GOVERNMENT TECHNOLOGY'S
digital communities
BUILDING TWENTY-FIRST CENTURY COMMUNITIES
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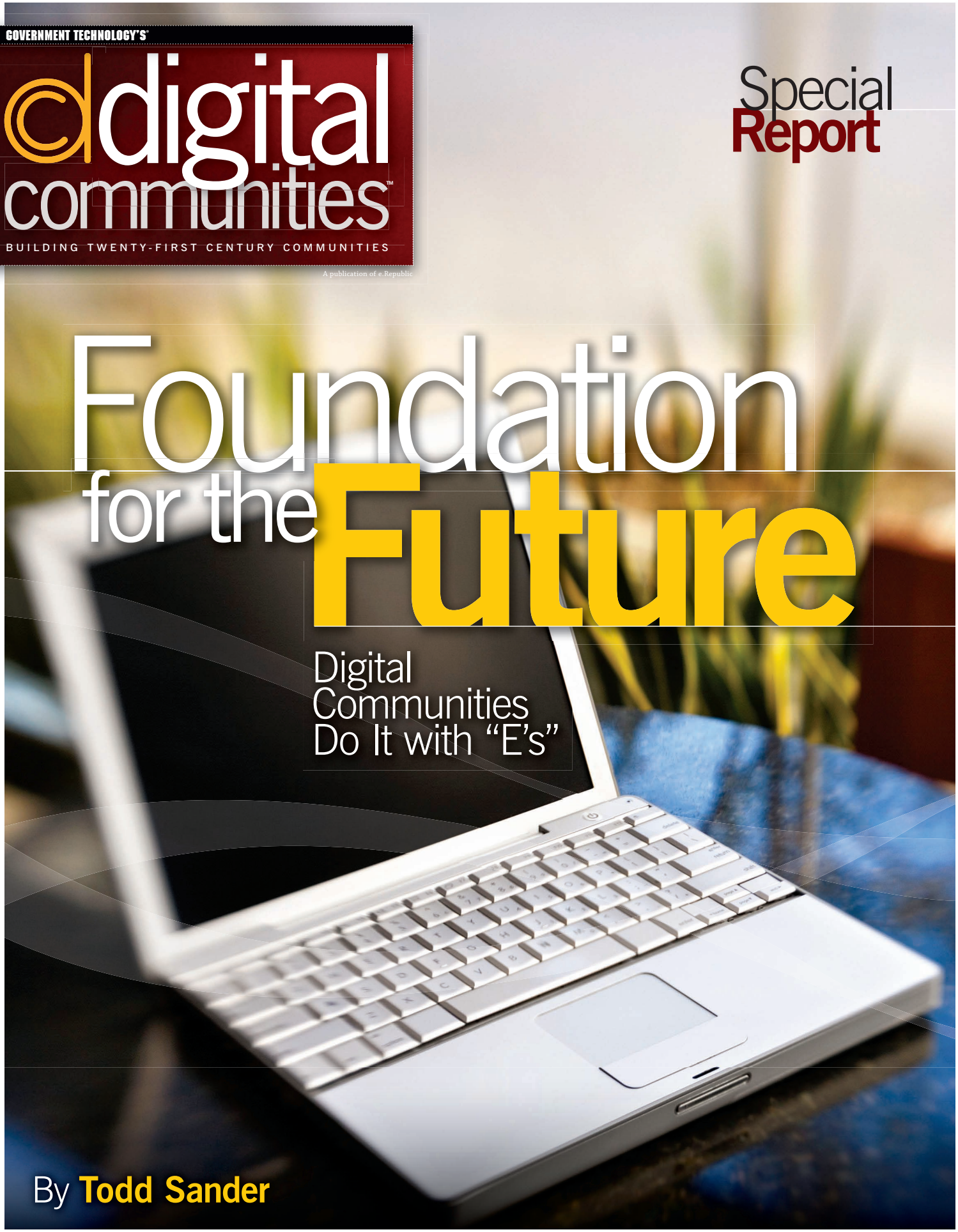
Special Report

# Foundation for the Future

## Digital Communities Do It with "E's"



By Todd Sander

For a community to think, act and prosper as a whole, it must unite the various communities within the community. Successful post-industrial cities with effective local leaders have found a way to fuse the economic, social, cultural, educational and governmental forces that have a vested interest in a community's success and vitality. Through coordinated effort, a shared vision is created and the unique talents, interests and investment potential of each group get focused on creating a future in which the whole is stronger than the sum of its parts.

Today "digital communities" use technology tools to come together like buildings: brick by brick, sector by sector, tool by tool with networks, computing infrastructure, devices, solutions and service applications tying it all together. Individuals, families, schools, businesses, nonprofits and governments address the common issues of emergency preparedness, governmental efficiency, employee expectations, economic development, environmental health, education and civic engagement within their communities. This creates a networked effect whereby the promise of the community increases when a new participant joins the effort. However, success requires leadership, vision, political will and resources.

Over the past 40 years, technology has been only one of many tools available, and governments and citizens have chosen whether to use it. We're at the point where information and communications technology have become essential building blocks of the community, and critical policy levers for local government officials.

Fortunately many communities now have the tools to create the collective network necessary to secure their future in an increasingly competitive and global world. But there is no time to waste.

The National Association of State Budget Officers recently reported that fiscal 2007 has yielded stable financial conditions for the states, and by

extension, local governments. Though most states expect a steady fiscal 2008 with reasonable revenue growth, a few already see some slowing of their revenue. Across the country, estimated state general fund expenditures in fiscal 2007 totaled approximately $616 billion, an increase of 8.6 percent from the previous year. The 29-year historical average rate of growth is 6.5 percent.

In fiscal 2008, governors' budget proposals show a lower expected growth rate of just 4.2 percent, with expenditures expected to total $642 billion. Pressures will likely increase in health care, criminal justice, employee benefits and pensions, and physical infrastructure — in part to make up for the lingering effects of cuts made in previous years.

Even so, demand for digital infrastructure is increasing. According to a 2006 MuniWireless research report, local governments intend to spend more than $3 billion over the next four years to create or expand municipal wireless networks. The Center for Digital Government (CDG) — a division of e.Republic, the publisher of *Digital Communities* magazine — identified more than 500 solicitations from state or local government in the past 12 months for mobile or wireless networks, devices or support services. Investment is driven by the need for additional public safety applications like video surveillance, mobile communications and reductions in public service work force due to retirements. Increased pension and benefit costs also are resulting in the need for a smaller but more connected and mobile work force, and creating a general trend toward public-sector infrastructure consolidation.

This public-sector investment is a natural extension of and response to industry-leading private-sector investment since people's expectations of government are influenced by their dealings with the business community. According to *Enterprise Mobile Adoption: A Corporate Conundrum*, a 2006 report by the Aberdeen Group — a research group focused on technology marketing — 80 percent of top-tier companies surveyed expect to purchase new PDAs with wireless access; 60 percent plan to purchase wide-area wireless data cards; and 54 percent plan to purchase new mobile phones for sales, marketing and customer service departments. As smaller devices with faster processors, better screens, more functional software, and even dual-mode (Wi-Fi and cellular) operation come to market, researchers believe the corporate enterprise market will advance with more users being more mobile than ever before.

The conclusion of a recent CDG white paper, *Living in a Wireless World*, confirms the trend for those engaged in supporting government operations: Citizens' habits are changing, and today's on-the-go population doesn't want to be tied down, even when conducting

business with government. Citizens have stepped out of line, and are moving past going online, beginning to expect no-line access through wireless services.

Flood, fire, earthquake, hurricanes and the growing threat of terrorism are but a few of the things that make providing public safety more difficult.

## Emergency

For any community to be successful, it's fundamental that its members be secure in their person and property. It's such a vital concept that it's commonly reflected in state constitutions. James Madison explained in *Federalist No. 51* that the very reason governments are established is because in the absence of government, "the weaker individual is not secured against the violence of the stronger."

In modern communities, it isn't simply the actions of the stronger against the weaker that endanger people and civilized order, but natural and man-made disaster and calamity as well. Flood, fire, earthquake, hurricanes and the growing threat of terrorism are but a few of the things that make providing public safety more difficult.

Communities that find ways to successfully meet the challenges place information and communications technology at the forefront of their efforts. A flexible digital infrastructure gives public officials the opportunity to prevent crime and respond to natural disaster.

As an example, video surveillance technology is becoming a common component of public safety operations in many cities. By some estimates, there are more than 30 million surveillance cameras in the United States, shooting 4 billion hours of footage weekly. Video surveillance has grown into a $160 billion global industry, especially after the U.S. government began investing in the technology to boost homeland security efforts in the wake of 9/11.

New York City has created a network of thousands of cameras citywide, including locations in subway stations, private businesses and on traffic signals. The city's police department operates its own 3,000-camera network. Chicago also built a "Homeland Security Grid" of 2,250 cameras — with plans to add more in the future — as have Baltimore and New Orleans, to name a few.

Municipalities rely on Wi-Fi networks to greatly reduce the cost of deploying video cameras, and the success of such installations leaves little doubt that the number of video cameras will increase dramatically in the next decade, especially in cities that already have a supporting network infrastructure.

Those that don't will likely find themselves negotiating with service providers to identify an affordable and sustainable system funding model. The early, and by most accounts overly optimistic, view that municipal networks could be built and run solely on the proceeds from advertising has been overtaken by reality. Now companies like Atlanta-based EarthLink and California-based MetroFi increasingly require local governments to commit to paying for services before wireless networks are built.

Paying a fair and reasonable rate for service isn't necessarily a bad thing. By guaranteeing network providers a consistent revenue stream, cities can better ensure that the wireless networks they rely on will remain viable and available. Paying for service also changes the relationship from beneficiary-benefactor to a much stronger one of customer-service provider.

As investments in communication infrastructures are extended, the opportunity for creative experimentation also increases. In Franklin, Mass., a town of 30,000, the police department launched a series of public safety podcasts to help engage and inform residents. Last year, the department began using YouTube to post surveillance video from convenience stores and patrol cars, annotated with a case file number, to show suspects in several investigations. Through combining and extending the assets of public and private security technology, popular social networking tools and more traditional investigative resources, the department has engaged the community in new ways, improving community safety and deterring crime.

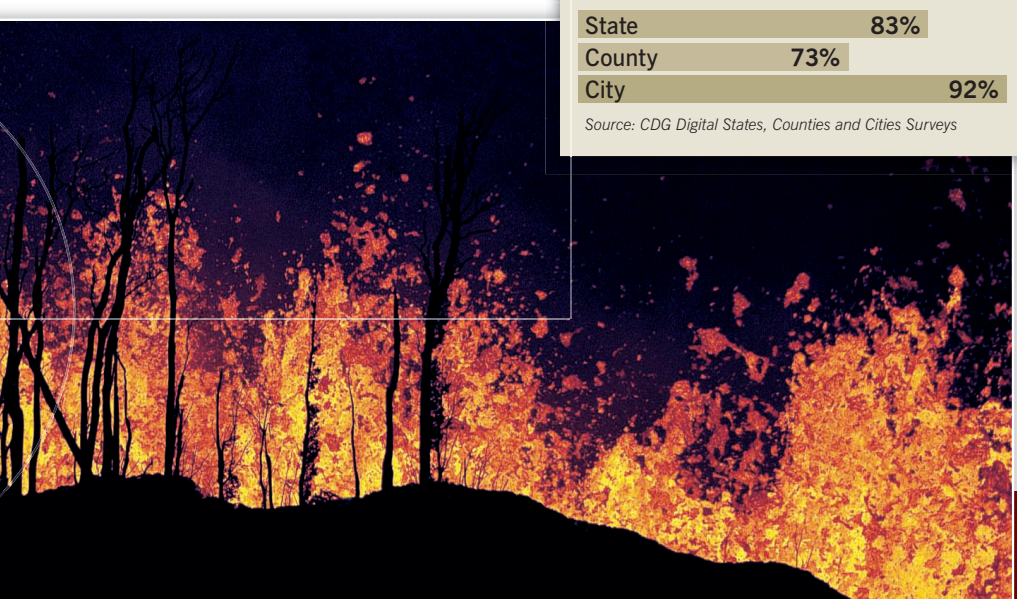
New York Gov. Eliot Spitzer recently announced two new initiatives that will provide digital emergency alerts to the public. One of these new systems, NY-ALERT, lets state and local governments provide notifications about

### On the Alert

Digital Delivery of Emergency Information and Alerts




*Source: CDG Digital States, Counties and Cities Surveys*



severe weather, advisories on road closures, and other emergency response information from federal, state and local authorities to select groups through a secure Web portal.

New York isn't alone in using technology to connect with the public. The most recent results from CDG surveys of states, counties and cities show an impressive commitment to real-time electronic alerting. Eighty-three percent of responding states push out emergency information electronically, as do 73 percent of counties and 92 percent of cities, and these numbers are likely to increase.

## Efficiency

Like community safety, the need for demonstrated efficiency is a constant for government. "Do more with less," "no new taxes" and "eliminate waste and reduce bureaucracy" are all phrases and campaign promises familiar to public servants. There will never be enough resources to do everything that can or should be done, so it falls to elected and appointed leaders to make choices on behalf of the communities they serve.

More and more, these leaders turn to IT to secure efficiencies and performance improvements. For employees, mobile technology means less time in the office, which translates to more time spent in the community dealing with the people who rely on government service. Mobile public-sector staff — like firefighters, inspectors and social service workers — benefit by accessing centralized information remotely and communicating more efficiently.

When building inspectors have full access from the field to the information back at the office, the inspection process becomes faster and more efficient. This improves not only the speed and efficiency of inspectors, but also benefits the construction industry and homeowners. Building permits account for 70 percent of the transactions between city government and business. It's also one of the most cumbersome and difficult areas to administer because it requires multiple agencies and government employees to coordinate multiple reviews and approvals of documentation, often resulting in long, expensive delays for developers. By relying more on its wireless infrastructure, Corpus Christi, Texas, expects to save $85,000 on building inspection overhead, $1.6 million through automated meter reading and $500,000 in eliminated cell phone charges.

Cocoa Beach, Fla., initially implemented a wireless network providing police officers with Internet connection for in-vehicle laptops, but it didn't take the city long to move beyond its initial law enforcement implementation. Using the same infrastructure, city officials were soon able to remotely perform tasks like turning on lights at the city skate park or turning off the irrigation system. Parking meters equipped with wireless radios and vehicle sensing technology could soon use the city's wireless network to notify field enforcement personnel of the location of vehicles parked at expired meters.

In digital communities, the concept of efficiency is expanding beyond simply streamlining bureaucracy. Some communities also allow people to efficiently participate in the public process and meet their civic obligations.

The Municipal Court of Phoenix recently became the city's newest hotspot facility by offering public wireless Internet in its Jury Assembly Room. Jurors can use their laptops, PDAs or other wireless-ready devices to access filtered wireless Internet while they await their turn in the jury selection process. On an average day, 85 people appear at the court for jury service, and many of these people depend on Internet access for work and personal needs. They can now fulfill their civic obligation with less interruption to their normal routine.

### Mobile Work Force

| Metropolitan Statistical Area | Percentage of Telecommuters to Transit Commuters |
|---|---|
| Oklahoma City | 4.67 |
| Nashville | 3.20 |
| Kansas City | 2.62 |
| Tampa | 2.38 |
| Indianapolis | 2.23 |
| Raleigh | 2.06 |
| Phoenix | 1.85 |
| Dallas | 1.67 |
| San Diego | 1.29 |

*Source: Reason Institute calculations from 2000 U.S. Census Data*

## Employees

Digital communities must also plan for and consider the people who provide service to the public. The number of smart, young people ages 25-34 with a four-year college degree who choose to live in a community is an increasingly important benchmark of success, and they represent the public officials of the future.

They have been raised in the information culture and have a very different set of career goals and expectations than their predecessors. They very much believe that work is something you do, not someplace you go. Digital communities are making the necessary

investments to support work force mobility and telework as strategies that will allow tomorrow's public servants to balance their professional and personal lives in the way they will demand.

The transformation is already under way in many places. Census Bureau data shows that telecommuters outnumber transit commuters in places like San Diego, Dallas and Phoenix. They outnumber commuters by more than two to one in places like Nashville, Tenn.; Kansas City, Mo./Kan.; Tampa, Fla.; Indianapolis; and Raleigh, N.C., and almost five to one in Oklahoma City.

To be an attractive employer in the future, governments must continue restructuring themselves to take advantage of technology's potential to change the historical status quo. There's no time to lose.

A CDG white paper, *Telework 360*, concludes that the next few years will see a transformation of public service the likes of which hasn't occurred since the inception of the Great Society in the 1960s. *The Washington Post* reports that the federal government's Office of Personnel Management estimates that 60 percent of the government's 1.6 million white-collar employees and 90 percent of about 6,000 federal executives will be eligible for retirement over the next 10 years. The projected high-water years will be 2008 through 2010, as baby boomers and others leave public service. The numbers may be even more significant for state and local government.

Cities such as Tucson, Ariz., are making the necessary operational changes to the way government employees work. For example, as community members are able to apply for and pay for licenses and permits online, the people who spent their days managing traffic at a counter, researching account history or keying data into systems can take on more complex and higher-value work.

The Kane County, Ill., Coroner's Office coupled mobile technology with new software applications to create a system that transforms handwritten notes via a tablet PC into typed documents that are uploaded directly into the county database. By streamlining the data entry process for 150,000 forms a year, staff members can populate multiple forms by entering data only once. Via a secure wireless network connection, data moves from the tablet PCs to the office within seconds, ensuring both information privacy and near-instant information access. And citizens can learn the results of Coroner's Office investigations much more quickly.

## Economy

Digital communities require a digital infrastructure, and for many, that begins with wireless. A report by independent market analyst Datamonitor says the municipal wireless trend is positioned to explode in the UK and the U.S. over the next five years as local governments and Internet service providers recognize the economic and community benefits these networks offer. Benefits of municipal wireless networks include making free broadband wireless Internet access available to mobile professionals and citizens, on-the-spot police and fire department access to time-sensitive information, lower communication costs for government agencies and improved reputations as "cutting-edge" cities.

According to *The Future of Municipal Wireless Networks*, the amount spent in the U.S. and UK will increase at a compound annual growth rate of 48 percent from $900 million in 2007 to $6.4 billion in 2012.

Many networks are being deployed in partnerships between government and the private sector, and responsibility for operating the network falls to the private sector. Although governments may see a municipal wireless network as part of an evolving economic development strategy, the pressure is on private partners to generate financial return for their owners or shareholders today. The long-term economic-development view and the more immediate corporate reality of profitability can go hand in hand, but first the unfortunate idea that a municipal wireless network is simply "free Internet access" must be done away with.

Municipal wireless networks can provide much more than free Internet, and to be successful and sustainable, they must.

Municipal wireless networks can provide much more than free Internet, and to be successful and sustainable, they must. When a network is Internet protocol-based, covers an entire city and is built to provide robust services, it creates a foundation for advanced applications and services like video security, automated meter reading, mobile land management, and business and tourist access.

Wireless infrastructure is an important component of a digital community strategy, but it isn't the only component. In the best cases, it complements wired infrastructure. For example, Westchester County, N.Y., created Westchester Telecom, a 700-mile fiber backbone owned in public-private partnership that links county offices, town halls, schools,

Technology allows education and government officials in digital communities to improve services to a foundational component of community life: families and children.

libraries, hospitals, police, fire departments and even sewer pump stations throughout the county with voice, video, high-speed data and Internet services.

The network is a centerpiece of the city's economic development strategy, providing dozens of commercial office buildings with the same capabilities government receives and making it possible for the county to convince companies to locate major facilities in Westchester.

Sometimes economic development becomes economic self-defense. A few years ago, the mayor of Scottsburg, Ind., discovered that Scottsburg and Scott County were on the brink of an economic crisis. A local military supplier nearly lost a million-dollar contract because it couldn't e-mail a proposal on time. A local car dealer and its 72 employees were about to leave town because mechanics couldn't download service manuals. Within four months, the mayor and a small team had put in place a broadband-wireless infrastructure for businesses and residents, thereby staving off economic disaster.

## Environment

When thinking about a digital community and the promise and prosperity technology can bring, it's sometimes easy to lose sight of the more unpleasant but very necessary realities of community life.

Take, for example, Roanoke, Va., where operators of the regional landfill discovered a problem when the solid waste disposal facility was required by the U.S. Environmental Protection Agency to monitor the potentially dangerous liquid produced from the decomposition of waste within landfill storage tanks.

Several times a day, an operator had to drive a half-mile to the tank, take a manual reading and log the data by hand because an old buried line had failed. Because of the distance and constantly changing landscape of the landfill, laying conduit and running a new wire line was going to be expensive and impractical. Landfill operators knew that as the landscape changed, they would have to dig up the conduit and place it in a new location, leaving no communications link across the site during construction.

The answer to their problem was a wireless device that transmitted the critical data from storage tanks to a display panel in the main control room.

New York City had a different type of problem. The New York City Housing Authority (NYCHA) is the largest public housing authority in North America and provides approximately 179,000 affordable apartments in 2,653 buildings to low- and moderate-income residents throughout the city's five boroughs. Reducing energy consumption and emissions, as well as containing NYCHA's rapidly rising utility costs, are critical priorities. In addition, there's a need for housing officials to be automatically notified of emergency conditions at its 195 primary heating plants and from critical building infrastructure components, such as elevators.

A networked remote monitoring solution that sends status messages and alerts via wireless technology proved to be the answer, and dramatically improved living conditions for residents while saving NYCHA more than $20 million a year in reduced staff and fuel costs.

## Education

Technology allows education and government officials in digital communities to improve services to a foundational component of community life: families and children.

In Milwaukee, public school officials recently announced the extension of free Internet access into homes of students and faculty members through Worldwide Interoperability for Microwave Access (WiMAX) technology, which broadcasts signals without needing a clear line of sight. WiMAX uses TV channels that the FCC allocated for educational purposes and can provide Internet access to students or families who can't afford monthly charges. The deployment will be one of the first in the nation by a school system. The initial implementation will cover approximately five square miles and is scheduled to be operational in time for the start of the 2007 fall term.

In Floydada, Texas, 50 miles northeast of Lubbock, a 2004 grant from the Texas Technology Immersion Pilot placed a Wi-Fi-ready laptop in the hands of every sixth-, seventh- and eighth-grade student, allowing them to take their new computers from class to class and home and at the end of the day. However, nighttime brought several small blue-white glowing spots reflecting against the exterior walls of the junior high school. Not sure how to respond to this new phenomenon, neighbors called the police. Officials found out that the mystery lights were the glow from laptop screens of students gathered around the school building after dark to catch the wireless Internet signal.

In Sarasota County, Fla., county and education officials work together under a consolidated organizational structure and communitywide technological infrastructure that supports all government

and educational institutions within the county. Under a single CIO, the county is tying fiber networks into one community network instead of dozens of networks maintained by separate institutions. Technology has also helped increase parental awareness and involvement in their children's education, improve communication and reunite the triumvirate of teacher, student and parent.

## Engagement

Digital communities choose to make the investment necessary to inform, consult, engage and collaborate with citizens in ways never before possible. For many, that effort has initially taken the form of 311 networks.

New York City has long been a leader in this area, and its 311 Customer Service Center recently answered its 50 millionth call — demonstrating the importance and utility of the four-year-old system that consolidated the operation of more than 40 separate call centers and hotlines that were previously represented in 11 pages of government listings in the phone book. Today, the call center answers more than 40,000 calls daily, with an average wait time of just five seconds.

In the coming year, 311 will begin providing an added choice to New Yorkers by allowing customers to manage their interactions with 311 on the Web via NYC.gov and ultimately allowing interaction from personal mobile devices.

Portland, Ore., has worked to actively engage the community through the eVolvement project. This effort emerged from a desire to connect residents at a regional level with local government and with their neighbors. The resulting Web site, called North Portland Online, provides residents with various effective and convenient tools for getting news and information specific to their neighborhoods and to collectively solve problems.

Residents can post questions for city staff or their fellow neighbors and share information about local events, public safety and other neighborhood issues. City staff use the forum to inform residents of budget hearings, area construction schedules, crime alerts and other community issues, and community residents share their needs, opinions and desires with their government.

As many are learning, successful civic engagement requires more than just the purchase of new tools. It requires a commitment to change the way government views its role and responsibilities. Engaging the public in the governance process requires an honest interest and investment by elected officials, appointed leaders and operational staff. Average citizens won't waste their time presenting their views if they feel no one who matters is listening.

Digital communities are those communities that use available technological tools to identify and confirm a community agenda and have the courage to engage the community in a shared vision, collaborative decision-making and collective responsibility for the future.

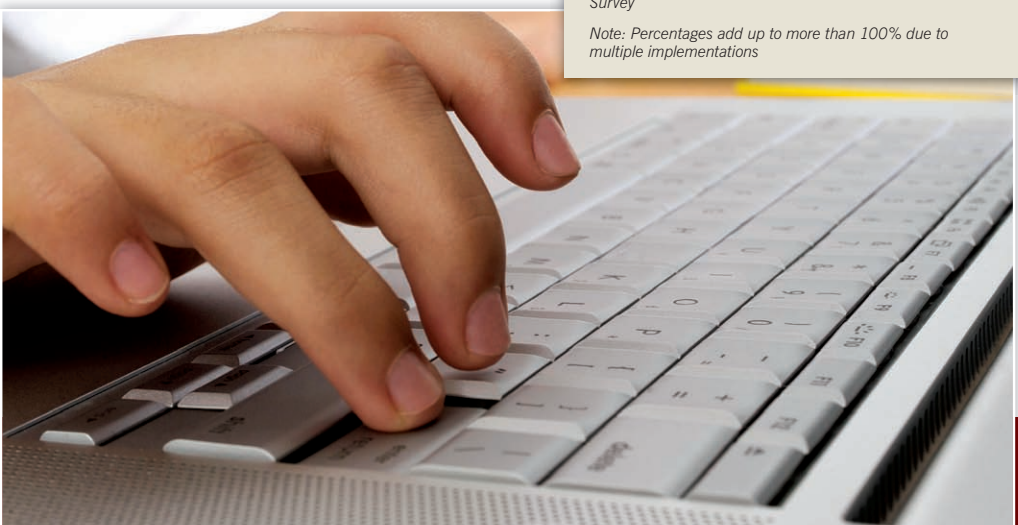
### Tech Trends

Municipal Wireless Infrastructure Deployment

| | |
|---|---|
| Wi-Fi | 77% |
| Broadband Cellular | 65% |
| Mesh Networks | 58% |
| WiMAX, WiWAN | 49% |

*Source: Center for Digital Government, 2006 Digital Cities Survey*

*Note: Percentages add up to more than 100% due to multiple implementations*



## The Future

Future opportunities look bright for companies offering products and services that support a community's ability to comprehensively meet the challenges brought forward by this digital age.

Responses to the most recent CDG *Digital Cities* and *Digital Counties* surveys indicate that 90 percent of counties and 94 percent of cities already rely on a wireless infrastructure to support some service delivery. Originally deployed to support public safety, many of those communities are just now beginning to fully explore the additional applications and functionality various wireless infrastructures can make available. Applications allowing utility meter readers, health and social workers, tax assessors, building inspectors and other field personnel to input data at the point of collection are providing an affordable way for growing communities to deliver service without adding a significant number of employees.

Almost all communities are making investments, but cities with populations of 30,000 to 150,000 seem especially well positioned to benefit from Wi-Fi, wireless mesh and WiMAX broadband installations and the associated applications. Because these communities have fewer other options, fewer stakeholders and less bureaucracy that must be involved than very large cities, progress is often easier and quicker. Although individual purchases in such communities may be smaller, the sheer number of these communities creates an important and viable market opportunity.

By working with industry now, governments of all sizes can ensure they have the systems and tools in place that will help them meet their service obligations in the future.

## Underwritten by: