Examples of Current Approaches to Rural Broadband Deployment

(As published in the Rural Futures Magazine)

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Note: All rural broadband deployment items on the pages to follow have been included in the Rural Resource Commission's news magazine, Rural Futures, over the past three years, listed in chronological order as they appeared. Readers are encouraged to contact the Commission with examples of current approaches they know about.

NYS Legislative and Budget Initiatives

Current Approaches to Rural Broadband Deployment

NYS Legislative and Budget Initiaves

Rural Customer Access to Advanced Telecommunication Services

(Chapter 132, Laws of 2002)

Sponsored by the NYS Legislative Commission on Rural Resources

February 2003. The NYS Department of Public Service published the *Study of Rural Customer Access to Advanced Telecommunication Services* in compliance with the above legislation sponsored by the NYS Legislative Commission on Rural Resources.

Rural Broadband Bill

(Chapter 295, Laws of 2006)

Sponsored by the NYS Legislative Commission on Rural Resources

The measure directs the Empire State Development Corporation in consultation with the State Office of Technology, and other agencies and private industry to develop recommendations which include the utilization and expansion of Federal, state and local programs and capacities, and private sector deployments.

May 2007. The Empire State Development (ESD) issued *Policy Alternatives Supporting Deployment of Broadband Services in Rural Areas of New York State* in compliance with the above legislation sponsored by the NYS Legislative Commission on Rural Resources. Download from http://www.senate.state.ny.us/SenateReports or ESD at http://www.nylovesbiz.com/pdf/broadband.pdf.

2007-2008 State Budget Item

A new state competitive grant program for communities and organizations seeking to develop high-speed Internet access in currently underserved areas was established in 2007-2008, with a budget of $5 million. Nine projects were awarded grants in March 2008.

What communities in New York state are doing???

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What rural communities in New York state are doing...

- Delaware County, nestled within the Catskill Mountains, is leading the way in providing information technology in a rural region. With help from the Appalachian Regional Commission (ARC) and other partners, they created the Delhi CyberCommunity, a network providing wireless broadband Internet access to a number of local public and nonprofit agencies. A grant from ARC covered installation costs and network access. Motorola donated access points to create its Canopy system network. The Center for Appalachian Network Access, based at Carnegie Mellon University's School of Computer Science in Pittsburgh, donated additional access points to permit 360-degree coverage. Microsoft donated $25,000 in software for use by participating agencies. SUNY Delhi faculty and staff oversaw the project, and students majoring in electrical construction did the actual installation of access points on the college roof and at user sites. This project was a true public-private partnership. To build the CyberCommunity network, technicians mounted a half-dozen radio communication network access points on the roof of the tallest building in Delaware County (a seven-story tower located high on the hillside campus of SUNY Delhi). Each access point can send and receive radio signals to any point on the compass within about three miles, covering the small valley. In February 2007, the Delaware County eCenter opened, supported by a grant from ARC. The eCenter includes a business incubator with room for six or more small firms, a computer lab open to the community, and office space for the Delaware County Chamber of Commerce, which will manage the facility. The eCenter has two tenants. One is IndiePay, a New York City–based company that provides payroll services to film production companies. The other is the Learning Lab, which provides tutoring for students of high school age and younger, both face-to-face and online. The new eCenter will also house a water quality testing laboratory, the first project to be established under the umbrella of the Center of Excellence in Watershed Applications and Technology-Based Economic Revitalization, a joint partnership between SUNY Delhi and the SUNY College of Environmental Science and Forestry at Syracuse. The lab, which will meet the certification standards of the NYS Department of Health under the Environmental Laboratory Accreditation Program, will provide water testing facilities that are currently not available locally. O'Connor Hospital, a 23-bed hospital on a hillside facing the SUNY Delhi campus, has benefitted from the network as well. The hospital uses laptops with wireless network cards installed, to give patients the ability to check their email from their bedsides. Learn more at http://www.dcecenter.com/.

- New Visions Powerline Communications, a start-up company in Central New York deploys high-speed Internet access with a plug-in methodology to electrical outlets in homes, businesses, schools. New Vision was awarded $1.3 million in 2008 from the state to develop Internet service for Onondaga County's western suburbs. The state grant will help the company develop its broadband-over-power-line (BPL) Internet service in Westvale, Fairmount, Camillus and Geddes; and expand its service in Solvay, where it began in 2006. Broadband over power line, or BPL, works by using existing electric wires to deliver Internet data to homes and businesses. New Visions leases pole space from utilities and has partnered with the village of Solvay's municipal electric system and National Grid for the project. Solvay was the first utility in the state to attempt widespread deployment of BPL. To use the service, customers simply plug a computer modem into an electrical outlet. Advocates of the technology say they hope it will eventually compete with phone and cable systems as a third major provider of Internet access. New Visions hopes to reach as many as 12,600 homes in the western suburbs with the technology. Learn more at http://www.nvplc.com/.

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- The Federal Communications Commission (FCC), under the Rural Health Care Pilot Program (RHCPP), awarded more than $15 million in early 2008 to expand broadband healthcare access in rural New York. The four projects are listed below:

    1. In northeastern New York, the Adirondack-Champlain Telemedicine Information Network was awarded $7,648,304 (2008 FCC grant). The group has developed a new fiber optic telemedicine network, connected to Internet2, which will join approximately eight health care facilities. The new network will enable real-time consultations, sharing of medical image files, and distance education.

    2. In northern New York, the North Country Telemedicine Project was awarded $1,984,998 (2008 FCC grant). The project will connect approximately 30 health care facilities in a poor, sparsely populated region of northern New York to an existing regional fiber ring and Internet2 at speeds ranging from 10 to 100 Mbps. Services will include telecardiology, teleradiology, and psychiatry through video conferencing, research and education. The network will also serve Fort Drum, which currently lacks a healthcare facility.

    3. In Western New York, the Western New York Rural Area Health Education Center (WNY R-AHEC) Network was awarded $5,981,450 (2008 FCC grant). The moneys will be used to expand the Western New York Rural Broadband Healthcare Network, connecting about 40 facilities using advanced communications technology to specialty physicians and critical lifesaving treatments at modern, urban medical centers. Connections are to Internet2 at 1 Gbps and the backbone at 2 Gbps.

    4. Northeast HealthNet was awarded $1,700,340 (2008 FCC grant). The network will facilitate real-time information sharing between approximately 38 mostly rural healthcare facilities and specialists in Pennsylvania, western New York, and the Adirondacks, to provide remote diagnosis, treatment and education of patients, and wellness initiatives. Many mobile dental units in Orleans County were included; as well as several health practices in Allegany, Chautauqua, Essex, Franklin, Monroe, Orleans, and Wyoming.

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- Governor Spitzer created the NYS Council for Universal Broadband administered by the State Office of Technology in December 07. The Council is charged with developing strategies for ensuring every New Yorker has access to affordable, high-speed Internet service.

- ***Open Access Telecom Network (OATN***): The Development Authority of the North Country (DANC) is a public benefit corporation, created in 1985 to address the infrastructure and community development needs for the Counties of Jefferson, Lewis and St. Lawrence Counties. DANC developed an Open Access Telecom Network (OATN), which began operation in 2004. This network includes 450 miles of fiber optic cable, across the three county region and down to Syracuse (Onondaga County). The OATN is a wholesale network, providing telecom transport services to public and private network operators. The network is regulated by the Public Service Commission and the Federal Communications Commission. DANC is financially self-sufficient and functions as a revenue-based utility. The network was created through extensive public-private cooperation between the Authority and telecommunication firms. Financing for the network was a combination of state and federal grants and private debt financing. DANC is promoting wireless broadband services in smaller communities around the OATN service area; working to create a telemedicine network throughout the region; and extending the OATN into commercial and industrial parks in the North Country. Learn more at http://www.danc.org/.

- ***Wireless Internet Networks on the Rise in Upstate New York***: RidgeviewTel, a Colorado-based company, is primarily focused on rural broadband communications. The company recently began providing wireless Internet service in rural pockets in Lewis and Jefferson Counties. RidgeviewTel plans to continue its expansion into surrounding towns in the North Country. The company utilizes the Development Authority of the North Country's (DANC) fiber-optic line. The monthly cost for wireless Internet service through RidgeviewTel ranges from $29.99 to $59.99, with a one-time $30 activation fee. Learn more at http://www.ridgeviewtel.com/. Also, Premier Wireless of Canton (St. Lawrence County) continues to expand its wireless network in St. Lawrence and Jefferson counties. Learn more at http://www.premierwireless.us/.

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What rural communities in New York state are doing...

- ***Mid-Hudson, New York:*** Everyone knows that high speed broadband access has become required infrastructure in order for economic development to take place. And in most rural areas, Internet access is still limited to inferior dial-up connections or expensive satellite connections. But about 25,000 people in Greene, Columbia and southern Albany counties, are about to get lucky! Mid-Hudson Cablevision Inc. is undergoing a $5.3 million upgrade and expansion of its Internet, telephone and cable television infrastructure. The improvements were funded by a US Department of Agriculture (USDA) Rural Broadband Access loan program. *Note: The company was the first in the state to be approved under the USDA's loan program.* For information ont he Rural Broadband Access loan program, visit http://www.usda.gov/rus/telecom/broadband.htm. You may also contact the Broadband Division at (202)690-4673.

- ***Adirondack-Champlain Community Broadband Network***. A broad-based, grassroots, public-private community partnership has formed to bring a digital communications infrastructure to the rural region of the eastern Adirondack-Lake Champlain region of Clinton, Essex, and Franklin counties. The Community Broadband Network (CBN) is coordinated by a community Board, SUNY Plattsburgh, and the Research Foundation of SUNY. Federal moneys have been secured in the 2006 Federal budget to fund market demand research, the business model, a business plan, and the network design concept. The US Economic Development Administration has also invited a grant application to fund 50% of the $500,000 network design cost. The goal is to provide affordable broadband throughout the three counties including a telemedicine network; a distance education network that connects all public and private K-12, community college, and four year institutions throughout the region; abundant bandwidth to all industrial parks in the region; a network interconnecting all the libraries in the three counties; and more. Construction of a 500-mile system is planned in three years at an estimated cost of $20 million. Current providers, because of the capital investment required, are not meeting such needs. Track CBN's progress at http://www.plattsburgh.edu/offices/centers/tac/cbn.php.

- ***Fulton County considers countywide wireless service.*** Frontier telephone company is considering the installation of wireless Internet technology throughout Fulton County. The company wants to bring an urban amenity to a rural area — making the county more attractive to the younger, technologically savvy set. The project is in its exploratory stage — discussing the possibility with community, education, government, and business leaders.

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- ***Rural Greene County Expands Broadband Wireless Internet Coverage.*** NYAir, a division of high-speed Internet service provider Surferz.net, Inc., based in Greenville, has been awarded a $87,138 Quantum Fund loan from the Greene County Legislature to help expand broadband wireless Internet coverage in underserved areas of the county. The loan requires a 50% match with private funds and creation of at least four new jobs. NYAir will use the loan during the next six months to invest in new equipment, electronics and inventory to install eight new towers and antennas that will close gaps in its existing coverage areas. The company is taking special care to protect the aesthetics of the beautiful Catskills — keeping towers out of open spaces and blending them in with the natural landscape. Service fees are expected to be affordable with installation fees ranging from $50 to $200 and monthly service from $20-$35. Greene County is lucky to be home to a number of other Internet providers — State Telephone provides dial-up and DSL service and is creating new Wi-Fi hot spots in the county; Mid-Hudson Cable recently embarked on a major expansion of its cable service with the help of funding from the USDA Rural Development program; and Hudson Valley DataNet, which got its start in Orange County, is the newest company to offer high-speed fiber-optic line service in Greene County. For more information, contact Greene County Planning and Economic Development at (518) 719-3290 or visit www.greeneeconomicdevelopment.com.

- In an effort to combat segmented telecommunications in the region, the ***County of Ontario*** recently established a not-for-profit Local Development Corporation (LDC) charged with building a regional open access fiber optic ring connecting all municipalities, healthcare, police, fire, education, research facilities, and critical businesses locations county-wide. The LDC will use private sector contracts to build, operate and maintain the infrastructure and the fiber will be open to all businesses for lease. The ring will also connect to fiber infrastructure in Monroe and Seneca Counties, with fiber connectivity options into Yates, Livingston, Steuben and Wayne Counties in the future. The county anticipates the $7.2 million project will take two years to build, with an estimated completion date of December 2008.
- In ***Genesee County***, a telecommunications infrastructure study is underway to level the telecommunications playing field. Investment in fiber and wireless infrastructure and digital technologies will be encouraged in an effort to offer more competitively priced services throughout the county.

- In ***Suffolk County***, New York, a business plan is in the works, to create a government-sponsored wireless network to serve 1.5 million residents, businesses, and visitors. The network would benefit the county by providing speedy transmission of information to emergency responders, filling in service gaps for local businesses, attracting tourists, and giving local residents more flexibility. The County hopes to begin the project next spring.

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- One promising option for rural areas is broadband over power lines (BPL). BPL is a wireline method of communication that uses the existing electric power transmission and electricity distribution lines. And, since electric lines reach most homes and businesses, the new technology could make it easier for rural areas across the state to access high-speed Internet services. In New York, broadband over power lines (BPL) is still in its infancy stages. A pilot BPL project has been underway in Briarcliff Manor in suburban ***Westchester County***, as well as parts of Manhattan and ***Orange County*** for several years. Ambient Corporation, along with Consolidated Edison, and the New York State Energy Research and Development Authority (NYSERDA), recently enhanced the project. Entitled the Advanced Grid Management Phase, the project will increase the reliability and the efficient management of the utility's local distribution systems. NYSERDA will be funding up to $200,000 of the project. Learn about energy smart programs at **www.nyserda.org** or 1-866-NYSERDA. Visit the Consolidated Edison, Inc. Web site at **www.coned.com**. Learn more about the Ambient Corporation at **www.ambientcorp.com**. In addition, the Public Service Commission (NYS PSC) is using the Ambient pilot to establish the framework for potential use of BPL technology by regulated utilities throughout New York state. The PSC is proceeding cautiously with the use of BPL technology. Safety and potential interference with other systems are two of the primary questions involved in deploying the technology within the state's extensive grid of overhead and underground distribution facilities. In Central New York, New Visions Powerline Communications, a Syracuse (Onondaga County) startup, has deployed BPL technology in Solvay (Onondaga County). New Visions brings High-Speed Internet access to every electrical outlet in homes, businesses, schools — anywhere you can plug in your computer for $28.95 a month. Call New Visions Powerline Communications at 315-472-6300 or visit their web site at http://www.nvplc.com. A BPL test deployment in Penn Yan (Yates County), managed by Data Ventures, was discontinued in June 2005. The rural Finger Lakes community of some 5000 residents considered various proposals with Data Ventures (DVI) to offer broadband service. The village continues to work with DVI to employ wireless mesh "WiFi" technology instead of BPL.

- ***Margaretville Telephone Co., Inc. (MTC),*** an independent rural exchange carrier (LEC) serving 4500 access lines in a 200 square mile area in the ***Central Catskill*** region offers broadband services via DSL, cable modem, and fixed wireless. MTC has been a family-controlled business for over five generations since its inception in 1916. Thirty percent of the company is owned by an employee stock ownership plan formed in 1985. It is currently operating fixed wireless services using both PCS spectrum and unlicensed devices.

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- The ***city of Utica in rural Oneida County*** is breaking ground with city-provided wireless Internet access; joining a small, but growing number of cities nationwide, that view wireless Internet networks as an essential piece of modern infrastructure. Small businesses, like restaurants and coffee shops, are excited about the prospects of patrons armed with laptops visiting their places throughout the day. Joe McCoy, president and chief executive officer of WavHost, an Internet service provider in Frankfort (Herkimer County), helped develop the network pro bono, and the city partnered with SUNYIT graduate students looking for real-world experience. The city government will own the network, but SUNY Institute of Technology at Utica/Rome will host the Web server (SUNYIT students will maintain it). Total start-up costs were between $15,000 and $20,000. The city is still working to determine what to charge users beyond the free daily hour. Officials expect to offer several packages, with the revenues helping to pay for upkeep.

- The ***village of Frankfort*** began offering a community-wide wireless Internet access network last summer with the help of WavHost, an Internet service provider in Frankfort (Herkimer County). Subscription costs are $29.99 per month under a one-year contract or $24.99 per month under a two-year contract. Portions of each subscription go to the village. Village officials are considering developing a hightech neighborhood watch, which would allow WavHost subscribers to pull up a photo on their computer of an area in the community and allow them to keep an eye on crime in the village. Learn more at http://www.wavhost.com/.

- Premier Wireless provides high speed Internet service to rural residents in Morley (which is in the hamlet of ***Canton in St. Lawrence County*** where the home office is located). Premier has recently spread out to provide high speed Internet service to Canton residents, as well. Monthly residential service rates begin at $19.95 plus $4.95 for a receiver and external antenna. The company also offers dial-up Internet service for $8 monthly. The company hopes to expand wireless service into Madris and Potsdam next. Learn more at http://www.premierwireless.us/.

- ***Genesee/Finger Lakes Region Gets WIRED:*** The Genesee/Finger Lakes Regional Planning Council (G/FLRPC) is preparing the region to compete in today's global economy. The region — including the counties of Genesee, Livingston, Monroe, Ontario, Orleans, Seneca, Wayne, Yates, and Wyoming — was one of 13 nationally to receive a three-year $15 million grant from the US Department of Labor through the Workforce Innovation in Regional Economic Development (WIRED) Initiative to advance high-skill and high wage opportunities in the area. A $1.1 million regional aerial imagery system is also in the works. Learn more at http://www.gflrpc.org/.

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What rural communities in New York state are doing...

- Windstream Corporation recently became the largest telecommunications and entertainment services company focused on serving rural America. Windstream has 8,000 employees and offers voice, broadband and digital TV services in 16 states; including New York. The central component of the company's advertising campaign – developed by *The Concept Farm of New York*, Windstream's advertising agency – is a green vintage pickup truck. The Windstream green truck will serve as a memorable brand icon that evokes the spirit of the new company. A multi-state mobile truck tour will start in August and travel throughout Windstream's markets. Learn more at http://www.windstream.com.

- ***Town-Wide Broadband Access Project in Rural Keene, NY:*** Located deep in the Adirondacks, the Keene Valley School Enhancement Task Force recommended a Town-Wide Broadband Access Project in 2008 in an effort to boost the school district and community. The project group did their homework before deciding on how to provide broadband Internet service which the town now lacks. At first they thought that wireless broadband was the way to go, but learned that the wireless frequency available in the US does not travel effectively through trees and other vegetation, nor is it practicable in a mountainous area. Next they contacted Verizon and NYSEG — neither corporation was interested in providing broadband service to a town with such a small population, noting it would not be cost-effective for them. Finally, they decided coaxial and fiberoptic cable was the way to go. And they chose a local provider, Keene Valley Video (KVVI). Wires and cables will be installed along streets in town, but not connected to individual homes. The cost of connecting a house to the street line will depend on the length of the driveway, or the distance of the building from the line. Satellite service was recommended for residents of homes too far off the beaten track to be reached by KVVI cable. The project is underway — fifty residents gathered in late December to learn more about the proposed Town-Wide Broadband Access Project. The project is designed to provide the entire town of Keene, including the hamlets of Keene and Keene Valley, with broadband Internet service. The High Peaks Education Foundation is raising funds for the project and intends to offer KVVI a no-interest loan to be repaid over 20 years, as well as grants for work in noncommercial areas. As KVVI repays the loan, these payments will flow into a fund to further benefit the school.

What other states are doing???

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What other states are doing...

- ***Ten Sleep, Wyoming:*** Ten Sleep, a rural town in Wyoming, population 350, is becoming a high-tech hub. Thanks to fiber-optic cable installed throughout town in 2006 by Tri County Telephone, the telecom cooperative that serves the Ten Sleep area. The Wyoming Technology Business Center at the University of Wyoming is also responsible for the least populated state's success. The fastest growing high-tech company in Ten Sleep, Eleutian Technology, hires people in towns across northern Wyoming to teach English to Koreans of all ages using Skype, a free online calling and person-to-person video service. The two-year old company has close to 300 teachers hooked up to more than 15,000 students in Korea, offering one-on-one and group teachings. Eleutian isn't the only company harnessing the Internet from the distant ranges of Wyoming. More and more companies are recognizing the advantages of doing business in "connected" remote areas. Learn more about Eleutian at http://www.eleutian.com/. Also, visit the Wyoming Technology Business Center's web site at http://www.uwyo.edu/WTBC/.

- ***Superior, Arizona.*** Unlimited high-speed Internet access is a reality in yet another remote, rural town. Residents of Superior, a rural town in Arizona gained broadband connectivity in 2007 for $29.99 a month thanks to WI-VOD, a company that specializes in providing broadband in rural communities. Superior got its broadband through grants from public and private groups totaling $340,000. Of that, $270,000 came from USDA Rural Development. Superior provided a $25,000 grant, and the business community provided $10,000 in matching funds. WI-VOD has placed 13 access points around Superior. WI-VOD hopes to extend service to other rural communities. Learn more at http://www.wi-vod.com/.

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What other states are doing...

- ***Vermont:*** The state of Vermont is moving ahead with its efforts to offer universal cell phone and broadband Internet coverage by the end of 2010. The Vermont Telecommunications Authority was approved by the Legislature in 2007 to work towards that goal. Cell phone coverage is nearly complete along the interstate corridors. Now the Authority must work to provide cell phone and broadband Internet coverage to the rural areas of the state. To accomplish this, the Authority, along with the Vermont Public Service Department, has encouraged telephone, wireless and cable companies to completely build-out the areas where they expand services. The Authority is also considering a couple of options to reach places without cell phone and Internet coverage (now being mapped by the authority) -- putting up 200 or more towers (on church steeples, barn silos or wind turbines) complete with radio equipment, acting as a roaming service provider to other companies and charging them when their customers access their signals. The Authority has $40 million available from a bonding authority, as well as new permitting regulations to help it achieve state goals. Despite the obstacles, Vermont remains optimistic there will be universal coverage by the end of 2010. Follow their progress at http://www.telecomvt.org/.

- ***Maine:*** Maine created the ConnectME Authority in the summer of 2007 with the goal of expanding broadband access in the most rural, unserved areas of the state. The Authority's first task was to identify the unserved areas of the State and develop proposals for broadband expansion projects to fill the gaps. ConnectME's next task was to fund proposals through grants. The first round of grants awarded $787,174 to seven recipients. A second round of grants awarded a total of more than $1.75 million to six additional recipients, expanding services to an estimated 12,500 residents. Through these investments, people in rural areas now have enhanced access to modern Internet service and new business opportunities. Learn more at http://maine.gov/connectme/.

- Connected Nation, a Washington-based group, is working to encourage wider broadband availability in rural areas of the nation. Their approach is loosely modeled on efforts by the federal government to bring electricity to rural areas in the 1930s. Employees fan out to small towns and rural areas and hold meetings where they demonstrate the benefits of broadband and form eCommunity teams made up of local officials and other community members. Connected Nation then helps the communities appeal to Internet providers, like Comcast and AT&T. Connected Nation is credited with boosting the availability of broadband in Kentucky to 95% of the population, from 60% in 2004. Connected Nation's outreach in Kentucky was backed by a $7 million state contract. And bills sponsored by Illinois Senator Dick Durbin and Hawaii Senator Daniel Inouye would designate $40 million in grants to help states fund nonprofits pursuing the Connected Nation approach. Connected Nation also has set up outposts in Tennessee, Ohio, West Virginia, and South Carolina. It hopes to expand into every state. Nationwide, a 7% increase in the number of people who have broadband would generate $134 billion in economic activity and create or save 2.3 million jobs annually, according to a report issued by Connected Nation in early 2008. Learn more at http://www.connectednation.com/.

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What <u>other states</u> are doing...

- ***Kentucky:*** Rural broadband options continue to expand for localities. With a budget of $8,500, a small community in rural Kentucky built a municipal Wi-Fi network. Prestonsburg has less than 4,000 residents at the rural, eastern edge of the state. In early 2008, the community lit up with free Wi-Fi a 2-mile corridor running through its downtown core. And, as of late March, 2,500 users had accessed the service. The community had developed its system using equipment from Meraki, a Mountain View, California, startup that offers a do-it-yourself approach to building Wi-Fi networks. Founded in 2006, Meraki started as a doctorate-research project at the Massachusetts Institute of Technology. Fueled by funding from Google and Sequoia Capital, the company's mission is to bring the Internet to the masses with wireless routers, which are cheap to buy and easy to install and operate. Meraki uses mesh-networking, which means each access point not only communicates with nearby wireless computing devices, but also serves as a router, passing the radio signal to other nodes. A Meraki Pro router for outdoor use costs $150 to $200 and covers a radius of about 500 feet. Prestonsburg installed 48 outdoor units and 12 indoor units. Other vendors were quoting them $10,000 for an outdoor access point. The system allows for incremental build out. Prestonsburg started out by installing a pilot system, with a couple of routers. It worked exactly like Meraki claimed; so they bought the full amount to go 2 miles. The 48 outdoor and 12 indoor routers cost the community about $5,300. About $2,700 paid for three DSL connections with two years of service. With the remaining money, they bought advertising to publicize the service. Meraki keeps its prices low, in part by relying on economies of scale. The company has thousands of networks around the world – they are in more than 110 countries -- and that number continues to grow. The technology is less expensive because a Meraki network isn't self-contained. Rather than situating the bulk of the network's intelligence in the local infrastructure, Meraki conducts much of its essential activity in its Mountain View data center. That means the user doesn't have to install and manage the entire infrastructure that other Wi-Fi networks require. To set up a network, a user simply installs the routers and then logs in to the Meraki dashboard on the Web site, www.meraki.com, to create an account. The administrator then uses Meraki's software, via the dashboard, to set policies and manage the network. The dashboard is also used to enter text messages, which appear in a bar at the top of the screen while a user is on the network. Some operators sell ads in that space to help support the service. For Prestonsburg and many other customers, Meraki includes three years of its data center services in the price of the hardware. Larger customers can opt for a plan that discounts the hardware, but adds a monthly fee for service. Currently Prestonsburg isn't selling ads in the messaging bar, and since it's not charging for the service, the network isn't producing revenue. The community might start selling advertisements in the future, as it develops an e-government Web site. When that's ready, the first stop for anyone connecting to the Wi-Fi network will be Prestonsburg's home page. Display ads could be sold on that splash page.

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What other states are doing...

- **Massachusetts:** Drury High School, a small public school nestled in the Berkshire mountains of northwestern Massachusetts, provided laptops to every public school student; but once the computers were deployed, the district needed to figure out how to connect all those students to the Internet. The school turned to Infobridge, a company based in Maine that specializes in technology solutions for K-12 public education throughout New England. Infobridge introduced the school to Meraki, which pitched a deployment that included hardware, hosted services and all labor costs for $17,000. Tapping into an existing backhaul including a lone T1, two microwave relay towers, and a few cable modems, Infobridge had the network up in 2 days. More than 100 users are on the network each day, including students and faculty. The school district is extremely happy and is planning to expand its Meraki network to outdoor areas, including the athletic fields, so that coaches can communicate in realtime from the sidelines. In addition, Infobridge has begun deploying Meraki in half a dozen public schools in Maine. The company praises Meraki as the best choice for the K-12 market, thanks to its flexibility, low capex, and scalability.
- **New Hampshire:** Wireless Nashua, New Hampshire. The joint effort between the Greater Nashua Chamber of Commerce and the City of Nashua provides free wireless internet service to downtown visitors, clients, and residents. The community chose Meraki to provide its service. They are pleased by the company's flexibility to expanded the signal beyond the current service area by adding additional Meraki antennae. Learn more at http://meraki.com/.
- **North Carolina:** Greene County, North Carolina, a rural community with high rates of poverty, low educational attainment, and outmigration through the 1990s, was in serious economic decline until community leaders made a major investment in local citizens and technology. In 2003, the county provided all students, grades 6 through 12, with laptop computers, and installed an affordable countywide wireless internet system so that the computers were easy to use. Remarkable changes resulted -- the county SAT composite scores increased by 41 points and high school proficiency scores increased from 53 percent to 78.4 percent. Not to mention, more than 80 percent of the 2006 Senior Class applied to college compared to 28 percent of the 2004 Senior Class. And those are just the educational changes. The County partnered with One-Economy.com, to make the technological changes. The wireless system brought local forces together, including schools and municipalities. And after years of negative business growth, twelve new businesses opened in Greene County in 2006. More than a dozen church and community buildings have become hot spots for free internet access and free technology training. The County has also developed its own social networking site with such features as: candidates' forums, business news, plus information on careers, small business development and agricultural alternatives to tobacco. The cost of high-speed internet access has deterred many rural communities from making Greene County's move, but more affordable WiFi options in rural areas may change all that. Last week Intel announced development of its rural platform. The technology extends wireless internet access across 60 miles, using a processor, radios, specialized software and an antenna. Visit http://www.one-economy.com/.

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What other states are doing...

- **Vermont**: has committed to securing ubiquitous broadband and cellular coverage by the end of 2010. The state created the Vermont Telecom Authority (VTA) last year to oversee telecom projects. The VTA is currently overseeing several mapping projects to identify what type of Internet coverage Vermonters have or don't have. In their efforts to provide statewide coverage, the VTA is encouraging incumbent providers to expand their networks and are aggressively looking at building towers and antennae as well as providing connectivity to those towers to achieve total mobile phone coverage. The legislature has given the VTA authority to sell revenue bonds to finance these projects. The challenge is to design projects that will repay the bonds within 15-20 years. Visit http://www.telecomvt.org/. *Some communities aren't waiting for the state and have established telecommunications projects of their own.*

- ***Burlington, Vermont** initiated a fiber-to-home network two years ago and is now close to covering the entire city.* Burlington Telecom, a municipally-owned 21st century fiber optic infrastructure, provides Burlington's citizens and businesses with up-to-date telecommunication services at affordable rates. Burlington Telecom envisions this network as the "electronic public road" system of the future, capable of delivering telecom's ever-changing services. The network is privately financed and free from taxpayer contributions. Burlington Telecom provides the three basic services itself: cable, TV, telephone, and high-speed Internet. *The Burlington network has seen 40% of households taking its services. Learn more at* http://www.burlingtontelecom.net/.*And now, the success of Burlington is snowballing.*

- *A similar fiber-to-home network is being designed to bring highspeed broadband to rural communities in East Central Vermont, based on Burlington Telecom's success. The East Central Vermont Community Fiber Network or ECFiberNet is a community-owned, universally available, open access, fiber-to-the home network.* This network is intended to not only provide broadband to underserved communities *(many of the homes in these towns have only dial-up access with only a small percentage even reaching 56K),* but also to build an infrastructure to support future growth. *The network will cover 100% of the homes, businesses, schools, and institutions in the 25* Vermont towns and cities *who have committed to the project.* The state-of-the-art fiber-optic network will bring television, telephone, and high-speed Internet to the communities. *The privately-financed network will not require any direct financial support from participating municipalities.* Nearly 1,000 households and businesses in the 25 towns have pre-registered for service, including over 15% of the households in poorly served towns. Vermonters are anxious to deal with a local company. The VTA strongly supports the ECFiber network. Learn more at http://www.ecfiber.net/.

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- ***Could balloons expand telecom services in rural areas?:*** Jerry Knoblach, CEO of Space Data Corp., wants to bring wireless service to millions of rural Americans by beaming service down from balloons hovering at the edge of space. His company, Space Data Corp., already launches 10 balloons a day across the Southern US, providing specialized telecom services to truckers, military, healthcare and oil company customers. The balloons soar 20 miles into the stratosphere, each carrying a shoebox-size payload of electronics that acts like a mini cell phone tower covering thousands of square miles below. Balloons could play a big part in expanding rural telecom services. About 36% of rural Americans don't have Internet connections. The problem is that it's expensive to string cable or build cell phone towers in areas with so few customers. Space Data says a single balloon can serve an area otherwise requiring 40 cell towers. Space Data believes it can cover the whole country with a WiMax broadband network with just 370 balloons. That compares with some 22,000 towers that would be needed in a traditional deployment. Space Data must constantly send up new balloons because the inexpensive balloons are good for only 24 hours or so before ultimately bursting in the thin air of the upper atmosphere. The electronic gear they carry, encased in a small Styrofoam box, then drifts gently back to earth on tiny parachutes. Space Data hires mechanics employed at small airports across the South. It also hires farmers — particularly dairy farmers as launch crews. Space Data pays them $50 per launch. The balloons rise about 1,000 feet a minute and reach their target altitude of 65,000 to 100,000 feet in under two hours. Most of Space Data's balloons are filled with hydrogen, because it is cheaper than the helium used in toy balloons and modern blimps. Space Data's balloons are similar in design to weather balloons, about 1,800 of which are launched world-wide every day without problems. According to the Federal Aviation Administration, there are no records of passenger jets colliding with balloons in the US. The engines of a commercial jet are designed to withstand the ingestion of an eight-pound bird, the FAA says. *(The payload on a Space Data balloon weighs six pounds.)* At Space Data's command center, engineers track their 10 balloons on an electronic map. Balloons move slowly across Texas, New Mexico, Oklahoma and Arizona, where Space Data sells wireless services used by truckers to track their fleet. When a balloon approaches the end of its useful life, technicians send a signal to separate it from its electronic payload, which parachutes to earth. The balloons eventually burst from the low air pressure. Some environmentalists fear latex balloon scraps can be fatal to turtles, fish and whales, which mistake floating latex for jellyfish or other edible sea life. Several states, including Florida and Virginia, restrict balloon launches. But the Balloon Council, a trade group for balloon makers, says latex balloons biodegrade at the rate of an oak leaf that falls from a tree. Federal agencies reviewed Space Data's plan and found no significant environmental impact. Some agencies even consider it a net benefit because the balloons replace tall cell phone towers. While the balloons are cheap and disposable at $50 a pop, the transceivers they carry are worth about $1,500. Once a transceiver is released from its balloon to parachute back to earth, there's no way to predict where it will land. So Space Data has hired 20 hobbyists with GPS devices to track them down. Recovery missions have included plucking transceivers out of trees in Louisiana, climbing rocky cliffs in Arizona, trudging through swamps and kayaking across ponds. Space Data pays them $100 per transceiver recovered. Learn more about this fascinating technology at http://www.spacedata.net/.

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- Industry experts say that Google Inc. is considering contracting with Space Data. Google believes balloons could radically change the economics of offering cell phone and Internet services in out-of-the-way areas. And, Microsoft co-founder Bill Gates and Bellevue venture capital firm Ignition Partners are backers of Extend America, a Bismarck, N.D., company that has initiated a similar balloon concept. Visit http://www.extendamerica.com to learn more.
- *Note: The Capanina project — a European project spent three years demonstrating the use of balloons, airships or unmanned solar-powered planes as high-altitude platforms (HAPs) to bring low-cost broadband connections to remote areas. Stratospheric broadband fills the gap between satellite and terrestrial wireless technologies. Visit* **http://www.capanina.org/.**

- ***California Broadband Bonds***: The California Broadband Task Force, commissioned in November 2006, recently issued its final report — ***The State of Connectivity. Building Innovation through Broadband.*** The group started by mapping the state — discovering that 96 percent of California residents already have access to broadband — ***but...*** 1.4 million rural Californians have no broadband of any kind, and only half of California homes have actually signed up for service. Rather than building infrastructure itself to correct this inequity, the Task Force recommends that the state issue *broadband bonds*. The group advises creating an *Advanced Services Fund* that would make one-time payouts to subsidize broadband infrastructure in rural areas, and issue tax incentives for broadband deployments in unserved areas. To boost broadband usage and increase statewide health services, the Task Force is also pushing an *E-health network* , as well as telecommuting and videoconferencing. California leads the United States in broadband availability but feels it needs to do a lot more to ensure high speed access makes it throughout the state in order to compete globally. Download a copy of the Task Force final report from http://www.calink.ca.gov/taskforcereport/.

- ***Iowa, Texas and Oklahoma*** boast statewide broadband access. Now, Verizon is spearheading an effort for a national broadband plan that offers grants and loans for broadband providers to extend service to rural areas.

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- ***Montana/Wyoming***: Visionary Communications, a service provider in the Northwest may serve as an example to the nation in transitioning from low-band services, such as dialup, to broadband service. Visionary, started as a dialup Internet Service Provider in December of 1994, and has evolved into a rural broadband provider. The company provides broadband services to customers in rural areas of Montana and Wyoming where population is low (sometimes less than 300 people in an area) and space between residences is large. Visionary recently surpassed fifty percent saturation for broadband services across its service areas. Visionary's successful combination of T1, DSL, Ethernet and broadband service options to accommodate the different needs of its customers could serve as a model to nationwide universal broadband.

- ***Oklahoma:*** Oklahoma partnered with AT&T to bring high-speed Internet service to 68 rural communities in the state. The DSL100! project took only one year to complete. The project was made possible by the state's deregulation of retail telecom services. Small businesses already boast increased sales due to the high-speed Internet. AT & T offers a variety of packages and bundles, starting as low as $12.99 a month.

- ***Ohio's Statewide Broadband Effort:*** Ohio's Governor recently signed an executive order establishing the Ohio Broadband Council and the Broadband Ohio Network to coordinate and expand access to the state's broadband data network. The order directs the Ohio Broadband Council to extend access to the Broadband Ohio Network to every county in Ohio in an integrated statewide network infrastructure unmatched in service. The order allows public and private entities to tap into the Broadband Ohio Network in an effort to expand access to high-speed Internet service to rural areas of the state. It is being touted as a model for the rest of the nation by state officials. Text of the Executive Order 2007-24S can be found at http://governor.ohio.gov/News/July2007/News72707/tabid/335. Additional information about the Ohio Broadband Council and Broadband Ohio can be found at http://www.ohiobroadbandcouncil.org/.

- ***Massachusetts's Broadband Incentive Plan:*** Another effort is underway in Massachusetts to expand broadband to 32 communities that have no broadband access whatsoever. The Broadband Incentive Plan will direct up to $25 million for the construction of basic telecom infrastructure — conduits, fiber and wireless towers in those 32 communities. State officials hope the plan will make it more cost-effective and attractive for private companies to invest additional funds and deliver complete solutions for customers in rural areas without broadband access. Download the plan at http://www.mfw.us/broadband-incentive-fund.

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- Connected Nation Inc., a national nonprofit aims to make broadband and computers pervasive. The organization brings together public agencies and private industry with funding from both. The nonprofit started out as ***ConnectKentucky***, where its efforts contributed to increasing broadband subscriptions in that state by 82% over the past 30 months. Connected Nation's success derives from developing maps that lay out where broadband exists. The company then gathers household data to have a better understanding of what number of people are likely to subscribe once broadband is available. But it's still a challenge to prove viability in rural areas — it's expensive — companies need to have some comfort that they're not going to lose money. This is where government should step in — with grants and low-interest loans. Connected Nation is available to work with any state, region or federal body in an effort to measure and map the availability and use of broadband. Learn more at http://www.connectednation.com/.

- ***SkyWay USA***: A ***Kentucky*** satellite company is offering new hope to rural pockets throughout the country seeking high speed broadband Internet access. SkyWay USA is dishing out affordable broadband Internet access via satellite to virtually everyone; but especially to rural areas. Sales are focused exclusively on rural regions or areas where other forms of high-speed Internet aren't available. In fact, before signing up a customer, SkyWay will check to make sure that DSL isn't already an option. If it is, the customer will be directed to that provider, because DSL is generally faster and better than satellite. What makes SkyWay different from other satellite providers is it uses a hybrid system of Internet access making it faster and more affordable. SkyWay USA utilizes the satellite's strengths for downloading of information only; therefore a user doesn't experience the same time-out delays caused by "two-way" approach of uploading requests to the satellite. SkyWay downloads come in at high speed from above, but outbound communication from the user uploads travel over a slower dial-up connection. The other two major satellite Internet companies are HughesNet and WildBlue Communications, both of which provide two-way communication directly to the satellite. SkyWay believes it can compete with its competitors because its service and equipment cost less. WildBlue plans start at $50 per month. HughesNet starts at $60. SkyWay offers plans starting at $30 monthly. In addition, equipment for SkyWay's competitors can cost from $300 to $500. After rebates, SkyWay's dish and modem are available for about $100. Currently, SkyWay has about 300 customers, but by October 2008, it hopes to have 50,000. After two years it anticipates 200,000 customers, and in five years, it projects a customer base of 1 million. Across America, 25 million homes don't have access to a digital subscriber line (DSL) or cable Internet — SkyWay's mission is to end the wait for those rural Americans. Learn more at http://www.skywayusa.com/.

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What other states are doing...

- **Scottsburg, Indiana**, a tiny town in southern Indiana, has proven that rural broadband is possible. Here's their story. In 2002, the local government began considering the possibility of establishing a center for technology and entrepreneurship. In their quest to establish the center, information technology experts advised Scottsburg's leaders to conduct an audit of existing IT infrastructure and business needs. The City discovered that telecommunications was seriously lacking — most of it being 56 kilobits/sec dial-up. The City set out to correct these inadequacies. Scottsburg's first attempt for an easy solution failed when the telephone and cable companies rejected their appeals for broadband service. Next, the community considered wireless, but it was too costly. Joining forces with the Indiana Municipal Power Agency and the American Public Power Association, Scottsburg heard about a successful fiber-optic system in Owensboro, Kentucky that uses wireless network technology to achieve last-mile data connectivity. Scottsburg contacted Wireless Connections, the company Owensboro used, and asked if it was possible to provide total wireless broadband connection. Wireless Connections agreed to bring wireless broadband to Scottsburg using a point-to-point system, for $275,000; and extending coverage beyond the city limits to rural schools in Scott County for an additional $100,000. The system's Internet point of presence is the city's Lifelong Learning Center. From there, the city mounted wireless equipment on grain bins, water towers, utility poles, all structures used by the sheriff's department, a radio station, the hospital, the cellular industry, and four different water utilities. The City now provides service to more than 1,500 customers in nine counties. Residents can choose between 512 kilobits/sec or 1 megabit/sec broadband speeds. Businesses have more choices, ranging from 128 kilobits/sec to 1.5 megabits/sec. The ratio of residential to business customers is seven to one. *Note: After Scottsburg deployed broadband service, Verizon and Comcast also began offering it, despite their earlier protestations that the market wouldn't support it. Scottsburg saw a drop-off initially, but customers are coming back - enjoying the community's small town, personal approach. Plus, the city requires no service contracts, and doesn't charge customers to rent its equipment. City residents get a single bill for water, electric, sewer and broadband service. Learn more at Citizens Communications Wireless Broadband http://www.c3bb.com/ and/or http://www.wirelessconnections.net/main/default.asp.*

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What other states are doing...

- ***Indiana:*** A small Internet provider has found its niche serving communities in rural northeast Indiana. OnlyInternet Broadband and Wireless Inc. tripled the size of its network in the past year in an effort to bring high-speed Internet access to communities in rural Indiana. The company invested over $2 million to expand its coverage. OnlyInternet provides wireless Internet service using a system of antennas to transmit radio frequency signals. The technology is cheaper than DSL or cable Internet service. WildBlue introduced satellite Internet in the region to cover customers in wooded areas where antennas wouldn't reach. Learn more at http://home.onlyinternet.net/.
- ***Indiana:*** Officials in Greencastle are pushing broadband in some rural areas using low interest loans from the U.S. Department of Agriculture's Rural Development program. The Rural Development program granted a low-interest loan to Cinergy Metronet, which is installing high-speed fiber-optic cable in several rural communities. Some small communities have given up trying to get major companies to offer broadband, and instead have made efforts to offer it as a municipal utility.

- ***Stamford, Vermont*** — a small, rural mountain town of 900 people — is one of only a dozen towns in the country to have successfully founded a broadband cooperative. The Southwestern Vermont Broadband Cooperative was founded last September and provides high-speed Internet to 30 households within the broadcast radius. The co-op is about to expand to a total of 60 or more homes.

- ***Vermont:*** In northern Vermont, 12 towns will use a grant from the U.S. Department of Agriculture and the Small Business Development Center, as part of a two-year study to see how small businesses would improve with broadband access. One of the small businesses is the historic Lyndon Freighthouse in Lyndonville — with a gallery, ice-cream parlor, restaurant, gift shop and a Starbucks, all with wireless Internet.

- ***Pennsylvania:*** A new publication is available that provides a step-by-step guide to using municipal wireless to cut local government costs. The guide entitled, *"Fighting the Good Fight for Municipal Wireless"* recounts Philadelphia's efforts against incredible obstacles to launch its citywide broadband wireless system. The author and business strategist, Craig Settles gives a foundation for planning a wide-scale wireless project. Get your copy at ***http://www.hudsonhousepub.com/fgf/.***

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- ***New Hampshire:*** The Colebrook Development Corp. (CDC), a volunteer community organization in northern New Hampshire, is building a wireless broadband network in Colebrook, a border town with Vermont and in close proximity to Maine with federal funds and local, private grants. The wireless project will launch five wireless hubs in the area.

- **Northern Vermont and New Hampshire** are lucky to have ***Cloud Alliance***, a company offering wireless high-speed Internet infrastructure and services to rural areas. Over 200,000 households and 10,000 businesses reside in this 6,000 square mile area with the majority only receiving electricity and basic telephone service on copper lines before Cloud Alliance came to town. Their motto is the *"dirt road wireless crowd".* The company has successfully built a rural wireless high-speed Internet infrastructure where large corporations refused to. The services provided by Cloud Alliance, such as high-speed wireless Internet access, wireless "hotspots", and other related services provide rural Vermont and New Hampshire with unprecedented business opportunities, and yet preserve the beauty of the rural landscape. The key to wireless broadband is the receiver, which looks something like a satellite dish and needs to be in a line-of-sight of the transmission tower, even if its 25 to 30 miles away. ***Some have compared the arrival of high-speed Internet service in Vermont to the arrival of the Interstate highway system a half century ago.*** High-speed data transmission will enable people to live in the most remote areas of Vermont and work from there in jobs that previously required them to live in or commute to cities. About 75 percent of Vermonters now have access to broadband Internet service, but most of those are in larger communities that are served by cable television or telephone-based DSL service. Vermont is also set to build a $10 million, 375-mile fiber optic system throughout its northern region.

- In **Maine**, 86 percent of residents have access to broadband Internet. A year ago, Governor John Baldacci announced an initiative called *Connect ME*, which set a goal of high-speed Internet access for 90 percent of Mainers. Since that level is nearly obtained, the state is considering raising its goal for access to 95 percent.

- In **San Francisco**, the city selected Google and EarthLink to offer tiered levels of wireless service. Chicago is building a citywide wireless network requiring no public financing. City officials said they would begin requesting bids this spring from private-sector companies to install and manage the system. Other cities have chosen not to rely on existing providers but handle network administration on their own. Many smaller cities are choosing public ownership for their WiFi networks. St. Cloud, an Orlando suburb of about 22,000 residents, spent $2.6 million to set up a network over 15 square miles. The city expects to save $650,000 annually in operating efficiencies like supplying Internet-based cell phone service to city workers. The network plans to develop new services in health care, education and public safety. Learn more at http://www.muniwireless.com/.

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- The **City of Princeton, Illinois** began providing high speed Internet access to large businesses, small businesses, and rural residents over BPL a few years ago. Princeton's choice to install BPL has reaped benefits — bringing competition into the market. Manassas, Virginia was the first city to implement BPL citywide. And, two towns in Michigan began getting BPL last fall. Visit the Broadband Over Power Lines Industry Association's web site at http://www.bplia.org/.

- ***Missouri Rural High-Speed Internet Access***: The state of Missouri created the Rural High-Speed Internet Access Task Force in October 2007, a 30-member board of elected officials, industry leaders and technology experts, to create a plan, timeline, and incentive model for private enterprises or public-private partnership to offer high-speed Internet access to businesses and residents alike in rural communities. The Task force is moving along expeditiously. A series of public hearings were held between November 07 and January 08. Numerous recommendations came out of the hearings. The Task Force is now in the process of seeking consultants with experience in providing affordable Internet service to rural areas. The Task Force's efforts are outlined in their preliminary report which can be downloaded from http://www.ltgov.mo.gov/ruralhsi/index.htm.

- ***Mid-West:*** A group of communications companies banded together four years ago to help small cable companies bring telephone and Internet service to rural areas. Investors bought a small long-distance company and added local calling and Internet service. They renamed the company ***Big River Telephone***. The company has been providing local and long-distance service to rural small and medium-sized businesses, with a limited number of residential customers in southeast Missouri, Southern Illinois and Western Kentucky. *Big River* works with five cable companies serving rural communities in Missouri, Kentucky, Tennessee and Arkansas and will be expanding soon into Mississippi, Nebraska and West Virginia. For more information, visit http://www.bigrivertelephone.com/.

- ***West Virginia:*** The City of Philippi will institute a fiber-to-home system linking residents to a network that provides digital cable television and high speed Internet access. The project, which covers the city and a portion of the surrounding area, also lays the foundation for expanding high speed Internet access to other remote locations of the county. The project cost more than $5 million, but is partially funded by a $2.4 million grant from the USDA Rural Utilities Service's Community Broadband Grant Program.

- **V*irginia***: Citizens, a small telephone and cable company serving a few rural communities along the Blue Ridge in Southwest Virginia, is launching Citizens Mobile Wireless Internet. Every home, office and road in the area will have access to high-speed Internet.

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- The **Mid-Atlantic Broadband Cooperative** (MBC) launched a $27 million broadband technology initiative, after four years of searching for innovative ways to fund and deliver high-speed broadband Internet access to largely rural Southside Virginia. This initiative provides 700 miles of new fiber-optic cable creating an open-access telecommunications infrastructure. The project will connect five cities, 20 counties, and 56 industrial parks; and will provide high-speed Internet access to nearly 700,000 Virginians and more than 19,000 businesses who do not now have it. The initiative will also reduce high-speed Internet access costs to businesses and consumers by at least 20 percent. This initiative may serve as a national model for rural economic development. Full operations are expected for July 2006. Learn more at http://www.mbc-va.com/privacy.asp.

- **WiFi:** More than 200 cities across the country are investigating free WiFi options. WiFi routers can be mounted to city streetlights, which can be used for electricity — creating equal access to all residents and serving to level the playing field *(at least in cities*). Most jurisdictions are choosing to partner with vendors that will build and own the networks at their own expense and make money either by charging subscription fees or selling online advertising. In Philadelphia, EarthLink offered the city a deal they couldn't refuse. City officials there say they lost some level of control, but the advantages are worth it — they don't need to spend any money and they don't have to figure out how to run the municipal network. Philadelphia's model is emerging as a blueprint for many big cities.

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- Another high speed Internet option for rural areas is satellite. However, to date, it remains a very costly option. But it may be cost effective for small businesses. Eventually, increased competition should help to decrease prices. Check out the satellite options listed below:

  Agristar Global Networks: Offers high-speed connectivity to families and businesses in rural areas everywhere through DirecWay satellite service. But the costs are high. Agristar's two-way satellite network encompasses the entire continental US — which focuses on reaching the millions of farms, ranches, agribusinesses and other rural residences that DSL, cable and other broadband connections cannot. What's different about Agristar is that it not only provides Broadband Internet connectivity, it also provides timely ag business and economic news, weather, market data and analyses and special multimedia programming at no additional charge. Subscribers network with top producers, ag businesses, and industry decision makers, as well. Call 1-888-777-0440 or visit **http://www.agristar.com/** to learn more.

  WildBlue Communications: Offers high-speed Internet access via satellite to rural areas across the US. Visit**http://www.wildblue.com/.** *Note: WildBlue prices seem to be the most competitive.* AT&T recently partnered with Wild Blue to provide satellite broadband services in rural markets where DSL service is not available.

  StarBand: Offers two-way high-speed satellite Internet to rural residents and small businesses. Downloads at speeds up to 10 to 20 times faster than dial-up services. Learn more at **http://www.starband.com/.** There are many StarBand dealers located in rural New York. Click on *"Where to Buy"* and put your zip code in to find the dealers closest to you.

  HugesNet or DirecWay: Satellite Internet access ready anytime, any where. Compatible with Windows and Mac. Learn more at http://go.gethughesnet.com/.

- Check out http://www.switchmaxx.com/index.htm — a web site that allows rural telephone companies to offer a variety of high-tech services to customers. Switchmaxx is a patented technology which serves as a customer service tool, making it easy for customers to manage Wireline, Wireless, VoIP and Broadband services by giving them an integrated Communications Portal solution. Over 20 rural providers throughout the United States are implementing the Switchmaxx solution. Phonetics, the maker of Switchmaxx, recently sold out to CopperCom — http://www.coppercom.com/.

- Visit http://www.fcc.gov/osp/rural-wisp/rural-wisp-orgs.html for a list of companies providing wireless connections to rural areas. And visit the Federal Communications Commission's web site on telecommunications service in rural America at http://www.fcc.gov/cgb/rural/.

- ***Broadband Deployment is Extensive throughout the United States, but it is difficult to assess the extent of deployment gaps in rural areas.*** Published by the US Government Accountability Office (GAO). May 2006. Download from http://www.gao.gov/index.html. Type in GAO-06-426 in *Keyword/Report # box*.

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- Also visit http://www.soundtivity.com. The company provides wireless broadband to rural communities in upstate New York. It uses point-to-multipoint (PMP), broadband wireless access.

- ***Connecting Rural Communities***: ***Connecting Rural Communities*** is a downloadable guide to enhance the use and adoption of information technology tools and infrastructure in rural communities. This is a valuable tool for cooperative extension educators, community leaders and facilitators. Features include: 1) helping local leaders understand what connected communities are and their potential; 2) conducting community capital and technology assessments; 3) engaging the community in a visioning process to identify goals for the adoption and use of technology; 4) designing projects that help the community reach their goals; 5) facilitating the implementation of the community projects; and 6) helping communities document their progress and tell their story. Download a copy from http://www.connectingcommunities.info/index.cfm

- ***Wi-Fi***: Metropolitan areas across the country had high hopes for offering free wireless Internet hubs or Wi-Fi in their downtowns. Unfortunately, many of those metropolitan projects fell through the cracks. Wi-Fi projects failed in major cities like, San Francisco, Houston, Chicago, and St. Louis. However, the promise of Wi-Fi continues to grow in hundreds of smaller communities where Wi-Fi networks are thriving. Success stories include such unknown, rural communities as, Owensboro, Kentucky; Rio Rancho, New Mexico; Kutztown, Pennsylvania; and Brookline, Massachusetts. St. Cloud, Florida is the goal for wireless plans, according to a study released earlier this year by the independent wireless testing company Novarum (http://novarum.com/). St. Cloud's $3 million network was named the best metro Wi-Fi in North America by Novarum. The community of 28,000 residents is home to a truly citywide Wi-Fi network at no additional cost to residents. For more than a year, it has been the only town in the country able to offer 100 percent service availability. More than two-thirds of households in St. Cloud have signed up. *Note: National cable and DSL companies aim for the 15 to 20 percent realm.* Brookline, Massachusetts signed on with a small IT firm, Galaxy Internet Service, based in a neighboring town. The new network credits its success to five principles: homeowners, public safety, businesses, mobile users, and municipal workers.

- **Muniwireless** — a web site devoted to municipal broadband projects supported by cities, towns, and rural municipalities worldwide; especially those projects that incorporate wireless technologies. Learn more at http://www.muniwireless.com/.

- Two websites to help you find a Wi-Fi hot spot near you: anchorfree.com – Focusing on free Wi-Fi hot spots, the website's search engine lists more than 12,000 wireless hubs in the United States alone; and jiwire.com – The site boasts a massive catalog of 150,000 international Wi-Fi zones.

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What <u>other states</u> are doing...

- ***Satellite Broadband:*** For now, satellite broadband connections seem to be the answer for receiving high-speed Internet access in the most remote and rural corners of the world. Subscribers install an outdoor dish and receive connections 10 times faster than dial-up (512 kilobits per second) for about $50. For $30 more dollars, users can get connections at 1.5 megabits per second — equal to DSL. To date, farmers and residents in rural locations have made up the bulk of satellite subscribers, but people with second homes now make up almost 40 percent of the customer base. ***Satellite appeals to those customers who have no other choice.***

- ***DigitalBridge Communications***: DigitalBridge Communications (DBC) is a fast-growing rural broadband carrier striving to deploy WiMAX services in rural markets across the country. The company hopes to bring high speed Internet and other telecommunications services via broadband wireless technology to towns with fewer than 100,000 people. DBC has built an adaptable platform to allow for wholesale and retail growth — enabling DBC to partner with incumbent regional WISPs and telecommunications providers to leverage WiMAX capabilities. Once DigitalBridge launches service in a community, it deploys base stations that utilize licensed radio frequencies to reach each customer through small, wireless modems. Since no wires are required to establish service, its service is portable and customers can use it inside or outside their homes and offices. DBC maintains a strong commitment to work with local communities and schools to make broadband services and content available to those residents and students who are often left behind. With WiMAX, the company is able to offer a broadband wireless service that is more reliable, portable, affordable, faster, and easier to install than WiFi. Setting up DBC service involves "plug-and-surf" installation, with customers able to set up service on their own in a matter of minutes. Alvarion, a leading provider of wireless broadband network solutions, is the supplier for Digital Bridge. Learn more at http://www.digitalbridgecommunications.com.

- ***Stratospheric Broadband:*** On a similar note, Europe is also experimenting with Stratospheric Broadband. The Capanina project, involving 14 partners from across Europe and Japan and funded by the European Union, aims to deliver low-cost, high speed wireless broadband from aerial platforms to rural areas. The group spent three years demonstrating the use of balloons, airships or unmanned solar-powered planes as high-altitude platforms (HAPs) to relay wireless and optical communications. The consortium has established how the system could bring low-cost broadband connections to remote areas and even to high-speed trains. It promises data rates 2,000 times faster than a traditional modem and 100 times faster than today's "wired" ADSL broadband. Learn more at http://www.capanina.org/.

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What other states are doing...

- ***Wireless Clouds:*** According to *Government Technology* magazine, 300 municipal wireless projects were underway as of August 2006. Regional wireless clouds can cover hundreds of square miles and provide affordable wireless Internet access — serving to improve government efficiency, promote digital inclusion, and stimulate economic development. A few projects to note include — five Colorado communities joined together in pursuit of affordable wireless broadband — creating the Colorado Wireless Communities (CWC). The network continues to grow, now including 10 cities sprawling over 197 square miles and serving 620,000 people. Two New Jersey counties joined forces to create a Wi-Fi network covering 550 square miles and offering free or low-cost service to 800,000 residents. The project is still in its initial stages, but the two counties plan to encourage surrounding counties to join the network. And in New York, Suffolk and Nassau counties have launched WiFi Long Island with the goal of providing Wi-Fi access to all 900 square miles of Suffolk County and 300 square miles of Nassau County. This project differs from other municipal projects — the wireless network provides a backbone for service providers that, in turn, offer tiers of wireless connectivity to residential customers. California's Wireless Silicon Valley is the biggest public-sector partnership created for a regional wireless cloud — covering 1,500 square miles, serving 2.4 million residents. For the full article, visit http://www.govtech.net.

- ***KeyOn Communucation in Las Vegas:*** Another leading provider of wireless broadband and voice-over-IP (VoIP) services in small and rural markets is KeyOn Communications, based in Las Vegas. The company has been working to acquire rural providers and consolidate wireless broadband services— creating the largest rural, wireless broadband company in the nation, covering a dozen states: Nevada, Idaho, Colorado, Iowa, South Dakota, Nebraska, Kansas, Oklahoma, Texas, Illinois, Indiana and Ohio; with a network footprint of over 45,000 square miles. KeyOn commenced operations in 2002 in Las Vegas and has experienced rapid growth in its markets as a result of organic network builds and acquisitions. KeyOn Communications' wireless broadband service has a speed rivaling cable-modem and digital-subscriber-line technology, but at a significantly lower rate for residential and business customers. And, KeyOn's VoIP services allow rural users to enjoy the latest technology to make long-distance telephone calls over the Internet, often at a much lower cost than that charged by standard utility companies. For additional information visit http://www.keyon.com/.

Current Approaches to Rural Broadband Deployment

What other states are doing...

- ***WiMax:*** WiMax provides Internet service wirelessly over a radius of about 40 miles,many times greater than WiFi. It operates through a system of towers that transmit and receive signals allowing users to be online. WiMax has been around for a while, but has been used primarily for small businesses. Now Clearwire is launching a new service in Seattle, Washington that provides Internet service to the home wirelessly. WiMax offers an alternative to DSL and cable broadband Internet access. The service is sent through the air, eliminating the need to install anything in the home or lay any wires. Also, it isn't assigned to a specific house or a business, so people can take the service with them. The service does require a modem, about the size and weight of a slim hardback novel, which must be plugged into the computer and an electrical outlet. There is no setup or software to install on the computer. The service is sold through Best Buy stores, mall kiosks and online. To date, Clearwire has launched in mostly rural areas or small or midsize markets. Unfortunately, the service has not reached the Northeast yet. Learn more at http://www.clearwire.com/.

What's being done nationwide???

Current Approaches to Rural Broadband Deployment

What's being done nationwide...

- Both the House of Representatives and the Senate passed the Broadband Data Improvement Act, (S. 1492) a key initiative of the Communications Workers of America's (CWA) Speed Matters project. The bill was signed into law on October 10. The new law establishes a federal grant program to support states' efforts to improve broadband communications service; calls on the federal government to collect and maintain data on the status of broadband deployment throughout the country; and takes proactive steps to encourage public/private partnerships to identify barriers to broadband adoption on the state level. Congress must now fund S.1492 grants to states so that they can move forward with mapping and stimulating broadband. The new law creates a national goal of 10 megabits per second access downstream by 2010 and 100 megabits by 2015. Keep informed at http://www.speedmatters.org/.

- Things are looking up for broadband in rural areas. Two ideas which have been circulating for years are coming to fruition. First, the Federal Communications Commission (FCC) approved use of white spaces to provide Internet Services. Secondly, Broadband over Power Line (BPL) technology is reemerging for use in hard to reach areas. A National Broadband Strategy Symposium was held in Washington, D.C. late last year to develop strategies to roll out broadband nationwide.

- The FCC approved a change in November to allow unused television frequencies to be used to provide Internet services. This change is a great leap forward in bringing low cost, high speed Internet and new wireless devices to rural areas. Since 2004, the FCC has been studying whether the frequencies between television channels — the white spaces — could be used by other devices, particularly because digital signals are less prone to interference. The FCC performed two sets of tests that showed some potential for disruption on frequencies, but the FCC is confident that such interference can be mitigated through tight regulation of new devices. The new frequencies could be a boon for rural areas because its high-powered, low-frequency waves can travel through trees, buildings and other rough terrain. Devices using the spectrum are expected to be on the market within a year to 18 months; such as portable communications gadgets as well as in-home electronics that carry a video signal from a computer or recording device to a television. This is a significant step toward ushering in a new era of technology that allows for major investments in innovative wireless broadband.

Current Approaches to Rural Broadband Deployment

What's being done nationwide...

- IBM announced in late 2008 that the company is leading a $9.6 million Broadband over Power Line (BPL) project targeting rural communities across seven states and including a half dozen electric cooperatives. The goal is to bring advanced Internet connectivity to millions of Americans who currently can't access wireless or WiFi networking options. BPL technology has been around for over a decade, but interference issues stalled expansion. However, IBM, the International Broadband Electric Communications (IBEC) and the United Telecom Council (UTC) are not deterred by the slow start. The three players believe that the rural market and the electric cooperative space are ripe with promise. Rural areas desperately need broadband technology and BPL is cheaper and more viable when used in the right place. *Note: There are currently 900 electric cooperatives nationwide, representing 12 percent of the U.S. population and 45 percent of the total electric national grid. BPL could bring broadband to 50 million Americans who currently have no access.* Learn more at http://www.ibec.net/.

- Lack of access to broadband is influencing the real estate market. Homes that have broadband are winning out over more remote ones that don't. Areas with better and faster broadband are becoming more desirable than ones with slower access. Experts believe that over time, the lack of universal broadband, could pull people from the countryside toward cities and suburbs. On the federal level, the FCC is considering using the Universal Service Fund, which subsidizes phone service in rural areas, to promote broadband coverage as well.

- ***Nationwide broadband network dedicated to health care:*** The Federal Communications Commission (FCC) has initiated a pilot funding program to facilitate the creation of a nationwide broadband network dedicated to health care, connecting public and private non-profit health care providers in rural and urban locations. Support is growing for such a network creating opportunities for delivering telehealth services, including telemedicine. Establishment of a nationwide health care broadband network is critical for rural and underserved areas, where distance separates patients from needed medical care. A broadband healthcare network would also facilitate implementation of electronic medical records nationwide. Learn more about the effort at http://www.fcc.gov/cgb/rural/rhcp.html.

- **The Federal Communications Commission (FCC), under the Rural Health Care Pilot Program (RHCPP),** awarded more than $15 million in January 2008 to expand broadband healthcare access in rural New York.

Current Approaches to Rural Broadband Deployment

What's being done nationwide...

- ***The Federal Communications Commission (FCC) and United States Department of Agriculture (USDA)*** recently announced the launch of a new web site for those in rural America looking to bring the benefits of broadband services to their communities; called the *"Broadband Opportunities for Rural America"*. The new web site combines the expertise and resources of the FCC and USDA into a single, user-friendly site — providing information on the different technology platforms that can be used to provide broadband services, government funding for broadband services, relevant FCC and USDA proceedings and initiatives, and data on broadband deployment. In addition, the site provides instructions on how to locate companies already licensed to provide wireless services in or near specific rural communities, as well as helpful links to other government and private resources related to encouraging broadband opportunities in rural America. Learn more at http://wireless.fcc.gov/outreach/index.htm?job=broadband_home.

What's being done in other countries???

Current Approaches to Rural Broadband Deployment

What's being done in <u>other countries</u>…

- In Finland, remote and sparsely populated areas must be guaranteed reasonably-priced fixed-line broadband connections, according to the top civil servant at Finland's Ministry of Transport and Communications.

- Spain's rural Basque County is leading the way in rural broadband access — with almost all its more than 2.1 million residents with access to basic broadband connectivity. An innovative government program called KZ@Banda Zabala provides broadband infrastructure throughout the Basque region, covering more than 4,500 square miles. The government venture utilizes a public-private partnership approach. The government provides the communications network, land space, and the customer premise equipment; while the operational maintenance of the project is run by a private telecom company. KZ@Banda Zabala has proven to be a success — many rural schools now have access to broadband; small and medium-sized companies have extended their businesses; small town city halls have started participating in e-administration programs; new startup businesses have emerged; and tourism is up.

- ***Rural Ottawa Goes Wireless***: Rural residents of Ottawa, Canada will soon be hooked up to the information superhighway. Like most rural areas, Ottawa's rural regions have a low population density, increasing the cost of providing DSL or cable broadband services due to large capital infrastructure costs. A Motorola-based fixed wireless broadband platform has been selected to cover the entire rural Ottawa market. Both line-of-sight and nonline-of-sight technologies are planned, with the use of 20 to 30 towers to deliver wireless broadband services to rural homes. The proposed service rates range between $30 and $50 for residential service and between $60 and $150 for business and enterprise packages.

Current Approaches to Rural Broadband Deployment

What's being done in other countries...

- ***Rural Wireless Internet Network Working in Denmark***: Djursland is a rural region located in the middle of Denmark and home to a successful, affordable rural wireless Internet Network — **DjurslandS.net** — one of the biggest non-commercial rural wireless Internet networks in the world, according to *Government Technology*. **DjurslandS.net** could be the answer to leveling the play field and providing affordable broadband deployment in rural areas across the world. What makes **DjurslandS.net** different is, it is run solely by volunteers — they are passionate about sharing their experience and knowledge to help rural communities around the world build their own wireless networks and bridge the growing digital divide. The group has set up the Djursland International Institute of Rural Wireless Broadband (DIIRWB) to teach the lessons they have learned in building a successful rural wireless community network. **DjurslandS.net** is based on an Internet connected optical fiber ring all around Djursland and bandwidth rented from commercial Internet Service Providers. Each of the ten community networks on Djursland has access to this optical fiber ring in their biggest village, the bandwidth is spread out wirelessly — point to point — by directional antenna links that are placed on towers, silos or high buildings in the central villages. From there it is again wirelessly spread — point to point — by directional antennas pointing in different directions to more distant villages. This splitting structure is repeated several times until all villages get their wireless backbone connection. From each of the connection points of this web infrastructure, the bandwidth is then spread locally by omni directional antennas to directional antennas on the roofs of the houses — point to multipoint. Amplification of radio signals with cheap antennas make it possible to use this kind of equipment for a wide/vast area network. To become a user in one of the community networks on Djursland, a household pays a one-time fee of $350 for the equipment, and pays a monthly $17 for full-time broadband access (2-7 Megabit/sec). The broadband access payable to the ISPs is shared by all the member households, so that each member can get unlimited full-time access for a modest monthly fee. Djursland has been in operation for four years. More than 5000 rural households, institutions and firms have joined the "landscapenet". For the complete article, visit http://www.govtech.com/dc/123811.