Creating Competitive Advantage for the Dan River Region

Presented by Virginia Tech’s eCorridors Team

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Presentation Outline

- Introduction
- Overview of the Dan River Project
- Examples of How You can get Involved
- Questions & Answers
Virginia Tech’s eCorridors Program

- Begins here in the Dan River Region
- “e58” is now “eCorridors”
- Other eCorridors projects will be based on Dan River Region model
Objective of eCorridors

- To level the playing field.
- Enhance regional economic vitality.
Virginia Tech’s Role

- Response to request by Future of the Piedmont Foundation
- Serve as a catalyst
- To work to ensure sustainable, long-term benefit
Dan River: Demonstration Project
eCorridors 21st Century Infrastructure Program

Commercial ISPs
Network Services
Telephone Services
Education / Distance Learning Content
Management Services
Entertainment Services
E-Commerce
Multimedia Content

Competitive Advantage

Multimedia Service Access Point (MSAP)

Cable  ATM  LMDS  Fiber  DSL

Education
Entertainment
Communication
E-Commerce

Next Generation Network

MNAP
MSAP
MSAP
MSAP
MSAP
What’s on the horizon for next generation communications and internet technology?

“Narrowband” = 56Kbps Modem

Phone or Cable Company
“Broadband” = 1 – 2 Mbps

Future applications will demand more bandwidth! (voice, data, video ...)

Next Generation = THIS times > 1,000
A Producer Network: next generation broadband internet
Research and Development

I

IV Commodity

A New Competitive Space

III Commercialization

Internet

NSFnet/VERnet

1990’s

Wireless

DmWDM

Next Gen IP

Fiber to Home

II

Large Scale Prototype

DoD R&D, Universities, & Private Sector

Private:
Low Risk, high/early ROI

& Public:
High Risk, low/delayed ROI

Next Generation Internet
A New Industry
eCorridors: Dan River Demonstration Project

- Strategies: Eliminate Barriers to Entry
  - Access to Next Generation Internet Gateways
  - Inter-community Next Generation Optical Links
  - Inter-regional Optical Backbone Links to Tier 1 Network Access Points
  - Incentives to Drive Next Generation Local “1st Mile” Access & Applications
**eCorridors Demonstration Project**

**Dan River Components**

- Inter-Community Next Generation Optical Link
  - (Danville – Chatham)
- Gigabit Gateways
- Multimedia Services Access Points (MSAP)
  - (Danville & Chatham)
- Pilot Projects: Local “1\textsuperscript{st} Mile” access
  - (e.g. LMDS, 802.11a, 802.11b, FTTH, GTTH)
- Inter-regional Backbone Business Plan:
  Dan River Region to National Tier 1 Access Point
Examples of Ways You can Get Involved

- Federal court ruling on state restrictions on municipalities
- Telecommunications sub-committee
- Regional perspective
- Leverage municipal assets
QUESTIONS
Questions to start with

1. What elements of the MSAP will be built where and how much will they cost?
2. Who provides the connectivity from the hub to the home?
3. How is the connectivity delivered fiber, wireless?
4. How can the infrastructure help businesses and attract new business to the area?
5. How can we sustain the competitive advantage provided by advanced network infrastructure?
MSAP Service Model Description

* ASP – Application Service Provider
* ISP – Internet Service Provider

VirginiaLink

Broadband ASP*

Broadband ASP*

Commercial ISP*

Internet2 / NGI

MSAP

Community Broadband Network

Multifamily Residential

Corp Campus / Office Park

Health Care Facility

Commercial / Industrial Site

Local ILEC or CLEC

Home

Home

Home

Business

Home

Home

Home

Business

* ASP – Application Service Provider
* ISP – Internet Service Provider
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
The Next Step: Neighborhood LMDS

Whittemore Hall (Connection to Fiber Network)
An Exploratory Example: e58 Corridor?

Advanced Communications Infrastructure Development
- Fiber along route 58 east to west with access nodes to north-south fiber.
- Ease permitting, right of way, regulatory obstacles.
- Public-private partnership.
- Combined with community infrastructure projects.
- Develop carrier hotel and cable landing.
- Very high benefit/cost for infrastructure development.

Multi-Use Fiber
Network Research
E-58 Economic Development
Commercial Lease / IRU

- Research Node / Carrier Hotel
- North South Fiber Route Interconnect Points
- Community Access Nodes
Geodesic Network Mesh

County X

County Y

County Z
Next Generation Fiber Optics:  
Dense Mode Wave Division Multiplexing  
Adding Lanes with No Construction Delays!

Traditional Approach

VT/CIT - OCx - NIH - OCx - vBNS - OCx - USDA - OCx - Abilene

Fixed bandwidth, daisy chained

New Approach Using WDM or DMWDM

Channels multiply bandwidth  
Add flexibility; security

VT/CIT - NIH - vBNS - USDA - Abilene

Next Generation Internet Exchange  
Bio-Tech Research Network  
Commercial Services Bundle Network
eCorridors Demonstration Project

Dan River Components

- Inter-Community Next Generation Optical Link (Danville – Chatham) - $500,000
- Gigabit Gateways - $100,000
- Multimedia Services Access Points (Danville & Chatham) - $700,000
- Local access (wireless, fiber) infrastructure - $1,300,000
- Business Plan: Dan River Region to Tier 1 Backbone