Assessing Community Efforts to Reduce the Digital Divide

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Introduction: Background and Context

Early analyses of the digital divide by the National Telecommunications and Information Administration (NTIA), the Pew Foundation, and other organizations stressed the dangers of an increasingly stratified society, divided by inequalities in access, situating the divide as an issue requiring active national policy. They argued the need to intervene in the technology diffusion process to reduce the social stratification that can be anticipated with the diffusion of new technologies and ideas, an idea in keeping with critiques of diffusion theory in the 1970s. Later studies, however, often reflect the ascendancy of contrarian rhetoric, articulating the digital divide as an issue to be addressed through market logic and what are seen as natural diffusion processes that require no policy intervention. This policy shift manifested in rising criticism of federal programs designed to address the divide, such as the Technologies Opportunities Program (TOP) and the Department of Education's Community Technology Centers. A parallel dynamic is visible at the state level in Texas, when looking at the rise and fall of the state's Telecommunications Infrastructure Fund (TIF).

These patterns have important implications for U.S. government policy and for how we understand the digital divide. Current government policy might be termed a kind of market-oriented analysis that assumes that market mechanisms and the gradual process of technological diffusion will gradually reach all parts of American society with computer and Internet access and use. However, this paper uses our work in Texas to show why a continuing gap exists between poor and others, minority and White/Anglo, and more and less educated in terms of both access to and use of Information and Communication Technology (ICT) resources.

One key point of policy intervention has relied on communities and local involvement to "solve" the digital divide. The involvement of communities and community-based organizations with communication and information technologies is not a new phenomenon. Indeed, when cable television was rapidly expanding in the 1980s, community groups organized to use that technology to create local content and local channels, in effect trying to adapt it to the purposes of enhancing communication and local participation. We can look even earlier to see how community groups also

coalesced around local newspaper publishing efforts as well, a common occurrence in major US cities shortly around the turn of the 20th century. As communities struggle to maintain or achieve cohesion and identity, such local communication efforts grow in importance. Many scholars and critics have commented on ways computer networks facilitate those same goals (e.g., Rheingold, 1993; Turkle, 1995), characteristically in a tone that ranges from romantic enthusiasm to techno-optimism for a new global future.

Both the notions of access and the nature of outcomes associated with community communications involvement are complicated. In spite of the historical white upper and middle class bias characterizing the acquisition and use of computer technology both at home and in the workplace, contemporary access advocates generally presume that a technology "solution" could deliver the advantages that commonly seem to accompany the computer literate (and white middle class status). Issues of class, race and profound structural inequalities in American society have eluded the computer access rhetoric, lurking behind the scenes in code words and phrases such as "disadvantaged" and "on the wrong side of the divide." A series of surveys performed by NTIA in the late 1990s statistically analyzed computer ownership and Internet access by race, household income, and other demographic indicators, and became a short-lived benchmark for documenting a "digital divide" in the US (US Department of Commerce, 1995, 1998, 1999, 2000). However, the surveys never went much further than simply illustrating "lags" across ethnic and racial groups and income categories. The causes of the differential pattern of ownership and use were not elaborated, and the simple solution of "access" became the straightforward answer to eradicating the different patterns.

The larger outcomes associated with computer and Internet access likewise are presented in rather muddy, ambiguous ways in much of the literature. There are broad assumptions regarding the need for certain skills and the implicit benefits, but there is little research on the actual life-changing force of such "improvements." For example, Jennings (2000) found that children with computers at home were more proficient in school than were children whose only computer access was at school; Hoffman, Novak and Venkatesh come to similar conclusions in their studies of minorities and computer use (1998). In general, however, we lack strong empirical results that provide compelling evidence that economic and community development goals can be realized through

programs of computer and Internet access. If one broad social goal in the US over the past ten years has been to facilitate access, the more important goal of ensuring that access is *meaningful* for communities and individuals has slid off the agenda.

Reviewing major trends described by nationwide surveys of the UCLA Center for Communication Policy[1], and the Pew Internet & American Life Project[2] over close to a decade, Rainie and Bell (2004:47) conclude that the overall American online population has stalled somewhere between 60% (Pew's findings) and 70% (UCLA's findings). Older Americans, those who just completed high school or less education, less well-off Americans, rural residents and Africans Americans and Hispanics are still less likely to go online. Border States (Arizona, New Mexico and Texas) stand out as regions of contrast with fairly pervasive wired areas but low Internet penetration rates. The Internet population at the U.S-Mexico border is mostly young, composed by an interesting mix including the wealthiest and those of modest incomes, with significant number of Hispanics users (62:63).

Understanding these trends has demanded a new paradigm that goes beyond old formulations of the divide looking into the emergence of various *digital divides* and further stratification. A second generation of Internet research has drawn on longitudinal studies tracing different types of use, attitudes among users and reasons of non-users for not going online (Wellman, 2004). Currently, Internet access and use is better understood as a *spectrum* that goes from populations totally disconnected – approximately a fourth of the all American population (Lenhart et al., 2003:26) -- to groups of *net evaders, dropouts* (Katz and Asdpen, 1998; Katz and Rice, 2003), and users with different degrees of sophistication in employing the variety of online applications (NTIA, 2002; Madden et al, 2003; The Digital Future Report, 2004).

Users go online from diversity of places. The Pew Internet & the American Life Project estimates that 23% of the adult Internet users go online from places different from home or the office (Harwood, March 2004). Most people gain access at schools (27%), friends' homes (26%) and libraries (26%), and only few have used Internet while traveling (4%), staying at hotels (3%) or in cyber cafés (2%). A small fraction uses it at

[1] http://ccp.ucla.edu/pages/internet-report.asp
[2] http://www.pewinternet.org/reports.asp

community centers and houses of worship. Users of "the third place" represent two very different sets of demographics. The first group consists of heavy users, anxious of going online wherever they are. They are between ages 18-24, and typically are students. The second group is composed of users from households earning less than $30,000, with lower levels of education, living in rural areas and having little experience in the online world. Some of them totally depend of "the third place" to have Internet access (2).

As new layers of connectivity and access add up and more differences in use are unveiled, the illusion of a fading digital divide grows. While some assume differential access and use as mere reflection of individual choice equating the adoption of Internet with the adoption of the TV sets (The Digital Future Report, 2004), others see the phenomenon as a byproduct of inequalities materialized in different levels of techno-competencies (Eamon, 2004). Building on his work on the un-phoned, Schement (1995) has shown how inequalities in access to information services (telephone, cable) tend to persist in contrast to the rapid diffusion of information goods. Can the potential of the technology be developed through the operation of the Internet as a broadcasting system or as a truly interactive technology? Who will be in better standing to take advantage of the possibilities opened by high-speed connectivity? What should be the role of local communities in working with deprived populations? As these questions wait for a response, we argue that the potential of the technology lies in its uses, and closer attention has to be placed on the study of Internet use among the less privileged, and the disconnected, and on how community resources can address those populations. Only in this way we will be able to articulate new policies to answer the problem of the diversity of *divides*.

The broader policy context for programs to address the digital divide has multiple dimensions. Ever since deregulation spread throughout US telecommunications industries, policymakers were charged with ensuring that competition developed across the country, and that its benefits would be sufficient – in line with the theoretical promises of deregulation – and available to all.[1] With the arrival of the graphical browser powering widespread use of the Internet in the early 1990s, access to the Internet assumed public importance, and the role of networks as well as equipment was thrown into high relief. Although the Internet is barely mentioned in the 1996

Telecommunications Act (it appears in the later overturned Communications Decency Act portion of the Act), FCC reports that monitored the deployment of broadband infrastructure suggest the growing importance of computer networks and the Internet for both home and business. The agency issued reports that presented broadband deployment information in 1999, 2000 and 2002 (FCC, 1999, 2000, 2002). The Departments of Education and Housing, and the National Telecommunications and Information Administration initiated programs to support community or school-based efforts to establish sites for computer and Internet access in the digital divide policies of the 1990s, illustrating national efforts to intervene socially to provide public access and ICT training to those who would not otherwise receive it. Specific national U.S. policies and programs by NTIA, Department of Education, Department of Commerce, and, in Texas, by the Texas Infrastructure Fund (TIF) implemented this general policy.

As well, states initiated their own broadband policies, sometimes by assessing statewide broadband infrastructure (North Carolina, Ohio, West Virginia, Texas), by mapping network routes and capacities (North Carolina, Georgia, Oregon), by undertaking legislation to create incentives for better telecommunications infrastructure (Michigan), by creating programs to enhance Internet access in localities (North Carolina), or by establishing special agencies or commissions tasked with enhancing access (Texas, North Carolina). Telephone companies jumped on the bandwagon as well, and proposed to invest more heavily in broadband networks *if* they could obtain "regulatory relief" from various PUCs, state legislatures, or from the federal government.[23] Many if not most of these initiatives explicitly allude to the economic development potential of more widely available broadband facilities, although few established any mechanism to actually assess such outcomes.

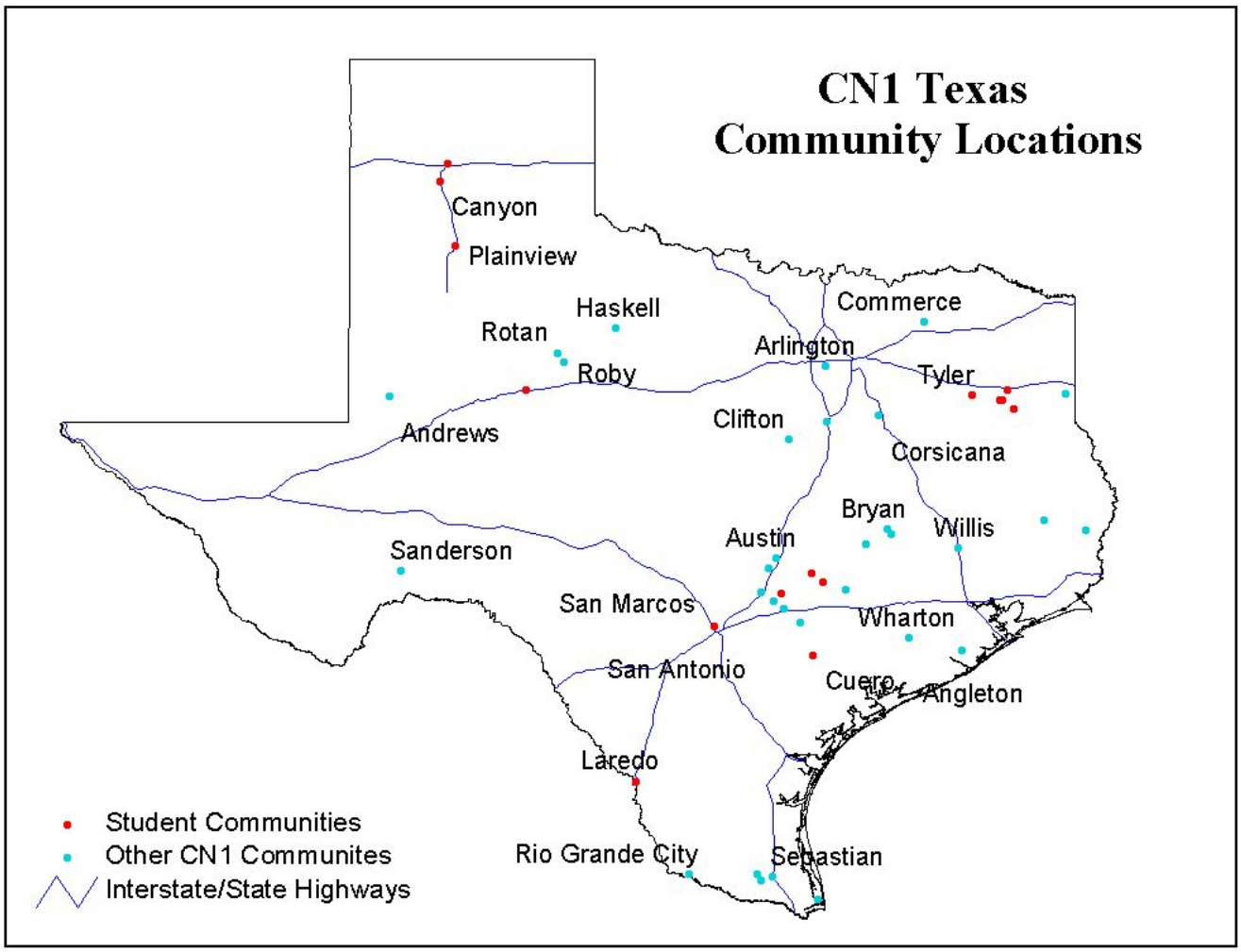
The research presented here focuses on a set of state-sponsored community efforts to expand or deliver computer and Internet access, a program whereby 36 communities of varying sizes in Texas received up to $500,000 to establish community networks over a two-year period. The state agency, the Telecommunications Infrastructure Fund (TIF), had been active in funding schools and libraries and healthcare facilities for several years for computers and Internet access, largely delivered through T-1 links supplied by incumbent telephone companies. It had a generous budget of about $150 million per

year, assessed directly on telephone companies. The current project evaluates the efforts of those towns and cities in order to assess how communities organized themselves to establish community networks. We are interested in the process features (management, access to expertise, organizing volunteers, organizing training, etc.) associated with organizing community networks, and also the range of local outcomes attributable to networking activities. The larger research project compares the 36 sites and highlights the unique roles and difficulties of collaboration, institutional involvement and support, and the economic development and civic engagement processes associated with technology training and access. (This work does not focus intensively on outcomes because they are difficult to apprehend over short time spans and because the communities themselves rarely gathered adequate data on their own training and outreach programs, much less the "success" of people trained through these programs who obtained subsequent jobs or other positions.)

The work reported here focuses particularly on how communities thought about public access and how they went about establishing public access sites, as well as how they articulated public access-related development goals and connected them to new computer and Internet capabilities. This in turn reflects on how state-crafted efforts to encourage telecommunications capabilities in rural areas may or may not yield desired outcomes because of dynamics quite separate from straightforward levels of funding.

The efforts of these communities cannot be separated from the program that funded them from the outset, a 1999 program initiated by the Telecommunications Infrastructure Fund Board. Dissolved by the Texas governor in the summer of 2003, TIF spent nearly eight years making grants to schools, libraries, not-for-profit medical facilities, and community organizations as part of a broad mandate to improve the state's access to computers and the Internet, particularly in rural areas and among the poor. The agency was created by 1995 legislation (Texas HB 2128, later renamed the Public Utility Regulatory Act of 1995) that granted substantial deregulation to Southwestern Bell, the dominant incumbent telco, and during its lifetime it has had its advocates and its detractors. Many people agree that its community networking initiative was its most innovative program, but also one of its most problematic by virtue of the agency's lack of experience in administering such endeavors, its low staffing level overall, and its lack of

sufficient tools and metrics to gauge progress or ensure accountability. **Error! Reference source not found.** presents a list of all the communities in the first grant round, and a map of the communities' locations appears below.



Research Methods

This project uses both qualitative and quantitative data in order to assess the communities' efforts to establish networks. Our broad primary research questions are (1) How did communities define their goals? What did public access mean to them, and how did they identify or target their users? (2) What are the outcomes of the individual community efforts in terms of achieving improved public access, launching training

programs, and developing the means to create local web-based content? (3) What organizational and institutional practices were used to implement the projects? And (4) What is the relationship between projects' accomplishments and specific elements (funding amount, connectivity requirements, partnership requirements) of TIF sponsorship? However, in this essay we focus only on issues of public access, investigating the first question in terms of site location decisions, schools' and libraries' involvement, how communities thought about reaching targeted users through mobile facilities (laptops and mobile cans), and factors that enhanced or impaired certain locations' use. We sought to assess the level of meaningful involvement in the project by the targeted users as a way to investigate the meaning of public access within the communities.

Since beginning the project in June 2002, researchers compiled a database of project leaders and participants; designed and administered a mail survey; analyzed survey data and prepared an interim report based on over 200 responses to this survey; and made field visits to the entire set of 36 communities to interview participants, gather documents, and carry out observations at the network sites. Most of the data-gathering entailed conducting phone, e-mail and personal interviews with project managers, board members, volunteers, access site personnel, and other community members. A standardized survey was developed with several areas of focus: community processes, promotion of civic engagement, public access sites, infrastructure, equity, economic development and training. The survey also gathered data about the processes utilized within the CN1 initiatives to define, implement, and sometimes evaluate their projects, and asked survey respondents to identify the programs and services that were prioritized within their projects, and the social groups and actors that participated in design, implementation, and use of network services and facilities. Researchers asked project partners to reflect on day-to-day undertakings and to identify factors that affected the implementation of their networks. Survey findings helped to frame the second stages of the research, in which field research methods including participant observation of project sites, in-depth interviews with network partners and users, and analysis of key project documents were undertaken. Researchers made multiple visits to the 36 communities and endeavored to talk with personnel at the access sites, those involved with launching and

operating the project, with users and other staff at the sites, as well as with community leaders or members who could provide some perspective on the project's role within the locality. The team visited as many public access sites as it could, and generally spent time observing their operations. Researchers completed 210 interviews across the 36 communities.

The research reported here focuses on only a portion of our findings. The remainder of this article will address how communities went about creating public access and how they framed its goals and utility. It concludes with observations regarding policies that are most and least effective in community-based efforts to establish improved access to computers and the Internet.

Communities and Public Access

On its face a primary goal of the CN1 initiative was to increase public access to computers and the Internet. TIF's Request for Proposals explicitly requested that the community networks extend computer and Internet availability to the public in convenient locations dispersed throughout each project's geographic region. In many cases, the TIF funds were seen as a way of extending access to members of the "underserved" sectors in communities who lack the financial and other resources to have a personal computer in the home, or access to computers in the workplace. In addition, TIF envisioned public access as a catalyst for the production of local content, requiring that each proposal articulate how network access sites access would be used to provide "web development tools [to] create, publish, and contribute to the local content" (TIF Board Grants for Collaborative Community Networks, 1999, p.10).

The projects funded under CN1 did indeed expand access. By our count, the grants helped either establish or enhance 323 sites across the 36 communities, and about 80% of the sites projected in proposals were actually established. These numbers are somewhat deceptive, however, in that many of those sites already provided *some* public access, and some "new" sites amounted to computers located for internal staff or agency use only. Additionally, although nearly every project designated special groups – racial and ethnic minorities, low-income families, seniors, people with disabilities, youth, and

so forth – as target users, the types of locations chosen for public access often were not intrinsically attractive or available to those constituencies.

We assess the overall impact of the CN1-funded access sites by first identifying the range of sites selected or established for public access; second, by identifying factors that facilitate or discourage their use; and third, by examining the ways that "public access" itself was defined and deployed across these projects.

Functions of Public Access Sites

Overall, five types of sites were typical across the 36 CN1 communities: (1) multi-use facilities that already had computers to which more were added (libraries and schools, primarily); (2) multi-use facilities with rooms or spaces designated solely for computer use which were added as part of the grant (recreation centers, seniors' and youth centers, for example); (3) stand-alone, single-purpose centers dedicated to public access and computer training (community "telecenters" or computer labs); (4) facilities designated for other uses that accommodate one or two computers on a stand-alone basis (local chambers of commerce, churches, private businesses); and (5) stand-alone kiosks. Our research suggested that kiosks and the one or two-single computer sites were the least frequently used, while sites such as community centers, schools and libraries, with ongoing programs and activities that attract people, were most popular. Other access strategies included establishing mobile computer-equipped vans, laptop loan programs, and establishing videoconferencing facilities to draw different users and provide new services. However, only the laptops proved to be particularly effective in extending public access.

Access sites generally offered PC workstations, access to printers and scanners. Many sites also housed digital cameras, which proved to be very popular. Although the sites collected very limited data, most access site personnel and project managers identified Internet, e-mail, word processing and some digital photography as the most common applications of the computers. There were some unconventional uses, particularly with some of the peripherals (high quality printers, scanners) and additional equipment (videoconferencing) some communities purchased. For example, local ranchers in Haskell used the CN's digital cameras and access site computers to send photos of horses that were suspected of having contracted an equine version of "mad cow

disease" to veterinary specialists at Texas Tech University in Lubbock. In Clifton, people used the project's digital cameras to photograph objects they planned to sell on E-Bay. The high quality printer in Sanderson allowed one individual to print his photographs as postcards that were then sold in the local Visitor's Center. In Bryan a local resident put together a community newspaper in the youth center public access site. Several communities were using CN computers and Internet access for teacher in-servicing and other training programs. Hillsboro, Rockdale, Commerce and Corsicana outfitted special training rooms as part of their grants, for example.

In addition to fixed sites, several projects also equipped mobile units, providing vans with computers and wireless antennas in order to extend access and training opportunities to rural and remote locations. Cuero Community Network, Empowernet in the Rio Grande Valley and Corsicana, for example, had mobile units funded at least in part by the CN grant. (Corsicana had a bus outfitted, but had not used it as of spring, 2003; UT Pan American, EmpowerNET's lead agency had a functional mobile unit prior to CN1, but upgraded and added new equipment with TIF funds). Although several communities purchased videoconferencing facilities (Commerce, Corsicana, Plainview, Hillsboro, Luling EmpowerNET, Prairie Lea, Kirbyville, Smithville, Burleson County, and Clifton), we saw little evidence of much use to date. The Wharton County Junior College's CN project was somewhat atypical in that most of the funds were devoted to upgrading videoconferencing and distance learning capacity at the College. Training for trainers and other network personnel had been made available via videoconferencing at several sites, including Rio Grande City. One community's two systems were still in the boxes when we visited at the close of the grant period.

The cost efficiency of expending significant resources on video-conferencing is problematic since few communities expressed an explicit need for these facilities prior to the grants. In several communities, complete systems purchased by the CN added to already existing resources held at school districts, colleges, or regional service centers. The demand, particularly from the business and educational sectors that would most likely benefit from this equipment, was low, and the equipment was generally underutilized. Community colleges identified the potential to expand their constituencies, and there was anecdotal evidence that political will within the administration of former

Governor Bush to promote videoconferencing for economic development may have influenced these decisions. However, most of the access sites equipped with videoconferencing equipment did not report heavy or, in some cases, *any* use.

Public access was established as well through laptop loan programs. About one third of the 36 communities purchased laptops and derived either an institutional/agency or personal loan policy. In Cuero, for example, the library-housed laptops were available to all members of the community (one qualifies with a driver's license designating residency in Dewitt County), while in Haskell, Austin, and Tyler the units could be loaned only to organizations. The GREAT project in Rockdale purchased tripods for its fleet of laptops, and used them for mobile training, network promotional events, and sometimes for loans to community groups. Several projects used laptops exclusively for training (La Grange and Smithville), and the BETC network in Angleton offered laptops for mobile access within the Brazoria County Library. Reviews were mixed on laptop loan programs, particularly those serving individuals. Reporting great community response to the initiative, Cuero Community Network's project manager opined that, were she to design the network again, she would eliminate all fixed access sites and *only* offer laptop loans. Others, however, felt that laptops introduced new problems and administrative concerns, such as security and enforcement of acceptable use policies and mostly kept the use of their machines very limited. In several communities, thefts had been reported.

Access Site Locations

In overwhelming numbers, schools or libraries obtained more computers as a result of the CN1 projects. Both types of institutions by and large already had computers and, in many cases had received previous TIF resources. Schools were critical drivers in a majority of the projects, and they also were among its key beneficiaries. There were de facto practical reasons for their heavy participation in the projects: schools were automatically TIF-eligible, and having TIF-eligible partners was a program requirement; schools were generally the largest institutions in small and medium-sized towns and had accounting and technical infrastructures that facilitated administration of the projects (particularly procurement and technical support which often caused problems for other

types of agencies); and finally, school and school district personnel often had previous experience with TIF, and understood its bureaucracy and practices. Project partners often raised these latter points when discussing the difficulties and barriers encountered working with TIF. It seemed that the strong presence of educational institutions in CN1 projects was a key factor in many networks' "success" or "failure." As well, many libraries in counties across the state had previously received support to purchase or upgrade infrastructure and equipment from TIF and had "insider's" knowledge of how best to negotiate the sometimes arduous process of buying, installing and maintaining TIF-funded equipment according to the agency's regulations. Indeed, the overwhelming majority (55%) of project fiscal agents were school districts, with agencies of higher education (at 28%), a distant second.

The rationale given by many partners in CN1 community projects was that both schools and libraries were logical, open-to-all institutions with more staff, infrastructure, and resources to manage this equipment than other types of locations. The availability of technical and financial staff alone significantly lessened some of the aggravations faced by agencies or sites without these resources. Many projects acknowledged this by selecting schools as primary sites. The ICAN project in Corsicana absorbed most (around 150) of its computers under the grant into its public school system, and its technical staff serviced them; Austin's largest equipment purchase supported a middle school's after-school program (as well as daytime classes), allowing it to add another lab to its facilities and develop a neighborhood tutoring program in the late afternoon and evening hours. Ten of the eighteen sites established in the communities involved in the Connection in the Millennium project based in Clifton were schools, school districts or school libraries. Clearly, K-12 educational facilities are well-suited to reach much of the youth in communities, and many projects specifically designated school-aged children of varying socio-economic, ethnic, racial and other status, as underserved groups. In Willis, community network planners extended this even further, recognizing that schools were the best ways to reach underserved youth, and their parents, due to the paucity of other programs and agencies. The network placed 129 of its roughly 134 computers in schools, since project partners felt that the underserved groups would be most likely to use school and district services through their children. Certainly, in very small towns schools are the

true heart of the community: many aspects of community life revolve around events that occur there.[4] Several districts (e.g.,Willis, Austin and Hillsboro) had expanded their mandate to serve parents as well, and conducted community outreach through parent resource and education centers, and community services (including food pantries, clothing donation centers, and ESL and other services for non-english speaking parents). Thus, Schools' and school districts' participation sometimes did mean that these institutions accepted a wider range of functions, activities, and constituencies; however, this was not always the case. It is also important to note that some sites were established in ISD administrative and technology centers, rather than school campuses themselves.

This latter point raises a critical issue regarding the extensive deployment of public access computers in schools and libraries in many communities. The availability of facilities tends to be restricted in summer when schools are closed, and on weekends and evenings, also times when schools are closed and when public libraries have abbreviated hours (which is very common in small towns). Schools and libraries generally are closed at precisely the times of day when one might expect adult users to have the opportunity to actually visit the facilities (i.e., non-working hours). In small communities in particular, hours of library operation also tend to be very limited; having a library open just a few days of week was not uncommon. In several communities, including Willis and Hillsboro, ISDs were attempting to either seek or divert additional resources to expand hours of availability, but increasingly restricted funds made it difficult to staff centers during non-school hours.

Consequently, we observe that the issue of access to computers in schools outside of regular teaching hours was not well thought through by many communities. This pattern of access site placement raises an essential question: do facilities placed in schools and libraries meet the goals of reaching *new* constituencies, as opposed to the people accustomed to those institutions from the outset? Our fieldwork, as well as our familiarity with other community access studies, suggest that certain social groups, in fact, do not feel comfortable in schools or libraries, and do not view these as inviting sites. We find a great deal of variation in how relevant these facilities are to peoples' lives. For some localities, schools are absolutely central institutions; for other communities, they are distant and even oppressive places.

On the plus side, schools generally already had broadband access through earlier TIF grants, and most utilized the state's Regional Service Centers for network connectivity as well, which kept costs low (the state supports statewide high speed networks for its K-20 public school systems). Several libraries, however, even if they had had previous TIF grants, used CN funds to upgrade their connections to broadband standards, enhancing their attractiveness to users. Using these institutions, however, introduces other issues pertaining to the types of filtering requirements the sites faced, and how they constructed their Acceptable Use Policies (AUPs). In most cases, the extant policies of the institutions housing access dictated the policies the community network facilities would inherit. There are strengths and liabilities to this approach. Most significantly, AUPs defined what the computers were supposed to be used for, often disallowing the "non-utilitarian" uses of the Internet (chatting, gaming, etc.).

Libraries and schools offered distinct advantages in terms of sustainability. In the majority of projects, either the library or the school district (and in many cases, both) were project partners, and thus held to certain obligations concerning material and in-kind resources at least for the period immediately following the expiration of the grant. Even there, however, in the prevailing economic climate in the state it was sometimes the case that financial obligations could not be met. One of the EmpowerNET sites was facing imminent closure or a drastic reduction of services and programs because a beleaguered school district was unable to allocate funds to a school-sited center, and ambitious plans for distance education through video-conferencing had been abandoned in Angleton since the school district's connectivity budget had been slashed. Schools' "bedrock" status as public access sites thus cannot always be assumed.

In addition to K-12 institutions and municipal and county libraries, community colleges, and clinics, hospitals and public health units were also popular sites to establish public access. Several projects also selected less conventional locations. Chambers of Commerce, city halls, community centers (including Boys and Girls Clubs, YMCAs, neighborhood centers), churches, public housing developments, seniors' centers and assisted living facilities, and a handful of business sites were represented among the CN public access facilities, with mixed results in terms of ease and frequency of use. Private businesses offered opportunities for CNs to be more innovative: a local sandwich

shop/upholsterer hosts a Prairie Lea access site; computers at a logging supply store in Woodville are often used by local truckers to gauge weather conditions before transporting lumber and by animal owners who use the Internet to gather information about their animals' conditions and diagnoses at a veterinary clinic site.

Institutions and Building Community Networks

Our research suggests that forming community partnerships at the level that TIF envisioned had varying degrees of success. Secondary schools (kindergarten through high school), libraries, higher education, and healthcare facilities generally received the rant funds and were required to partner with local civic organizations and local government. Grant proposals outlined the roles of the various partners, with the number of community partners varying from project to project. In some instances, these community partnerships seemed like natural extensions since partnerships had been formed to work on previous grants. For example, workforce development organizations had ongoing relationships with local schools and community colleges to provide job-training programs. However, in other cases, there was a limited history of working relationships between the organizations and the fiscal agent – generally a larger institution. In these instances, project leadership relied on community organizations to help them reach out to specific populations, for example Boys and Girls Clubs who worked with youth or Meals on Wheels programs that served the elderly. The goal was to find additional venues where public access sites could be placed as well as to develop methods for reaching those publics. However, these partnerships were not always the right fit. For example, providing a public access site in a women's shelter causes some conflicts for public access.

Often there were not clear guidelines on how these different entities would work together or which agency would take ownership of the equipment after the two-year funding cycle ended. Civic organizations are often understaffed and underfunded and adding additional responsibilities or services, such as offering training in a specific facility, proved to be too burdensome. In Corsicana, for example, the project ultimately fell entirely under the authority of the local school district. In general, projects hoped that volunteers would be able to assist with marketing and training, yet we found that

heavy reliance on volunteer support was problematic, and in general the volunteer workforce did not materialize.

The most successful partnerships were those in which written contracts established guidelines for use and maintenance of public access computers. In the Clifton in the Millennium (CIM) project, for example, each partner town was provided with three computers and Internet access. They received free maintenance throughout the grant cycle and had the option to have reduced maintenance after the contract was over. Partners agreed to open their facilities for a certain number of hours per week in exchange for ownership of the equipment.

However, some natural partnerships were problematic. In the East Texas Community Consortium (ETCC) project, project leaders originally planned to connect the local city government to the T1 lines provided by the school in order to allow for more advanced city services, such as digitizing deeds and records and offering online services. However, city officials did not buy into the project. Management at the local Chamber of Commerce was also resistant to connecting to the network or providing public access because of the increase in traffic to the facility, an irony because one of the main goals of a Chamber of Commerce is to encourage economic development. Instead, the ETCC project used funds to add public access sites in local businesses, including a restaurant and a logging supply store.

One positive aspect of the structure of the TIF projects was that schools and libraries had the in-house technical expertise to maintain the computers and assist in establishing local area networks. However, when there was not an explicit agreement between outside public access sites and the schools and libraries, maintenance became a problem and the fiscal agent often absorbed the equipment for its own purposes. One YMCA collaborating with a school district had public access computers that were down for at least three months because the district personnel never came by to fix them.

Placing computers at social service agencies provided another dimension to the idea of public access. A few communities gave computers to social service agencies or other “middleman” organizations using the logic that the public would be best served if the agencies were well equipped. For example, the ICAN project in Corsicana gave a computer to a charity that used it to obtain low cost prescription medicine for the poor

through electronic insurance filings. In another example, Tyler initially envisioned that the Meals on Wheels program would deliver laptop computers to meal recipients. However, when it became apparent that the Meals on Wheels clients were not interested in the computers, the agency absorbed the computers. It may be that supplying organizations that support target populations with resources such as computers may be a more significant aspect of community building.

Another trend was the absorption of "public access" computers into facilities' own locations. Projects such as those in Plainview, Fisher County and Brazos Valley had "public access" computers that were used mostly or entirely by the staff. However, this brings up an important distinction. While TIF explicitly prohibited the delivery of equipment or connectivity to serve "communities of interest," several projects found that access to additional, faster computers and Internet enabled staff working in public service, healthcare, and educational facilities to be more responsive to the needs of the community.

In general, we observed an initial sense of inertia between fiscal agents and community partners in designing their project. Because it took so long to purchase and install equipment, some of the enthusiasm that characterized envisioning the project wore down, leaving uncertainty and frayed communication cycles.

Where the project leadership located public access indicates a great deal about their notion of who will use it. One key observation is that while the most common public access points were in schools and libraries, the minority and poorer members of the target populations were not the most regular users of such facilities. Indeed, in some situations such institutions may feel alien to them. By placing access sites in the locations of standard community power, the powerless or marginalized populations who are nominally the object of these projects were distanced at the outset.

Factors that Facilitate and Discourage Access Site Use

Our research suggested that computers that were "dropped into" locations where they were unexpected or inconsistent with the other activities and services offered at that place were not well utilized. Most of the Chambers of Commerce, city halls, and health clinic sites, for example, typically had one or two computers in a general purpose or

"waiting" area, but there was often little or no staff to offer instruction or even permission for users. In some cases, site personnel actually resisted receiving equipment for public access because of anticipated problems with security, assistance, and space. Additionally, a lack of signage indicating that the computers were for public use, or other users (with whom potential users could interact), was common at such sites. This was the case in projects such as WCJC-Net in Wharton County, the East Texas Community Consortium in Woodville, Terrell County and Commerce. During field visits, we rarely saw these computers in use and, in several cases, it was reported to us that they had not been turned on in many months. Even more troubling, in some of these cases, our researchers were unable to discern the public access computers at these sites, even when looking for them. It seems unlikely that "the public" was receiving much encouragement either.

We also observed that public access computers sometimes were located in facilities with little participation with or commitment to the network projects by site staff, and these tended to be poorly utilized. Staff at one Chamber of Commerce site in Southeast Texas did not know where its public access computer had come from, and reported that it had never been used in the 18 months it had been there. The computer at one hospital site in Commerce had disappeared, and no one knew where it was. Staff and several residents interviewed at low-income housing developments in the Bryan-College Station region were similarly` somewhat puzzled by the existence of the computers. The Connection in the Millennium project based in Clifton equipped 18 sites with computers, but few personnel from these sites participated in the project and usage was very low. Another trend was the internal absorption of "public access" computers into their locations. In projects including Plainview, Fisher County and Brazos Valley's network, "public access" computers were used mostly or entirely by staff, which was generally an unintended pattern but should not be dismissed when we assess public access (discussed below). While TIF explicitly prohibited the delivery of equipment or connectivity to serve "communities of interest," several projects had found that access to additional, faster computers and Internet connections sometimes enabled staff working in public service, health care and educational facilities to be more responsive and efficient to needs of the community.

In contrast, computers that were integrated into facilities with existing activities and services seemed to be very well-utilized. Seniors' Centers were among the most heavily used sites, attracting many users and proving to be popular training sites. Site personnel and some users themselves attributed this success to seniors having time to learn and use computers, their enjoyment of the company at such centers and, with specific reference to training, the opportunity to be among people their own age when learning something as potentially daunting as computers. Roughly 40% of the CN1 projects placed computers in facilities that serve or house seniors, however, few projects gathered usage data concerning these or other types of sites so it was difficult to quantify their frequency of use. Several youth-oriented facilities – Boys and Girls' Clubs, recreational facilities with after-school programs and community centers – were thought to attract the heaviest use in some communities. In several cases, including BVCNet in Bryan-College Station and Wharton County's network, Boys and Girls' club access sites had requested more computers or sought additional grants to augment facilities established with the CN1 funds.

Sites with kiosks offered rather limited options to the user; these often simply did not work (in Bastrop and Corsicana, for example), or they were placed in out-of-the-way spots (such as a hospital waiting area in Tyler). Hillsboro's CN sub-contracted several site-specific kiosks to be placed in areas with high tourist traffic (an outlet mall and a local historical site), but these had not been deployed in time to assess their usage. In the East Texas communities of Woodville and Livingston, kiosks were placed in a range of locations, including restaurants, stores, county and city facilities, banks and libraries, and a corresponding range of responses from the sites ensured: one site requested the kiosk be removed since a customer had bumped into one and raised liability issues, while several others reported good usage among community residents but significant technical difficulties including connectivity and problems with wireless keyboards. In general, kiosks' performance had not met expectations due to poor locations, no publicity and ongoing technical and connectivity problems.

Projects with separate, dedicated facilities for computer/Internet access were less common, but appeared to attract users if they offered classes, or were integrated into other community services and programs. For example, the San Antonio project's concept

of access was coupled with the City's efforts to promote literacy in targeted neighborhoods. The CN1 grant was used to provide and upgrade computers in city-run Learning and Leadership Development Centers in low-income neighborhoods, and to supplement the city's programs in the centers with basic computer literacy. Hillsboro's CN established one of its two access sites in an old ISD facility that had been retrofitted to accommodate a variety of community programs and services primarily for low-income residents. The center now offers an after-school homework program, as well as computer training and videoconferencing. CNs in Plainview, Smithville, Luling, Lockhart and Colorado City also support dedicated facilities just for computer access, with varying degrees of success. Plainview's site was reportedly very popular among certain groups (such as ISD students and teachers and network training participants), but was not necessarily well known or utilized by the public. Colorado City's project partners assessed their dedicated technology center as a success, citing staff and technology support as primary reasons. In Lockhart, on the other hand, network reliability, coupled with nonexistent tracking of usage patterns made it seem doubtful that much use was being made of its technology center.[5]

However, the examples of San Antonio's Learning and Leadership Development Centers, the computers located in a women's shelter that protects its address, the single computer in a Chamber of Commerce site used every day by one disabled person, and the staff of five non-profit community organizations that share office space in a site housing CN computers, challenge the conventional vision of the library-style free, unfettered and largely unmonitored access.[6]

It may be that supplying an organization that *supports* the target population is more significant in the long term for serving the goals of access. This is particularly significant when we consider that very few project partners felt that unrestricted public access sites had successfully attracted users from target populations: aside from K-12 students (and sometimes their parents), and seniors, few of the groups identified as neediest in communities were well-served by the CN grants.

In this context, the factors that influence the culture and accessibility of locations comprise another dimension of public access. Location, proximity to transportation, availability of childcare, staff support and language spoken at the site all affect use by

community members. Even though most projects made some attempt to locate public access computers within or close to neighborhoods where target groups tended to reside - most frequently, low socio-economic demographic groups, and often African Americans and Latinos – few project partners stated that they felt their CNs had reached these groups adequately. In many cases, hours of operation, as discussed above, were considered an important factor, but other issues seemed to discourage use: at one site in South Texas, the addition of child care had lead to a measurable increase in use of *all* services offered at a community center/public access site, including use of the CN1 computers and training. The impact of transportation options was made clear to staff at the Barbara Bush Family Center in College Station when a change in municipal bus routes in the city led to some users to arrive and wait at the center hours before it opens.

Whether to offer services in Spanish was a prominent issue in the planning of CN1 projects, particularly since Spanish-speaking communities traditionally have been among those groups most marginalized in terms of access to computer resources. In execution, however, few projects realized full services in Spanish. Only a few sites had multilingual capacities: the BETC network in Angleton had some Spanish language training and a fully Spanish language computer, purchased from Dell. Several sites had purchased Spanish language and ESL software, often in conjunction with training programs. San Antonio conducted most network activities in Spanish, including training, signage, evaluation of training programs and access sites, and needs assessments. About one third of the 36 CN1 projects offered Spanish language training, but a large subset within this group indicated that they had only offered one or two classes due to the lack of curriculum, qualified instructors or interest. Several project managers echoed the views expressed by one southeast Texas partner who felt frustrated by knowing that Spanish speakers were “out there” and the CN1 had resources available to them, but they were unable to engage or attract this group to public access.

However, aside from bilingual or Spanish hardware, training courses, software and sometimes personnel, it was difficult to discern any effort to engage Latinos, African Americans, and lower-income communities as part of the network projects themselves, although most of the 36 projects cited at least one of these as a target group. It is likely that this failure to integrate target communities into the process of developing and

establishing networks may have had an impact on the usability of access sites. While project personnel in many cases attempted to establish sites in neighborhoods or close to areas where their target groups lived, the groups themselves had no "ownership" or direct involvement in the project. At least three project managers reported that they specifically chose churches with primarily African American congregations, for example, or centers in neighborhoods with a high proportion of African American residents, for public access locations. However, simply putting a site in these locations did not seem to be enough. One project manager described visiting several of the Latino cafes in her town to spread information about the network. Another addressed African American church congregations, but to slight effect.

Despite such efforts, only a very few CNs expressed satisfaction with the extent to which they had reached most target groups, particularly African Americans and Latinos. Partners from San Antonio, EmpowerNET (based in Edinburg), the San Marcos Community Network, and Arlington's CN were more satisfied than most by their networks' efficacy in addressing the needs of target groups, and they were unusual in that they documented access site use, including demographics. In general sites did not collect data that reveal socio-economic, racial and ethnic composition of access site users (and participants in network services and programs, in general) even though managers "felt" they had failed to adequately reach intended users.

Regardless of the socio-economic profile, race or ethnicity of public access site clients, the availability of staff to help with questions and reliable technical support were both crucial to usability. Complementing the effect of good technical support, good *technology* was also fundamental. Sites with poor or unreliable hardware components, connectivity or limited software were not heavily used. Unfortunately, bad network connections or other technical problems often went unnoticed or unreported – some were discovered only during our research site visits.

Outreach, marketing and other functions designed to attract community users also frequently were cited as reasons for low levels of access site use. It would be difficult to overstate the strength of conviction that characterizes most CN partners' views on TIF's decision to disallow CN1 fund expenditures directly on marketing. With almost complete unanimity, participants in these projects identified marketing and publicity as the least

successful aspect of their CNs, and they attributed many failures to meet network objectives (particularly in attracting target groups) to difficulties encountered in "getting the word out" about the networks in general and the access sites in particular. As we note above, for instance, only a handful of sites actually posted signs that identified access sites to the public (Hillsboro, Rockdale, Austin, and Andrews).

These problems were largely rooted in the lack of funds to use on marketing: most efforts to advertise, promote or identify access sites were funded by partner institutions or by matching or privately donated funds, both of which were exempt from TIF's restrictions on the use of grant funds for marketing. Considerable confusion surrounding what was allowable in this context clouded the issue. The Angleton CN's management team publicized access sites using match funds from community partners – a route that many other projects assumed was prohibited, but proved very effective in this case. That network's management team included a community outreach/marketing person, and used a number of means to publicize its sites: prominent signage was posted at all locations including names of donors and sponsoring entities and each lab was equipped with an Angleton CN mouse pad, including the Web site's URL, access site locations, and training and contact information. These mouse pads offered the additional benefit of allowing monitoring of access site traffic: as the more popular sites' pads quickly grew worn and dirty, those at less busy locations remained pristine. Pencils and brochures advertising the CN also were distributed at sites. This project was the exception, however. Most networks, however, relied on word of mouth, newspaper ads, fliers, and public presentations for publicity, and almost none of the 36 projects assessed these efforts as sufficient or appropriate.

"Success" and Public Access

The experiences of these 36 communities substantially expand the usual notion of public access, and raise the fundamental question of how we define the "success" of public access. There are no authorities on this question even though the commonplace notion of success might refer to numbers of users who visit such sites. Is success a matter of meeting overall demand, or meeting specialized demand? Can using of public access in order to save money on prescription drugs ordered online be deemed a more significant social use of public facilities than playing computer games in a library? Beyond this,

how are communities defining public space? In many cases, public space was assumed to be synonymous with public buildings - buildings owned by the government or the school. However, publics use space differently, and some gather very naturally in places that are not owned by the public sector. The coffee counter at a local store may, in fact, be a superior public access site and "public" space.

From the state perspective, TIF's own discourse tended to discount such possibilities since the agency made it very clear that equipment was to be located only in "TIF-eligible" entities, except under the most "extreme" of circumstances; the agency made it very difficult for project managers to find flexibility even when they knew that private businesses, for example, were the best sites to attract users. Essentially, there was a mismatch between institutional definitions of acceptable access locations and realistic and presumably effective locations for access.

What constitutes successful public access in the communities might have been addressed by the projects themselves if they had had an assessment mechanism. Only two sites systematically gathered data from users outside of organized classes, and that data did not seem to lead to program changes of any sort. Many projects employed a fairly haphazard approach to their data collection, relying on largely unmonitored sign-in sheets or log books to gauge usage patterns and almost no demographic details that indicated who used CN1-funded computers and for what purposes. Bureaucratic inertia surrounded the issue of evaluating the utility of certain sites: why was it that sites obviously under (or never) used still existed, and why were some over-used sites not granted better resources or technical support? Part of the explanation can be attributed to the sunk costs of establishing the computer site, arranging for its "sponsorship" at an institution, establishing an Internet connection, and the difficulty of moving it.

Another explanation in certain sites has to do with the difficulty in finding places willing to host the sites at all. In Kirbyville and Gonzales, for instance, project planners sent letters to numerous churches and other institutions in their region soliciting access locations, but only two churches opted to host computer access facilities. In Brazos Valley, at least one site manager reported that public access was "forced" into his facility since he had neither the staff, nor the space or the connectivity, to support public access computers. Moreover, in many cases there was simply no mechanism for tracking the

computers themselves: in one community, a theft of several laptop computers was noticed only because a faculty member observed a student using a (stolen) project computer at an unconventional place, which prompted him to inquire about it with the program. Another project's manager discovered only during a site visit made for this research that a CN computer, sited in a very public place, had been used for downloading pornography for several months. In this case, in fact, the site's management neither noticed nor cared since they had no knowledge of the CN and only a vague idea that the computer was provided by the local school district.

Public access as developed in these communities represents a diverse set of ideas and practices. A great deal of the access conformed to expected locations in schools and libraries, but other sites that promised to reach more targeted constituencies also were established. Defining the public to be reached, and defining the public spaces they inhabit proved to be difficult for many of the projects, especially in the face of the not-so-simple tasks of maintaining fussy computers and ensuring someone would be available to help users. Strategies that maximized in-place resources (technical support, project direction, site management) dominated, sometimes at the expense of mounting the more difficult process of launching public access at unfamiliar sites that presented logistical (distance from an existing network or hub; less proximate to technical support, etc.) and cultural (e.g., reaching minority populations) difficulties.

Conclusions and Policy Implications

Our broader research investigates the dynamics of launching and sustaining community-instigated communications sites. We conclude that "providing public access" was largely equated with imply expanding the computer and Internet availabilities in schools and libraries. For both pragmatic and philosophical, and sometimes self-serving reasons, communities concluded that these conventional institutions were optimal for reaching the members of their towns, even though they produced scant evidence that this was the case. They rarely checked these assumptions against the statistical and lived realities of the potential users of their network. While several project leaders confessed that they had intended to reach other constituencies with their network efforts – minority

members of their towns, people living in nearby rural areas, the poor – such outreach did not receive priority once the task of implementing the grants was upon them. Public access to computer and the Internet **was** dramatically expanded even if much of that expansion occurred at places that already offered Internet access. In this, the path chosen represents efforts that place minimal burdens on extant, major institutions in localities. Indeed, schools and libraries already had computers and high-speed connections. The more difficult task of incorporating sites that represented places where poor and minority populations had control and power was avoided. In other words, the very placement, staffing, and use of public access in these projects largely replicated the power structure and access advantages that already were in place.

We do not dispute that many of these sites, particularly libraries, did indeed expand the availability of computers and the Internet to deprived populations. From a public policy perspective, those public access sites have benefited from many of the federal and state programs and grants addressing the digital divide. They could doubtless benefit even more if the grant programs emphasized community processes and the creation of leadership capabilities within the marginalized populations, all within the context of new technology-based opportunities.

It is anticipated that major shifts in public support for these access locations (e.g., funding cuts, their dismantling of service agencies, etc.) will significantly affect those segments of the population whose Internet connectivity relies on public access sites, and it will negatively influence communities trying to redress some of the inequities in their localities. Such a prospect calls for more investigation into the sites and populations affected by these cuts, and what their users will do if policy changes deprive them of public access opportunities.

From a policy perspective, the interventions created by the federal government agencies before 2000 and by the State of Texas until 2003 to create public access were very successful. They created a network of public access points in Texas that in general are being used by precisely those who were targeted: the poor, minority groups, and the less educated. Ironically, that infrastructure is part of what enables contrarian critics to point to elevated numbers of people using the Internet and to declare that "the war is won." What we do not know from the general surveys reporting Internet use reflects

back to what we observe in the case studies at hand: that cities and towns can still do much more to reach these underserved communities and to incorporate their needs into the pragmatics of access site location, definitions of acceptable use, and training.

The experience of the projects raises questions about what public access actually is, and how it is best achieved. Several projects reasoned that their communities would be best served if the intermediary social service agencies benefited from the project's computers and access. This is classic social capital at work: the project resources reduced the transaction costs for these institutions, and allowed them to improve their jobs and their services. Bringing social service entities - and even for-profit businesses – into the mix could help raise the overall level of social capital within the localities by creating bridging and bonding social capital (Putnam, 1993). In this sense the true "network" aspect of these projects – aside from the technological referent – might have best been served by linking social agencies to both the leadership facilitating the projects but more importantly to the communities they serve.

In general, the results from all 36 communities present a mixed picture of successes and partial accomplishments. When local communities did not expand their base of leadership to actual users or when local participation in the project organization and implementation was low or limited, the resources available to them tended to be more poorly utilized. When, on the other hand, local institutions had a ready plan that was the result of community discussions, and when they actively examined their own programs, their outreach was better and more people were served by the community network sites and its training. A critical implication is that policymakers need to establish the indicators or evidence that can help them determine which communities are in fact well equipped to use scarce resources to their maximum potential.

From a theoretical perspective, those interventions can be seen as a policy implementation of the theoretical critique applied to diffusion theory in the late 1970s. That is, in order to avoid information gaps and increases in social stratification which seem to often accompany the diffusion of new technologies, the soundest strategy is to identify those who will most likely be among the disadvantaged, the late adopters if you will, and to target them with specific programs designed to create access and conditions for successful use of the new media. A critical awareness of the stratifying potential of

new media in the information society, coupled with research to identify who is excluded from early diffusion as well as research regarding what community mechanisms fare best, seem superior in their predictive power to a strict theoretical reliance on market mechanisms to solve the digital divide.

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[1] We date the onset of telecommunications deregulation with AT&T's divestiture in 1984, but states deregulated their carriers in many different fashions throughout the 1980s and 1990s. The 1996 Telecommunications Act pushed deregulation further across several media industries, allowed competition in the local loop and also redefined universal service.

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[3] See Strover, 2003 for a review of the federal Tauzin-Dingell bill introduced in 2002 and the various "broadband parity" legislative activities around the country in 2002-2003.

[4] In Sanderson, population 800, one of our interviews was conducted in the high school, the site of the project management, as the cheerleading team baked pies for the 4th of July celebration. The school was where people naturally gathered for all public celebrations.

[5] When visiting access centers during posted business hours with no signage, no staff, the lights and computers off (and in one case turned toward the wall, preventing access), we conclude there may be usage problems.

[6] Several communities articulated access rather differently: for them, access to even one person can be judged a success, even when TIF claimed differently. In at least two cases (Wharton County and the East

Texas Community Consortium), when communities articulated access that did not seem sufficiently "public," TIF asked them to add conventional places to their access rosters, suggesting the agency itself espoused an idea of public access as simply "access in a place available to the public," rather than for targeted users at a less "public" place.