Application for Economic Development Funding
Tobacco Indemnification and Community Revitalization Commission

Vision

In partnership with Virginia Tech and private sector players in the advanced networking arena, we are initiating a pilot project in the Dan River Region (City of Danville and Pittsylvania County). The project is intended to implement two ideas. First, we will bring to the region the most advanced internet technology; second we will substantially alter the economics of access to advanced internet and communication services.

This pilot project is intended to be a proof of concept model for a much more ambitious program. The larger program under consideration will be focused on the transformation of Virginia regions which currently have substantial deficiencies in advanced network and communications technology infrastructure. Potentially this program will lead to a critical mass of citizens who have full command of next generation internet features and capabilities.

The Southside and Southwest Virginia regions could be the focal point for the initial expansion of the pilot project consistent with the vision for the larger program. (A placeholder name for this program is the “e58 Telecommunications Free Trade Corridor.” See Tab A)

Rationale

The economic disparity that exists among the communities of the Dan River Region is well documented. The Dan River Region’s population has decreased 1.1% since 1990 and is currently estimated to be about 109,000. In contrast, the State of Virginia has seen an 11% increase in overall population. The Dan River Region’s unemployment figures have consistently been well above the state and national norms. In May 2000, there was a 6.6 percent unemployment rate in the Dan River Region. This is considerably higher than the state reported figure of 2.5% and the national figure of 4.1%. Since 1990, the Dan River Region has experienced negative growth in real per capita adjusted gross income; today the per capita personal income is approximately 70% of the national average.

The severe economic downturns in the textile and tobacco industry, as well as the lack of interstate roadways have directly contributed to the inability of these rural communities to compete on a statewide and national level. In addition, because these communities are not considered to be profitable markets for early deployment of advanced network services, they are further disadvantaged due to the lack of access to adequate competitive high-speed telecommunications services. Therefore, the region is at a distinct competitive disadvantage when competing for high tech businesses as well as ‘bricks and mortar’ businesses that are increasingly in need of access to inexpensive, high-quality, high-bandwidth telecommunications services.
The Dan River Region has lost opportunities to attract new industries due to deficiencies in the existing telecommunications infrastructure. (See Tab B) Without the development of a high-bandwidth telecommunications infrastructure, many businesses will have no choice but to relocate to remain competitive. The Dan River Region Network Economy Focused Economic Base Study being conducted by Virginia Tech suggests that the Dan River Region will continue its current economic downturn if it remains underserved, and in some cases un-served, by high-bandwidth telecommunications.

We live in an age of information, an age of learning, an age in which the competitiveness of individuals, organizations, communities and regions, depends upon the ability to obtain and process information. The implementation of this vision will require a radically different communications and network infrastructure. This new infrastructure will be designed such that every citizen has the potential to become not just a consumer, but also a producer and contributor of value added information and services to the national communications and information network fabric.

This implies architecture and technology choices that do not prohibit high bandwidth (within this decade, hundreds of megabits per second) access to and from every potential connection. It requires a different array of tools and services that support people-to-people, people-machine, and machine-to-machine high bandwidth data couplings. The emergent technologies of the Internet Protocol (e.g. quality of service, differentiated services, multicast, multiprotocol label switching, etc.), combined with efficiencies in fiber optics and optical switching, and very high bandwidth wireless technologies are radically increasing the opportunities for commodity priced services at the local community level.

**Project Description and Location**

Based upon the preliminary findings of the economic base study referenced above, the Future of the Piedmont Foundation proposes to build, in cooperation with Virginia Tech and local internet service providers, the beginnings of a next generation, high-bandwidth network infrastructure to serve the City of Danville and Pittsylvania County. This proposal is for the initial phase of a multi-phased project that can serve as a prototype for other Southside and Southwest Virginia localities in guiding the development of their local network infrastructures. It will also serve as a catalyst for high bandwidth backbone access to other regions, to the developing national optical internet infrastructure and to Tier 1, 2 and 3 markets.

The Foundation’s desired outcomes for this project are:

- Implement a project that will have an immediate impact on the Dan River region;
- Promote regional cooperation with investment and return equitably distributed throughout the City of Danville and Pittsylvania County;
- Reduce the barriers to entry for new and existing businesses aspiring to enter the network economy;
• Generate a critical mass of consumers and producers of advanced network services to drive the market towards commodity pricing;
• Encourage private sector involvement, investment and competition;
• Demonstrate a viable business case for advanced network services in rural regions.

The Foundation proposes to develop a distributed Multimedia Services Access Point (MSAP) network architecture serving Danville and Pittsylvania County with high-bandwidth advanced communications and commodity internet connectivity. See Addendum 1 for a graphic representation. Initially, this MSAP will be connected to Next Generation Network Virginia. (See Tab C) In the long-term, we plan to connect this MSAP to what is currently being proposed as an e58 long haul fiber corridor. The MSAP architecture provides local high-speed peering of broadband connections to support development and participation in the next generation of e-business. It provides substantially more bandwidth where it is needed and it helps to reduce traffic bottlenecks through higher tier internet service providers. It can also provide the foundation for the development of an e-business data center competitive with that in major Tier 1 markets. The Dan River Region will become a model for future MSAP community build-outs throughout Southwest and Southside Virginia.

This proposal focuses on building infrastructure that provides the broadest possible coverage for the investment and that can grow to serve additional areas and users in future phases. Initial access to the MSAP architecture within the City of Danville and communities of Pittsylvania County will consist of a combination of fiber and high-speed wireless links to critical locations. Much of this infrastructure will initially be based on wireless technology. Wireless technology is quick to deploy, cost effective and can easily be redeployed. As demand for high speed services increase, fiber infrastructure can be built or obtained to replace the wireless infrastructure. This wireless infrastructure will continue to have value when redeployed to support broader network expansion across the region.

The wireless infrastructure to be developed will be a combination of point-to-point and point-to-multipoint links using Local Multipoint Distribution Service (LMDS) and unlicensed spectrum designed to provide the best coverage with the available funds. (See Tab D) As part of the project planning and engineering, we will seek to leverage the Pittsylvania County Schools wireless infrastructure including coverage, capacity, towers and expertise.

This project will determine where to locate, then build the initial components of the distributed MSAP. The MSAP architecture and network infrastructure will be managed by an entity to be selected by the Future of the Piedmont Foundation. The Foundation as the “owner” of the infrastructure will be responsible for ensuring the MSAP Architecture is open to all credible communications and internet service providers and applications providers.

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Local service providers and service consumers will influence the selection of locations for specific MSAP elements, according to their needs. Some potential sites may include: the Danville downtown area, Danville Regional Medical Center, Averett College, Danville Community College, RCATT, Dan River Business Development Center, Institute for Advanced Learning and Research, and city and county industrial parks and developments. See Addendum 2.

Timing of the buildout and selection of specific sites will be determined during the first and second quarter of 2001. This will be based on one or more of the following: the location of current fiber infrastructure; proposed development of new fiber infrastructure; availability of high unobstructed ground; access to rights of way, availability and access to facilities needed for building the wireless components; and projected demand. Potentially we will provide connectivity to the MSAP to the edge of residential developments and/or neighborhoods. This part of the buildout will be dependent on availability of the developments or neighborhoods that have suitable infrastructure and an internet service provider that is willing to manage the local service. Where internet services are currently provided at sites served, the intention is to enable substantial enhancement of service at commodity prices.

**Project Costs**

*Sources of Funds:*

Tobacco Commission Request $2,000,000

Other Virginia Tech Led Participation:

- Over 2 years “in kind” services, beta-test hardware and software, private sector investment, and negotiated discounts 1,500,000

Total available Funds $3,500,000

*Uses of Funds:*

- Fiber, License Fees and Wireless Infrastructure $1,075,000
- MSAP Related Infrastructure 1,000,000
- Technical & Engineering Development 750,000
- Design and Project Management 450,000
- Network Access (2 years) 225,000

Total Costs $3,500,000

**Summary**

The Dan River Region realizes advanced network technologies are critical to be competitive in attracting and retaining new-economy businesses and to develop and maintain a technologically knowledgeable workforce. For this reason, the region is eager
to move forward leveraging next generation network technologies to propel the region’s economy towards revitalization.

Support from the Tobacco Indemnification and Community Revitalization Commission for the deployment of the MSAP architecture, in conjunction with wireless and other advanced network technologies will provide participating businesses and residents with reliable, commodity priced, high bandwidth, symmetric connectivity. This will be the first important step in empowering the Dan River Region to become significant producers as well as consumers in the information economy. The result will be dramatically increased regional competitiveness, economic vitality and growth.
Letter of Agreement

The Future of the Piedmont Foundation hereby affirms that the monies given to it by the Tobacco Commission will be used specifically for the purposes laid out in the attached application.

The applicant further agrees that it will make quarterly reports to the staff of the Tobacco Commission detailing the expenditures of Tobacco Commission funds, goals that have been reached and the goals for the upcoming quarter.

Read and Agreed to:

Future of the Piedmont Foundation
Addendum 1

Distributed Multimedia Services Access Point (MSAP) for Danville and Pittsylvania County

**Distributed MSAP**: one or more local and/or regional backbone network access nodes interconnected with high-speed backhaul facilities to provide a virtual high capacity access point with high-speed Internet access.

**Design Guidelines**:  
- provide reliable high-speed access to users  
- minimize cost of infrastructure, operation and service  
- use Ethernet and Internet Protocol switch-router infrastructure where possible  
- scale MSAP functionality and capacity as needed  
- use whatever network media is most cost effective (e.g., fiber optic, LMDS, unlicensed wireless, other)  
- distribute MSAPs where cost effective facilities are available--perhaps trading service for space  
- initial access methods include the use of LMDS for local backhaul with UNII band wireless feeding ISM band connections to end users  
- fiber optic backhaul infrastructure should be obtained over time where cost effective to replace wireless that can then be redistributed to the edge of the network  
- create redundant and/or mesh network topologies to maximize reliability  
- support next generation Internet quality of service features and multicast where possible

Virginia Tech, 10/26/00