REVISED PROPOSAL 9801-024

PART ONE

Blacksburg Electronic Village, Incorporated
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The Use and Social Impact of Telecommunications and Information Infrastructure Assistance upon Local Public and Nonprofit Sectors: An Assessment of Community Networks

This proposal is submitted pursuant to BAA-SBNT-98-01

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(18 months)

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PART TWO: Technical Information

A. Abstract

Fostering community networks represents a central thrust of the TIIAP Infrastructure Assistance Program. Community networks constitute a critical meeting place for local stakeholders within their existent social systems and the technological innovations that would reshape the information/communication infrastructure in our society. This interplay of community social structure and new information technology offers great opportunity to enhance the delivery of needed information services to local populaces and to structurally empower populations that have been greatly underserved in the information age. The proposed research project will develop and implement a sustainable package to assess the uses and impacts of information infrastructure and technology on public and nonprofit agencies within localities served by community networks. This project will establish a dynamic database of research results, methodologies, and instruments, one permanently accessible to practitioners and researchers. The database design will be compatible with the existing web-based structured reporting system and related resources established by TIIAP.

The proposed research will evaluate the uses and impacts of information technology and services [using quantitative and qualitative methodologies] from a sample of 50 existent community networks. In addition, the project will integrate findings from four comprehensive case studies into the information gathered from the larger sample. These four comprehensive evaluation sites will be finalized in collaboration with project partners and TIIAP program officers. The project will integrate our new "project" data with results already collected by TIIAP, Westat, project researchers, and other entities--including community network managers known to the project staff. Dr. Andrea Kavanaugh, Director of Research for the Blacksburg Electronic Village, will lead an evaluation team comprised of nationally recognized communication and information research experts.

B. Response to NTIA and TIIAP Goals

The proposed research responds to the NTIA mission and the TIIAP goals as follows. Thus the goals of this evaluation are:

- To increase understanding of the use and effects of information infrastructure in public and nonprofit sectors;

- To establish a knowledge base of public and nonprofit sector applications of telecommunications and information technologies for nationwide information dissemination, technical assistance, and continued research and evaluation; and

- To foster a better understanding of information technology diffusion problems that, in turn, will help accelerate Internet adoption and extend benefits to underserved public and nonprofit sectors.

Specifically, we will evaluate:

- Problems related to the scalability of telecommunications and information technology systems used by public and nonprofit organizations in 50 community networks;
- The level of community involvement in the development and implementation of community network projects ('participatory design' strategies);
- The extent to which community networks are reducing disparities in access to information and infrastructure provided by public and nonprofit organizations;
- The extent to which organizational change in public and nonprofit sectors can be attributed to the Internet.

We seek to contribute innovative, but effective, techniques and methodologies for evaluating applications of telecommunications and information technology projects in the public and nonprofit sectors. We expect to do this by encouraging community network managers to offer to local public and nonprofit organizations a 'package' of Internet services, including web space, a listserv and two organizational email accounts. This package should be offered for no more than $30 per year (cost recovery) to local organizations. We are requesting $1,000 in NTIA funds to be used to offset the cost of the Internet service package for up to 50 severely disadvantaged community organizations. Other interested organizations in networked communities would be expected to pay the minimal fee of $20 to $30 per year for this package (listserv, web space and email accounts), managed by BEV. Organization members or constituents have an existing and interest in and need for organizational information (meeting agendas, minutes, updates, announcements, newsletters) as well as an ongoing discussion within group. By putting useful communication tools into the hands of established social groups and networks, the Internet becomes a natural medium overlaying existing nodes of communication and information exchange.

In Blacksburg, we have found that this 'packaging' of tools (which we call 'Community Connections' offered for $20/year) not only greatly assists organizations in adopting information technology and services for their existing communication needs and purposes. It also establishes an innovative medium and methodology through which to evaluate the uses and gratification obtained by constituents and group members. In collaboration with the community network manager (offering the package) and the list owner, we will place a survey questionnaire on the organization listserv (see Supplemental Information for sample questions). In using this approach in Blacksburg, we have found that data collection is unobtrusive, but effective, with much higher rates of return than online surveys. The listserv survey is targeted only at the subscribers of a specific organizational list (a public school district's administrators, or teachers of social studies, or one school's PTA; a church; or support group).

There is no question that disadvantaged members of a community are less likely to have access to the Internet, and therefore would not be able to subscribe to a listserv. However, we find that it is often *not the cost but the content* that prevents disadvantaged individuals from using the Internet. The content is typically not relevant to their immediate daily needs. The rewards are not

greater than the cost of getting to a location where there is free access, plus the cost in time and effort of learning how to use it. When people see that other members in their social network are obtaining important information online, and communicating with affiliates in the same social network, they are highly motivated to use these communication tools.

This approach is similar to the notion in critical mass theory that the more high resource individuals on the network (telephone, Internet), the higher the value of the network to the subscriber, and the more rapidly it will reach critical mass. Clearly, the Internet has reached critical mass for the higher socio-economic strata of society in the United States. For disadvantaged groups, however, high resource individuals might be the pastor of their church; the social worker who assists them with life skills and future employment; a coal mining heritage association. And these organizations are also unsure about how to use the Internet for their purposes. Packaging common Internet services (web space, listserv and email accounts) at cost recovery rates, greatly facilitates their adoption by organizations.

We contend that by not targeting nonprofit organizations and public agencies that serve disadvantaged segments of the population, the effort to diffuse information technology and services is like rolling water uphill. There's a lot of spillage. We cannot afford to waste scarce resources, especially among disadvantaged groups. As part of this research project, we will be evaluating the validity of this approach to accelerating the diffusion of information technology.

C. Statement of Work

The evaluation team, led by Dr. Andrea Kavanaugh, is comprised of leading experts and researchers in information and communication; these are: Dr. Andrew Cohill, Dr. Joseph Schmitz, Dr. Scott Patterson and Dr. Joan Durrance. More information about the background and qualifications of the evaluation team are included under the Personnel section below.

The proposed evaluation effort will address the broad research goals (above) by determining whether and the extent to which Internet use among disadvantaged segments of the population is associated with;

- increases in access to information targeted at disadvantaged groups (e.g., job banks, social services, medical information, nutrition);
- increases in discussion in community groups, activities and issues;
- increases in attachment to and involvement in local community;
- expansion and strengthening of social networks and relationships;
- increases in human capital and economic development generally, and to skills upgrading, training and employment, specifically.

We will employ a combination of quantitative and qualitative techniques to assess the use and socio-economic impact of the Internet. Specifically, these include telephone and mail surveys, online questionnaires, focus group and one-on-one interviews. We intend to measure the use and impact of the Internet in public and nonprofit organizations serving disadvantaged groups in 50 community networks, including four comprehensive case studies, with special

focus on TIIAP-funded projects. We are also collaborating with the Association for Community Networks (AFCN) in the identification and recruitment of community network managers and their participating organizations in the nonprofit and public sectors.

A few community network initiatives have been assessed directly by the number of people who participate or take advantage of the resources, including:

· trends in the total number of users;
· user demographics, computer/network literacy, expectations, impact;
· participation in training workshops, use of online training guides;
· use of community network web site and other Internet-based resources

Some of these data are available from existing sources, (TIIAP, Hecht, among others discussed below), but need to be updated and elaborated upon in terms of social impact. We will update information, as needed, from community network managers, using telephone interviews supplemented by email questionnaires. These CN managers, together with TIIAP archives and Westat database will help us identify nonprofit organizations and public agencies (and their constituents) within four community networks we will target for comprehensive case study research.

1. Technical Approach and Methodology

Much of the discussion about "new" information technology has been based upon speculation about the uses and impacts of the Internet in the popular press. Often this discourse has shed far more heat than light. During this period, a much smaller amount of sound theoretical work has been contributed by such authors as Doheny-Farina (1996), Dutton (1992), Jones (1995, 1997), O'Sullivan (1995), and several others. And a small but increasing set of reliable data and empirical research has been gradually emerging.

Some of the earliest empirical research has focused upon Santa Monica's Public Electronic Network and has been performed by communication scholars at the Anneberg School For Communication. These researchers include Joseph Schmitz, Everett M. Rogers, William Dutton, Kendall Guthrie and their associates. We will draw from this body of knowledge and are quite familiar with both its published and unpublished data.

The Rand Corporation conducted a series of case studies of community networks in 1995 which provide a valuable benchmark. Most of the data is based on archival data and interviews. There is very little quantitative data or impact assessment, except by the Blacksburg Electronic Village (BEV).

BEV has been a leader in community network evaluation and research since its inception in 1993. The Director of Research, Andrea Kavanaugh, has collaborated with other scholars and faculty in the collection of quantitative and qualitative data on the use and social impacts of networking in the community. The proposed research project would draw on the five years of research experience (instruments, methodology, expertise) related to the BEV and environs, which includes use and impacts among disadvantaged groups in rural

Appalachia and some inner city areas of Virginia. Also of special focus in the BEV research has been the impact of community networking on community involvement, civic engagement and social capital (Rothenbuhler 1991; Putnam 1993, 1995a; Patterson and Kavanaugh 1999).

We will also draw from the wealth of evaluation data that is archived in the TIIAP reports submitted by funded projects and has been made available through the web-based structured reporting system. The Westat Report and studies conducted by individual researchers (Hecht, in process; Schuler 1997; The CPB/CWEIS Initiative, under review for EJC/REC; Cohill and Kavanaugh 1999; Patterson and Kavanaugh 1994; Schmitz et al. 1995; Turow 1999; and Kohut 1999) will be employed by the research team.

The Kohut (1999) and Turow (1999) studies are national projects which assess the uses and impacts of the Internet among dispersed users and compare the differences between experienced and new users, particularly in demographic terms and with regard to their political interests (for Kohut, see also http://www.people-press.org). Interestingly, Kohut reported that recent Internet subscribers are less affluent and less politically active than Internet users who have subscribed for more than one year. We will also refer to the Turow (1999) important national study on the family and the Internet .

2. Expected results

We will take a social science approach generally and will use social network analysis and community involvement measures to assess the impact of the Internet on social relationships, human capital and economic development. We expect to produce an online database of raw data, research hypotheses and findings, a set of instruments, a finalized methodology and numerous articles for presentation at professional meetings and publication in appropriate journals.

We expect to design the database so that community networks managers, nonprofit organizations and public agencies can continually update information about their projects as part of their funded evaluation effort. The database will be planned in coordination with TIIAP officers in order to meet the evaluation requirements of the sponsor agency. Interested researchers, scholars, policy makers and the general public will access the database in order to stay informed of findings, conduct analyses on raw data, and use or adapt instruments and questionnaires.

3. Tasks

a) Tasks related to broad survey of nonprofit community organizations and public agencies in 50 community networks (CNs)

- Identify nonprofit organizations and public agencies using the Internet in the context of a community network from the full list of TIIAP funded community networks;
- Review results of TIIAP-sponsored Westat study and online reporting system and questionnaires;
- Enlist cooperation of representatives of at least 50 CN managers by telephone and follow up with email questionnaire;

- Extend technical assistance to CNs in offering "Community Connections" package of Internet services (organizational listserv, web space, email account) for organizations that do not have listserv already;
- Interview by phone the representatives of nonprofit and public sector organizations in these 50 CNs; secure commitment to complete follow-up questionnaire by email.
- Survey constituents and other users of services of nonprofit organizations and public agencies through organizational listserv and / or web site, if it has been operational for at least four months.
- Compile phone interview data in NUDIST program for content analysis
- Convert email questionnaire results to SPSS file for statistical analysis

b) Tasks related to Four Comprehensive Case Studies

We will conduct in depth case studies in five community network sites. The PI and members of the evaluation team will collaborate on the final details of the methodology, the design and / or adaptation of instruments, and the final wording of questions. Local coordinators will be recruited at each site, once the final sites are determined. They will be selected on the basis of the overlap of nonprofit and public agencies, funded by TIIAP, within a community network setting, that serve disadvantaged segments of the population. For example, public schools in remote rural areas or inner cities; public libraries, local government, health and social services agencies; community organizations such as United Way, National Urban League, or similar groups.

We will conduct telephone interviews with a total of 80 representatives of nonprofit organizations and public agencies (10 nonprofit organizations and 10 public agencies per community network, that is 20 total per community network case site). This gives a total of 40 nonprofit organizations and 40 public agencies across 4 community network case sites.

Specific tasks, the responsible parties, and approximate time frame, are attached as a timeline / milestone schedule to the clarifications section.

4. Survey Instruments

The following candidate instruments will be adapted, as necessary, for the evaluation. The FINAL set of questions, instruments or adaptations and general methods, need to be discussed and agreed upon by the participants in the proposal. Candidate instruments are included in the Supplemental Information section.

Mail Surveys

User Profile, Internet Use and Impact

Please see Supplemental Information section for candidate user profile survey instrument which was developed and tested by Andrea Kavanaugh and Scott

Patterson, Blacksburg Electronic Village and Virginia Tech, with support from the Council on Library Resources in 1993 and the U.S. Department of Commerce TIIAP Program (1995-97). This instrument requests information from Internet users in each community network about basic demographics, computer and network literacy, interest in various services and applications, social networks, and the impact of the Internet on their daily lives, social relationships and community involvement. We will conduct one survey round planned at about month 12, in order to assess emerging trends within and across communities.

Nonprofit and Public Organization Survey

This candidate instrument seeks information regarding community organization type and size, uses of Internet, expectations, and requirements of online services. It is being tested in the Blacksburg environs during an online survey (summer 1999). It will be adapted to include questions about employee job skills, training requirements and effectiveness of employment training programs facilitated by computer networking from the perspective of the employee (one survey round planned).

One-on-one and Focus Group Interviews

Each of the four case studies will conduct mail surveys of users and businesses (noted above). They will also participate in the CN manager telephone interview and online questionnaire (by telephone and email). In addition, they will conduct a series of focus groups and one-on-one interviews.

Data from the focus group interviews (in each of the 4 case studies), will be coded and entered into NUDIST software for analysis, with the assistance of the RA under the supervision of the principal investigator. A common set of themes will guide the coding scheme (network use, social relationships, employment, training, etc.), that are agreed upon by evaluation team members and case study participants.

Each of the four communities participating in the comprehensive case studies will locally manage the focus group interviews among different users (workplace, school, government, business, residence). All focus groups will use a common set of interview protocols (guiding questions) to assess the effectiveness of networking in achieving community network goals.

The focus groups are an excellent opportunity to also collect data from participants regarding social networks, community involvement, and usefulness of Internet in job training and related human capital assessment. By using Opscan sheets, these questionnaires can be processed at minimal cost at a central location (e.g., Virginia Tech Office of Research and Measurement). Statistical analysis will be conducted by the Statistical Center of the VT Department of Statistics. Additional background information about the Statistical Center is included in the Supplemental Information section.

We will establish an online database with raw data from all evaluation tasks, as well as instruments and research results, for use by all participating communities, and interested observers. Complete anonymity for survey respondents and focus group participants will be observed. The intention is to

build a database that can be continuously updated by community network project managers and TIIAP / NTIA program officers, after the grant period.

5. Selection of Case Study Sites

The evaluation team will identify, recruit and select four case study sites in the first quarter of the grant period. The selection of sites will be based on the active Internet use of at least ten nonprofit organizations and ten public agencies serving disadvantaged members of a population within a community network, with special focus on those funded presently or in prior rounds by TIIAP.

The case studies will include random sample mail surveys of the community population, one-on-one interviews with representative of ten nonprofit organizations and ten public agencies, and focus groups with members of the disadvantaged population targeted by these public sector organizations. The local coordinators will assist in the local distribution of mail surveys, participant observation, archival records review, and the collection of interview data. Local coordinators will arrange interviews and conduct them, including focus groups.

D. Personnel

Please see the Supplemental Information section for resumes of the evaluation team.

Evaluation Team:

Andrea Kavanaugh (Principal Investigator): a Fulbright scholar and Cunningham Fellow, has worked extensively on communications systems and effects. Her areas of current research are the use and social impact of computer networking, and communication policy. She has served for the past five years as Director of Research for the Blacksburg Electronic Village, Information Systems, at Virginia Polytechnic Institute & State University (Virginia Tech). Her most recent books include "Community Networks: Lessons from Blacksburg, Virginia" (1999, second edition), co-edited with Andrew Cohill.

Dr. Joseph Schmitz (Co-Principal Investigator): is Assistant Professor of Communication at the University of Tulsa. His dissertation research developed and tested the Social Influence Model of Technology Use--a theoretical framework now widely used by communication scholars who study information technology in organizations. Dr. Schmitz helped the City of Santa Monica create and evaluate its Public Electronic Network, the first city government-sponsored community network in the United States. He has a long-standing interest in developing community networks and assessing their social impacts. Presently he is completing a book manuscript for SAGE Publications, one that compares Santa Monica's community network to those of other localities. Schmitz has worked to help extend information technology to underserved populations and has authored one refereed journal article that included a homeless man [Paschal] among its coauthors.

Dr. Andrew Michael Cohill, the Director of the Blacksburg Electronic Village (BEV) for Virginia Tech, is an information architect with an educational background in architecture, ergonomics, and computer science. His career in computing and networked information systems covers twenty-five years work in private industry, consulting, and academia. Dr. Cohill has been the Director of the BEV for nearly six years; he is responsible for the marketing and development of electronic village services, and supervises a technology group and an operations group that manages the BEV office and administrative services. He directs the long range planning effort for the group, and serves as an advocate for networking in the university and around the Commonwealth of Virginia and the country.

Dr. Joan Durrance: Professor at the University of Michigan School of Information, teaches and conducts research in public libraries, community information networking, access issues, information needs, and professional practice. She is co-principal investigator on "Help-Seeking in an Electronic World" a research and demonstration project funded by a $189,026 National Leadership Grant from the Institute of Museum and Library Services (IMLS). This research project looks at the role of librarians in assisting users with finding community information over the Internet. It involves surveying U.S. public library involvement in community networking and networked community information provision, and conducting case studies of public library-community networking activities. For several years Dr. Durrance has been coordinator of the UM SI Community Networking Initiative which includes the Community Connector which is an electronic gateway of digital community information resources. The Connector showcases ways community information systems serve and engage their communities. She has written three books--*Meeting Community Needs through Job and Career Centers* (1994) and *Serving Job Seekers and Career Changers*, (1993), and*Armed for Action*, (1984), and numerous articles about community information and professional practice. She has been active in PLA's Community Information Section and in the development of the new Association for Community Networking.

Dr. Scott Patterson (Co-Principal Investigator): is Associate Professor, Department of Broadcasting and Electronic Communications, San Francisco State University. He is an expert in the evaluation of community networks and innovation diffusion; he contributed significantly to the early research on the evaluation of the Blacksburg Electronic Village, including instrument design and development, focus group interviewing, survey research, and statistical analysis. Dr. Patterson is the author of numerous articles on community networking and related communication studies. He will contribute toward the proposed research along similar lines, particularly the survey research and statistical analysis.

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PART FOUR: SUPPORTING INFORMATION

A. Other research projects currently undertaken by Principal Investigator

Dr. Kavanaugh is currently supported 10% by the US Department of Commerce, Public Telecommunications Facilities Program on a one-year planning grant (#99231) from October 1, 1999 through September 30, 2000. This planning grant seeks to design a hybrid wireless wireline system for health and education training for professionals and the minority populations they serve.

B. Roles played by other organizations:

Association for Community Networking (AFCN)

AFCN is a new membership organization designed to address the challenges that communities not yet online face, to assist the networks that are struggling to continue, and to understand why many have not succeeded. AFCN provides leadership and guidance so people can spend their time and money building up their communities, rather than creating these tools from the ground up. AFCN's mission is to improve the visibility, viability and vitality of community networking by assisting people and organizations, encouraging research and developing services.

The AFCN will assist the evaluation team in identifying and recruiting community network managers for interviews and related data collection. Dr. Joan Durrance of the evaluation team is a past member of the AFCN Board. Dr. Cohill is a current member of the Board. In a recent meeting of the AFCN Board, outgoing president, Amy Borgstrom and president Steve Snow, expressed the organization's enthusiastic support of the evaluation project.