Switchboard in the sky

CHESTERHILL, a tucked-away village in Ohio's Appalachian southeast, has been on technology's periphery for years. Its 312 residents have limited cellphone service and no broadband Internet service. The town's antiquated telephone lines struggle to handle minimal Internet speeds for those who do dial up. But thanks to a rural technology grant from the American Distance Education Consortium and a network built by Ohio State University's Information Office, residents are set to go high speed wirelessly. With a satellite receiver mounted at their library, and a broadcast antenna on the village water tower, Chesterhill, where 20 percent of the residents live below the poverty line, now has a 1.5-megabit Internet pipeline in the air.

J. Emilio Flores for The New York Times
Dwight Lomayesva, on the tower, and Mihael Peralta maintain Wi-Fi equipment on the Pala Indian Reservation in San Diego County.

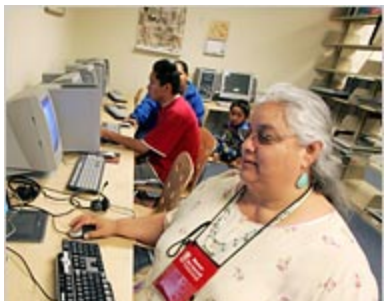
Local governments across the country are getting into the wireless Internet business. Communities left behind by the high-technology revolution of the last two decades view municipal networks as an affordable means of renewing their economic competitiveness and a way to bridge the digital divide between technology haves and have-nots.
Big cities and their suburbs see potential in municipal Wi-Fi, too. Systems are being developed in San Francisco, Philadelphia and Chicago, while last week Suffolk County on Long Island announced it was planning a network that would reach 1.5 million people spread over more than 900 square miles.

The new programs have put local governments into the telecommunications arena, where they sometimes work with conventional service providers and sometimes compete with them.

Many telecommunications providers are resisting such community networks, particularly when they overlap with the carriers' own service territories. Arguing that they are better suited to the task than their municipal rivals, telecommunications companies are bidding to manage civic networks. At the same time, industry-friendly legislative proposals at the state and federal levels threaten to limit municipal control.

Chesterhill's wireless network, which began service last month, has sparked excitement in the village and already led to several new community programs. The library will offer higher-education courses through regional colleges; the volunteer fire department will work with online distributors for discounted equipment; and local businesses expect to set up Web sites.
Ann Horner, a lifelong resident of Chesterhill and owner of the Posy Place, a flower shop, said she planned to discontinue FTD floral service and manage her own customers online. "I can keep that 20 percent, and my customers can get their full value," she said.

Municipal wireless networks are cheaper to build than cable or fiber- optic networks and are easier to deploy. According to one study by muniwireless.com, an industry Weblog, more than 120 such networks are up and running around the country, including some that allow public access and others that are exclusively for city services. Nearly 60 other cities and towns have requested proposals from vendors or taken steps toward creating networks.



J. Emilio Flores for The New York Times
Juana Majel-Dixon online at the Pauma Indian Reservation, one of 14 reservations in San Diego County, Calif., with high-speed service.

Rollouts of municipal networks in major metropolitan regions like San Francisco and Philadelphia have attracted attention, but development of community wireless networks holds even greater promise for out-of-the-way and poorer areas. For these smaller cities and towns, the networks are a tool for more efficient municipal operations and a way to provide inexpensive Internet access to residents who could not afford it.

A case in point is the Tribal Digital Village, a high-speed network linking 14 remote Indian reservations spread across 250 square miles of mountains and valleys in San Diego County, Calif. The network operates by solar-powered antennas, which relay signals between tribal settlements as far as 26 miles apart. The mountaintop backbone attains transmission speeds in excess of 45 megabits a second, which is equivalent to the speeds used by Internet service providers and major Web sites.

Broadband access has greatly improved communications on a swath of reservation land that still lacks full telephone service — and in some places even water and electricity.
Michael Peralta, a descendant of the Rincon Band of Luiseño Indians and the network's administrator, regularly scales the reservation's mountains to install and maintain the equipment, sometimes with helicopter assistance. Mr. Peralta says the newfound connectivity has quickly changed life on the reservation.

"There are elders who a little while ago didn't know what a computer was," he said. "Now they bug me whenever they can't get to their e-mail."

More than a social services project, the Tribal Digital Village is also a potential revenue source for the tribes. "There are million-dollar homes out there, and they can't get broadband," Mr. Peralta said. "We're looking at a new business plan that could provide broadband to those homes as well."

To speed the process and ease network responsibilities, some communities have turned to private companies for help operating municipal wireless intranets and providing Internet access to the public.
Several approaches are being tested. Philadelphia established a nonprofit corporation in 2004 to plan its municipal network. It contracted with the Internet service provider EarthLink to manage the infrastructure and make subsidized access available to the public, although the city has yet to finish plans or begin building the network.

In San Francisco, the city selected Google and EarthLink to offer tiered levels of wireless service. Google will provide free public access at near-dial-up speed, paid for by in-browser advertising, while EarthLink will charge around $20 a month for faster, ad-free service. It is unclear when the network will be completed, and last week a local politician threatened to block the arrangement for lack of public comment.

In Suffolk County, the plan announced last week calls for a comprehensive countywide network for use by the government and the public. Sharon Cates-Williams, Suffolk County commissioner for information technology, said that officials were evaluating how to pay for the system.
"It's a little too early to tell what we're going to do," Ms. Cates-Williams said. She added that she would look at other cities' business plans for ideas, and expected proposals from providers by the

end of the year. "I want something that is not going to have any expense to the taxpayer, whether that's public or commercial or a combination."

Chicago announced in February that it would build 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.
After unsuccessfully petitioning Verizon to bring broadband to their community, town officials in Scottsburg, Ind., decided to run their Wi-Fi network like a public utility. Scottsburg charges home users $35 a month for access to a 512-kilobit-per-second data stream (comparable to residential DSL service).

Some municipalities charge nothing at all. St. Cloud, Fla., where the city-led municipal network is among the showpieces of the community wireless movement, was the first to install a free citywide network, paying for it with money saved by administrative efficiencies generated by the network itself.

Glenn Sangiovanni, St. Cloud's former mayor, rallied for the network. "We had a true need for economic development," he said. "We needed a hook, and looked at making this a tech-savvy community."

Mr. Sangiovanni said that the rising cost of broadband service was the best argument for the public network. A study by the city showed that 47 percent of the residents were paying $450 a year for broadband, a third more than the average household's city tax bill. In all, nearly $4 million in broadband fees was leaving the community every year, Mr. Sangiovanni said.

"What if we could keep those dollars here, and spark the local economy with this project?" he said.

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 cellphone service to city workers. As of April 20, 45 days after it began service, 36 percent of the city had logged nearly 192,000 hours online. The network will not only help increase the efficiency of existing systems, officials say, but it will also help develop new services in health care, education and public safety.

"We're going to be doing things with public safety, and mounting video cameras in parks so our police force won't have to be everywhere in order to keep the city safe," said Howard DeYoung, director of information technology for St. Cloud. "This is going to open up performance dramatically."

When St. Cloud was considering its wireless plan, it hired MRI, a branding and consulting company, to hold public meetings on the subject to build support.
"We told them that this was no more expensive to install than a roadway intersection," said Jonathan Baltuch, MRI's president.

Despite having a free wireless network in St. Cloud, Mr. Baltuch said, there is still an option for existing providers there to sell better offerings. "Their opportunity is to deliver 20-megabit, or even 100-megabit service, to offer a luxury service to premium clients," he said.

Established telecommunications companies, meanwhile, argue that they are better equipped than local governments to provide the infrastructure for city wireless networks.

"In many cases, it's a much more effective solution to work with a service provider," said Jason Hillary, a spokesman for AT&T, which has bid on city projects in Houston and Grand Rapids, Mich. "We have infrastructure in a local level and at a backbone level, and we're updating the networks on a daily basis."

In some cases, industry spokesmen say, there is no need for municipal networks at all.

Link Hoewing, vice president for technology policy at Verizon Communications, said that carriers like Verizon are already expert at providing broadband service. "Where there's a lack of broadband, it makes sense for communities to take care of this," he said, "but in urban areas, we believe the private sector already responds well."

Mr. Hoewing said there was a role for community hot spots, however, in places like libraries and city halls, as well as in rural communities beyond the carriers' reach. "We have not supported outright bans on municipal Wi-Fi networks," he said.

Yet state and federal legislators are pushing for just that. Telecommunications companies and cable television providers are supporters of laws that could hamper cities' abilities to deploy networks, both wired and wireless. Fifteen states have passed such legislation.

Two federal bills introduced in 2005 threaten to rein in municipal broadband projects. The Preserving Innovation in Telecom Act, introduced by Representative Pete Sessions, Republican of Texas, and the Broadband Investment and Consumer Choice Act, sponsored by Senator John Ensign, Republican of Nevada, would limit public services' ability to coexist with private providers. John Eger, professor of communications and public policy at San Diego State University and a former director of the White House Office of Telecommunications Policy, said such legislation could backfire if telecommunications companies shut out their largest customers, cities.

"Providers don't want a partnership, they want to provide it all by themselves," he said.

Mr. Eger faulted the federal government for failing to curtail the companies' influence over policy.
The Congressional battle may be shifting. Another new proposal, the Community Broadband Act, sponsored by Senators Frank R. Lautenberg, Democrat of New Jersey, and John McCain, Republican of Arizona, would protect municipal broadband programs as long as the public providers did not discriminate against private ones. And last week, the House of Representatives defeated a proposed amendment to another communications bill that would have made it easier for supporters of incumbent telecommunications providers to block rural Wi-Fi networks.

"I would hope the incumbents stand back and look at what they're seeing across the country," said Jim Baller, a lawyer in Washington who represents local governments in utility issues. "There is a way to view this situation as an opportunity."

Mr. Baller says that municipalities considering wireless programs can draw a lesson from history, and likens the modern wireless movement to the rural electrification movement of the late 1800's. Then, communities beyond the reach of the electric companies took control of their electric futures and struck out with their own power plans.

"And they were successful," Mr. Baller said. More than 2,000 of the original electrification groups still exist in rural communities and big cities like Los Angeles.

"There are a great many parallels," he said. "Broadband is becoming today's platform for everything we do: economics, education, safety, medicine and cultural enrichment. You can't blink this away."