

# **Collected Case Study Evaluations: Summary of Findings**

Study Conducted by Westat  
For the U.S. Department of Commerce  
National Telecommunications and Information Administration

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# PREFACE

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The following report is being issued as part of TIIAP's ongoing evaluation initiatives designed to gain knowledge about the effects and lessons of TIIAP funded projects. This report is a summary of findings across case studies of 12 TIIAP projects. The case studies were designed to examine three topics: (1) issues particular to rural communities (2) issues particular to urban communities, and (3) challenges in sustaining information technology-based projects. This report addresses trends uncovered across the urban and rural sites and steps taken by projects to develop sustainable technology initiatives. The appendices provide a description of the process used to select the case study sites and contain a list of the interview topics.

The case studies, conducted under contract by Westat, an independent research firm, consisted of extensive review of project files and records, interviews with project staff, representatives of partner organizations, and project end users.

NTIA wishes to thank the case study participants for their time and their willingness to share not only their successes but also their difficulties. Most of all, we applaud their pioneering efforts to bring the benefits of advanced telecommunications and information technologies to communities in need. We are excited about the case studies and the lessons they contain. We believe that these projects provide a unique insight into the variety of ways to eliminate "the digital divide" which exists in our nation. It is through the dissemination of these lessons that we can extend the dividends of TIIAP-funded projects nationwide.

We hope you find this report valuable. You may obtain individual case study reports and other TIIAP publications through the NTIA website ([www.ntia.doc.gov](http://www.ntia.doc.gov)) or by calling the TIIAP office at (202) 482-2048. We also are interested in your feedback. If you have comments on these reports or suggestions on how TIIAP can better provide information on the results and lesson of its grants, please contact Francine E. Jefferson, Ph.D., at (202) 482-2048 or by email at [fjefferson@ntia.doc.gov](mailto:fjefferson@ntia.doc.gov).

Stephen J. Downs, Director  
Telecommunications and Information Infrastructure Assistance Program

# 1. INTRODUCTION

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As part of its ongoing evaluation of the Telecommunications and Information Infrastructure Assistance Program (TIIAP), Westat conducted site visits to 12 demonstration and access TIIAP projects in 1999. Eight of these projects were funded in Federal fiscal year 1996 (these visits focused on issues associated with urban and rural sites). The remaining four were funded in fiscal year 1994 and 1995 (these visits focused on issues associated with sustaining projects beyond the TIIAP grant period). This report provides an overview of common issues that were identified across these 12 sites.

## PURPOSE AND CONDUCT OF THE CASE STUDIES

The purpose of the site visits was to identify issues, innovative practices, and lessons that would be of use to current and future TIIAP projects. We targeted three types of projects—urban, rural, and initiatives that had demonstrated their capacity to remain operational well beyond the TIIAP grant period. These types of sites were singled out because of the special challenges they pose, and the need to develop a better understanding of factors that can facilitate project success. In addition, every effort was made to select sites that met as many of the following criteria as possible<sup>1</sup> (see Appendix A for a description of the process used to select the Year 2 case study sites):

- **Beneficiaries in extreme poverty.** All of the primary and alternative sites that we selected indicated in their project narratives that they would be serving rural/urban residents in areas plagued by high poverty and/or high unemployment.
- **Models for other communities.** We tried to select projects that were implementing an innovative approach that other sites might replicate or adapt.
- **Uniqueness of the project.** We attempted to identify projects that appeared to be using a novel or innovative approach that would be of interest to other communities. In addition, we attempted to exclude projects that appeared to be relying on conventional

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<sup>1</sup> During the first year of the study, we used random selection to assure that we visited a representative cross-section of the projects funded by TIIAP. Given the decision that the Year 2 site visits would be used to assess best practices, we used the site selection process to identify projects that might serve as models for other communities.

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approaches, e.g., linking school buildings to the Internet, establishing Internet access sites in public libraries.

- **Measurable community outcomes.** We attempted to identify projects that had delineated community outcomes that were tangible and attainable.
- **Duration and size.** We also reviewed the narratives to identify projects that were of sufficient duration and/or had leveraged ample matching funds.

During the 2-day site visits, we generally met with the project director, other key staff, project partners, and a sample of end users. In some sites, we also had an opportunity to observe a demonstration of how new technologies were being used by workers and community residents. The resulting case studies were used to address the following types of issues:

- What specific problem were the projects designed to address?
- What technical approaches did the projects use to ameliorate these problems?
- What were the characteristics of the projects' proposed end users and other beneficiaries?
- What was the role of the projects' partners and other stakeholders?
- What steps were taken to involve stakeholders and end users in the planning and implementation of the projects?
- What steps were taken to inform end users and other potential beneficiaries about the project-related activities?
- What steps were taken to provide end users and other beneficiaries with training and technical assistance?
- What impact did the projects have on the way in which services were delivered or accessed?
- What impact did the projects have on the overall community?
- What problems did projects encounter—and what steps did projects take to overcome these obstacles?
- What approaches did projects use—or propose to use—to sustain themselves beyond the TIAP grant period?

- What lessons did projects learn that could be passed on to other TIIAP grant recipients?

## **CHARACTERISTICS OF CASE STUDY SITES**

The Year 2 case studies were designed to collect information from access and demonstration projects that had implemented potentially promising practices that warranted further study. Exhibit 1 provides an overview of the 12 grant recipients. As discussed previously, one of our principal criteria for selecting the Year 2 sites was the use of an innovative approach to solving a problem commonly faced by communities. We therefore attempted to select projects that appeared to have undertaken approaches that went beyond simply providing access to underserved communities, e.g., by wiring a library or school building (this assessment was based on a limited review of grant applications, quarterly reports, and final reports). In addition, we looked for projects that were either addressing interesting problems or had developed content that would be useful in other communities and might warrant replication.

As shown in Exhibit 2, the five rural sites generally developed projects that were designed to ameliorate some of the difficulties inherent in living in an isolated region (e.g., lack of access to health care, inadequate telecommunications infrastructure for providing educational services). In addition, some of the rural projects we visited were designed to address more specific problems, such as providing interactive instruction at home to students unable to remain in a traditional school environment. The seven urban projects (including the four 1994 and 1995 sites that were selected because they had sustained themselves beyond the TIIAP grant period) represented a wider range of application areas and problem areas.

## **PROJECTS' STATUS AT THE TIME OF THE SITE VISITS**

Eight of the case study sites had completed their TIIAP close-out activities by the time of the site visit. The remaining four projects had received no-cost extensions. All of the projects were scheduled to be closed by September 1999. Several projects were still running in generally the same fashion they had been at the end of the TIIAP grant period. Two of the older projects had discontinued most of the activities initiated during the TIIAP grant period. They had, however, moved on to other, related projects. Only one project

had not yet begun actual operations of their system (the initial system was to be deployed soon after the site visit). The remaining two projects had almost completely shut down.

**Exhibit 1: Overview of the Grant Recipient Organizations  
Included in the Option Year 1 Site Visits**

<b>Project name</b>	<b>Grant year</b>	<b>Grantee organization</b>	<b>Grantee location</b>	<b>Application area</b>	<b>Award amount</b>	<b>Match amount</b>
Middle Schools Online	1996	Baltimore County Public Schools	Timonium, MD	ECLL	\$104,499	\$217,853
East Austin Community Network	1996	Austin Free-Net	Austin, TX	Community Networking	\$246,679	\$613,161
Interactive University Project	1996	University of California at Berkeley	Berkeley, CA	ECLL	\$650,000	\$5,033,513
Northern New Mexico Telemedicine Project	1996	Northern New Mexico Community College	Espanola, NM	Health	\$500,000	\$1,011,870
Regional Electronic Alternative Learning (REAL) Center	1996	North Central Regional Education Service Agency	Fairmont, WV	ECLL	\$350,000	\$827,857
South Coast Telecommunications Project	1996	South Coast Education Service District	Coos Bay, OR	ECLL	\$249,900	\$1,284,527
Tele-Network for Remote Pain Management	1996	Virginia Mason Medical Center	Seattle, WA	Health	\$235,434	\$474,499
Dakota Telemedicine System	1996	Medcenter One Health Systems	Bismarck, ND	Health	\$400,000	\$2,033,375
Harlem Environmental Access Project (HEAP)	1994	Teachers College, Columbia University	New York, NY	ECLL	\$450,000	\$651,919
Information Technology Initiative	1994	United Neighborhood Houses of New York, Inc.	New York, NY	Public Services	\$697,936	\$698,950
Plugged In – Learning Through Technology	1995	Plugged In – Learning Through Technology	East Palo Alto, CA	Community Networking	\$192,995	\$247,355
Greater New Orleans Free-Net	1995	University of New Orleans Business/Higher Education Council	New Orleans, LA	Community Networking	\$368,827	\$412,970

**Exhibit 2: Overview of Projects and End Users  
for the Option Year 1 Site Visits**

Project name	Project description	Project end users	Community type
Middle Schools Online	Electronic school-to-home project designed to link students and parents to school and library resources by placing computers in homes of 30 7th graders	Middle school teachers and students	Urban
East Austin Community Network	Local network to provide low-income residents access to the Internet through 9 access sites	Community members and community agency staff	Urban
Interactive University Project	Project to connect schools, community service organizations, libraries in high poverty areas	K-12 teachers and students	Urban
Northern New Mexico Telemedicine Project	Telemedicine project to develop virtual patient record for rural health clinics	Physicians, medical records managers in multiple clinics	Rural
Regional Electronic Alternative Learning (REAL) Center	K-12 project to enable harder-to-serve students to learn in home environment and provide online support services (access to counselors, health care providers)	Homebound students	Rural
South Coast Telecommunications Project	Community access network and virtual learning network	District and school staff, students	Rural
Tele-Network for Remote Pain Management	Two-way telemedicine network connecting 4 sites in rural clinics through teleconferencing equipment	Seattle-based and rural health care providers and their patients	Rural
Dakota Telemedicine System	Telemedicine project to provide new and expanded health care services to veterans and Native American veterans in rural regions	Physicians and specialists in hub hospital and rural clinics and their patients	Rural
Harlem Environmental Access Project (HEAP)	Project to install equipment and connect schools to a university and partner organization and provide extensive training	Teachers and students	Urban
Information Technology Initiative	Project to connect 5 settlement houses through LANs and a WAN for resource sharing and program activities for residents	Program staff and community residents	Urban
Plugged In – Learning Through Technology	Project to provide community information access and technology training to children and adults via an access center and training classes	Community members and community agency staff	Urban
Greater New Orleans Free-Net	Project to establish and expand a free-net that provides free public access to local information, e-mail, and Internet services	Community members, school staff and students	Urban/Rural



## **ORGANIZATION OF THE REPORT**

The remainder of this report addresses two key issues, i.e., trends uncovered across the urban and rural sites (Section 2) and steps taken by projects to develop sustainable technology initiatives (Section 3). Appendix A provides a description of the process used to select the 12 Year 2 case study sites. Appendix B contains a list of the generic study topics that were used to conduct the Year 2 site visits.

## 2. TRENDS ACROSS URBAN AND RURAL SITES

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As discussed in Section 1, 8 of the 12 Year 2 sites were selected because they were situated in urban or rural settings (in addition, the remaining 4 sustainability sites were selected—in part—because they were providing services to inner-city residents). The purposes of focusing on urban and rural projects were to (1) identify innovative practices that were being used to implement TIAP projects and (2) assess the range of challenges faced by projects serving inner-city and isolated rural communities. In spite of our initial expectations—that urban and rural technology initiatives face dissimilar obstacles—we did not find any significant differences in the types of barriers encountered by projects serving inner-city and isolated rural communities. Rather, we found that projects in both urban and rural settings sought similar objectives, encountered comparable obstacles, and relied on a core of common practices to implement their approaches. We have therefore concluded that, for the purpose of this report, the 12 projects that were visited should be categorized as having occurred in harder-to-serve communities (as opposed to urban or rural settings).<sup>2</sup>

This section describes the range of practices and obstacles that occurred across the 12 sites. Once again, it should be noted that these findings and trends may be unique to the type of sites we visited, that is, TIAP projects implementing an innovative approach in a hard-to-serve community.

### PRACTICES

In spite of their differing technology approaches, we did find that the case study sites adapted many of the same practices to implement their projects. Three trends in particular are worth noting:

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<sup>2</sup> It should be noted that three of the five rural projects we visited were designed to address health-related issues. The remaining two rural sites addressed educational problems. It is possible that we would have encountered different types of obstacles and approaches if we had visited rural projects that received funding through other TIAP application areas.

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- In most of the 12 sites we visited, partners<sup>3</sup> were active in project implementation. In fact, in at least seven sites, we found that the distinction between partners and project end users was blurred; that is, partners were actually using TIIAP-related equipment and could therefore be considered end users. This prominence of end users as partners represents a distinct change from what we found during the Year 1 site visits to 1994 and 1995 projects (where end users were typically considered to be the passive recipients of a given technology solution). It is not clear whether this trend reflects the types of projects we visited in Year 2 (i.e., applying innovative approaches in hard-to-serve communities), or part of a larger effort among 1996 TIIAP grant recipients to involve end users in planning and implementing their projects.
- The 12 projects undertook a variety of efforts to involve and engage their various stakeholders. Sites often noted that stakeholders' involvement was important for gaining project buy-in within the community, as well as for gathering feedback on project development and design. Projects generally identified three primary strategies for involving stakeholders: establishing advisory boards, holding regular project meetings, and conducting formal or informal needs assessments among prospective end users.
- Across the 12 projects, training models fell into three major categories: stand-alone sessions (7 sites), ongoing courses or a series of connected classes (4 sites), and train-the-trainer (5 sites). Significantly, the majority of sites employed more than one model. This was particularly the case when sites had more than one type of end user and/or when partners also served as end users; that is, projects used different models for different groups of people. We did not obtain any evidence that any of these three training approaches was more or less effective. Rather, we found that training appeared to be most beneficial when it was tailored to the needs, learning style, and availability of a given audience. One critical aspect that emerged was the importance of integrating instructional activities into normal work duties, rather than offering training on a voluntary basis or as an additional requirement.

An analysis of the practices and procedures employed by the 12 sites we visited suggests that there is no magic formula for implementing a TIIAP project. Successful strategies for using and maintaining partnerships, involving stakeholders, and training end users are very

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<sup>3</sup> We use the term "partner" in the programmatic sense, rather than the strict legal sense. Grant recipients described their partners broadly and generally included all organizations that worked with the project in some way. This is not intended to conform with TIIAP's definition for "partner," but is useful in describing the roles undertaken by various partners.

specific to a variety of interrelated factors (e.g., the overall approach, the skills and characteristics of the project’s end users, the type of community in which the project is being conducted). With so many intervening factors, within and beyond a grant recipient’s control, it is difficult to suggest which strategy is best for a given project.

Our review of trends does suggest that stakeholder and end user buy-in is generally a critical component of successful technology projects. Among the 12 projects we visited, the most successful appeared to have involved community stakeholders in their design and development phases. This inclusionary approach contributed to technology initiatives that met the needs of (and were therefore used by) their intended beneficiaries. Conversely, as is discussed in the next section, projects that failed to involve stakeholders and end users often found themselves struggling to gain community support for their overall approach. Moreover, we found that buy-in is important across all levels of project implementation, that is, among top-level administrators (who must often lend their support to staff training and other structural changes), end users (e.g., teachers and doctors), and other beneficiaries (e.g., students and patients).

## **PROBLEMS ENCOUNTERED**

The sites we visited, while largely successful, encountered and addressed a number of challenging obstacles. While some of these problems were experienced by a majority of projects (e.g., delays due to worse-than-anticipated technology infrastructures), others were unique to a given approach or locality. As stated previously, we found that the urban and rural case study sites experienced many of the same types of problems. As such, one general conclusion might be that communities that lack access to the information infrastructure can expect to encounter similar obstacles (described below).

**Technology Infrastructure.** The most frequently cited problems were related to the time, cost, and effort required to develop the infrastructures that supported the technological innovations. Nine of the 12 projects—and *all* of the rural initiatives—indicated that their communities’ existing physical infrastructures were either nonexistent or incompatible. These problems, which were generally discovered *after* a proposal had been formally submitted to TIIAP, often resulted in exorbitant fees and extensive delays for line installation, long-distance calls, or additional equipment to make disparate systems compatible.

In some cases, the problems were due to incompatible infrastructures, where end users (e.g., teachers, physicians) in multiple sites were using different systems. These problems

often necessitated additional equipment or the reconfiguration of an entire network. Equally important, they typically increased overall costs and resulted in significant implementation delays. In other sites, delays were caused by the lack of a telecommunications infrastructure in the project's region. While this problem was most common in rural settings, a number of urban projects also indicated that they were delayed by difficulties associated with wiring older buildings (e.g., schools, community centers). In rural sites, this problem was sometimes exacerbated by the need to work with multiple, small, independent telephone companies that provided service to the region (this lack of a single provider generally meant that projects had to engage in complicated technical arrangements to gain Internet service). Projects frequently found that smaller phone companies were reluctant to provide cost-effective Internet services to regions that were viewed as lacking other potential users (e.g., businesses, households). Also, rates for the small, independent phone companies often fluctuated over time, leaving projects concerned that their costs might unexpectedly increase in any given month.

**Underutilization.** Six projects reported that they had difficulty getting their end users to make full use of the technologies that had been deployed as part of the TIIAP initiative. In some cases, lower-than-anticipated use stemmed from a lack of buy-in, commitment, or even awareness on the part of partners or end users. In other cases, lower than expected utilization emerged after end users became frustrated with inadequate equipment or other recurring problems. In still other cases, the underutilization of project resources was attributed to end users' resistance to using new technology (this, in turn, was blamed for providers' lack of commitment to the project).

**Stakeholder and End User Buy-In.** While often the root of underuse, lack of buy-in was a frequent problem in and of itself. Seven of the 12 projects had difficulty generating interest in their efforts, obtaining the support of prospective end users (who often had no previous experience using e-mail and the Internet and, therefore, could not envision how the proposed system could transform their workplace), and/or gathering necessary high-level political and administrative support. Several sites also found that, by moving too quickly on too many tasks, they risked losing the trust and support of their stakeholders and end users. In most of these sites, this lack of stakeholder and end user buy-in was an initial obstacle that projects were able to overcome. In three sites, however, we found that projects' failure to gain the support of key stakeholders and/or end users eventually served to diminish their effectiveness and impact.

**Staff Turnover.** Eight of the projects indicated that insufficient staff, staff turnover, and difficulties hiring qualified technical staff created problems in implementing and sustaining their projects. In both urban and rural communities, projects found that it was difficult to

locate and/or afford competent computer specialists. Once technical staff were hired, projects were often unable to compete with the high salaries that such specialists were receiving in the more lucrative private sector.

**Partners.** Several projects had other problems with partners that were inherent to the grant recipient's or partner's organizational structure—or in the relationship that developed among participating organizations. In a number of sites we found that grant recipients and partners had developed different understandings of (1) their roles and responsibilities, (2) the types of services that would be provided to end users and other beneficiaries, and (3) what their projects were ultimately designed to achieve. Once again, we found that these problems were less pronounced in those sites that had invested in stakeholder and end user buy-in at the outset of their projects.

**Time.** Almost all of the projects indicated that they underestimated the amount of time implementation tasks would require, particularly with regard to technology. In most cases, delays were beyond the control of project staff, e.g., difficulties with existing equipment and infrastructure; installing new lines; purchasing, configuring, testing, and maintaining equipment. In some sites, however, these delays contributed to other problems, e.g., growing mistrust among partners and end users that the technology would function as planned. As a result, a number of respondents encouraged future projects to conduct feasibility studies (e.g., to identify and factor such delays into their timeline) and schedule additional time for implementation activities.



### **3. SUSTAINABILITY TRENDS**

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As discussed in Section 1, 4 of the 12 Year 2 sites were selected because they had successfully sustained themselves beyond the TIIAP grant period. Although the purpose was to identify sustainability strategies for future projects, we did not uncover any unique or innovative strategies that sites had used to remain operational over the long term. Rather, we found that sustainability—and project expansion—was most likely to occur when a project had devised and successfully implemented an approach that met a specific community need.

This section summarizes the steps that projects took to keep their technologies operational beyond their TIIAP grant period. It also identifies factors and practices that appear to increase the likelihood that technology projects will persevere and expand.

#### **SUSTAINABILITY STRATEGIES**

Among the 12 projects we visited, the strategies used to sustain projects generally fell into three categories (with projects generally relying on at least two of these approaches). Seven projects were seeking (or had obtained) private or public grants/donations. Five (closed) projects were looking to generate revenue through a fee structure or other process. Three grant recipients (and partners in five sites) were absorbing project-related costs. Only one of the 12 sites did not appear to be taking any steps to sustain itself beyond the end of the TIIAP grant period.

The four 1994 and 1995 “sustainability” sites relied on different strategies to keep their technologies operational over the long term. Plugged In – Learning Through Technology has changed its approach to meet the needs of its end users (at the time of the site visit, it was running a revenue-generating web-design business run by teens, in addition to its drop-in center). The Information Technology Initiative has encouraged its settlement house sites to build technology costs into the budget for all aspects of their programs, thereby spreading costs over a number of budget categories rather than leaving them a line item by themselves. The Harlem Environmental Access Project received a large grant to significantly expand its school-technology program under the name the Eiffel Project. Finally, the Greater New Orleans Free-Net collects user fees, is investigating a business underwriting support mechanism, and plans to sell its CD-ROM-based computer training system.



## **FACTORS THAT CONTRIBUTE TO PROJECT SUSTAINABILITY AND EXPANSION**

TIIAP is understandably interested in identifying factors and practices that increase the likelihood that its projects will remain operational over the long term and expand to serve additional end users and other beneficiaries. While we are able to describe the steps taken by the four “sustainability” sites to obtain ongoing funding and expand their operations, we are not able to make any comprehensive conclusions about the extent to which these strategies were innovative, successful, or even responsible for their long-term sustainability.

We are, however, able to make some general conclusions about factors that appear to contribute to the longer-term success of TIIAP-funded activities. First, technology projects that demonstrate their capacity to ameliorate a visible problem are more likely to have the stakeholder support needed to sustain their operations. Second, having sustainability as a project goal from the outset can keep stakeholders focused on the need to secure funding and devise longer-term strategies. Third, having a long-term technology plan (that extends beyond the life of the TIIAP grant) in place can help projects remain focused on the “bigger picture”—and the need to have a sustainability plan in place. Fourth, projects are well positioned to capitalize on the prestige of their TIIAP grants—e.g., by seeking influential partners and leveraging funds from other public and private sources.

Finally, our review of case study findings suggests that technology projects can increase the likelihood that they will be sustained if they rely on a series of best practices, including (1) conducting a needs assessment—to assure that the technology will be embraced and used by the intended beneficiaries, (2) conducting an up-front feasibility study—to assure that the approach can be implemented as planned, (3) involving stakeholders and end users in planning and implementation processes, (4) integrating technology into ongoing activities—such that it is viewed as a means to achieving something useful and durable (as opposed to becoming an end unto itself), and (5) collecting data that can be used to demonstrate and publicize the project’s benefits (to help attract ongoing funding). These and other best practices are discussed in more detail in the next section.

## 4. RECOMMENDATIONS FOR FUTURE TIIAP PROJECTS

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Over the past 2 years, we have conducted site visits to a total of 37 TIIAP projects—of which 29 were funded in 1994-95 and the remaining 8 in 1996. During each of these visits, we asked respondents to summarize the lessons that they had learned as a result of their efforts to implement their technology projects. In asking this question, we tried to get respondents to share any practical advice they would proffer to other grant recipients looking to develop a similar approach. Each of the 37 case studies prepared as part of this ongoing evaluation contain the project-specific lessons that were provided during the site visits—lessons that often pertain to a specific application area or technology strategy. What follows, therefore, is our attempt to identify some broader practices that future grant recipients—regardless of their location, project type, or application area—can use to overcome common barriers and develop sustainable technology solutions.

**Conduct a Comprehensive Needs Assessment Prior to Selecting a Technical Approach.** A number of the projects that we have visited over the past 2 years selected a technology before fully assessing whether the proposed approach would actually have the desired effect. In a few of these sites, an approach that made sense on paper failed to achieve the intended outcomes because little effort was made to survey prospective end users to see if they would actually use the new technology. Conversely, we found that projects that *had* conducted a comprehensive needs assessment prior to submitting their TIIAP proposal were generally in a better position to match their approach with the needs of their intended end users. We therefore recommend that prior to implementing a given strategy, grant recipients invest the time and effort required to determine whether they should use the approach (and, if so, under what conditions), as well as whether there are more cost-effective or efficient solutions that would have the same desired effect. In most cases, this can be accomplished through discussions with prospective end users and other community stakeholders about (1) the scope of the problem, (2) the range of desired outcomes—for both end users and the overall community, and (3) the full range of acceptable strategies that might be used to bring about these desired outcomes.

**Conduct a Comprehensive Feasibility Study Prior to Finalizing a Technical Approach.** Many of the grant recipients that documented the need for their project (and the willingness of prospective end users to use the resulting technology) failed to also assess the feasibility of implementing their proposed approach—within a specified

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timeframe—before submitting their proposal to TIIAP. These projects were often surprised by the amount of time required to assemble the partnership, obtain end user buy-in, develop the technology infrastructure, and collect baseline data. We therefore recommend that projects set aside 6 to 12 months to identify the full range of technical barriers (e.g., poor quality of the existing telecommunications infrastructure), organizational barriers (e.g., lack of strong commitment among some influential stakeholders), and management issues (e.g., need to hire technical staff with the requisite skills) that need to be addressed before the implementation phase.<sup>4</sup> Such a planning phase can also be used to align partners’ and end users’ expectations, work with telephone companies and other providers to assess the telecommunications capabilities of prospective end users, identify a realistic process and timetable for enhancing end users’ telecommunications capabilities, assess whether there are any alternative approaches that might be easier to implement, and collect baseline data that can eventually be used to assess the project’s impact.

We also recommend that the feasibility assessment process culminate in a formal document that identifies the “nuts and bolts” issues that need to be addressed. This document can then be used to provide stakeholders a detailed roadmap of how they will progress from their present status to where they would like to be. To paraphrase one respondent, “Do not proceed on a vision until it can be described in operational terms.”

**Involve Partners, Other Stakeholders, and End Users in All Phases of Project Planning and Implementation.** The least successful projects were often those that unwittingly forced a vision or approach on their stakeholders and end users—a strategy that increased the potential for differing expectations and conflicting goals. Conversely, the most successful projects generally sought input from their stakeholders and end users from the very beginning and involved them in every phase of the project. Methods included convening stakeholder meetings on a regular basis (as early in the planning process as possible), conducting focus groups (e.g., to learn what end users and other potential beneficiaries hope to gain from the project), and finding creative ways to facilitate an ongoing exchange of ideas between problem solvers (e.g., top-level administrators, computer technicians) and beneficiaries (e.g., the end users who are expected to rely on the resulting technologies).

**Establish Written Agreements with Partners.** The experiences of the case study sites demonstrate the importance of ensuring that the grant recipients’ and partners’ roles

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<sup>4</sup> It is worth noting that the more complex the strategy, the greater the need for a planning period that enables projects to assess whether their existing technology and staff infrastructures are sufficient to support the proposed approach.

are mutually agreed upon and put in writing in advance of the grant period. This not only generates project support and buy-in on the part of all stakeholders, but it provides a guide for implementation and a commitment by all parties through the grant period. While it is important that roles remain flexible and adaptable to the projects' changing needs, experience suggests that establishing mutually agreed-to roles enhances the likelihood that tasks will not slip through the cracks.

**Identify Specific and Measurable Objectives That Delineate How Technology Will Affect the Workplace and the Greater Community.** Many of the projects that we visited over the past 2 years focused on the achievement of broad and generic goals, such as enhancing “program quality through better integration and coordination of services” and increasing “the efficiency with which programs are administered.” The use of more specific targets (e.g., use online job search to find employment for 40 residents per month) can help managers and staff focus on *how* technology will be used to enhance program quality and efficiency. It can also serve to raise (or curb) staff expectations of what can be accomplished through the use of technology. An evaluation report for the Information Technology Initiative noted that

These targets force implementers to think through the design of specific changes to the organization (such as changes in technology, work policies and procedures, employee jobs, organizational structures, etc.) that are necessary to achieve these detailed target objectives. When such detailed targets are not present, the risk of *lapsing* into a “technology-push” implementation greatly *increases*. Technology-push implementations tend to focus on the IT [information technology] itself rather than on the organizational utility of the IT. That is, these implementations fail to address how specific IT features can be appropriated by specific individuals to accomplish specific work tasks within a specific organizational setting.<sup>5</sup>

**Do Not Try to Do Everything at Once. Start Small with a Function That Can Be Expanded and Enhanced as Time Goes On.** The experiences of several case study sites demonstrates the value of providing partners and end users with a series of small victories along the way to keep participants motivated, focused, and “hopeful.” Conversely, problems encountered in several sites suggest that projects should not attempt to implement too many strategies or activities at once—especially if stakeholders view the overriding approach as being too broad, expensive, or political.

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<sup>5</sup> Turner, Jon, et al. *Final Evaluation Report: Formative Phase of the United Neighborhood Houses of New York, Inc. Information Technology Initiative*. The Center for Research on Information Systems, New York University, October 1996.

Projects looking to implement a single approach in multiple sites should consider a pilot phase. This “pretest” can be used to identify operational issues that need to be resolved before the approach is rolled out to other sites. In addition, a successful pretest in a contained environment can serve as a strategic victory that alleviates the concerns of apprehensive end users and other stakeholders.

**Set Aside Sufficient Time and Resources for Training.** An important lesson from the case studies is that training is a critical component of a successful technology initiative. Projects should therefore incorporate a long-term training agenda into their implementation process. The lessons learned regarding training were varied, including the need to (1) solicit input from end users as to the content and format of training, (2) wait until equipment is in place before initiating a full-scale training effort, (3) develop training exercises that demonstrate how the technology fits into the workplace and embed training in the actual duties staff will be performing (e.g., train staff not only to use Excel, but also in the use of spreadsheets to perform an administrative function), (4) anticipate the need to provide some end users with training in such basic computer skills as keyboard functions, (5) provide training that is “strategic” (e.g., providing training to workers who perform a common function) as opposed to “opportunistic” (e.g., training a mix of individuals simply because it is convenient for them to meet at a given time), (6) institutionalize training (e.g., hold training sessions at the same time every week), and (7) gather feedback to evaluate the usefulness and depth and breadth of training in order to make mid-course corrections.

**Anticipate Staff Turnover.** The very nature of technology projects requires that end users have quick and dependable access to technical staff who can provide ongoing training, maintain the equipment, resolve problems, and identify new and useful products. In today’s economy, however, technology projects are often vulnerable to losing their technical staff to organizations that can offer higher wages, benefits, and career/educational advancement opportunities. Staff turnover can harm a project in many ways. At a minimum it can delay a project’s progress. If the problem persists, however, the loss of key staff can cripple a project’s technology ability to keep pace with end users’ demands. It is therefore important that projects remain aware of the potential for staff turnover and devise creative methods for overcoming the high cost of maintaining computer specialists.

**Do Not Wait Until the End of the Project to Think About Evaluation.** Timely and robust evaluations can help projects determine whether—and to what extent—their primary goals have been attained. These data can then be used for a variety of purposes, such as to identify and correct operational inefficiencies (e.g., shutting down inefficient or

underachieving operations) and to attract additional funding from other sources. Although we found few examples of strong evaluations, many of the respondents we interviewed indicated that, in hindsight, they would have benefited from having given more thought to evaluation at the outset of their project.

**Spread Ongoing Technology Costs Across Other Existing Program Activities.** In projects where TIIAP-funded technologies are being integrated into larger program activities, technology-related expenditures should not be viewed as stand-alone line items. Rather, technology-related expenditures can be spread across all existing programs that stand to benefit from the project (e.g., through continued access to computers and the Internet). In the words of a respondent that is making use of this approach, “We are not asking foundations to fund computers in literacy class. Rather, we are asking foundations to fund a literacy program that includes access to a computer.” This approach can minimize the likelihood that the long-term maintenance of technology becomes overly dependent on a single funding source.



## APPENDIX A: CRITERIA USED TO SELECT CASE STUDY SITES

This appendix outlines the criteria that were used to select the sites that were visited during Year 2 of our evaluation of TIIAP. As prescribed by the program, three of these visits focused on urban projects that were funded in FY96, five focused on rural projects that were funded in FY96, and four focused on projects funded in FY94 and FY95 that were still in operation at time of Westat's mail survey (summer 1998).

The purpose of these site visits was to explore in greater detail the experiences of projects that have implemented potentially promising practices that warrant further study. As is discussed below, every effort was made to select sites that would potentially serve as a model for other communities. Each of the resulting case studies was used to provide information on the following topics:

- The specific problem(s) the project was designed to address.
- The technical approach that was used to ameliorate these problems.
- Characteristics of the project's proposed end users and other beneficiaries.
- Role of project partners and other stakeholders.
- The project's effect on the way in which services are delivered or accessed.
- The project's impact on the community.
- Obstacles encountered by the project (and steps taken to overcome these obstacles).
- Lessons learned by the project.
- The project's plans for sustaining TIIAP-related activities beyond the grant award period.



## SELECTING RURAL AND URBAN CASE STUDY SITES

**Process Used to Identify 1996 Sites That Served Rural/Urban Populations.** The universe for the rural and urban site visits encompassed all of the projects that were initiated in 1996. We used the following criteria to *remove* projects that were *less* likely to serve as replicable models for current and future TIIAP-related activities:

- Of the 67 grants that were funded in 1996, we excluded the 2 projects that were never fully implemented (Atlanta Empowerment Zone Corporation and Fort Wayne Area Infonet). The remaining 65 grants included 23 Education, Culture, and Lifelong Learning (ECLL) projects (35 percent), 21 community networking projects (32 percent), 11 health projects (17 percent), 5 public safety projects (8 percent), and 5 public services projects (8 percent).
- Of the remaining 65 grants, we excluded the 12 planning projects. This decision was based on two assumptions. First, a primary purpose of the case studies was to obtain detailed information about projects that would potentially serve as models for other communities. Since TIIAP has de-emphasized planning grants, we decided to focus on demonstration and access projects. Second, our experience from the previous round of site visits suggests that demonstration and access projects make better case study subjects, since there is generally more to experience and discuss while on site. The remaining 53 demonstration and access grants included 21 ECLL projects (40 percent), 16 community networking projects (30 percent), 8 health projects (15 percent), 4 public safety projects (8 percent), and 4 public services projects (8 percent).
- Of the remaining 53 grants, we excluded the 2 projects that received less than \$75,000 in TIIAP funding. This was the cutoff that was used when selecting sites for 1994 and 1995.
- Of the remaining 51 grants, we excluded 3 projects that were located in Alaska or Hawaii. This decision was based on the assumption that the potential benefit of visiting these remote projects would be outweighed by the time and cost required to visit them.
- Among the remaining 48 grants, we excluded 13 projects that did not specifically indicate that rural or urban residents would be targeted as end users or other beneficiaries.<sup>6</sup> This left us with 21 rural projects and 14 urban projects.

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<sup>6</sup> These narratives appeared in the TIIAP publication *Fiscal Year 1996 Grant Awards*.

The 21 rural grants included 10 ECLL projects (48 percent), 6 health projects (29 percent), 4 community networking projects (19 percent), and 1 public services project (5 percent).

The 14 urban grants included 6 ECLL projects (43 percent), 6 community networking projects (43 percent), 1 health project (7 percent), and 1 public services project (7 percent).

**Criteria Used to Select Rural/Urban Sites.** We reviewed the project narratives (in the TIIAP publication *Fiscal Year 1996 Grant Awards*) for each of the 21 1996 demonstration and access grants that indicated they were designed to serve rural populations. We then reviewed the TIIAP monitoring files (i.e., application narratives, quarterly reports) to obtain more detailed information on 10 of these 21 projects. Finally, we spoke with TIIAP staff to gain a better understanding of what these projects actually accomplished. Based upon these reviews, we selected 5 primary sites and 1 alternative site that appeared most likely to serve as innovative models that could be replicated in other rural communities. The decision to visit 5 (as opposed to 4) rural sites reflected the fact that all of the sustainability sites we recommended were located in large urban centers. Adding an additional rural site from the 1996 cohort enabled us to focus 5 of the 12 visits on projects designed to serve residents in more isolated communities.

We also reviewed the project narratives (and in some cases, the TIIAP monitoring files) for the 14 1996 demonstration and access projects that indicated they were designed to serve urban populations. As a result of this review, we recommended 3 primary sites and 2 alternative sites that appeared most likely to serve as innovative models that could be replicated in other urban communities. Once again, the decision to visit only 3 urban sites reflected the fact that all of the sustainability sites we recommended were located in major metropolitan areas.

The following criteria (in order of importance) were used to select the rural and urban projects:

- **Beneficiaries in extreme poverty.** All of the primary and alternative sites that we selected indicated in their project narratives that they would be serving rural/urban residents in areas plagued by high poverty and/or high unemployment.
- **Uniqueness of the project.** We reviewed the narratives to identify projects that appeared to be using a novel or innovative

approach that would be of interest to other communities. Conversely, we tended to exclude projects that appeared to be relying on conventional approaches, e.g., linking school buildings to the Internet, establishing Internet access sites in public libraries.

- **Measurable community outcomes.** We reviewed the narratives to identify projects that appeared to have delineated community outcomes that were tangible, attainable, and novel.
- **Duration and size.** We also reviewed the narratives to identify projects that were of sufficient duration and/or had leveraged ample matching funds.

## SELECTING SUSTAINABILITY CASE STUDY SITES

**Process Used to Identify 1994-95 Sites That Sustained Operations Beyond the Grant Period.** The universe for the sustainability site visits encompassed all of the 1994-95 demonstration or access projects<sup>7</sup> that met all of the following criteria:

- Responded to the Westat mail survey (n=135).
- Were still in full operation or serving an expanded/changed function at the time of the Westat mail survey (summer 1998).<sup>8</sup>
- Had expanded to serve additional end users in locations or organizations beyond those targeted in the TIIAP proposal.<sup>9</sup>
- Had generated spin-off activities that provided additional services not included in the TIIAP proposal.<sup>10</sup>
- Had not been visited during the 1998 case studies.

We then used data from the 1998 Westat mail survey to examine the characteristics of these remaining projects. Of the remaining 35 grants:

- Fourteen (40 percent) were funded in 1994 and 21 (60 percent) were funded in 1995.

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<sup>7</sup> For reasons described earlier, we excluded the 48 planning projects that were funded in 1994-95.

<sup>8</sup> Item 81 on the Westat mail survey.

<sup>9</sup> Item 52 on the Westat mail survey.

- Twelve (34 percent) of the remaining projects were ECLL, 12 (34 percent) were community networking projects, 7 (20 percent) were public services projects, and 4 (11 percent) were health projects.
- Thirty (86 percent) indicated that their projects had been designed to address geographic barriers.
- Twenty-eight (80 percent) indicated that their projects had been designed to address economic barriers.
- Twenty-two (63 percent) indicated that they had provided services to impoverished end users or other beneficiaries.
- Twenty (57 percent) indicated that they had provided services to rural end users or other beneficiaries.
- Thirty-one (89 percent) reported “large” impacts for at least two of the seven strategic goals identified in the Westat mail survey (28 [80 percent] reported “large” impacts for at least three of the seven strategic goals).<sup>11</sup>

**Criteria Used to Select Sustainability Sites.** We asked TIIAP staff to review the list of 35 sites to identify projects that had implemented unique and sustainable activities that might be of interest to other communities. Based upon these recommendations, we refined the list to 9 projects. For each of these 9 projects, we reviewed existing documentation (e.g., the 1994 and 1995 project narratives, application materials, quarterly reports, closeout documentation) to identify 4 projects that (1) appeared to be using a novel or innovative approach that would be of interest to other communities and (2) appeared to have delineated community outcomes.

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<sup>10</sup> Item 56 on the Westat mail survey.

<sup>11</sup> Item 46 on the Westat mail survey.



## APPENDIX B: SUGGESTED INTERVIEW TOPICS FOR YEAR 2 SITE VISITS

### A. Background

#### ■ Community Characteristics

- Population size
- Demographics
- Distinguishing features that pertain to the project (e.g., high unemployment or crime rate)

#### ■ Characteristics of the Grant Recipient Organization

- General functions (e.g., coordinates technology issues for district's elementary and secondary schools)
- Role on the project (e.g., did most of the work, organized staff from other entities)

#### ■ Project Overview

- *Problems/Disparities the Project Was Designed to Address*
  - Disparities that exist within the population to be served (e.g., low rates of computer ownership and usage, lack of access to health care)
  - Barriers to access that are responsible for these disparities
- *Technical Approach*
  - How information infrastructure services and technologies are being used to address these problems/disparities
  - Brief description of equipment purchased by project for staff and other end users
- *Anticipated Outcomes*
  - Specific/measurable outcomes expected to occur as a result of the project
  - Longer term effects expected to occur as a result of the project

■ **Project Status at the Time of the Site Visit**

- Was project still in operation?
- Had number of end users/beneficiaries expanded/diminished?
- Had range of services expanded/diminished?

## B. Community Involvement

### ■ Partnerships

- Number/characteristics of organizations that entered into formal partnerships with the grant recipient organization
- Contributions of project partners (e.g., financial, equipment, personnel, space)

### ■ Community Outreach

- *Involving Community Stakeholders*—steps taken to involve end users and other community stakeholders in the planning and development of the project (e.g., holding open meetings, conducting needs assessments and surveys, conducting focus groups, meeting with community leaders, developing a steering committee or advisory panel that involves end users and other key stakeholders)
- *Project Outreach*—steps taken to inform potential end users and other beneficiaries about the availability of project-related resources
- *Training*—steps taken to support end users (e.g., training, ongoing technical assistance – of special interest will be steps taken to address the needs, skills, working conditions, and living environments of targeted end users)
- *Protecting Privacy*—steps taken to protect the privacy of end users and other beneficiaries (e.g., maintaining system security, preventing unauthorized access to information)

## C. Evaluation and Dissemination

### ■ Evaluation (i.e., plans for assessing project impact and effectiveness)

- Organization(s) conducting the evaluation
- Budget (e.g., total funds allocated for evaluation, percent of overall project budget earmarked for evaluation activities)
- Evaluation questions (e.g., questions the evaluation is seeking to answer, what project expects to learn from the evaluation)
- Evaluation strategy (e.g., overall approach, collection of pre/post data, types of data collected from end users and other beneficiaries)
- Problems encountered in conducting the evaluation (e.g., lack of expertise, low response rates to project surveys)





- **Dissemination** (i.e., plans for disseminating information about the project)
  - Presented findings at conferences and workshops
  - Hosted site visits
  - Published findings in professional journals

#### **D. Problems Encountered**

- **Partners/Stakeholders**
  - Loss of support (e.g., staff, financial) by a partner or community stakeholder
  - Lack of commitment and follow-through on the part of community stakeholders
  - Diminished political support due to a change in administrations
  - Communication problems (e.g., misunderstanding of roles)
- **Planning/Administrative**
  - Underestimated the financial resources needed to complete a specific task
  - Underestimated the amount of time/effort needed to complete a specific task
  - Change/loss of key personnel
  - Inadequate or underqualified staffing
  - Needs assessment obtained inadequate or insufficient information
  - Worked with outdated, insufficient, or poor quality data/information
  - Difficulty obtaining matching funds
  - Delays due to legal issues
  - Policy barriers
  - Significant change in project scope or focus
- **Technology**
  - Lack of availability of technology (within budget)

- Mechanical obsolescence (equipment became inoperable, unreliable)
  - Technological obsolescence
  - Technology not performing as expected
  - Delays purchasing or receiving equipment
  - Delays due to difficulties gaining line connections
  - Delays in installing equipment
  - Delays due to incompatibility problems with technology
- **End Users and Community Support**
- Resistance to change (e.g., among end users, partners, stakeholders)
  - Difficulty reaching potential end users
  - New technologies being ignored or underutilized by potential end users
  - Underestimated amount of training required by end users
  - Language/cultural barriers

**E. Project Outcomes**

- **Impact on End Users**—provide specific examples of how the project changed the way in which end users communicate with others, access information, deliver benefits, access benefits, perform their duties, or learn.
- **Impact on Other Beneficiaries**—provide examples of how the project benefited other beneficiaries and/or the overall community

**F. Sustainability and Project Expansion**

- **Strategies Used to Fund Project Activities Beyond the TIIAP Grant Period**
- Steps taken to solidify existing funding sources
  - Description of steps taken to identify new funding sources
  - Description of steps taken to generate new revenue streams (e.g., user fees)

- **Steps Taken to Maintain or Expand TIIAP-Related Partnerships**
- **Project Expansions**
  - Steps taken to exploit new opportunities made possible by advances in technology
  - Steps taken to serve additional end users (e.g., in the same community *and/or* in other communities not originally served by the project)
  - Steps taken to provide additional services (e.g., project spin-offs)

**G. Lessons Learned and Recommendations for Other Communities**

