BLACKSBURG
electronic village

BEV Research Studies, 1995 - 1998

Technical Report 1999-01

An outreach effort of

Virginia Tech

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The Village information servers can be reached
via the World Wide Web at <http://www.bev.net/>

The BEV provides additional information about starting and managing comunity-based networks on
the BEV Web site. Check <http://www.bev.net/evupstart/> for additional reports and information.

The BEV staff is also grateful to Judy Lilly, Director, VT Communications Network Services, for
her advice and support, and to Erv Blythe, Vice President of Information Systems at Virginia Tech,
for his guidance and support of the project.

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The BEV is an outreach project of Virginia Tech
<http://www.vt.edu>.

Organizationally, the BEV is part of
Communications Network Services
<http://www.cns.vt.edu>.
CNS is a Virginia Tech department that provides
voice, video, data, and related services to the
university.

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February 1999

Goals of the Grant

The three main aims of the project during the grant period were:

1. Educate a wide variety of rural, under-served users in Montgomery County (teachers, students, government servants, citizens, library patrons, and businesses) in the integration of Internet-based services into their daily activities;

2. Evaluate and test the replication of the BEV model for community networking through a formal partnership with another community (Radford); Assist other communities interested in networking by augmenting and enhancing the BEV online clearinghouse of "how-to" information, documentation, evaluation and training materials; and

3. Evaluate the effectiveness of training and replication efforts, using both quantitative and qualitative data to assess the use and impact of networking.

The Blacksburg Electronic Village (BEV) is a community network serving Montgomery County, Virginia (population 75,000). Within the county, the Town of Blacksburg, home of Virginia Polytechnic Institute & State University (also known as Virginia Tech), has a population of 36,000. The term 'BEV usage' refers to Internet usage, and appears in early surveys (1994-95), when BEV provided access to the Internet for any interested individual or organization. With the advent of private Internet Service Providers in 1995, and the success of the BEV 'experiment,' non-affiliates of Virginia Tech were required to obtain access to the Internet from private ISPs.

A number of quantitative and qualitative techniques have been used to assess the demographics,

computer and network literacy, and the use and impact of the Internet-based community network of the Blacksburg Electronic Village. This report summarizes the findings from various quantitative studies (primarily, mail, telephone and online surveys of users and nonusers, including local businesses and K-12 educators).

Highlights of User Profiles
Demographics

A reported 87% of Blacksburg residents use the Internet; about 20% of Montgomery County residents outside Blacksburg use the Internet.

The majority (85%) of Internet users in Blacksburg are affiliated with Virginia Tech; users outside Blacksburg (the rest of Montgomery County) represent diverse backgrounds. Free Internet access is available through the Montgomery Floyd Regional Library system, serving Montgomery and Floyd counties.

In general, the majority of Internet users in the Blacksburg community are consistent with national profiles of young, college-educated males. The majority are either employed as professionals or identify themselves as full-time students. Users of the public library are about 48% female.

Electronic mail and the World Wide Web are the two most popular services. The percentage of users reporting they are "somewhat" or "very interested" in electronic mail is 97%; in using the World Wide Web 95%.

Users report an average length of Internet use of 13 to 18 months. The majority (85%) of respondents report they primarily access the Internet from home; 20% report they primarily access the Internet from their workplace; these are consistent with national data showing more home use of Internet than use from the workplace. Eighty-three percent use a modem to connect to the Internet; 3% use off-campus ISDN; 11% use off-campus Ethernet; 30% use on-campus Ethernet; 7% use on campus CBX (percentages total to more than 100% because people access the Internet from multiple locations).

Users' Expectations and Use of the Internet

Consistent with national and international surveys, BEV surveys show that electronic mail is the most popular service, followed closely by the World Wide Web. In looking at the scores of the longitudinal use of the BEV home page, users report that the links they use most frequently are: 1) "Library and Reference Tools" and "Regional Information" (tie); 3) Health Care Center 4) VT Web and 5) Virginia Resources.

The majority (77%) report accessing the Internet in the last 24 hours and generally report using the Internet once a day or more. The average length of time persons were connected during their last Internet session was between 45 and 60 minutes. Table 1 shows trends in user expectations of the

Internet for various purposes (that is, those reporting they expect the Internet to be "somewhat" or "very helpful," the two highest points on a four point scale):

Table 1

Purpose:	1995	1996	1997 (Ethernet Users)
learning:	90%	94%	88%
computer skills:	na	90	81
local info:	70	74	67
social relations:	64	79	86
civic affairs:	62	72	68
work/business:	65	69	46
teaching:	47	59	57
consumer affairs:	48	54	54
medical services:	26	54	60
entertainment:	42	53	64

Table 2 shows the percentage of users reporting that they are "somewhat" or "very interested" in using specific applications. Data is given in the order of greatest popularity, and in comparison with user profile questionnaires completed in 1994-95, and between early 1995 and October 1996. After October 1996, the majority of users signing up for service (and completing questionnaires) are Ethernet users with access from off-campus apartments :

Table 2

Type of Application:	'94-95	'96	'97 (Ethernet Users)
electronic mail:	95%	97%	98%
Accessing info/data:	93	93	97
World Wide Web:	86	95	95
BBS, newsgroups:	89	86	79
Access library:	83	78	76
Gopher:	77	57	45

General Population Studies

Blacksburg About Town survey

Over the past three years, we have enclosed a survey in 4,000 About Town newsletters for each round (January 1994, April 1995, October 1996 and October 1997) to randomly selected households within each census block in the town of Blacksburg; the number of responses are 332, 334 and 224, and 202, respectively. Respondents in the October '97 survey are similar in profile to those of the previous two years: over half of respondents are female (56%); average age is 45 years. Thirty-eight percent of all respondents have completed graduate school. The majority (65%) are members of a church or local club; 66% use the public library. The average length of residence in Blacksburg is 12 years.

As the BEV community network has diffused throughout the population, and media coverage of the Internet generally has grown, we expect the population's awareness and knowledge of terms to increase. Table 3 shows the percentage of respondents who are somewhat or very familiar with following terms:

Table 3

Percentage of Respondents:	1995	1996	1997
electronic mail	51%	58%	73%
World Wide Web	25	48	63
gopher	28	25	26
UseNet Newsgroup	20	20	25
FTP	22	24	28
Telnet	21	24	27
listserv	18	26	36
MUD/MOO	7	8	7

Table 4 shows trends over the past two or three years in computer ownership, use of electronic mail (proxy for Internet access), and computer and network literacy (percentage of respondents reporting they are 'somewhat' or 'very experienced,' the two highest points on a four point scale):

Table 4

Percentage of Respondents:	1994	1995	1996	1997	1999
Use a computer in their home:	74%	75%	79%	81%	81%
Use electronic mail/Internet:	na	62	69	83	87
Experienced w/computers:	75	72	71	80	76
Experienced w/networks:	38	40	51	67	72

Table 5 shows trends among users and non-users in the general population who expect the Internet to be helpful for various purposes:

Table 5

	1995	1996	1997	1999
commercial services	29%	29%	32%	57%
local news and information	63	55	61	50
health and safety information	40	40	40	48
playing online games	13	18	15	15

Electronic mail is the most popular service among users. Table 6 shows trends among users and non-users in the general population who expect BEV to be somewhat or very helpful for communication with:

Table 6

	1995	1996	1997	1999
friends outside Blacksburg	61%	55%	79%	84%
close friends	50	49	70	65
family	49	52	76	66
national interest groups	49	44	46	54
co-workers	43	46	61	60
local interest groups	42	46	41	30
teachers	37	38	53	46
classmates	32	34	52	42
neighbors	30	37	29	24
support group	25	29	31	31
church members	21	27	26	26

Highlights of Montgomery County Survey 1998

In 1998, BEV research staff sent a survey to a random sample of 3,000 non-Blacksburg residents of Montgomery County. From several earlier, more accurate, surveys (1995, 1996) we estimate that 18-20% of the County population (excluding Blacksburg) uses the Internet. The response rate of the 1998 survey was low (10%), making generalizations inappropriate. Sixty-two percent (65%) of respondents report that they use the Internet. Thus, the results are clearly skewed towards respondents using the Internet. Despite these caveats, the results do show some interesting trends, particularly among Internet users.

The average length of residence in Montgomery County is 24 years; average educational attainment is some college or a community college degree. The majority (71%) are members of a church or local club; only about a third (32%) have a child in school. Sixty-five percent (65%) of respondents use a computer in their home; 62% use a computer outside their home. Sixty-one percent (61%) report being 'somewhat experience' or 'very experienced' with computers; 46% report being 'somewhat experience' or 'very experienced' with computer networks.

Respondents report they expect the Internet to be 'somewhat helpful' or 'very helpful' for the following purposes (whether or not they currently use the Internet):

general information	77.1%
commercial services (online shopping)	37.9%
local news and information	46.7%
health and safety information	65.9%
civic affairs	32.8%
online games	45.7%

The following percentage of respondents expect the Internet to be 'somewhat helpful' or 'very helpful' for communication purposes with:

friends outside the area	70.6%
family	65.4

friends in the area	48.6
national interest groups	54.9
co-workers	51.8
local interest groups	29.4
teachers	40.1
classmates	39.2
neighbors	20.5
support group	34.0
club or church members	35.8

We asked several questions in order to determine the extent to which community networking strengthens social relationships and community involvement. The results can be summarized as follows:

Since getting on the Internet, are you more, equally or less involved in local issues that interest you?

More (9.2%)   Equally (80.3)   Less (10.5)

Since getting on the Internet, do you feel more, equally or less connected to people like yourself in local area?   More (20.8%) Equally (71.1) Less (8.1)

Since getting on the Internet, have you become more, equally or less involved in your local community? More (3.3%)   Equally (90.2) Less (6.5)

On average, respondents frequently keep up with local news, and occasionally have ideas for improving things and/or work to bring about changes in their community. These measures of community attachment and involvement correlate with length of residence. Internet users who report being more involved in their local community since getting on the Net score higher on community involvement measures than Internet users who report they are equally or less involved in their community since getting on the Net. This would imply that the Internet has facilitated the increased involvement of people who were already 'passively involved' in their community.

The Impact of Networking on Community

Computer networks, such as the Internet, allow interaction among groups of people. As such, they have the potential in geographic communities of restoring "a political dynamic of an earlier time" (Ithiel de Sola Pool 1984), and supporting and extending social relationships. The quality of life in a community with dense social networks, high levels of trust, and norms of mutual reciprocity, what Putnam (1996) calls its "social capital," is higher than the quality of life in communities with low social capital.

The concentration of local information and services, local newsgroups, and other locally-focussed material on the BEV web pages provide the environment in which social networks, social trust, and norms of mutual reciprocity can be supported, possibly even enhanced. From the outset of the project, users expressed their interest and satisfaction in being able to be more connected to their

community. As noted above, 72% of BEV users report they expect the Internet to be somewhat or very helpful with civic affairs; 86% indicate they are somewhat or very interested in bulletin boards and newsgroups; 79% report they expect BEV to be somewhat or very helpful in social relations. In the 1997 round of the About Town Newsletter survey of the general population of Blacksburg residents, 28 % report being more involved in the local community since getting on the Internet.

In a random sample telephone survey conducted in November 1996 of the local calling area (Blacksburg, Montgomery County and environs), there was no statistically significant correlation between community involvement and access to the Internet. Nonetheless, 22% of respondents who use the Internet, reported that they were 'more involved in their local community since getting on the Internet.' This 'Community Involvement' study has established benchmark data to determine over time whether the community network supports, and possibly increases, social capital.

Local Government
Users' Perspective on School Board Mailing List
James Klagge is the elected representative, from District F in Blacksburg, Virginia, to the Montgomery County School Board, and owner of an electronic mailing list to interested subscribers and district F constituents. In November 1996, Dr. Klagge, in collaboration with Andrea Kavanaugh and Steve Parson, distributed a questionnaire to the 369 members of his mailing list. The survey was conducted in order to understand the needs and interests of users and to better understand the value of computer-mediated communication.

Seventy-six members of the mailing list responded. A large majority (78.9%) of respondents rated the mailing list very helpful or extremely helpful in clarifying education issues. A large majority (87.3%) also rated the list very helpful or extremely helpful in keeping up to date with school issues. Most respondents (82%) reported that having school issues communicated via the list has made them feel more involved in these issues. Below these and other results are summarized.

1) How long have you been on this mailing list?

1 to 6 months   23.0% 7 to 12 months   70.0% more than 12 months   7.0%

2) On a scale of 1-5, how would you rate the helpfulness of the communication via this list in clarifying issues?

not at all helpful   4.2% somewhat helpful 1.4%   helpful 11.3%   very helpful 31.0% extremely helpful   47.9%   no answer 4.2%

3) On a scale of 1-5, how would you rate the helpfulness of the communication via this list in keeping you up to date with school issues?

not at all helpful   4.2% somewhat helpful 4.2%   helpful 1.4% very helpful 23.9%

extremely helpful 63.4%   no answer 2.8%

4) Would you say that having school issues communicated to you via this list has made you feel more involved in these issues than you felt prior to subscribing to this list?

yes 81.7%   no1 2.7%   no answer 4.2%

5) On a scale of 1-5, how do you rate the reply function of this list?

not at all important   2.8% somewhat important   2.8% important   11.3%
very important 19.7% extremely important   56.3% no answer 7.0%

6) Would you say that your participation in public meetings regarding school issues has increased, decreased or stayed the same since you became a member of this mailing list?

increased   12.7% decreased   2.8% same   78.9% no answer   5.6%

7) Would you attribute an increase in your attendance at public meetings on school issues to the communication from this list?

yes   12.7% no   38.0%   no answer   49.3%

8) How many times have you called a public official or school administrator as a result of communication exchanged via this list?

None   59.2%   1 to 5 times   31.0%   6 to 10 times 2.8%   no answer   7.0%

9) How many times have you written a letter to an elected official or school administrator as a result of communication exchanged via this list?

None   42.3%   1 to 5 times   50.7%   6 to 10 times 2.8%   no answer 4.2%

10) How many times have you spoken at a public meeting as a result of a communication exchanged via this list?

None   85.9%   1 to 5 times 4.2%   no answer 9.9%

11) Have you told other people whom you thought might be interested about this list?

yes 53.5%   no 36.6%   no answer 9.9%

Local Business Trends 1995-97

In order to assess trends in the local business community with regard to the Internet, the Blacksburg Electronic Village (BEV) Research Group designed and implemented two survey rounds, the first in June 1995 and the second in June 1997. Both rounds consisted of two survey instruments: one for businesses that were using the Internet, the other for businesses NOT using the Internet. In 1997, the survey instrument was modified by preserving all the questions from the 1995 survey and adding additional questions.

In the earlier survey round, only 14 percent of respondents reported an increase (up to 10 percent) in contacts per month (with suppliers and clients), and 4 percent reported increases between 11-20 percent, resulting from the Internet. By 1997, 27 percent of respondents noted up to 10 percent increases in contacts per month, and one company, a web distributor of books, noted increases between 41 and 50 percent in contacts with clients and suppliers.

On the revenue side, only 5 percent of respondents in 1995 noted increases (up to 10 percent); by 1997, 17 percent of respondents noted up to 10 percent increases in revenue generation per month resulting from their Internet site. The web distributor company noted revenue increases between 41 and 50 percent.

Online Commercial Transactions
While online commercial transactions are not offered as a service to local businesses yet, the BEV is interested in making it possible for businesses to conduct such transactions in the near future.

There is evidence of a trend away from interest in online commercial transactions, dropping from 60 percent in 1995 to 53 percent in 1997. Among those reporting they were not interested, a third of respondents in both rounds (32 percent in '95, 31 percent in '97) noted that online commercial transactions were not applicable to their business; only a few companies reported concern about data security (8 percent in '95, 11 percent in '97).

Businesses NOT using the Internet
Among the 92 respondents NOT using the Internet that were surveyed in the earlier round, most (72 percent) indicate that they do not list information about their business on the Internet (the BEV Village Mall web pages) because they do not use computers in their business. Or, If they do use computers, they do not have a network connection (28 percent). Other reasons (listed below) were not a consideration. By 1997, only 6 percent of respondents noted that they do not use computers in their business; 22 percent said they use computers but do not have a network connection. In addition, the following factors were noted as reasons why they do not list their business on the BEV:

No market application	28%
Need technical knowledge	24%
Lack time	24%
Cost	14%
Have not heard of BEV	7%

Almost all respondents (95 percent) noted that technical training and education were important motivating factors for using the Internet in the future. Ninety-four percent of businesses noted in

1997 that 1-5 of their employees had taken Internet-related training classes in the previous year; this compares favorably with 95 percent for this variable among businesses that DO use the Internet. By 1997, training and education were motivating factors for only 29% of respondents. Other important motivating factors for using the Internet in the future (noted by 1997 respondents but not 1995 respondents):

Evidence of increased revenue potential	51%
Evidence of large market base	25%
Reduced costing scheme	22%
Evidence of decreased marketing costs	22%

A detailed breakdown of all results for both survey rounds is posted on the BEV Research web site (http://www.bev.net/project/research) and is also available upon request.

Teacher Evaluation of Training

Internet Training Classes at Auburn High School

Participants in the above noted training activities were asked to complete an exit evaluation after the session; some of the results are shown below. A complete summary of the evaluation is posted online at:
<http://www.bev.net/education/NTIA/evaluation/Auburn_evaluation_results.html>.

Summary Evaluation of Internet Training Sessions
 Auburn Community Internet Training and Resource Center Auburn Middle/High School

Training sessions in April and May 1996 (teachers and community members) N=43

Questions were answered using a 5 point scale; 1 = excellent Response averages are as follows:

1. Course content	1.34	2 Usefulness of handouts/materials	1.32
Pace of lesson	1.34	4 Individuals assistance provided	1.04
convenience of time	1.30	6 convenience of date	1.34

Previous experience working with computers	4.36 years
Previous experience working with the Internet	0.14 years