Cooperative Model for Innovative Open-Access Telecommunications Network in Rural Virginia

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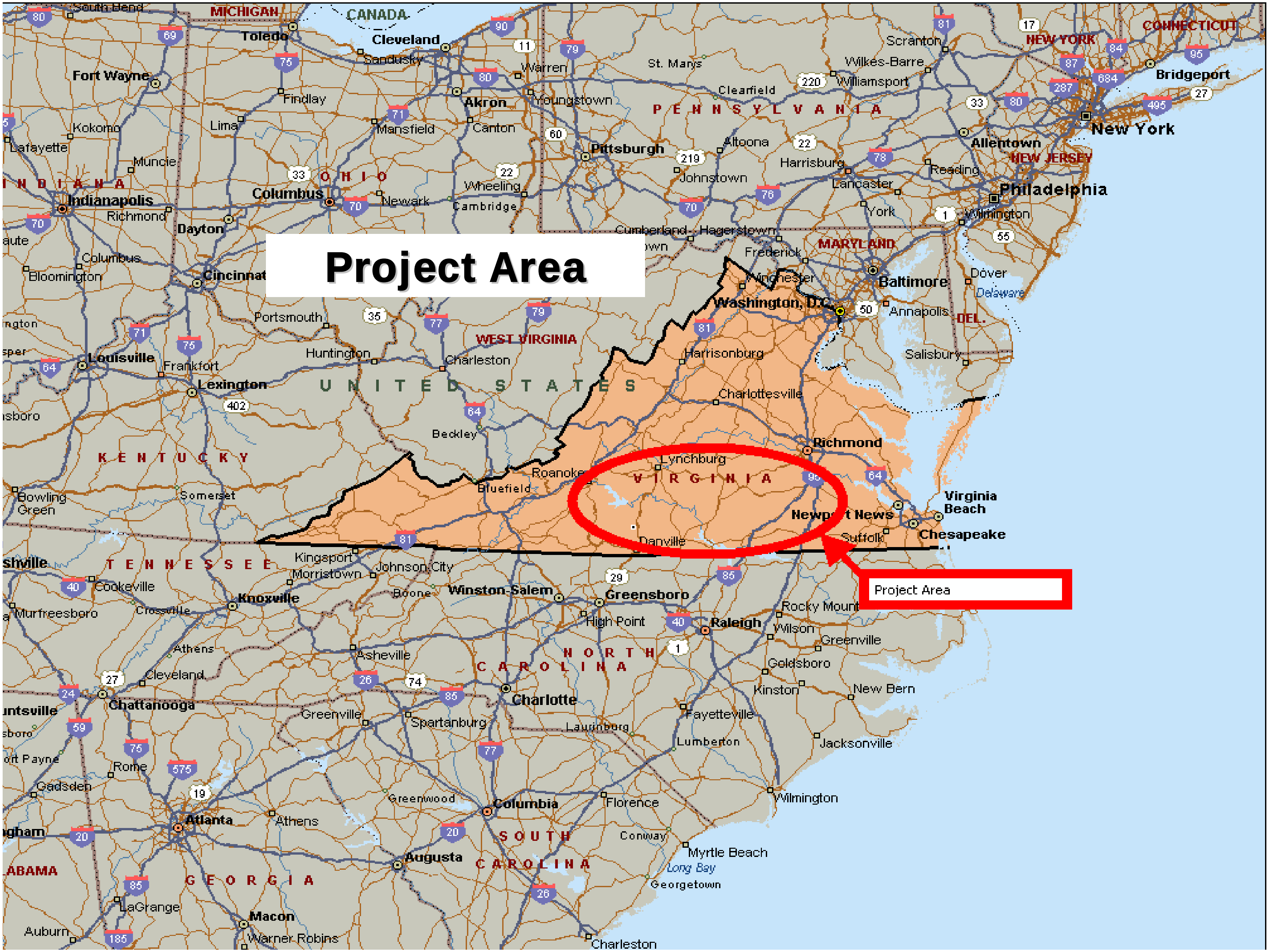
Overview

- Why an Cooperative Open-Access Telecommunications Network was needed in rural Virginia.
- What led to the strategy development, business model and implementation of the network.
- How does the cooperative model work, and what can rural America learn from the success of this model in rural Virginia?



Project Area
Project Area
CANADA
MICHIGAN
I N D I A N A
O H I O
P E N N S Y L V A N I A
NEW YORK
CONNECTICUT
NEW JERSEY
MARYLAND
DEL.
WEST VIRGINIA
U N I T E D S T A T E S
K E N T U C K Y
V I R G I N I A
T E N N E S S E E
N O R T H
C A R O L I N A
S O U T H
C A R O L I N A
G E O R G I A
South Bend
Toledo
Cleveland
Sandusky
Fort Wayne
Findlay
Akron
Warren
Youngstown
Canton
Mansfield
Lima
Kokomo
Lafayette
Muncie
Indianapolis
Richmond
Dayton
Columbus
Newark
Wheeling
Cambridge
Pittsburgh
Altoona
Johnstown
St. Marys
Clearfield
Williamsport
Wilkes-Barre
Scranton
Harrisburg
Lancaster
York
Reading
Allentown
New York
Bridgeport
Philadelphia
Wilmington
Cumberland
Hagerstown
Frederick
Baltimore
Dover
Delaware
Annapolis
Salisbury
Winchester
Washington, D.C.
Harrisonburg
Charlottesville
Richmond
Lynchburg
Roanoke
Bluefield
Danville
Newport News
Virginia Beach
Chesapeake
Suffolk
Cincinnati
Portsmouth
Huntington
Charleston
Beckley
Louisville
Frankfort
Lexington
Bloomington
Somerset
Bowling Green
Kingsport
Johnson City
Morristown
Knoxville
Cookeville
Crossville
Murfreesboro
Boone
Winston-Salem
Greensboro
High Point
Raleigh
Rocky Mount
Wilson
Greenville
Goldsboro
Kinston
New Bern
Fayetteville
Lumberton
Jacksonville
Wilmington
Asheville
Athens
Cleveland
Chattanooga
Charlotte
Laurinburg
Greenville
Spartanburg
Rome
Gadsden
Atlanta
Athens
Greenwood
Columbia
Florence
Conway
Myrtle Beach
Long Bay
Georgetown
Augusta
Macon
Warner Robins
LaGrange
Auburn
Charleston

The Need for Open Access Networks

- **The PROBLEM**: Region in south-central Virginia hit very hard by fundamental shifts in federal policy and the global economy. In early 2000:
  - Tens of thousands of job losses
  - Entire industries/way of life disappearing (Tobacco Farming, Textiles, Furniture, Traditional Industrial Manufacturing)
  - Low education, old skills of workforce
  - No competitive telecommunications carriers
  - Lack of ubiquitous broadband coverage
  - Very expensive telecom services

The Need for Open-Access Networks

- Idea formed in 2000 by Old Dominion Electric Cooperative, funded by EDA and Virginia Tobacco Commission, VT concept of having the Commonwealth of Virginia highways become e-corridors, VDOT rights-of- way
  - Lack of affordable, advanced telecom broadband infrastructure
  - Private sector has to be key player in the project
  - Transform the regional economy by creating a competitive advantage in economic development

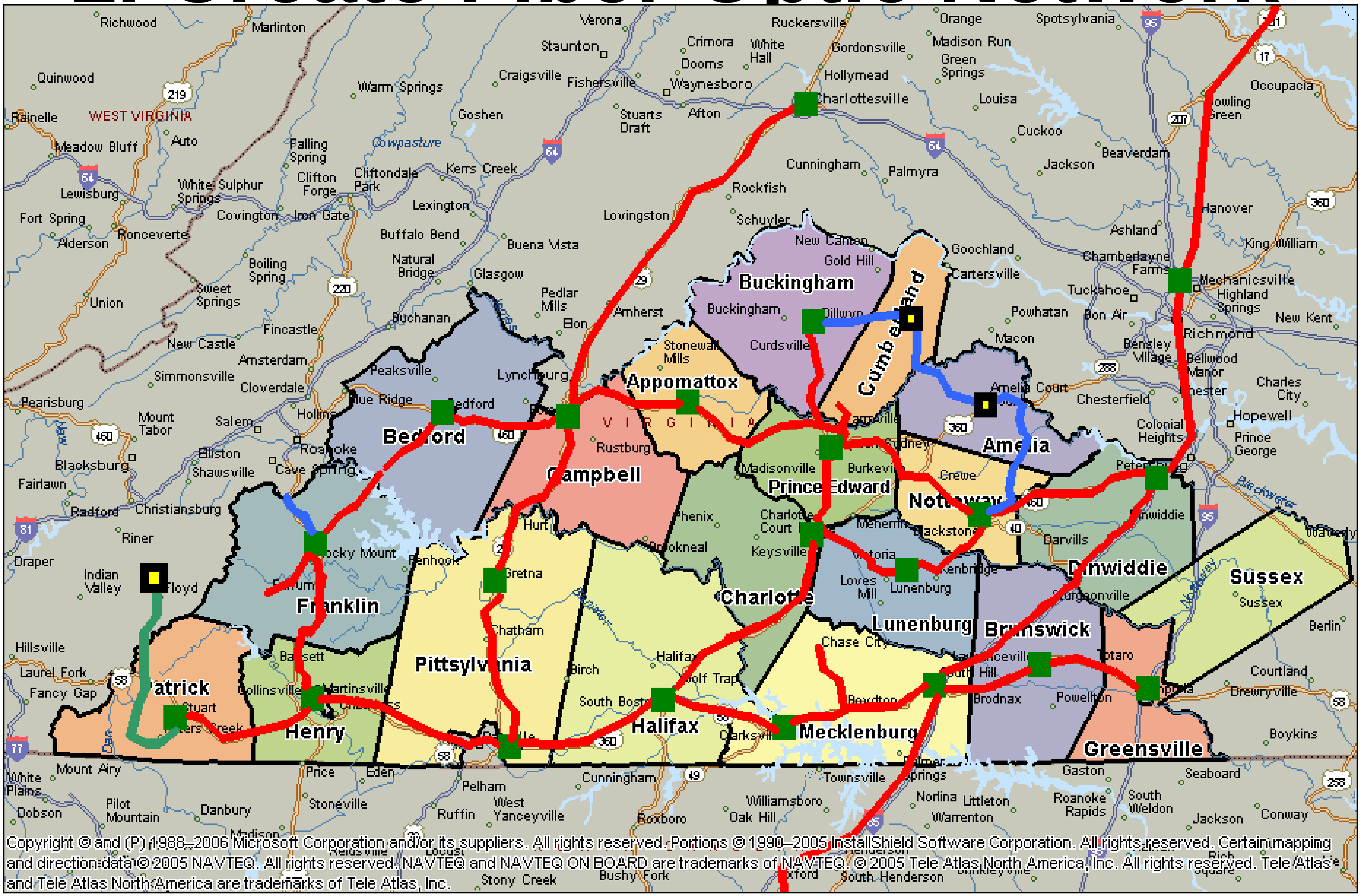
The Need for Open Access Networks

- The **SOLUTION:** Invest in 4 key areas to improve the long term outlook of the region:
  - Build open-access telecommunications infrastructure
  - Build human infrastructure
  - Build conditions for innovation
  - Build regional development capacity

Building Open-Access Telecom Infrastructure

1. Create a world class fiber optic mesh network that spans the entire region, that "…leaves no county behind".
2. Connect the region's fiber optic network to the national and global infrastructure.
3. Create multi-media service access points (MSAP's or POP's) at strategic aggregation points across the region.
4. Deploy optical and wireless technologies for community infrastructure that reflect the best technical and economic choices available.

1. Create Fiber Optic Network



1a Create Fiber Optic Network

- Several Issues to overcome:
  - Political hurdles of 20 counties, 4 cities, 2 towns each with own histories, agendas, ideas, and knowledge of telecom
  - Patchwork networks difficult to manage, harder to integrate
  - Capital and operational cost considerations
  - "It's not the money but **it's the money"**
- Solutions:
  - Cooperative business structure (not for profit) to manage project, oversee construction, insure compatible infrastructure/network connections for each county/city/town
  - Accountable for results to multiple stakeholders – open, equitable, public and visible
  - Grant dollars offset debt service payments – appropriate investment for the public good

1b Create Fiber Optic Network

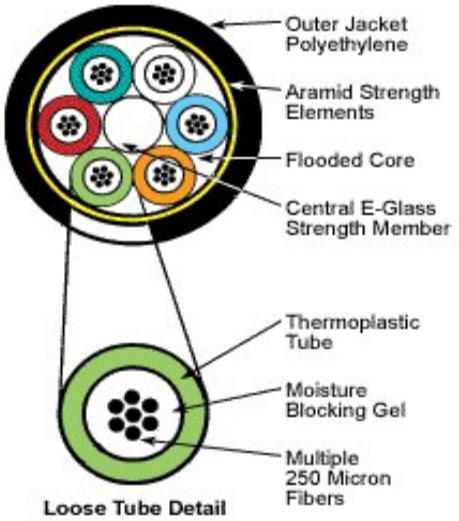
- Design connected 100% of industrial, business, technology parks, incubators (>60)
- Open-Access wholesale fiber optic backbone network that all can use, including the incumbent carriers (Verizon, Quest, Sprint, Embarq, etc.)
- Not just dark fiber, but optical transport services (Layer 1 & 2 in OSI Model)
- Let private sector serve the end user-last mile

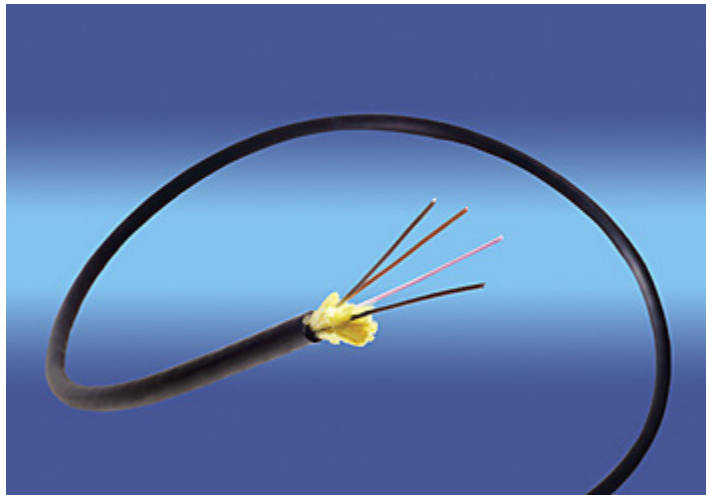
1c Create Fiber Optic Network

- 144 strand fiber backbone (SMF-28E)
- Over 1,100 route KM (120,000 fiber KM)
- 20 MSAP (POP) locations, with OC-48 and OC-192 backbone rings
- Carrier class standards using NORTEL at core
- 12 strands dedicated for “Public Use”
- Private sector use of the network

What's our Fiber Network?

- MBC Installed highly advanced single mode fiber cable (SMF-28E) with Nortel carrier grade electronics
- 24 strands minimum to all industrial parks
- Strands connect to one or two MBC nodes





2. Connect Region to National/Global Telecom Infrastructure

- MBC owns fiber and transport network to Tier1 data locations
- 200Gbps system - Infinera
- Why Equinix?
- 1Gbps of direct internet access from Tier 1 providers
  - $16/Mbps versus $266/Mbps
- Key to attracting new 21st companies to rural Virginia

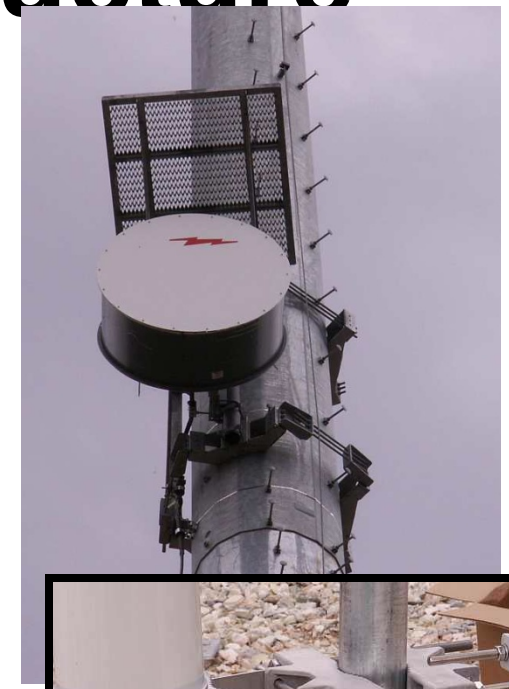
3. Create MSAP's (POP's) in Region

- Access point for communities
- Electronic equipment add/drop
- Co-location for other providers
- Open-Access co-location policy

4. Deploy Optical/Wireless Technologies

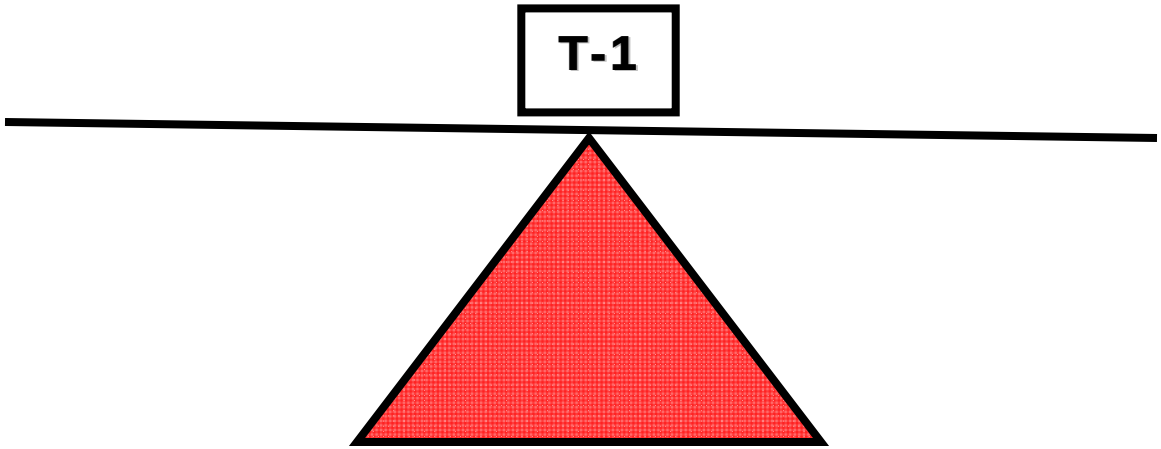
- MBC build “open-access” towers…vertical real estate
- Private sector (cellular companies, wireless ISP’s) co-locate on facilities to reduce costs and improve services
- MBC owned towers creating opportunities for further wireless deployment in region

Enable Last Mile Infrastructure



Appomattox, VA

Problem to Solve?



Dial-up	ISDN	DSL	Cable	Wireless	T-1	T-3	OC-3	OC-12	OC-48	OC-192
54k	128k	768k	1.5MB	2.0MB	1.5mb	45mb	155mb	622mb	2.5gb	10gb

Ethernet Services: 10MB…..10GB

Residential / Small Business **Carriers / Enterprise / Large Users**

MBC Cooperative Open-Access Business Model

- Layer 1 & 2 open-access transport
- Don’t select last-mile winner/losers
- Private sector participation
- Flat rate wholesale pricing model
- Level the playing field for broadband services
- Metro Ethernet, TDM, wavelength services
- Willing to provide dark fiber

How does Cooperative Model Work?

- Telecommunications companies join MBC as a cooperative member
- MBC provides open-access to network, regardless of carrier, needs, or competitive position
- MBC provides optical transport and/or dark fiber to telecom company to expand their reach, lower their cost, or improve their service.
- Telecom company determines their ultimate service to end user retail “customer”
- Members shares in profitability of MBC through Capital Credits

Considerations for Applying MBC Cooperative Open Access Model

- Work closely with private sector telecom providers and local communities on where infrastructure builds would do the most good
- Encourage private sector participation
- Single entity for ownership and management of the network
- Wholesale only, provides more opportunity for retail service providers

Results to Date

- Mid-Atlantic Broadband Cooperative members, include the Institute for Advanced Learning and Research (Virginia Tech), the New College Institute and the Southern Virginia Higher Education Center, actively support a broad variety of distance learning programs in cooperation with community colleges throughout Southern Virginia.
- MBC members are implementing telemedicine connectivity at multiple clinics and hospital facilities throughout Southern Virginia. This opportunity was made possible through a FCC award to the University of Virginia-Telehealth Center with matching funds provided by the Virginia Tobacco Commission.
- MBC enables members to expand the reach of advanced affordable broadband to residential and small businesses throughout Southern Virginia.
- The Virginia Tobacco Commission has provided and continues to finance interconnect regional broadband networks to provide seamless connectivity through rural Southwestern and South-central Virginia.
- Broke even January 2008,, stimulated both 700+ jobs (most above the prevalent wage) and $800 million investment in the Virginia Tobacco Commission footprint, now a recruiting tool for Virginia Economic Development Partnership in rural and working 4 mega projects today.

THE BEGINNING…