



Convergence The Future of Community Technology and Telecommunications

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+ People and places

- ▶ Haysi, Virginia -- pop. 432. 2 mile fiber backbone within the community
- ▶ Damascus, VA -- pop. 700. Transformed local economy with one used computer and dial up modem
- ▶ Independence, VA -- pop. 2000. 2 mile blown fiber backbone down the main road
- ▶ Derek -- Nova Scotia woodworker who turned a marginal business into a profitable international enterprise
- ▶ Haines Junction, Yukon -- Put quality first

**“I love my email,
and I hate my
computer.”**

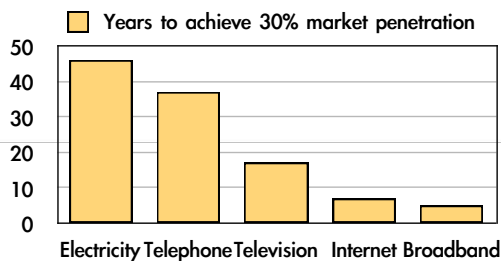
**Most common remark in
Blacksburg in the late
nineties.**

**Technology has the
capacity to get people
out of their homes and to
become more involved in
the community.**



+ What we have learned

- Nobody cares about the technology except geeks
 - What matters is what people do with the technology to make their own lives, their business, or the life of the community better
- Technology services should be agenda free
 - Technology and telecom should be provided as a service to the community, not subjugated to a specific social service goal
 - Individual groups use technology to pursue community needs or deliver social services
- Training and education needs have not diminished
- Without community technology and media services, the community has no space in cyberspace--no voice or representation



About the BEV

First community technology project based entirely on Internet technology (1993)

First community to offer residential broadband (1994)

First community to offer broadband in the public library (1994)

First community to have broadband to every school and every classroom (1994, 1996)

First community to offer broadband to businesses as an amenity (1994)

Widely hailed as "most wired community in the world" (1998, 1999)

The iPod Generation



▶ iPod Generation Trends

- ▶ Much younger than the average Internet user
- ▶ They read *Wired* magazine
- ▶ Favorite car is a Volkswagen
- ▶ Prefer hard cider to beer or wine
- ▶ A favorite TV channel is BBC America

iPod Facts

Apple sells more than a million songs a day from the iTunes Music Store (iTMS)

More than 14% of all Internet users worldwide have been to iTMS

iTMS is the fastest growing site on the Internet

Apple sold 100 iPods/minute in December, 2005 (for the ENTIRE month)

iPods have 83% of the U.S. portable music player market

iPod video downloads are increasing the ratings of broadcast TV shows

No one predicted this!

Channels are dead

The *Barbecue Channel* is one of DaveTV's most popular offerings

- The traditional meaning of a “channel” is now *meaningless*
- A channel now refers to a particular kind of content, rather than frequency spectrum
- Television and radio are no longer limited by frequency spectrum
- More content can be delivered to smaller, more varied audience groups--markets are not geographic anymore
- IP TV is growing rapidly, with potentially millions of new content producers
- Google, DaveTV, DTV, Growing Digital and many others are offering thousands of “channels”
 - Growing Digital is a community Webcasting project staffed by middle school kids who Webcast community events, including highly popular local football games



Every community can have its own series of “channels,” providing multimedia to local residents and to the world

Why we need faster pipes

Where most of North America is now

Where many other countries are now

Content	Size	Dialup 28 K	DSL/cable modem (512k typical)	T1 (1.5 megabits)	T3/DS3 (45 megabits)	Gigabit Ethernet (1 gig/sec)
Test (one email)	2 K	.7 s	.039 s	.013 s	.00044 s	.00002 s
640x480 picture	92 K	32.9 s	1.8 s	.61 s	.02 s	.00092 s
30 minutes of video 1/4 screen 320x240	67 meg	6h 39m	21m 49s	7m 27s	4.9 s	.67 s
30 minutes of video full screen 640x480	269 meg	26h 41m	1h 28m	29m 53s	59.8 s	2.69 s
30 minutes of video high definition 1920x1080	3.63 gig	360h 7m	19h 42m	6h 43m	13m 26s	36.6 s

It's not about the technology

- The fiber vs. wireless debate is vendor driven
- Content will drive hardware choices, despite the vendors
- Vendors want to sell equipment
- People want to buy content
- Any content can now be delivered over a broadband connection--radio, TV, movies, music

It's not a choice between fiber OR wireless
--it's both--
fiber AND wireless

We will want and have both

***We will have capable wireless devices that can access any kind of content:
music, video, voice, text, Web pages***

We will have fiber connections in our homes and businesses for videoconferencing and HD TV

The future is configurable 10GigE lightpaths--dozens of lightpaths to every home and business

What is broadband?

The Media-rich Community

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- ▶ 100-155 megabits/second of sustained throughput—let's just call it GigE to the home
- ▶ Three channels of HDTV (15-20 megabits/channel)
- ▶ PacketFront neighborhood equipment designed for 3 HD channels per household
- ▶ Voice telephone (multiple lines)
- ▶ Radio
- ▶ Music and video downloads
- ▶ Web surfing
- ▶ Outgoing data--business servers, video streaming, videoconferencing
- ▶ Other countries well ahead of the United States
 - ▶ Korea's target is 155 megabits to the home
 - ▶ 100 megabit fiber is \$60/month in Japan



Abundant, inexpensive services from many providers

Massive connection to the rest of the world

Community media utility helps create and support rich local content

Businesses use broadband to reach new markets and create jobs

A knowledgeable and engaged citizenry

A wide variety of devices, including video monitors, distributed audio systems, converged media centers (computers), PDAs, wireless handheld phones, and tablet computing devices

What has changed?

Where we want to be

Distributed ownership of infrastructure protects the community

	Manufacturing Economy		Knowledge Economy
	Telephone	Cable TV	Varied
Infrastructure	Monopoly control of twisted pair cable to the home or business	Monopoly control of the coaxial copper cable to the home	Multiple delivery systems: copper, fiber cable, wireless, and satellite. No inherent monopoly control.
Access	Monopoly control of the connection to the Telephone Network (PSTN)	Monopoly control of the connection to the cable head end	Open access network provides multiple vendors for an IP address and bandwidth.
Services	Monopoly control of dial tone – the ability to make a telephone call	Monopoly control of the TV signal–ability to watch a TV channel	Choice of service vendors for VoIP, video, audio, Web site hosting, etc.

Convergence of community technology

- Community networks (CNs)
 - Services like email, Web hosting, community portals, training, sometimes included a CTC/CAP site
- CTCs and CAPs
 - Focus on public access, often some CN services
- Independent community media
 - Focus on community broadcasting, typically TV, radio, the Web
- Public TV and radio (regional)
- Community access TV (larger communities)
- Community broadband infrastructure

All these organizations compete for staff, leadership, funds, volunteers, and content

The Community Media Utility

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- The primary service is the delivery of data packets anywhere in the community
- Community owned and managed infrastructure
 - Most efficient as a regional organization
- Some community-provided services for government, schools, civic, and personal use
 - Email, Web hosting, audio and video streaming
 - Production facilities for media, workstations, training classroom, videoconferencing facility
 - Training and education, meeting spaces, classrooms
- Many services delivered by the private sector
 - “Television”, some telephony, gaming, entertainment of all kinds
- +
- Business services, security, network backups, etc. +

We need a single organization that can deliver packets of photons or electrons anywhere in the community

We don't care what is in those packets or where they originated

One Cleveland, a converged community technology organization, increased Adelphia's commercial broadband business 60% in one year

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The Community Media Utility



The CMU gives every person and organization in the community a voice in cyberspace

- ▶ Information aggregator and editor, with substantial local content
- ▶ Vested in the community; mission supported by sponsors but not set by sponsors
- ▶ Guardian of the community's privacy by providing a wide range of online services that do not require giving away personal information
 - ▶ Provides services for youth groups and kids
- ▶ Provides a community commons that facilitates conversations
- ▶ No more passive "viewers"....instead, each user is a viewer/producer/listener/speaker/reader/author--often simultaneously

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CMU Services

- + +
- Video and audio delivery services
- Community Web portals with community calendar, news, and information
- Online discussion forums for community conversations
- Web hosting and email services for nonprofits and community groups
- Family friendly chat server, blogs, photo albums, family Web sites
- Community historybase
- Social service and healthcare information--health providers, wellness information, links
- + +

Local/Regional CMU Facilities

Network center that provides a connection to the communitywide networks

Publishing center that archives and delivers content on demand

Production center where video, audio, music, news, and other content is created and edited

Training facility for workshops and classes delivered to the community

Offices for management and administration

AV meeting rooms with videoconferencing facilities for internal and community use

Small performance arena/auditorium for live performances, meetings

Public atrium area with coffee service and WiFi for casual meetings and as a social gathering place for conversations



+ Broadband is essential public infrastructure +

A “Common Good” test for infrastructure

	20th Century Roads	21st Century Digital Roads
Equal access	Paved roads gave everyone in the community increased mobility and allowed them to work farther from home.	Broadband is an essential 21st century utility that is needed by all for work, personal, and civic use.
Economic opportunity	Communities without good roads were at an economic disadvantage.	Broadband directly affects jobs creation and economic development.
Quality of life	Paved roads made life easier. Citizens and businesspeople spent less time traveling, and could get around the community more easily.	Broadband directly affects quality of life by improving network access and increased access to services. Broadband increases alternative work and lifestyle options.
Scarce resource	Roads use valuable real estate. The community manages roads to ensure the best use of land.	Broadband directly affects community rights of way. Communities have a limited amount of right of way, and it must be managed carefully.
Duplication of systems	A single road system used by businesses, government, and citizens is less expensive than making businesses build their own roads.	Community investments reduce the cost of services, reduces wear and tear on roads and landscaping caused by overbuilding.

Current broadband policy is like asking Fedex, UPS, and Airborne to each build their own roads to customers

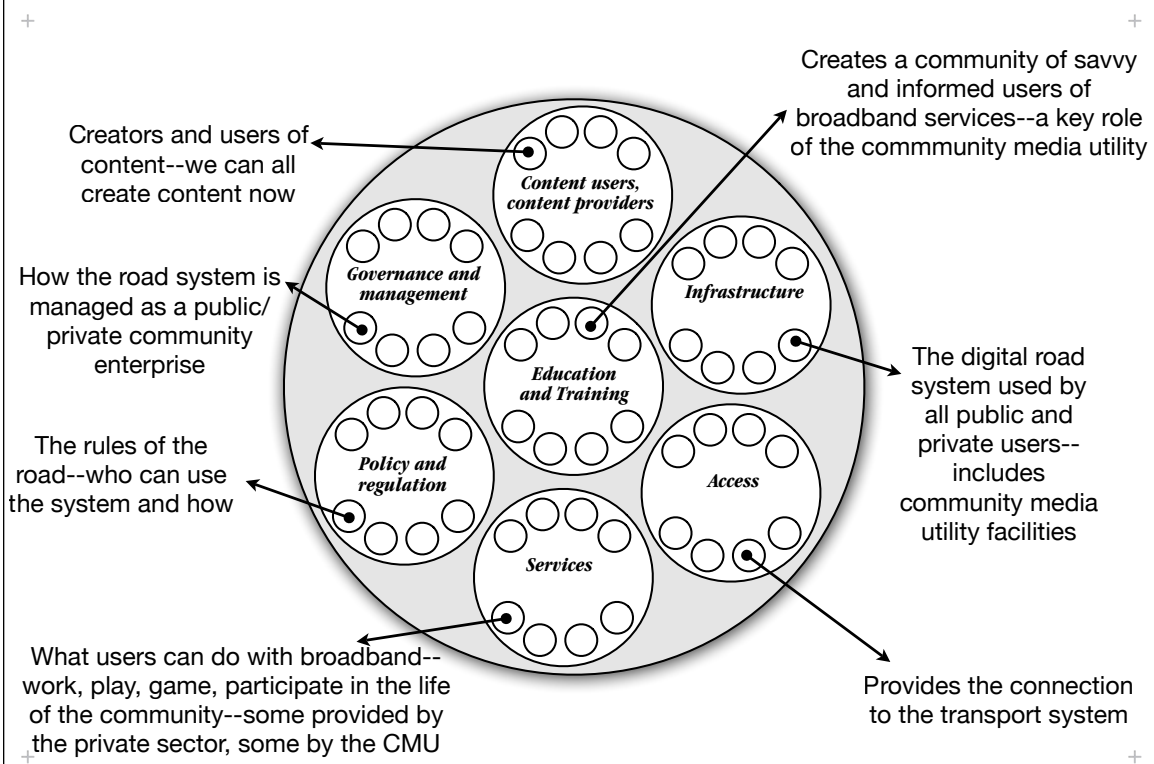
Broadband is just like roads

	Roads	Broadband
		
History	Roads originally built by the private sector	Telecom originally built by the private sector
Infrastructure	Roads built for the common good of all in the community, including businesses	Digital roads built for the common good of all in the community, including businesses
Access	Access to the road system provided by property owners and developers	Access to the digital road system provided by property owners and developers
Services	Government maintains roads, but does not own the businesses that use roads	Government maintains digital roads, but does not own the businesses that use digital roads
Fees	There are no "road connection" fees. Anyone can use roads. Fees are proportional to use.	Broadband connections are free. Fees for services pay for use of the digital road.

Broadband Step by Step

	Communitywide Broadband	Office Building	Water or Sewer Project ¹⁶
Project Manager Type	Telecommunications architect	Building architect	Civil engineer
Phase One	Develop Telecom Master Plan	Develop schematic design for the building	Do initial system study and plan
Phase Two	Review plan, set initial projects, set funding, create business plan	Review building design, adjust plan to meet budget	Review plan, select system design, set cost and fees
Phase Three	Write RFP for project(s), solicit bids, select qualified firm	Write RFP for project(s), solicit bids, select qualified firm	Write RFP for project(s), solicit bids, select qualified firm
Phase Four	Telecom architect supervises construction, service providers identified and qualified	Building architect supervises construction, tenants are identified and leases signed	Civil engineer supervises construction, customers are signed up as service passes by
Phase Five	Digital road system is complete. Service providers begin selling services, fees pay for management, expansion, debt.	Building is complete. Tenants move in and lease fees pay for management, maintenance, and debt.	System is complete. Customers are hooked up to the service, user fees pay for management, maintenance, and debt.

Elements of a Broadband Plan



Which came first?

+ ...the chicken?



+ ...or the egg?



If you have to choose between massive

intra-community
connections or massive
inter-community

connections, the choice is easy:

Jack the whole community into the fastest intra-community digital road system you can afford, with a design that can expand continuously all the way to 10 Gig lightpaths

The CMU creates markets that attract private investment.

A big connection to the community has nothing to connect to, and goes unused. Massive connections within the community will pull the big connection to the community.

+ World Class Quality

- Rural communities have an opportunity to finally level the playing field
- Quality of life is attracting entrepreneurs and small business people
- Affordable broadband is critical
- Identify community needs and vision first
- Identify the competition correctly
 - Hint--it's not the community down the road
- Don't let the budget limit imagination or aspirations
- **Boldness and vision always beat money**

Haines Junction, YT has a world class community center and performing arts venue



+ Storytelling +

- ▶ We all have stories to tell
 - ▶ About ourselves
 - ▶ About our businesses
 - ▶ About our interests and our passions
 - ▶ About our community
- ▶ The community media utility creates a community commons where people can come together to both listen to and tell stories
- ▶ We are on the verge of a golden age of community media--where content is unbounded and unrestricted by physics



Technology news and information:
www.designine.com/news/

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Benefits

- The Technology Master Plan (TMP) is a valuable marketing tool to attract businesses to the region
- The TMP provides direction for both public and private technology and telecommunications investments
- The TMP saves money for local government and the private sector by identifying opportunities to aggregate broadband expenditures
- The TMP assists with business retention and expansion
- The TMP helps to make the community and region more competitive in the global Knowledge Economy

Deliverables

- Handouts for all meetings
- Multiple draft versions of the Master Plan
- Final printed and bound version of the Master Plan
- Executive Summary suitable for wide distribution
- Presentation slide show (PDF format) of key points in the plan
- Next Steps checklist of follow-on activities
- Online mailing list used during development of the plan
- Interactive Web site provided during the planning process

Design Nine acts as a technology-neutral advisor for your community. We help your community task force develop a technology master plan that can be fully integrated with other community planning efforts.

Our decades of experience in the computer and telecommunications industries enables us to provide high quality technology expertise.

We work for the community, not for vendors, so our goal is to identify technology strategies and investments that meet community needs, not vendor sales goals



Supported Activities

Public meetings to explain the need for broadband

Clear, simple, and understandable explanations of key telecommunications concepts

Master plan work sessions with the task force

Extensive written material provided every step of the way

Meetings with local businesses and elected officials to discuss economic development potential

Identification of telecom impact on rights of way and land use

