsolescence

INFO/PENNSYLVANIA KIOSK PROJECT
1994 Demonstration Project in Public Services

The Info/Pennsylvania kiosk pilot project installed kiosks that employed simple-to-use, touch-screen interfaces that linked customers in a variety of communities with seven agencies and Penn State University. The kiosk project was officially discontinued in October 1997, a year after the grant period ended. A major factor that contributed to the end of Info/Pennsylvania was the emergence of Web technology during the grant period. The World Wide Web allowed state agencies to disseminate information to a much wider audience and at a much lower cost than the kiosk system. In addition, state agencies found it much easier to revise information in a Web environment to ensure that content was timely. As agency interest in participating in the kiosk system diminished, the project decided to disconnect the units. Project staff indicated that the advent of the Internet served to magnify the shortcomings of the kiosk approach. As a result, several respondents suggested that future projects research all available and emerging technologies before investing in a long-term approach.

Source: 1998 case study.

- **Conduct Ongoing Strategic Planning.** The NetWellness project continues to conduct strategic planning to generate specific sustainability strategies. To determine NetWellness future, a planning team organized a strategic planning session in 1997 involving members of the local business community, health care community, the Medical Center, and Bio/Start, a state agency whose purpose is to assist in developing commercial applications of biotechnical research. Many of the ideas that were generated at that meeting were being prioritized by the NetWellness team at the time of the site visit in January 1998. Among the ideas being discussed were the following: (1) conducting formal outreach activities to encourage doctors to promote NetWellness during their consultations with patients; (2) making NetWellness more interactive by developing a point/counterpoint feature in which different perspectives on a current medical controversy or development will be presented and allowing users to react to the information via a formal survey; (3) restructuring the Ask an Expert feature to incorporate more multi-disciplinary, multi-institution teams to work together in responding to health inquiries from the public; (4) expanding into areas in which the public has expressed a great deal of interest such as alternative medicine and medical insurance; and (5) involving medical and pharmacy students in answering public questions as part of their curriculum under the oversight of instructors and physicians.

Exhibit 5-4
Example of a project collecting user fees to fund ongoing activities

LOS ANGELES FREE-NET
1994 Demonstration Project in Community Networking

The Los Angeles Free-Net charges users a small annual fee for accounts and therefore had a reliable source of income prior to receiving the TIIAP award. However, in keeping with the free-net philosophy, subscription fees are waived for anyone who cannot afford the annual fee, as well as for classroom accounts and library accounts. The annual fee is $20 for the text-based service and $40 for the graphics-based service. Current projections show that user fees will fully cover all operational expenses associated with maintaining the network and possibly expanding the user base and the range of services provided. Whereas LAFN used to have one paid staff member prior to the TIIAP-funded expansion, the network has added three part-time assistants to help with systems operations. These positions are funded entirely through user fees (not through the TIIAP grant). LAFN management plans to continue expanding the service area receiving local call access. A geographical analysis has identified a node location that would complete the network's local service area coverage of Los Angeles County and also include a large portion of Orange County. It is expected that LAFN will be able to fund the $7,000-$10,000 expansion project entirely with income generated through user fees. Because the income generated by the user fees has allowed the project to sustain itself beyond the grant period and, in all likelihood, will enable the network to continue to expand its user base and range of services, this novel (at least among free-nets) funding strategy represents an important practice that other projects may consider emulating.

Source: 1998 case study.

PROJECT EXPANSIONS AND SPIN-OFFS

Respondents were also asked to provide information on the extent to which their projects had expanded to serve additional end users or generated spin-off activities that provide additional services not included in their TIIAP proposal. This section addresses these two issues.

Projects Expansions that Serve Additional End Users

Nearly two-thirds (65.4 percent) of respondents reported that their projects had expanded to serve additional end users in locations or organizations beyond those targeted in the proposal. In addition to increasing the number of end users and access

sites, many of these projects had taken advantage of the Internet's capabilities to dramatically broaden the service area covered by their projects (see Exhibit 5-5). One respondent, for example, reported that after the project team developed a core training capacity, they "launched a virtual training initiative, which offers hands-on training at major conferences and events nationwide."

The total dollar amount of additional equipment or resources that were leveraged in connection with these expansions was over $93 million. The amounts leveraged for individual projects ranged from $4,500 to $20 million, although the majority of projects leveraged funds in the range of $100,000 to $1 million. The funding for these expansions came from a wide range of sources, including local, state, and federal agencies, private industry, nonprofit foundations and organizations, and community organizations in varying combinations. Exhibit 5-6 provides an example of a project that leveraged $3 million.

EXHIBIT 5-5
Example of a project that used its TIIAP grant to serve additional end users

LOS ANGELES FREE-NET
1994 Demonstration Project in Community Networking

Some case study sites indicated that they may have been able to implement parts, but not all, of their projects and therefore would not have been able to serve as many end users. For example, the Los Angeles Free-Net management doubt that they would have been able to expand local call access throughout Los Angeles County without the TIIAP grant. They speculate that perhaps one of the four expansion nodes may have been able to be funded with user fees; however, there were no alternative funding sources that would have supported the implementation of all four expansion nodes. TIIAP funding not only was critical for implementing the network, but it validated the network in the eyes of the community. Universities and community organizations were found to be more willing to work with a network that has received a seal of approval from the Department of Commerce.

Source: 1998 case study.

There were no notable differences in the extent to which expansions had taken place across projects of differing application areas or funding levels. Nor were there any differences between projects funded in 1994 and 1995. However, projects funded for 21 months or longer were more likely to have expanded to serve additional end users (79.6 percent) than were projects funded for a shorter duration (57.1 percent).[29] And demonstration projects were more likely to have expanded to serve additional end users (71.9 percent) than were access projects (52.3).[30]

Spin-Off Activities that Provide Additional Services

Almost two-thirds (62.1 percent) of projects indicated that they had generated spin-off activities that were providing additional services not included in the TIIAP proposal. The types of spin-off activities that were reported included the establishment of (1) training laboratories, institutes, workshops, and programs; (2) technical services to individuals and organizations; (3) information databases and directories; (4) software and website development; (5) research collaboration; and (6) Internet-based public services.

The dollar amounts for additional equipment or resources that were leveraged in connection with these spin-off activities tended to be smaller than the amounts leveraged for project expansions. The total dollar amount of additional equipment or resources that were leveraged in connection with these spinoffs was over $41 million. The amounts leveraged for individual projects ranged from $1,600 to $10 million, although the majority of projects leveraged spin-off funds in the range of $300,000 to $700,000. The funding for these spin-off activities came from a similarly diverse combination of public and private sector organizations. There were no notable differences

[29] $\chi^2_{(2)}=6.96$, $p<.05$

[30] ($\chi^2_{(1)}=5.02$, $p<.05$

in the extent to which spin-offs had taken place across projects of differing types, application areas, grant period, or funding levels.

Exhibit 5-6
Example of a project that leveraged funding after the grant period

MOBILE COMMUNITY HEALTH INFORMATION NETWORK
1995 Access Project in Health

Other sites used the prestige of a TIIAP grant to leverage funding after the grant period. Since the Mobile Community Health Information Network (MCHIN) grant ended, the hospital system has secured $3 million to continue networking health care providers and to improve the ability to transfer medical information, including patient records, electronically. The $3 million direct appropriation from the U.S. Department of Health and Human Services, Health Resources and Services Administration, will continue and expand the work initiated through the TIIAP grant to establish MCHIN. Without the TIIAP grant, the project director said, the additional funding from DHHS and the project expansion are not likely to have occurred. Now the participants are asking for faster access and more types of information.

Source: 1998 case study.

VI. Lessons Learned

The TIIAP program has always had an emphasis on learning from the experiences of the projects it funds. In fact, a document published by the program in 1996 focused exclusively on lessons that could be learned from the 1994 and 1995 TIIAP projects. The publication, *Lessons Learned from the Telecommunications Information Infrastructure Assistance Program*, provides a number of noteworthy recommendations for projects preparing to implement similar technology projects. Topics covered by the document include conducting a needs assessment, developing a plan that outlines project goals and activities, preparing an evaluation plan, identifying funding, planning for sustainability, developing partnerships, and other practical lessons learned.

This chapter builds upon the recommendations outlined in the 1996 document by identifying additional lessons that emerged from our mail survey and case studies. These recommendations are organized around the following four themes: developing a human network, developing a telecommunications network, sustaining projects beyond the end of the grant period, and developing specialized projects.

DEVELOPING A HUMAN NETWORK

As discussed in Chapter II, an important benefit of many projects was the network of partnerships that were formed or strengthened as a result of TIIAP. However, the program's emphasis on forging partnerships proved to be a double-edged sword for some projects. Findings from the mail survey and case studies suggest that a project's failure to manage its human network can limit the eventual success and impact of its technological innovations. As one project director stated, "it is not the hardware nor the software that creates the most problems, it is the peopleware." Feedback from other projects confirmed this insight. Thus, one overarching lesson that emerged from this study is that developing and managing a human network is a necessary condition for having a successful community-based technology project. Such partnerships are often needed to identify the full extent of a community's needs, provide necessary financial and political support, help in the development of a technological innovation, publicize the availability of new technologies to community residents, and evaluate the implementation and impact of a given technological activity.

Mail survey respondents and case study participants offered a variety of recommendations regarding the development and maintenance of a dynamic human network. These lessons are summarized below.

Chose partners wisely. A number of projects emphasized the importance of developing alliances with organizations that are capable of performing their assigned role. One mail survey respondent suggested that grant recipients take the time to understand the strengths and limitations of their partner organizations. Another respondent cautioned against selecting partners that clearly lacked the time and resources to handle their assignments. Still others suggested partnering with organizations that shared common goals. Finally, one respondent cited the importance of identifying partner organizations that were flexible and comfortable with changing technologies.

Take steps to maximize partners' commitment to the project's goals. A number of respondents described the benefits of partnering with organizations that were highly motivated to facilitate the project's success. These respondents noted, however, that obtaining a high level of buy-in among partners often requires a great deal of work by the grant recipient organization. That is, such buy-in rarely occurs because all partner organizations share the same goals. Rather, it occurs because project leaders take the time to do the following:

- Define an explicit role for each partner;
- Develop a mission statement and operational plan that delineates the goals of the project and the responsibilities of all participating partners;
- Develop good working relationships with their counterparts in each of the partner organizations;
- Formalize a range of communication mechanisms (e.g., e-mail, conference calls, and face-to-face meetings) at the outset of the project;
- Meet on a regular basis with project partners (e.g., to keep members informed of upcoming activities and ensure specific tasks are being completed in a timely manner); and
- Ensure that partners receive appropriate credit for activities that they successfully accomplish.

Findings from the mail survey and case studies emphasized the importance of meeting with project partners as early in the project as possible. Projects indicated that involving partners early on can reinforce that they are valued and important members of the team. Meeting at the beginning of the effort can also ensure that all participating organizations have shared expectations about the project's timetable and outcomes. One project suggested making sure that, "each partner has a contact person (site coordinator) that is interested in and excited about your project." This project also suggested meeting weekly in an official capacity and allowing for social and casual contact between members. Partners unable to attend these meetings can be kept informed through a website or newsletter.

Formalize working relationships. An important lesson that emerged from both the mail survey and case studies was the need to establish written agreements with all project partners. Such agreements were viewed as means of minimizing the potential for subsequent misunderstandings about roles, responsibilities, and timetables.

Projects further recommended that written agreements should be as specific as possible. One mail survey respondent warned, "be sure you receive some kind of legal or binding agreement for matches in the form of money." Other projects noted that formal contracts can minimize misunderstandings about whether a given organization has actually agreed to participate in a coalition (one site's failure to formalize its relationship with the local municipality contributed to the project's eventual collapse). In a rural project in Ada, Oklahoma, for example, a written memorandum of understanding was used to delineate the responsibilities of each organization that was using TIIAP-funded terminals to provide public access to the Internet. The agreement outlined the responsibilities of both the lead agency (the Chickasaw Nation) and the participating organizations. The use of these agreements assured that all agencies understood their responsibilities regarding the installation and maintenance of equipment, the payment of fees, and the provision of access and support to end users. It also ensured that there were no misunderstandings regarding who owned the equipment, who was responsible for maintaining the equipment, and who was responsible for providing technical assistance to end users.

Anticipate staff turnover (within and outside the grant recipient organization). Many projects described the difficulties of retaining quality personnel over the life of their initiative. Programmers responsible for working with new

and complex technologies are often in high demand. Thus, as some projects progressed, personnel became more marketable as they gained valuable experience with innovative equipment and up-to-date software packages. The trends uncovered during the site visits suggest that in the short run, working with contemporary hardware and software sometimes makes it easier to obtain personnel (who need on-the-job experience). However, once these staff become proficient, they are often able to command significantly higher wages from other employers. One case study site recommended staggering the hiring and training of computer personnel to reflect the following 3-year cycle:[31]

Year 1: Hire and train new technical staff member.

Year 2: Technical staff member is semi-productive as s/he applies skills learned in the first year.

Year 3: Technical staff member is very productive. Consequently, s/he is hired by another company by the end of the third year.

This cycle suggests that projects should attempt to (1) understand early the types of technical skills that will be needed to complete a given task; (2) have an appreciation of the salaries being paid to local programmers who possess these technical skills; (3) develop a project timeline and corresponding staffing plan that ensures the necessary staff will be trained and available (i.e., still affiliated with the project) when a given task is ready to be undertaken; and (4) have alternate staff available in case the original staff leave before a given task is completed. In addition, a project's staffing plan should do the following:

- Recognize the need to have a "third-year" (i.e., experienced) programmer on hand to complete the most complicated assignments;
- Contain incentives to keep good technical staff employed for at least 3 years (or whatever learning/implementation cycle is in place in a given labor market);
- Stagger the hiring of technical staff so that they are not preparing to leave at the same time; and
- Budget for more staff members to prevent burnout.

Projects pointed out that problems associated with staff turnover are not limited to the grant recipient organization. As such, they suggested establishing working relationships with several individuals within a given partner organization. One mail survey respondent indicated that by making sure organizational support runs deeper than a single individual, projects can avert delays that often occur when the partner's primary contact leaves for another job (as happens frequently in technology-based projects).

Gaining the support of key community stakeholders takes considerable time and energy. Some case study sites indicated that they failed to recognize early on the need to demonstrate the shared value of their project to the very stakeholders that had the most to gain from the project. As such, they stressed that promoting or marketing the project's benefits at the outset can make it easier to reach intended beneficiaries as the project matures. Several projects offered advice on accessing essential organizations and their constituencies, including demonstrate nonduplication of services, show how the project can be of assistance to the organization's members, be aware of an organization's customs, utilize key community and religious leaders who are influential within a targeted neighborhood, and develop a media plan that relies on cost-effective approaches for reaching an intended audience.

Pay attention to the political environment. Several projects indicated that some stakeholders became more concerned with getting publicity for their own group, rather than the project as a whole.

[31] The current demand for computer programmers with cutting-edge skills suggests that in some labor markets, this 3-year cycle may actually represent a 1- or 2-year cycle.

They suggested that this issue be handled on a case-by-case basis, the goal being to finesse each relationship into something more beneficial for all parties involved. In addition, projects cited the importance of gaining support from elected officials and other important political figures. However, as one survey respondent warned, "expect to step on toes if you intend to change the landscape."

DEVELOPING A TELECOMMUNICATIONS NETWORK

The success of many TIIAP projects rested on their ability to develop telecommunications applications that were useful and accessible. It is therefore not surprising that projects had an abundance of practical pointers for future organizations seeking to develop or expand access to existing telecommunications networks. For example, projects recommended that prospective technology should design networks for general use, build expandable networks, and (whenever possible) integrate with other networks rather than running new wires. In addition, projects emphasized that multimedia capabilities, Web server access (in addition to text Internet access), and e-mail need to be made available on all networks.

The following lessons learned, taken from the mail surveys and case studies, cover a wide range of technology-related issues. These recommendations are organized around three broad topics: financial, technical, and training.

Financial Considerations

Look for innovative and practical ways to cut operating costs. Given the expense associated with most telecommunications ventures, projects were especially mindful of the need to monitor and, if possible, moderate their operating expenses. Projects offered the following financial lessons learned from their own experiences.

- *Find a cost-effective place to house equipment.* One project noted that hospitals or other public sites can be ideal settings for housing equipment. In this particular project, the telecommunications technology was situated in a regional medical center that housed the regional network's server. The site was air conditioned, physically secure, and had emergency generators in case of a power failure. In addition, the project received the space to house servers free of charge. Finally, the hospital donated telephone lines, thereby alleviating any expenses associated with leasing.

- *Share resources to avoid duplication of expensive costs.* In Louisville, Kentucky, project partners coordinated efforts to install and later maintain different sections of the fiberoptic cable they laid. Working this out in advance took time and careful negotiation, but the project reported that it was worth it in the end. Through cooperation, they avoided duplication of laying and maintaining costly fiber technology.

- *Negotiate for discounted services.* Many telephone companies (and third-party providers) are vigorously competing for customers, particularly long-term data customers. As such, according to projects, they often have such unannounced discounts as free installation.

Avoid the most expensive technology for technology's sake. Projects often stressed that it is not always necessary to buy top-of-the-line equipment. One of the case study sites was operating on a shoestring budget, with donated office space and 500 active volunteers. Nonetheless, the project reported monthly operating expenses of $26,000. Although the project has leveraged over $13 million in operating funds, staff indicated that unnecessary expenditures to procure the finest cutting-edge technology might have pushed the project to bankruptcy. They concluded that it only makes sense to purchase the best equipment that money

can buy if the project's needs demand it. In the case of this project, such technology was not needed.

Explore Alternative Payment Options. Projects indicated that it is not always necessary to purchase computer equipment. For example, one option is to lease, rather than buy, equipment. This is an especially important consideration for telecommunications initiatives, where technology changes so rapidly that leasing may enable projects to adapt more easily as new innovations become available at an accelerated pace.

Technical Considerations

Maintain a balance between content versus connectivity. As one ECLL project recommended, throughout the different phases of the project, "content development and affordable connectivity must occur simultaneously—if one is developed before the other, neither will be effective." Not only should projects with an educational mission strive to provide quality content in their networks and programs, but technology demands constant updating to keep the content on the cutting edge.

Do not underdesign the system. That is, anticipate the project's future needs, which requires diligence due to the rapid pace of technological advancement. One project recommended that since a network can grow faster than anyone expects, causing the file server to become overburdened, "build a basic framework four times as big as you anticipate needing."

Have local technical expertise on hand. Local experts are often necessary to assist with software and hardware selection and other needs that may arise, such as consulting on standard protocols. One project found that local communities that designed their own networks needed standards to prevent incompatibility problems. Such standards should be sought from the community's telecommunications provider (e.g., Southwestern Bell), but a technical advisor will be able to translate standards into practical guidelines. In addition, a good technical help desk may also be a necessity—telecommunications technology is complicated and as such is prone to complex problems. A reliable help desk should be able to ameliorate many problems that occur during project operation.

Rely on industry standards. Projects repeatedly recommended relying on industry-standard hardware and software purchases rather than taking chances with unproven technologies. Standard protocols, software, and hardware will enable a project to adapt more nimbly to the evolution of the product marketplace. In one instance, a project team strayed from this general strategy and attempted to develop their own customized version of Mosaic, and a great deal of time and effort was expended with virtually no benefit. This occurred because the marketplace had caught up with the needs of the project by the time the extensive customization had been completed. This constraint does not, however, mean that a project cannot be innovative. For example, a project used multiple PCs as servers that allowed the network to be more flexible and cost efficient as it grew and evolved, rather than a mainframe-based configuration that would (theoretically) have been more powerful. System failures were reported to be easier to diagnose and correct because different network modules were located on different PCs.

Develop technological applications that are user-friendly. As discussed previously, the most difficult problems faced by technology projects are often linked to political and human considerations. Therefore, it is not surprising that many projects stressed the importance of developing technologies that are as easy to access and use as possible. The more user-friendly the network, the greater the likelihood that community members will use a given service. Several projects suggested that prospective end users be asked early in the project to:

- Identify the types of services they most desire;

- Specify the types of barriers that will need to be overcome if they are to use a given service;

- Pretest a given technology to assess its usability, identify problems, and recommend additional features; and

- Review handbooks, manuals, and other instructions to ensure that other users will have the materials needed to help them navigate the system.

Training Considerations

The need for training is relentless. As technology changes, the need for training is never-ending. One survey respondent noted, "training people to use computers was necessary—we didn't think this would be so universally true." Several projects have recommended a train-the-trainer approach to keep up with demand. This technique can provide a low cost and ongoing method for training a large volume of users.

Provide what is necessary for good instruction. Training essentials include a computer for each participant during training sessions, personal instruction, and equipment in good working order. Trainees will also need locally tailored, technically correct end-user documents. These can be provided in a hard copy form as well as online for easy access. Online training materials that guide self-directed learning has also been recommended. When educational materials are available online, they can provide assistance to users without requiring them to travel to a training center.

Budget for proper training. Projects should have an adequate budget that covers the costs for training time, materials, and trainers that can work with non-computer-literate trainees. It is important to give adequate time to train and not rush through important material. Giving participants time to practice new skills is essential, and this is best accomplished by using a hands-on approach to learning. It is also important to have trainers that can relate the material to the students, so it has been recommended that a project hire experienced instructors. As one survey respondent put it, "hire trainers with superb communication skills and ability to articulate the benefits and applications of the NII in a context that is relevant to the end user."

Tailor training for individual needs. Training for the project, partners, and other staff should be tailored to their needs and levels of computer literacy. For example, breakout sessions can be used to provide more intensive training to those individuals who have had the *least* exposure to the Internet or computers. Train-the-trainer programs can be used to increase the number of local citizens who are knowledgeable about the possibilities of the telecommunications and information infrastructure.

SUSTAINING PROJECTS BEYOND THE END OF THE GRANT PERIOD

As discussed in Chapter VIII, sustainability is an issue that cuts across all types of projects and technologies. Projects offered four fundamental recommendations for sustaining activities beyond the life of the grant period.

Develop a sustainability plan early. Projects stressed the need to begin thinking about sustainability as early as the planning stage. One suggestion was to develop a long-range financial plan at the outset of the project that identified potential funding and staff resources well after the expiration of the grant award. Starting early to garner additional funds is an essential lesson to learn for project sustainability. For example, NetWellness, a health-related network in Ohio, recognized early on that developing broad community involvement and solid political underpinnings would be critical to the success of the project. By nurturing long-standing relationships with important 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.

Proper budgeting is essential for sustainability. It is important to budget for programming tasks and maintenance. More time and money than expected are often needed to complete programming tasks. In addition, ongoing maintenance and repair may require more staff resources than originally expected. Budgeting for changes in technology and other aspects of community-based technology programs is another challenge to overcome. Several sites indicated that both training materials and website maintenance were much more expensive than they had budgeted for. High costs were also reported for labor, wiring, and equipment costs. Therefore, budgets should include ample amounts for training materials, website maintenance, and other ongoing expenses that can seem, at first, to be limited.

Continue to expand the base of end users. Many projects continued their outreach and dissemination activities after the grant period in order to continue to grow the demand for their products and services. Developing a market in this way is useful for both leveraging outside funds and generating funds through user fees.

Take advantage of creative funding opportunities. Another suggestion was to develop creative options for obtaining new funds. For example, charging fees for telecommunications services is permissible, with restrictions, during the grant period. Several of the case study projects were exploring the feasibility and consequences (e.g., loss of low-income users) of charging for certain services. Other projects have taken advantage of other Federal funds, e.g., the Technology Literacy Challenge Funds.

DEVELOPING SPECIALIZED PROJECTS

Projects also involve specialized concepts and networks that have created their own lessons. These projects included telemedicine projects, education programs in schools, and distance learning networks.

Considerations for Telemedicine Projects

Proper communication and training of all parties is essential. When beginning a telemedicine program, sites noted that neither technology nor legal issues were barriers to telemedicine. However, telemedicine is a complicated technology and often took more time than expected to start operating. In some areas, this might have been due to the training necessary, not addressing reimbursement of consultants and physicians early enough, and the placement of the technology.

Tackle telemedicine payment issues early. Telemedicine is so new that it is often not clear who will be paid for their services. One site reported that it is important to clear up misconceptions about payment early to further facilitate physician and personnel buy-in.

The location of computers is critical. In health projects, it was noted that if computers were located in physicians' offices or near the workstations of clinic staff who used them, they—and the network—were used more frequently than if the computers were located in a less accessible or convenient place, such as central office shared locations.

Considerations for K-12 Education Projects

Computer learning must be interactive. Not only is this lesson backed up by a great deal of research, it was learned as a result of experiments with classroom technology. The project involved "virtual visits" to museums and other places of educational interest. The project found three elements that increased student involvement with the lesson. First, virtual visits need a theme. Technology itself is not enough, and merely walking through a museum or park was insufficient to engage students. Second, placing

the computers in rows or against the wall did not create interest like a circular formation with the computers (and students) facing one another. Third, interactive lessons were the most engaging for students.

Communication is vital. Internally, technical coordinators, teachers, and school management need to communicate regularly. Each of these representatives has a different stake in and perspective on information technology. Reconciling these differences to forge a project that garners consensus will likely increase the project's acceptance and success.

Different schools have different needs. Thus, a multi-school project needs to provide flexibility and accommodate growth. Schools with different interests and needs may find a single solution restrictive and, eventually, unsuitable. In addition, different economic burdens may be borne by individual schools. For example, in one project, rural schools that were farthest from the frame relay had the highest costs and the smallest population base over which to spread the costs. Thus, it may be necessary for potential participants to have a choice in their access strategies that balances costs with a school's capability to pay.

Use direct digital connections to the Internet. In designing a school technology program, projects recommend that schools use direct digital connections to the Internet. This increases connection speeds and maintains student interest.

Placement of computers with Internet connections is important. One site observed that computers in classrooms are better than in labs. When computers are available in the classroom, students can get more consistent access to technology and teachers can integrate it into the lessons more easily.

Be clear about learning goals. Internet connectivity is not successful in and of itself. Success should be measured by the way schools use the technology to enhance and further education in their curricula. A study developed by New York's Electronic Learning Community Project found that technology could substantially change the ways students learn, as compared to using technology to teach in the same ways.

Providing Internet access requires a clear understanding of its administration and economics. That is, communities should work with existing Internet service providers whenever practical rather than becoming providers on their own. One project found that operating an Internet service is fraught with economic pitfalls and misperceptions. Its staff conceded that they would have been better concentrating their efforts on developing the infrastructure of the various school sites.

Schools need to view information technology as an investment. Otherwise, the considerable telecommunications costs can become a never-ending impediment to continued Internet access. Access fees are only a small fraction of the total costs because providing Internet access is only one piece of a complex arrangement between Internet service providers, hardware vendors, computer consultants, telecommunications companies, and other miscellaneous businesses. Schools need to be aware of the total cost so they can control their budgets during implementation and the subsequent operation of the network.

Schools need to have a local area network. The LAN infrastructure that connects to the wide area network is the first step in delivering Internet access to schools. A LAN will reduce Internet costs by extending its deployment to a large population. Dial-in access for most schools is not an option because it limits the number of students who can use the system at any one time. A LAN provides a cost-effective solution for campus-wide access as well as other computer services.

Considerations for Distance Learning Networks

For distance learning, it is important to remember that learning through this medium is not like being in a classroom. The influence of the equipment, the connections, and other environmental factors make it a unique medium for teaching and learning. As with any new technology, it takes some acclimation before it can be optimally productive. For example, some participants are uneasy about being on a monitor. Other advice for distance learning projects includes the following.

- To encourage camera-shy students to actively participate in discussions, the camera should not zoom in on students who comment or ask questions.

- Fax machines or Internet-based chat lines could be employed to allow students to comment and ask questions spontaneously and anonymously.

- The interactive classroom setup might work better if the instructor did not have any students in the on-campus classroom and could focus exclusively on the students in the remote classroom.

Know the learning community. It is important for any age group to have a meaningful learning experience, and projects must utilize whatever is at their disposal to pique the interest of each segment of the population served. Thus, it is essential to understand the culture of the communities that will receive services, including local institutions, professional associations, educational needs, resource needs, and target audience. For example, projects should determine if specific education needs exist by utilizing knowledgeable campus faculty, corporations, professional associations, other state and local agencies, and market research.

Plan adequately before enrolling students. The complexity of providing student services at a distance, the difficulty in securing local receiving sites for distance programs, and the high costs associated with nonresident tuition and distance learning technology can create significant barriers. Planning and laying the groundwork before enrolling students in a particular program is critical. The project director of the Western Brokering Project in Boulder, CO, speculated that a cost-effective system would market an umbrella or mall concept where all programs are "located" together through electronic means. Rather than the time-consuming and often fruitless process of matching individual students to individual programs, he believes it would make more sense to market one service where a variety of programs are listed. Potential students would then come to that one site.

Distance education requires significant administrative support. A separate administrative system may have to be set up to accommodate interactive class testing and evaluation dates. For building distance learning networks, one project advised using professional association contacts rather than university contacts. Professional associations provide a good source of information about the market for programs and contacts to garner potential students. The distance learning project found that where strong professional associations were lacking, recruiting was not as successful.

Know your equipment. Allow at least one semester for experimenting with new equipment before formally introducing classes utilizing the technology. Many distance learning start-up problems might have been avoided if there had been a longer lead time between the receipt and installation of equipment and the actual start of classes. A longer lead time may also help the faculty and technical staff who will be working with distance learning technology.

The distance "classroom" is different from regular classroom. It is more important to determine the needs of the students being served in a distance learning situation and carefully tailor the innovation to meet those needs than to attempt to duplicate or approximate the classroom experience. In one instance, students who had

previously enjoyed the flexibility of checking out prerecorded videotapes of class sessions were unwilling to give up that flexibility for increased interaction with the course instructors. It has been strongly suggested that a project move into distance education technology with a pedagogical mindset rather than letting the romance of the technology overshadow the needs of the student population being served.

VII. Summary and Conclusions

Overall, the data collected through the surveys and case studies of the 1994 and 1995 grant recipients provide substantial evidence that the program is effective and has contributed significantly to enhancing the technology and telecommunications infrastructure across the nation. By targeting areas where telecommunications has been problematic (e.g., because of geographic or economic barriers), the activities supported by TIIAP have increased access to a variety of technology-based services and enhanced collaborations within and across a variety of communities. While not all projects have been successful, the majority have met their goals and brought changes at the local, state, and national levels.

While skeptics might discount some of the data obtained through the surveys as being based on self-report, the case studies provide broad and convincing evidence that the program has made important contributions to the way citizens access and use information. The benefits, although not always formally documented, were apparent in the schools, medical facilities, and public service agencies visited. There has been considerable spread of impact whether assessed in terms of end users or indirect beneficiaries. And, the interest that these projects has engendered, as evidenced by the visits to view the activities and the number inquiries received, suggests that there is a good chance that many of the activities can, and will be, replicated elsewhere.

The emerging evidence for the sustainability of these early efforts is encouraging. Over 90 percent of the demonstration and access projects were still in operation at the time of the survey. While some were no longer at full strength, others have expanded and even engendered additional spin-off activities. Admittedly, it is still too early to talk with great confidence about whether the projects will survive after TIIAP funding is completed—TIIAP funding and technical assistance support have only recently ceased for many of the projects in the study universe. What happens to these projects and the extent to which they do provide models for others are issues that should therefore be tracked over time.

While it is always chancy to deal with "what ifs," grant recipients strongly believe that without TIIAP their work would not have been brought to fruition or, if implemented, would have provided fewer services to fewer people. TIIAP began at a time when support for innovative uses of technology was not easy to acquire; indeed, many of the technologies that we would consider innovative today were just on the verge of erupting. The monies provided by TIIAP were both an incentive for exploring the applications of the new technologies and, even more importantly, an inducement for targeting these efforts in traditionally underserved areas.

The current challenge for TIIAP is different in many ways than it was when the program began. Many of the technologies that were only on the drawing board are now part of our everyday life. Telephone access is almost universal and telephone lines are being used for a variety of activities that only a few envisioned a decade ago. Computers and the Internet are but one example of technological advancements that have become almost commonplace. But in other ways, the

challenge has not changed that much. There are still the haves and the have-nots. There is still a need to bring "commonplace" services to the rural and poor communities. And, there is still a need to develop new applications of the myriad of emerging technologies to enhance communities' access to knowledge, skills, and services.

It is clear that the need for TIIAP continues to be strong. While financial support is critical, equally consequential is the need to provide timely guidance and technical assistance to communities that seek to increase their access to the expanding information infrastructure. Having proven its value during the emergence of the new technological age, TIIAP is well positioned to apply what it has learned as it helps the next generation of grant recipients take advantage of the technological innovations of the 21st century. As such, the true test of TIIAP's enduring value may well be the extent to which it can continue to identify and nurture projects as technological applications become more diverse, complex, and challenging to implement.

Appendix A

TIIAP Case Study Methodology and Sites

Appendix A

TIIAP Case Study Methodology and Sites

Westat staff conducted site visits and wrote case study reports for 25 TIIAP projects in order to examine the context, strategies, organization, accomplishments, and factors leading to their success. Site visits were used to obtain detailed information on the planning and implementation processes used by the various projects. The case studies were also employed in identifying lessons learned and those which are most applicable to certain types of projects. Findings were used to characterize common themes and promising practices that can be applied elsewhere.

SITE SELECTION

The site selection process was based on a total number of 206 projects for 1994 and 1995, which excludes 4 projects from 1994 that received additional monies in 1995. Other projects were also excluded from the selection pool. Characteristics of excluded projects were:

- Projects that have been suspended, withdrawn, or terminated;
- Projects that lasted fewer than 12 months; and
- Projects that received awards of less than $75,000.

The criteria used in the site selection process included the year, geographic region, category, size of the award, area served, and domain. Projects from both award years, 1994 and 1995, were included in the list of case study sites. Fifteen of the 25 sites were selected from the 1994 cohort because a greater percentage of these projects have been completed, and therefore staff should be able to provide more perspective on what was achieved through the project, as well as the sustainability of project activities.

Other areas were also important to the selection process. Geographic region was used to cover the entire country using the four regions designated by the Bureau of Economic Analysis, which correspond to the categories in the TIIAP database. Case studies were evenly distributed across the Northeast, Southeast, Central, and West regions. Category, or type of award, was also factored into the selection process. The proportion of case study sites by project type was similar to the distribution across all 1994 and 1995 projects:

Project type	All projects (n=206)	Case studies (n=25)
Access	22.3%	16.0%
Demonstration	50.5%	52.0%
Planning	27.2%	32.0%

The last three criteria used for site selection included size of award, area served, and domain. Projects of less than $75,000 were excluded, with the remaining sites divided into three categories: $75,000 - $199,999; $200,000 - $399,999; and $400,000 and above. Some TIIAP projects involve an entire state; others focus on an urban community. Other target areas include rural communities, a region within one state, a region involving more than one state, and the nation as a whole. The five domain categories used for the FY 1997 awards (community-wide networking; education, culture, and lifelong learning; health; public and community services; and public safety) were used in site selection.

Application area	All projects (n=206)	Case studies (n=25)
Community Networking	25.7%	32.0%
ELCC	34.5%	28.0%
Health.....	12.1%	12.0%
Public Services.....	24.8%	20.0%
Public Safety.....	2.9%	8.0%

With the exception of the year of the project, the number of sites selected from each application area was proportional to the total number of projects. In addition, sites were randomly selected within the application area.

One site from the original sample was removed and replaced with another comparable site. In attempting to contact the project director from a planning project at the University of New Mexico, Gallup Branch, Westat staff learned that the project director was hired specifically for and with TIIAP funds and, thus, left the project with no forwarding information when funding ended. The project director did most of the work on the grant and would be critical to interview for the case study. Current staff at the University of New Mexico who finished the final project report were willing to host the site visit, but they were not involved during the grant period and were only involved minimally at the end to close out the grant. They indicated that the Consortium established by the planning grant was still active, but none of the original members were available.

With TIIAP approval, another site was selected that closely matched the original selection characteristics (western, ELCC, planning, 1994, fund amount) for the New Mexico project. The Western Brokering Project in Boulder, CO, was ultimately selected.

CASE STUDY METHODOLOGY

Twelve Westat staff members were trained for the site visits, including background on the TIIAP program and mission, overview of the study purpose, use of interview protocols, and plans for writing case study reports. Westat prepared and pilot tested an unstructured discussion guide for conducting intensive interviews. Prior to the site visits, team members reviewed the project's quarterly and final reports submitted to TIIAP to provide some background information, identify important questions to ask, and tailor the discussion guide accordingly.

Site visits were usually conducted over a 2-day period by two Westat staff members. During the visits, Westat team members attempted to interview the original project personnel. In some cases, however, this was not possible, and their successors were contacted. Site visitors observed project activities where useful to do so. Documents from the sites were also collected when available and often complemented the quarterly and final reports already submitted.

Following each visit, case study reports were written according to an outline for consistency. Each report included:

- Purpose and general approach of the project;
- Description of grant recipient and partners;
- Community and telecommunications context;
- Implementation activities occurring before, during, and after the grant period;
- Issues and problems in implementation;
- Accomplishments and impacts;
- Evaluation and dissemination activities;
- Lessons learned;
- Future plans; and
- Site visit methodology.

CASE STUDY SITES				
Project	**Location**	**Year**	**Type**	**Domain**
Charlotte's Web	Charlotte, NC	1994	Demonstration	Community Networking
Comanche County Memorial Hospital	Lawton, OK	1994	Demonstration	Health
Cornell University Family Life and Development Center	Ithaca, NY	1994	Planning	Public Safety
Distance Learning and Literacy Networks in Louisiana	New Orleans, LA	1994	Demonstration	ECLL
Grace Hill Neighborhood Services	St. Louis, MO	1994	Demonstration	Public Services
Greater Kalamazoo TeleCity USA	Kalamazoo, MI	1995	Demonstration	Community Networking
Info/Pennsylvania Kiosk Project	Harrisburg, PA	1994	Demonstration	Public Services
Leadership, Education, and Athletics in Partnership	New Haven, CT	1994	Demonstration	ECLL
Los Angeles Free-Net	Los Angeles, CA	1994	Demonstration	Community Networking
Mni Sose Intertribal Water Rights Coalition, Inc.	Rapid City, SD	1995	Planning	Community Networking
Mobile Community Health Information Network	Mobile, AL	1995	Access	Health
National Emergency Resource Information Network	Seattle, WA	1995	Planning	Public Safety
NetWellness	Cincinnati, OH	1994	Demonstration	Health
New York State's Electronic Learning Community	Albany, NY	1994	Planning	Community Networking
Oklahoma Department of Commerce	Oklahoma City, OK	1995	Demonstration	Public Services
Project InterLinc	Lincoln, NE	1995	Access	Community Networking
Project NETmobile	Edinburg, TX	1995	Demonstration	ECLL
Project Rural-Urban Network	Louisville, KY	1995	Demonstration	ECLL
Quality Educational Scholastic Trust, Inc.	Pittsfield, MA	1995	Access	ECLL
SafetyNet—New Hampshire	Concord, NH	1995	Access	Public Services
South Carolina's Information Highway	Columbia, SC	1994	Planning	Community Networking
SmartCities	Kansas City, MO	1994	Planning	Community Networking
Trans-Border Information Technology Collaborative	El Paso, TX	1994	Planning	Public Services
Tri-State Network Demonstration Project	Starkville, MS	1994	Demonstration	ECLL
Western Brokering Project	Boulder, CO	1994	Planning	ECLL

Appendix B

Mail Survey for
Demonstration and Access Projects

Appendix C

Mail Survey for
Planning Projects

U.S. Department of Commerce National Telecommunications & Information Administration EVALUATION OF THE TELECOMMUNICATIONS AND INFORMATION INFRASTRUCTURE ASSISTANCE PROGRAM **Survey of Grant Recipients** Version A1: *Demonstration and Access Projects in Community-Wide Networking and in Public and Community Services*	FORM APPROVED O.M.B. No.: 0660-0013 EXPIRATION DATE: 05/31/2001

This survey is authorized by law (20 U.S.C. 1221e-1). While you are not required to respond, your cooperation is needed to make the results of this survey comprehensive, accurate, and timely.

INSTRUCTIONS FOR THIS SURVEY:

The U.S. Department of Commerce is conducting an evaluation of the Telecommunications and Information Infrastructure Assistance Program (TIIAP). The purposes of this survey are to evaluate the impact of TIIAP and to identify ways the program might be improved.

We ask that the requested information be provided by the current principal investigator (PI) or, if this is not possible, from the person who is most knowledgeable about the history and current status of the project. The PI name, contact information, and other descriptive information about the project appear below. Please correct the label if any of the information is incorrect.

AFFIX LABEL HERE

IF ANY OF THE ABOVE INFORMATION IS INCORRECT, PLEASE UPDATE DIRECTLY ON LABEL.

RETURN COMPLETED FORM **BY JULY 6** TO: TIIAP Evaluation Westat RA1105F 1650 Research Boulevard Rockville, Maryland 20850-9973	IF YOU HAVE ANY QUESTIONS, CALL: Paul Tuss 1-800-937-8281, ext. 4136

Public reporting burden for this collection of information is estimated to average 60 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information including suggestions for reducing this burden to Linda Engelmeier, Acting Departmental Forms Clearance Officer, Department of Commerce—Room 5327, 1401 Constitution Avenue NW Washington, D.C. 20230; and to the Office of Management and Budget, Paperwork Reduction Project 0660-0013, Washington, D.C. 20503. Not withstanding any other provision of law, no person is required to respond unless the survey displays a valid OMB control number.

I. PROJECT PURPOSE

The first few questions will help us understand the ideas behind your TIIAP project and the outcomes it was designed to accomplish.

1. We are interested in the long-term improvements within the community that your TIIAP project was designed to achieve through the application of information infrastructure technology. For each goal below, please specify whether it represents a major goal of your project; a minor, supplementary goal; or a goal that your project was not designed to address.

		Major goal	Minor goal	Not a goal
a)	Improve delivery of social services	1	2	3
b)	Increase sense of community and focus on the common good	1	2	3
c)	Increase family stability	1	2	3
d)	Increase cultural sensitivity and social tolerance	1	2	3
e)	Foster civic participation	1	2	3
f)	Increase employment	1	2	3
g)	Reduce poverty	1	2	3
h)	Promote economic development	1	2	3
i)	Promote community development	1	2	3
j)	Serve long-term telecommunication needs	1	2	3
k)	Improve the quality of health care	1	2	3
l)	Improve the effectiveness of public safety services	1	2	3
m)	Improve training and learning opportunities	1	2	3
n)	Provide cultural enrichment	1	2	3
o)	Coordinate community-wide information and communication services	1	2	3
p)	Other (*specify*) _____	1	2	3

2. List up to four long-term outcomes you had identified, at the time of your proposal, to demonstrate progress in achieving your community change goals. A long-term outcome is defined as a measurable change in your community that could realistically and logically be expected to result from your project. For example, a health project might identify a decrease in the number of deaths attributed to diabetes-related complications.

1) _____
_____
_____

2) _____
_____
_____

3) _____
_____
_____

4) _____
_____
_____

3. We are also interested in the strategic goals that were proposed in your project as a means to effecting community change. For each strategic goal below, please specify whether it represents a major goal of your project; a minor, supplementary goal; or a goal that your project was not designed to address.

		Major goal	Minor goal	Not a goal
a)	Foster communication, resource sharing, and cooperative partnerships among government agencies, businesses, community-based nonprofits, individuals, and/or other entities	1	2	3
b)	Improve organizational efficiency and institutional capacity to adapt to changing needs	1	2	3
c)	Improve the accessibility of information services and resources	1	2	3
d)	Improve delivery of on-line information services	1	2	3
e)	Improve the quality and responsiveness of information services and resources	1	2	3
f)	Reduce the costs of providing information services and resources	1	2	3
g)	Provide training and learning opportunities to develop skills in using the information infrastructure	1	2	3
h)	Improve participation in the democratic process	1	2	3
i)	Other (*specify*) _____	1	2	3

4. Did your project seek to address any of the following barriers to access of advanced telecommunications technology?

		Yes	No
a)	Linguistic	1	2
b)	Technological	1	2
c)	Geographic	1	2
d)	Cultural	1	2
e)	Economic	1	2
f)	Physical	1	2

II. PROJECT IMPLEMENTATION

The next several questions will help us understand your experiences implementing the TIIAP project.

5. Below are implementation strategies to support community-wide networking and public service goals. In column A, indicate whether each strategy was specified in the proposal as a means to accomplish the project's goals. For those marked "Yes" in column A, use column B to indicate the extent to which the project met its implementation objectives.

	A. Proposed?		B. Extent of Implementation			
	Yes	No	Never implemented	Less than planned	Same as planned	More than planned
a) Conduct a community assessment and develop a telecommunications plan	1	2	1	2	3	4
b) Establish an information service, resource center, or other centralized location for information exchange.....	1	2	1	2	3	4
c) Provide information or services to meet community needs via the World Wide Web..	1	2	1	2	3	4
d) Create electronic town meetings	1	2	1	2	3	4
e) Establish an economic development network	1	2	1	2	3	4
f) Establish an employment and job training network	1	2	1	2	3	4
g) Establish a network to provide government services	1	2	1	2	3	4
h) Establish a network to provide educational services	1	2	1	2	3	4
i) Establish a network to provide health services	1	2	1	2	3	4
j) Establish a network to provide public safety services	1	2	1	2	3	4

6. Below are implementation strategies to promote access to the information infrastructure. In column A, indicate whether each strategy was specified in the proposal as a means to accomplish the project's goals. For each proposed implementation strategy, use column B to indicate the extent to which the project met its implementation objectives.

	A. Proposed?		B. Extent of Implementation			
	Yes	No	Never implemented	Less than planned	Same as planned	More than planned
a) Create a network to refurbish and/or distribute donated computer equipment.....	1	2	1	2	3	4
b) Establish access sites for reaching the information infrastructure	1	2	1	2	3	4
c) Provide mobile access to the information infrastructure.....	1	2	1	2	3	4
d) Develop an alliance for better access to technology	1	2	1	2	3	4
e) Provide Internet services through an established ISP (Internet Service Provider)..	1	2	1	2	3	4
f) Create a new entity to provide telecommunications services	1	2	1	2	3	4

7. Below are implementation strategies involving technology. In column A, indicate whether each strategy was specified in the proposal as a means to accomplish the project's goals. For each proposed implementation strategy, use column B to indicate the extent to which the project met its implementation objectives.

	A. Proposed?		B. Extent of Implementation			
	Yes	No	Never implemented	Less than planned	Same as planned	More than planned
a) Connect new community-based organizations and agencies to existing network	1	2	1	2	3	4
b) Establish links between existing networks ...	1	2	1	2	3	4
c) Extend the area covered by an existing network	1	2	1	2	3	4
d) Upgrade the hardware capabilities of an existing network	1	2	1	2	3	4
e) Create a distributed network of hub sites.....	1	2	1	2	3	4
f) Integrate disparate telecommunications systems (such as video conferencing with public broadcast facilities)	1	2	1	2	3	4
g) Develop new interface technology and accessible media (such as video-on-demand)	1	2	1	2	3	4
h) Establish new network by creating links between disparate databases, programs, agencies, or organizations.....	1	2	1	2	3	4
i) Create an interactive network for distance learning, teleconferencing, or telemedicine ..	1	2	1	2	3	4
j) Develop a new database or link existing databases to the Internet.....	1	2	1	2	3	4

8. Below are implementation strategies to support education and training. In column A, indicate whether each strategy was specified in the proposal as a means to train end-users in the use of telecommunications technologies. For each proposed implementation strategy, use column B to indicate the extent to which the project met its implementation objectives.

	A. Proposed?		B. Extent of Implementation			
	Yes	No	Never imple-mented	Less than planned	Same as planned	More than planned
a) Conduct media campaign to increase awareness of the value of the information infrastructure	1	2	1	2	3	4
b) Provide computer hardware needed to meet education and training needs	1	2	1	2	3	4
c) Establish a training and resource center	1	2	1	2	3	4
d) Provide onsite education and training	1	2	1	2	3	4
e) Create a network of certified trainers	1	2	1	2	3	4
f) Develop a system for electronic/on-line self-training	1	2	1	2	3	4
g) Develop training materials (print, video, electronic)	1	2	1	2	3	4
h) Use a "train-the-trainer" approach	1	2	1	2	3	4

9. Think back on the various steps you went through in developing and implementing your project. In column A, indicate the approximate number of months it took to complete each implementation stage. In column B, indicate how the actual implementation schedule compared to your proposed or anticipated timeline by circling the appropriate number. See definition below.

1 = Actual implementation took less time than anticipated
2 = Actual implementation was right on schedule
3 = Actual implementation took more time than anticipated

	A. Months	B. Actual schedule		
		Less time	On time	More time
a) From the time planning for the project first began, including preparation of the application, until the grant was awarded	_____	1	2	3
b) From the time the award was received until all project equipment was installed and integrated in working order	_____	1	2	3
c) From the time equipment was operational until the full range of project activities and services were implemented	_____	1	2	3

10. Did any of the following obstacles or impediments prevent you from carrying out the project as well as you might otherwise have done?

	Yes	No
Personnel problems		
a) Inadequate or underqualified staffing	1	2
b) Excessive staff turnover	1	2
c) Communication problems/misunderstandings of roles	1	2
d) Lack of commitment and follow-through on the part of partners and/or community stakeholders	1	2
Planning problems		
e) Underestimated the resources needed	1	2
f) Underestimated the amount of effort/time required	1	2
g) Underestimated the demand for services or the magnitude of the problem	1	2
h) Outdated, insufficient, or poor quality data/information to work with	1	2
i) Difficulty obtaining matching funds	1	2
j) Necessary information was proprietary	1	2
Technology problems		
k) Inadequate hardware capabilities	1	2
l) Lack of availability of technology (within budget)	1	2
m) Incompatibility problems with technology	1	2
n) Technology became obsolete	1	2
Other problems		
o) *(specify)* _____	1	2
p) *(specify)* _____	1	2

11. Based on the experiences of your project staff, what advice would you give to other organizations developing a similar project with regard to achieving the implementation objectives set for your project?

_____

_____

_____

III. TECHNICAL ASSISTANCE

The next section contains questions about technical assistance that you may have received while you were planning or implementing the TIIAP project.

12. What kind of technical assistance did you receive from TIIAP staff while you were preparing the application for your project?

_____

_____

_____

13. What kind of technical assistance did you receive from TIIAP staff after the grant was awarded to help you implement the project?

_____

_____

_____

14. Do you have any recommendations on how TIIAP could improve the quality and usefulness of their technical assistance?

_____

_____

_____

15. In addition to the technical assistance you received from TIIAP, did you seek out any technical assistance or training relating to your project from any other sources?

Yes 1
(In the space below, please list all agencies, groups or individuals that provided you with technical assistance or training and mention the type of assistance received from each.)
No ..... 2 *(Skip to Q16)*

1) **Provider of Assistance**: _____
Type of Assistance received: _____

2) **Provider of Assistance**: _____
Type of Assistance received: _____

3) **Provider of Assistance**: _____
Type of Assistance received: _____

4) **Provider of Assistance**: _____
Type of Assistance received: _____

IV. COMMUNITY INVOLVEMENT

The next several questions will give us a better understanding of the organizations involved in developing and implementing your TIIAP project.

16. From the list below, indicate the category that best describes the grantee organization.

Enter number from list below: _____

ORGANIZATION TYPES	
Health care organizations 11 Medical school 12 Hospital 13 Health maintenance organization 14 Clinic, medical center, or specialized practice 15 Public health agency 16 Other health care entity (*specify*) _____ **Education organizations** 21 Early childhood organization 22 K-12 school or school system 23 Higher education institution 24 Adult education organization 25 Other education entity (*specify*) _____ **Public safety organizations** 31 Law enforcement agency or department 32 Fire and Rescue agency or department 33 Emergency agency or department 34 Other public safety entity (*specify*) _____	**Governmental organizations** 41 State government agency 42 County government agency 43 City or municipal government 44 Tribal government 45 Other governmental entity (*specify*) _____ **Community organizations** 51 Library 52 Museum or other cultural entity 53 Community development organization 54 Nonprofit organization or entity not listed elsewhere 55 Other community organization or entity (*specify*) _____ **Private sector organizations** 61 Media organization 62 Private foundation or institute 63 Independent telephone company 64 Cable company 65 Regional Bell operations company 66 Other private entity (*specify*) _____

17. Please list all organizations that served as a partner in your project. In column A, list the complete name of the partner organization. In column B, indicate the category that best describes the type of organization the partnership represents using the list of organization types from Q16. In column C, describe the parameters of the relationship by indicating the contributions provided by the partner, whether they served as a subrecipient of TIIAP funds, and whether a working relationship existed prior to the TIIAP grant. (*Attach additional sheets of paper if necessary.)*

A. Partner organization name	**B. Organization type (*Enter number from list*)**	**C. Parameters**		
			Yes	**No**
		Provided funding?	1	2
		Provided equipment or equipment discounts?	1	2
		Provided in-kind or reduced rates for services?	1	2
		Provided personnel?	1	2
		Provided space or facilities?	1	2
		Provided data access?	1	2
		Provided expertise or intellectual capital?	1	2
		Subrecipient of TIIAP funds?	1	2
		Prior working relationship?	1	2
		Provided funding?	1	2
		Provided equipment or equipment discounts?	1	2
		Provided in-kind or reduced rates for services?	1	2
		Provided personnel?	1	2
		Provided space or facilities?	1	2
		Provided data access?	1	2
		Provided expertise or intellectual capital?	1	2
		Subrecipient of TIIAP funds?	1	2
		Prior working relationship?	1	2
		Provided funding?	1	2
		Provided equipment or equipment discounts?	1	2
		Provided in-kind or reduced rates for services?	1	2
		Provided personnel?	1	2
		Provided space or facilities?	1	2
		Provided data access?	1	2
		Provided expertise or intellectual capital?	1	2
		Subrecipient of TIIAP funds?	1	2
		Prior working relationship?	1	2

17. (continued)

A. Partner organization name	B. Organization type (*Enter number from list*)	C. Parameters	Yes	No
		Provided funding?	1	2
		Provided equipment or equipment discounts?.....	1	2
		Provided in-kind or reduced rates for services?	1	2
		Provided personnel?.....	1	2
		Provided space or facilities?.....	1	2
		Provided data access?	1	2
		Provided expertise or intellectual capital?..	1	2
		Subrecipient of TIIAP funds?.....	1	2
		Prior working relationship?.....	1	2
		Provided funding?	1	2
		Provided equipment or equipment discounts?.....	1	2
		Provided in-kind or reduced rates for services?	1	2
		Provided personnel?.....	1	2
		Provided space or facilities?.....	1	2
		Provided data access?	1	2
		Provided expertise or intellectual capital?..	1	2
		Subrecipient of TIIAP funds?.....	1	2
		Prior working relationship?.....	1	2

18. Have your relationships with partner organizations changed as a result of this project? For example, in the types of activities conducted jointly, the ways in which joint activities are conducted, or plans for future interaction?

Yes (*Please describe how the partnership has changed.)* 1

_____

_____

_____

_____

No 2

19. Based on the experiences of your project staff, what advice would you give to other organizations developing a similar project in identifying and working with partner organizations?

_____

_____

_____

V. PROJECT TECHNOLOGY

The next section of the questionnaire is about the telecommunications technology used in your TIIAP project.

20. Which of the following types of equipment are available through your project?

		Yes	No
a)	Computer(s) with connections to the Internet or a wide area network (WAN)	1	2
b)	Computer(s) with telecommunication capabilities via local area network (LAN)	1	2
c)	Computer(s) with telecommunication capabilities via modem	1	2
d)	Medical equipment (e.g., teleradiology, diagnostic imaging, and other equipment specific to telehealth networks)	1	2
e)	One-way transmission delivery system (i.e., cable television, broadcast television/radio, etc.)	1	2
f)	Two-way video and audio	1	2
g)	One-way video with two-way audio or computer link	1	2

21. Does your network involve data transmission?

Yes ..... 1 *(Continue with Q22)*
No ..... 2 *(Skip to Q23)*

22. Which of the following types of media does your network use for data transmission?

		Yes	No
a)	Telephone service	1	2
b)	Cable-based service	1	2
c)	Cable-coaxial hybrid service	1	2
d)	Satellite-based service	1	2
e)	Other (*specify*) _____	1	2

23. Does your project involve connecting to an existing telecommunications network?

Yes ..... 1 *(Continue with Q24)*
No ..... 2 *(Skip to Q25)*

24. Which of the following types of networks does your project connect to?

		Yes	No
a)	State government	1	2
b)	College or university	1	2
c)	School district	1	2
d)	Internet service provider	1	2
e)	Free-net	1	2
f)	Other (*specify*) _____	1	2

25. In column A, indicate whether project equipment or resources were housed in each of the listed settings. For each of the settings designated as housing project equipment or resources, specify in column B the number of distinct facilities or implementation sites that were involved.

	A. Equipment setting		B. Number of sites
	Yes	No	
a) K-12 school or school district	1	2	_____
b) College or university	1	2	_____
c) Library, museum, or other cultural entity	1	2	_____
d) Hospital, clinic, or other health care organization	1	2	_____
e) Fire and rescue department/agency	1	2	_____
f) Law enforcement department/agency	1	2	_____
g) Community center	1	2	_____
h) Government building	1	2	_____
i) Nonprofit organization or entity	1	2	_____
j) Private sector organization or entity	1	2	_____
k) Mobile vehicle	1	2	_____
l) Private home or residence	1	2	_____
m) Other (*specify*) _____	1	2	_____

26. Does your project provide access to the Internet?

Yes..... 1 *(Continue with Q27)*
No..... 2 *(Skip to Q29)*

27. How are implementation sites connected to the Internet?

	Yes	No
a) Modem (dial-in access)	1	2
b) Leased facility (56K, T1 or T3 lines)	1	2
c) SLIP/PPP connection	1	2
d) Frame-relay	1	2
e) Other (*specify*) _____	1	2

28. Which of the following Internet resources/capabilities does your project provide?

	Yes	No
a) E-mail	1	2
b) News groups	1	2
c) Listserves	1	2
d) Resource location services (e.g., Gopher, Archie, Veronica, etc.)	1	2
e) World Wide Web	1	2
f) Hosting home pages _____	1	2
g) Other (*specify*)_____	1	2

29. Was the technology planned for your project sufficient to implement the goals of your project?

Yes..... 1
No (*Please explain*) 2

_____

_____

_____

VI. PROJECT ACCOMPLISHMENTS

The next set of questions will help us understand the accomplishments of your TIIAP project.

30. What has been the major or most important outcome to result from your TIIAP project?

_____

_____

_____

31. Approximately how many end users of project equipment or resources have been <u>directly</u> impacted by your TIIAP project to date? ..... [ ]

32. Which of the following best describes the geographic distribution of the project's end users, i.e., individuals having direct access to project equipment or resources?

a) In a single city, town, or county 1
b) In a major metropolitan area (i.e., a central city and its adjacent counties)..... 2
c) In 2 or more adjacent counties within a single state (not associated with a common metropolitan area) 3
d) In 2 or more non-adjacent counties within a single state 4
e) In all counties within a single state 5
f) In 2 or more adjacent states (not associated with a common metropolitan area) 6
g) In 2 or more non-adjacent states..... 7
h) In all 50 states..... 8
i) Other area definition not listed above (*specify*) _____.. 9

33. Which of the following best describes the geographic distribution of the project's indirect beneficiaries, i.e., individuals who indirectly benefited from the improved services offered through the project without having direct access to project resources or equipment? (For example, students might indirectly benefit from a project involving a telecommunications network that is used exclusively by teachers.)

a) In a single city, town, or county 1
b) In a major metropolitan area (i.e., a central city and its adjacent counties)..... 2
c) In 2 or more adjacent counties within a single state (not associated with a common metropolitan area) 3
d) In 2 or more non-adjacent counties within a single state 4
e) In all counties within a single state 5
f) In 2 or more adjacent states (not associated with a common metropolitan area) 6
g) In 2 or more non-adjacent states..... 7
h) In all 50 states..... 8

i) Other area definition not listed above (*specify*) _____.. 9

34. Did your project impact any disadvantaged or underserved community segments either as direct end users of project equipment and resources or as indirect beneficiaries of project-related services?

Yes..... 1 *(Continue with Q35)*
No..... 2 *(Skip to Q36)*

35. In column A, indicate whether each of the following disadvantaged or underserved community segments served as end users of project equipment or resources. In column B, indicate whether each community segment indirectly benefited from the improved services offered through your project without having direct access to project equipment or resources.

		A. End users?		B. Indirect beneficiaries?	
		Yes	**No**	**Yes**	**No**
a)	Extreme poverty	1	2	1	2
b)	Illiterate.....	1	2	1	2
c)	Limited English speaking	1	2	1	2
d)	Disabled.....	1	2	1	2
e)	Inner city.....	1	2	1	2
f)	Rural.....	1	2	1	2
g)	Geographically isolated.....	1	2	1	2
h)	Tribal	1	2	1	2
i)	Mexico border communities	1	2	1	2
j)	Other group not listed above (*specify*) _____	1	2	1	2

36. Did your project impact any community service organizations (economic development councils, social service organizations, or cultural organizations)?

Yes..... 1 *(Continue with Q37)*
No..... 2 *(Skip to Q38)*

37. In column A, give an estimation of the total number of end users directly served by your TIIAP project to date for each of the following community segments. In column B, estimate the number of people to date who have indirectly benefited from the improved services offered through your project without having direct access to project resources or equipment. Write "0" if the number is zero. Write "D/K" if a given community segment was an end user or indirect beneficiary and you don't know the approximate number. **DO NOT LEAVE ANY SPACES BLANK.**

		A. Number of end users	**B. Number of indirect beneficiaries**
a)	Libraries, museums, and other cultural organization staff..	_____	_____
b)	Patrons of libraries, museums, and other cultural organizations	_____	_____
c)	Economic development organizations (business councils, tourism councils, etc.)	_____	_____
d)	Family, child, and youth assistance organization staff	_____	_____
e)	Community planning and service coordination organization staff	_____	_____

f)	Counseling organization staff (self help, support groups, substance abuse)	_____	_____
g)	Disability services organization staff.....	_____	_____
h)	Financial assistance organization staff (including food, clothing, and household goods)	_____	_____
i)	Housing assistance organization staff.....	_____	_____
j)	Job training and development organization staff	_____	_____
k)	Legal services organization staff	_____	_____
l)	Public information organization staff (including civic participation, recreation, transportation, technology)	_____	_____
m)	Senior services organization staff	_____	_____
n)	Other group not listed above (*specify*) _____	_____	_____

38. Did your project impact any <u>government</u> entities?

Yes..... 1 *(Continue with Q39)*
No..... 2 *(Skip to Q40)*

39. In column A, give an estimation of the total number of end users directly served by your TIIAP project to date for each of the following categories of <u>government</u>. In column B, estimate the number of people to date who have indirectly benefited from the improved services offered through your project without having direct access to project resources or equipment. Write "D/K" if a given community segment was an end user or indirect beneficiary and you don't know the approximate number. **DO NOT LEAVE ANY SPACES BLANK.**

		A. Number of end users	**B. Number of indirect beneficiaries**
a)	State agency officials	_____	_____
b)	City or municipal government officials	_____	_____
c)	County government officials	_____	_____
d)	Tribal government officials	_____	_____
e)	Other group not listed above (*specify*) _____	_____	_____

40. Did your project impact any <u>public safety organizations</u>?

Yes..... 1 *(Continue with Q41)*
No..... 2 *(Skip to Q42)*

41. In column A, give an estimation of the total number of end users directly served by your TIIAP project to date for each of the following <u>public safety communities</u>. In column B, estimate the number of people to date who have indirectly benefited from the improved services offered through your project without having direct access to project resources or equipment. Write "D/K" if a given community segment was an end user or indirect beneficiary and you don't know the approximate number. **DO NOT LEAVE ANY SPACES BLANK.**

		A. Number of end users	**B. Number of indirect beneficiaries**
a)	Law enforcement personnel	_____	_____
b)	Recipients of law enforcement services	_____	_____
c)	Emergency medical personnel	_____	_____
d)	Recipients of emergency medical services	_____	_____

e)	Fire and rescue personnel	_____	_____
f)	Recipients of fire and rescue services	_____	_____
g)	Other group not listed above (*specify*) _____	_____	_____

42. Did your project impact any educational organizations?

Yes..... 1 *(Continue with Q43)*
No..... 2 *(Skip to Q44)*

43. In column A, give an estimation of the total number of end users directly served by your TIIAP project to date for each of the following educational communities. In column B, estimate the number of people to date who have indirectly benefited from the improved services offered through your project without having direct access to project resources or equipment. Write "D/K" if a given community segment was an end user or indirect beneficiary and you don't know the approximate number. **DO NOT LEAVE ANY SPACES BLANK.**

	A. Number of end users	**B. Number of indirect beneficiaries**
a) Early childhood education faculty and staff	_____	_____
b) Early childhood program participants	_____	_____
c) K-12 faculty and staff	_____	_____
d) K-12 students	_____	_____
e) Higher education faculty and staff	_____	_____
f) Higher education students	_____	_____
g) Adult education faculty and staff	_____	_____
h) Adult students in continuing education programs	_____	_____
i) Other group not listed above (*specify*) _____	_____	_____

44. Did your project impact any health care organizations?

Yes..... 1 *(Continue with Q45)*
No..... 2 *(Skip to Q46)*

45. In column A, give an estimation of the total number of end users directly served by your TIIAP project to date for each of the following health care communities. In column B, estimate the number of people to date who have indirectly benefited from the improved services offered through your project without having direct access to project resources or equipment. Write "0" if the number is zero. Write "D/K" if a given community segment was an end user or indirect beneficiary and you don't know the approximate number. **DO NOT LEAVE ANY SPACES BLANK.**

	A. Number of end users	**B. Number of indirect beneficiaries**
a) Emergency care staff	_____	_____
b) Patients receiving emergency care	_____	_____
c) Routine care staff	_____	_____
d) Patients receiving routine care	_____	_____
e) Consultation care staff	_____	_____
f) Patients seeking medical consultation	_____	_____
g) Monitoring care staff	_____	_____
h) Patients receiving ongoing health monitoring	_____	_____
i) Other group not listed above (*specify*) _____	_____	_____

46. How successful has your TIIAP project been in achieving each of the following strategic goals?

		No impact	Small impact	Large impact
a)	Foster communication, resource sharing, and cooperative partnerships among government agencies, businesses, community-based nonprofits, individuals, and/or other entities	1	2	3
b)	Improve organizational efficiency and institutional capacity to adapt to changing needs	1	2	3
c)	Improve the accessibility of information services and resources	1	2	3
d)	Improve delivery of on-line information services	1	2	3
e)	Improve the quality and responsiveness of information services and resources	1	2	3
f)	Reduce the costs of providing information services and resources	1	2	3
g)	Provide training and learning opportunities to develop skills in using the information infrastructure	1	2	3
h)	Improve participation in the democratic process	1	2	3
i)	Other (*specify*) _____	1	2	3

47. How successful has your TIIAP project been in achieving each of the following community improvement goals?

		No impact	Small impact	Large impact	Not applicable
a)	Improve delivery of social services	1	2	3	NA
b)	Increase sense of community and focus on the common good	1	2	3	NA
c)	Increase family stability	1	2	3	NA
d)	Increase cultural sensitivity and social tolerance	1	2	3	NA
e)	Foster civic participation	1	2	3	NA
f)	Increase employment	1	2	3	NA
g)	Reduce poverty	1	2	3	NA
h)	Promote economic development	1	2	3	NA
i)	Promote community development	1	2	3	NA
j)	Serve long-term telecommunication needs	1	2	3	NA
k)	Improve the quality of health care	1	2	3	NA
l)	Improve the effectiveness of public safety services	1	2	3	NA
m)	Improve training and learning opportunities	1	2	3	NA
n)	Provide cultural enrichment	1	2	3	NA
o)	Coordinate community-wide information and communication services	1	2	3	NA
p)	Other (*specify*) _____	1	2	3	NA

48. What do you believe would have been the most likely outcome of your project if you did not receive Federal funds through the TIIAP program?

The project would probably never have been implemented	1	*(Skip to Q52)*
The project would probably have been implemented using alternate funding sources	2	*(Continue with Q49)*

49. How do you believe the absence of TIIAP funding would have affected the range of services offered by your project?

The project would still be able to offer the full range of services	1
The range of services offered by the project would suffer minor reductions	2
The range of services offered by the project would have to be dramatically reduced	3

50. How do you believe the absence of TIIAP funding would have affected the scale of your project?

The project would still have reached an equivalent number of people	1
The project would have reached a slightly smaller number of people	2
The project would have reached significantly fewer people	3

51. How do you believe the absence of TIIAP funding would have affected the implementation schedule for your project?

The project would still have been implemented on the same schedule	1
Project implementation would have been delayed slightly	2
Project implementation would have been substantially delayed	3

52. Has your project expanded to serve additional end users in locations or organizations beyond those targeted in the TIIAP proposal?

Yes	1	*(Continue with Q53)*
No	2	*(Skip to Q56)*

53. Please describe any expansions and the additional end users being served.

_____

_____

_____

54. Please list all funding sources for the expansion(s).

_____

_____

_____

55. Please estimate the approximate dollar amount or value of any additional equipment or resources that were leveraged by your project in connection with the expansions.

_____

56. Has your project generated spin-off activities that provide additional services not included in the TIIAP proposal?

Yes	1	*(Continue with Q57)*
No	2	*(Skip to Q60)*

57. Please describe any spin-off activities and the additional services being provided.

_____

_____

_____

58. Please list all funding sources for the spin-off activity or activities.

_____

_____

_____

59. Please estimate the approximate dollar amount or value of any additional equipment or resources that were leveraged by your project in connection with the spin-off activity.

_____

60. Has your project stimulated professional opportunities, community outreach activities, partnerships, or other unexpected benefits not mentioned elsewhere on the survey?

Yes 1
(*Please describe any unexpected benefits.)*

_____

_____

_____
No..... 2

61. The previous questions asked mainly about positive outcomes of your project. Has the project resulted in any negative outcomes?

Yes 1
(*Please describe any negative outcomes*.)

_____

_____

_____
No 2

VII. PROJECT EVALUATION

The next set of questions asks about data collection and evaluation activities related to your project.

62. Was a formal evaluation plan developed to assess the impacts of your project?

Yes	1	*(Continue with Q63)*
No	2	*(Skip to Q71)*

63. Was this plan developed by project staff, an outside individual or group, or a combination of both?

By project staff	1
By an outside individual or group	2
Combination of project staff and outside individual or group	3

64. To what extent has the evaluation plan been implemented?

Never implemented, and probably will not be implemented	1	*(Skip to Q71)*
Implementation hasn't started yet, but it is expected to in time	2	*(Skip to Q71)*
Implementation is partially completed	3	*(Continue with Q65)*
Implementation has been completed	4	*(Continue with Q65)*

65. Did your project accomplish any of the following evaluation steps?

		Yes	No	Not applicable
a)	Indicators of success were identified	1	2	NA
b)	Techniques or approaches to measure the project's success were identified	1	2	NA
c)	Individuals to conduct the evaluation were identified	1	2	NA
d)	Evaluation data were collected	1	2	NA
e)	Evaluation data were analyzed	1	2	NA
f)	Evaluation reports were prepared	1	2	NA
g)	Evaluation results were used to improve project operations and services	1	2	NA

66. Which of the following data collection methods were used to evaluate your project?

		Yes	No
a)	Survey	1	2
b)	Case studies	1	2
c)	Participant observation	1	2
d)	Interviews	1	2
e)	Focus groups	1	2
f)	Document review	1	2
g)	Website monitoring	1	2
h)	Monitoring of information requests	1	2
i)	Pre/post-testing	1	2
j)	Site visits	1	2

67. Which of the following did your project collect information about?

		Yes	No
a)	End user's satisfaction with your project's telecommunications services or activities	1	2
b)	Indirect beneficiaries' satisfaction with your project's telecommunications services and activities	1	2
c)	Project staff's (or service providers') satisfaction with the project's services and activities	1	2
d)	Intended end users who refused to use your project's telecommunications services or resources	1	2
e)	Intended end users who rarely or reluctantly made use of your project's telecommunications services or resources	1	2
f)	The efficacy with which telecommunications services are now being provided	1	2
g)	Project benefits on end users	1	2
h)	Project benefits on indirect beneficiaries of project services	1	2

68. To what extent do you agree with each of the following statements about the quality of your project's evaluation activities? Indicate your agreement using a 1-to-5 scale, in which

1 = Strongly agree
2 = Moderately agree
3 = Neither agree nor disagree
4 = Moderately disagree
5 = Strongly disagree
NA = Not applicable

		Strongly agree	Moderately agree	Neither agree nor disagree	Moderately disagree	Strongly disagree	Not applicable
a)	Evaluation activities have been critical to the success of the project.	1	2	3	4	5	NA
b)	The indicators developed in the evaluation plan were clearly defined and relevant to the project's intended outcomes	1	2	3	4	5	NA
c)	The information gathering techniques used in the evaluation were feasible, considering the project's timeline, resources, and staff expertise	1	2	3	4	5	NA
d)	The information gathering techniques provided appropriate and relevant data for measuring the indicators that were identified	1	2	3	4	5	NA
e)	Data analysis allowed project staff to develop conclusions regarding the project's value	1	2	3	4	5	NA
f)	Evaluation reports communicated the results in a useful way	1	2	3	4	5	NA

69. Have the evaluations found any emerging signs of progress in reaching the projects' long-term goals? What do these initial effects tell us?

_____

_____

_____

70. Based on the experiences of your project staff, what advice would you give to other organizations developing a similar project with regard to developing and implementing an evaluation of the project?

_____

_____

_____

VIII. PROJECT DISSEMINATION

The next set of questions addresses whether and how your project is accomplishing its dissemination objectives.

71. Do you feel that your project can serve as a replicable model for other similar organizations or partnerships to follow?

Yes..... 1
No..... 2

72. We are interested in assessing the likelihood that the innovations introduced by your project will be adopted by other organizations. Please indicate the extent to which you agree with each of the following statements about the quality of your project's evaluation activities. Indicate your agreement using a 1-to-5 scale, in which

1 = Strongly agree
2 = Moderately agree
3 = Neither agree nor disagree
4 = Moderately disagree
5 = Strongly disagree
NA = Not applicable

	Strongly agree	Moderately agree	Neither agree nor disagree	Moderately disagree	Strongly disagree	Not applicable
a) The innovation brought about by this project provides a marked advantage over alternative ways to provide similar services	1	2	3	4	5	NA
b) The advantages of the innovation introduced in this project are easily documented, demonstrated, and communicated to others.....	1	2	3	4	5	NA
c) Project equipment and resources are not threatening or intimidating to use.....	1	2	3	4	5	NA
d) The project's innovation makes the information infrastructure easier to understand and use than it would be otherwise.....	1	2	3	4	5	NA
e) The innovation brought about by this project can be easily implemented by others with a reasonable amount of effort and expense	1	2	3	4	5	NA

73. Has the project generated materials or approaches that have been shared with or disseminated to others outside your organization?

Yes	1	*(Continue with Q74)*
Not yet but intend to	2	*(Skip to Q81)*
No, and do not intend to	3	*(Skip to Q81)*

74. Please indicate approximately how many different organizations received information and/or technical assistance relating to your project through each of the following dissemination categories:

a) Casual conversation _____
b) Casual Internet correspondence _____
c) Responses to unsolicited requests _____
d) Meeting, conference, or other event _____
e) Article, report, or other written publication _____
f) Internet web site _____
g) Listserve, newsgroup, or electronic bulletin board _____
h) Site visits, tours, or technology demonstrations _____
i) Marketing efforts and advertising _____
j) Technology fairs, job fairs, or other community events _____

75. To your knowledge, have any of the organizations receiving information relating to your project implemented similar projects or project-related ideas?

Yes	1	*(Continue with Q76)*
No	2	*(Skip to Q77)*

76. Please list the name and location of each organization adopting ideas from your project and, if possible, the name and number of a contact person at each organization. If the organization name is unknown, write down the type of organization. (Attach additional sheets of paper if necessary.)

1) _____
_____
_____

2) _____
_____
_____

3) _____
_____
_____

4) _____
_____
_____

77. Beyond what has already occurred, will additional external sharing/dissemination of project approaches or materials be conducted?

Yes..... 1 *(Continue with Q78)*
No..... 2 *(Skip to Q79)*

78. Indicate whether each of the following dissemination mechanisms are intended to be used in the future.

	Future use?	
	Yes	**No**
a) Casual conversation.....	1	2
b) Casual Internet correspondence	1	2
c) Responses to unsolicited requests	1	2
d) Meeting, conference, or other event	1	2
e) Article, report, or other written publication	1	2
f) Internet web site	1	2
g) Listserve, newsgroup, or electronic bulletin board	1	2
h) Site visits, tours, or technology demonstrations	1	2
i) Marketing efforts and advertising	1	2
j) Technology fairs, job fairs, or other community events	1	2

79. Has project dissemination been influential in stimulating or generating any spillover benefits to organizations and communities not directly served by the projects, other than those already detailed in your responses to previous questions?

Yes 1
(*Please describe any spillover benefits*.)

_____
_____
_____
No..... 2

80. Based on the experiences of your project staff, what advice would you give to other organizations developing a similar project with regard to sharing project-related materials and resources and stimulating replication of the project's strategies and approaches?

_____
_____
_____

IX. PROJECT SUSTAINABILITY

The final set of questions ask about the steps that have been taken to ensure that your TIIAP project and its benefits will be sustained.

81. What is the current status of your project?

a)	In full operation	1	*(Skip to Q83)*
b)	In partial operation providing the full range of services but impacting fewer end users than intended	2	*(Continue with Q82)*
c)	In partial operation serving the full scope of end users but providing a limited range of services	3	*(Continue with Q82)*
d)	No longer in operation	4	*(Continue with Q82)*
e)	In operation but serving a function that has changed/grown/expanded considerably from that outlined in the original proposal	5	*(Skip to Q83)*

82. Which of the following factors are responsible for the project no longer operating at full capacity?

		Yes	**No**
a)	Mechanical obsolescence (equipment became inoperable, unreliable, worn-out)	1	2
b)	Technological obsolescence (faster, more accurate, better alternatives became available)	1	2
c)	Personnel changes (project staff who were most interested are no longer involved)	1	2
d)	No funding available for maintenance	1	2
e)	Loss of partners	1	2
f)	Lack of community support	1	2
g)	Other (s*pecify*)	1	2

83. Have you secured funding beyond the grant period for the following general operating expenses for each site in your network?

		Yes	**No**	**Not applicable**
a)	Access lines	1	2	NA
b)	Maintenance and upgrade of hardware, software, and other equipment items and facilities	1	2	NA
c)	Depreciation expenses	1	2	NA
d)	Training costs	1	2	NA
e)	Taxes	1	2	NA
f)	Physical plant	1	2	NA
g)	Personnel and contractual salaries	1	2	NA
h)	Travel expenses	1	2	NA
i)	Data subscriptions	1	2	NA

(IF NO ONGOING FUNDING HAS BEEN SECURED, CHECK THIS BOX….☐ THEN, SKIP TO QUESTION 85.)

84. What are the sources of ongoing funding for any of the general operating expenses that you just mentioned in question 83? (*List the name of each funding source below*.)

1) _____

2) _____

3) _____

4) _____

85. What additional steps, other than securing funds for general operating expenses as addressed in question 83, have been taken to ensure that the project is sustained beyond the grant period?

_____

_____

_____

86. Based on the experiences of your project staff, what advice would you give to other organizations developing a similar project in regard to building a sustainable project?

_____

_____

_____

87. What future plans are envisioned for your project? Please describe any plans to sustain the project or expand it to serve additional end users or provide new services. Be sure to mention the anticipated source of funds for any future plans.

_____

_____

_____

_____

_____

_____

_____

_____

88. Please give your name, title, telephone number, e-mail address, and the most convenient days/times to reach you. The information will be used only if it is necessary to clarify any of your responses.

Name
Title
Telephone (with area code)
E-mail address

Convenient days/times to reach you, if necessary.	
Day	Time
	☐ a.m. ☐ p.m.
	☐ a.m. ☐ p.m.
	☐ a.m. ☐ p.m.
	☐ a.m. ☐ p.m.
	☐ a.m. ☐ p.m.
	☐ a.m. ☐ p.m.

THANK YOU FOR ASSISTING US IN THIS SURVEY.
YOUR TIME AND EFFORT ARE APPRECIATED.

Please return this questionnaire in the enclosed envelope or send to:

TIIAP Evaluation
Westat
RA1105F
1650 Research Boulevard
Rockville, MD 20850

If you have any questions, please call Paul Tuss at
1-800-937-8281, ext. 4136

U.S. Department of Commerce National Telecommunications & Information Administration EVALUATION OF THE TELECOMMUNICATIONS AND INFORMATION INFRASTRUCTURE ASSISTANCE PROGRAM **Survey of Grant Recipients** Version B1: *Planning Projects in* *Community-Wide Networking and in* *Public and Community Services*	FORM APPROVED O.M.B. No.: 0660-0013 EXPIRATION DATE: 5/31/2001

This survey is authorized by law (20 U.S.C. 1221e-1). While you are not required to respond, your cooperation is needed to make the results of this survey comprehensive, accurate, and timely.

INSTRUCTIONS FOR THIS SURVEY:

The U.S. Department of Commerce is conducting an evaluation of the Telecommunications and Information Infrastructure Assistance Program (TIIAP). The purposes of this survey are to evaluate the impact of TIIAP and to identify ways the program might be improved.

We ask that the requested information be provided by the current principal investigator (PI) or, if this is not possible, from the person who is most knowledgeable about the history and current status of the project. The PI name, contact information, and other descriptive information about the project appear below. Please correct the label if any of the information is incorrect.

AFFIX LABEL HERE

IF ANY OF THE ABOVE INFORMATION IS INCORRECT, PLEASE UPDATE DIRECTLY ON LABEL.

RETURN COMPLETED FORM **BY JULY 6** TO: TIIAP Evaluation Westat RA1105F 1650 Research Boulevard Rockville, Maryland 20850-9973	IF YOU HAVE ANY QUESTIONS, CALL: Paul Tuss 1-800-937-8281, ext. 4136

Public reporting burden for this collection of information is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information including suggestions for reducing this burden to Linda Engelmeier, Acting Departmental Forms Clearance Officer, Department of Commerce—Room 5327, 1401 Constitution Avenue NW Washington, D.C. 20230; and to the Office of Management and Budget, Paperwork Reduction Project 0660-0013, Washington, D.C. 20503. Not withstanding any other provision of law, no person is required to respond unless the survey displays a valid OMB control number.

I. PURPOSE OF THE PLAN

The first few questions will help us understand the ideas developed in your TIIAP planning project and the outcomes your telecommunications plan was designed to accomplish.

1. We are interested in the long-term improvements within the community that your telecommunications plan was designed to accomplish upon implementation. For each goal below, please specify whether it represents a major goal of your plan; a minor, supplementary goal; or a goal that the plan did not address.

		Major goal	Minor goal	Not a goal
a)	Improve delivery of social services	1	2	3
b)	Increase sense of community and focus on the common good	1	2	3
c)	Increase family stability	1	2	3
d)	Increase cultural sensitivity and social tolerance	1	2	3
e)	Foster civic participation	1	2	3
f)	Increase employment	1	2	3
g)	Reduce poverty	1	2	3
h)	Promote economic development	1	2	3
i)	Promote community development	1	2	3
j)	Serve long-term telecommunication needs	1	2	3
k)	Improve the quality of health care	1	2	3
l)	Improve the effectiveness of public safety services	1	2	3
m)	Improve training and learning opportunities	1	2	3
n)	Provide cultural enrichment	1	2	3
o)	Coordinate community-wide information and communication services	1	2	3
p)	Other (*specify*) _____	1	2	3

2. List up to four long-term outcomes that the plan identified to demonstrate progress in achieving its community change goals. A long-term outcome is defined as a measurable change in the community that could realistically and logically be expected to result from implementation of the plan. For example, a health plan might identify a decrease in the number of deaths attributed to diabetes-related complications.

1) _____
_____
_____

2) _____
_____
_____

3) _____
_____
_____

4) _____
_____
_____

3. We are also interested in the strategic goals that were proposed in the plan as a means to effect community change. For each strategic goal below, please specify whether it represents a major goal of the plan; a minor, supplementary goal; or a goal that the plan did not address.

		Major goal	Minor goal	Not a goal
a)	Foster communication, resource sharing and cooperative partnerships among government agencies, businesses, community-based non-profits, individuals, and/or other entities	1	2	3
b)	Improve organizational efficiency and institutional capacity to adapt to changing needs	1	2	3
c)	Improve the accessibility of information services and resources	1	2	3
d)	Improve delivery of on-line information services	1	2	3
e)	Improve the quality and responsiveness of information services and resources	1	2	3
f)	Reduce the costs of providing information services and resources	1	2	3
g)	Provide training and learning opportunities to develop skills in using the information infrastructure	1	2	3
h)	Improve participation in the democratic process	1	2	3
i)	Other (*specify*) _____	1	2	3

4. Did your plan seek to address any of the following barriers to access of advanced telecommunications technology?

		Yes	No
a)	Linguistic	1	2
b)	Technological	1	2
c)	Geographic	1	2
d)	Cultural	1	2
e)	Economic	1	2
f)	Physical	1	2

5. In your plan, are the <u>end users</u> of project equipment or resources expected to come from any of the following community segments?

		Yes	No
a)	Providers of a community service (i.e., educators, health care providers, public safety personnel, social service providers, government service providers, etc.)	1	2
b)	Consumers of a community service (i.e., students, patients receiving medical care, recipients of public safety, social, or government services, etc.)	1	2
c)	General public or community at large	1	2

6. In your plan, are the <u>indirect beneficiaries</u> expected to come from any of the following community segments? An indirect beneficiary would be anyone who benefits from the improved services being offered without having direct access to project resources or equipment.

		Yes	No
a)	Providers of a community service (i.e., educators, health care providers, public safety personnel, social service providers, government service providers, etc.)	1	2
b)	Consumers of a community service (i.e., students, patients receiving medical care, recipients of public safety, social, or government services, etc.)	1	2
c)	General public or community at large	1	2

7. Did your plan target any <u>disadvantaged or underserved community segments</u> either as direct end users of project equipment and resources or as indirect beneficiaries of project-related services?

Yes..... 1 *(Continue with Q8)*
No..... 2 *(Skip to Q9)*

8. In column A, indicate whether your plan intends to serve upon implementation each of the following <u>disadvantaged or underserved community segments</u> as end users of project equipment or resources. In column B, indicate whether each community segment is intended to indirectly benefit from the improved services offered through your project without having access to project equipment or resources.

		A. End users?		**B. Indirect beneficiaries?**	
		Yes	**No**	**Yes**	**No**
a)	Extreme poverty	1	2	1	2
b)	Illiterate.....	1	2	1	2
c)	Limited English speaking	1	2	1	2
d)	Disabled.....	1	2	1	2
e)	Inner city.....	1	2	1	2
f)	Rural.....	1	2	1	2
g)	Geographically isolated.....	1	2	1	2
h)	Tribal	1	2	1	2
i)	Mexico border communities	1	2	1	2
j)	Other group not listed above (*specify*) _____	1	2	1	2

9. Did your plan target any <u>community service organizations</u> (economic development councils, social service organizations, or cultural organizations) either as direct end users of project equipment and resources or as indirect beneficiaries of project-related services?

Yes..... 1 *(Continue with Q10)*
No..... 2 *(Skip to Q11)*

10. In column A, indicate whether your plan intends to serve upon implementation each of the following community segments as end users of project equipment or resources. In column B, indicate whether each community segment is intended to indirectly benefit from the improved services offered through your project without having access to project equipment or resources.

		A. End users?		B. Indirect beneficiaries?	
		Yes	**No**	**Yes**	**No**
a)	Libraries, museums, and other cultural organization staff	1	2	1	2
b)	Patrons of libraries, museums, and other cultural organizations	1	2	1	2
c)	Economic development organizations (business councils, tourism councils, etc.)	1	2	1	2
d)	Family, child, and youth assistance organization staff	1	2	1	2
e)	Community planning and service coordination organization staff	1	2	1	2
f)	Counseling organization staff (self-help, support groups, substance abuse)	1	2	1	2
g)	Disability services organization staff	1	2	1	2
h)	Financial assistance organization staff (including food, clothing, and household goods)	1	2	1	2
i)	Housing assistance organization staff	1	2	1	2
j)	Job training and development organization staff	1	2	1	2
k)	Legal services organization staff	1	2	1	2
l)	Public information organization staff (including civic participation, recreation, transportation, technology)	1	2	1	2
m)	Senior services organization staff	1	2	1	2
n)	Other group not listed above (*specify*) _____	1	2	1	2

11. Did your plan target any government entities?

Yes..... 1 *(Continue with Q12)*
No..... 2 *(Skip to Q13)*

12. In column A, indicate whether your plan intends to serve upon implementation each of the following categories of government as end users of project equipment or resources. In column B, indicate whether each category is intended to indirectly benefit from the improved services offered through your project without having access to project equipment or resources.

		A. End users?		B. Indirect beneficiaries?	
		Yes	**No**	**Yes**	**No**
a)	State agency officials	1	2	1	2
b)	City or municipal government officials	1	2	1	2
c)	County government officials	1	2	1	2
d)	Tribal government officials	1	2	1	2
e)	Other group not listed above (*specify*) _____	1	2	1	2

13. Did your plan target any public safety organizations?

Yes..... 1 *(Continue with Q14)*
No..... 2 *(Skip to Q15)*

14. In column A, indicate whether your plan intends to serve upon implementation each of the following public safety communities as end users of project equipment or resources. In column B, indicate whether each community segment is intended to indirectly benefit from the improved services offered through your project without having access to project equipment or resources.

		A. End users?		B. Indirect beneficiaries?	
		Yes	**No**	**Yes**	**No**
a)	Law enforcement personnel	1	2	1	2
b)	Recipients of law enforcement services	1	2	1	2
c)	Emergency medical personnel	1	2	1	2
d)	Recipients of emergency medical services	1	2	1	2
e)	Fire and rescue personnel	1	2	1	2
f)	Recipients of fire and rescue services	1	2	1	2
g)	Other group not listed above (*specify*) _____	1	2	1	2

15. Did your plan target any educational organizations?

Yes..... 1 *(Continue with Q16)*
No..... 2 *(Skip to Q17)*

16. In column A, indicate whether your plan intends to serve upon implementation each of the following educational communities as end users of project equipment or resources. In column B, indicate whether each community segment is intended to indirectly benefit from the improved services offered through your project without having access to project equipment or resources.

		A. End users?		B. Indirect beneficiaries?	
		Yes	**No**	**Yes**	**No**
a)	Early childhood education faculty and staff	1	2	1	2
b)	Early childhood program participants	1	2	1	2
c)	K-12 faculty and staff	1	2	1	2
d)	K-12 students	1	2	1	2
e)	Higher education faculty and staff	1	2	1	2
f)	Higher education students	1	2	1	2
g)	Adult education faculty and staff	1	2	1	2
h)	Adult students in continuing education programs	1	2	1	2
i)	Other group not listed above (*specify*) _____	1	2	1	2

17. Did your plan target any health care organizations?

Yes..... 1 *(Continue with Q18)*
No..... 2 *(Skip to Q19)*

18. In column A, indicate whether your plan intends to serve upon implementation each of the following health care communities as end users of project equipment or resources. In column B, indicate whether each community segment is intended to indirectly benefit from the improved services offered through your project without having access to project equipment or resources.

		A. End users?		B. Indirect beneficiaries?	
		Yes	**No**	**Yes**	**No**
a)	Emergency care staff	1	2	1	2
b)	Patients receiving emergency care	1	2	1	2
c)	Routine care staff	1	2	1	2
d)	Patients receiving routine care	1	2	1	2
e)	Consultation care staff	1	2	1	2
f)	Patients seeking medical consultation	1	2	1	2
g)	Monitoring care staff	1	2	1	2
h)	Patients receiving ongoing health monitoring	1	2	1	2
i)	Other group not listed above (*specify*) _____	1	2	1	2

II. DEVELOPING THE PLAN

The next several questions ask about the planning activities associated with your TIIAP project.

19. In column A, indicate which of the following activities were detailed in your proposal as a component in the development of your project's telecommunications plan. In column B, please indicate the extent to which any proposed activity was conducted using a 4-point scale in which

1 = The proposed activity was not conducted
2 = The proposed activity was conducted, but to a lesser extent than planned
3 = The proposed activity was conducted at about the same level as planned
4 = The proposed activity was conducted to a greater extent than planned

		A. Proposed?		B. Rating			
		Yes	No				
a)	Conduct a needs assessment to gain a better understanding of the population to be served	1	2	1	2	3	4
b)	Evaluate the capabilities and limitations of an existing information/communications system or network	1	2	1	2	3	4
c)	Identify mechanisms to create communications links between disparate databases, programs, agencies, or organizations	1	2	1	2	3	4
d)	Identify mechanisms to integrate disparate telecommunications systems (such as video conferencing with public broadcast facilities)	1	2	1	2	3	4
e)	Identify approaches to provide education and training in the use of telecommunications technologies	1	2	1	2	3	4
f)	Determine the computer hardware and other equipment needed to accomplish the plan's intended outcomes	1	2	1	2	3	4
g)	Identify sites for accessing the planned telecommunications network	1	2	1	2	3	4
h)	Identify service providers for implementing the planned telecommunications network	1	2	1	2	3	4
i)	Develop an evaluation plan to assess the impacts of implementing the plan	1	2	1	2	3	4
j)	Develop a strategy for disseminating the materials or approaches that would be generated or developed through the implementation of your plan to others outside your organization	1	2	1	2	3	4

20. Did any of the following obstacles or impediments prevent you from carrying out the planning activities as well as you might otherwise have done?

		Yes	No
Personnel problems			
a)	Inadequate or underqualified staffing	1	2
b)	Excessive staff turnover	1	2
c)	Communication problems/misunderstandings of roles	1	2
d)	Lack of commitment and follow-through on the part of partners and/or community stakeholders	1	2
Planning problems			
e)	Underestimated the resources needed	1	2
f)	Underestimated the amount of effort/time required	1	2
g)	Outdated, insufficient, or poor quality data/information to work with	1	2
h)	Difficulty obtaining matching funds	1	2
i)	Necessary information was proprietary	1	2
Other problems			
j)	*(specify)* _____	1	2
k)	*(specify)* _____	1	2

III. TECHNICAL ASSISTANCE

The next section contains questions about technical assistance which you may have received while you were planning the TIIAP project.

21. What kind of technical assistance did you receive from TIIAP staff while you were preparing the application for your project?

_____

_____

_____

22. What kind of technical assistance did you receive from TIIAP staff after the grant was awarded to help you develop your telecommunications plan?

_____

_____

_____

23. Do you have any recommendations on how TIIAP could improve the quality and usefulness of their technical assistance?

_____

_____

_____

24. In addition to the technical assistance you received from TIIAP, did you seek out any technical assistance or training relating to your project from any other sources?

Yes..... 1
(*In the space below, please list all agencies, groups or individuals that provided you with technical assistance or training and mention the type of assistance received from each.)*
No..... 2 *(Skip to Q25)*

1) **Provider of Assistance**: _____
Type of Assistance received: _____

2) **Provider of Assistance**: _____
Type of Assistance received: _____

3) **Provider of Assistance**: _____
Type of Assistance received: _____

4) **Provider of Assistance**: _____
Type of Assistance received: _____

IV. COMMUNITY INVOLVEMENT

The next several questions will give us a better understanding of the organizations involved in developing your telecommunications plan.

25. From the list below, indicate the category that best describes the grantee organization.

Enter number from list below: _____

ORGANIZATION TYPES	
Health care organizations 11 Medical school 12 Hospital 13 Health maintenance organization 14 Clinic, medical center, or specialized practice 15 Public health agency 16 Other health care entity (specify) _____ **Education organizations** 21 Early childhood organization 22 K-12 school or school system 23 Higher education institution 24 Adult education organization 25 Other education entity (specify) _____ **Public safety organizations** 31 Law enforcement agency or department 32 Fire and Rescue agency or department 33 Emergency agency or department 34 Other public safety entity (specify) _____	**Governmental organizations**: 41 State government agency 42 County government agency 43 City or municipal government 44 Tribal government 45 Other governmental entity (specify) _____ **Community organizations** 51 Library 52 Museum or other cultural entity 53 Community development organization 54 Nonprofit organization or entity not listed elsewhere 55 Other community organization or entity (specify) _____ **Private sector organizations** 61 Media organization 62 Private foundation or institute 63 Independent telephone company 64 Cable company 65 Regional Bell operations company 66 Other private entity (specify) _____

26. Please list all organizations that served as a partner in the project. In column A, list the complete name of the partner organization. In column B, indicate the category that best describes the type of organization the partnership represents using the list of organization types from Q25 above. In column C, describe the parameters of the relationship by indicating the contributions provided by the partner, whether they served as a subrecipient of TIIAP funds, and whether a working relationship existed prior to the TIIAP grant. (*Attach additional sheets of paper if necessary.)*

A. **Partner organization name**	**B.** **Organization type** **(*Enter number from list*)**	**C.** **Parameters**	**Yes**	**No**
		Source of funding? .... Provider of equipment or equipment discounts? .... Provider of in-kind or reduced rates for services? .... Provider of personnel? .... Provider of space or facilities? .... Provider of data access? .... Provider of expertise or intellectual capital? .... Subrecipient of TIIAP funds? .... Prior working relationship?	1 1 1 1 1 1 1 1 1	2 2 2 2 2 2 2 2 2
		Source of funding? .... Provider of equipment or equipment discounts? .... Provider of in-kind or reduced rates for services? .... Provider of personnel? .... Provider of space or facilities? .... Provider of data access? .... Provider of expertise or intellectual capital? .... Subrecipient of TIIAP funds? .... Prior working relationship?	1 1 1 1 1 1 1 1 1	2 2 2 2 2 2 2 2 2
		Source of funding? .... Provider of equipment or equipment discounts? .... Provider of in-kind or reduced rates for services? .... Provider of personnel? .... Provider of space or facilities? .... Provider of data access? .... Provider of expertise or intellectual capital? .... Subrecipient of TIIAP funds? .... Prior working relationship?	1 1 1 1 1 1 1 1 1	2 2 2 2 2 2 2 2 2

26. (continued)

A. Partner organization name	B. Organization type (*Enter number from list*)	C. Parameters	Yes	No
		Source of funding?	1	2
		Provider of equipment or equipment discounts?	1	2
		Provider of in-kind or reduced rates for services?	1	2
		Provider of personnel?	1	2
		Provider of space or facilities?	1	2
		Provider of data access?	1	2
		Provider of expertise or intellectual capital?	1	2
		Subrecipient of TIIAP funds?	1	2
		Prior working relationship?		
		Source of funding?	1	2
		Provider of equipment or equipment discounts?	1	2
		Provider of in-kind or reduced rates for services?	1	2
		Provider of personnel?	1	2
		Provider of space or facilities?	1	2
		Provider of data access?	1	2
		Provider of expertise or intellectual capital?	1	2
		Subrecipient of TIIAP funds?	1	2
		Prior working relationship?		

27. Have your relationships with partner organizations changed as a result of this project? For example, in the types of activities conducted jointly, the ways in which joint activities are conducted, or plans for future interaction?

Yes (*Please describe how the partnership has changed.)* 1

_____

_____

_____

_____

No 2

28. Based on the experiences of your project staff, what advice would you give to other organizations developing a similar project in identifying and working with partner organizations?

_____

_____

_____

V. PROJECT TECHNOLOGY

The next section of the questionnaire is about the telecommunications technology involved in your telecommunications plan.

29. Which of the following types of equipment are specified for use in your plan?

		Yes	No
a)	Computer(s) with connections to the Internet or a wide area network (WAN)	1	2
b)	Computer(s) with telecommunication capabilities via local area network (LAN)	1	2
c)	Computer(s) with telecommunication capabilities via modem	1	2
d)	Medical equipment (e.g., teleradiology)	1	2
e)	One-way transmission delivery system (i.e., cable television, broadcast television/radio, etc.)	1	2
f)	Two-way video and audio	1	2
g)	One-way video with two-way audio or computer link	1	2

30. Does the planned network involve data transmission?

Yes	1	*(Continue with Q31)*
No	2	*(Skip to Q32)*

31. Which of the following types of media will the planned network use for data transmission?

		Yes	No
a)	Telephone service	1	2
b)	Cable-based service	1	2
c)	Cable-coaxial hybrid service	1	2
d)	Satellite-based service	1	2
e)	Other (s*pecify*) _____	1	2

32. Does your project involve connecting to an existing telecommunications network?

Yes	1	*(Continue with Q33)*
No	2	*(Skip to Q34)*

33. Which of the following types of network does your project connect to?

		Yes	No
a)	State government	1	2
b)	College or university	1	2
c)	School district	1	2
d)	Internet service provider	1	2
e)	Free-net	1	2
f)	Other (s*pecify*) _____	1	2

34. In column A, indicate whether the plan intends for project equipment or resources to be housed in each of the listed settings. For each of the settings designated as housing project equipment or resources, specify in column B the number of distinct facilities or implementation sites that are specified.

	A Equipment setting		B Number of sites
	Yes	**No**	
a) K-12 school or school district	1	2	_____
b) College or university	1	2	_____
c) Library, museum, or other cultural entity	1	2	_____
d) Hospital, clinic, or other health care organization	1	2	_____
e) Fire and rescue department/agency	1	2	_____
f) Law enforcement department/agency	1	2	_____
g) Community center	1	2	_____
h) Government building	1	2	_____
i) Nonprofit organization or entity	1	2	_____
j) Private sector organization or entity	1	2	_____
k) Mobile vehicle	1	2	_____
l) Private home or residence	1	2	_____
m) Other (*specify*) _____	1	2	_____

35. Does the plan involve providing access to the Internet?

Yes..... 1 *(Continue with Q36)*
No..... 2 *(Skip to Q38)*

36. How are implementation sites to be connected to the Internet?

	Yes	**No**
a) Modem (dial-in access).....	1	2
b) Leased facility (56K, T1 or T3 lines).....	1	2
c) SLIP/PPP connection.....	1	2
d) Frame-relay	1	2
e) Other (*specify*) _____	1	2

37. Which of the following Internet resources/capabilities are to be provided in the plan?

	Yes	**No**
a) E-mail	1	2
b) News groups	1	2
c) Listserves	1	2
d) Resource location services (e.g., Gopher, Archie, Veronica, etc.).....	1	2
e) World Wide Web	1	2
f) Hosting home pages	1	2
g) Other (*specify*) _____		
_____	1	2

VI. ACCOMPLISHMENTS AND CURRENT STATUS

The next set of questions will help us understand the accomplishments and current status of your TIIAP planning project.

38. What has been the major or most important outcome to result from your TIIAP award?

_____

_____

_____

39. Do you believe you would have been able to develop the telecommunications plan if you did not receive Federal funds through the TIIAP program?

Yes	1	*(Continue with Q40)*
No	2	*(Skip to Q41)*

40. How do you believe the absence of TIIAP funding would have affected the implementation schedule for your project?

The plan would still have been developed on the same schedule	1
The plan would have been delayed slightly	2
The plan would have been substantially delayed	3

41. To what extent has the telecommunications plan been implemented?

The plan has been fully implemented	1	*(Skip to Q43)*
The plan has been partially implemented to provide the full range of services but is reaching fewer end users than intended	2	*(Continue with Q42)*
The plan has been partially implemented to provide the full scope of end users with a limited range of services	3	*(Continue with Q42)*
Activities are underway to secure the necessary funding, personnel, and partners for implementation	4	*(Continue with Q42)*
A revised version of the plan has been implemented and it is serving a function that is considerably different from that outlined in the original plan developed through TIIAP	5	*(Skip to Q43)*
The plan has not been implemented and no steps are being taken to initiate implementation	6	*(Continue with Q42)*

42. Which of the following factors are responsible for the plan not achieving full implementation?

		Yes	**No**
a)	Lack of available funding	1	2
b)	The technology specified in the plan has become obsolete	1	2
c)	The required personnel have not been secured	1	2
d)	The required partners have not been secured	1	2
e)	Lack of community support	1	2
f)	Lack of interest on the part of the grantee organization	1	2
g)	Time constraints	1	2
h)	Other (*specify*) _____	1	2

43. Did you receive a subsequent TIIAP award to implement the telecommunications plan developed through this award?

Yes (*Please list the year of award:* ***19*** ____.) 1
No 2

44. Have you secured funding for the following expenses associated with implementing your plan?

	Yes	No	Not applicable
a) Access lines	1	2	NA
b) Maintenance and upgrade of hardware, software, and other equipment items and facilities	1	2	NA
c) Depreciation expenses	1	2	NA
d) Training costs	1	2	NA
e) Taxes	1	2	NA
f) Physical plant	1	2	NA
g) Personnel and contractual salaries	1	2	NA
h) Travel expenses	1	2	NA

(IF NO ONGOING FUNDING HAS BEEN SECURED, CHECK THIS BOX…. ☐, THEN SKIP TO QUESTION 47.)

45. What are the sources of funding for any of the operating expenses mentioned in question 44 above? (*List the name of each funding source below*.)

1) _____

2) _____

3) _____

4) _____

46. Was the TIIAP grant helpful in securing additional funds to implement your plan?

Yes 1
(*Please explain*.)

_____

_____

_____

_____

No..... 2

47. What additional steps, other than securing funds for implementation expenses as mentioned in question 44, have been taken to implement the plan?

_____

_____

_____

48. With the information that your organizers have learned about implementing the telecommunications plan developed in the project, what advice would you give to other organizations that have developed a similar plan to help them with implementation?

_____

_____

_____

49. What future plans are envisioned for your project?

_____

_____

_____

50. Please give your name, title, telephone number, and the most convenient days/times to reach you. The information will be used only if it is necessary to clarify any of your responses.

Name
Title
Telephone (with area code)
E-mail address

Convenient days/times to reach you, if necessary.	
Day	Time
	☐ a.m. ☐ p.m.
	☐ a.m. ☐ p.m.
	☐ a.m. ☐ p.m.
	☐ a.m. ☐ p.m.
	☐ a.m. ☐ p.m.
	☐ a.m. ☐ p.m.

THANK YOU FOR ASSISTING US IN THIS SURVEY.
YOUR TIME AND EFFORT ARE APPRECIATED.

Please return this questionnaire in the enclosed envelope or send to:

TIIAP Evaluation
Westat
RA1105F
1650 Research Boulevard
Rockville, MD 20850

If you have any questions, please call Paul Tuss at 1-800-937-8281, ext. 4136