

**U.S. DEPARTMENT OF COMMERCE  
National Telecommunications & Information Administration**

Evaluation of the  
Telecommunications and Information Infrastructure Assistance Program

**Case Study Report**

**The Trans-Border Information Technology Collaborative (TB-ITC)  
University of Texas at El Paso  
94056**

**El Paso, Texas**

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Site Visitors: John Lockwood and Debra Prescott

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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](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 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](mailto:fjefferson@ntia.doc.gov).

Larry Irving  
Assistant Secretary for Communications and Information

## **TIIAP CASE STUDY**

### **The Trans-Border Information Technology Collaborative (TB-ITC) University of Texas at El Paso**

#### **EXECUTIVE SUMMARY**

The project originally began as a 12-month planning project to improve the information infrastructure for the City of El Paso. The grant recipient was the University of Texas at El Paso (UTEP), which became the lead agency in the Trans-Border Information Technology Collaborative (TB-ITC), a consortium of organizations and agencies formed to conduct telecommunications planning for the region. The TB-ITC is a collaborative effort involving a variety of educational institutions, businesses, governmental agencies, and community-based organizations within the region encompassing western Texas, southern New Mexico, and northern Chihuahua, Mexico. The organization has focused primarily on education but also has tested and explored different uses of state-of-the-art software and videoconferencing equipment for the delivery of education, health, art, government, and business communication requirements across the entire region.

Providing an impetus for the direction of the planning was a fiber-optic donation made by a local cable company, Paragon Cable of Time Warner. This donation was made to TB-ITC for educational purposes only and allowed an economical means of linking distance learning sites and providing other educational applications. Other funding in the area was also supporting educational telecommunications projects, so the project took on an educational focus. Indeed, early information from the project's task forces supported this direction.

Since planning activities were not perceived as being very visible to the community, the TB-ITC moved to organize a period of demonstration that illustrated the various applications of telecommunications technology for the area. So in early 1996 the project held a post-planning demonstration phase. The demonstration was coordinated with a number of vendors that loaned TB-ITC equipment for the exhibit and helped show the community the possibilities of the technology. For example, demonstrations of software, telemedicine, and videoconferencing were all featured. These demonstrations showed that the system was viable, could save time and money, and could expose people to new avenues of communication and learning.

As the project evolved, it has become a sophisticated distance learning network with the UTEP, New Mexico State University (NMSU), the Universidad Autónoma de Ciudad Juárez (UACJ), the El Paso Community College (EPCC), and several other University of Texas (UT) campuses participating. This network includes the delivery of instructional television and interactive courses that all earn the same college credit as on-campus courses. In spring 1997, the EPCC Distance Learning Network *alone* delivered nine videoconferencing classes to distant sites using the area's fiber-optic network. This was in addition to the distance classes taught by UTEP, UACJ, NMSU, and others. On the horizon are courses offered via the Internet as part of the newly created virtual University of Texas, the UT Telecampus, which features web-based instruction ([www.com/telecampus](http://www.com/telecampus)).

The main issue that TB-ITC had to face concerned the dynamics of the planning group. The TB-ITC was a group of people that had rarely, if ever, worked together. This led to mistrust, committee factions, and impatience with committee members. However, these problems were largely overcome through systematic meetings, involved leadership, and good communication.

The accomplishments of the projects include improved access to educational programs through distance learning, improved access to the National Information Infrastructure (NII), and increased regional cooperation. The project has also reportedly helped to reduce stereotypes of the region and opened funding streams that before the grant were not forthcoming. One of the greatest accomplishments was proving that the demonstration could be done across the boundaries of cities, counties, states, and nations. That proof became, according to one TB-ITC member, “the battering ram to knock the door down for other technologies to be represented at the table.”

The work of the TB-ITC can be judged a success, partly due to its accomplishments and partly due to the lessons learned, including:

- **People are the key** -- people need to be able to work together and decide on some common principles in order for the project to go forward.
- **Be aware of political implications** -- people may be more interested in publicity for their own group, rather than for the project as a whole.
- **Communication is essential** -- a diligent effort on the part of the membership to communicate needs to be made, e.g., through a website, newsletter, or articles in the local newspaper.
- **Try before you buy** -- demonstration allows a project to see the commitment of vendors and to determine if the hardware/software will meet the project’s needs.
- **Keep looking for funding** -- throughout a project, the membership needs to keep applying for funding.

The technological future for TB-ITC and the El Paso area appears to be bright. The success of the telecommunications development in the area seems to be directly attributable to the vision of the project director and the funding sparked by the TIIAP planning grant. The organizations that banded together for the planning project maintain routine contact with each other and feel that they have done a great deal in the education area through distance learning. TB-ITC is currently moving to redefine itself and decide how the member organizations should branch out to integrate other telecommunications applications.

## OVERVIEW

### Purpose of the Project

The project originally began as a planning effort to improve the information infrastructure for the City of El Paso. During the first planning meeting it was decided that the scope of the project would be expanded to include the tri-city area of El Paso, Texas; Cd. Juárez, Mexico; and Las Cruces, New Mexico. This led to changing the name of the project from the El Paso Information Technology Collaborative (EPITC) to the Trans-Border Information Technology Collaborative (TB-ITC).<sup>1</sup> The group assembled various education and business leaders to develop a telecommunications system that would go beyond the state and national borders and across the different organizations involved.

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<sup>1</sup> Funds were still controlled by UTEP and dispersed only for planning activities. The international direction of the grant was not directly funded by the TIIAP grant. The inclusionary nature of the planning committee allowed a diversification of the TB-ITC membership without a significant change in the way the grant was managed. At no time were funds provided to UACJ, Cd Juárez., or Mexico to expand their information infrastructure. The grant did however provide UACJ with a leveraging tool to garner funds from the Mexican government to further bolster regional telecommunication capabilities.

The project director and two co-directors of the project were administrators at the three universities in the area, University of Texas at El Paso (UTEP), Universidad Autónoma de Ciudad Juárez (UAJC), and New Mexico State University (NMSU). Thus, the project took on an educational emphasis with the goal of, according to one of the co-directors, “facilitating access to the knowledge explosion for the community.” Of particular concern was the importance of providing access to the National Information Infrastructure (NII). To achieve this goal, the area has invested in developing a distance learning network ([www.UTEP.edu/tdl](http://www.UTEP.edu/tdl)) to serve the needs of the region’s diverse population.

More specifically, TB-ITC has stated its purpose as follows.

*The overriding goals of the effort include: the development, more widespread availability and equitable access to the advanced telecommunications and digital-based electronic networks to better and more efficiently promote the new socio-economic agenda the region has set for itself under NAFTA. The collaborative effort is conceptualized as an opportunity to get on the ground floor of the Infobahn and the expected new socio-economic realities of life in the 21st century. We see these changes as a driving force in the explosive merger of video, telephone, and computer technologies to bring neighborhoods, schools and educational institutions, health and medical facilities, related human services, business, governmental agencies and homes together for a virtually seamless pipeline for the effective and efficient sharing of resources and transfer of information, knowledge and know-how to people and places where it can most effectively make a significant difference in quality of life for all.<sup>2</sup>*

To this end, the project tested and explored different uses of state-of-the-art software, the Internet, and videoconference equipment for the delivery of education, health, art, government, and business messages across the entire region.

Indeed, this 12-month planning grant was seen by the organizers and partners as an opportunity to harness the necessary resources to:

- Convene the partners in the strategic alliance for systematic, comprehensive planning discussions to design and develop a structure for connectivity;
- Make configuration recommendations, and outline costs, strategies, products, services, and users;
- Tap appropriate outside expertise;
- Conduct relevant needs assessment studies and focus group discussions for targeting key user groups and services, as well as strategic business partnerships;
- Facilitate the development of the necessary knowledge base;
- Acquire the resources to expand and enhance the technological network infrastructure; and
- Share the outcomes of the planning effort on a more widespread basis as it moves from the planning to demonstration and implementation stages.

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<sup>2</sup> Taken from their website ([www.utep.edu/tbitc](http://www.utep.edu/tbitc)).

## **Grant Recipient and Project Partners**

The grant recipient was the University of Texas at El Paso, which became the lead agency in the TB-ITC. The TB-ITC is a collaborative effort involving a variety of educational institutions, businesses, governmental agencies, and community-based organizations within the region encompassing western Texas, southern New Mexico, and northern Chihuahua, Mexico. The organization has focused primarily on education but reports that it is “currently focusing on the areas of health and human services, education, workforce re-tooling, community and business development.” In addition, the TB-ITC is interested in the role that telecommunication media and emerging telecommunications technology will play in the implementation of the new socio-economic agenda for modernization of the border region.

The list of partners at one time included 55 members, but the list of contributing members is somewhat shorter. Contributing members include:

- ANDA of El Paso
- City Government of El Paso
- Coldwell Foundation
- Envision Technologies Corporation
- El Paso Community Foundation
- El Paso Community College
- Huntleigh Telecommunications Group, Inc.
- KCOS Public Television (Channel 13)
- Paragon Cable/Time Warner
- Providence Memorial Hospital
- Region 19 Education Service Center
- Rio Grande Free Net
- Robert E. and Evelyn Mcgee Foundation
- Texas Trans-Pecos Library System

Although contributions totaling over \$105,000 were collected from many of the partners, the local cable company made the most impressive contribution. Paragon Cable, a division of Time-Warner, donated the use of four strands of fiber in their fiber-optic ring to TB-ITC for educational purposes. This allowed an economical means of linking distance learning sites and the growth of the TB-ITC network. Other involved corporate partners included vendors that loaned equipment to TB-ITC for the demonstration phase of the project.

The main partners of the TB-ITC were the grant recipient and two other universities. The project director was located at UTEP, the grant recipient, and the two co-directors were located at NMSU and the UACJ. Educational and corporate partners that are described below.

**UTEP – The Grant Recipient.** The University of Texas at El Paso (UTEP), the second oldest of the 16-campus University of Texas system, was established in 1914. It is located on the El Paso-Juárez border and is the largest Hispanic-majority university in the United States. The university's student population closely mirrors the demographics of the region from which UTEP draws more than 85 percent of its students.

- Forty-six percent male, 54 percent female; 65 percent Hispanic, 3 percent African American.
- Average age: undergraduate 25, graduate 35.
- Eighty-five percent from El Paso County commute daily.
- Eight percent Mexican nationals.
- Forty-five states and 67 countries are represented.
- Seventy percent are employed.
- More than 50 percent are first-generation university students.
- Fall 1996 enrollment was 15,393.

UTEP employs 819 full-time and part-time faculty, 94 percent of whom hold a doctorate or equivalent in their field. UTEP's six colleges (business administration, education, engineering, liberal arts, nursing and health sciences, and science) and the graduate school offer 60 bachelor's, 53 master's, and 7 doctoral programs. UTEP's annual research expenditure is \$33.8 million. Funding comes from such agencies as the U.S. Department of Commerce, the National Science Foundation, the National Institutes of Health, the Department of Energy, the Environmental Protection Agency, and the National Endowment for the Humanities.

UTEP faculty, staff, and students are engaged in a broad range of outreach activities that try to ease the social needs of El Paso and the surrounding area. The university's outreach and social programs include the following:

- The Kellogg Foundation-funded Institute for Border Community Health Education, which provides outreach to medically underserved areas.
- The El Paso Collaborative for Academic Excellence, a UTEP-based coalition of higher education, public school districts, and the community, which is committed to increasing the academic achievement of this region's children.
- The Texas Manufacturing Assistance Center, housed at UTEP's Institute for Manufacturing and Materials Management, which provides technical assistance to more than 700 small and mid-sized manufacturing operations in this region.
- The College of Business Administration's Franchise Center and the Family and Closely Held Business Forum, which are major resources for local economic growth and development.

- The Office of Technology Planning and Distance Learning (TPDL), which spearheads the design, development, and delivery of all formal and non-formal distance instruction from UTEP's new high-tech Undergraduate Learning Center.

The Communications and Technology Planning Program at UTEP received the TIIAP grant. Later, other parts of the campus, including the College of Education, the Fine Arts Program, and the Museum, joined the project as partners.

**NMSU.** New Mexico State University (NMSU), established in 1888, is in the southern New Mexico city of Las Cruces, which has a population of approximately 75,000. Fall 1997 enrollment at NMSU's main campus was 15,067, with minority enrollment being about 42 percent (36.1 percent Hispanic, 2.5 percent American Indian, 2.2 percent African American, and 1.3 percent Asian American). There are approximately 700 regular faculty members on the main campus, 78 percent of the full-time faculty have their doctorates. The university offers 75 bachelor's, 50 master's, and 20 doctoral programs.

NMSU is characterized by the Carnegie Foundation as a level one research institution; NMSU had research expenditures greater than \$104 million in 1996-97. The campus has two of the state's five Centers for Excellence, one in computing and one in plant genetics, as well as the physical science laboratory.

NMSU's distance education program is directed by the Office of Distance Education, and coordinated, facilitated, and delivered by the Center for Educational Development. It offers a variety of graduate and undergraduate courses, seminars, and short courses that are broadcast statewide and nationally. Transmission is via analog or compressed Ku band satellite uplink, T-1, microwave, ITFS, two-way compressed audio/video, or videotape delivery.

NMSU is a founding member of the Electronic Distance Education Network, a New Mexico consortium of higher education institutions delivering education throughout New Mexico using electronic technologies. It is also a member provider for the National Technological University, televising graduate level industrial, electrical, and environmental engineering courses nationally.

**UACJ.** Ciudad Juárez is the sixth largest city in Mexico and its university, the Universidad Autónoma de Ciudad Juárez (UACJ), is second in technology only to the National University in Mexico City. UACJ is made up of four colleges: The College of Architecture, Graphic Design, and Art, the College of Biomedical Sciences, the College of Social Sciences and Business Administration, and the College of Engineering and Engineering Technology.

The College of Engineering and Engineering Technology is of most concern for this report because it is in the forefront of distance learning on the Mexican side of the border. In addition to the distance learning facilities that have recently been established in the College, it is also equipped with workstations and labs for studies in physics, micro-processing, and a host of other scientific applications. The UACJ co-director of the project is presently the Dean of this College; during the grant period he held the title of Director of the Center for Information Technology and Telecommunications at UACJ.

**Other Educational Partners.** Other educational partners are playing a major role in building the regional infrastructure through distance learning technologies. These partners include the public schools of Texas' Region 19 Educational Service Center, the El Paso Community College (EPCC), and the public library system.

Region 19 is made up of three school districts that serve El Paso -- El Paso Independent School District, Ysleta Independent School District, and Socorro Independent School District.

- El Paso Independent School District – has 10 high schools, 12 middle and junior high schools, 1 technical center, 4 elementary/intermediate schools, and 49 elementary schools. September 1994 enrollment was 65,194.
- Ysleta Independent School District – has 7 high schools, 1 career center, 10 middle/junior high schools, 32 elementary schools, 2 K-8 schools, and 2 pre-K schools. September 1994 enrollment was 48,119.
- Socorro Independent School District – has 2 high schools, 4 middle schools, and 12 elementary schools. September 1994 enrollment was 18,881.

The EPCC is one of the largest comprehensive community colleges in the nation. The college consists of three campuses with a total enrollment of 19,780 students for accredited courses and 7,500 students in non-accredited courses. It offers associate degrees in science, arts, and applied science, as well as certificates of completion in other courses of study. Basic programs at the EPCC include:

- Advanced Technology Center (ATC) -- designed to provide training to meet the specific needs of local industry including customized training in CAD/CAM, plastic injection molding, computer numerical control, plastics technology, electronics, pneumatics, hydraulics, statistical process control, mold making and repair, and tool and die.
- Customized Training Department -- serves business, industry, and government agencies by providing training needs assessment, customized training, and education programs that meet their needs at the site and time chosen by the client.
- Occupational Education -- 89 occupational education programs, leading to an Associate of Applied Science or Certificate of Completion.
- Arts & Sciences -- engineering, physics, biology and chemistry, leading to one of 40 Associate of Arts or Associate of Science degrees.

**Corporate Partners.** The TB-ITC network held a month long technology demonstration in the months of February and March of 1996; the vendors that supported the demonstration part of the project included:

- Huntleigh Telecom – Provided a T-1 Connection
- IBM – Provided PCs
- AT&T – Provided Telecom Equipment
- SabreData – Provided hardware & tech support
- CISCO Systems – Provided routers & ATM equipment
- Fujitsu – Provided ATM equipment
- Norstan Communications – Provided CLI video equipment & voice PBX system
- V-Tel – Provided video equipment

- Southwestern Bell – Provided an ISDN demo
- Apple Computer – Provided Macintosh computers
- Envision Technologies – Provided hardware & tech support

Many of the partners had never worked together before the grant. Indeed, one great success of the project, according to the board members, is that it linked city and university administrations together. This was true on several levels. First, it involved the universities in a dialogue about technology development for the region. Second, it motivated the mayors of El Paso, Las Cruces, and Cd. Juárez to initiate face-to-face communication with each other – for the first time. This governmental link-up was done through a videoconferencing set-up supported by the universities.

### **Project Costs**

For the planning grant, the TIIAP contribution was \$105,093 with matching funds from the partners.

Since the TIIAP planning grant was awarded to UTEP, other federal monies have also been at play in the community. These included two additional TIIAP grants, U.S. Department of Education Challenge Grants, and National Science Foundation (NSF) funding as an Urban Systemic Initiative and a Star School site. In addition, in 1994, El Paso Community College received a \$1.75 million Title III grant from the U.S. Department of Education to set up an interactive videoconferencing network to reach the outlying areas of El Paso County and the Upper Rio Grande Valley.

Funding also came from the state level. One funding stream was the Texas Telecommunications Infrastructure Fund (TTIF) of the State of Texas. This fund is a state technology initiative that collects money for telecommunication and other technology uses from a tax levied on the telecommunications industry. TTIF's specific charge is to help develop the telecommunications infrastructure that connects public entities such as public schools, public libraries, 2- and 4-year colleges and universities, and the public health system in Texas. It is governed by a nine-member board of directors that controls the disbursement of approximately \$1.5 billion in revenues through loans and a formal grant program. To augment existing efforts to develop the state's telecommunications capabilities, TTIF places particular emphasis on the universal service aspects of the NII.

TTIF's work began officially in November 1995 when the TTIF Board was formed. In June of 1996, TTIF's executive director was hired, and later that year, additional staff was added. An interim Master Plan was published for public comment in November 1996. At the same time, TTIF's first request for proposals (RFP) was issued. In January 1997, TTIF awarded \$25 million to 111 schools throughout the state, one-third of which were rural, and two-thirds of which represented disadvantaged school districts. TTIF recently made approximately \$101 million available through a non-competitive grant process to provide Internet connectivity to Texas public schools. The TTIF Board will also affect technology training programs and encourage quality content that strengthens education, health care, and libraries in Texas. Similar to TIIAP, priority for the grants are given to rural and underserved populations.

The other state source was the result of a lawsuit that charged the state with inequitable resource distribution across educational institutions in the border regions. As a result of this lawsuit, UTEP received \$35 million. This funding was spread throughout the campus, with \$15 million going to build a new state-of-the-art high-tech building, the Undergraduate Learning Center at UTEP. This building is fully wired with the latest technology including distance learning facilities and Internet access.

Local funding included a bond issue to build a new technology magnet school and improve the technology infrastructure of the public schools.

On the Mexican side of the border, the TIIAP planning grant was used as leverage for money from the central government in Mexico City. Although no TIIAP funds went to Cd. Juárez, the force of the planning grant allowed the Director of the Center for Information Technology and Telecommunications at UACJ to secure \$1 million for technology in the first year and \$2 million in subsequent years. This money was used to improve the technological infrastructure of the university, which included laying fiber-optic lines, buying computers for faculty and student use, as well as building a new technology center.

Other funding streams for technology and technology programs in the region come from NASA and GTE. Through a grant from NASA, UTEP has established a Network Resources and Training Site (NRTS), which is striving to increase access to the Internet and the use of Internet resources by faculty and students in science, mathematics, and engineering technology (SMET) departments as well as across elementary and middle schools in the region. UTEP was selected as one of seven NRTS and was awarded \$450,000 in the first year and guaranteed at least \$400,000 per year for the following 4 years.

GTE has also provided funding for the area through the Growth Initiatives for Teachers (GIFT) grant program. The GIFT program awards \$12,000 grants, which include \$7,000 for a school enrichment program and \$2,500 per teacher for professional development activities. The school enrichment project must integrate mathematics, science, and technology in an innovative way, provide a classroom-based benefit to students and the school, and have the potential for lasting benefits.

Other types of assistance included:

- UT Chancellor's office funds to facilitate the design and development of web-based courses,
- Ford Foundation grant for revamping campus ethnic area studies curricula to include a border studies emphasis,
- Local grant from the El Paso Community Foundation,
- Funds provided by UTEP reducing its overhead and redistributing those monies into the project, and
- Equipment loaned to the project by major technology companies involved in the demonstration.

The general consensus of those interviewed on site was that much of this funding was leveraged using TIIAP planning grant funds. As one person remarked, "it was the spark that got the whole thing going." That is, the TIIAP award signaled to many organizations that the area should not be ignored, and because of the planning grant, business and governmental agencies took notice.

## **PROJECT CONTEXT**

### **Community Description**

The residents of Ciudad Juárez, El Paso, and Las Cruces are, in many ways, one people divided by artificial borders. El Paso is located in the westernmost tip of Texas, bordering both New Mexico and Mexico. El Paso is the 4<sup>th</sup> largest city in Texas, the 22<sup>nd</sup> largest city in the U.S., and the 17<sup>th</sup> poorest city in

the nation. Juárez, Chihuahua, Mexico, is separated from El Paso by the Rio Grande. It is the 6th largest city in Mexico and the economic center of northern Mexico. Dona Ana County, where Las Cruces is located, occupies 3,804 square miles in south central New Mexico, bordering on El Paso County, Texas, and the Mexican State of Chihuahua. Thus, together, El Paso, Cd. Juárez, and Las Cruces form the largest international border community in the world.

El Paso County, TX	725,482
Dona Ana County, NM	185,564
Cd. Juárez, Mexico	<u>1,334,758</u>
Total Metropolitan	2,245,804

Although culturally rich, the area is the 5th poorest region in the U.S. with an average per capita income of \$9,177. Currently, only three percent have annual incomes of over \$60,000, 10 percent make more than \$30,000.

### **El Paso**

Christened El Paso del Norte (the Pass of the North) by Don Juan de Oñate in 1598, the fertile valley and surrounding mountains provided the first all-weather path through the Rockies. El Paso's area is 248 square miles, and it is the nation's third fastest growing metropolitan area. El Paso is the county seat of El Paso County's 1,054 square miles and has become the site of computer manufacturing, telecommunications, consumer products, and plastics.

El Paso has a long history, enriched for more than four centuries by contributions from Native Americans, Europeans, and Asians. One of the largest impacts on the region in recent years has been the changes that NAFTA has brought. These changes include a growing El Paso industrial base of transportation and storage facilities for goods that travel in both directions across the border.

## **Ciudad Juárez**

The economic boom that Cd. Juárez has seen is the growth of the “maquila” industry. A maquila or maquiladora is a Mexican assembly or manufacturing operation that can be up to 100 percent owned by non-Mexican interests. A maquiladora utilizes competitively priced Mexican labor in assembly processing or other manufacturing operations that temporarily import most components parts from the U.S. and other sources. Mexican law also allows these operations to bring in most capital equipment and machinery from abroad. Maquiladora operations are generally labor-intensive cost centers, with most productions geared for export from Mexico. In addition, maquiladoras may be entirely foreign managed, unlike other multinational corporations operating in Mexico. For every one maquiladora job, two additional indirect jobs (support services) are created in Juárez as a result. In the 1980s, the maquiladora industry was fully incorporated into the region’s economical activity, and there was extraordinary population growth.

## **Southern New Mexico**

Like El Paso, Dona Ana County has a long history and has been a slowly developing multicultural region. By 1990 the county was urbanized, with a population of 135,510 and an economy based in service and retail. Rapid population growth has recently occurred in and around the city of Las Cruces and in the southern part of the county. This population growth is expected to continue at a rapid pace over the next 20 years. The average annual rate is projected to be in the four to six percent range. This means that by 2015, a population of more that 300,000 people will live in the County. The primary areas of growth will be in the Las Cruces metropolitan area and the southern part of Dona Ana County. Residents fear that this increased population and the industrial growth that will accompany it may have a negative impact on the area’s quality of life.

Indeed, the entire region is bracing itself for rapid growth. It is predicted that the population of El Paso and Juárez in 2010 will be:

El Paso County, TX	935,000
Juárez, Mexico	<u>1,292,243</u>
Total	2,227,243

This represents a growth of 25 percent over the present population.

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

Although Paragon Cable had laid a fiber-optic ring in El Paso in the early 1990s, telecommunications activity was reported as minimal. Indeed, at the time of the grant, there was no frame relay in El Paso (Southwestern Bell has since put one in). In 1994, the same year as the TIIAP grant, EPCC received a Title III grant from the U.S. Department of Education to establish an interactive videoconferencing network, but that had not yet had an impact on the area when the TIIAP grant was disbursed.

In the years after the TIIAP grant, the infrastructure in the El Paso area improved dramatically. This growth was in large part credited by the TB-ITC to the TIIAP planning grant. Several members of the TB-ITC membership stated that the TIIAP grant showed other agencies that the information infrastructure of El Paso should be taken seriously. Thus, the planning grant not only acted as a catalyst for bringing partners together and planning for the expansion of the local information infrastructure, but also acted as a leveraging tool to obtain funding and interest from other sources.

## **PROJECT IMPLEMENTATION**

### **Activities/Milestones that Occurred Prior to the TIIAP Grant Period**

A native of El Paso, the project director had recently returned to El Paso after a long professional absence when the TIIAP grant competition was announced. He had been working with telecommunications projects in other parts of the U.S. and developing countries; so once he heard about the grant possibilities, he began to assemble a group of local educators and business people to put together a proposal. They stated that, “we did not have a lot of federal grant opportunities so we wanted to make the most of the chance to bring development funds to the area.” The group felt that they needed to involve city government in the process, but to do this they needed to demonstrate community involvement. This is when Paragon Cable donated the fiber-optic strands. A TB-ITC member reported that this was “instrumental in mobilizing city officials” and the group began to pick up momentum.

This diverse group of partners initially wanted to apply for a demonstration grant to build up the infrastructure. However, since the infrastructure was so underfunded at that time, the project director convinced the committee that a planning grant was the necessary first step. The project director felt that with solid planning, the group would be in a better position to choose and purchase hardware in the future. So, the planning proposal was penned and sent to TIIAP.

As one board member stated, “if the planning grant had not come along, we would not be as far along as we are today. The grant provided the opportunity to make clear the issues and individual agendas.”

### **Activities /Milestones that Occurred During the TIIAP Grant Period**

After the grant was awarded, the groups included in the planning process expanded to 55. The group representatives were very diverse, and many had never worked together before the grant. Thus, it was reported that meetings could be quite acrimonious and on occasion, people would storm out of the room. As one TB-ITC member stated, “the only thing that held the group together was the common mission that the planning grant provided.”

The proposal was originally for the El Paso area, but during the first planning meeting under the grant, this direction changed. The project director had invited a representative from both NMSU and UACJ, and when the scope of the project was discussed, the committee decided that it would be a regional project that included the entire tri-city area of El Paso, Cd. Juárez, and Las Cruces. The NMSU and UACJ representatives became co-directors of the project under the direction of the UTEP project director.

In the very early stages of the project, TB-ITC established three major task forces or “working clusters”: technical, service, and user.

- The technical working cluster was a group of experts responsible for providing technical advice and assistance in producing the network conceptual design, the regional network physical plan, and the long-range support plan.
- The service working cluster provided input into the planning process concerned with the identification of the types of current and potential services that were to be provided on the network and determine what would be necessary to support them.

- The user working cluster was formed from a broad-based cross-section of network users. They assisted the planners with the identification of both user needs and the services desired by different user communities.

These three working clusters held together for the duration of the grant. What they found was that school districts wanted professional development brought to their own sites. Since schools are on year-round schedules, time for professional development was difficult to secure. In addition, it was not convenient for many teachers to drive to UTEP for classes. Thus, distance learning for professional development became a focal point for UTEP. Other area colleges and universities also became involved in distance learning planning activities to reach students that could not travel to their campuses.

The planning grant brought together the necessary resources to plan and develop, on a continuing basis, a distance learning network as well as explore other telecommunications avenues and leverage additional funds as they were needed.

Since planning activities were not very tangible, a demonstration was something the TB-ITC felt they needed to increase their visibility in the community. So at the end of the grant period, the project director requested an extension and permission to use some \$30,000 in remaining funds to support a short demonstration of both Internet access and teleconferencing technology. TIIAP granted the request, and in February and March of 1996 the project entered a short demonstration phase. Planning grant funds were redistributed and combined with in-kind contributions. Partners provided what they needed for technical support and vendors supplied hardware. The fiber was already in place, and Paragon donated network time. The challenge for TB-ITC was to coordinate all these elements and make it apparent to the community that telecommunications technology could provide many benefits.

The demonstration phase was coordinated with a number of vendors that loaned TB-ITC equipment for the exhibit. For example, the VTEL corporation loaned a video unit to the project (they have since donated the unit) and for two months TB-ITC invited applications of interactive video sessions. This included demonstrations of software, a diagnostic link of a doctor to a rural clinic, and links between the mayors of the three cities involved. In addition, the videoconferences brought together the three university presidents and academic deans. They also ran teacher training sessions and featured a virtual tour of the painted murals of El Paso. This last demonstration allowed students to tour the city murals without getting on a bus. A crew videotaped murals with artists and art experts discussing them. Indeed, students could log on to the system the TB-ITC set up and experience the murals with the artist. These demonstrations showed that the system was viable, could save time and money, and could expose people to new avenues of communication and learning. They also showed that educational institutions could collaborate and share courses and libraries. Commercial groups were also reportedly impressed with the demonstration and wanted to sign on as partners.

### **Steps Taken to Sustain Project Activities Beyond the TIIAP Grant Period**

To sustain the project momentum, a flurry of grant writing commenced. The planning member groups submitted 11 TIIAP proposals and were granted 2 (for Region 19's ELENA and a trans-border law enforcement project).<sup>3</sup> Other grants were also applied for and received (see Project Costs above). Although the colleges do not pay anything for the time on Paragon's fiber ring, TB-ITC assumes that this benefit will

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<sup>3</sup> Region 19, a Texas Education Service Center, received a TIIAP grant to develop the Electronic Learning Network Alliance (ELENA), which was an effort to implement distance learning in rural school districts. The County of El Paso also received a TIIAP grant in 1995. This grant was to be used to construct a video conferencing network in the tri-city area to improve the effectiveness of trans-border law enforcement.

not continue indefinitely. At some point, as the network expands, Paragon may charge for the service. So grant writing continues.

### **Activities/Milestones that Occurred Following the TIIAP Grant Period**

The project has evolved into a sophisticated distance learning network ([www.UTEP.edu/tdl](http://www.UTEP.edu/tdl)) with all three member universities, the EPCC, and several other University of Texas campuses participating. Distance learning in this case is the delivery of instruction that is mediated by technology and provided by instructors who are geographically separated from their students. The region's distance learning philosophy is to use technology to reach students by extending the campus to them in a way that is convenient and effective. To do this, the regional colleges and universities are using several different technologies to teach students at a distance.

The telecommunications aspect of the distance learning network is made up of instructional television (ITV) and interactive courses. These courses all earn the same college credit as on-campus courses.<sup>4</sup> ITV has been offering courses for a number of years and is currently increasing the number of credit course offerings to 17 per semester at EPCC in fall 1998. These telecourses are offered both on KCOS TV Channel 13 and on Paragon Cable Channel 14 (both partners in the TIIAP grant). Videocassette tapes are also available for viewing in the campus libraries during regular library hours.

The region also has an Instructional Television Fixed Signal (ITFS) transmitter that can broadcast courses. The ITFS transmitter has a range of approximately 30 miles, covering most of the El Paso city area, which presents courses via one-way video and two-way audio. Videoconferencing is also available as part of the area's distance learning network. The area colleges and universities have access to a statewide videoconference network, but it also has local facilities that utilize the fiber donation of a TIIAP partner.

UTEP is actively involved in interactive videoconferencing classes and web-based distance learning. In spring 1998, UTEP offered 16 distance learning courses to local school staff, military personnel at Ft. Bliss, other UT system campuses, and across the border to several Mexican universities. These courses included:

- Seminar in Communication: Case Studies for Border Communication Practices
- Fate, Transport and Treatment of Pollutants (part of the Environmental Science Ph.D. program)
- Seminar in Reading Teaching Methods: Reading, Writing and Technology (part of a new Educational Leadership Ph.D. program)<sup>5</sup>

Other credit courses were also offered at UTEP through other universities via distance learning technologies. These courses were:

- The University of Texas Master's of Library and Information Sciences

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<sup>4</sup> EPCC also has a Credit for Learning by Experience Option (CLEO) program that does not involve telecommunications. It has been developed primarily for working adults to recognize the academic value of learning gained from experience outside college classrooms. This experiential learning can result from work experience, employment training and non-credit seminars, volunteer work, military service, or intensive self-directed study.

<sup>5</sup> Site team members observed this class from a remote classroom.

- Administration of Libraries and other Information Agencies
- The University of Texas Master's of Public Health
  - Health Promotion Theory II
  - Addictive Behavior (a class for paraprofessionals)

Among the facilities of the UTEP campus are three distance learning suites and the Multimedia Teaching and Learning Center (MMTLC). The 125,000 square foot high technology building, the Undergraduate Laboratory Center, houses the Distance Learning Center and MMTLC. It has 400 computers, computer laboratories, production stations, and projection systems. It is designed to allow faculty members to incorporate technology into their classroom presentations through the development of courseware using multimedia platforms and software.

Current UTEP projects include:

- The Kids Kiosk Project -- a cooperative project started to stimulate class discussion and encourage U.S. and Russian students to respond to each other's questions.
- Project DIVAA (Digital Image, Video and Audio Access) -- a campus-wide effort to create a digital image, video, and audio database for both archival purposes and for multimedia courseware development.
- EPBIONET Project -- an online reference of El Paso's regional biology. This project, currently under construction, is primarily targeted to the K-12 student and education community.
- Rotifer Systematics Database Project – the development of a database about the phylum Rotifera, which plays a major role in freshwater ecosystems.
- MAGO project -- a biography of Margarita "Mago" Gordara, a local El Paso mural artist.
- The Institute of Oral History -- preserves the history of the region adjacent to the Rio Grande both in the United States and Mexico.
- Introduction to Politics CD-ROM -- an interactive electronic book on CD-ROM to accompany an Introduction to Politics course.
- The Border Encyclopedia – a World Wide Web ([www.UTEP.edu/border](http://www.UTEP.edu/border)) and CD-ROM-based curriculum on border life.

Both UACJ and EPCC have four fully operational distance learning classrooms. In Spring 1997, the EPCC Distance Learning Network delivered nine video conferencing classes to distant sites using the area's fiber optic network. EPCC is also installing a dial-up system by which interactive video conferencing can be conducted anywhere in the world. This system will be ready in Spring, 1998.

Video technology is still a complicated set of technologies that requires skills to set up and run the equipment. Distance learning requires these skills and adds additional requirements for instructors to monitor students and make use of all the equipment has to offer. At EPCC, training is required and routinely offered for instructors who use the equipment. To date, at EPCC alone, over 30 faculty have been

trained, and approximately 900 students have enrolled in distance learning classes. Faculty are paid release time for distance learning training and course development so they can modify their traditional courses for the distance learning medium.

Another feature of the distance learning information infrastructure that is on the horizon in the El Paso area is computer desktop conferencing with the ability to deliver instruction to the home- or place-bound student. Although distance learning for homebound students has been tried before, soon courses of study will be custom designed to meet the needs of the individual students. This type of instruction is closely related to courses that will be offered on the Internet. The El Paso area will shortly begin to offer credit classes via the Internet as part of the new virtual University of Texas, the UT Telecampus. Because of the time pressures on today's students, the region and the State of Texas are going to use state-of-the-art asynchronous technology to deliver courses. That is, through the Internet, courses will be offered where instructors and students can interact at the same time. Asynchronous courses, such as Internet-delivered courses, allow students to access their course materials over an Internet connection. Faculty members post materials, instructions, readings, and assignments online for students to complete on their own or in groups. Faculty are available via e-mail or telephone for questions. Faculty electronically moderate online discussions and students may interact with each other online.

Although the project could do more in the area of public access for poor and underserved populations, the distance learning initiatives coupled with the area's FreeNet are reaching many individuals who would otherwise be without access to the NII. The project represents an effort to expand the opportunities for education in the area and attempts to reach all levels including K-12 students, non-traditional students in the community college setting, and a large local commuter student population through UTEP (many of whom are also non-traditional and first-generation college-bound students). In one innovative inclusionary program, UTEP offers a range of Ph.D. classes in environmental science that includes equal participation from students on the Mexican side of the border via distance delivery.

## **Issues**

The main issue that TB-ITC had to face concerned the dynamics of the planning group. This was a group of people that had rarely, if ever, worked together. This led to issues of mistrust, committee factions, and impatience with committee members.

## **Mistrust**

An issue that came up during the early phases of planning included some animosity by groups that were not included in the original planning group. Since the planning phase had two stages (prior to and during the grant period), there were groups that were not asked to participate in the flurry of initial planning and grant writing. This was an oversight that was corrected when the grant was awarded, but some suspicions remained for individuals that learned about the grant after the fact. This led to some difficulties with getting the group to gel in the early days of the award period.

There were other misunderstandings that led to suspicion and distrust by partners. According to the project director, "some people somehow thought UTEP was sitting on a big pile of dollars and these groups were concerned about what portion would come to them." When they realized that it wasn't going to be distributed and it was one pool to support the region, people became suspicious. In addition, there were two UTEP staff members on the project planning committee, which added to the mistrust. As one board member remarked, "we're all nice people, but all have different interests to protect. Once we got over the trust issue, we realized that this is a community venture that would benefit each of us."

## **Factions**

Another issue arose from the group dynamics of the project: according to several board members, “some of the people had never worked in a collaborative this big so this in itself led to problems.” There were representatives from educational institutions, the private sector, local government, and community-based organizations. Factions along these lines were created in the planning group and they had their own set of expectations. Community-based organizations tended to be more emotional and they would storm out; government representatives expected agendas sent 3 days in advance; and the education group was more “in a listening mode than driving mode.” Similarly, the private sector included groups that were trying to get technology funding for their own business ventures. This group, however, was allayed in part because the fiber had been donated for educational purposes, not commercial use.

## **Impatience**

There was also impatience with group members. In such a large group, people are bound to bring different levels of awareness to the table about telecommunications issues. It was reported, however, that “the large engineering groups, coming out of the companies involved, became impatient when educators would ask too many questions.” In general, it was reported that in the beginning of the award period, there was a great impatience and intolerance for the level of ignorance on the part of some planning group members.

## **Calming the Waters**

The group eventually began to clear the air and mistrust dissipated. Throughout the meetings there was an attempt to allay fears and improve communication. For example, a planning group member brought her administrative assistant to draft minutes of the sessions. These were printed out *before* the meeting ended and read over by the planning members present. This was done so there would be “no question of what had happened.” Everyone had a formal record. Informal communication, such as follow-up phone calls after meetings and e-mail, was also important in straightening out “little misunderstandings.” One board member remarked that the project director “did a great job of involving everyone and making a level playing field.” In short, good communication was the key to moving the planning forward to the demonstration. Indeed, it has also played an important role throughout the project.

## **Problems**

### **Lack of Technical Expertise.**

As mentioned above, the lack of technical expertise in the region led to difficulties during the planning grant. Although such problems led to impatience and exacerbated feelings of mistrust, this dearth of talent also led to a lack of qualified personnel. This is partially due to the problem that as people begin to gain expertise in projects, they often move on to other projects. As a result, TB-ITC used to recruit engineers but now they “grow their own,” and former UTEP students become technology leaders in the area and TB-ITC staff members. Although the project is reportedly paying more than what the open market pays for their graduates, the project director feels that it is important to retain local talent. This is not only for their technological expertise, but also for their expertise in living and working in a border/bilingual community. Indeed, this strategy for TB-ITC seems to reduce turnover and maintain a qualified staff.

## **Leadership Change**

In a community-based project, a leadership change in city or county government can affect projects. During the project, city government experienced leadership changes, which adversely affected some of the partners. One board member mentioned that “one of the things we needed was to keep up visibility among changing administrations. The changeover meant a loss in any momentum libraries might have had.” As organizational leaders change, it is difficult to maintain the momentum of special projects, particularly if they involve new technology. The change in local government reportedly diminished the participation of the public libraries.

At NMSU, organizational apprehension occurred because of a shift toward improved telecommunications technology. According to a TB-ITC member, the NMSU president was highly criticized and eventually resigned because of his commitment to distance learning. Reportedly, the NMSU faculty felt threatened by the technology and worked against the administration and its plans to expand the campus distance learning program. As a result, a new president is in place and plans for the rapid expansion of distance education have been significantly curtailed.

## **PROJECT ACCOMPLISHMENTS AND IMPACT**

### **Technology-Related Accomplishments**

Since the TIIAP award was for planning, the technology-related accomplishments during the grant period were minimal. During implementation, however, there have been achievements in the areas of improved access to educational programs and the National Information Infrastructure (NII).

### **Improved Access to Educational Programs**

Distance Learning has expanded in the region and as a result offers a number of courses that have increased access to education. For example, UTEP offers a Ph.D. in environmental science that includes equal participation from Mexican students; a new educational leadership doctoral program; classes for Ft. Bliss’ military families and their dependents; and courses are being developed for the Internet that will be entirely web-based. In addition to producing their own courses, the area is receiving courses from other places (e.g., the University of Texas at Austin and the UT Telecampus). Improved access to education has also positively affected homebound students, teachers, and nurses.

### **Improved Access to the NII**

EPCC has been providing training in using the Internet as a search tool; area public libraries all have FreeNet (and World Wide Web) access, so anyone can walk into a library and use the resources of the NII; and low-income housing authorities have centers for public access.

### **Impact of Project on Direct End Users**

### **Regional Cooperation**

Since “Telecommunication has no boundaries,” once the grant had been awarded the TB-ITC realized that they needed involvement across the region. So, as mentioned previously, the project director invited a delegation from NMSU and UACJ. During the first meeting after the grant was awarded the committee decided “it would be foolish not to branch out” and included the entire tri-city area. Indeed, they voted to

change the name from EPITC to TB-ITC at that meeting. According to the project director, these delegations became “a very integral part of the group.”

### **Cooperation Between Area Libraries**

Prior to the planning grant, there had not been a history of librarians from the region working together. But today, through digital library resources and other means, they actively work together to make the most of limited funds by sharing resources (and avoiding duplication). This has led to making resources bilingual and accessible to a wider range of local residents. It has also been reported that during the process of cooperating and sharing, stereotypes were dispersed and friendships cemented. This is because many librarians had not visited Mexico, much less their colleagues there. So during the planning phase they convened in Cd. Juárez and cooperation began to grow. As a result, a board member reported, circulation in the El Paso library has increased 28 percent.

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

#### **Improved Access for Homebound Students**

Traditionally, homebound children have been totally isolated (because of disabilities) from the classroom environment and required an instructor to visit their home. As a result of the planning grant and subsequent work performed in telecommunications development, companies provided PCs with software so that homebound students could be connected to the classrooms to which they would have been assigned, if not for their disability. The students at home and in the classroom could finally see and interact with each other. It was reported to be a learning experience for both the homebound and classroom students that participated.

#### **Improved Access to Teacher Professional Development**

Due to the distance learning capabilities at UTEP, a new educational leadership doctorate is being offered. In addition, other courses designed for teachers and their professional development needs in the area of new information technologies are being offered at the graduate level.

#### **Improved Access for Health Professionals**

Distance learning has affected the professional development of health care professionals. Paragon Cable provides a mobile educational unit, and classes are offered to local practitioners through the UTEP College of Nursing. There is also stand-alone video technology available through the College that is loaned to clinics in Socorro and elsewhere in the region.

#### **Reduced Stereotypes**

Through regional cooperation and the development of the Borderlands Encyclopedia, a web-based and CD-ROM curriculum, there is “a more grounded image of the border.”<sup>6</sup> A TB-ITC member reported that people now see the region as “more than killings, drugs, food, fun, and fiestas.”

#### **Other Funding Streams**

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<sup>6</sup> The Borderlands Encyclopedia is a comprehensive look at the region that was completed in the wake of grant and other regional technology activities.

Other funding streams have been established for the region. For example, the Ford Foundation has selected El Paso as a model site for its literacy project as well as a UTEP planning grant for revamping its Border Studies curriculum. Reportedly, they were surprised at how well TB-ITC worked together. As a board member stated, “when you come from an area of extreme poverty and isolation, you either work together or it doesn’t get done.” In addition, it was reported that many schools were able to use their involvement with the TIIAP project to get access to Texas Telecommunication Infrastructure Fund (TTIF) monies.

### **Impact on the Grant Recipients and Project Partners**

The organizations that banded together for the planning projects maintain routine contact with each other. The board and the membership meet regularly and plan to continue to do so. At this time, the TB-ITC is at a transition point and is discussing how to proceed in the future. Ideas include becoming a nonprofit organization to orchestrate further development of telecommunications and technological access in the region. The question about what direction TB-ITC will follow is still open (see Future Plans below).

Other impacts were reported by partners:

- El Paso City Library circulation is up by 28 percent.
- PBS station was one of first stations in El Paso to have a web page. They have a virtual school on a home page for school children.
- Partners shared information and resources. As one person interviewed commented, “This group has been the mechanism to interface with the other networking folks.”
- Paragon reported getting some good press, subscriber growth, and demonstrated commitment to the community.
- Web-based databases could be hooked up into a system that will enable easy access.

One of the largest impacts on the partners was proof that the demonstration could be done across the boundaries of cities, counties, states, and nations. What that proof became was “the battering ram to knock the door down for other technologies to be represented at the table.” The state government in New Mexico realized, “hey, we can do these things, we don’t have to drive all the way to Las Cruces anymore.” As a result, the Las Cruces area has also seen a rise in the number of distance learning courses, changes in technology, and faculty technology training.

### **Project Goals Not Met**

Very few of the goals of the project have not been met. The only area that seemed to be short-changed in the infrastructure building process was telemedicine. This was attributed to the buying and selling of local hospitals and the restructuring of medical services in the region. As profits become more of a focal point for hospitals, the expenditures required to upgrade health care for rural citizens through telemedicine have not materialized. In the wake of one recent hospital sale, the medical nonprofit foundation that sponsored the telemedicine demonstration was dissolved, leaving a gap in TB-ITC health care initiatives that has yet to be filled.

## **Impact of TIIAP Support on the Initiative**

The timing of the TIIAP grant was “ahead of the curve,” as one partner remarked. At the time the grant was awarded, the funding for telecommunications in the area was severely lacking. In fact, it wasn’t until TIIAP showed an interest in the area that others began looking at the potential of the region. It was reported that Southwestern Bell initially was leery about getting involved in the process. It was not until the grant was awarded and the cable industry came to the table that it became a partner.

In addition, as mentioned previously, the TIIAP grant was a leveraging point that was used by schools to get TTIF money, UACJ to get funds from their federal government, and for partners to garner the support of other federal, state, and private sources. Without the TIIAP grant such an inflow of support may not have materialized.

## **EVALUATION AND DISSEMINATION**

### **Evaluation**

In an effort to measure the impact this project had on its users, the TB-ITC conducted a case study. The study revolved around a focus group session conducted on April 9, 1996, with “the most participatory members of the TB-ITC” (see Appendix A). This session was supplemented with additional off-campus interviews and led to an evaluation report that is available on their website ([www.utep.edu/tbitc](http://www.utep.edu/tbitc)). The evaluation was conducted by 15 graduate students as part of a class with the project director dealing with problem-based research. Highlights of what the evaluators found are provided below.

#### Accomplishments

- The TB-ITC created a high level of awareness of new technology and demonstrated the impact that technology could have on the El Paso-Juárez-Las Cruces community.
- The TB-ITC played an extremely important role in providing information access to the border community, via modern technology.
- The TB-ITC proved to be an important first step in bringing together and organizing leaders of the different organizations involved in daily communication processes across the border.

#### Problems

- Budgetary restraints created problems.
- Computer equipment was outdated.
- Some segments of the population lacked computer literacy.
- More publicity of the TB-ITC and its accomplishments was needed.
- Communication levels among members of the TB-ITC needed improvement.

#### Future Possibilities

- Technology applications could be investigated in the area's business, government, and health organizations.
- Computer education is possible through existing channels, e.g., public TV and library workshops.
- Marketing and public relations via students from UTEP or other universities might be possible.
- A more disciplined and thorough assessment of the border community's needs, could eventually lead to the organized development of information tools and technologies.
- A paid coordinator may need to be hired, but a listserv could be developed as a central point of communications.

### **Dissemination**

Ample information and documentation is available on a number of websites. These bilingual sites include:

- The University of Texas at El Paso – [www.utep.edu/tb-itc](http://www.utep.edu/tb-itc)
- The New Mexico State University – [www.nmsu.edu](http://www.nmsu.edu)
- The El Paso Community College – [www.epcc.edu](http://www.epcc.edu)
- Universidad Autónoma de Ciudad Juárez – [www.uacj.mx](http://www.uacj.mx)

The project has also been featured in numerous articles in area newsletters and newspapers. The universities have sponsored conferences on technology, and the area schools sponsor the annual technology conference known as BET-C, the Border Educational Technology Conference. This year marks the BET-C's eighth year of providing professional development in technology for school teachers and staff. In addition, the local PBS station donated time to develop a video of the project and that is available from both the TB-ITC project site at UTEP and THAP staff.

### **LESSONS LEARNED**

#### **People are the Key**

It was reported that “the most difficult thing in projects is not the hardware, software, or infrastructure, but people.” This was manifested in several ways, the first of which was discussed previously as an issue of mistrust. People needed to communicate and decide on some common principles in order for the project to go forward. The second aspect is that a project like TB-ITC requires a great deal of time and energy on the part of participants. It was reported that “some people were spending much more time on the collaborative than their own job.”

#### **Be Aware of Political Implications**

A number of those involved in TB-ITC wanted publicity for their own group. The project “had to make sure each group was mentioned when putting out a press release,” yet there continued to be misunderstandings concerning who would take the lead on issues. For example, Paragon and Southwestern

Bell had been fierce competitors before the grant, and when a major press release mentioned the large fiber donation from Paragon, Bell went to UTEP's president seeking to become more integrally involved in the effort.

### **Communication is Essential**

TB-ITC met almost weekly in an official capacity, and there was also social and casual contact between members. Members could not always attend these meetings so there was a diligent effort on the part of the membership to communicate through the website, newsletter, and articles in the newspaper so "people could keep up, if they weren't at the meeting."

### **Try Before You Buy**

Many promises are made by vendors in the throes of making a sale. The demonstration phase of the project allowed vendors to show what the hardware and software could do and also allowed TB-ITC members to see what the technology could not do. The demonstration allowed TB-ITC to see the commitment of vendors and whether the set-up would work. Indeed, it allowed vendors a chance to exorcise set-up and connection problems before the local educational agencies purchased the systems.

### **Keep Looking for Funding**

Throughout the project, the membership applied for funding the vision and plan of the TB-ITC. The membership helped shape proposals through a review process and worked cooperatively to garner financial support for each other. In one instance, they set up a production room to apply for additional funding from TIIAP. They submitted 11 proposals. As the project director stated at the time, "If we submit 11, we're not going to get 11 -- we should be happy with 1." The region was awarded two additional TIIAP grants as a result of that session (one to Region 19, a Texas Education Service Center, and the other to the County of El Paso).

### **FUTURE PLANS**

The TB-ITC membership feels that they have done a great deal in the education area through distance learning and should branch out to include other telecommunications applications. As a member pointed out, "education is important, but that should not be the sole focus." Even so, they do plan to make adjustments to their educational focus by outsourcing the commercial service and concentrating on their strengths of developing instruction, rather than maintaining the system. After all, educational institutions outside of the UT system can use TTIF money and the new federal E-rate program to buy discounted educational telecommunications time. What is now needed is quality offerings for distance learning programs.

As it was recently reported, TB-ITC priority functions are twofold:

- Nurturing and supporting the development of new telecommunications applications that can improve educational, public, and private sector services.
- Implementing the applications and overseeing the connectivity functions for the network.

In relation to these functions, it was reported that the "immediate urgency for TB-ITC appears to be managing the resource donation from Paragon Cable. The asset management function might include the development of at least two non-profit entities: (1) the vision and planning group embedded in the TB-ITC from its inception, and (2) the group that oversees the use of the fiber donation."

Since UTEP was advised by attorneys not to take on the role of maintaining the project, TB-ITC is moving to create a non-profit organization. Although there is some debate about becoming a non-profit agency, this seems to be the direction they are heading. According to the minutes of the December 1997 meeting of TB-ITC Subcommittee on Organizational Structure:

*Top priority was a review of possible options . . . for reconfiguration of [the] TB-ITC organizational structure, which includes telecommunications efforts such as the Smart Valley Inc. of the S.F. Bay Area (Connect '96 fame), the CHECS-Net of New Mexico, the GATTN Project of Austin, Texas, the Blacksburg Electronic Village (BEV) of West[ern] Virginia, and the Telecity of Greater Kalamazoo, Michigan.*

Interest was also expressed in being able to keep local network traffic in the region to reduce transmission time. Thus, "they are looking into developing an area intranet." At a recent meeting the membership agreed that "the future of technology and telecomm services in the region requires a range of integrated services that includes voice, data, text, image (e.g., interactive video, Internet services, and local connectivity) so we don't have to route groups to Austin or out of the state for simple informational exchanges in the local region."

Applications appear to be driving the growth of the telecommunications network structure in the tri-city area and thus, TB-ITC is looking into its options. For example, possibilities for the area include:

- Imaging and GIS telecommunications applications, e.g., controlling traffic signals and traffic information across I-10 and downtown streets;
- Columbia and Providence Hospitals are looking at telemedicine services to nearby and outlying clinics;
- Trans-border communication services for the "maquila" industry;
- Distance education and telecommuting needs;
- Meeting the needs of displaced workers through educational "re-tooling";
- Military and super computer applications from White Sands may be explored (White Sands is presently marketing private sector services);
- Gateway super computer applications across the universities may be another important application; and
- Developing an MBA degree program offered via distance learning technology.

So the project is a success and the technological future for TB-ITC and the El Paso area appears to be bright. The success of the telecommunications development in the area seems to be directly attributable to the vision of the project directors and the funding sparked by the TIIAP planning grant. Indeed, it would be interesting to visit the region several years from now and see what else has been achieved through the

APPENDIX A  
**TRANS-BORDER INFORMATION TECHNOLOGY COLLABORATIVE EVALUATION**

**FOCUS GROUP  
DISCUSSION GUIDE**

(NOTE: While waiting for the group to start, participants were asked to fill out a short, confidential questionnaire to provide more information.)

**I. INTRODUCTIONS**

A. Explain the Moderator's role: to listen to your opinions, thoughts and ideas related to the Trans-Border Information Technology Collaborative.

B. Explain the Focus Group technique

C. Group length of (approximately) one hour

D. General topic: "Collaboration at the Border: Experiences of the Major Partners in the Trans-Border Information Technology Collaborative (TB-ITC), 1995-96."

E. Determine previous focus group participation -- "Have any of you participated in a focus group before? (show of hands)

F. Discussion guidelines:

--Videotaping

--Speaking up

--Speaking one at a time

--Participation encouraged for everyone

--Speaking up when reacting differently than others, speaking up when new information creates change of opinion--no consensus expected, (i.e., participants can feel or think more than one way.)

--Room comfort issues: no smoking, washrooms, refreshments, etc.

G. Participants--It's important to start with having you introduce yourselves.

Please tell us the following:

1. Your name

2. A little information about you--

\*Your organization

\*The position you hold there

\*Your role in the TB-ITC project

**II. GENERAL IMPRESSIONS OF THE TB-ITC PROJECT**

A. What were the goals of the TB-ITC project during this past year, and do you feel those goals were accomplished?

- B. Describe your experiences with the TB-ITC project during this past year.
- C. What were the major accomplishments of the TB-ITC project during this past year?
- D. What suggestions for improvement in the TB-ITC do you have, based on your experience with it?
- E. How would you describe communication between the TB-ITC members during the project?

### **III. REACTIONS TO THE TB-ITC PROJECT BY INDIVIDUAL ORGANIZATIONS**

- A. What did your organization hope to accomplish through the TB-ITC project, and do you think you succeeded in accomplishing those goals?
- B. How well did your organization communicate with others TB-ITC members involved with the project?

### **IV. THE FUTURE - NEXT STEPS FOR THE TB-ITC**

- A. What are the next steps the TB-ITC should take, in your opinion?
- B. What should your organization's role be in helping the TB-ITC to accomplish these steps?
- C. Who specifically do you feel will use the technologies made available through the TB-ITC?
- D. What resources is your organization willing to commit to the future of the TB-ITC?
- E. Who are the major recipients of your organization's services, and how do you think the resources of the TB-ITC could be helpful to them?
- F. Do you have plans to make the resources of the TB-ITC available to your clients? If so, when do you think this will occur?
- G. What do you think will be the socio-economic position of your clients who use the resources of the TB-ITC?

### **V. INFORMATION ACCESS ISSUES**

- A. How important is universal access to new technologies, in your opinion?
- B. Who do you feel should pay for universal access? What should be the role of companies/organizations like yours in providing universal access?
- C. What advice would you give to other organizations attempting to provide access to new technologies in underserved and/or border regions?

### **VI. CLOSING**

- A. What did you find most interesting or surprising about your experiences with the TB-ITC?
- B. What other comments or suggestions do you have related to the TB-ITC project?