Final Public Report

Getting Rural Virginia Connected: A Vision for the Future

Funded by the U.S. Department of Commerce under Technologies Opportunity Program Grant 51-60-01007

Blacksburg Electronic Village
Virginia Cooperative Extension
Communities located in:
Accomack County, Virginia
Craig County, Virginia
Cumberland County, Virginia
Dickenson County, Virginia
Louisa County, Virginia
King and Queen County, Virginia
Northampton County, Virginia

Abstract

"Getting Rural Virginia Connected: A Vision for the Future" was funded by a 2001 Technology Opportunities Program (TOP) grant from the United States Department of Commerce. This final public report describes the need for the project, the model used, includes relevant assessment data, and documents the impacts of the program. It is intended for use by others planning similar projects involving Internet-based community and economic development. Additional details about this project can be found on the project Web site at http://top.bev.net

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Introduction

Need

The following paragraphs from the project proposal[1] describe the need for this project:

> Virginia's rural communities lag the rest of the state in terms of income, education, and wealth. Most of these rural communities are saddled with high rates of poverty, illiteracy, and unemployment when compared to more prosperous urban and suburban areas of Virginia. Even though many of these communities want to be connected to the Information Age economy, they struggle mightily to make the transition. They lack the local expertise necessary to be successful understanding and exploiting the opportunities available to them in this new environment. Furthermore, these communities are largely ignored by the major telecommunications service providers because the communities are deemed too small to recoup the investment required to upgrade services to a level that will make them competitive players in the new economy. Perhaps the most unfortunate thing is that these rural communities likely have hidden treasures (skills, knowledge, and abilities of people) that only need to be discovered and properly engaged.
>
> Worn down by decades of deep poverty, a continuous outward migration of their brightest and best youth, and the destruction and loss of their local merchant class by chain stores (the Wal-Mart problem), these communities suffer from a leadership crisis. Existing aid programs ameliorate suffering but do not provide systemic solutions to move these communities up the economic and social ladder.
>
> The rise of the Internet, coupled with the potential of having a high quality of life in rural communities, offer for the first time the promise that these communities can break the chains of geography. But there are several necessary conditions that must exist if these communities are going to succeed. It is very clear that injections of technology alone are not sufficient. These communities need comprehensive assistance in five areas:
>
> - Leadership training and development for both citizens and local leaders
> - Technology training and development for citizens and local leaders
> - A long term planning and vision process that is professionally led
> - Virtual business incubator program providing technical assistance and business management advice to home-based and small business startups in each community
> - Appropriate technology systems designed to support governance and economic development

[1] 2001 TOP Proposal (Revised 7/30/2001) Getting Rural Virginia Connected: A Vision for the Future

Background

In October 2001, the US Department of Commerce NTIA (National Telecommunications and Information Administration) awarded a Technology Opportunities Program (TOP) grant to fund a proposal from the Blacksburg Electronic Village (BEV) titled "Getting Rural Virginia Connected: A Vision for the Future,". The proposal was developed during the summer of 2001 by Dr. Andrew Cohill (Director of the Blacksburg Electronic Village at that time) and Dr. John Dooley (Associate Director for Family and Consumer Sciences and Community Initiatives in Virginia Cooperative Extension at that time). The proposal called for the BEV to partner with Virginia Cooperative Extension (VCE) "to help rural communities in Virginia develop the capacities needed to prosper in the Information Economy"[2]. These counties were spread from Virginia's Eastern Shore to its western border with Kentucky and included, from east to west, Accomack and Northampton (the Virginia Eastern Shore), King and Queen, Louisa, Cumberland, Craig, Carroll, Grayson and Dickenson.

Unfortunately, the start of the project was delayed due to significant personnel turnover at Virginia Tech in early 2002. First, Dr. Dooley, the project leader for VCE, was assigned a new set of responsibilities as Interim Associate Provost for Outreach and therefore could not work on this project. About the same time Dr. Cohill resigned his position as the Director of the BEV. Budget reductions in Virginia resulted in the loss of VCE agents in several counties and new local leadership had to be identified before the project could move forward.

Early in the Spring of 2002, Dr. Eleanor Schlenker took over Dr. Dooley's responsibilities and Mathew Mathai was appointed Director of the BEV and Project Director for this project in June. In addition, Tabitha Combs resigned her position as TOP Project Coordinator and Jaime Shetrone took her place. The new project team met for the first time in June 2002 and work on the project finally got underway in July — nine months after the funding was awarded.

By this time, Carroll and Grayson counties had completed large portions of the proposed effort with other funding. The project scope was modified in August 2003 to exclude Grayson and Carroll because, there were not sufficient time or resources to implement a modified project plan in these two counties.

Model

The Blacksburg Electronic Village (http://www.bev.net) was developed and has evolved in response to the needs of the community it serves. This project in selected rural communities of Virginia loosely followed the same model, only without the need for the communities to develop the technology themselves. The basic idea was to let residents determine the challenges facing their communities and decide how to address them.

[2] 2001 TOP Proposal (Revised 7/30/2001) Getting Rural Virginia Connected: A Vision for the Future

Then, appropriate information and communications technologies already available through the BEV would be used to pursue community goals by facilitating exchanges of information and streamlining transactions among government and citizens, businesses and their customers, community organizations and their members, and among citizens themselves

Virginia Cooperative Extension agents, having served and built their reputations in these communities, knew many of the issues first hand. They were therefore well positioned to bring all interested parties to the table. The Blacksburg Electronic Village, one of the oldest and most widely known community networks, would provide systems, training, and expertise in matters of deployment.

The model called for the following:

1. recruiting interested residents from each county
2. facilitating a community planning process (Take Charge[3])
3. creating an Electronic Village in each county
4. performing technology assessments in each county
5. developing a technology master plan for each county

The hope was that these electronic villages, like the BEV, would add enough value that their communities would elect to sustain them locally beyond the term of the grant.

Implementation

Details of the implementation can be found on the project Web site at http://top.bev.net/implementation.php. The steps included:

1. **Obtaining support from county administrators and leaders within the county**
   Administrators and other leaders within each of the counties were asked to support this effort. Extension agents contacted county administrators and leaders to explain project goals and outcomes and to request their support for the project. The suggested list of people to be contacted included, but was not limited to:
   - Board of Supervisors
   - County administrator
   - Chamber of Commerce
   - Representatives of Industrial/Economic Development groups
   - Superintendent of Schools
   - School Board
   - Extension Leadership Council

[3] The Take Charge process used in Virginia is adapted from the "Take Charge: Economic Development in Small Communities" program published by North Central Regional Center for Rural Development.

Agents were asked to request these leaders to participate in and provide names of residents who would be willing to serve on the technology leadership teams.

2. **Conducting Extension Agent Training**
   Extension agents were briefed about the proposed implementation plan for this project. They also received training in the following areas:
   a. **Introduction to telecommunications infrastructure**
      Helped extension agents become familiar with the telecomm infrastructure issues facing rural communities.
   b. **Community assessment**
      Extension agents were briefed about community assessments with a special focus on telecommunications. The CSPP model to be used as a starting point for technology assessment was described during this session.
   c. **Introduction to community networks**
      Extension agents learned how community networks can make local communities more effective in solving problems by engaging more citizens in local issues and creating a stronger sense of community.

   In addition to these training sessions, agents were informed about the evaluation component of this project.

3. **Establishing Local Technology Leadership Teams**
   Each agent was requested to recruit at least ten residents drawn from representatives from local governments, business and agribusiness, industry, public education, the faith community, civic organizations, youth, and seniors with a strong interest and commitment to the effort and willingness to contribute time and energy for the following tasks:

      1. Serve as the core group for planning and implementing the Take Charge program intended to reach out to the entire community**.**
      2. Advise and coordinate local program planning and to communicate and advocate the process to all segments of the community.
      3. Work with project staff and Virginia Tech faculty to perform an assessment of current technology in the community.
      4. Serve as facilitators in community workshops and forums to enhance the understanding of the general public about the potential of technology.
      5. Work with project staff to identify and secure the resources necessary to fulfill and sustain the strategies of the local plan.
      6. Remain in place after the end of the TOP funding with a commitment to continuing to provide technology leadership in the county.

   Hind sight has proven what we anticipated from the outset of this program: Leadership teams are the single most important factor to determine the overall success of this project. The next two paragraphs therefore expand on recruiting and selecting members for the leadership teams in each county

Recruitment: Extension Agents were fundamental to the process of recruiting these members because they knew their communities and the members that represent the power base. They used the following process designed to provide an opportunity for citizens from all walks of life to volunteer for this project:

1. Begin by inviting members of the local government board or council. This is usually best accomplished by a personal phone call explaining the process and intended outcomes. Agents should get a firm commitment from at least one member of the board or council in each of the participating communities.
2. Create a list of other leaders in the communities using *Appendix C: Significant Segments of the Community and Decision Makers* in the Take Charge manual as a guideline. Every effort should be made to include as many sectors as possible. Inform these individuals about the project and invite them to join this effort.
3. Contact individuals identified by local leaders as most active and likely to champion the process. Request these individuals, if they cannot participate, to recommend other individuals to be invited to serve on the leadership team. In most cases, several follow-ups may be necessary to fill all segments of the community.
4. Publicize the project and the need for participants using a combination of the following suggestions:
    1. Plan an informational meeting to attract interested parties
    2. Meet and make informal presentations to local groups to generate interest
    3. Run advertisements for the informational meeting in the local papers
    4. Distribute and flyers place posters throughout the community
    5. Send out personal invitations to groups such as, but not limited to:
        - Clubs and organizations in the community
        - Fire/Rescue
        - Service organizations
        - NAACP
        - Churches
        - Principals and staffs of all schools
        - Historical societies
        - Business heads that have shown support for progress in the county
        - Private residents that have shown interest in economic growth
        - Senior Citizens groups

Selecting members for the TLT: TLT members were selected based upon the following criteria:

1. They had a personal commitment to using technology to improve the community
2. They were willing to participate actively in both training and ongoing citizen team training
3. They represented a broad cross section of the community
4. They made a commitment to continue work past the end of the grant period in order to help their communities with their ongoing technology needs

4. Training Technology Leadership Teams

TLT members receive training in three areas:

a. **Introduction to telecommunications** was designed to familiarize them with the telecomm infrastructure issues facing rural communities.
b. **Take Charge** taught how the Take Charge program works, key aspects and phases of the initiative, and how to participate effectively in the process. During this session, the team members divided up the responsibilities for finding suitable locations in three areas of the county, establishing dates for the community meetings, finding sponsors for food, notebooks, copying, workshop materials, and establishing a plan for advertising the Take Charge program
c. **Introduction to community networks** taught them how community networks can make local communities more effective in solving problems, engaging citizens in local issues, and creating a stronger sense of community.

5. Conducting Take Charge Workshops

Extension agents facilitated the Take Charge program. Its three, three-hour workshops are designed to foster collaboration among the citizens of each community, to move the group toward consensus, and to provide a framework for creating a vision for the county.

Workshop #1 - Where Are We Now?

- Examine historical and current trends and characteristics of the community and consider implications for the future.
- Self examination of the community's strengths and vulnerabilities in terms of financial, social, human, and natural assets.

Workshop #2 - Where Do We Want To Be?

- Develop a collective vision for the future of the community. Findings for each community will be combined to develop a collective vision for the future of the county.
- Assess the opportunities for and threats to achieving that vision.

Workshop #3 - How Do We Get There?

- Identify and frame overarching development issues
- Identify existing resources to help address these issues
- Explore alternative ways to organize the community for action

6. Deploying Community Network

Each county received a local version of the Blacksburg Electronic Village services referred to as ***BEV in a Box*** customized for them. Training sessions were held to familiarize team members with each of the services which were deployed in stages. Each county held a public launch of their community networks to let residents know about the various offerings available to them.

7. Technology Assessments and Master Plans

This is described in more detail in the Technology Assessment and Master Plan section of this report.

8. **Launching Virtual Business Incubator and Community Connections**
   These packages were designed to allow home based and micro businesses (five employees or less) as well as community organizations an opportunity to establish a presence on the Internet without incurring any overhead. These packages consisted of Web hosting, two email accounts and an online mailing list of up to 100 subscribers. Training was provided to those who signed up for these services on how to put up their Web sites. Interns working with the BEV assisted some of these businesses and organizations with their Web sites as well.

Implementation Timeline

It took two years to implement this project. Tasks one through five listed above were completed during the first year and tasks six through eight were undertaken in the second year. The third year will be devoted to sustaining and supporting ongoing activities to help ensure that benefits continue for many years to come.

Take Charge Assessments

Four counties (Accomack, Cumberland, King & Queen, and Northampton) took part in the Take Charge community planning process. The three meetings involved in the process respectively lead a community to identify challenges, to set goals related to those challenges, and to identify specific steps toward those goals. After each meeting, participants filled out surveys reflecting their opinions of the experience. Table (1) reflects the level of participation and Table (2) participants reaction to take charge as measured by the surveys.

Table (1)

Take Charge Process	Accomack	Cumberland	King & Queen	Northampton	Total
Overall Attendance	34	69	44	29	176
Average Attendance per meeting	11	23	15	10	15
Overall Attendees New to Community Planning	13	41	16	7	77
% of Attendees New to Community Planning	38%	59%	36%	24%	44%

Table (2)

Survey Reponses Across all Counties	Agree	Somewhat Agree	Disagree
Purpose and goals were clear	142	29	3
I learned something new about the community	146	24	3
I felt like my ideas were acknowledged	147	22	0
Participation in Small Group Assessments was fair	160	4	0
Assembly Assessments were fair	160	5	2
My overall reaction to this meeting is positive	158	12	1
Percentage of Overall Response	90%	9%	1%

Not all participants attended all meetings, nor filled out surveys completely, so we cannot know for sure how many unique persons actually were involved. Regardless, participation was relatively strong and reaction highly positive.

Participation: Across the counties, average attendance at each meeting was 15 people, but the average varied considerably from a low of 10 to a high of 23.

First Time Community Planning Participants: Of greatest significance may be the fact that so many of the overall participants (44%) indicated that they had never participated in a community planning experience before. Cumberland County had the highest level of participation overall (69 people) and the highest percentage of new participants (59%) which may reflect both a particularly strong core leadership in that county and a broad base of recruitment.

Reactions to Take Charge: Participant opinions of Take Charge were uniformly high as indicated by the average responses in Table (2). The survey allowed respondents a neutral selection, but about 90% responded at the positive end of the scale compared with 9% neutral. Only 1% of all survey responses were negative. Written comments from respondents were generally consistent with their numeric responses.

In general, that the Take Charge process did an excellent job of setting the stage and initially getting people involved in those counties that participated. The process may have been a particular boost in Cumberland County and King and Queen County, both of which had less technological infrastructure from other sources than did Accomack and Northampton counties which eventually combined efforts and used the Eastern Shore of Virginia Portal for their community network as opposed to BEV in a Box.

Technology Assessments

As part of this project we conducted a technology assessment in each county based on the Computer System Policy Project (CSPP) Readiness Guide. This was a significant effort the details of which can be found at http://top.bev.net/tamp which includes the technology assessments and master plans for each county as well as appendices. The rest of this section is a condensed description of the process used and a brief summary of the assessment results.

To obtain local Network Readiness information, we interviewed members of the Technology Leadership Teams (TLT) and others in the communities identified by TLT members. An Interview/Survey template was created to serve as a guide for questions and a format for documenting answers. This template can be found in the appendix. Since we anticipate that data, voice, and video are evolving to an integrated digital network, we included questions for voice and video needs. Though some of those interviewed, or surveyed, did not answer all questions, the information obtained was still valuable.

Information sought during interviews/surveys included:

- Current voice/data/video services, providers, costs, and needs
- Measure of network applications in use and those expected to be used
- Network speed and throughput needed to support expected applications
- Estimated levels of network application utilization and training needs
- Desired cost for expected network access needs
- Suggestions for community network needs and solutions

We considered the following sectors for the assessment:

1. Telecommunication access providers
2. Government
3. Education
4. Healthcare
5. Business and home users

Telecommunications access providers were included as a special sector due to their importance for broadband Internet access. Business and home categories are considered together, since many small businesses and homes use similar broadband access.

In addition to interviews, information used for assessments included results of Take Charge (or other) planning process, TLT meeting notes, county comprehensive plans, planning/vision documents, demographic/census reports and GIS data (street, boundary, business points).

Useful sources of information included:

- VEDP (Virginia Economic Development Partnership) county profiles—the best single source found for comprehensive county profile information (www.yesvirginia.org)

- U.S. Geologic Survey GNIS (Geographic Names Information System)—the official source of known places and features within counties (geonames.usgs.gov)
- SRC custom demographic reports—a commercial online source for census and demographic information (www.demographicsnow.com)
- U.S. Dept. of Labor Consumer Expenditures in 2002—includes statistical averages for income and expenses (www.bls.gov)
- U.S. Dept. of Agriculture NASS (National Agriculture Statistics Service) census report—2004 data for 2002 was recently released; agriculture is a major business in many rural areas (www.nass.usda.gov/census/)
- Virginia Dept. of Education 2002 School Census data (www.pen.k12.va.us)
- FedStats State and County—FedStats is an online Internet gateway to over 100 sources of official statistics collected and published by Federal agencies (www.fedstats.gov)
- VDOT (Virginia Dept. of Transportation) county highway maps—only hardcopies available (www.virginiadot.org)
- Local area telephone directories and yellow-pages
- Numerous websites

Much of this information was also useful for technology planning.

Assessment Results

The table below contains a summary of the assessments.

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Summary of TOP County Readiness Stages

County	Metric	Access Providers	Gov	Edu	Health care	Business and Home
Accomack	Current Access	Dial, DSL*	BRI, dial	Dial, BRI, T1, 4xT1	BRI, T1	Dial, DSL*
	Access Needed	broadband	T3	T3	T1, T3	broadband
	Cost/mo Expected	-	$350	$350	$100	$40
	Application Level	-	2-7	8	4-6	2
	Training Level	-	1-7	8	3-7	2
	Network Readiness	1.5	1.5	2	2	1.5
Northampton	Current Access	Dial, DSL*	Dial, T1	T1, T3	BRI, FR512k, T1	Dial, DSL*
	Access Needed	broadband	T1, T3	T1, T3	T1, T3	broadband
	Cost/mo Expected	-	$40/100/3000	$3500	$100	$40
	Application Level	-	1-7	8	4-6	2
	Training Level	-	3-7	6	3-7	2
	Network Readiness	1.5	2	3	2	1.5
Craig	Current Access	Dial	Dial, FR56k	T1, wireless	Dial	Dial, DSL**
	Access Needed	broadband	DSL	T1, wireless	broadband	broadband
	Cost/mo Expected	-	$50	$200	-	$40
	Application Level	-	2	7	-	2
	Training Level	-	2	7	-	2
	Network Readiness	1	1	3	1	1
Cumberland	Current Access	Dial, fixed wireless	Dial, BRI, T1, PRI, FR512k,	10 Mbps wireless	Dial	Dial
	Access Needed	broadband	100 Mbps, Pub Safety wireless	T3, wireless	broadband	broadband
	Cost/mo Expected	-	$500	$550	-	$40
	Application Level	-	6	8	-	-
	Training Level	-	6	7	-	-
	Network Readiness	1	2	3	1	1
Dickenson	Current Access	Dial, DSL*, wireless	wireless, T1	T1, FR-768, FR-256	FR-384, T1	Dial, DSL*, wireless
	Access Needed	broadband	T3, wireless	T3, wireless	broadband	broadband
	Cost/mo Expected	-	-	-	-	-
	Application Level	-	8	-	-	-
	Training Level	-	7	-	-	-
	Network Readiness	2	3	2	2	2
King &Queen	Current Access	Dial	FR T1,dial	T3,T1	N/A	Dial
	Access Needed	broadband	T1	T3,4xT1	N/A	broadband
	Cost/mo Expected	-	-	-	N/A	$40
	Application Level	-	-	2-6	N/A	-
	Training Level	-	-	3-7	N/A	-
	Network Readiness	1	1.5	2.5	1	1
Louisa	Current Access	Dial, DSL*, cable	T1	T3,2xT1	-	Dial, DSL*
	Access Needed	broadband	T1	T3, 4xT1	broadband	broadband
	Cost/mo Expected	-	-	-	-	$40
	Application Level	-	7	8	-	2
	Training Level	-	5	9	-	2
	Network Readiness	1.5	2	3.5	1.5	1.5

Metrics in the above table for access, application level, and training level are estimates derived from the Interview-Survey results. The Interview-Survey form asks the interviewee to identify from a list the network applications currently in use, or those that are expected to be used in the future. From these, one can deduce the broadband speeds needed to support the applications, even if the person interviewed does not know. In general, it followed that if affordable broadband was not available, then people were not able to utilize the more advanced applications and they did not have the experience and training needed.

Definition of Metrics:

- Current Access: the current primary type of telecommunications line and the implicit speeds for accessing the Internet
- Access Needed: the perceived access speeds needed to support expected future applications
- Cost/mo Expected: price questions were unanswered by many, but the general expectation is current broadband prices, such as $30-$50/mo for residential service
- Application Level: estimated level of networked application utilization on a scale of 1 to 10, where 10 is the highest level; application level can also be deduced from the range of applications currently in use as identified on the interview form
- Training Level: estimated level of existing training/expertise where 1 is lowest and 10 is highest; the need for training may be indicated by the level of applications currently in use as identified on the interview form
- Network Readiness: assessed level of Network Readiness on a scale of 1 to 4; for example, if only dial-up is used, then the lowest level of 1 is assessed, but if an organization is making full use of high-speed wired and wireless applications, then it is assessed at the highest level 4.

Technology Master Plan

The methodology for developing the technology plan was a three-step process. First, identify needs and goals. Second, identify technology solution alternatives. Third, recommend solutions that appear to be most applicable.

Needs and goals were determined from community interviews and recommendations from leaders in the Federal Government, Virginia State Government, and from industry experts. Technology alternatives include DSL, Cable TV modem, wireless, BPL, satellite, and fiber optics. Recommendations include a vision, mission, and consolidated goals from extensive lists recommended from the federal, state, and local sources. Coordination with the Virginia Center for Information Technology (CIT) and other partners are recommended. Funding sources are covered in a guide prepared by CIT. Periodic reassessments are recommended to measure progress.

Detailed technology plans for each county are too voluminous to be included in this report. They can be found on the project Web site at http://top.bev.net/tamp along with appendices that contain county specific and general information for all counties.

Project Outcomes

1. **Increased participation by a broad cross section of the community in decision making and consensus building**
   The proposed outcome of increasing public participation at public meetings had to be amended because we learned that there were few public meetings in the counties where head count information was collected. Thus, no attendance history existed that could serve as a baseline measurement prior to the commencement of the project. Though this is unfortunate, the spirit of the measure is to determine if this project caused more citizens to become involved in the community decision making process and other indicators of increased involvement are available.

   Technology Leadership Team (TLT) members were selected from a broad cross section of residents in each county. They went through the Take Charge (or equivalent) planning process in each county. Of the 176 individuals who went through the Take Charge process 44% indicated that they had never participated in a community planning process before. This represents a significant number of first timers willing to get involved and discuss key issues faced by their communities.

   Leadership teams have been meeting regularly and have been advising government leaders on issues related to the use of technology for economic development and building community. Virginia Cooperative Extension (VCE) agents, who coordinated the efforts at the local level, updated Boards of Supervisors on ongoing activities in the county. Leadership team members in each county continue to inform residents about public meetings held in the county through the calendar on their Electronic Village Web sites.

   Two counties (Cumberland and King and Queen) have live online discussion boards which are being used by residents to ask questions, seek clarification from and provide responses to community leaders on various issues that face their communities. As of September 15, 2004, Cumberland's discussion board, first used in January of that same year, had 58 messages in 13 different threads posted by 16 unique authors. King and Queen's board which went live in July 2004 had 37 messages, in 11 different threads from 7 unique authors. Other counties have been provided online discussion boards on their sites as well. However, their Technology Leadership Teams want to be sure they have in place proper policies and personnel to manage their online discussion forums before they go "live."

   Another measure of increasing involvement on key issues is the level at which counties are sustaining project related activities now that the project is over. In

addition to meetings by leadership teams in various counties, spin off activities resulting from this project continue to occur These are described in more detail in the "Spin Off" section of this report.

Leadership team members, through the calendars on their Electronic Village Web sites, continue to inform residents about public meetings held in the county. As use of the county Web site for such communications increases, we expect turn out and involvement at public meetings to grow accordingly.

2. **Technology assessment and master plan for each community**
   Each county has the results of the technology assessment conducted by John Nichols of Virginia Tech. Nichols is an Information Technology Manager at Virginia Tech and a veteran in the planning and deployment of telecommunications infrastructure. He has spent over a year working on this component of this project: evaluating available assessment instruments suitable for this purpose, using them to design a questionnaire appropriate for this project, conducting technology assessments, and using that data to develop a technology master plan for each county. These technology master plans are available online at the project Web site http://top.bev.net/tamp

3. **Increased Internet usage in each county**
   There were no baseline data for Internet usage at the start of the project and they are not available now. However, we do have data pertaining to the growth in hits on Web sites developed as part of this project which we analyzed using a software package called Wusage (http://www.boutell.com/wusage/).

   The average number of unique visits per county Web site in the month in which they were launched was 63.51. In June 2004, when this project ended, that average had climbed to 335.65, a five fold increase in twelve months. Though it may be unrealistic to assume that growth at this level can be sustained, the data do indicate that the sites have been well received and quickly adopted by many residents of counties. We have every reason to believe this trend will continue due to the activities described in the "Spin Off" section below.

   Another measure of Internet use is the number of businesses who listed themselves in the Village Mall section of their respective Electronic Village Web sites. This number went from zero when the project began to a total of 295 businesses on August 31, 2004.

   Of course, we recognize that simply listing businesses online has no value if visitors don't access those listings. We therefore analyzed data on visits to the Village Mall. In the first month that the county Web sites were deployed, we had an average of 58.652 visits to the Village Mall listings. In June, 2004, when the project ended, the average monthly visits to the Village Mall had grown to 159.472, an increase by a factor of 2.71. These numbers indicate that residents of these counties and others are

both using the Internet and looking at local businesses for their needs, an encouraging indicator for the small business economy in these counties.

We also measured the use of the community organizations Web sites set up as part of this project. These listings went from zero per month when the project began to 113. Hits on community organization listings rose from an average of 48.618 hits per site in the first month to 112.686 in the last month of the project, an increase by a factor of 2.3178. This indicates that community organizations in these counties are enjoying a growth in Internet use similar to that of small businesses.

4. **Increased opportunities for home based and micro businesses to establish a presence on the Web**
   The Virtual Business Incubator (VBI) package was designed specifically to help home and micro businesses (five employees or less) establish a Web presence and promote their businesses online. By the end of the project, we had set up a total of 39 VBI accounts in the seven participating counties with each county (with the exception of Dickenson) having at least five accounts. Dickenson County held the public launch of their offerings in June 2004, just before the end of this project. While only one person signed up for a Virtual Business Incubator account at that time, the county Chamber of Commerce sponsored the launch and is actively promoting the Dickenson County Electronic Village to local businesses. We won't be surprised to see them catch up, if not exceed, the number of accounts in other counties.

5. **Increased opportunities for community organizations to use the Internet to provide publicity for themselves**
   In addition to home and micro-business owners signing up to use the Web, we also had 25 faith based and community organizations sign up for the Community Connections packages that allow them to use the Internet to provide information to existing members and to promote their mission to potential new ones. In their 2002 article "Building Sustainable Communities through Network Building" (http://www.orgnet.com/BuildingNetworks.pdf), Valdis Krebs and June Holley state "Communities are built on connections. Better connections usually provide better opportunities." Since community organizations play this significant role in connecting residents within communities, they undoubtedly are contributing not only to social well being but to economic opportunity as well.

6. **Fully functional community network using local members to manage content**
   Each county now has a presence in cyberspace facilitated through the creation of an electronic village. Since counties on the Eastern Shore of Virginia (Accomack and Northampton) had the Eastern Shore Virginia Portal (http://www.easternshorevirginiaportal.com), they chose to use the portal as their community network. Team members in all counties received training on BEV in a Box services provided with their electronic village sites to ensure they could manage and administer their electronic villages.

These services include

1. A professionally designed and maintained Web site infrastructure
2. Online directories for individuals (also know as villagers), businesses (the village mall) and community organizations.
3. Online calendar of events
4. Online discussion forum
5. Virtual Business Incubator (VBI) – offered under the grant at no cost to home and micro businesses (five employees or less) in each county through June 30, 2005.
6. Community Connections (CC) – offered under the grant at no cost to community organizations in each county through June 30, 2005.

Virtual Business Incubator and Community Connections packages provide 20 MB of web hosting, 3 email addresses and an online mailing list of up to 100 subscribers. Individuals signing up for these packages attended a community workshop that provided basic training, ideas and guidelines on using these services effectively to promote their businesses or organizations. As of August 26, 2004, two months after official close of the project, total signups already had increased to 44 VBI accounts and 32 CC accounts.

Electronic village sites for the five[4] counties using these services are as follows:
Craig: http://www.craigev.net
Cumberland: http://www.cumberlandfirst.net
Dickenson: http://www.dcev.net
King and Queen: http://www.kqinfotrail.net
Louisa: http://www.louisaelectronicvillage.net

These sites have been well received in their communities. As of August 31, 2004, a total of 295 local businesses had listed themselves on Village Malls and were finding customers among the residents of participating and nearby counties. A total of 113 community organizations were listed online to promote themselves to community residents.

7. **Internship opportunities for individuals that grow and publicize their skills**
The BEV internship program which was launched during this project gives interns and volunteers real world experience working on Web sites for community organizations and businesses. While wondering how to provide more Web site development assistance to counties in need, the BEV received requests from both the Woodrow Wilson Rehabilitation Center (WWRC) in Staunton, VA and the New River Community College to place interns. So far, BEV has interviewed and accepted three interns and matched them with multiple businesses and community organizations to establish their initial Web page at no cost to them. In return, the interns have been given the option of placing on the pages they produce a link to a site provided by BEV where the intern may place a resume and online portfolio.

[4] Technology Leadership Teams in Accomack and Northampton counties chose to use the existing Eastern Shore Virginia Portal as their community network.

In addition, the WWRC interns are performing their work over the Internet from Staunton, VA, even though the server is in Blacksburg, and their customers are dispersed across the state. These interns, should they choose to do so, can continue to do the same work from anywhere in the Commonwealth where they can find appropriate connectivity.

Furthermore, we were particularly impressed with highly successful personnel screening and self-training techniques developed through Project Train IT at Woodrow Wilson. This model, developed under a grant from the U. S. Department of Labor, can scale and could be used to create online entrepreneurial and economic opportunities “virtually” for anyone. The BEV hopes that program will be able to continue and be a partner in the future.

8. **Web authoring system for novices and first time creators of Web sites**
   In working with individuals who had signed up for the Virtual Business Incubator and Community Connections packages, we found that some of them were daunted by the prospect of putting up their first Web site despite the training provided. One way to overcome this obstacle was the BEV internship program described earlier. At the same time, we launched an effort to locate an easy to use, low (or no) cost package that we could add on to the BEV in Box offering without too much effort. We found software that offered the basic functionality we were looking for and adapted it for use with Virtual Business and Community connection accounts.

   The interface to the software is similar to the one on Microsoft Word with which many individuals are familiar. We've developed a tutorial for non technical people to use to create their "bill board" site, i.e. a one page site that contains a description of the business or community organization, other salient information (address, hours, contact information etc.), and appropriate graphics to attract visitors. Since the software runs on the server, an advantage of this approach is that individuals do not have to learn to upload their files from their local machines using FTP, a source of confusion and a stumbling block for a lot of novices learning how to put up Web pages for the first time.

9. **Alliances with community colleges to promote economic and workforce development activities**
   The Eastern Shore Community College and Southside Community College have held Web design workshops and business development courses that have benefited residents of the Eastern Shore (Accomack and Northampton) and Cumberland counties, respectively. We anticipate and encourage affiliations of this nature with such institutions capable of delivering classes and training on a variety of topics such as business development, work force training, and Web design.

10. **Established partnerships with school systems to use their facilities to provide training to leadership teams and members of the community**
    Computer labs in school systems were used to provide hands on training to leadership teams and residents of the community. The Craig technology leadership team (TLT) conducted its meetings and held training in the computer lab in the local high school, perhaps the only places where such training would be possible in Craig County. The Cumberland County TLT used the computer facilities in the Log Cabin, a computer lab for Cumberland High school, to conduct TLT and community training sessions.

11. **Agritourism workshops aimed at attracting tourists and increasing revenue for farmers and rural land owners**
    A noteworthy outcome of the work on this project in King and Queen County was the organization of a regional Agritourism Business Opportunities Conference held in King and Queen Courthouse on May 9, 2003. This regional conference was supported by the VCE programs in (Virginia) Planning District 18 which includes King and Queen, King William, Essex, Gloucester, and Middlesex counties. More than 60 persons registered for the conference, including the Director and Associate Director of Virginia Cooperative Extension, a staff member of Congresswoman J.A. Davis from Virginia Congressional District 1, and economic development officers from surrounding counties. Conference speakers included Dr. Ann Lastovica and Andy Hankins, Associate Professors at Virginia State University in Petersburg, VA. A panel of entrepreneurs currently engaged in agritourism and direct marketing ventures shared their experiences with the audience. Evaluation survey results described below indicate that the conference met a perceived need and that additional community readiness workshops of this nature are needed. As a result of this workshop:
    a. 72% learned ways to determine the opportunity that best suits their situation;
    b. 60% learned of resources available for beginning an agritourism business;
    c. 52% gained some new ideas for their agritourism business;
    d. 48% plan to begin the start of their agritourism business;
    e. 12% plan to expand a current business;

Project Accomplishments

This project has provided tangible means for residents in seven rural Virginia counties with underserved populations to better participate, if not prosper, in an economy that thrives on the exchange of timely information between producers and consumers of goods and services.

The development of an electronic village provided a focus and a framework for community members to discuss significant issues facing their communities and appropriate uses of technology for improving both their social and economic environments.

Each county now has a team of motivated individuals who can provide leadership in matters involving the use of information technology to aid in economic development and building community capacity. These individuals went through the Take Charge (or equivalent) community planning process, to inform themselves of issues facing the county and attended training sessions to educate themselves on the appropriate use of technology to solve problems that faced their communities.

The leadership team also has access to a technology master plan that outlines their most likely technology infrastructure options and suggests next steps that might be taken to achieve the vision that they articulated during the consensus building phase of this project. They're committed to establishing a resource base to ensure sustainability of this project. Examples of these efforts include writing proposals to bring broadband to rural areas, forming partnerships with local school systems to ensure that there is a trained work force, and involving the Chamber of Commerce in supporting technology initiatives for new and existing small businesses. "The process has provided a turning point in Cumberland County" – Cumberland County resident.

Residents in the counties where we created electronic villages increasingly are using the Internet to look for resources within their own counties. Local home-based and micro businesses are using the Internet to promote themselves and make their communities more aware of the choices available to purchase goods and services locally and to support local businesses. This in turn has encouraged other businesses to list themselves on the Village Mall and to use Web sites and the online mailing lists available through the Virtual Business Incubator. As a result, local organizations and businesses have unprecedented exposure in their communities through a new marketing and communications channel. At the same time, end users have convenient access to that channel and are using it to inform their choices about how they might spend their time and money, increasingly to local benefit.

Residents also are benefiting from the online "Community Connections" listings. Non-profit faith based and social organizations as well as clubs are using Web sites and online mailing lists to make residents more aware of their offerings thereby increasing community "networking" opportunities for end users.

Residents use the Community Calendar to become more aware of Board of Supervisors, School Board, and other government meetings.

Online discussion boards on electronic village Web sites are providing a forum for residents to ask questions, seek clarification from, and provide responses to county leadership thereby increasing awareness of local issues. End users have a new means to make their voices heard by elected officials and other community leaders.

This project has empowered all the communities where it was implemented. The counties for this project were selected because they had a large disadvantaged and underserved population. They also didn't find much help from individuals, businesses and other organizations located outside their communities.

Now, instead of depending on people on the outside to help, they have a team of local residents who are in a position to guide their leadership on various issues that face them. Instead of feeling like they were left behind, they now realize that they have a start toward the skills and knowledge they need to participate in the Information Economy. Alliances with the School Board ensure that youth initiatives are supported. This helps the county have a more qualified workforce and retain residents who can continue to help it grow. Perhaps for the first time, they have started believing in themselves as the following quote from a Craig County TLT member indicates -- "Now we feel like we are a part of the mainstream society."

The Dickenson leadership team chose to launch the Dickenson County Electronic Village using their local Chamber of Commerce, which helped draw a large crowd for this event.

This project "busted paradigms" in Cumberland County according to feedback received from the Cumberland County Technology Leadership Team members during a focus session held on Feb 11, 2004 to discuss project outcomes. Responses received during that meeting indicated that for the first time, citizens, local government, educators, and other sectors of the community came together. They were willing to travel and meet in the middle of the county in a county that typically doesn't want change. "And they never expected it would work." "The process has opened doors into the community."

Project Impact

We estimate that approximately 30,675 individuals have benefited directly or indirectly from this effort because it has the potential to benefit residents in all participating counties who access the Internet. We arrived at this figure (30,675) by using the following process:

1. Took the US Census Bureau's estimate for the 2003 population of each county – Craig, Cumberland, Dickenson, King and Queen, Louisa. We didn't use Accomack or Northampton numbers since they chose to use the Eastern Shore Virginia Portal for their community networks and we didn't set up their community networks.

2. Subtracted the population under 5 (too young to use or benefit from the information)

3. Multiplied it by 50% as the Internet Usage rate for rural localities. We deliberately used an Internet Usage rate lower than the Internet usage rates in rural America estimated by NTIA (52 %) and Pew Charitable Trust (54%) in order to be conservative in coming up with these numbers.

4. Added the numbers for all participating counties

Examples from the Counties

Stories, comments, and examples submitted from the participating communities provide particular and personal insight into the effects of the project.

Cumberland County:
Even though Van Petty retired from Virginia Cooperative Extension (VCE), he continued to lead the effort in Cumberland County. He is now on the Board of Supervisors. In an email message to the project director, this is what he has to say about the impact of this project in Cumberland County: “Many volunteer hours have been worked by the Cumberland Technology Leadership Team to make this project a reality. The Cumberland TLT has been a pleasure to work with. The BEV and VCE staffs made it possible for the Cumberland Community Web Page to happen. As a county supervisor, I hear very positive comments about our web page. Several new citizens have commented that they found helpful information about the county and services available via the web page. I know that more local businesses will use web pages in the future to promote their businesses. We also discovered that Cumberland will need broadband to stay in touch with the rest of the world. I feel that this technology project has opened Cumberland's eyes to see the possibilities. I am excited about our future and look forward to working with the citizens of Cumberland, BEV and VCE to achieve our technology goals.”

Carol Eltzroth and George Costen own Ampthill Plantation Bed & Breakfast. Their business has increased since June of 2004 after signing up for a virtual Business Incubator account. Their Web site has helped them market their business and they are getting clientele from outside the county. To quote them, "We Love Our Site!” (http://vbi.cumberlandfirst.net/ampthill-plantation/)

Sarah Schember, who has a cake making business called Cake Kitchen (http://vbi.cumberlandfirst.net/cakekitchen1/), states that she is getting requests from people out of the county. For example, she thinks she received an order for a cake from some one whose child is a student at a nearby college. Ms. Schember said these customers were looking for professionals. The Virtual Business Incubator account web site distinguished her business from an average cake-maker.

Craig County:
Marjorie Lewter, DVM and single parent, is using the Internet to publicize and build her veterinary practice. She offers in-home veterinary care locally by appointment and provides information nationally on holistic veterinary medicine involving acupuncture, botanicals, nutritional therapy, and conventional medicine. She had limited time, expertise, and resources to build her business while providing for her young daughter, so she signed up for a Virtual Business Incubator account through Craig County Electronic Village and got assistance putting up her Web site (http://vbi.craigev.net/ccvs/) through the BEV internship program.

Dickenson County:
Kim Carrol owns Thirty-one Ten (http://www.thirtyoneten.com/), a Web design business, and serves on the Dickenson County TLT. She wrote concerning the impact of the Dickenson County Electronic Village (DCEV) http://www.dcev.net). “I have had this Web design business for almost 8 years but expanded and relocated to an office outside of my home this year. We have had great response from the community so far concerning DCEV and people are starting to see its benefit. I know that it is playing a key role in prompting more people to look to the internet for the future of their business. We are seeing a surge in the need for web design and maintenance. So I can confidently say that it has played a major role in raising the demand for my services. Until the last year most of my business was from out of the area and sometimes out of state. Local businesses had not seen the need to expand to the internet. Most even saw having a web site as a luxury, not a necessity. With the development of the DCEV and a few other projects at the same time, business owners finally see that without a web site they are being left behind. Also, people finally see how the internet "levels the playing field" for them.”

Ms. Carroll also reports that the county now has a team of three administrators who are more than capable of maintaining the site but whom she assists as time allows. “We have lots of pictures now and better content that I hope to incorporate…as time allows,” she says. “I can say this. [Extension agent] Phyllis Deel did a great job putting the TLT together. It was the first project that brought technology-savvy people together. I am already seeing how this has affected our community. Technology is coming to the forefront and the TLT has the opportunity to lead even in ways other than the DCEV.”

Under a parallel project to the TOP program, Dickenson County is deploying a municipally owned wireless broadband network (DCWIN). The combined effect of the two projects has been dramatic enough in the county that the Chamber of Commerce has taken a lead role in working with the TLT to promote their electronic village among area businesses. BEV Director Bill Sanders was able to attend the electronic village launch by video conference from Blacksburg over the Internet and a DCWIN wireless link. This coupling of a ‘top down’ public broadband infrastructure deployment (DCWIN) with a “bottom-up” incubation of grassroots social and economic activity (like the electronic villages funded by TOP) simultaneously provides a community with access to, and prepares its people and businesses to participate in, e-commerce and the global market. The potential of this model—one that builds technology infrastructure while providing education and support “in place” for personal, community, and small/micro-business development—should not be underestimated. What the Cooperative Extension model did for communities during the era of the family farm, this “electronic extension” model might be able to do for communities in the age of e-commerce in which, hopefully, “everyone can be a customer and everyone can be a producer.”

King and Queen County:
Lawrence Simpkins serving on the Board of Supervisors in King and Queen County has consistently supported and been actively involved in the project in King and Queen County. He writes: “Being a very rural county, we found most people are just starting to use the Internet as a source of information. We found most small businesses were

interested in having a Web site but thought it would be too expensive and just had no idea about how to begin to get one. If we had not offered free Web sites and information on how to get started, most would not have gotten one."

His wife, Cindy Simpkins, designs, makes, and sells custom handbags. Many potential customers who lived outside the county were asking for her Web site so they could see a sample of her offerings. She was frustrated because she didn't have a Web site and it was cost prohibitive for her to set one up to find out if it was worth doing. When she heard about the Virtual Business Incubator offering, she signed up for an account and became one of the first local business persons in King and Queen County to do so. Her site (http://vbi.kqinfotrail.net/cindysdesigns/) was developed through the BEV internship program. As a result of this she is now able to reach a broader customer base and therefore expand her business.

Eddie Weindel, owner of Underground Graphixx, a sign company, has consistently participated in discussions on KQInfoTrail and attended one of the community meetings. He was so enthusiastic about the project's potential for the county that he is creating 25 political campaign-type signs publicizing KQInfoTrail. The signs will be posted across the county.

The owners of a King and Queen campground, Rainbow Acres, discovered the Mattaponi Queen river excursion when they logged in to the KQInfoTrail for the first time. Now campers looking for something to do in and around the area are referred to the Mattaponi Queen as well as to two museums and a variety of other "County Attractions" listed on KQInfoTrail.

The Mills family had talked about turning their 30-acre farm into a family business with each family member developing and managing a different component. Mr. Mills contacted the Extension agent to have the specialist come from the university to "walk the land" and make recommendations. Favor Farm & Nursery, now an up-and-coming regional agribusiness resource, signed up for a Virtual Business Incubator account and, with help from a BEV intern, created their site (http://vbi.KQInfoTrail.net/favor/). It provides a great overview of the family, their philosophy, and current offerings: farm-grown honey, shiitake mushrooms, blueberries, and nursery stock. Future plans include handmade crafts (their own and others from across the county), archery lessons, pony rides, and a 3-hole golf course--things specifically designed to keep some people busy while others peruse sales or "pick their own."

The first community group Web page belonged to the Woman's Club of King & Queen (http://civic.kqinfotrail.net/kqwomansclub/). Alinda Uzel, county VCE agent and Unit Coordinator, found the enthusiasm displayed by this group of ladies, ages 60 and over, very refreshing. To her it seemed like the older generation was leading the younger into new and exciting adventures. Lenea England, the member who worked with the intern to develop the site, was excited and said she learned a lot by being involved in its creation. She volunteered to make a presentation to the Club on September 23, 2004 to promote the Web page and to encourage all members with access to the Internet to become

Villagers. Ms. England visited KQInfoTrail the first week it was available to the public, learned about the Mattaponi Queen river boat cruise, and made reservations for her entire extended family to take a cruise that very next weekend. The president of the group has now shown an interest in learning how to set up an online mailing list to communicate with those members who have e-mail access.

The organizers for the yearly Community Pride Day celebration, created forms for vendors and parade participants as well as information flyers so that they could be printed directly from the KQInfoTrail Web site. One objective for The King and Queen Info Trail (http://kqinfotrail.net,) was to make more residents aware of issues facing local government and to get people more involved in the decision making process. Since the Discussion Board went "live", there have been several communications regarding the fact that the school system Web site which has a link on KQInfoTrail was outdated and therefore not useful. These "conversations" were shared with the Superintendent of Schools who responded that their Web site would be updated prior to the opening of school. Web administrators for KQInfoTrail relayed this reply to the individuals posting the comments. The administrators also were able to educate villagers about the KQInfoTrail, that it simply provides a link to the school system site and they encouraged concerned individuals to contact the superintendent at the school board office to discuss school-related concerns.

Another discussion dealt with the inactivity of the local Park and Recreation Department. This misconception was clarified by a KQInfoTrail villager who explained that the county does NOT have a Parks and Recreation Department but DOES have a Parks and Recreation Commission which is an advisory group to the Board of Supervisors. Individuals with concerns or ideas were encouraged to refer to the Web Calendar posted on KQInfoTrail and attend the regularly scheduled meetings of the Board of Supervisors to voice concerns and help propose some workable solutions.

At a presentation to the Upper King & Queen Ruritan Club, which is in the process of developing its Web site, a member indicated that he had lived in the county for over 30 years and this (the KQInfoTrail) was the best thing to happen to the county in all that time. He was excited about the potential economic impact this could have over time "...if we can get our local government officials and the public to embrace it completely and explore the possibilities."

Unanticipated Problems

1. As we were getting ready to conduct training sessions in each county, we realized that some of them didn’t have adequate facilities to conduct such activities. This may have impacted the quality and effectiveness of some training sessions.

2. We realized that we did not have a publicity budget for this project. This hurt our efforts in promoting the project as effectively as we would have liked in some counties.

3. Hindsight leads us to conclude, that calling the citizen's team a "technology leadership team" may have intimidated non-technical people who may have thought that it was for tech savvy individuals and therefore didn't join the team. With a different name, we might have attracted individuals with a broader range of non-technical skills e.g. writing, group facilitation and publicity

4. Turnover caused project delay which frustrated residents of counties who expected to see results sooner than we could deliver and possible loss of active participants. Similar efforts that were intended to be cooperative moved ahead because of the delays resulting in this project being viewed as competing rather than complementing the other efforts.

5. We also found ourselves lacking appropriate resources to provide direction on policy issues related to the appropriateness of content on a family oriented community Web site.

6. In some counties the resistance to Take Charge due to the reliance on an existing County planning document resulted in fewer individuals being brought into the process and lack of specific goals pertaining to the inclusion of technology in economic development.

7. The time commitment in the early stages of this project was more than expected both for VCE agents and TLT members.

8. Geographical disparity i.e. the distance between the various counties caused some logistical problems in terms of training and travel schedules.

Project Expansion

Leadership teams in Craig, Dickenson and King & Queen Counties are beginning to focus on rural tourism. Ways in which Web sites developed as part of this project can be used to develop and promote these activities. The Virginia Tourism Corporation has recently published materials to support the development of Agritourism enterprises. The micro and home-based businesses that offer goods or services of interest to tourists can also link their Web page to Virginia.org, an Internet site sponsored by the Virginia Tourism Corporation.

The BEV expansion strategy for this project depends to a large degree on initiative from the counties: suggestions or ideas that they generate and for which they seek advice or assistance, such as the inquiries from the Rappahannock Tribe in King and Queen County (described under "Spin Off" activities). Such initiatives are perhaps the best indication that the TOP investment has made a lasting difference in the activities of various communities and the thinking of their leadership.

Spin-Off Activities

Here are a few examples of the kinds of spin off activities that this project has generated.

1. Blacksburg Electronic Village (BEV) and Virginia Cooperative Extension (VCE) plan on continuing to explore ways to develop the partnership established by working together on this project. Experience with this project has demonstrated that economic development in disadvantaged rural areas and based on e-commerce requires strong, credible local leadership working in concert with external resources in a position to provide needed startup expertise and services. VCE is in an excellent position to help with leadership; the BEV can continue to bring needed technical expertise; and both can negotiate for additional resources as needed for interesting projects and prototypes going forward. Leaders from both organizations met at the end of this project to discuss a certification program that addresses the need to discover and nurture local talent in rural counties, and build the kinds of technical expertise they will need to be able to participate in online commerce. We see the need to provide the kind of comprehensive business support to the online entrepreneur that VCE traditionally provided to the family farm and through many community development programs. Though still in its "incubation" stage, we believe such a program —- consumable locally through Extension and focused on how to plan, start, and operate an online micro-business (or expand an extant home-based business online) using resources available on the Web today—might be a grass roots force to help increase the amount and types of goods and services flowing from rural areas into the world economy. As such, it should increase demand for rural broadband investments even as it offers economic opportunity to rural residents. We'll be looking for examples of programs like this and for financial support for this idea over the next year.

2. Towards the end of this project, King & Queen County's Rappahannock Tribe of Native Americans shared their Comprehensive Plan with BEV management through the county extension agent, Alinda Uzel. The tribe's plan is to recover and manage their original lands in keeping with traditional tribal values. These values are consistent with many ecological principles popular today as well as with the idea of sustainable "rural systems" espoused by Virginia Tech Professor Emeritus Robert Giles, College of Natural Resources. Giles uses GIS and data mapping techniques to analyze resources and economic opportunities in geographic areas. Consequently, arrangements were made and Dr. Giles traveled to King & Queen with the BEV Director, Bill Sanders, in late August and met with Chief Anne Richardson and VCE agent Alinda Uzel to explore ideas, needs, and potential economic development opportunities consistent with tribal resources, goals, and traditions. Enthusiasm among all parties at that meeting was high and the chief will be approaching her tribal council with many of the concepts and ideas. Should the tribe decide to move any of those ideas forward, BEV will meet with them again and begin looking at ways to partner and assist.

3. The Cumberland County school system received a three year "Learn to Serve" grant that will help the school board utilize the Web site developed for Cumberland County as part of this project to meet grant objectives. The grant addresses several issues such as

providing business and industry links to the Cumberland First Web site, developing promotion materials for county economic development, students teaching adults Web page development, and the opportunity for high school students to learn Web page design. The public school system plans to work with the Cumberland technology leadership team to accomplish these tasks. The grant period is March, 2004 through September, 2007.

4. Tiger Tail Web site for children: A spin off activity of the Electronic Village in King and Queen has been the addition of a site for children. The Community Prevention Council provided resources for the development of a site http://www.thetigertrail.net just for kids that includes a calendar of events for children and youth, resources for help with homework, and connections with the local DARE (Drug Abuse Resistance Education) program.

5. The BEV internship program: Though this program (described earlier in this report) was initiated in the second quarter of 2004 (i.e. during the life of this project), interest in continuing it past the life of the project is very strong. BEV Director Bill Sanders is continuing to explore possibilities with Woodrow Wilson Rehabilitation Center in Staunton, VA and other organizations that wish to train interns under this program. These institutions are in the business of providing professional development and job training in the technical fields, including various certifications. A partnership that can systematically place their interns not just locally, but virtually anywhere in the Commonwealth significantly expands opportunities and has the potential to create considerable added value to all concerned. Since Community Colleges throughout the state offer similar programs, the BEV plans to discuss this idea in that venue in the year ahead to determine what can be done to advance this partnership idea. The BEV Director will join representatives from Woodrow Wilson and one of their interns at the Governor's Conference on Workforce and Career Development, Richmond, VA in October, 2004 as part of a panel discussion of the results of the internship program.

Partnerships

The primary partnership in this project involved the Blacksburg Electronic Village (BEV) and Virginia Cooperative Extension (VCE). For the most part, this partnership was very successful. VCE provided the network of agents in the field who live in the communities and had the infrastructure to manage their activities. The BEV provided its experience building community networks and its expertise in deploying appropriate technologies towards that end. What made this a successful partnership was the recognition by members of both organizations of the value the other brought to this project. This enabled project team members to work in an atmosphere of mutual respect and cooperation. However, an aspect of this partnership that did not work very well was knowledge transfer of community network building to VCE technical staff assigned to assist local citizen teams. As a result, the BEV had (and continues) to provide direct technical support to the leadership teams in each county whereas it would have been more appropriate and sustainable for the leadership teams to turn to professionals within

Extension for this purpose. Ongoing discussions between leadership at the BEV and VCE (described in spin off activities) may remedy this situation so that it doesn't hinder in future joint projects undertaken by these two agencies. Most other successful partnerships have been described elsewhere in this report. They are:

1. Partnership with Woodrow Wilson Rehabilitation Center, the Community Colleges, and potentially other organizations that can offer opportunities and training to make it possible for entrepreneurs new to the Web to use it effectively for sales, marketing and research purposes.

2. Partnership between the BEV and the Eastern Shore Virginia Portal to provide Virtual Business Incubator and Community Connections accounts to residents of Virginia's Eastern Shore. This is an example for how a project such as this can cooperate with other initiatives targeting the same communities.

3. We partnered with local school systems to use their computer labs to conduct workshops in some counties. This allowed us to leverage existing facilities to provide hands on training to inexperienced users who benefited by having access to trained personnel and relatively modern equipment.

4. The Director of Technology for Craig County School systems, Adele Morris, was a member of the Craig TLT and has included this project as a community outreach component of the Technology Plan that is required by the State Dept. Of Education. Debbie Snead, retired VCE agent, who leads the effort in Craig county believes that this collaboration between the technology leadership team members, other leaders in the community and the school system has helped to promote and give credibility to the project and its goals. She anticipates that youth, families, community organizations, local government and businesses will continue to have the opportunity to learn more about the significance of technology and use their Internet skills in ways that will increase their visibility and income, and provide an economic boost to the entire community.

5. The Dickenson County Wireless Integrated Network (DCWIN) program in Dickenson County provides broadband wireless access to residents in the county. Network engineers and managers who are responsible for DCWIN also participate in Dickenson County's Technology Leadership Team thus ensuring that the goals of both projects are supported through this partnership. The Chamber of Commerce in Dickenson County has recognized the potential for the Dickenson County Electronic Village to provide economic development opportunities and is another member in this partnership.

Lessons Learned

The most significant barrier that we had to overcome was constantly having to negotiate bottlenecks caused by limited resources, both of time and money. Though the vision of connecting residents of rural Virginia is a powerful and compelling one, in our (project team's) collective opinion the proposal underestimated resources (both time and money)

needed to guarantee timely completion of all proposed tasks. Turnover in personnel compounded the problem as we had to spend some time getting new people up to speed. We found ourselves scrambling more often than we would have liked to find appropriate resources to conduct activities in a manner befitting that vision. Existing project staff including the Project Director, M. Mathai; VCE Project Lead E. Schlenker; VCE Research Associate P. Gibson; all VCE agents and Luke Ward, BEV Technology Manager contributed significantly more time to this project than was originally proposed. We are fortunate and very grateful that two retired VCE agents (D. Snead and V. Petty) volunteered a lot of their time to assist with this program. Bill Sanders, the incoming Director of the BEV, spent much of his time in the last quarter of this project assisting with project activities related to sustainability and spin off activities. However, despite these efforts, we could not bridge the gap between what we needed and the resources that we had at our disposal. To meet proposed objectives we had to add more resources to the project even though there was no grant funding to pay for them.

We have presented the lessons we have learned as a checklist that may be useful to others attempting a similar project. It includes things that worked well during this project as well as things we would do differently were we asked to do it with other counties. Particular emphasis should be given to the issues of interest and leadership within the communities being served. From the beginning, communities should contribute their own goals and objectives, identify their own leaders, and help write their own portions of any proposal. If early discussions and solicitations do not produce at least this level of interest and participation, adjust project expectations accordingly or reconsider your desire to move forward with that prospective partner.

The lessons are grouped by the four phases of the project in which they occurred (1. Project Feasibility Study, 2. Proposal development, 3. While waiting for funding and 4. Project implementation).

Phase I - Project Feasibility Study:

1. To ensure that the project has strong support should it be funded, have VCE agents assess interest in the expected outcomes among elected officials, business leaders, and community members.

2. Determine if similar efforts are being proposed or undertaken through another project in the same communities. If so, ensure that the implementation plan has the flexibility to coordinate with those efforts.

3. Residents of geographically disparate areas have different concerns that they would like to address. Including areas that are at large distances from one another makes it difficult to schedule regular visits by project team members because much time is spent traveling. Given a choice, work within regions close to one another, e.g. working within a Planning District ensures that the project ties well with the vision of the Planning District Commission.

4. If you want activities to continue after the project funding is over, ensure the availability of local resources, training facilities, and technical support for the project.

Phase II - Proposal development:

5. Leadership teams that participated in the Take Charge process seemed to work more cohesively than those just adopting a county comprehensive plan or another visioning process. This doesn't surprise us since the vision and outcomes of the Take Charge came from within the group rather than from individuals outside the leadership team. Make it a requirement that the members of a community go through Take Charge or similar process to foster ownership of the vision and outcomes.

6. As part of the proposal, develop a detailed implementation plan for what you're going to do. If you're counting on volunteers for local leadership, be extremely specific about what's required from them in terms of time and skills. Make sure that some members of your project team are proficient in gathering data and related information for the reports that have to be produced as part of the project.

7. Present the implementation plan to potential volunteers and recruit individuals who have time and motivation and who commit to actively participate.

8. Recruit interested people new to civic activities as opposed to those who are already serving on various committees and professional organizations that require significant amounts of time. Try and involve senior citizens and high school seniors since they have more discretionary time on their hands than those who are employed on a full time basis.

9. If you can't get passionate local advocates, reconsider both your choice of localities and your approach.

10. Don't call the leadership team a "Technology" Leadership Team if the intention is to train non-technical individuals to understand technology issues. It tends to discourage people with other skill sets – writing, marketing, fund raising, etc. because they don't consider themselves "technical" and may think they have nothing to contribute.

11. Include adequate funding in the project budget for ongoing marketing and publicity efforts.

12. Volunteers tend to find or have other interests and commitments. If the project requires a large number of volunteers (as ours did) find ways to keep the number of volunteers at a healthy level to ensure that one or two people are not expected to carry the whole load .

13. Ensure that decisions made in the communities about match funding are binding for the duration of the project. Otherwise, an incoming set of elected leaders could vote not to continue the funding.

14. Anticipate turnover in paid project personnel. Ensure that the implementation plan is well understood by all involved and make provisions for bringing new members up to speed without losing momentum or causing significant delays.

15. Clearly identify as part of the proposal any benchmark measures, their baselines, requisite data, and the method of analysis. This will give you an idea about how easy or difficult it will be to meet your evaluation requirements at the end of the project.

16. Ensure that the implementation plan includes a methodology for ongoing data collection against benchmarks.

17. Emphasize sustainability. Create buy in and get commitments from local IT specialists and others capable of providing guidance and support in technical matters in each region so as to minimize dependence on some central organization. These individuals and organizations will be needed to sustain this effort once the project is over and personnel paid with project funds move on.

18. Ensure that each locality has an appropriate facility for conducting hands on training. People who are not familiar with technology learn best by trying things out for themselves, making mistakes, asking for and receiving help and retrying those things until they understand what they're supposed to do. In communities where residents don't have computers or network access, a community technology center would be an ideal solution.

19. If training is an important part of the project, ensure that individuals with training experience for the target audience are part of the implementation team. Draw up tentative training schedules as part of the project proposal so that travel times, holidays, winter travel, etc. are all factored in.

20. Propose activities in which people without a technology background can participate and be assisted by others who have the background.

21. Include funding for project personnel to meet periodically to share experiences and materials, exchange stories, and review progress and lessons being learned.

22. Carefully review the capacities and capabilities of proposed technologies to be sure they are appropriate for the intended audience, e.g. HTML training of neophytes can be very challenging.

23. Ensure that technology to be deployed is production quality and ready to be deployed as soon as word of funding is received.

24. Plan from the beginning for sustainability: Include funding and other provisions for a year or more of efforts beyond the official grant period. With each participating community, research other grants and funding sources. Find matching funding sources

within the community to increase buy in and participation. Build activities into the proposal that lend themselves to sustainability.

Phase III - While waiting for funding

25. Ensure that you're ready to go as soon as the funding for the project is received. Consider no (or low) cost activities that can be started as soon as funding is received, i.e. organize publicity meetings with refreshments donated/sponsored by a local business.

26. Write newspaper articles, design posters, book marks, business cards and other publicity material and have them ready to go as soon as approval of funding request is received.

27. Create a list of additional material (other than publicity) that may be needed once the project is funded, e.g. guidelines for content on community network sites that have been reviewed by legal counsel to ensure that no laws were being broken.

Phase IV - Project implementation:

28. Ensure that local leadership groups have the means to communicate with each other directly instead of always having to go through the (central) project leadership. Ideas that worked in one region can then quickly be transmitted to and acted upon in another region.

29. Report writing, usually an integral and unavoidable part of a grant funded project, has considerable overhead associated with it. Set up report templates that include all relevant data needed for project reporting purposes from the granting institution. Distribute these requirements information to local teams when the project begins and set up a means for them to submit data periodically so that end of quarter reporting includes all relevant data, e.g. at the end of a leadership team meeting have a way for the minutes taker to submit the minutes at the end of the meeting or the next day with minimal overhead.

30. Reiterate project goals and deliverables on a regular basis to keep local leadership teams on track and aware of the big picture.

31. Convene regular status meetings of the project leadership team and invite representatives from the field to participate in these meetings. Keep them brief (sixty to ninety minutes) to allow maximum participation.

32. Ensure that information gathered from the reporting process is acted upon in a timely manner so as to create a support structure for agents and others in the field to assist them in overcoming obstacles that they encounter during the project.

33. Continue to facilitate Take Charge (or similar) sessions on a regular basis, e.g. every six months to ensure that the leadership team has the means to evaluate its progress and modify its course midstream if need be.

34. Pair VCE agents with a member of the local leadership team who serves as team leader. Send communication and clarification about the project to both individuals to both relieve the burden on VCE agents and reinforce the idea of local control. Rotate this position if needed to give every one interested an opportunity to share in this work and not put too much of a burden on one or two individuals who don't know how to say "no."

35. During the last six months, engage leadership teams in discussing sustainability strategies to ensure that project objectives have a way of diffusing into the community at large. Come up with and activate strategies to sustain the momentum generated during the implementation.

36. Maintain a Web site for the project and keep it up to date for participants, project team members, and interested parties to view. This is a source of free publicity and a useful tool for others considering a similar effort.

Future Plans

Various aspects of the project and its spin-offs hold promise for the future:

1. Online activity in rural communities opens eyes. Even a small success with a modest Web site in such a county is significant because people begin to understand that it is possible to find global markets for local products. This has led to more sophisticated discussions about online shopping carts, accepting credit cards, and other online business support services. As a result, VCE and the BEV, with the Virginia Tech's Vice-Provost for Outreach, are discussing what it would take for Virginia Tech to adopt or create a programmatic approach for the support of online micro businesses. Philosophically, such a program might be similar to VCE's traditional support of the family farm, essentially the micro business of yesteryear.

2. The internship program being used to help develop initial Web pages in needy counties contains seeds of workforce development. Project Train IT out of the Woodrow Wilson Rehabilitation Center screens its interns for both technical aptitude and ability to learn on their own prior to turning them loose on self-study curricula designed to prepare them for certifications such as those available from Microsoft and Cisco. The BEV Director will participate with Woodrow Wilson on a panel at the (Virginia) Governor's Conference on Workforce and Career Development (October 18-21 in Richmond, VA) to discuss the potential this approach has to prepare people "in place" to participate in the global, information economy.

3. Technology Master Plans for each county give them a real leg up in thinking about broadband infrastructure and the opportunities it affords. The BEV will expand its role as a testing and field laboratory, especially in the wireless arena and will both share and broker information among its constituents.

4. The TOP funded activities have been primarily ‘grass roots,’ as are traditional Extension programs. As such, they are increasing the “bottom up” support for the usually “top down” efforts of our state institutions, agencies, and planning district commissions in pursuit of universal broadband infrastructure. That support has already translated into increased involvement of the BEV, in particular, with those additional partners and efforts.

The above four themes (broadband infrastructure, micro business based economic development, workforce development, and locally available programmatic support) have emerged from our TOP investment and comprise a comprehensive approach to online community and economic incubation. They represent avenues of additional effort in which the BEV, VCE, and other partners can work. Without the TOP grant, these avenues would seem not nearly so obvious and approachable as they do now. Efforts to further develop these ideas are underway and likely will lead to future proposals related to building broadband infrastructure, community technology centers, locally based entrepreneurship and micro business development, and sustainable systems approaches to agriculture and natural resources. We hope to be in a position shortly to discuss some of these possibilities with program officers, including TOP.

Final Words

We would be remiss if we didn’t stress that when all is said and done, the single largest indicator of success for a project of this nature is the passion and commitment of the residents in a community, the individuals who see the potential of the project to enhance their lives, who are willing to embrace its vision, make it their own, roll up their sleeves, and get to work. We can safely say that if a community doesn’t have passionate “evangelists” capable of touching others with their zeal, the chances are slim that such a project will ever succeed. On the other hand, when these individuals do exist, the results far surpass expectations and something of great significance takes root and grows to the benefit of all.

Someone describing the Blacksburg Electronic Village, upon which this project was modeled, may have said it best:

“It’s a people project, not a technology project.”

Mathew Mathai, Director
Blacksburg Electronic Village
Project Director: Getting Rural Virginia Connected: A Vision for the Future
Funded by a US Department of Commerce TOP grant (51-60-01007)

Appendix: Survey to Determine Broadband Network Readiness and Network Needs

Cover letter

Your help is needed to provide information about the level of network readiness in your county. The information will be used for technology planning, to seek support for proposed plans, and to seek funding.

The Department of Commerce NTIA (National Telecommunications and Information Administration) awarded a Technical Opportunities Program (TOP) grant for a project titled "Getting Rural Virginia Connected: A Vision for the Future." The grant was awarded to your county, the Virginia Cooperative Extension, and the Virginia Tech Blacksburg Electronic Village. A major task for the project is to work with representatives of the community to assess current levels of network access, identify needs, and to propose a technology plan to address the needs.

The Virginia Tech Blacksburg Electronic Village developed a survey and interview template to obtain the following information:

- Current voice, data, and video services, providers, costs, and additional needs
- A measure of network applications in use, plus those expected to be used
- General measures for levels of technology utilization, training needs, and desired network access cost
- Most importantly, to identify specific broadband network needs that can be used as goals for technology planning

If you have questions about the survey or technology needs, please contact John Nichols.

Please fill out the attached survey and return it to:

John Nichols, Information Technology Manager
Virginia Tech
1770 Forecast Drive
Blacksburg, VA 24061

Tel: 540-231-4336
Fax: 540-231-3928
e-Mail: John.Nichols@vt.edu

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Survey Form

Date:	By:
Contact:	Title/Position:
Tel:	e-Mail:
Organization:	Web site:
Number of locations:	Total employees:

Return survey to: John Nichols, Virginia Tech, 1770 Forecast Dr., Blacksburg, VA 24061, or e-mail to John.Nichols@vt.edu. Call or e-mail John, if you have questions (Tel: 540-231-4336, Fax 540-231-3928).

Separate voice, data, and video networks are converging over time to an integrated digital network. In the section that follows, describe communication services, access technologies, costs, and additional needs/desires by location for each type of service. For service providers, this survey may be applicable to internal business needs.

Repeat this page for each location:

Name:
Street:
City/State/Zip:
Employees at location: End users at location:

Voice: (e.g., dial-lines, dial-trunks, Voice over IP, ISDN (Basic or PRI), T1/DS1, T3/DS3, wireless)

- Service:
- Provider:
- Access technology (e.g., telephone-wire, coax-cable, fiber, wireless, satellite):
- Cost/mo:
- Needs/desires:

Data: (e.g., dial-up, ISDN (Basic or PRI), DSL, cable modem, satellite, T1/DS1, T3/DS3, OC3c, wireless)

- Service:
- Provider:
- Throughput to premise: Throughput from premise:
- Access technology:
- Cost/mo:
- Needs/desires:

Video: (e.g., cable TV, satellite TV, wireless cable TV, digital video, video over IP)

- Service:
- Provider:
- Access technology:
- Cost/mo:
- Needs/desires:

Other communication service:

- Service:
- Provider:
- Access technology:
- Cost/mo:
- Needs/desires:

What is broadband? Broadband is high-speed, always available, access to the Internet and Intranet. User applications determine the throughput and quality of service that broadband networks must support, whether wired, or wireless. Low end speeds suitable for many applications are about one megabit per second. Common home and office LAN speeds are 100 megabits per second. High end speeds are about one gigabit per second, with ten gigabits per second now becoming available. Viewing high quality video and transferring large files may need 20 Mbps to hundreds of Mbps. Cost for two-way 10/100/1000 Mbps *access* in some municipal and non-profit networks is in the $30-$40/mo range, which is a desired goal. Additional services over the network connection, such as Internet, dial-lines, Voice over IP, and commercial video-on-demand generally cost extra.

In the following table, place a checkmark in the column for network applications your organization is *using now*, plus those *expected* to be used. This provides a measure of utilization and throughput needs.

Internet and Intranet Applications	**Used now?**	**Expect to use?**
e-Mail, with attachments		
Web browsing and research		
Voice over IP		
Teleworking		
Banking		
Placing orders		
Making payments		
Web site for marketing or publishing information		
Web site for receiving orders/payments		
Web site for providing customer or employee support		
Education and training		
Audio streaming on demand		
Video streaming on demand		
Videoconferencing		
Monitor & control for security, alarms, health applications, etc.		
Transfer large files		
Telemedicine		
Online graphical applications (e.g., computer aided design, GIS)		
Network storage and/or backup		
Disaster recovery and loss avoidance of data		
Communications between site locations at T1 speeds		
Communications between site locations at higher than T1 speeds		
Wireless LAN access wherever your users may need it		
Other (specify):		

To what level is your organization fully *utilizing* the above applications (1-10, where 1 is lowest)? _____

To what level does your organization have the *skills* and *training* to fully utilize the above applications (1-10, where 1 is lowest and 10 is highest)? _____

Given expected applications, what throughput speeds are needed? To premise _____ From premise _____

At what price/month would you consider paying for access that supports the expected applications? _____

What could be done within your community to reduce network costs, improve network speeds, or meet specific broadband needs (use more pages, if needed)?