



By Tod Newcombe

Ask someone to describe a digital city and they may mention Songdo, South Korea, a sustainable city built from scratch more than a dozen years ago.

About This Report

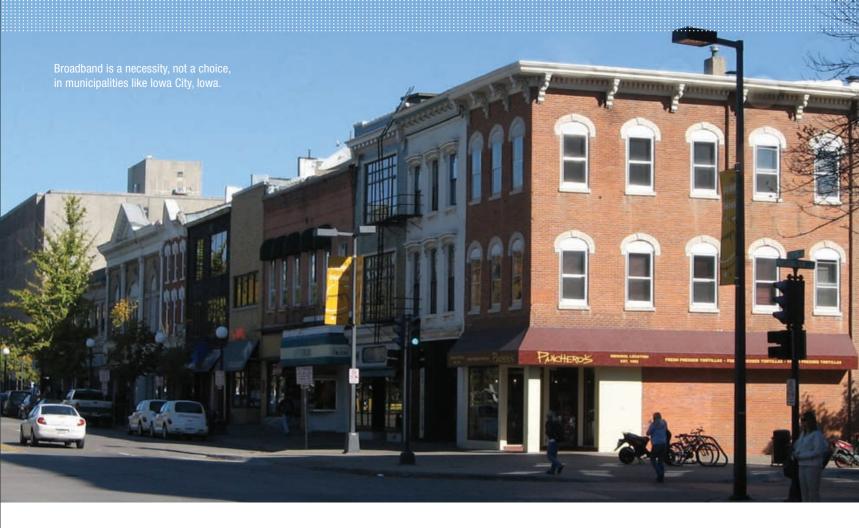
The Digital Communities Special Report, which appears twice a year in Government Technology magazine, offers indepth coverage for local government leaders and technology professionals. It is part of the Digital Communities program, a network of publicand private-sector IT professionals working to improve local governments' delivery of public service through the use of technology. The program — a partnership between Government Technology and e.Republic's Center for Digital Government - consists of task forces that meet online and in person to exchange information on important issues facing local government leaders and technologists.

Or, they may reference Rio de Janeiro, Brazil, with its Centro de Operacoes, a high-tech control center run by the city government that can monitor everything from crime to traffic congestion to water levels on streets after rainstorms. Similarly, they might suggest Santander, Spain, where thousands of sensors do everything from counting the number of cars in parking garages to deciding when to turn on sprinklers in parks to brightening streetlights when they sense a car driving down a street late at night.

Those, of course, are the eye-catching, headline-grabbing examples of smart cities. But for most cities and the public officials who run them, a digital city is something more mundane: an open data platform; an enterprise geographic information system; a multi-channel customer relationship management platform for customer service; analytics tools to digest large streams of data. And while these technologies may seem routine — GIS has been around for nearly 30 years — they have been evolving to where they have become integral and essential in fulfilling the goal of digital cities, which is to improve the lives of their citizens.

With urban areas continuing to grow at a substantial rate — from 30 percent of the world's population in 1930 to a projected 66 percent by 2050, according to the United Nations — getting the urban experience right has become paramount. To help understand the building blocks to a successful digital city, this report looks at five key technologies — broadband, open data, GIS, CRM and analytics — and provides a window into how they are helping city governments cope with economic, educational and societal demands.

The good news is that these essential technologies are getting cheaper, faster and better all the time. But technologies like these still cost money, need talent to run them and are dependent on the right policies if they are going to succeed. In other words, digital cities need smart thinking in order to work.



Broadband: 21st-Century Infrastructure

Iowa City, Iowa, is a modest-sized city, with a population of just over 73,000. But what makes it stand out is the fact that it ranks fifth in the nation overall when it comes to the percentage of households that subscribe to broadband. With 86 percent of its homes connected to high-speed Internet, Iowa City outranks San Diego, Seattle and Washington, D.C., to name just a few of the best-connected cities in the country, according to a survey by the Brookings Institution. Cities that have high levels of fast Internet connectivity to households reap more economic and educational benefits, according to Brookings: "There is no question that the Internet is a huge boon to the economy and society, but maximizing its potential is only possible if all individuals are online."

What makes Iowa City so special? It has an educated workforce that has a relatively high average household income and large numbers of technology workers, as well as people who

work from home; it's also a university town (University of Iowa); and it has fewer senior citizens compared to other cities of its size. Most importantly, it's a city where broadband is seen as a necessity, not a choice.

For decades, when it came to infrastructure and potential, the cities with a well developed network of roads, bridges, rail and subway lines, as well as good electrical and water utilities, were considered world leaders. Now, local governments are expected to have a digital infrastructure consisting of cable and fiber with deep penetration into every neighborhood, if they are to compete regionally, nationally and even globally. Broadband is now essential for 21st-century communications and commerce.

Take jobs. Broadband is the catalyst for economically competitive cities. America's 50 most research- and technology-intensive industries have added 1 million jobs since 2010, and these industries are disproportionately based in cities, Bruce Katz, a researcher with Brookings, told *The Economist*.

Education is another big reason why broadband infrastructure is critical for the ideal digital city.

A growing number of studies point to the fact that cities that lack wide adoption of broadband will struggle when it comes to educating and graduating students with the skills needed to advance in college or for sustaining an economy that is increasingly tech-driven. Local governments also have an opportunity to cut costs by creating more online services, but only if there's close to universal adoption of broadband in the community.

And that's where the problem lies with urban broadband infrastructure. Nationally, 75 percent of Americans had a connection to broadband in 2014, according to Brookings. But there's a great variation in connectivity across demographic groups and between metropolitan areas. While the San Jose-Sunnyvale-Santa Clara (Silicon Valley) area has the nation's highest rate of adoption at more than 88 percent, cities like Laredo, Texas, have adoption rates of less than 58 percent.

Then there's the speed factor. The Federal Communications Commission defines minimum broadband speeds as 25 Mbps for downloads and 3 Mbps for uploads, but 44 million Americans are more likely to experience download speeds of 4 Mbps or less. Meanwhile, closure of the availability gap between those who have broadband and those who don't appears to be slowing, according to the FCC. In other words, broadband progress has stalled.

To become the ideal digital city, urban areas realize their broadband infrastructure has to reach nearuniversal availability at speeds ranging from 100 Mbps up to 1 gigabit per second. Seattle commissioned a study on what it would take to implement a municipal broadband service for universal adoption, but balked at the \$480 million to \$685 million price tag. Still, other major cities continue to explore the idea of municipal broadband to make the Internet as universally available as water and electricity. Boston is considering the idea and, most recently, San Francisco studied what it would take to create gigabit Internet service for the entire city.

While San Francisco may be the largest city to contemplate this, it's not the only one. At least 48 cities have some kind of gigabit service available at residential rates, according to Highspeedgeek.com. Chattanooga, Tenn., is perhaps the most famous and largest of the cities offering gigabit broadband as a municipal service, but others provide very fast Internet service either as a municipal utility or through a provider.

For a long time, the major broadband providers have downplayed the need for gigabit Internet service in cities. But Google Fiber has begun to change the equation. The service, launched in 2012, has brought gigabit service to a handful of cities, including Kansas City, Mo.; Provo, Utah; Austin, Texas; and Atlanta, with plans to add service in San Antonio, Nashville, Tenn., and Charlotte, N.C. As a result, cable providers that dominate the

existing broadband infrastructure have begun to actively market their plans to provide gigabit service.

In February, a municipally owned electric utility in Huntsville. Ala.. announced that it would lease its fiber lines to Google Fiber, which would deliver gigabit service to residents and businesses starting in 2017. Some see the partnership as a game-changer in how municipalities provide broadband. "The Huntsville model changes Google's path to scale as it potentially decentralizes construction efforts to multiple cities," according to Brookings. The partnership will "decouple" ownership of the fiber network from providing Internet service, speeding up the delivery of fast Internet service. It's also expected to bring more municipalities into the world of gigabit service, as incumbent cable and telecom companies will compete to provide a similar service.

That's good news for cities, big and small, that need abundant, affordable broadband for the next generation of economic growth and education.

Open Data & APIs: Collecting and Consuming What Cities Produce

Nobody likes to see their streets dug up for some utility project. Worse, nobody likes to discover a new street project is slowing them down during a morning commute. In Los Angeles, where just about everybody drives, street projects are a nuisance, and when the work isn't well coordinated and timed it can be a major headache.

That's why the city government launched Street Wize. It uses open data so that city employees can see whether the road they want repaved is also scheduled for utility repair. Residents can also look up the same information and find out in advance whether a street they commute on is going to be partially shut down for a sewer repair.

Information like this has always existed in local governments, but there

have rarely been attempts to open up the data and publish it in a way that people, whether they are city employees or residents, can understand. But attitudes on making city data publicly available have undergone a sea change in recent years. Starting with calls to make government more transparent and information easier to disseminate, the idea has spread throughout the public sector. But its biggest impact, arguably, has been at the local level, where citizens interact with government most frequently.

GovLab, a research laboratory run by New York University, credits open data with changing our world in four significant ways:

- 1 / It has improved government primarily by increasing transparency and tackling corruption, but also by improving public services in new and innovative ways.
- 2 / It has empowered citizens by giving them information to make more informed decisions and to make it easier to mobilize socially, aided by new ways of communicating and accessing information.
- 3 / Unlocking data has fostered innovation and, more importantly, economic growth and job creation.
- 4 / It is playing an increasingly important role in giving citizens and policymakers new ways to assess problems while enabling civic engagement that has produced targeted interventions and enhanced collaboration.

Governments began making data openly available to the public through Web portals. These somewhat ad hoc efforts often brought mixed results when it came to the usefulness of open data. In some cases the data was still locked because of the format used (often PDF files). More importantly, cities failed to develop the proper application programming interfaces (APIs) that



Improving Service Delivery and the Citizen Experience

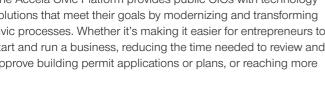
ocal governments are charged with maintaining safe, prosperous and healthy communities. Chief information officers (CIOs) play an important role in achieving these goals by implementing technology to improve service delivery and enhance the overall citizen engagement experience.

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America's broadband infrastructure

is considered to be overpriced and slow when compared to Internet speeds in other countries. Worse, it's far from universal. Nationally, 75 percent of households have broadband, and 53 percent of rural Americans lack access to even moderate-speed service. Critics of the country's broadband infrastructure say the lack of universal access to high-speed broadband is a drag on education and the economy.

"Think if we were at 75 percent for electricity or running water," Adie Tomer, a research analyst with Brookings, told *Governing* earlier this year. "With 25 percent of the population without broadband, it has ramifications for students who don't have access, for job seekers," he said.

Laying cable or fiber in the ground or on poles and connecting homes to the Internet backbone is an expensive proposition, holding back the goal of low-cost, universal adoption. But high-speed wireless might be the answer. Already a small but growing number of households rely entirely on 4G mobile networks to provide not just phone service, but data needs as well. The network has been around since 2010, and it adopted IP technology in a way that significantly boosted broadband access to mobile devices with higher speeds and an emphasis on streaming data rather than just transmitting voice communications.

Now, the wireless industry is stirring interest in 5G networks. While far from being a global standard, there's already growing excitement that it could take wireless broadband to a new level with speeds reaching 1 gigabit per second (and perhaps reaching 10 Gbps as the technology matures) and a latency of no more than 1 millisecond versus today's 4G latency of about 50 milliseconds, according to *The Economist*.

But it could take years before standards emerge. There's also a question of where the spectrum for 5G might come from, since today's wireless devices operate in a crowded part of the radio frequency, leaving little room for 5G. Stay tuned.



developers can use to consume the data and create value through new services.

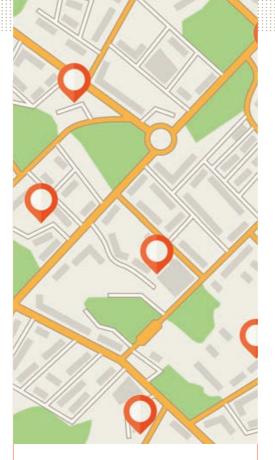
Initial efforts at creating APIs for open data were informal, often done as part of a hackathon. But as cities recognize how they can spur new forms of service delivery either at the desktop or, more significantly, on a mobile device, the pressure to formalize how APIs are developed has increased. And for good reason. APIs combined with open data have led to the creation of apps that put the "smart" in smart cities.

For example, a growing number of cities have launched bike-share programs. But savvy cities have supported software developers to create mobile apps that help guide bike riders in choosing the best routes to reach their destination. Well developed APIs allow a user to query data to find an answer.

But APIs are more than just a way to connect a user with data in an innovative way. They're also about functionality, empowering citizens to do new things more efficiently. One of the leading cities in API development is overseas. Barcelona, Spain, has developed a global reputation for publishing APIs across government departments that include transit, environment, land use and business data. The city also has an open source infrastructure platform that uses APIs to access sensor data that monitors temperature and air quality, garbage collection, parking and pedestrian flows.

The development of APIs for digital cities has become so important that the European Union launched an initiative known as the City Service Development Kit that fosters development of interoperable and uniform APIs for cities that can turn data from 311 systems into new types of services, and link transportation and geographical data for mobility solutions, as well as APIs that can provide location-based services for tourists.

In the U.S., several cities — including Boston, New York City, San Francisco and Seattle — have been aggressive about opening up their data and developing APIs. Philadelphia has led with its open



data as well, becoming one of the largest government users of GitHub, a hosting service for open source code management that has boosted collaboration and faster development of new software services that use the city's open data.

The importance of open data and APIs doesn't stop at the public good they create. Open data is increasingly seen as a powerful economic development tool. The consulting firm McKinsey estimates open data's economic potential at more than \$3 trillion in added value to the world's economy. GovLab's Open Data 500 is a list of firms that benefit from information published by the federal government.

But economic development doesn't start to flow when a city publishes data. The information has to be in a standardized format that companies can use, and it must be kept fresh. Cities also need to decide which data to publish. There are hidden costs to publishing open data and expenses can rise quickly if a city isn't smart about which data to make publicly available. Governments that pay attention to these best practices will find their open data initiatives are not only more cost-effective, but also deliver more value for the public overall.

GIS: An Established Technology Finds New Purpose

It was a mild winter for most parts of the country. But don't tell that to residents in the Washington, D.C., region, which got clobbered by a 30-inch snowstorm in January. As government workers sent plows out into the streets, residents were able to do something rather unique: enter their address on the city's website and find out when the snowplows would be nearby. The map also showed where the city received 311 requests for snow removal and gave users a chance to look at recent photos from road cameras showing driving conditions.

The secret sauce behind this application and others like it is location-based data, digital maps and software known as a geographic information system.

GIS has been one of the longest running success stories in government technology. Throughout the 1980s and '90s, GIS was a godsend to city operations, helping plot development plans, track road and sewer repairs, and manage natural resources and other assets.

But with the rise of the Internet and now open data and mobile technology, GIS has been transformed from a technology to aid internal government operations into one that supports a new generation of customer services. Traditionally, only the biggest cities with the biggest IT budgets could afford GIS and have been the leaders in terms of new location-based services that use the wealth of geo-coded data in public-sector servers.

However, GIS has become cheaper and faster, opening up opportunities for smaller jurisdictions, while providing new options for cloud-based solutions that can be accessed by smartphones and tablets in real time. Open data has also helped expand the way the public can access and use geographic information. A key reason GIS has become so embedded in local government is that, by some estimates, nearly 80 percent



CLOUD POSITIONS PUBLIC UTILITY FOR THE FUTURE Board of Public Utilities wanted modern financial management tools that would help them support innovation in the industry.

New ERP system reduces costs while helping the Kansas City Board of Public Utilities keep pace with industry innovations.

Public utilities are undergoing major change as new technologies such as automated meters and smart grids help deliver better service, conserve energy and cut costs. To get the most out of those innovations, in 2014, officials at the Kansas City Board of Public Utilities (KCBPU) decided they also needed the most up-to-date financial management tools. "Our chief financial officer wanted a system that could support industry best practices, regulations and system capabilities," said Paul Pauesick, the public utility's director of information technology.

The 90s Called, They Want Their Hardware Back

KCBPU had been using the same enterprise resource planning (ERP) system for financials and human resources (HR) since 2005. "It was a great system, but it was born in the late 1990s," Pauesick said. "We wanted a financial system that would evolve with us and not get stagnant."

Running on servers in KCBPU's data center, the financial system had not been upgraded since 2008. Updating the existing system would have required several months and thousands of dollars in license fees and new hardware, not to mention additional labor to maintain the system. "And we would have been stuck with the effort and expense of doing a 'forklift' upgrade every three years," Pauesick said.

Instead, KCBPU replaced its old system with Oracle Fusion Financials. Implementation was swift and future updates promised to be painless.

The Kansas City Board of Public Utilities (KCBPU) is an agency of the Unified Government of Wyandotte County/Kansas City, Kan. It provides electric service to 63,000 customers and water service to 50,000 across a 127.5-mile territory.

In fact, KCBPU upgraded to Version 10 of Fusion Financials only six weeks after going live with Version 9. "We did that upgrade in about four weeks," Pauesick said. "Typically, that would have taken six months or so."

To purchase Oracle Fusion, KCBPU took advantage of a U.S. Communities contract offered by DLT Solutions. This cooperative contract gives public agencies a price advantage while eliminating the effort attached to a traditional procurement.

"The RFP [request for proposals] process and review could have consumed the better part of a year," Pauesick said. And the work involved carries a cost of its own. "I saved a lot of money by using an existing co-op contract," he said. With a shorter procurement cycle, KCBPU could get the Oracle system up and running quickly and start enjoying its benefits.

Numbers Don't Lie

By moving to a cloud-based system, KCBPU saw immediate savings to the tune of \$375,000. Including the cost of software, it's estimated the agency's net 5-year benefit will be \$1.8 million.

KCBPU reaped "soft savings" as well, such as ensuring uptime in the case of a regional disaster and increasing security without hiring additional staff.

"The Oracle cloud provides security through encryption. The data is encrypted in motion and at rest. And we do that across a spread of IP addresses, which improves my security posture. It also offers business continuity through a dual-site approach, with a primary cloud in Chicago and a backup cloud in Austin," Pauesick said. "I could not provide that locally without spending millions of dollars, and it still wouldn't be secure against a regional disaster."

Same Staff, More Time

An added benefit of moving to the cloud is that Oracle handles the day-to-day operations for the finance system. "In the cloud, you don't have to upgrade your oper-

ating system, servers or firmware, and you don't have to devote staff to maintaining hardware," said Pauesick.

Pauesick's staff now attends to higherend work, such as integrating Fusion Financials with tools for business planning and budgeting and asset management.

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Looking Ahead

KCBPU has plans to move more systems to the cloud. In 2017, it will migrate from its old HR system to Oracle Fusion Human Capital Management. Now that the agency has experience in the cloud, Pauesick anticipates an even faster implementation than the Fusion Financials project. "I expect we'll be able to move HR to the cloud in less than half that time."

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of all city information is address-based, making the technology extremely useful. GIS has gone from being a niche system favored by a select few city departments to one that's used by everyone, including management, said Richard Leadbeater, government industry solutions manager at Esri, a GIS software firm.

The result? A growing number of interactive public services have emerged in cities. Besides weather-based apps for snow-filled streets (Los Angeles has developed a map to help residents navigate the city during downpours from the most recent El Niño), there are maps for pinpointing where and when the worst outbreaks of smog are occurring, and apps that tell residents when their trash and recycling will be picked up based on address information.

Chicago recently launched a map that lets users search for certain data like food inspection reports, street closures and potholes. Users can narrow searches by ZIP code, or use a tool to select areas on a map they want information on.

Cities have always used GIS to plan development. But now, some have opened up their GIS assets so that the public can use location data to help new businesses get started or expand existing ones. One example is a mapping tool created by Rancho Cucamonga, Calif., that lets users search and browse available buildings for business needs. They can narrow choices based on square footage, zoning and building type. Users can also find businesses by name or address, and look at property exteriors via an embedded connection with Google Street View.

GIS is still a powerful tool for internal operations, but now it can incorporate some of the latest tech trends. For example, in Huntington Beach, Calif., the police department has started to monitor real-time social media activity using software for analyzing location data from social media. The police can monitor live social media activity, target key words like "gun" or "fight," and then identify where trouble might start. The same technology

can be used to monitor social media activity in specific locations. Other cities have developed similar ways to link location to social media activity to spot trends or issues it might have to deal with.

Cities have also turned to GIS to passively engage citizens in terms of improving services and infrastructure. Boston developed Street Bump, an app that residents can install on their smartphones. The app records vibrations as the user travels over city streets and sends geo-tagged information back to the city that would indicate the location of a pothole or other street surface issue.

For digital cities, collecting location information about everything from potholes to pollution hot spots or rat infestations has become standard operating procedure. And GIS makes that happen. At the same time, when location data is analyzed by asking the right questions, it provides public officials and policymakers with insights for better decision-making. The wealth of geo-data has really empowered cities, and when used strategically, it can help cities make better decisions while reducing costs.

If there's a concern with GIS, it's around privacy. Cities need to have proper policies in place if they want to leverage the power of location without violating citizens' privacy. GIS also has a lingering reputation as a hard technology to use, according to Esri's Leadbeater. But when done correctly — and city governments have had years of experience learning how to use GIS — it's a powerful platform for improving how cities can work, both internally and externally.

Customer Relationship Management: Diversity in Service

People like service that's good and speedy, all at a low price. While parts of the private sector have excelled at providing all three, few local governments are able to be so consistent. But customer relationship management (CRM) software could be just the answer to that conundrum. Cities have been using CRM for years, primarily as the back end to 311 hotlines, in which callers talk to operators to get answers or to request services that were non-emergency in nature. The first 311 operation began in Baltimore in 1996 and has been growing across the country ever since. But running a call center is costly, and few cities can afford to staff them adequately, given the surging demand.

That's where the next generation of CRM technology comes into the picture. Customers — as they are called by city call center managers — now have a choice to call an operator, submit a query online, access information over their smartphone, lodge a complaint via interactive voice response, text or use live chat. They can get answers to many of their questions — some managers say they can post answers online to 85 percent of the questions they receive — by looking them up on the city's website.

Cory Fleming, 311/CRM program director for the International City/
County Management Association, has pointed out that governments now recognize that city services must be 24/7 and that residents expect the level of customer service in their city or town to match what they get in the private sector. And CRM can help make that happen without blowing a big hole in the budget.

Having multiple channels doesn't mean citizens will stop calling a city's hotline number — local governments have rarely seen more than 20 percent of CRM interactions that are classified as self-serve — but it reflects the diverse ways that people want to interact. As one 311 call center manager put it, "Some people will also want to talk with an operator, and there are others who only want to use the Web or chat."

When it comes to CRM's impact on the digital city, there are a number of factors to watch:

✓ First, CRM is moving to the cloud, making it possible to implement



extremely important in local government, thanks, in part, to the merging of CRM, social media, mobile technologies and customer service. An excellent example of the interconnection between engagement and CRM can be found in Boston's Citizens Connect mobile 311 app, which allows users not only to report problems, but also to provide feedback on community issues. Social media is beginning to play an important role in CRM services.

to measure performance to improve internal processes and services. City managers like CRM because it generates a complete audit trail, which can help them understand a variety of factors, such as where there might be staffing needs, or it can help them spot deficiencies in certain operations.

CRM continues to evolve. One trend is known as "omni-channel" CRM, in which users can connect with the city through to run them can be expensive. Some cities, especially smaller jurisdictions, that have launched 311 systems in recent years have seen demand surge, putting a strain on budgets. Training is another concern. Teaching call takers to be knowledgeable about city operations takes time and effort.

But there's no mistaking the fact that

But there's no mistaking the fact that what started out as a solution to the problem of too many people dialing 911 with non-emergency requests has been transformed into an interactive, multichannel strategy to make customer service a top priority.



The New York City Fire Department (FDNY) has gone from reacting to fires to anticipating them. No, it doesn't have a crystal ball, but it does have data, algorithms and predictive analytics on its side. The FDNY has taken paper-based information from building inspections and built a database that can be analyzed based on a risk-scoring algorithm to help anticipate a potential building fire. The predictive tool works because the data is clean and the system shares information from other departments.

City fire departments aren't the only agencies taking advantage of analytics. The technology can be found in police departments, economic development efforts, public works, permitting, utilities and public transit, to name a few.

Fueling the growth is the explosion in data collection taking place in cities, whether it's data from sensors or from unstructured sources, such as Web forms and video. At the same time, cities are under pressure to release the data and make it available to the public, creating new opportunities to analyze what was once hidden from view. Just as important, analytics technology is becoming cheaper to own, faster to use and better at complex problem solving, making it more valuable.



Initially cities used Twitter, Facebook and other social platforms as a means to send outbound marketing and service-related messages. However, as residents have turned to social media to solve customer service issues, 311 service centers have responded and are beginning to use the tools as a way to interact, engage and help constituents.

✓ Finally, CRM collects so much data about citizen complaints, queries and requests that it only makes sense to use analytics to try and measure gaps in service performance and to even predict what services might need more funding (and which ones need less) before the next budget cycle begins. New York City, with the largest 311 service in the country, has been running CRM analytics for years one channel and then reconnect through another, but have the same user experience, explained Spencer Stern, president of Stern Consulting and an expert on 311 systems. Another trend is to personalize each contact between citizen and city, so that call takers have a profile of a user's past queries and service requests. And another trend is to allow for a single sign-on to reduce the number of accounts a citizen might have with the city to just one that's accessed through CRM.

"The goal is to make citizen interaction more retail-like," said Stern. "This dovetails with how smart cities want to simplify the user experience."

CRM does face some challenges, however. Despite lower technology costs, call centers and the labor needed

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"If you are talking about being a smart city, you are talking about information technology, which is about data," said Jennifer Robinson, director of local government solutions at SAS. "And data only becomes information when it can be digested. That's why analytics is the backbone of any smart city solution."

So far, many cities are pilot testing analytics to tackle discrete problems. But the goal is for cities to use analytics across the government enterprise. That requires a data center that can pull information from many different sources, similar to how the FDNY is using data from the city's building department to predict potential fire hot spots. In Chicago, data sharing is helping the city predict rodent infestation and food safety. In the case of the latter, the city prioritizes food safety inspections by statistically classifying food establishments with respect to the probability of a possible violation.

But these cities are the exception when it comes to enterprise analytics. Most entities struggle with getting an analytics project off the ground. According to Gartner, more than half of analytics projects either fail or don't deliver the expected results. Part of the problem is bad or unclean data, which produces poor results. Also, the data needs to be integrated. Despite years of discussion around the value of data sharing, many public-sector agencies are still unwilling to share with other departments.

But the good news is that analytics is getting better. New advances allow data to be analyzed prior to it being stored. Given how much data government is collecting and how much more it will have to handle as the Internet of Things matures, this could be a gamechanger for analytics. "This technology is going to help make sure the right data is collected and analyzed appropriately, so that the non-relevant data is dumped," said Robinson. The process is known as "analytics at the edge," she said. "It's a way to make sure data collection doesn't become overwhelming."

Getting It Right

When the President's Council of Advisors on Science and Technology released its 2016 report, Technology and the Future of Cities, it made an important point regarding the role of IT: "The urban ecosystem can benefit from the integration of a wide array of technologies that have been evolving rapidly, including systems to increase energy efficiency, renewable energy technologies, connected and autonomous vehicles, water and wastewater management systems, communications technologies to enhance connectivity, and new ways to do farming and manufacturing."

The report looks at the entire urban ecosystem and presents a variety of ways that the federal government can

help cities collaborate when it comes to advancing technology in a cost-effective way. Similarly, this report looks at five key technologies that every city government should have if it's to become a so-called smart city. On their own, each of the technologies — broadband, GIS, CRM, open data, analytics — provides a benefit to city operations and services. But the true impact comes when they are treated as part of an integrated system, rather than as singular solutions.

Along with having an enterprise vision when it comes to technology, government needs to have a coherent and sensible set of strategies and policies if it wants to maximize the smart city impact. That means having effective policies around privacy, security and open data sharing. Governments will need to craft creative initiatives to attract the talent needed to develop and run smart city solutions. And they will have to be willing to invest in the core technologies described in this report, but in a way that's strategic and has enterprise objectives. In other words, the days of siloed solutions need to end.

For decades, cities have faced a host of challenges that have tested their ability to function. Today, new ideas and answers are emerging that have the potential to help them cope with growth and also to transform into sustainable and resilient places to live and work. At the core of this transformation will be information technology. Best to get it right.



MANUAL AND PAPER-BASED?

Nobody (in Government) Has Time for That

espite the nation's recovery from the recession, state and local governments can still find themselves in financial straits. A March 2015 Rockefeller Institute report notes that tax revenue is slowing and even declining in most states, leading to budget shortfalls. At the same time, many organizations are losing manpower and expertise to retirement. In some state agencies, 40 percent of the workforce will be eligible for retirement by 2017.¹

How are state and local governments addressing these challenges? According to CDG's 2015 Digital Counties Survey, 47 percent of counties are implementing enterprise content management (ECM) systems — it was counties' most popular technology investment after security. It's no surprise government agencies are turning to ECM — automating paper- and laborintensive processes allows them to cut costs by freeing up valuable staff time and streamlining services for citizens.

Laserfiche can help agencies automate complex, multidepartmental processes, including permitting, case management, contract management, HR onboarding and more. By deploying Laserfiche's ECM system, which acts as a central repository for electronic documents and tools, agencies can automate workflows and manage content throughout its life cycle.

BENEFITS OF AUTOMATED PROCESSES



Savings. Fewer steps and less paperwork translate into lower direct costs. Other savings are reaped through reduced need for document storage and management, and increased productivity.



Efficiency. Reviews and approvals are fast with electronic forms and routing.



Accuracy. Defined workflows and routine business processes reduce errors.



Transparency. Digital documents available through a Web portal serve as a single point of access to <u>information for staff and citizens</u>.

The impact of automation is far reaching. For example, Boca Raton, Fla., implemented Laserfiche's ECM solutions as part of its accounts payable redesign. The city eliminated paper forms for vendor set up, and now routes documents and invoices electronically for approval and processing. Accounts payable can easily access information in the ECM system to print checks.²

As governments implement new technologies to meet citizen demands, the need for automated processes will increase. Laserfiche offers experts to help agencies go paperless, manage digital content, automate business processes and implement ECM.

Endnotes

- 1. http://www.governing.com/topics/mgmt/gov-governments-silver-tsunami.html
- 2. The New Answer to "Do More with Less," white paper, published by the Center for Digital Government, underwritten by Laserfiche















