U.S. DEPARTMENT OF COMMERCE
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Evaluation of the
Telecommunications and Information Infrastructure Assistance Program

Case Study Report

South Carolina's Information Highway (SCIway)
94014

Columbia, South Carolina

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PREFACE

On behalf of the National Telecommunications and Information (NTIA), I am pleased to share the following report that is one of a series of case studies conducted on grants awarded by the Telecommunications and Information Infrastructure Assistance Program (TIIAP) in 1994 and 1995. The case studies are part of the program's evaluation effort designed to gain knowledge about the effects and lessons of TIIAP-funded projects. NTIA contracted Westat, a research and consulting firm, to perform an independent evaluation of the program's first two years of grants. The evaluation consisted of a mail survey of 206 grant recipient organizations and in-depth case studies of selected projects. In February, 1999, the Commerce Department released Westat's evaluation report.

The projects selected for the case studies cover a broad range of program types and sizes, planning grants as well as demonstration grants, and they show varying degrees of implementation, sustainability, and replication. Westat selected the projects to represent a cross-section of all projects funded in the program's first two years. Specific selection criteria included geographic region, target population, project application area, project category, and size of award. To conduct each case study, Westat reviewed all project files, including progress reports and the final report, and conducted site visits. The site visits consisted of project demonstrations and interviews with project staff, representatives of partner organizations, and project end users.

NTIA thanks the case study participants for their time and their willingness to share not only their successes but their difficulties, too. 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 lessons they contain. It is through the dissemination of these lessons that we extend the benefits of TIIAP-funded projects nationwide.

We hope you find this case study report valuable and encourage you to read other TIIAP case studies. You may obtain additional case studies and other TIIAP publications, including the final Westat evaluation report, through the NTIA web site (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 this case study or suggestions on how TIIAP can better provide information on the results and lessons of its grants, please contact Francine E. Jefferson, Ph.D. at (202) 482-2048 or by email at fjefferson@ntia.doc.gov.

Larry Irving
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TIIAP CASE STUDY

South Carolina's Information Highway (SCIway)

A. EXECUTIVE SUMMARY

Before the TIIAP planning grant, the state of South Carolina had fragmented, poorly documented information infrastructure. Therefore, the goals of the SCIway project funded through TIIAP were:

- To identify and assess the effectiveness and efficiency of current electronic information services and resources in the state;
- To identify frequently requested public services and public information;
- To identify potential user access points to community information systems, particularly in rural and socially and economically disadvantaged areas of the state;
- To convene stakeholders to plan and develop the infrastructure that would be necessary to implement a plan;
- To identify user-friendly interfaces as a standard throughout the state;
- To estimate the educational and economic impacts of providing access to geographic regions not then served by a statewide information infrastructure; and
- To promote community awareness of these resources and plan to train a wide range of users.

The TIIAP planning project was highly successful in meeting its goals and, indeed, extended far beyond what was initially envisioned. Much of the success can be attributed to the extensive use of stakeholder input in both the planning and implementation activities, as well as its being customer(citizen)-oriented. The project did not attempt to use technology to solve a problem without first determining exactly what the problem was. Nor did it view technology itself as the solution; rather, technology was seen as a means to enable improved government performance.

The TIIAP project ended with the development of *SCIway Blueprint: A Plan for Developing the Public Portion of South Carolina's Information Highway*. The project has had considerable implications for government and public services in South Carolina through the implementation of the some of the major recommendations in the plan. Briefly, in terms of telecommunications infrastructure:

- Local telephone companies in the state have upgraded equipment and streamlined calling routes to support competitively priced Internet access in all but a very few areas in the state.
- Local Internet Service Providers (ISPs) now operate in all geographic regions of the state.
- All public schools and libraries in the state have Internet connections and satellite receivers. Some schools and most district offices have hook-ups with the capability to originate programming.

Beginning with a major restructuring of government in the 1990s and subsequently supported by the TIIAP grant, government is adopting a new service concept: citizen as customer. To support this commitment:

- The state legislature is in the process of passing electronic signature legislation, which will allow government business to be conducted over the Internet.[1]

- Government agencies are now encouraged to have as much public information as possible available to South Carolina citizens on the Internet. This effort, championed by the Information Resources Committee, challenges agencies to review their core competencies and services with an enterprise view and determine how those services could be provided more effectively.

- Collaboration within and across state and local government agencies has grown significantly and has been supported by a movement to a cabinet form of government.

- Major portions of the state are being mapped using information the latest technology. In a majority of the state's counties, all residences and businesses will be assigned street addresses. Having GIS map information on the Internet will ease the processes of zoning, residential and business development, taxation, and county and property boundary determination.

- The 29 local telephone companies formed a partnership committee, called Lightstar Partners, to coordinate the design and development of the state's telecommunications infrastructure. As the first effort of its kind in South Carolina, the Lightstar Partners have worked closely with the government, the largest customer of telecommunications services in the state.

While many of the specific findings of this project may apply only to South Carolina, the planning and implementation processes may be applied elsewhere. In particular, two important lessons learned would be of benefit to others. First, staff noted that even when all agencies are involved in at least an advisory capacity, a large project still requires a champion of the goals of the project in each office. Institutional buy-in is important, but it is enthusiastic and motivated individuals in leadership roles who make things happen. Secondly, throughout the planning and implementation phases of the project, staff have learned that content development and affordable connectivity must develop simultaneously. If one component is developed before the other, progress will be hampered and neither will be effective. Moreover, not only is initial content development difficult, but the culture of technology requires constant updating. In long-range infrastructure planning, the staff learned that their focus had to be capability rather than any particular technology.

B. OVERVIEW

Purpose and General Approach

The primary goal of this project was to develop a plan for extending and improving the public portion of a statewide community information system that could serve as a catalyst for the South Carolina

[1] Since the time of the site visit, digital signature legislation has passed and the Governor signed it into law both on paper and electronically. When regulations are completed, government business will be able to be conducted through e-mail, public access kiosks, bank automated teller machines, and other media and emerging technologies.

state government, as a whole, to transition to a statewide telecommunications network offering electronic access to essential services and information. The State Budget and Control Board, with the contracted services of the Appalachian Council of Governments (ACOG), would develop a plan using a successful community area network, AppNet, as a model for an expandable, seamless system of state and community networks providing ready access to online government information and services. The initial goals of the plan were:

- To identify and assess the effectiveness and efficiency of current electronic information services and resources in the state;
- To identify frequently requested public services and public information;
- To identify potential user access points to community information systems, particularly in rural and socially and economically disadvantaged areas of the state;
- To convene stakeholders to plan and develop the infrastructure that would be necessary to implement a plan;
- To identify user-friendly interfaces as a standard throughout the state;
- To estimate the educational and economic impacts of providing access to geographic regions not then served by a statewide information infrastructure; and
- To promote community awareness of these resources and plan to train a wide range of users.

The three key elements considered vital to the project's ultimate success through the implementation of the plan, although outside of the grant award, were to develop the following:

- A state telecommunications infrastructure,
- An expanded community networking system, and
- Useful content for citizens.

The planned network was designed to facilitate citizen access across the state. Planners said simply that end users of SCIway would be all South Carolinians. This included residents in disadvantaged and rural areas. During the implementation phase, extra attention was paid to rural regions. For example, several of the rural county libraries are very small. Staff there lacked the technical skills and experience with telecommunications technology to install and upgrade systems, and so were aided by the state.

The plan was also designed to benefit business. One of the economic development goals of ACOG and the state is to attract businesses. To do this, rural areas need educated citizens, good schools, and other services. The Internet allows a large, rural state such as South Carolina to offer these services more efficiently. For example, advanced placement courses in some rural high schools are being taught through two-way satellite hook-ups, upgrading the quality of course offerings in these schools.

Description of Grant Recipient and Project Partners

Grant Recipient. The grant recipient organization was the South Carolina State Budget and Control Board (BCB), which plays a key role in the management of state government. Collectively, the offices of the BCB have responsibility for technology and procurement, budget development, economic forecasting and impact analyses, local government infrastructure support, information technology planning, the government health insurance and personnel systems, and the government's telephone and existing telecommunications systems. The grant was awarded to the Office of Research and Statistics (ORS) because of its planning nature. However, when implementation began, the project was managed by a team from ORS and the Office of Information Resources (OIR), which has responsibility for operations in the state.

Several Budget and Control Board staff members contributed significantly to the project. The assistant director of OIR, who went with the project from the Office of Research and Statistics to OIR, co-wrote the application and managed the grant and its implementation. The director of the Office of Research and Statistics administered the original grant money. A staff member in Office of Research and Statistics, the only staff member paid under solely grant funds, conducted the telecommunications infrastructure assessment for the entire state. Staff in OIR worked on the network design and implementation and an assessment of existing technology infrastructure in government. The Webmaster in OIR is the Webmaster for the state, supports web activities for a number of state and local government entities, and monitors web usage on the state home page server. The statistical and research analyst at OIR works largely on dissemination and outreach activities for the network. The director of OIR serves as a co-chair of the Governor's Information Resources Committee, which grew from the grant and provides oversight to strategic information resources planning in the state.

Project Partners. The main partner for the TIIAP planning project was the Appalachian Council of Governments (ACOG), a voluntary regional organization of six county governments and their 43 municipalities in the upstate region. The upstate region includes areas that range widely in level of infrastructure development and, at the time, included cities where Internet technology was beginning to make a difference and rural areas where technology had not yet reached. ACOG focuses largely on helping local governments acquire state and federal funds for economic and community development, and works with them to improve their services in areas such as planning, financial management, public works, purchasing, computerization, personnel systems, and general public administration. Prior to the TIIAP grant, ACOG had developed AppNet as a successful, if struggling, community network. BCB felt that ACOG and AppNet would provide the best return on their investment during the short 18-month grant period, because ACOG already had an Internet presence and some resources available. AppNet could serve as a community information network model for the state, both for content and cost.

The information services manager at ACOG brought the idea for the plan to the BCB and co-wrote the TIIAP application. She conducted the early survey of telecommunications in the state and continues to work on sustainability issues. ACOG subcontracted the writing of the plan, the SCIway Blueprint, to a consultant, the Director of Information Services for The Citadel.

South Carolina Educational Television (SCETV) advised during the planning stages. SCETV's focus was on the infrastructure necessary for developing and extending their video network used in distance learning projects. It also works on content development for the business and education communities. The South Carolina Department of Education was also involved in an advisory capacity during the planning period. It was also engaged in a major statewide technology planning initiative coordinated with the activities of the TIIAP grant.

In addition to AppNet, two other community networks were involved in the planning process. CoastNet, a network services and information resources co-op connecting Charleston area colleges and libraries, and MidNet, a community information service that provides low-cost e-mail and text-based Internet access to Columbia area residents, were already developed, though neither as broadly as AppNet.

The Robert Wood Johnson Foundation provided a match to the BCB to improve the use of telecommunications in health statistics. The Annie E. Casey Foundation provided funding to BCB to develop the South Carolina Kids Count Databook, which uses the Internet to report demographic and epidemiological data for children in the state. The TIIAP grant underwrote the posting of this information on the Internet.

Two partners were added after the grant was awarded. The South Carolina State Library (SCSL) provides support for all public libraries in the state and responds to the information needs of state government agencies. SCSL worked primarily on the content development as a resource for the kinds of information that might be needed on the state network, including providing access sites, online databases, and training for state employees, library staff, and the public. A staff member at SCSL worked with all public libraries in the state to develop their infrastructure and training systems for users and other trainers. He also coordinates the Citizen Access Committee of the Information Resources Council.

The final partner organization, the Lightstar Partners, contributed significantly to the development of the plan. South Carolina is served by 28 small telephone companies serving primarily rural areas and BellSouth serving the metropolitan areas. The Lightstar Partners came together to be competitive with the larger BellSouth and had worked together prior to the grant period for other business purposes. To develop the infrastructure necessary to support a statewide network, the project staff saw the need to involve the independent telephone companies and BellSouth. TIIAP provided the phone companies another venue and a clear goal for working together. Motivated by the potential of future profits and the obvious benefits for education and economic development, the 28 independent companies, with BellSouth, formed a committee and basically built and upgraded the electronic information infrastructure, even assisting wiring schools and libraries.

Project Costs

Of the $430,000 federal grant, the BCB retained $100,000 for the state infrastructure assessment. The grant money funded one full-time staff member who worked with the telephone companies to determine what infrastructure was currently available and what would be needed to implement the plan. The remaining funds were subcontracted to ACOG, which in turn subcontracted the writing of the plan.

All matching funds were provided through in-kind contributions by the State Budget and Control Board, the Appalachian Council of Governments, BellSouth ($100,000 in-kind consulting), and the Robert Wood Johnson and Annie E. Casey Foundations. Robert Wood Johnson and Annie E. Casey fund the BCB for other projects with $1.2 million and $15 million, respectively, to support research and the development of information on the health status of South Carolinians and the status of children. BCB staff used work on these projects to contribute to the planning. Thus, the match was technically through the BCB, but the funding originally came from the foundations.

C. PROJECT CONTEXT

Community Description

About 45 percent of South Carolina's almost 3.5 million residents live in rural areas. The state stretches from the Atlantic coast to the Appalachian mountains. The large cities of Charleston, Columbia, and Greenville are in different regions of the state. About 12 percent of families in the state, ranging from 6 percent in some counties to 33 percent in others, live below the poverty line. BCB staff reported that South Carolina students have among the lowest standardized test scores in the country.

Status of Telecommunications/Information Infrastructure Environment Prior to the TIIAP Project

In 1989 the BCB's Division of Information Resource Management (later changed to Office of Information Resources) contracted with BellSouth and MCI to create the state government backbone of T1 lines in eight regions. It provided a low-cost voice and data network for state agencies through dial-up modem service. In 1990, four state agencies with about 200 locations were using the state's first shared data network, the State Data Network, on these lines.

In the early 1990s, a 4-year project conducted by the University of South Carolina and the South Carolina Department of Education and funded by BellSouth had attempted to develop a statewide network for teachers. The project initially connected 18 schools and eventually reached 1,100 schools, providing e-mail access only. However, most schools were ill-equipped to use their connections due to a lack of telephone lines in the schools and to availability of only AppleIIe computers. Most teachers involved used the system from home.

In 1990 there was no public dial-up Internet access in South Carolina. Only Clemson University provided an Internet connection (at 1200bps). Since then Internet service providers (ISPs), web developers, and hosting services have grown in South Carolina. Consequently, private industry in South Carolina soon developed a strong presence on the Internet. However, the public sector lagged far behind.

D. PROJECT IMPLEMENTATION

Activities/Milestones that Occurred Prior to the TIIAP Grant Period

Initial Telecommunications Study. When ACOG conducted a telecommunications availability study in 1991, they found that although two universities had local networks and Columbia and Charleston had fiber optic connections, there was virtually no connectivity in the upstate region and no libraries and few technical colleges had telecommunications capabilities. ACOG received a small grant to connect three libraries and two technical colleges with one Internet address. When they found this was very limiting, the public libraries put up over $15 million to expand the only existing state network. The network ran on a frame-relay cloud with dedicated lines and a discounted group rate. ACOG was the first agency to negotiate rates between providers.

Planned Educational Networks. Around the same time, the state government was also beginning to see a need for infrastructure development. After the State Department of Education and the University of South Carolina determined that the statewide network for teachers was not feasible for connecting more schools, their next plan was to provide technical colleges with modem pools and dial-up access. This would

have covered 91 percent of the schools in the state. But they discovered there were not enough phone lines available in the state to shoulder this increased burden. In addition, it was discovered that exactly where local phone line boundaries were and from what phone numbers and to what phone numbers a local call could be made was not well documented.

TIIAP. The ACOG staff learned about the TIIAP program, but did not know how they could use it. Neither that region nor the state had a comprehensive infrastructure plan. The information services manager at ACOG went to the state to suggest that a partnership between the state and regional governments would be mutually beneficial.

State staff were initially skeptical, but when high level officials gave the go-ahead, the ACOG information services manager and the assistant director of the BCB's Office of Research and Statistics spent 2 weeks planning how they could work together. Both acknowledged that this was probably the first substantial state and local government collaboration and project development in which they had been involved. They recognized early on that they must be able to clearly convey the benefits of the project to state agencies that would be involved. After they made presentations to each of the key agencies, they found that each agency wanted to write a piece for the application based on its own agenda and each wanted its own share of the money. Through cooperation, consensus, and strong leadership, a TIIAP application was produced.

The grant provided a focal point around which to build consensus among the partners; project staff feel that federal money provided a weight and legitimacy to the statewide information resources planning effort. Both the telephone companies and local ISPs were supportive of the project. Rather than seeing the state project as competition for their market share, they saw it as actually building demand for their products and services. The project would provide citizens access to technology that would increase demand for telecommunications services.

Activities/Milestones that Occurred During the TIIAP Grant Period

Infrastructure Assessment. The Budget and Control Board's main task was to conduct an infrastructure assessment of the state. A staff member of the Office of Research and Statistics, Information Technology Planning Branch analyzed the availability of local dial access to the Internet and used those data to identify underserved areas of the state. At that time, this information was not well documented. Based on information published in the directories of BellSouth and 28 independent telephone companies and visits to school sites and libraries, he developed a database of local calling areas (i.e., given the first 3 digits of a 7-digit telephone number, which other 3-digit prefixes were a local, unmetered call). All of the phone companies provided copies of the relevant pages, and this information was typed into a flatfile database. This database was then merged with a database of modem pool numbers of the emerging community of ISPs in the state to determine who had local call access to one or more commercial ISPs. Similar databases were developed to identify which public schools, regional and municipal branch libraries, and health care organizations had access.

The outcome of the analysis was that the Lightstar Partners, a consortium of independent telephone companies interested in expanding their market of telephone lines and developing an asynchronous transfer mode (ATM) network, were provided a venue for working together toward a clear goal. An ATM network provides high-speed connections that support data, voice, and video applications on the same line. The Lightstar Partners saw that such a database would indicate the location of unserved markets.

Citizen Surveys. As part of the website and content development demonstration task, ACOG conducted a web-based survey to determine what users like and dislike about AppNet and what public information and services they needed or would use if available. Staff collected all the e-mail addresses they could, including all university users in the state. In addition, ISPs in the state sent surveys to all of their subscribers. They received over 1,000 responses, many of which were very detailed. The survey results were difficult to tabulate because of the exploratory nature of the questions. However, the results formed the basis of the *SCIway Blueprint* assessment of what information and services citizens would like to see developed and implemented using Internet, e-mail, kiosks, and ATM technologies. The survey is kept on the ACOG website as a source of ongoing information gathering.

SCIway Blueprint. The direct result and goal of the TIIAP grant was the *SCIway Blueprint*, written by a consultant for ACOG. The *SCIway Blueprint* was developed using the infrastructure assessment and the user surveys. It explains why developing South Carolina's Information Highway is important both for citizen access and government effectiveness. After defining important technology-related terms, it explains how providing public information on line is useful, how government agencies can be connected to each other and the Internet, how to help citizens access and use the systems, and how to coordinate and promote the development of SCIway.

Steps Taken to Sustain Project Activities Beyond the TIIAP Grant Period

Information Resources Council (IRC). The *SCIway Blueprint* recommended that the newly formed Information Resources Council adopt the *SCIway Blueprint* as its benchmark and guiding document on citizen access enabled by technology. The IRC was created in March 1996 by Governor Beasley as a group of public and private sector leaders who would guide the development of policies, standards, and programs for utilizing information resources to support effective government and a statewide information resources management strategy. The IRC is not a legislatively constituted governing body, but its strategic tasks are far from advisory; committees are working on such diverse issues and tasks as telemedicine, geographic information systems, privacy issues, inter-operability standards, minimizing data redundancy, electronic commerce, and school and library technology, among others.

One of the IRC's committees is devoted entirely with citizen access issues and is guided by the *SCIway Blueprint*. The Citizen Access Committee is charged with developing a consistent and widely available set of policies, procedures, services, and delivery mechanisms that enable universal access to public information. The Content Subcommittee is developing a state information policy addressing the issue that taxpayers have already paid for information to be on the Internet, and should not have pay again for the same information, and it is establishing guidelines by which government should make information available, including fees. The Intranet/Internet Subcommittee is developing policies for developing, operating, and managing government websites with valuable information, requirements for updating information, and other systems to ensure consistency and usability. The Electronic Commerce Subcommittee is developing legislation that will enable electronic signatures that will improve state procurement as well as citizen's ability to do business transactions that normally require a written and signed record over the Internet.[2]

The Citizen Access Committee is also investigating the utilization of public access terminals, such as kiosks, that could be located in Social Service offices, employment offices, and libraries, or at bank ATM

[2] This legislation passed in spring 1998, several months after the site visit.

machines. Several issues are being considered, for example, hours of access and who would be responsible for maintaining the terminals and other equipment. The group is considering using existing bank ATMs as information sites where citizens could renew driver's licenses or conduct other state business. The feasibility of public access sites and ATMs in particular hinges on digital signature legislation, which would make personal identification numbers (PINs) legally binding.

K-12 Technology Initiative. The governor asked the legislature to fund a 4-year program to provide Internet access to all schools and libraries. The 1996-97 budget included $20 million: $10 million for network connectivity, Internet access, staff development, and software; and $10 million for hardware, satellite equipment, and private sector video distribution for distance education. The 1997-98 budget includes another $28 million to continue the network connectivity and distance education activities. Support for the school technology initiative was provided by the telephone companies, SCETV, the educational community, and the State Library.

Activities/Milestones that Occurred Following the TIIAP Grant Period

Infrastructure Development. With information from the infrastructure assessment and the opportunity to expand their markets, the phone companies virtually built the entire infrastructure and continue to maintain it. They anticipated that connections in schools and libraries would create a demand for connections in private homes and that providing lines for the schools and libraries could only improve their markets. The state established a proprietary listserv for the ISPs, providing regular updates identifying un- or underserved markets where business opportunities exist.

K-12 Technology Initiative. After the legislature appropriated the $20 million for school technology, the BCB staff used information from the infrastructure assessment for network design and implementation. The objective was to meet the needs of local schools, including Internet access, administrative applications, software support, and file server maintenance. Originally, staff planned to establish a wide area network (WAN) behind a firewall for each district and library, but cost feasibility dictated that they connect the districts and libraries to the backbones in each of four Local Access and Transport Areas (LATAs), within which telephone companies can provide services. Using lines provided by the Lightstar Partners, communications among the districts, the state department of education, and other state offices can occur without going out on the network and without the possibilities of running out of bandwidth. Schools were provided with a minimum of a dial-up connection, but if they had at least five computers, they were provided with a 64K dedicated line. Schools with 75 or more computers are given T1 lines. The state made the commitment that schools would not be limited by capacity and bandwidth and will upgrade connectivity when the need arises.

Many schools did not have local area networks or only small ones for administration and record keeping. With support from local telephone companies, many participated in the national NetDays. It is estimated that schools in South Carolina have held over 450 NetDays. BellSouth and the Lightstar Partners donated NetDay wiring kits to schools as well as the labor and technical expertise to complete the wiring. Moreover, some of the telephone companies routinely send workers to schools to pull wires for free on slow days. In terms of reaching rural areas where the most disadvantaged citizens live, they found that they only had to ask the phone companies to extend service and rarely had to bang on doors.

The schools were connected before the libraries, but the libraries were easier to connect because they are fewer in number, smaller, and more centrally controlled than the schools. The public libraries in the

state allocated all of their 1996 federal funding ($700,000) to connection activities. The State Library had some funding and technical support and now has wired all libraries.

User Training. The State Library provides two or three free training sessions per week for librarians and other state employees. Working on a training-of-trainers model, they ask those they instruct to go back and train their staffs. Training of the public has not been formalized at the state level and is conducted largely at the local level. Some libraries have brought in community volunteers to work with users.

The State Department of Education's Regional Training Centers were among the first sites connected under the K-12 Initiative. They also operate on training-of-trainers model, so when the system was rolled out, there would be staff already able to use it. The field staff was doubled to support users and continues to conduct trainings monthly.

Outreach. In the past couple of years, BCB staff have taken the plans for telecommunications all around the state with display materials purchased with TIIAP funds. They believe this publicity is very important in educating the public on what technology is available and what it can do. Staff have taken their "Traveling Technology Road Show" to 20 sites in the past 2 years, including conferences, state offices, schools, and teacher inservice trainings. They also talk with teachers about Internet problems such as plagiarism and inappropriate sites. They generally recommend that schools and districts do not use blocking software, and instead use supervision and teach responsible surfing and ethics. At the school shows, each student has the opportunity to use the Internet for 5 minutes.

For the past 3 years, staff have taken the technology exhibit to the State Fair. Their 20 by 60 foot booth has eight networked computers for use by fair-goers. Staff also conduct video conferences with state officials, promote SCINET Days, display multi-media and high definition television capabilities, and register voters on-line. As a promotion, they hold computer give-aways with prizes of surplus and donated computers. Staff estimate that 20,000 to 30,000 people have come through their booth in the past three years. The state has also taken the display booth to a trade show on South Carolina business and economic opportunities to their sister state, Rheinland-Pfalz, Germany.

Issues

Content vs. Connectivity. One issue the project has faced from the start is the dichotomy between affordable connectivity and content. Without affordable connectivity, citizens would not have access to government information and services or the Internet. But without valuable content, citizens would have no cause to use their affordable connectivity. Results of surveys found that access to government information and services is useful to the extent that the information and services are useful. Even as both strands are developed at the same time, the content development and infrastructure and technical people need to communicate to make sure they are working together.

The developer of the SCIway Web contends that the state has still not adequately addressed content. Developing useful information that is easily accessible continues to be a challenge. Ongoing AppNet surveys and other user surveys and the work of the IRC should help in this area.

Problems

Reaching Rural Areas. Staff were initially concerned that they would have difficulty providing access to citizens in rural areas. However, the local telephone companies and BellSouth cooperated with each other, OIR, and the state legislature to bring Internet access to rural areas. Local governments, particularly those in rural areas, have not supported the development of information technology as much as the regional and state governments have. The state and regional governments recognize a fundamental difference in that rural governments have little incentive to implement systems that may cause them to lose jobs to technology. Only pressure from citizens can help, and until the citizens have the awareness of applications and other services on line from other government entities and access to the technology that supports those applications and services, they will not apply that pressure. BCB and ACOG staff acknowledge that this is a very slow, but steady process.

Sustainability. The greatest issue that continues to face South Carolina's information technology system is sustainability. Their challenge is both to continue funding information technology and to keep the content side continuously updated. If the systems are not kept updated, users cannot and will not use the information and services.

BCB staff have explored alternative strategies for continued funding to information technology initiatives. Several strategies exist for increasing state funding: information technology bonds, expositions to educate legislators on the value of information technology, and the dedication of all-purpose taxes to information technology. To maximize existing investments, the state can lease existing government-owned antennas, sell value-added public information, and allow all agencies that use information technology to streamline their work and keep the savings rather than returning it to the general fund. The staff is also investigating further opportunities for public-private partnerships and foundation and corporate grants.

The APPnet Board is offering 50 percent matching grants in the upstate region for local governments to develop their own infrastructure. APPnet's funding comes largely from ACOG, which itself faces financial sustainability issues. One solution they are beginning to implement is to produce products such as directories, publications, and economic profiles that can be sold. They are also investigating the business plans of other local networks, such as Charlotte's Web in North Carolina.

Both AppNet and the SCIway Web are looking into the use of advertising to generate revenue for the web pages. AppNet has recently become a 501(c)3 nonprofit organization so that it can have paid sponsors but decline what it considers to be inappropriate sponsorship.

D. PROJECT ACCOMPLISHMENTS AND IMPACT

Because the TIIAP grant was for a planning project only, most of the accomplishments are beyond the goals of the original grant and represent outcomes of the implementation of the plan.

Technology-Related Accomplishments

Infrastructure Development. By the end of the grant period in 1996, all but 50 of 1,157 schools and almost all 180 public libraries (95 percent of the intended group) had Internet access.[3] Virtually all students have access to the Internet at their schools or libraries, if not both. Ninety percent of districts have dedicated lines, and 10 percent have dial-up connections because they do not have the local infrastructure to support higher speed lines. Most school districts also have a wide area network, and all schools have dedicated lines to the WAN. One district is using entirely ATM fiber optic lines, one of the most sophisticated technologies available.

When the Office of Information Resources issued an RFP to find a new ISP for the state, several of the large providers came in and said they were not interested because the South Carolina market was already saturated. BCB staff reported that the Educational Testing Service cites South Carolina as one of the four states with all schools connected to the Internet and that South Carolina has the highest quality connections in schools.

SCIway Web. A direct result of the surveys conducted by ACOG and a consultant, the SCIway Web is an Internet website (http://www.sciway.net) dedicated entirely to South Carolina culture, business, history, government, and tourism, among other things. It is organized with indices and directories that link to external websites. The SCIway Web is maintained entirely by a consultant working at home and by volunteers. He estimates monthly maintenance costs of $2,000, mostly for labor. Designed for repeat business, the website uses only minimal graphics. It contains many downloadable resources, such as the South Carolina Statistical Abstract.

SCINET. The South Carolina Information Network (SCINET) encompasses the set of network services that the Budget and Control Board's Office of Information Resources provides for state agencies, local governments, public schools, and libraries. It grew from the original State Data Network and now includes three computer networks, a combination computer and long distance telephone network connecting schools and libraries, a compressed video network, and MetroNet (a Columbia local area network). SCINET also has a website (http://www.state.sc.us/network.html) linking various services, such as voter registration, state procurement and technology policies, job announcements, and links to community network sites, SCIway, the K-12 Initiative, and SCILS (described below). While the SCINET system was begun prior to the grant, its growth has been attributed largely to the TIIAP grant. The information provided on SCINET was designed in response to the surveys conducted by ACOG and AppNet.

SCINET also provides an intranet for state government employees. The intranet is a password-protected service designed to increase internal efficiency by refocusing state employees from serving other state employees to serving citizens. The intranet system provides many of the forms and policies state employees need for travel, procurement, and other transactions.

Impact of Project on Direct End Users

Internet Usage. Internet usage has skyrocketed in South Carolina. The OIR web server (the state government's main server) has had numbers of raw hits[4] increase from 241,984 in January 1996 to

[3] By July 1998, 100 percent of schools were connected to the Internet, and 95 percent have a 56K link.

[4] The BCB Webmaster, and the counting software he uses, defines a "raw hit" as each item pulled up. For example, one page with four graphics counts as five raw hits.

2,059,298 in January 1998, an 851 percent increase in 2 years. In 1993, only the Department of Natural Resources had a home page. In January 1997, 57 state agencies had home pages, and 1 year later, 75 agencies had web pages; including higher education sites, 86 percent of all state agencies have home pages.

Number of raw hits on the Office of Information Resources web server

1996					
Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**
241,984	267,866	302,173	313,036	316,477	316,391
Jul	Aug	Sep	Oct	Nov	Dec
354,721	370,349	380,325	509,651	552,302	412,573
1997					
Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**
673,107	749,369	898,451	1,109,781	1,061460	1,051,023
Jul	Aug	Sep	Oct	Nov	Dec
1,157,448	1,113,490	1,293,261	1,553,186	1,274,839	1,433,480
1998[5]					
Jan	**Feb**	**Mar**	**Apr**	**May**	
2,059,298	2,199,857	2,767,090	2,957,802	2,768,191	

Note: The statistics shown here represent the main server, on which approximately 66 percent of the individual agency home pages reside. The other third reside on 23 other servers, mostly educational institutions and some commercial ISPs.

AppNet also reports increases in usage. The most frequently visited sites on AppNet are job listings (mostly during the week) and history (mostly on weekends). Other topics are business, government, schools, libraries, media, weather, recreation, tourism, relocation and retirement, and chambers of commerce.

The SCIway Web is also reporting increased usage, particularly from out-of-state users. As a directory or index of linked items, SCIway Web does not generate content. However, attesting to its popularity, in recent months organizations and business have been asking to be linked through the SCIway Web. The most popular links are newspapers, particularly obituaries.

The BCB does not have usage statistics for the schools and libraries, but they are certain that the benefit to teachers, students, and families is great.

Financial Benefits. The Budget and Control Board was eligible for Universal Service Fund (the E-rate) discount on telephone lines for all schools and libraries. The billing is structured such that all bills go directly to the BCB without the schools having to see them. This has improved efficiency for both the budget office and the schools. The BCB estimates that the E-rate has the potential to make available up to $5 million of funds that can go back to the schools to purchase more computers.

ACOG staff believe that the state would not have been as timely and focused in addressing the issue of school connectivity and Internet access if not for pressure from local government and citizens. Citizens had to be educated on the opportunities and possibilities for technology before they could push for it. The expansion of information technology around the state has been empowering for citizens.

[5] Data for February through May 1998 were added after the site visit.

Impact of the Project on Other Beneficiaries and/or the Overall Community

During the planning process for the grant, 28 independent telephone companies and co-ops and BellSouth came together as the Lightstar Partners. While not an unprecedented collaboration, Lightstar contributed an important task in implementing the technology plan: the independent companies worked together to lay the wiring throughout the state. The companies continue to cooperate and coordinate their work for information technology in South Carolina.

Impact of the Project on Grant Recipients and Project Partners

Government Processes. Almost all staff on the project cited the changes in how government works in South Carolina as one of the greatest benefits. Making government information and services available on the Internet to citizens has contributed significantly to a refocusing of government to service to citizens and viewing citizens as customers. The technology has supported managers in individual offices in improving government business processes. And the planning and implementation processes have encouraged collaboration across state and local government agencies. Planning for the grant application and the actual plan developed under the grant has created a "synergy between state offices all the way down to the lower level people who really do the work," one staff member commented. Moreover, state agencies and employees are connected and can conduct business with each other much more simply and efficiently.

One of the project's consultants called the experience an arduous journey that he many times thought might have been a big mistake that would not accomplish anything. He attributes its success to the fact that it did not develop in a vacuum, nor did it develop in academia or the bureaucracy. It was only with zeal and passion that the state could do so well.

Information Resources Council. KPMG conducted an audit of the entire South Carolina state government and was very positive about the potential for the IRC to make changes in how government works for citizens. They acknowledged that the IRC was not a panacea, but that it presented the best opportunity in a long time for cross-governmental collaboration and coordination. Its strength comes from having the governor behind it. Currently $300 million is being spent on information technology in the state, and the IRC wants to make sure it is being spent efficiently.

Project Goals Not Met

In terms of the TIIAP planning grant, the plan developed has been extraordinarily useful and successful, and has spun off many unforeseen improvements in information technology in South Carolina. In terms of the recommendations of the plan, the content and usability of the information resources developed and the increased interactivity that the state government offers its citizens is still a work in progress.

Impact of TIIAP Support on the Initiative

The director of OIR noted that without the grant, the citizen access component of the IRC would not have been nearly as far along. In fact, citizen access and the *SCIway Blueprint* is the cornerstone of the IRC. The results of the infrastructure assessment created a groundswell in the telephone and ISP market,

particularly with the state government as the anchor tenant. The assistant director said that the process opened up the dialogue and identified the opportunities for expanding the telecommunications infrastructure and the uses for information technology. Both felt that the timing of the project was critical; the funding came at the right moment when people and systems were ready to change.

F. EVALUATION AND DISSEMINATION

Evaluation

OIR is planning another infrastructure assessment to follow up on the survey conducted during the planning phase. They continually monitor web server usage and adjust content appropriately. Section D-2 above describes these efforts.

Dissemination

Aside from outreach activities at schools, the state fair, and presentations to state agencies, the Budget and Control Board has done little dissemination about project activities and accomplishments outside of South Carolina.

G. LESSONS LEARNED

Diligence in Identification of Stakeholders. The BCB attributes its success largely to its ability to bring all stakeholders together at all stages of planning and implementation. They saw the importance in establishing an enterprise-wide environment early on where those who would be involved in the implementation were heavily involved with the planning as well. By starting early with all groups in the public and private sector, they were able to get the buy-in of stakeholders who could then feel ownership with the project when the implementation began. The public-private partnership spanning all government levels was critical in both the planning and implementation phases.

Staff noted that even when all agencies are involved in at least an advisory capacity, a large project still requires a champion of the goals of the project in each office. Institutional buy-in is important, but it is individuals who get the work done.

Content vs. Connectivity. Throughout the planning and implementation phases of the project, staff have learned that content development and affordable connectivity must occur simultaneously. If one is developed before the other, neither will be effective. Moreover, not only is initial content development difficult, but the culture of technology requires constant updating. In planning an infrastructure system, the staff learned that they must also plan for the future. For example, in the schools that were wired early there is frequently not enough bandwidth for the content that schools now require, such as compressed video.

Flexibility. Project staff noted that the benefit of adequate planning time is that they could investigate different technology options without committing to one. In several instances they began down one path but were able to back up and start down another, more appropriate one.

H. FUTURE PLANS

Library Services. A project that is just getting started is the South Carolina Information Locator Service (SCILS), an online directory designed to help citizens find publications, services, records, and other information created by or for the state government. The BCB, State Library, and the SC Department of Archives and History, with a grant from the National Historical Publications and Records Commission, are planning and developing the prototype system. Users will be able to find out what the resources are, and when they are available in electronic form, users can access them directly through links on the web page. For each resource, the SCILS record will describe the information or service and explain why it was created, how it is made available, whom to contact for additional information, the costs, and the format options. The search capabilities will be different from Internet web searching because the key words to search will be more closely linked to the exact information and users will not have to know the state agency or program providing the information.

It is anticipated that because it is centralized, SCILS will enable agencies to provide frequently requested information more efficiently and cost effectively. It will also make it easier for agencies to locate and share information. Federal agencies are required to participate in a Government Information Locator Service (GILS), and many states are implementing similar systems to be consistent with the federal GILS. They plan to eventually expand the document base to include local government and other information.

One key issue with electronic information concerns how such information will be archived on a system that is not yet fool-proof. Committees for SCILS and the IRC are working to determine how long information remains on line and whether hard copies of reports and other resources need to be archived.

The State Library is also working on a virtual library system that would provide full test databases, including general news, academic research, home health, and business information. The State Library and Department of Education have made a budget request of $1.5 million to purchase the databases. Annual costs are estimated to be $700,000. The databases would be available through network connections and provide the same research databases to every school, university, and library in the state.

Additional Surveying. ACOG will continue to solicit information from users on their website. Also, OIR is planning another survey on the connectivity of schools and libraries.

Infrastructure Development. Another recommendation in the *SCIway Blueprint* is to integrate the various school WANs. Putting routers between the LATAs was a first step. They are considering using the existing infrastructure and encouraging private companies to upgrade capabilities. New ATM LATA lines will expand the bandwidth for distance education.

Additional Services Offered. One of the most popular and rapidly growing sites on SCINET is the state jobs page. An idea from the user survey, the pages provide job seekers a central site for state job announcements. The project started as a voluntary system with three offices listing open positions in 1996. By 1998, 30 agencies listed positions. A new system is planned that will list all state jobs through the Human Resources office. All jobs announcements will be electronically sent to Human Resources, and new jobs will be posted each night. Users will be able to visit kiosks in state employment offices and print out listings and applications. As digital signature legislation is developed, job seekers will be able to apply for jobs on line.