GOVERNMENT TECHNOLOGY
SOLUTIONS FOR STATE AND LOCAL GOVERNMENT
VOL27 ISSUE7 | SEPTEMBER 2014

INSIDE:

PLUS:
Digital States Survey grades released

PULLING TOGETHER

HOW THE SHARING ECONOMY IS STRENGTHENING EMERGENCY RESPONSE AND RECOVERY.

MOLLY TURNER,
HEAD OF PUBLIC POLICY AT AIRBNB

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September 2014

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Shifting responsibilities, new technologies mean cyber-security isn't likely to get easier.

New Blood
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Government Technology (ISSN# 1043-9668) is published monthly except for January and July by Government Technology, 100 Blue Ravine Rd, Folsom, CA 95630. Periodical Postage Paid at Folsom, Calif., and additional offices. POSTMASTER: Send address changes to: Government Technology, 100 Blue Ravine Rd, Folsom, CA 95630.

By Steve Towns / Editor

States of Resiliency

Resiliency takes many forms, but ultimately it's all about bouncing back.

We all saw a great example in April when, a year after terrorist bombs killed three people and injured more than 260 others at the 2013 Boston Marathon, the event was back bigger than ever. Nearly 36,000 runners turned out for the 2014 race, almost 10,000 more than normal — and despite worries that terrorism fears might hurt attendance, spectators and participants packed the city early to take part in commemorative events.

In this issue we talk to a number of IT professionals who were faced with managing and recovering from emergency situations — including Boston's Justin Holmes, constituent engagement manager of the city — to learn from their experiences.

A different form of resiliency is evident in our latest Digital States Survey, which shows states largely bouncing back from years of recession and sputtering economic recovery. (See page 10.) The biannual survey conducted by e.Republic's Center for Digital Government grades states on how well they use technology to carry out the public's business. And for 2014, the trend is positive.

Grades improved in 22 states, an indication that smart technology investments made by state government leaders during some very difficult financial times are paying off, said Todd Sander, director of the Center for Digital Government. In states that performed the best, leaders invested in analytics and business intelligence systems to help them make smarter decisions. They also deployed citizen self-service applications that eased the impact of agency staff cuts.

"They had to make some really tough choices," Sander said. "There's been a lot of competition for budget dollars among government programs. In order to receive funding, IT projects had to be very well thought out and managed."

Of course, the news isn't all good; grades fell in 11 states. Sander said the difference often comes down to the outlook of leaders and senior managers. If technology is viewed as an enabler of government operations, particularly during tough times, states perform well on the survey. If technology is seen as merely another cost to cut, grades tend to slip.

Luckily, improving state revenue means fewer cuts are being made these days. And years of lean budgets have forced technology professionals to become more sophisticated in how they justify new projects.

"As revenue starts to return, states are being thoughtful in where they invest," Sander said. "We're seeing a turning of the tide."

So with that bit of good news, welcome to our resiliency issue. Here's to bouncing back. GT

RAISE YOUR VOICE

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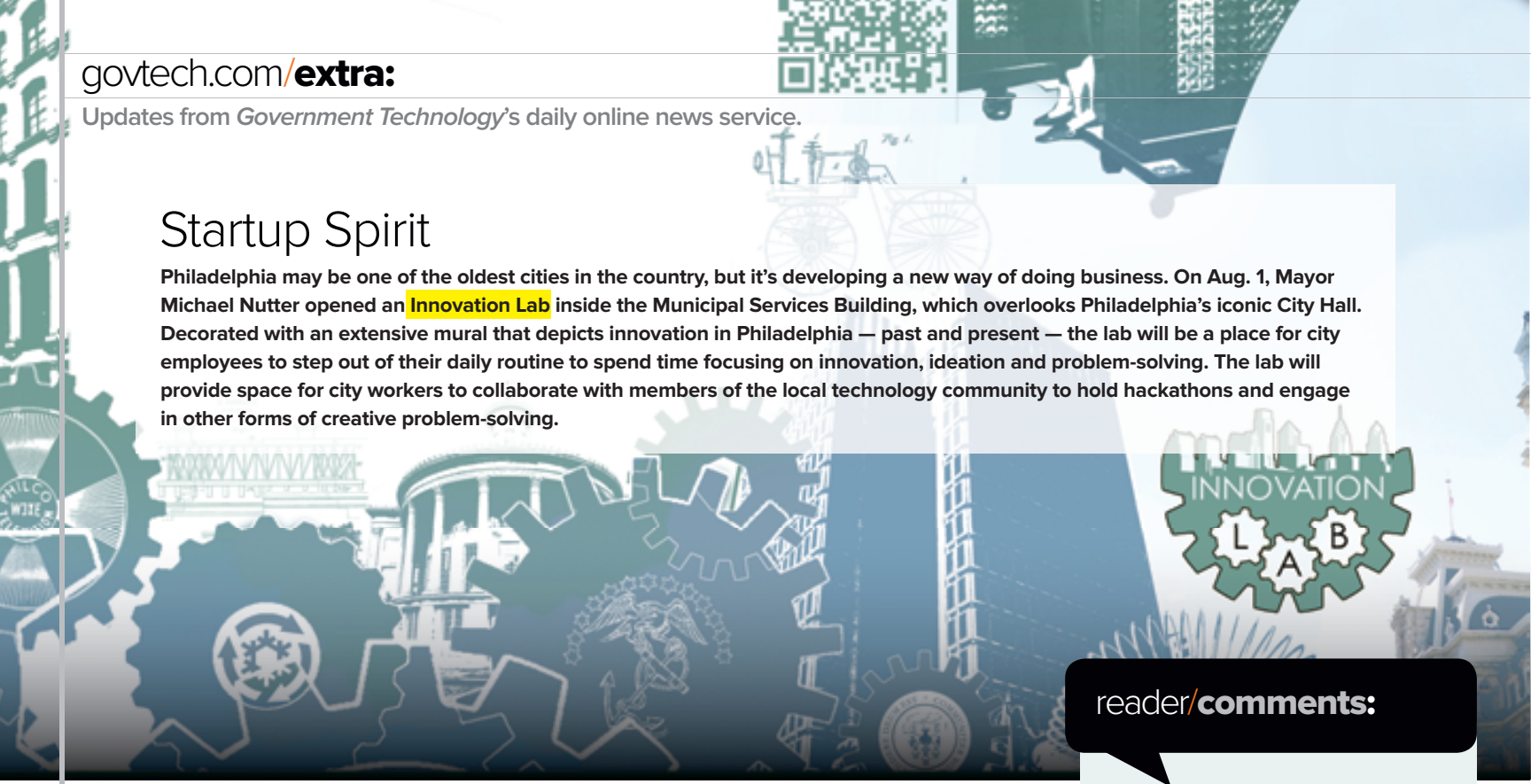
Startup Spirit

Philadelphia may be one of the oldest cities in the country, but it's developing a new way of doing business. On Aug. 1, Mayor Michael Nutter opened an Innovation Lab inside the Municipal Services Building, which overlooks Philadelphia's iconic City Hall. Decorated with an extensive mural that depicts innovation in Philadelphia — past and present — the lab will be a place for city employees to step out of their daily routine to spend time focusing on innovation, ideation and problem-solving. The lab will provide space for city workers to collaborate with members of the local technology community to hold hackathons and engage in other forms of creative problem-solving.



A Data Set a Day ...

The birth of California's first Health and Human Services open data portal is much like the birth of a child: It took about nine months to create and is the object of great affection. The site, health.data.ca.gov, launched Aug. 7, and the initial sets of data tables include birth profiles, poverty rates and locations of vendors that accept vouchers from the Women, Infants and Children program. Though all initial data stems from the Public Health Department, eventually the portal will serve as a hub for open data from other California HHS agencies.

Long term, officials hope the portal will be a public single point of entry for all state health data. It will be used for reporting, reference information, and Web and mobile apps that provide additional data tools for residents. By year's end, the portal will be translated into Spanish to accommodate access for California's large Latino population.

WHO SAYS?

"Most government apps are nothing more than information push. Very few of them do anything useful."

www.govtech.com/quote-sept14

MOST SHARED STORIES

Is Crowdsourcing the Future for Legislation?	408 SHARES
Philadelphia Opens Innovation Lab for City Employees	370 SHARES
Pennsylvania's Data Center Cloud Deal Has Big Potential	277 SHARES

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3,728 VIEWS

2014 Digital Counties Survey Winners Announced
3,240 VIEWS

Top 5 Things Millennials Consider in Job Searches?
2,420 VIEWS

Using Predictive Analytics, Adaptive Learning to Transform Higher Education
1,989 VIEWS

Data Shows How Morning Habits Affect Happiness
1,938 VIEWS

Weird AI has Lampooned the Jargon in Your Strategic IT Plan
1,900 VIEWS

reader/**comments:**

"It is critical that we in city government, if we are to remain relevant, rethink our service delivery models. With the increased demands of our citizens for more responsive, accessible and cost-effective government, the service delivery processes that may have served us well in the past will doom us in the future.

Melvin L Waldrop **in response to Kevin Johnson: Cities 3.0 - Hubs of Innovation, Entrepreneurship, Technology**

"The legislators and people need to be aware of foreign influences in the discussion. They're not inherently bad (discussing particular policies that have existed in other jurisdictions, and how they've turned out) — but they do need to be disclosed, so that the people of a particular jurisdiction understand that they are ultimately the ones who should have the say.

KyleH **in response to Is Crowdsourcing the Future for Legislation?**

"Why would the computer that is driving need any connection to the outside world? Separate the driving computer from the rest of the car and require a physical update to modify instruction sets and maps. No hacking that way.

hkraznodar **in response to FBI Says Autonomous Vehicles Could Be Lethal Weapons**

Communicating with Confidence

Enhanced Record-Keeping Boosts Hollywood's Social Media Presence

Hollywood, Fla., is a quaint beach town between Miami and Fort Lauderdale, named one of the nation's "Top Ten" weekend getaways by *USA Today* in 2014. Its 2.5 mile brick-paved Broadwalk along the Atlantic Ocean, tree-lined streets, and perfect weather make Hollywood a favorite of vacationers and location scouts alike.

But Hollywood isn't all just fun and games. It has a serious business base, being home to Port Everglades — one of the largest passenger and cargo ports in the world — and is the 12th-largest city in Florida. Despite an expanding population and thriving commercial and corporate presence, the City of Hollywood's social media presence prior to 2013 consisted largely of calendar events sent automatically via Twitter from the City's website and videos produced in-house and posted on the YouTube channel. Concerns over public records management and reduced staffing from the recession meant limited resources and barriers to developing and growing social media engagement.

Hollywood's City Manager, City Commissioners and the Director of Public Affairs knew expanding the City's social media outreach could add to the City's online presence, reduce barriers to access and provide another channel to engage with citizens. To help accomplish these goals, as they sought to hire a new Public Information Manager, they searched for an individual with experience in developing social media sites. In October 2013, Joann Hussey was hired with a focus on growing the City's social media presence.

While Hussey tracked and saved her social media efforts manually — using her PC's snipping tool to collect and save information in Word documents — compiling files was time consuming and the end product was not searchable or legally authenticated. Given that most states classify government social media as a public record subject to records requests, the City Attorney cautioned against expansion of the social media program until a more effective system was found to capture, store and retrieve these communications. Records requests, made possible by the State of Florida's broad public records laws and the federal Freedom of Information Act, are a frequent occurrence in the Office of Public Affairs. Hussey says it's only a matter of time before public records requests are submitted for the City's social media content.

Tracking Traffic, Expanding Outreach

The Director of Public Affairs, Raelin Storey, learned about ArchiveSocial, an automated, cloud-based software service that preserves social media content in its native format, making it easy to search, view and understand the context. By continuously documenting the metadata within each piece of social media and assigning it a digital signature, the technology ensures compliance with state and federal records laws and confirms authenticity, should legal situations arise.

"We're not going to rely on the social media companies to keep our communications forever," Hussey says. "We're permanently and easily capturing it for ourselves thanks to ArchiveSocial." The department's

media standard operating procedure includes monthly downloads via the ArchiveSocial webpage. An Excel spreadsheet file and a PDF file which contain visual elements and screen captures are exported and saved to the City's internal network.

"I love having both formats. With the PDF, you can see very quickly what pictures you've posted, and the Excel spreadsheet is great for seeing numbers and dates at a glance which I can insert easily into reports," says Hussey. "I can see that I tweeted 350 times and who responded or retweeted it. It's laid out in file format all in one spot. It's much easier than hunting for information on Twitter and Facebook." Hussey can also view the information in a dynamic format using the Web-based interface which allows her to expand comment threads and view high-resolution photos.

SOCIAL MEDIA IN THE PUBLIC SECTOR

According to a study by the Fels Institute of Government at the University of Pennsylvania, **90 percent of cities and counties had established a presence on social networking channels by 2011.**[1] These jurisdictions are using social media to broaden transparency, provide useful information, enhance safety and improve public perceptions about government. In California alone, cities have created 430 social media accounts and accumulated 38 million combined Facebook likes, Twitter followers and YouTube views.[2]

Aside from capturing records, ArchiveSocial helps Hussey monitor her output. She can see what's been posted, gauge what's successful or not, leverage users and maintain a cohesive message. "I know that soon, I will need to create a chart that shows our social media growth over time. I can use ArchiveSocial to find that information, demonstrate trends, show where we've been and how we've grown."

ArchiveSocial now maintains records for Hollywood's five social media accounts: Twitter accounts for the City and for the Police Department, a Facebook page, a LinkedIn page and a YouTube channel. Knowing that records are continually archived has given the City the peace of mind to increase the social media output via those channels.

Recently, a Hollywood Police Officer was photographed pushing a disabled vehicle out of Friday traffic into a safer spot. That photo went viral and was retweeted repeatedly over the weekend. Hussey was able to log into ArchiveSocial and export all the interactions into one file then share the good news with the Chief of Police, Police Command Staff and the City Manager. That information was also shared in the Police Department internal newsletter.

The City's "Help Me Hollywood" website and mobile application permits residents and visitors to report non-emergency concerns to City Hall. The City's "Notify Me" email notification service generates emergency alerts, news and announcements to citizens' emails. Job opportunities with the City are posted on the website and on LinkedIn, while YouTube videos showcase a wide variety of City events. The public is responding to these useful community tools; the additional social media outlets are now making it a true two-way conversation.

> "I know that soon, I will need to create a chart that shows our social media growth over time. I can use ArchiveSocial to find that information, demonstrate trends, show where we've been and how we've grown."
>
> Joann Hussey, Public Information Manager, Hollywood, Fla.

Civic engagement and participation on the City's social media networks has grown, and while traffic has increased, the City has saved staff time and effort thanks to ArchiveSocial's automated operation. The City plans to train additional users to help boost the social media presence even further, and to possibly expand to other social media platforms.

Social Media Savvy Improves Communication with Residents

When done well, the investment in social media can help to build trust and goodwill between residents and City government, support priorities and help in the distribution of information.

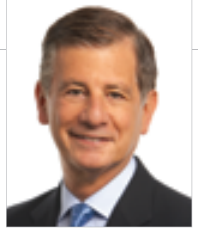
Social media networks and practices are constantly evolving, and traditional methods of record-keeping aren't necessarily effective in the fluid, digital interactivity of social media. Agencies must also take into account the legal requirements of records retention just as much as the message itself. An effective way to achieve both is to harness automated technology, thereby removing the elements of human time and error.

The City of Hollywood's social media expansion is another important communication tool to talk directly with residents where they are, and via the method and device they prefer, including mobile. The expansion also has an advantage that is less tangible, but valuable: "It's giving the City a different perspective in the eye of the resident. It's showing them that we're on top of issues and technology, and are available 24/7. If you have a concern, you'll be able to reach somebody via social media," Hussey says. "People want to be heard, and they're using these outlets every hour of the day to reach us. It serves almost as an advocacy tool for people who want answers, and we're there for them."

She adds, "I'm glad ArchiveSocial is there grabbing everything we're posting and retaining it. Now, when those records requests come in, we'll be ready."

ENDNOTES

1. www.govtech.com/internet/Industry-Perspective-Social-Media-is-Serious-Business-for-Government.html
2. www.govtech.com/internet/Dashboard-Shows-State-of-Californias-Huge-Social-Media-Footprint.html



Mapping a Healthy Future

Austin health and education leaders target youth obesity with neighborhood-level data.

Children's Optimal Health (COH) is an Austin, Texas-based nonprofit committed to improving all aspects of health for the city's youth. The organization only has five full-time staff members, but its success relies on the diverse coalition of critical leaders it brings together in its boardroom. As Executive Director Maureen Britton put it: "We cross government, health care, education and business to provide a neutral look at the realities in central Texas and identify potential solutions."

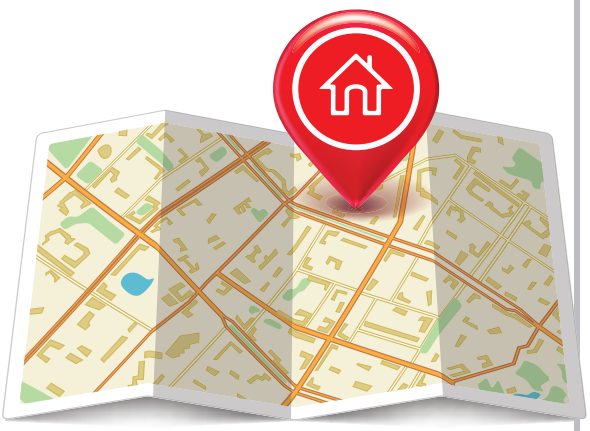
In our forthcoming book, *The Responsive City,* Susan Crawford and I offer examples of exceptional strategies for data-smart governance across the country. COH struck us for its use of data visualization as a tool to inform interventions in the city's youth obesity problem. A Texas law requires public schools to record fitness data on every student. Through data-sharing agreements with the school districts, COH gathers metrics on BMI and cardiovascular fitness scores that are geo-tagged with social and economic information. COH converts de-identified person-level data to aggregate neighborhood-level maps that illuminate the conditions faced by families and children in the area, all while protecting personal information. Enhanced with other data sets, these maps tell a more complex story of the factors that influence health outcomes — from proximity to fast food restaurants to the stress of high neighborhood crime rates.

As the movement to use big data analytics in local government gains momentum, it's important to keep in mind the primary stakeholders: the city's individual constituents. COH is successful because it is attuned to this specificity: "The real value is being able to use person-level data in aggregate, to look at very small geographies and by overlaying multiple data sets, give a fuller picture of health and social risk contributors," Britton explained.

Austin is one of the fastest growing cities in the nation. New businesses are constantly opening, bringing with them many high-skilled workers with high-paying jobs. Britton said rising housing prices have forced lower-income families to the fringes of Austin and worries that these families might fall through the cracks. "There's not enough attention paid to the struggles in Austin as the population outside of the tech industry grows. That's our concern," she said. "The more we bring this data to life through the maps, the more we get data-driven information to the right people."

Changing the physical education curriculum in schools was never part of the hospital's business model, just as targeting interventions in existing infrastructure was never part of the school's strategic plan. COH was created to serve as a neutral ground for these key players, who wouldn't normally interact with one another but, sitting at the same table, share a desire for real results.

Not only does COH integrate diverse sets of siloed data, its coalition-based model is changing the way that the data is being talked about altogether. This strategy



SHUTTERSTOCK

combats critical issues such as poor birth outcomes, transportation-related injuries and youth substance abuse — but the real takeaway is the value of these diplomatic champions of the cause. While political changes in government administrations or swings in the business cycle could slow or stall the efforts of an individual stakeholder, COH streamlines these varied interests into a persistent, collective vision. This isn't easy. Britton said securing data-sharing agreements can take anywhere from six months to four years — but such persistence is crucial, especially as the maps, over time, disclose potentially predictive information.

Those results matter and send an important message to individuals most in need of services. "You don't have to know English or have an education to see this and say, 'Oh my gosh, that's my neighborhood,'" Britton explained. Indeed, it's hard to argue with a map. GT

Stephen Goldsmith is the Daniel Paul Professor of the Practice of Government at Harvard Kennedy School and directs the Innovations in Government Program and Data-Smart City Solutions. He previously served as mayor of Indianapolis and deputy mayor of New York City.

Adam Thiel

Deputy secretary of public safety and homeland security, Virginia

Government Technology *has covered the many ways public-sector agencies are utilizing predictive analytics to become smarter about services, but an area where there's room for growth is in managing emergencies. During a White House Innovation Day in July, Adam Thiel discussed the opportunities — and challenges — for using predictive analytics to improve disaster response and recovery. We caught up with him to get more details on the benefits of incorporating data into emergency management.*

1 What potential do you see for predictive analytics impacting emergency response? In emergency management and disaster response, it depends on how you define predictive analytics. Weather forecasting to some extent is an example: We move assets around and we make decisions based on weather forecasts all the time when we see hurricanes or other potentially severe weather events approaching.

2 What's the biggest challenge to using predictive analytics in your field? There's always uncertainty. Past performance is no guarantee of future results. There are always issues with the fidelity of forecasts and what actually happened versus what's predicted. It's something for people to keep in mind and to be explicit about. This is something the Weather Service is increasingly doing in giving us probabilities of certain severe weather events impacting certain areas.

3 You mentioned predicting cascading effects at the White House event, what did you mean by that? A lot of folks when they hear "predictive analytics," they're thinking about predicting or forecasting the probability of a certain event or incident occurring at X place at Y time. It can be very difficult to know with a high degree of certainty exactly where and when a particular event is going to occur. But once an incident occurs, predictive analytics has a lot of promise for helping us identify and forecast the probabilities of the next effects of that event.

For example, the probabilities of an improvised explosive device detonating at the corner of Walk and Don't Walk can be very difficult to predict — we don't have a lot of past data on those types of events. But once that event happens, predictive analytics can hold a lot of promise for helping us understand the cascading effects: What are the traffic impacts and what's going to happen with the surrounding infrastructure if that device affects the adjacent water or power infrastructure, even medical infrastructure, schools and things like that.

4 How do we get to that point? It's really a matter of sitting down and thinking about all the potential variables, what the relationships are between the variables, mapping out conceptually how those variables interact and making sure that as many of those as possible are accounted for in the prediction algorithms. It's also understanding and being explicit about the variables that are not accounted for and how those may or may not affect the ultimate outcome or the uncertainty around the predictions. GT

— Elaine Pittman, Associate Editor

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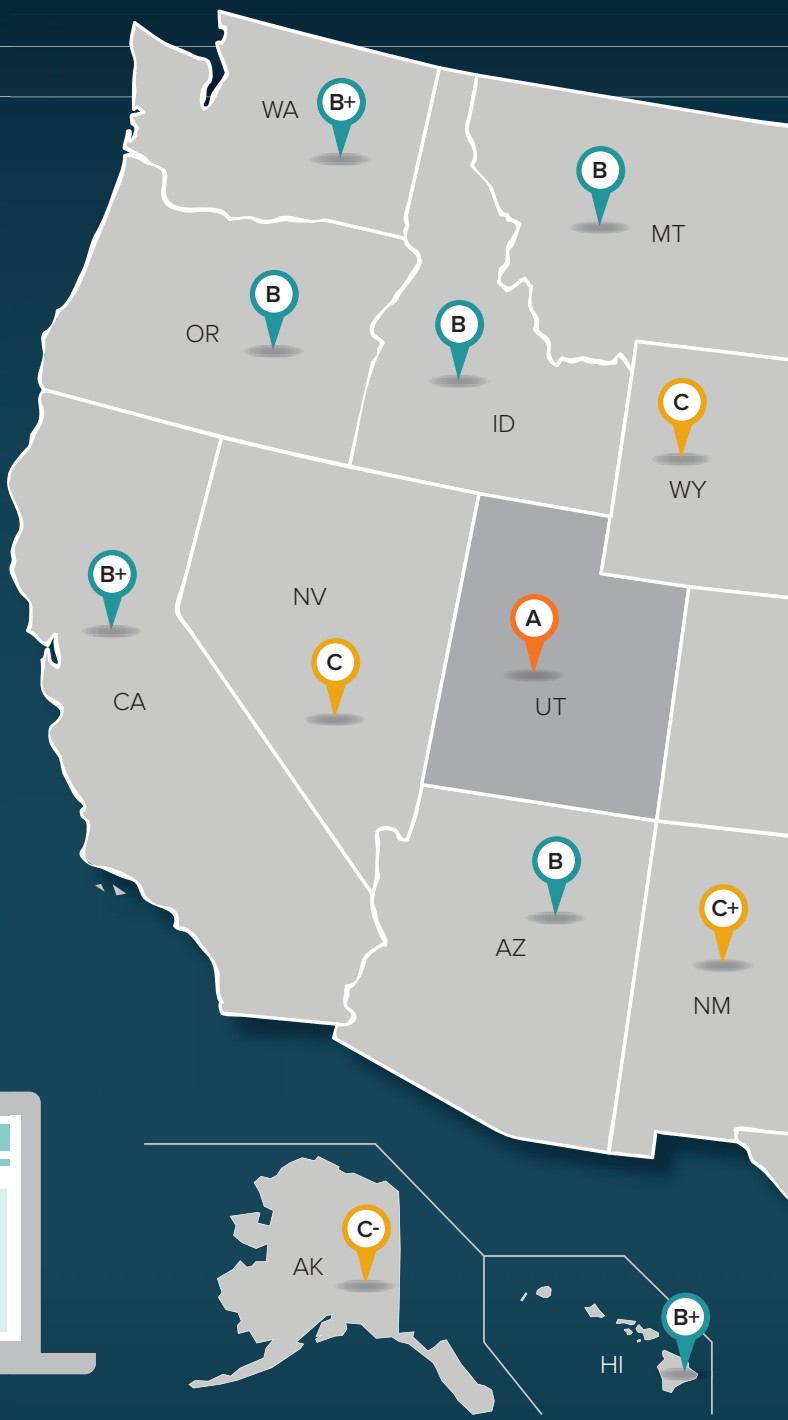
Digital States: Bouncing Back

Conducted in even-numbered years by e.Republic's Center for Digital Government, the Digital States Survey evaluates how well states use technology to carry out the public's business. Among the performance areas states are judged on during the comprehensive evaluation process are service delivery, citizen engagement, IT leadership, collaboration and innovation.

This year's grades show states bouncing back after years of recession. The number of A grades held steady at eight, the same as in 2012. But 30 states earned B grades this year, compared with 22 in the last survey. In addition, there were no D or F grades this year. Idaho, one of two states to earn a D in 2012, posted a B. Florida, the other D state, improved to a C.



EVALUATION CATEGORIES:

→ Strategy, approach, implementation or actions are shown to be consistent with and in support of state priorities and policies to improve operations and/or services (30 percent of grade).

→ A quantifiable and demonstrable return on investment in hard dollar savings and/or soft dollar benefits has been achieved that demonstrates IT has increased government's capacity to meet growing demand for service more efficiently (20 percent of grade).

→ Demonstrated and verifiable progress over the previous two years, either through a new initiative or through incremental improvement of an existing program or effort (15 percent of grade).

→ Innovation or creativity of solutions or approaches (15 percent of grade).

→ Demonstration of effective collaboration, including multijurisdictional and interdepartmental initiatives (10 percent of grade).

→ Demonstration of successful measures of transparency, privacy and security (10 percent of grade).

GRADE A:

A These states are trending sharply up. They show results across all survey categories. Modernization is used to realize operational efficiencies and strategic priorities. There is evidence of meaningful collaboration, and performance measures and metrics are widely adopted.

GRADE B:

B These states are trending up. They show results in many survey categories, and their leaders use modernization to change entrenched practices to prepare for more sustainable operations. Incentives for collaboration are in place, and performance measures are used in key areas.

GRADE C:

C These states are trending stable. They show results in some survey categories. Modernization is used to realize operational efficiencies. This grade level includes states that have launched reforms but where results have not been fully harvested.

GRADE D:

D These states are trending down. They show results in at least one survey category, but modernization tends to be siloed and limited. There is little evidence of collaboration. They have implemented few performance measures, and budget cuts threaten operational viability.

GRADE F:

F These states are trending sharply down. They show negligible results, and aging systems are destabilizing operations and increasing costs. There are no performance measures in place, and evidence of collaboration is non-existent. Budget cuts are cited for stopping any progress.

MOLLY TURNER, head of public policy at Airbnb: "We see the sharing economy as a real potential solution to helping with disaster response."

Governments are recognizing that sharing economy platforms can provide a vital link between needs and resources in times of disaster.

COLLABOR
RECOVER

ATIVE Y

JESSICA MULHOLLAND

BY JUSTINE BROWN

The "sharing economy" — the term now commonly used to describe using technology and social media to promote the sharing and reusing of assets — has received a good deal of press over the last few years. From cooperatives that allow people to share cars, bikes and homes, to crowdfunding and crowdsourcing initiatives that allow large undertakings to be accomplished through the combined efforts of many, working together appears to be the latest progression in the social media evolution.

More recently, the idea of leveraging the sharing economy to improve emergency response and recovery has emerged. Tapping into existing platforms that offer a built-in structure for resource-sharing allows community members to make resources available to people in need during or after an emergency. It's an idea the federal government and some local governments are now exploring more thoroughly.

FEDERAL EFFORTS, LOCAL NEEDS

The potential of the sharing economy to help with disaster response was first tested, quite by accident, in the wake of Hurricane Sandy. As the East Coast grappled with power outages, flooding and other challenges in late 2012, a number of sharing economy companies and their users stepped up to help. Users of Airbnb, a website for finding temporary housing, leveraged the platform to offer their homes to those affected by the storm for free. Waze, a crowdsourced mapping tool, opened up access to the feedback users were providing about which gas stations were open for people looking to refuel their vehicles. And Walk Score, a site that assists apartment hunters, helped people search for housing by commute time using various modes of transit.

"Hurricane Sandy proved the benefits of being interactive with the community and using technology to better inform and connect first responders and people in support of relief efforts," said Brian Forde, senior adviser to White House Chief Technology Officer Todd Park. "It marked a turning point in how we as a nation will respond to large-scale disasters in the years ahead."

Forde said Sandy also taught a valuable lesson: Trying to build out such technology-based sharing economy tools in the wake of a disaster is not the best course of action. In response, the White House launched initiatives to help develop these tools before they are needed, leading significant efforts to collaborate with what Forde called the "safety data community" and helping to formally connect the dots between sharing economy companies and state and local governments.

In January, more than 300 public safety stakeholders from the private, nonprofit and academic sectors participated in the Second Annual White House Safety Datapalooza. The event generated several new commitments from the public and private sectors, including standardized hashtags to enable citizens to report important emergency information such as downed power lines across social media platforms during a disaster.

Datapalooza also examined potential roadblocks. For example, finding housing for thousands of displaced survivors during and after Hurricane Sandy was among the most immediate challenges. While sharing economy platforms like Airbnb held great potential to help, the documentation needed for receiving federal disaster assistance was not designed to account for the new technology. Traditionally a FEMA disaster applicant needs to show a signed lease agreement to receive continued financial assistance for housing. While the requirement was designed to prevent fraudulent claims, it effectively disqualified the use of sharing economy platforms.

"We had to make a change — and quickly," said Forde.

Working closely with FEMA, Forde's team found a solution that allowed Sandy survivors to submit an email reservation and electronic receipt in lieu of a lease agreement to verify housing and a continued need for disaster assistance. The added flexibility allows future disaster applicants to secure housing through Airbnb too — FEMA now accepts email versions of leases and housing agreements (e.g., electronic or online reservations) as long as all listed requirements are met.

As sharing economy companies get more involved in disaster response, it's likely that similar obstacles may emerge. However, Forde doesn't expect any of them to be deal breakers. In most cases, policies may need to be changed or rewritten, but the benefits look likely to outweigh the costs.

The community of technologists and government representatives continued the conversation begun at Safety Datapalooza during the White House Innovation for Disaster Response and Recovery Demo Day in July. The key goal is to "find the most efficient and effective ways to empower survivors to help themselves," Park said. And one way to enable that is through crowdsourcing: Allowing residents to locate, and just as important, offer crucial needs and services after an emergency not only helps individuals to take care of themselves and their families but also allows response organizations to focus on those who are the most in need.

COLLABORATIVE CONSUMPTION

While the White House has taken the lead in promoting the connection between the sharing economy and disaster response, local jurisdictions — where disaster recovery efforts are centered — also are getting on board.

In June 2013 BayShare, an organization dedicated to sharing goods and services, announced a partnership with the San Francisco Department of Emergency Management designed to help citizens tap into sharing economy platforms during or after an emergency. BayShare is working with companies including Airbnb, Boatbound, Carma, City CarShare, Desks Near Me, FlightCar, GetMyBoat, LiquidSpace, Lyft, Nextdoor, SideCar and Yerdle.

"Many new sharing economy businesses are headquartered in the [San Francisco] Bay Area, making the city a natural incubator for this," said Francis Zamora, public information officer for the city's Emergency Management Department. "Through this partnership, we'll explore what we can do together to help the city become more resilient before, after and during an emergency."

One platform San Francisco is interested in is Nextdoor, a social networking site for neighbors to communicate on topics like crime, safety, services, nearby resources and emergency plans. Nextdoor says it is used in more than 39,000 U.S. neighborhoods and currently covers 99 percent of the neighborhoods in San Francisco. Among other things, the site has the potential to enable a real-time delivery system for city alerts, crowdsourced reports and crisis maps that connect residents to resources.

"With Nextdoor, we have the opportunity to go neighborhood by neighbor-

Brian Forde has led a White House initiative to better integrate sharing economy platforms into emergency response and recovery.

DAVID KIDD

hood to share preparedness messages, as well as alerts in the event of a real emergency," said Zamora, adding that the company's team monitors the city's alerts and can distribute them to specific areas. "People in each neighborhood can also use the site to list some of the skills and resources they have available and talk about what they could share with each other during an emergency."

The city put the new system to the test in March, when fire engulfed a six-story, 80-foot-tall building under construction in the Mission Bay neighborhood. San Francisco officials used AlertSF, a text-based notification system, to send a general alert, and Nextdoor then routed that message to users in potentially affected neighborhoods.

Zamora hasn't heard of other local governments leveraging this idea to the extent San Francisco is, but she has received a number of inquiries from other local governments that are interested in what the city is doing.

"Sharing, whether it's through the shared economy or through more traditional means, is more sustainable than just handing out a list of things that people should do in the event of an emergency," she said. "Getting San Franciscans prepared is a core mission of ours, and we feel that communities that are more connected are more resilient in the face of disasters."

Nextdoor has a similar agreement in place with the Houston Office of Emergency Management, which uses the platform to alert residents when safety issues arise in their neighborhoods. Nextdoor hopes to formalize partnerships with more cities in the future, though the service is proving useful for emergency response even without such agreements in place.

"The platform at its core is well positioned to help with emergency response," said Kelsey Grady, head of communications at Nextdoor, who pointed to recent uses during wildfires in Los Angeles and floods in Colorado. "But when those formal city-level agreements are in place, we can accomplish even more."

Grady believes that as cities become more aware of Nextdoor, additional emergency management agencies will get involved. The company recently began rolling out a new city platform aimed at helping get localities on board more easily and providing them the ability to exercise more granular control over how they broadcast information.

A TWO-WAY STREET

The fact that sharing economy companies often have a pulse on the city in which their members reside makes them valuable partners for local government. But such partnerships can benefit the sharing economy company as well.

Padden Murphy, head of public policy for Getaround.com, an on-demand car-sharing marketplace, said his platform wanted to be involved in sharing economy/disaster response efforts because it fits with its mission.

"We are already providing a public good, so the next step of how we can help in times of a crisis was kind of a no-brainer," he said.

Getaround.com promotes the idea that sharing automobiles can help take cars off the road. Better utilizing the cars that already exist — which sit idle an average of 22 hours a day — can reduce pollution and ease traffic jams, the company purports. Under normal circumstances, someone with a car available for use could list it on Getaround.com, and people in need of a vehicle could then use their phone to locate, pay for and unlock the car utilizing the

CONTINUED ON PAGE / 52

LEVERAGING THE CROWD

A number of new developments in matching social media and sharing economy ideas with emergency response were highlighted this year during the White House's Safety Datapalooza and the Innovation for Disaster Response and Recovery Demo Day.

Getaround is launching a disaster assistance policy and Web portal to help educate people about how to find or **share a vehicle** following a disaster.

The White House, FEMA and U.S. Department of Energy launched **standardized hashtags** (#PowerLineDown #NoFuel and #GotFuel) to enable citizens to report important emergency information, such as downed power lines or whether a **gas station** has fuel, across social media platforms during a disaster. The Weather Channel has committed to publicizing these hashtags to its Web visitors and TV viewers.

The U.S. Department of Energy plans to launch the mobile app **Lantern Live,** which was inspired by lessons learned from Sandy where situational awareness was lacking, particularly around the status of fuel and which gas stations were open. Its features will include the status of gas stations and the ability to report a power outage or downed power lines with geolocated information.

Geofeedia, a social media monitoring service, committed to offering a free version of its service to first responders, disaster survivors, utility companies and governments at all levels.

Appallicious unveiled the Disaster Assessment and Assistance Dashboard that pairs local disaster response resources with open data. Drawing upon the power of the local economy, the dashboard allows residents and city-based companies to post skills and equipment to aid recovery efforts.

The National Geospatial-Intelligence Agency highlighted the development of **GeoQ,** a tool that crowdsources geo-tagged photos of disaster-affected areas to assess damage over large regions.

A new website, nowtrending.hhs.gov, searches Twitter data for **health and natural disaster topics** and analyzes that information. The tool scours social media and looks for topics that could turn into public health emergencies.

TaskRabbit, a company that includes a network of more than 20,000 vetted workers across the U.S., announced it will provide a dedicated portal for crisis recovery efforts, called TaskRabbit Needs for First Responders, that can serve as an interface for relief organizations to request help during a disaster and connect with workers willing to volunteer.

SeeClickFix is sharing its database of citizen requests to help generate actionable data regarding the current state of infrastructure during and after a disaster.

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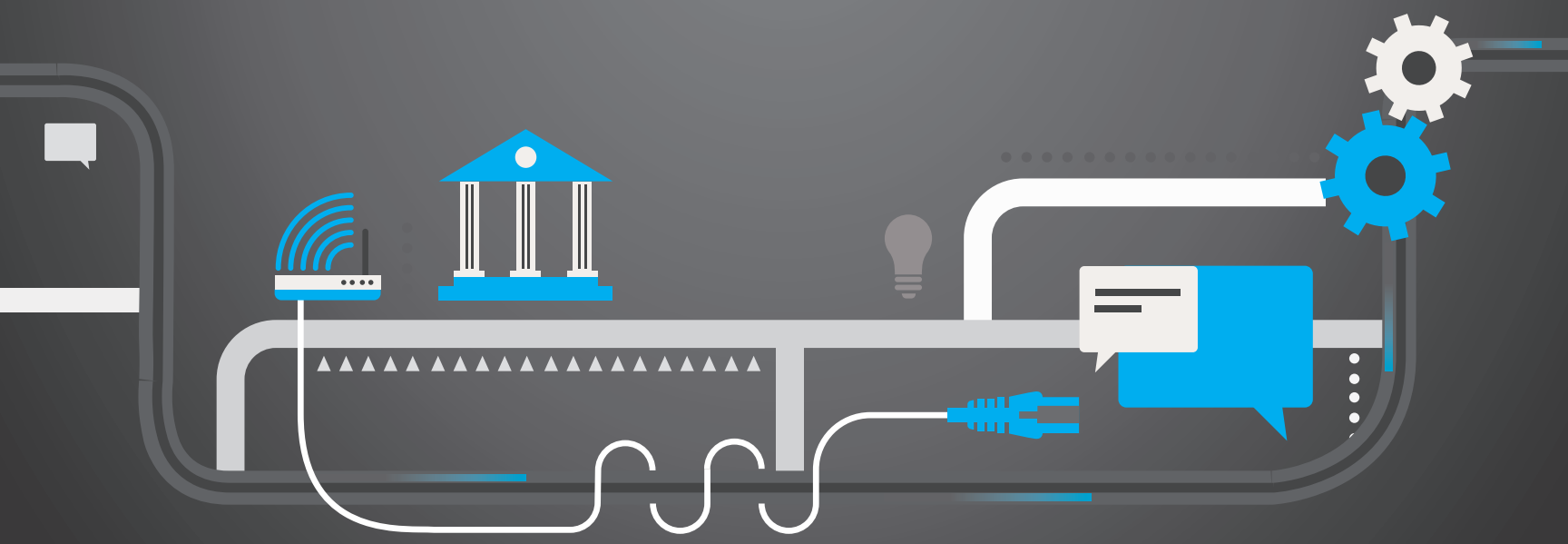

COX Business®

By Matt Williams

Katrina. Sandy. The Boston Marathon bombing. 9/11.

Some emergencies are indelible on the national consciousness to the point that they need no introduction. These tragedies are looked back upon as touchstones in America's quest to be as prepared as possible for the next disaster.

Perfection is an impossible goal, but the public officials who've been at the center of response and recovery efforts can't help but reminisce on what went wrong and right, what works and what doesn't, and how their experiences might be useful for others forced to live through a similar event.

The people who manage the public's technology and computer systems often are unheralded. But in an increasingly interconnected and online world, the lessons they've learned will only loom larger when — not if — the next large-scale disaster strikes.

Government Technology talked with officials who've worked amid some of America's biggest disasters and emergencies of recent years. They offer practical, real-world perspective that we all can learn from.

HARD-WON EXPERIENCE

REAL-LIFE LESSONS FROM AMERICA'S BIGGEST DISASTERS AND EMERGENCIES.

STEVE WILLIAMS

LESSONS LEARNED

- Don't underestimate the importance of GIS.
- Apps with two-way communication are effective.
- During a crisis, get everyone in the same room if you can.

RAFAEL MENA ORANGE COUNTY, FLA.

A DAY BEFORE THE official start of this year's Atlantic hurricane season, Rafael Mena was invited to the White House. On May 30, shortly after embattled Veterans Affairs Secretary Eric Shinseki resigned, Mena sat across a table from President Obama.

Mena and two others, a Virginia official and the U.S. Energy secretary, were there to discuss innovative approaches to disaster preparedness. As the CIO of Orange County, Fla., Mena has had more experience responding to hurricanes than many. In the decade since 2004, a year when Charley and two other hurricanes made landfall in the Orlando area, Mena has led several technology projects to prepare the county for the next megastorm.

In 2011, Orange County introduced an app called OCFL Alert. Developed in-house by the county, the Web and phone app gives people all the vital real-time data they need before and after a hurricane: where sandbags are being delivered, a map of shelters, the location of drinking water, and on and on. Thousands have come to depend on the app for the latest information.

"What makes our applications unique is they are tied to a back end — to case management systems. When you submit something to us, in real time, that information creates a work order or a ticket incident. It's delivered to the proper department so they can start working on the issue," Mena said. The user gets real-time updates. "It's very interactive and it gives the citizen information and it keeps us accountable; it's transparent."

An encore is coming. Mena and his staff are working on another app that will help deploy volunteers to big groups like the American Red Cross or the small food bank around the corner. Volunteerism can become chaotic if it isn't managed well.

Public-facing apps are indispensable, but Mena said just as much time and attention must be given to the computer systems that are out of the limelight. A point of emphasis in Mena's business continuity plan is ensuring the county's GIS system stays up and running. Basic map layers for electricity, lakes, schools and essential buildings help officials see what's happening even if they're confined to an emergency operations center. "A picture tells a story well and allows for better decision-making. GIS is very important," he said.

Another lesson learned that Mena suggests sounds almost too simple: Have the key decision-makers sit next to one another during a crisis. When an emergency strikes, get everyone — literally everyone possible — in the same room. Orlando's sprawling hospitality industry, Disney and other hoteliers, are major players inside Orange County's EOC because any type of evacuation in Florida could bring an influx of travelers who need lodging.

These are the kinds of lessons Mena shared with the president last spring. The commander in chief was engaged during the talk, Mena said.

"It was a great experience and he asked very good questions. It was very, very cool and I enjoyed it," Mena said.

JUSTIN HOLMES

BOSTON

WHEN TWO PERPETRATORS set off improvised bombs on Patriots' Day the afternoon of April 15, 2013, near the finish line of the Boston Marathon, Justin Holmes and his team immediately jumped into action to alert citizens and keep them apprised of the latest developments.

It wasn't a matter of creating a bunch of new social media channels and websites. For the most part, the city simply kept doing what it had been doing for years, only more of it. For the past four years Holmes has overseen Boston's 24-hour phone hotline along with a number of mobile and website applications.

"The wrong time to stand up a social media presence is in the middle of a disaster," Holmes said. It's most effective when you have an audience that is already familiar with your brand and leveraging that during an emergency. "Having sustained, proactive and daily engagement with residents helps you in a time of emergency."

Three were killed and 264 hurt in the marathon bombing. Residents were on edge and looking for any information on friends and family who might be potential victims. People also were sending in tips as law enforcement hunted the two suspects. Thousands of calls simultaneously flowed into Boston's call center, and the volume remained unusually high for the following two weeks. The city leaned heavily on its scalable telephony to handle the surge of volume.

Some of the Web tools the city had weren't as ready for an emergency as Holmes and other Boston officials would've liked, and that problem has been fixed in the bombing's aftermath. "Our website actually went down for a brief period during the marathon bombing because people were visiting cityofboston.gov in such higher numbers," Holmes said. The importance of having scalable solutions on hand was a lesson learned.

Having the right technology in place was important, Holmes said, but just as valuable, if not more so, was establishing trusted relationships ahead of time. "The right people who are willing to work together on whatever challenge arises is infinitely more important than anything else," he said. That also extends to partnerships with vendors that are willing to step in at a moment's notice. Esri helped Boston develop a tool to manage snowstorm operations, and Twitter helped raise more than $5 million among 500,000 donors during a six-hour sponsored tweet campaign for One Fund Boston, which was formed to help people affected by the bombings.

Establishing the public's trust online and on social media also has been critical to success. Holmes' advice is to adopt a personal, human tone when communicating — every day and during crises: "Too often when we try to solve problems of scale, getting thousands of phone calls at once, the technologist might say to just put up a recorded message. Well, during an emergency, people are so concerned that having a human voice on the end of a phone in a call center context is important. They're looking for comfort and assurance. A computer recording can't give them that in the same way."

His second pointer for social media use is being mindful to manage expectations. In an emergency, if someone is worried about their power being out, Holmes said the worst thing you can tell them is, "We're going to get it back on as soon as we can. Hang tight. We'll have the power back on in two hours."

Instead, be honest. You probably don't know exactly when the problem will be fixed. So tell them it could take a while and you will keep them posted.

LESSONS LEARNED

- Before an emergency, ensure that technology is scalable so you aren't caught off guard.
- Ask for help from the private sector; companies probably will respond quickly.
- Be personal, not robotic, when communicating with the public.

Boston's Justin Holmes says the city saw huge increases in phone and Web traffic during the marathon bombing.

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DAVID KIDD

LESSONS LEARNED

- Be prepared for help from the outside, including colleagues from other governments.
- Tap into the disaster recovery plans of the private sector when offered.
- Pilot projects can be put to use in the real world to fill a need.

STEVE EMANUEL NEW JERSEY

SUPERSTORM SANDY WAS a once-in-a-century weather cataclysm of unimaginable proportions when it hit the Eastern Seaboard on Oct. 29, 2012. It hit New Jersey especially hard; coastal developments were wiped away en masse and more than 100 people were dead or missing. Sandy caused an estimated $65 billion in damage nationwide.

For days in advance, New Jersey CIO Steve Emanuel pre-planned and made lists of possible needs — cell sites, email and other emergency messaging platforms, air cards and smartphones were just a few. "One of the things we talked about was voting by mail because it was right around election time," Emanuel said.

There also were more mundane considerations, like coordinating how relief trucks from across the U.S. would get through the interstate electronic toll system when driving to New Jersey.

Even so, when Sandy came to pass, Emanuel was caught somewhat off guard when his CIO colleagues, like David Behen from Michigan, Karen Robinson of Texas and Hawaii's Sonny Bhagowalia called him and offered assistance.

"You probably could help," Emanuel said at the time, "but I need to think about what the hell you can do for me."

The experience had Emanuel brainstorming that perhaps it's time to stand up a national database or website where CIOs in need could access a list of contacts, capabilities and resources. It would've been useful to know which states could've sent New Jersey an emergency supply of spare parts, switches and server infrastructure, or a dozen satellite phones.

Even having another state's CIO call the telecom companies on his behalf to collect statistics on outages would have been helpful, Emanuel said.

"Something as simple as that, because at one point in time we thought we had 40 to 45 percent of wireless capacity down. We didn't talk about where or who they were; we put a global number together so the governor would know why he's not getting information."

In the aftermath, Emanuel also found that the private sector — Cisco, Microsoft, Verizon and others — shared valuable action plans that New Jersey would use to further improve its disaster recovery and business continuity. Still, thanks to the state's preparations, he said New Jersey did well to avoid a major system outage and personnel stayed overnight in the state's data center to ensure uptime.

"The bottom line is there are so many things that surround us that we react to that you don't think about until that 'gray sky' day," he said.

Emanuel also said pilot projects that were in progress played a role in New Jersey's response efforts. For instance, the state had recently turned off a social media pilot that was aggregating data on specific discussion topics. New Jersey turned that back on during Sandy.

"Eventually that became one of the conduits for pleas for help from people. After the second week, they started dispatching responders based on social media," Emanuel said.

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[1]2013 Data Breach Resolution Client Survey

right decisions } **successful missions**

STEVE TOWNS

LESSONS LEARNED

- Brace for some chaos; it might be inevitable.
- Establish authority and leadership early on.
- Know who your vendors are before the emergency.

HUGH MILLER

SAN ANTONIO

IT'S EASY TO FORGET that Hurricane Katrina was a truly national-scale disaster. The Category 5 hurricane ravaged New Orleans, but the long-lasting effects extended well beyond the French Quarter into neighboring states.

San Antonio became a destination of last resort for an estimated 30,000 Katrina refugees, and the city quickly realized that an influx would be coming in search of shelter. San Antonio CIO Hugh Miller and a few of his staff members were put in charge of technology at an old Air Force building that would become a processing center for thousands left homeless from Katrina. Some came only wearing the clothes on their back.

It was a hasty operation by necessity, with routers, switches and wires strewn about between cubicles and rows of cots. The first phones were individual outbound wires before Miller's staff later installed an IP PBX system to organize call routing.

The United Way, FEMA and other organizations got involved, and for a time everyone was doing their own thing. Technicians from the big telecom companies would show up and begin installing equipment without oversight. There were almost too many volunteers. Chaos ensued.

"Early on we realized someone needed to be in charge of these different types of work so that you didn't have people stepping on top of each other," said Miller. The city had to aggressively assert authority over IT matters.

Slowly the project settled in and Miller and city staff turned to the day-to-day work of installing big screen TVs, organizing food and a multitude of other functions. They even created databases of the displaced residents and disseminated the information nationwide because the evacuees' loved ones didn't know where they were.

"One of the big things that was prevalent was that there was truly not the level of collaboration that was needed," Miller said. "Granted this was back in 2005, so there were a lot of things maturing — but there was not a clean, integrated way to process people."

The vendor community also stepped up. Dell is in Austin and AT&T has a huge footprint in San Antonio, and the presence of those companies was one reason the federal government chose San Antonio as an evacuation point, Miller said.

He advised to know who your vendors are and have those key contacts in advance. San Antonio was fortunate to have that list already in place, Miller said, in part because of the high volume of regular purchases necessary for the nation's seventh-largest city. Consequently, vendors reached out to offer assistance and the city already had extra computers and phones on hand because it was on a scheduled IT refresh cycle.

"We had a regular batch of systems that were ready, so we pulled from that stock and deployed it instantly," Miller said.

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CHIEF SCOTT THOMSON, CAMDEN COUNTY, N.J., POLICE DEPARTMENT

BY TOD NEWCOMBE
SENIOR EDITOR

FROM ANALYTICS TO VIDEO, POLICE LOOK FOR EFFECTIVE WAYS TO USE TECHNOLOGY IN A VERY HUMAN BUSINESS.

When city budgets face tough times, most agencies and departments must make cutbacks, sometimes major ones. But public safety has always been sacred. Belt-tightening, yes. But few police departments have faced layoffs. Until now. Perhaps the poster child for just how severe fiscal problems have become for some cities can be found in Camden, N.J., a poverty-ridden, high-crime city of 77,000, located on the banks of the Delaware River, across from Philadelphia.

Desperate to cut costs, the city disbanded its entire police force. The Camden County Police Department rehired most of the laid-off officers, and hired another 100 at much lower salaries and benefits, to create a consolidated regional police force. The move is considered highly controversial and certainly radical. While police departments in other jurisdictions have merged or consolidated to cut costs, none have gone down the path that Camden has taken.

Underpinning Camden's radical plan is an effort to run a "smarter police" operation, according to Chief Scott Thomson. The concept that he and other police chiefs have adopted is to use technology as a "force multiplier" to give cops a leg-up on fighting crime. The Camden Police Department has set up a real-time tactical operational information center that pulls together data from an array of cameras, gunshot location devices and automated license plate readers. Real-time data is fed back to the cops on the beat, giving them useful information when they respond to incidents. Even patrol car locations are tracked so officers can be deployed where they are most needed.

The situation in Camden certainly is unique and it's too early to tell whether the force multiplier approach is making a dent in the crime rate (in the first 12 months of the new department, the city recorded 57 murders, down from 67 in 2012), but in some ways it crystallizes what's happening to police departments across the country. In 2012, 51 percent of the nation's law enforcement agencies experienced budget cutbacks, according to a survey by the Police Executive Research Forum. While much better than the 78 percent that suffered cuts when surveyed in 2010, the numbers reflect ongoing budget pressures for police agencies.

When forced to reduce costs, police departments cut staff (23 percent), implemented hiring freezes (45 percent) and, most significantly, cut back or eliminated plans to acquire new technology (51 percent). The reduction in technology spending doesn't surprise Jim Bueermann, president of the Police Foundation. "When you are cutting people from your workforce, it's hard for police chiefs to justify spending money on new technology," he said.

But there are exceptions, according to Bueermann. "In some places the technology is considered essential, as a way to leverage existing resources,

ABOUT THIS REPORT

The Digital Communities Special Report, which appears quarterly in *Government Technology* magazine, offers in-depth coverage for local government leaders and technology professionals. It is part of the Digital Communities program, a network of public- and private-sector IT professionals working to improve local governments' delivery of public service through the use of digital 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.

Look for *Digital Communities* quarterly reports in *Government Technology* magazine in March, June, September and December.

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while in other agencies, it's more 'I wish we could do that, but we can't afford it.'"

There are more than 14,000 local law enforcement agencies in the U.S., employing more than 760,000 officers (and an additional 285,000 civilians), according to the latest FBI statistics. The U.S. spends approximately $100 billion on law enforcement, most of which goes toward paying for officers who are on the front line against crime. But as the recession recedes and budgets begin to slowly increase, cities and counties are starting to see they can achieve effective levels of public safety through the selective use of technology. Robert Davis, director of research at the Police Executive Research Forum, has a sanguine outlook, believing that cutbacks have reached bottom and police departments are once again boosting technology budgets. It can be something as high-end as gunshot location devices, license plate readers, better computer-aided dispatch, or something as low-end as using social media or mobile apps that allow citizens to self-report crimes.

Other technologies, like personnel management systems and cloud computing, are helping police departments operate on a more business-like basis. And always there are cutting-edge tools, like next-generation 911, real-time crime centers, and forensic and biometric technologies, which offer police departments tantalizing possibilities in the fight against crime.

This special report highlights trends in policing technology, how they are helping, and what needs to be done to ensure they are beneficial. That's important because policing is a people business and with half the law enforcement agencies in the country having fewer than 10 officers, deciding whether to add another cop to the beat or purchase the latest tech tool needs to be weighed carefully before making a financial commitment. As Bueermann pointed out, "just because we can do it, doesn't mean we should do it."

/ WEARABLE CAMERAS

PRO

- Produce valuable video evidence
- Reduce violence
- Increase officer professionalism

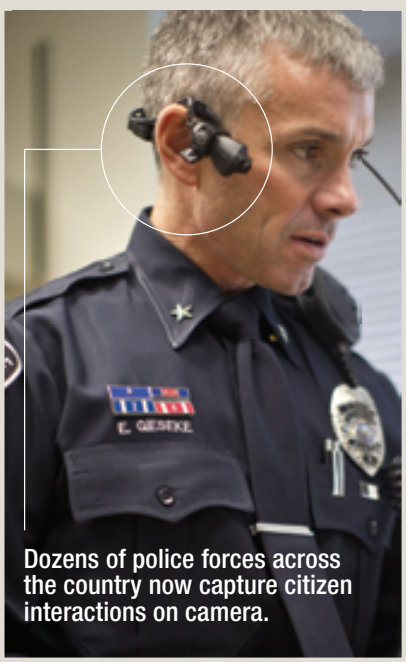
CON

- Incidents must be linked to recordings
- Full systems can be expensive
- You'll need to develop usage, security and image retention policies

WEARABLE CAMERAS:
THIS ARREST IS BEING RECORDED

In an era when everyone has a phone that can record video or audio, police have struggled to catch up with this new reality. Phone camera video recordings of officers behaving badly quickly go viral. But now the technology that puts miniaturized video cameras into smartphones also powers body-wearable cameras. And police are finding that to be a good thing.

Small cameras worn on an officer's vest, lapel or eyewear can capture interactions that have ramifications on several levels. First, the cameras can impact the judicial process. A survey by the National District Attorneys Association and the American Prosecutors Research Institute found that 91 percent of prosecutors have used video evidence captured by a police camera, whether in the car or worn on the body. Video evidence increases the ability to obtain convictions and the ability to obtain guilty pleas prior to trial.



Dozens of police forces across the country now capture citizen interactions on camera.

Cops like wearable cameras because they appear to reduce the likelihood of an assault, deterring violence and negative behavior. "People stop acting badly when you tell them they are being recorded," said Las Vegas Sheriff Douglas Gillespie during a 2013 Police Executive Research Forum (PERF) conference. The cameras also can affect professionalism, helping to improve the accountability of police officers as well as reduce complaints of police misconduct, according to a report by the National Institute of Justice.

"There's a considerable level of interest in the technology," said David Roberts, senior program manager for the International Association of Chiefs of Police. "It's helped police departments identify and reduce the number of frivolous lawsuits because it provides levels of documentation."

Just as phone video cameras have become smaller, better, easier and cheaper, body-worn cameras have gone through similar improvements in resolution, frame rate, battery runtime and low-light recording. Even storage — always an issue when it comes to video — has options that now include the cloud.

For cops, one of the biggest issues with wearable cameras is figuring out how to simplify linking a recorded event with an incident call. Should the officer be responsible for uploading the video or should it be handled by a third party to ensure that the video is not tampered with? Then there's cost. The cameras aren't that expensive, depending on the quality required,

/ FUTURE TRENDS IN POLICING TECHNOLOGY

What will be the next groundbreaking technology that will help law enforcement improve public safety while winning the war against crime? This year, the Police Executive Research Forum published a survey of its members conducted to find out which emerging tech tools could bring fundamental changes to policing. Social media, license plate readers and video streaming from wearable and in-car cameras stood out as technologies that have either received wide acceptance already or show promise. But several other emerging technologies were also singled out for their potential to change police operations:

1 / The Nationwide Public Safety Broadband Network

Also known as FirstNet, the proposed network was signed into law in 2012 with the mission to build, operate and maintain a nationwide wireless broadband, radio access network for public safety. The goal is to put an end to the interoperability and communications challenges that have occurred during exceptional and complex disasters, such as hurricanes, earthquakes and terrorist attacks. Participants include the federal government, all 50 states, six territories, local governments and approximately 5.4 million first responders. FirstNet estimates the cost for the network at $7 billion, with funds to be raised by the FCC's spectrum auctions. FirstNet is expected to provide police officers with a technology platform that will help them solve crimes more quickly and efficiently, using a secure and reliable network that could enhance everything from video streaming to real-time crime centers. But concerns over cost, participants and local control could stand in the way of FirstNet's mission.

2 / Next-Generation 911

One of the biggest shifts in how people communicate is the explosive growth in text messaging. Not surprisingly, the public is now demanding that they be able to text to 911 when there's an emergency. Current 911 technology is extremely limited in terms of options when it comes to receiving emergency text messages. The answer: Next-generation 911 has features based on the latest technology that runs on Internet Protocol standards. NG 911 allows call centers to integrate not just text messages, but photos, video and other types of attachments, as well as scripted responses, so call takers don't have to type out their messages to callers. New systems can also locate where the text message was sent from (dispatchers will still need to get a street address to verify the person's location). But NG 911 isn't cheap. The FCC estimates the cost of upgrading every call center in the country at nearly $3 billion.

3 / Real-Time Crime Centers

Facilities that can gather vast amounts of crime-related data, such as arrest records, mug shots and warrant information, and then push it out to officers and investigators in the field, are expected to have an impact on crime investigations in the future, according to PERF. New York City and Houston have pioneered the concept of real-time crime centers. Analysts in the Houston Police Department's crime center monitor social media during major incidents, sifting through feeds and sending relevant information to officers on their way to a crime in progress. Satellite imaging and mapping technology also can enhance the real-time data used in these crime centers.

4 / Cybercrime

While not a tool for the police, cybercrime has grown significantly in recent years. But many local law enforcement agencies are unsure of their role, in part because of jurisdictional issues. According to PERF, cybercrime is vastly underreported. Local police also have been slow to take on the challenge of cybercrime, which continues to grow in scope and sophistication. Police departments need to develop cybercrime expertise, as well as develop partnerships with other local, state and federal law enforcement agencies to expand their understanding of the crime. At the same time, police departments need training to understand how to respond to victims and to provide others with information on how to protect themselves.

but when a department purchases an entire system, with management and storage, costs can escalate.

But the most pressing issue with wearable cameras comes down to policies regarding image storage and retention. Agencies need to consider how long video clips should be stored and who has access to them. States have different laws on how long recordings must be kept. Speaking at a PERF conference in 2013, Scott Greenwood, an attorney with the American Civil Liberties Union, said 5 to 7 percent of video recorded by officers in the field has evidentiary or exculpatory value, which he believes should be flagged for longer storage. "Certainly any use of force video ought to be flagged so it's not deleted," he said. "We would call for routine data to be deleted relatively quickly."

Questions about usage, retention, management and security must be answered with clear policies well before a police department commits funds to using the technology, said Roberts. "The lack of policy in place before implementing the technology is a common problem," he said. The other often-overlooked issue is measuring the impact of the technology. "You've got to build some metrics around it," he added.

One of the most extensive studies on wearable cameras was conducted in 2012 by the Police Foundation with the Rialto, Calif., Police Department. When half the city's 54 uniformed officers wore cameras, the department saw an 88 percent decline in the number of complaints filed against officers, compared with the 12 months before the study. Rialto's police officers also used force nearly 60 percent less often — in 25 instances, compared with 60. When force was used, it was twice as likely to have been applied by the officers who weren't wearing cameras, the study found.

/ PREDICTIVE POLICING

PRO

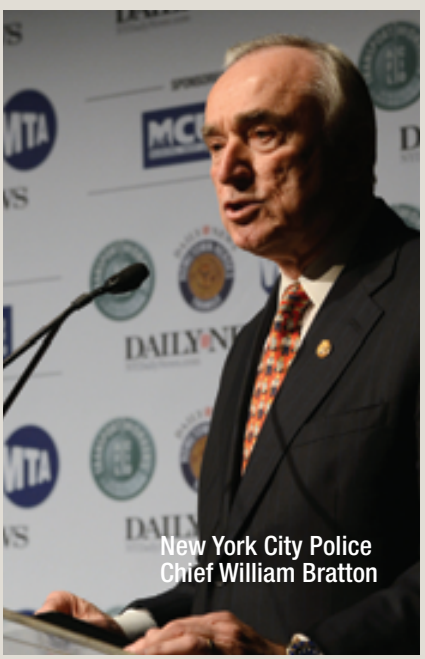
- Spots crime patterns
- Helps agencies target scarce resources
- Mining data from license plate readers has been effective

CON

- Needs high-quality data
- Predictions aren't exact
- Can trigger privacy and civil rights complaints

PREDICTIVE POLICING:
THE PROMISE AND PERILS

It should come as no surprise that the man who introduced computer-driven performance management — known originally as CompStat — to policing, is generally credited with envisioning how predictive policing could help fight crime. New York City's once and current Police Chief William Bratton saw predictive analytics as a way to anticipate gang violence, burglaries and thefts when he was chief of police in Los Angeles back in 2008. In 2011, the L.A. police used predictive analysis to cut property crime by 12 percent in one neighborhood. Bratton suggested that predictive policing could have a real impact when used in conjunction with existing policing techniques, such as community policing.


New York City Police Chief William Bratton


Heat maps populated by crime data help police know where to focus resources.

Cops have used statistical data and geospatial analysis to forecast crime levels for years. But as analytical tools have become more sophisticated and data sets much larger, the ability to forecast crime has grown more nuanced. Not everyone believes that technology can accurately forecast crime — some argue that humans who commit crimes are too random — but a growing body of evidence points to patterns in how and when crimes are committed. Eliminate some of the guesswork and police agencies can direct their manpower where it's needed.

"Predictive policing is another extremely popular technology when you have limited resources," Bueermann said. "It becomes extremely valuable when you can predict where to put your resources to be the most valuable and effective."

The RAND Corp., a nonprofit research organization, released an exhaustive study on predictive policing in 2013 and found that the technology can be used to: predict the place and times of crimes; predict and identify which individuals are likely to commit a crime; predict the profile that accurately matches likely offenders with specific past crimes; and predict victims of crimes.

But the effectiveness of predictive policing also can be hindered by emphasizing data accuracy over tactical utility, relying on poor-quality data, misunderstanding the factors behind a prediction, inadequate assessment and evaluation

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PREDICTIVE POLICING: A SILVER BULLET?

According to a 2013 RAND report, predictive policing has been so hyped that unrealistic expectations have created problems around its use. Some of the biggest myths include:

1 The computer actually knows the future. Computers can simplify the search for patterns, but all of these techniques are extrapolations from the past, making "predictions only as good as the underlying data used to make them."

2 The computer will do everything for you. Although some predictive policing solutions appear quite comprehensive, humans still must collect relevant data, preprocess the information so it's suitable for analysis, and then review and interpret it in response to ever-changing crime conditions.

3 Police need a high-powered (expensive) solution to get the job done. In fact, productivity tools, such as Microsoft Office and a geographic information system, can support many predictive methods. RAND says increases in predictive power tend to show diminishing returns.

4 Accaccurate predictions automatically lead to major crime reductions. Studies show that when the focus is on the analyses and software, the results tend to obscure the fact that predictions are just that: predictions. Actual decreases in crime require taking action on those predictions.

of predictions, and overlooking civil and privacy rights when using the software to label areas and people as at-risk.

Bueermann said predictive policing shows promise, but that more research needs to be conducted on its effectiveness. "The idea that you can forecast where the highest probability of crime will occur — it's never going to be an exact prediction, only a target for a future hot spot, that's all."

One technology tool that, on first glance, may seem to have nothing to do with predictive policing has become increasingly effective at just that. Automated license plate readers have been around since the 1990s, when the British government used cameras and readers to track vehicles used by the Provisional Irish Republican Army. More than 20 years later, the technology is extremely popular, primarily for detecting stolen vehicles.

But now some police departments are mining the data captured by the readers to identify vehicles near a crime scene. Records of license plate scans are stored in a database for as long as two years, so officers can use the information to solve crimes. Plate readers also provide geographic and time information, making the technology useful for cities that are battling drugs, homicides, burglaries and gang activities, according to RAND.

When matched with hotlists of vehicles with outstanding citations or expired registrations, license plate readers also can boost municipal revenue. But the technology isn't cheap. Cameras can cost as much as $25,000 per unit. Readers at fixed sites can cost even more — as much as $100,000 — although they can operate 24 hours a day in places where traffic choke points occur, such as bridges or busy intersections. New York City has used readers since 2006 and has increased arrests for grand larceny by 31 percent and recovered more than 3,600 vehicles. Sacramento, Calif., said the technology helped it drop from 6 to 13 in a national ranking for per capita auto thefts.

Many cities acquired readers with federal or state grants. But grants don't cover ongoing maintenance and data storage costs, which add up over time. Other issues like accuracy in reading plates and the frequency with which hotlist databases are refreshed (the more frequently the better) also can impact the benefit of plate readers.

But as more police departments adopt license plate reading technology, privacy concerns are mounting. Because the systems retain information about every license plate read, privacy advocates say law enforcement agencies could use the information to track the movement of individuals, even if they're not suspects in a crime.

In 2013, the ACLU reported that long data retention periods and more information-sharing among law enforcement agencies could degrade personal privacy. Law enforcement agencies need to set policies around the data's retention period and who controls the data. Done correctly, license plate readers can be an effective tool for crime analysis as well as generating revenue. But if the policies behind the technology are flawed, community response can become swiftly negative, say the experts.

CLOUD COMPUTING: (NEARLY) READY FOR PRIME-TIME POLICING

As local law enforcement agencies continue to pursue smarter policing, one huge potential benefit on the horizon is cloud computing. Three-quarters of the nation's 14,000 local law enforcement agencies have 25 or fewer sworn officers and nearly half have fewer than 10 officers. Cloud computing, which can minimize up-front investment and ongoing costs for IT systems and applications, makes sense in this era of fiscal austerity.

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MOTOROLA

/ CLOUD COMPUTING

PRO

- Can lower up-front and maintenance costs
- Puts technology in reach of smaller agencies
- Security regulations are becoming more cloud friendly

CON

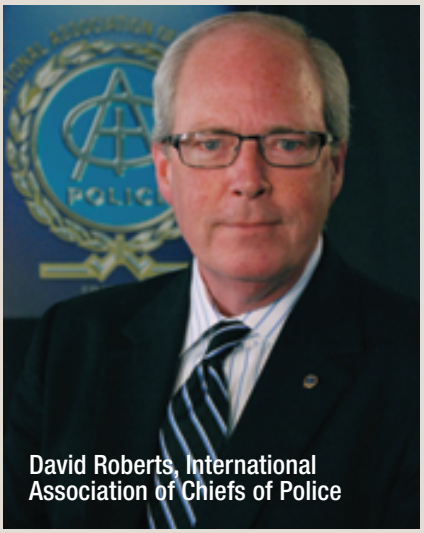
- Security concerns persist

The International Association of Chiefs of Police surveyed its members and found that nearly half were either using cloud computing or were considering it. "That ran counter to what we thought was a broad reluctance about the cloud," said IACP's Roberts. "Our survey found 16 percent were already using it and 38 percent were planning to use cloud computing within the next two years."

Like other government agencies, police hope they can save some money and get rid of legacy hardware and software by using the cloud. Email is the most popular cloud application, followed by storage, access to the FBI's Criminal Justice Information System (CJIS) and crime reporting, according to the survey. But cops also see the cloud helping with disaster recovery and backup, crime analysis and records management. "The cloud opens up sophisticated technology tools and services to smaller agencies that don't have the funds to purchase an entire application on their own," said Roberts.

Most experts would agree. Cloud computing has given a leg up to small businesses looking to be the next success story. It would follow that small police departments also could move quickly as far as using the latest digital productivity tools without big up-front costs. But the IACP survey found that large police agencies, with hundreds of officers, were likelier than small-town departments to use the cloud.

What's holding back many police departments — large and small — are security concerns. In fact, for some time, police were virtually shut out of the cloud computing market thanks to the fact that cloud providers couldn't meet


David Roberts, International Association of Chiefs of Police

the FBI's stringent security standards for data sharing on the Criminal Justice Information System (CJIS) network. In 2009, Los Angeles announced plans to migrate city workers to a suite of cloud-based productivity tools, including email. But the LAPD balked at the idea, citing the fact that the service did not meet the FBI's security and privacy requirements.

The sticking point was that anyone who has access to CJIS records must pass a criminal background check, including people who work for cloud providers. But cloud computing, by its very nature, is a borderless technology with servers and workers scattered across the globe. Given the architecture of cloud computing, storing emails with CJIS information in the cloud was nearly impossible.

But a 2013 FBI update to the CJIS security policy gave cloud providers a little more wiggle room to store criminal justice information, but with some limitations, including the insistence that law enforcement agencies retain data ownership and that cloud providers not conduct any metadata analysis to ensure the privacy and security of the information. Other limitations pertain to data portability, integrity and confidentiality. As a result, some cloud providers have made moves to meet the new criteria so they can provide cloud services to the law enforcement community.

At the same time, there's growing interest in so-called community clouds, where a group of law enforcement agencies build their own cloud solution for infrastructure, platform or services, Roberts said. "Because of the CJIS requirements, some agencies think the better solution is in having multiple justice agencies coming together and fashioning their own solution," he said.

SOCIAL MEDIA: BIG LESSONS FROM THE MARATHON BOMBING

At 2:49 p.m. on April 15, 2013, at the height of Boston's annual Marathon, two bombs exploded near the finish line, killing three people and injuring more than 260 others. What followed was an extraordinary manhunt, which included a shelter-in-place request from the governor that virtually shut down the city, along with the use of social media by law enforcement as a key communications tool to keep the media and frightened citizens accurately informed about what was going on.

Within 10 minutes of the bombing, Boston Police Department (BPD) Commissioner Edward Davis told his department to start using social media and to let people know what had occurred. The importance of social media as a policing tool, in particular Twitter and Facebook, soon became apparent. Misinformation, spread by professional media outlets and social media itself, was quickly corrected by the BPD. It didn't take long for the media to realize that the most accurate information about the bombing was coming from the official BPD Twitter account.

"The Boston Police Department was outstanding and it was so simple and effective," said Lt. Zachary Perron, public information officer for the Palo Alto, Calif., Police Department. "They became the news source during the crisis. It was a watershed moment for law enforcement and social media."

CAN CIVIC APPS HELP FIGHT CRIME?

It's a remarkable sight. Pay a visit to the city of Chicago's data portal, open up the latest crime data map and you can see a year's worth of crime information displayed geographically, down to the block. It's an amazing example of what can be done with open data. In 2011, shortly after he was inaugurated, Mayor Rahm Emanuel released a treasure trove of city data for public consumption, some of it geo-based information, including up-to-date crime incident data, which used to be available in hard-to-access aggregated formats that came out just once a month.

The city's open data strategy has given civic hackers a substantial boost, helping put a spotlight on the possibilities of merging open data with law enforcement. These kinds of cross fertilizations between civic data enthusiasts and police departments are still in their embryonic stages, but the few examples out there are tantalizing in terms of bringing together the needs of safe communities with law enforcement's efforts to fight crime and improve public safety.

In 2013, Chicago city officials sponsored a "safe communities" hackathon using the police department's latest application programming interface called ClearMap. Participants had a crack at using new methods to query crimes, wanted lists and mug shots, as well as graffiti problems, vacant building code violations and even police beat boundaries. The result has been a wave of apps that Chicagoans can use to track crime and improve public safety, according to Smart Chicago, an online civic organization that uses technology to improve life in the Windy City.

The success of Chicago's crime hackathon has spawned others, including one run by the U.S. Department of Homeland Security in May, and sponsored by AT&T, Google, Intel and Apperian. One of the winners was a mobile app created by Theo Rushin Jr., who developed Beacon, which lets an injured or lost person in an emergency situation send out a preconfigured distressed notice to anyone designated as a recipient. A second companion app sends out continuous updates on the location of the individual in trouble.

In Redlands, Calif., city officials have worked with software firm Cityworks to incorporate a mobile civic engagement app called CitySourced that can act as service request tool for residents. The city sees CitySourced as a rapid first step toward an eventual 311 call center that would allow residents to report problems and complaints. The app could also be leveraged by the Redlands Police Department as a tool for monitoring illegally parked cars.

In Philadelphia, the city's 2012 Code for America fellowship led to the creation of Textizen, another type of mobile messaging platform for public safety, law enforcement and criminal justice agencies that helps them access, analyze and track difficult-to-reach population groups. "The running theme is that communications makes or breaks a program," said Textizen co-founder Michelle Lee. Examples of how Textizen supports public safety range from letting neighbors know to double-check doors if their block is getting targeted for burglaries to reliable reporting and communication during someone's parole. "Too often that communication happens through manual channels that don't fit today's busy lives," Lee said.

Not all public safety and crime apps are created by hackers. Last year, the Virginia State Police launched a crime reporting app. Called See Something, Send Something, it's known as a suspicious activity reporting tool and was created by My Mobile Witness to connect individuals, law enforcement agencies and regional fusion centers, which collect and analyze intelligence on criminals and terrorists. So what does the Virginia State Police want citizens to report? "Suspicious photography, vehicles or people in places that just look out of place," Maj. Rick Jenkins told Fox5 News in Woodbridge, Va.

THE BEACON MOBILE APP LETS AN INJURED OR LOST PERSON IN AN EMERGENCY SITUATION SEND OUT A PRE-CONFIGURED DISTRESSED NOTICE TO ANYONE DESIGNATED AS A RECIPIENT.

Releasing crime data via the Chicago open data portal and a holding a "safe communities" hackathon have yielded several apps aimed at improving public safety.

DAVID KIDD

/ SOCIAL MEDIA

PRO

- Delivers message to large user base in real time
- Often provides evidence for investigators
- Strengthens relationship between citizens and police

CON

- Two-way communication demands a culture shift
- Messages can be distorted
- Use policies must be developed

Perron should know. He is in charge of the department's social media program in a Silicon Valley city where just about everybody uses social media and news is covered by four daily newspapers. What began as part-time work is now a full-time position for Perron. His job, as well as for other police officers in charge of social media, is to direct public relations through the various channels — Twitter, Facebook, YouTube — but to do it in a real-time manner and with a much broader constituency. No longer do press releases just go out to the established media; they are available to anyone in the community who follows the Palo Alto police via social media.

Social media has three sets of characteristics with key implications for law enforcement, according to a Harvard Kennedy School research report, *Social Media and Police Leadership*.

The first is the scope of social media, which continues to grow.

Perron said his department's social media outlets have thousands of followers compared to the handful of traditional media outlets that were interested in press releases issued by the Palo Alto PD.

The second characteristic is structure.

Social media lets police have two-way conversations with the community. Palo Alto routinely receives messages from citizens via social media, including anonymous tips. Perron also conducts "virtual ride-alongs," live-tweeting during an entire shift from an officer's patrol car. "It gives the public a great view of what we do and a better understanding of what's going on." Ultimately social media provides law enforcement a level of transparency it couldn't attain otherwise. When done correctly, the benefits are immeasurable, said Perron.

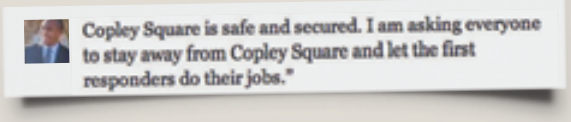
The third characteristic is tone.

When the police use social media, they are having a conversation with their community; it's informal and quite distinct from traditional press releases. "We try to use a voice and tone that is cultivated and professional, but also human and sometimes humorous," Perron said. Corporate marketing campaigns have struggled to adopt that kind of human and humorous tone. But beat cops have a lot of practice talking directly to the community in an informal manner. For that reason, they have probably been more successful than other government agencies at engaging the public via social media.

Besides using social media as a two-way communications tool with the public and media, police also use Twitter and Facebook in investigations. Four out of five law enforcement agencies say they use social media for investigations, according to a 2012 survey by LexisNexis Risk Solutions.

The most common uses include: evidence collection — people are more than willing to brag about their actions on social media sites; location of suspects — one investigator "friended" a suspect and was able to track his location; criminal network investigation — again, people are prone to talking about their actions on social media sites, giving the police a window into their activities. The New York City Police Department found that 72 percent of its social networking use was by its detective bureau, investigating crime patterns and suspects, according to a 2013 report by the Police Executive Research Forum and the U.S. Department of Justice's COPS program.

But using social media has its challenges too. There's the cultural shift from a one-way form of communication with the public and media to one that is clearly two way now. Social media also can amplify, even distort information as it gets passed



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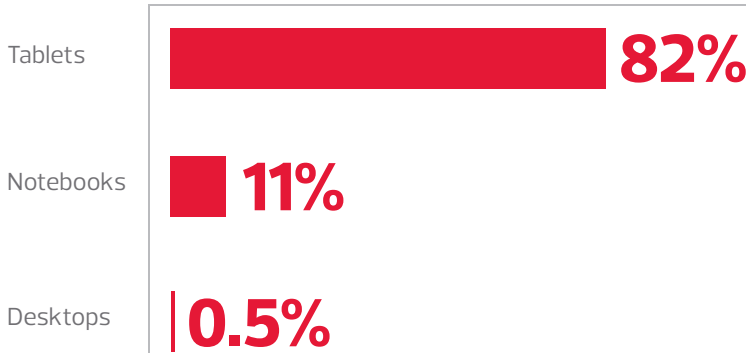

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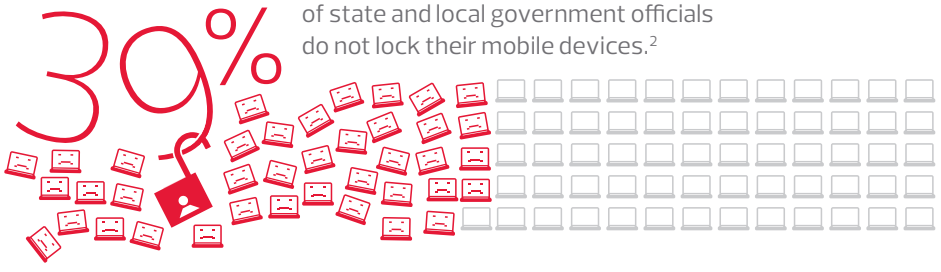

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along. In addition, police departments must set policies as to who controls the information. In Palo Alto, Boston and elsewhere, social media content is centralized. But other agencies let individual police officers communicate through their own Twitter accounts.

For someone like Perron, who knows how hard it can be to manage social media, the problem is one of who monitors social media accounts when an officer is off duty? "Twitter is going 24 by 7. What happens if there's an emergency and no one responds?" he asked.

FORECASTING THE FUTURE FOR TECHNOLOGY AND POLICING

In 2010, just as the recession's wave of fiscal calamity was peaking, George Bascom and Todd Foglesong, from Harvard's Kennedy School of Government, published a report, *Making Policing More Affordable*. They pointed out that public expenditures on policing had more than quadrupled between 1982 and 2006. But with city budget shortfalls opening up across the country, police departments and their chiefs, once used to ever-growing budgets, were now facing a new reality of cutbacks, layoffs and even outright mergers and consolidations of entire police departments with others. With federal subsidies disappearing (federal support for criminal justice assistance grant programs shrank by 43 percent between 2011 and 2013), thanks to a frugal Congress, police had few options.

With funding spigots turning off, law enforcement agencies must find ways to operate more affordably, according to Bascom and Foglesong. One obvious way is to use technology in more efficient ways. Being more efficient with technology also means being smarter.

Since 2010, police around the country have been paying attention to ways that make fighting crime a more affordable proposition for cash-strapped cities. And as budgets have started returning to normal, and police departments increase their investments in technology, the results are beginning to show. Davis, of the Police Executive Research Forum, said officers are becoming more professional in how they operate and that includes how they apply technology. "They are getting better at procuring technology that can deliver capabilities they didn't have before," he said.

A 2013 survey by the Institute of Justice found that 78 percent of law enforcement agencies had their grant funding cut since 2010 and 43 percent reported cuts of between 11 and 25 percent.

DAVID KIDD

Technologies like cameras, social media, DNA forensics, expanded use of GIS and predictive policing are gaining widespread acceptance. Others are emerging, but could pave the way for smarter policing down the road. They include the nation's first public safety broadband network, known as FirstNet; next-generation 911 that will be capable of receiving text messages, photos and videos; robotic tools, such as unmanned aerial vehicles, otherwise known as drones; and real-time command centers that can gather vast amounts of information on crimes for officers to use. There's even civic hacking, which has proven innovative when it comes to using big data to create new services that can be beneficial for public safety purposes.

As always, funding continues to be an issue. In May, the major law enforcement agencies sent a letter to the House and Senate Homeland Security Committee asking that the National Preparedness Grant Program reconsider a series of proposed changes that would reduce funding for terrorism prevention. A 2013 survey by the Institute of Justice found that 78 percent of law enforcement agencies had their grant funding cut since 2010 and 43 percent reported cuts of between 11 and 25 percent.

With new technologies emerging all the time and a new normal when it comes to funding, how should the police proceed? New technologies must be benchmarked, with metrics that forecast just what their impact will be on operations before they are fully implemented. Second, police departments need to set policies, especially around tools that gather data about individuals, such as video, to ensure that the civil liberties and privacy of law-abiding citizens is not compromised.

Ultimately, however, police can't forget the fact that they are in the people business. The quality of policing depends on the experience and common sense of every officer. "It's a very subjective business in many ways," Bueermann said. "There has to be a balance between the technology and the cop. If you lose the human side to policing, then you lose the compassion that's part of the job." ■

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ELIMINATING PASSWORD HEADACHES

City government streamlines and secures application access with Dell Software's identity and access management solutions.

When a government entity has thousands of employees and the need for strong security, the convergence of the two can sometimes mean a headache for IT. The city of Houston has 21,000 employees — 15,000 of which can access core services online. After implementation of a policy requiring employees to change their passwords every 90 days, the result was a deluge of customer service calls asking for password reset help.

Password resets hurt productivity and lead to security risks.

The city's IT team began tracking calls to the customer service desk and found about 40 percent of them were related to password resets — requiring the equivalent of three full-time employees working solely on this task. The team also discovered the process of resetting passwords often caused passwords for the company's multiple systems to get out of sync, leading staff to write their passwords down on visible sticky notes — not the best security practice.

The city explored technologies to help them stabilize the situation. Charles Thompson, CIO for Houston, says the team conducted a pilot with one product for over a year before determining the federated nature of multiple forests from a Microsoft Active Directory perspective was problematic. The team then needed a new solution.

"We took a look at the Dell One Identity suite of products and quickly determined it was the solution set we needed," Thompson says. "For us, it was the extra stuff under the hood: The Dell One Identity solutions allow us to deal with the multiple forests and the hosted apps, and to consolidate passwords based on a single ID from a single authoritative source." He adds that legacy applications may not be able to adhere to stringent government password policies, so taking advantage of virtual directory services for those was also critical.

DELL SOFTWARE SOLUTIONS

Dell One Identity and other Dell Software identity and access management solutions enable state and local governments to enhance security and increase organizational agility through comprehensive access governance, access management and privileged account management.

Learn more at software.dell.com/solutions/identity-and-access-management.

Password self-service: empowering users pays solid dividends

Dell One Identity Manager simplifies access management by automating management of user identities and privileges across the enterprise. It unburdens IT staff and gives them easy oversight of the environment, while providing employees with just the necessary access to perform their jobs. Workflows are based on business or policy needs, and user accounts are automatically provisioned or de-provisioned based on a feed from SAP. When new hires are recorded in HR, they

receive email and login information and access to applications.

The city of Houston began by rolling out the password self-service solution to about 500 people — and the number of password-reset calls to the service desk quickly fell by 5 percent. Based on that experience, IT staff expects a dramatic reduction in calls when the self-service capability is fully implemented.

The result will be a significant increase in productivity for both end users and service desk staff. After full deployment, Thompson calculates the city can recapture the 30 minutes each employee used to spend resetting passwords every 90 days. With 15,000 employees, that's 30,000 hours of productive staff time regained each year, which will enable staff to better serve constituents.

Meanwhile, password resets will no longer consume so much service desk time. "As soon as we're fully deployed for all the core on-premises and hosted applications, those IT staff hours dedicated to password resets can be redeployed for more complex support," says Thompson. "From our perspective, being able to take three employees and have them do something of greater value for the overall operation of the city is critical. This is a key benefit for us."

> "As soon as we're fully deployed for all the core on-premises and hosted applications, those IT staff hours dedicated to password resets can be redeployed for more complex support."
>
> Charles Thompson, CIO, City of Houston

Single sign-on — streamlined and secure

Dell One Identity Cloud Access Manager offers browser-based access to internal and cloud-based web applications. Delivering single sign-on (SSO), just-in-time cloud provisioning, identity federation, access control and auditing for a wide array of web application access scenarios, Cloud Access Manager facilitates consistent, rule-based security across different applications and access scenarios, including on-premises, remote and software as a service (SaaS).

The city of Houston's IT team has chosen a reduced sign-on, rather than a traditional single sign-on approach, but users still gain the benefits of streamlined access via cloud application password unification. Before, users were required to have a separate user name and login for SAP, Kronos, Saba training and other applications — a time-consuming and sometimes challenging process. Now the user, location and application are all unified under the same governance and security.

As rollout continues, the city of Houston is poised for success. "We now have a standard that says your user ID is your ID for all systems, whether they're on-premises or hosted," Thompson says. "We believe that the Dell One Identity solutions will not only provide on-premises and application integration, but also serve us well as we look at moving some of our critical applications to the cloud."

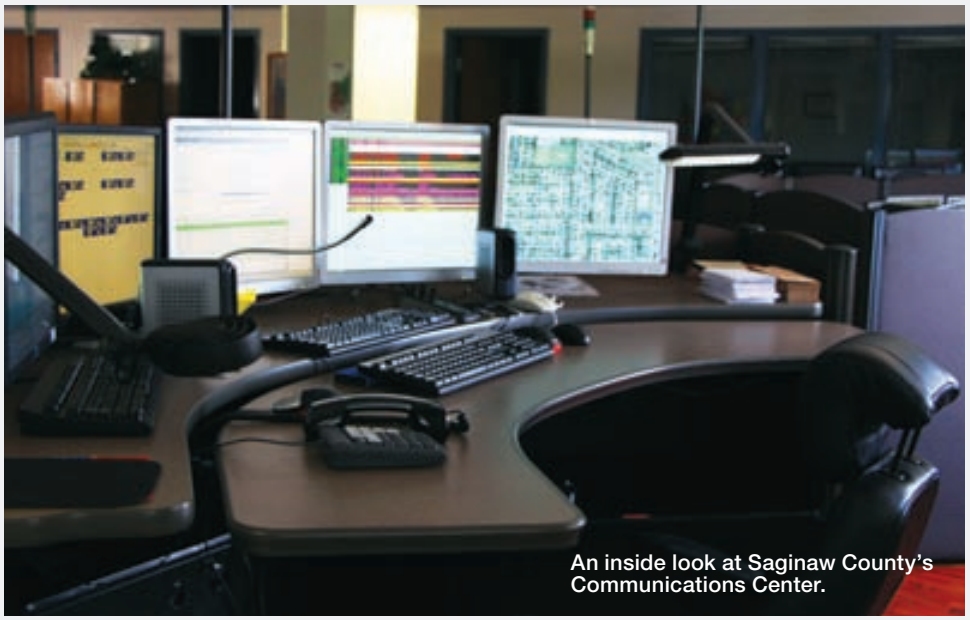
Choosing the right vendor

Thompson advises anyone looking at identity and access management solutions to completely map out their desired outcomes. He suggests taking the extra time to put the products through their paces, and using the vendor competitiveness required by the public sector to craft a relationship responsive to your needs.

"It's also critical to have professional consultative services from a third party that's certified by the product you select," Thompson says. "In our case, the consultants that came with the Dell One Identity solutions were professional, and they challenged the status quo when we tried to fall back into bad habits. You must have a partner that challenges the status quo."

He harkens back to his city's bottom line. "The operational efficiencies we have gained from the Dell One Identity solutions will lead to intangible cost shifts and better customer service — important components of the mayor's program."

CASE STUDY /
MOTOROLA



An inside look at Saginaw County's Communications Center.

ENHANCING SAFETY AND PREPAREDNESS

Clear, interoperable digital communications improve emergency response in Saginaw County.

A police officer must pick up a prisoner in another county, traveling beyond the reach of her mobile radio. A fire rages in an industrial warehouse, requiring a coordinated response of neighboring agencies. A suspect in an armed robbery leads law enforcement on a chase over city and county borders and back again — confusing jurisdictional responsibility for his capture.

These situations once proved challenging for Saginaw County first responders — until the adoption of Motorola's digital ASTRO 25® voice and data network and PremierOne™ Computer-Aided Dispatch (CAD) solutions. Now, police officers have nearly unlimited radio connectivity, greatly boosting safety. Pre-loaded box alarm cards can be triggered remotely to summon extra personnel and equipment when large fires strike. And interoperable channels keep public safety and dispatch agencies apprised of changing events in real time, allowing for a swift, targeted response.

From Dead Zones to a Reliable Digital Platform

Saginaw County sits near the thumb of the "catcher's mitt" that forms the shape of Michigan. The Central Dispatch Center is responsible for fielding all emergency calls and dispatching public safety personnel for every emergency in the county. Law enforcement, fire, emergency medical services and the road commission all play an integral part in the fluid call and response that ensures the safety of 200,000 county residents. To achieve that, clear and instant communication is vital — but it hasn't always been easy.

Tom McIntyre is the executive director of Saginaw County Central Dispatch, which handles about 370,000 calls each year. With just 30 dispatchers, the department must be highly productive in very stressful situations. What heightened that stress in the past was inadequate radio coverage and poor audio clarity when responders and dispatch tried to communicate during emergencies.

"Before the mid-1990s, we didn't have a unified radio dispatch," McIntyre says. "People went out and bought their own radios, using their own frequencies."

Don Pussehl, Jr., Saginaw Township's chief of police, remembers having just four radio channels in his vehicle as a young officer. Those transmissions, using the county's old analog system, were often garbled and impossible to understand, with many "dead zones" in hospitals, malls or rural areas. "If an officer had to leave the county to participate in an investigation, he'd get maybe 30 to 40 miles outside Saginaw County and lose all radio communication," he says.

In the early 1990s, the county implemented a Motorola analog 800 MHz system — a big advancement at the time. But the real difference came in 2008, when the county upgraded its emergency communications system, which included a Motorola 800 MHz digital radio system, MCC7500 IP dispatch console, 1,300 portable radios, a PremierOne™ CAD service platform and two additional towers for expanded radio coverage.

The county's new digital system was integrated with the state of Michigan's digital platform, which permits communication among different agencies throughout the state and offers the benefit of maintenance and support services by the state. The Motorola/state collaboration was a winning combination.

"With digital technology, I now have a portable radio that can communicate anywhere in the state of Michigan," Pussehl says. "I can switch to thousands of talkgroups. I can even communicate with the state police in an area if I come across something that requires my assistance. The system doesn't go down. We don't have dropped calls. We have clear communication, the ability for wider radio coverage

"With digital technology, I now have a portable radio that can communicate anywhere in the state of Michigan. The system doesn't go down. We don't have dropped calls. We have clear communication, the ability for wider radio coverage and total reliability."

Don Pussehl, Jr., Chief of Police, Saginaw Township

and total reliability." He adds that they've exceeded the life expectancy of their equipment by years, saving taxpayer money.

Interoperable Communication and Collaboration

Appreciation of the system's reliability is echoed by Bridgeport Township Fire Chief Pat Nelson, who is one of 21 fire chiefs that respond to an average of 11,000 calls and nearly 500 structure fires annually. He also manages the township's information systems — a combination of duties he is qualified for as a former executive in information systems management.

To test the system's capabilities, Motorola sent an engineer to ride along with law enforcement and fire representatives. "Teams checked every square mile of the county," Nelson says. "The teams also went to buildings and areas where problems and dead zones were known to exist. The coverage was outstanding, with very few coverage issues."

Fire personnel don't just fight fires — they're often called out to other types of emergencies such as car crashes, which can require the intervention of law enforcement, fire and emergency medical services (EMS). As situations evolve, these teams have the ability to seamlessly interoperate with each other.

"Very quickly, within a minute or two of an incident, we can all update each other on a common channel," Nelson says. "But if I need to talk to law enforcement and EMS and they're too busy to get on our channel, I can ask central dispatch to patch our three talkgroups together with the click of a mouse. That guarantees communication."

The new system also means the county's CAD system is now more robust, with the ability for pre-loaded box alarm cards that can be created for any type of response or location. When triggered remotely by dispatch, the card automatically generates a request for mutual aid support from neighboring municipalities. "This enhances our response times and our ability to better protect life and property," Nelson says.

Successful System, Next-Generation Public Safety

Saginaw was one of the first counties in the country to implement PremierOne CAD, adding capabilities such as providing officers in the field with real-time situational information, allowing dispatch to send photographs of wanted suspects to officers' mobile computers and storing multimedia files from an incident record for future reference. That progressive attitude is a thread that runs throughout Saginaw County's entire emergency response network. Police and fire chief subcommittees meet weekly, looking at new technologies that could benefit public safety personnel, and cross-pollinate new ideas among agencies. They take interoperability far beyond simply sharing radio channels.

"We work well together," Pussehl says. "I think that helps as we all agree upon and look to new technology, especially with Motorola as a partner. We're able to implement new technology that maybe other areas of the country have not."

"We have that cooperative spirit in every discipline here," Nelson says. "We understand how new technologies will benefit our organizations and how to get it implemented." At the recommendation of the subcommittees, the county is budgeting now for another system upgrade in 2017, including the purchase of APX P25 digital radios.

The chiefs and directors in Saginaw County tasked with thinking about tomorrow's technology know that text-to-911, integrated social media and the ability to communicate nationwide is coming down the road, fast. Plans are afoot to recreate what has worked so well in Saginaw on a statewide level. McIntyre, who has seen the system operate from every angle, isn't surprised. "The reliability of the system is the backbone of this success," he says.

For more information, visit www.motorolasolutions.com/MAP

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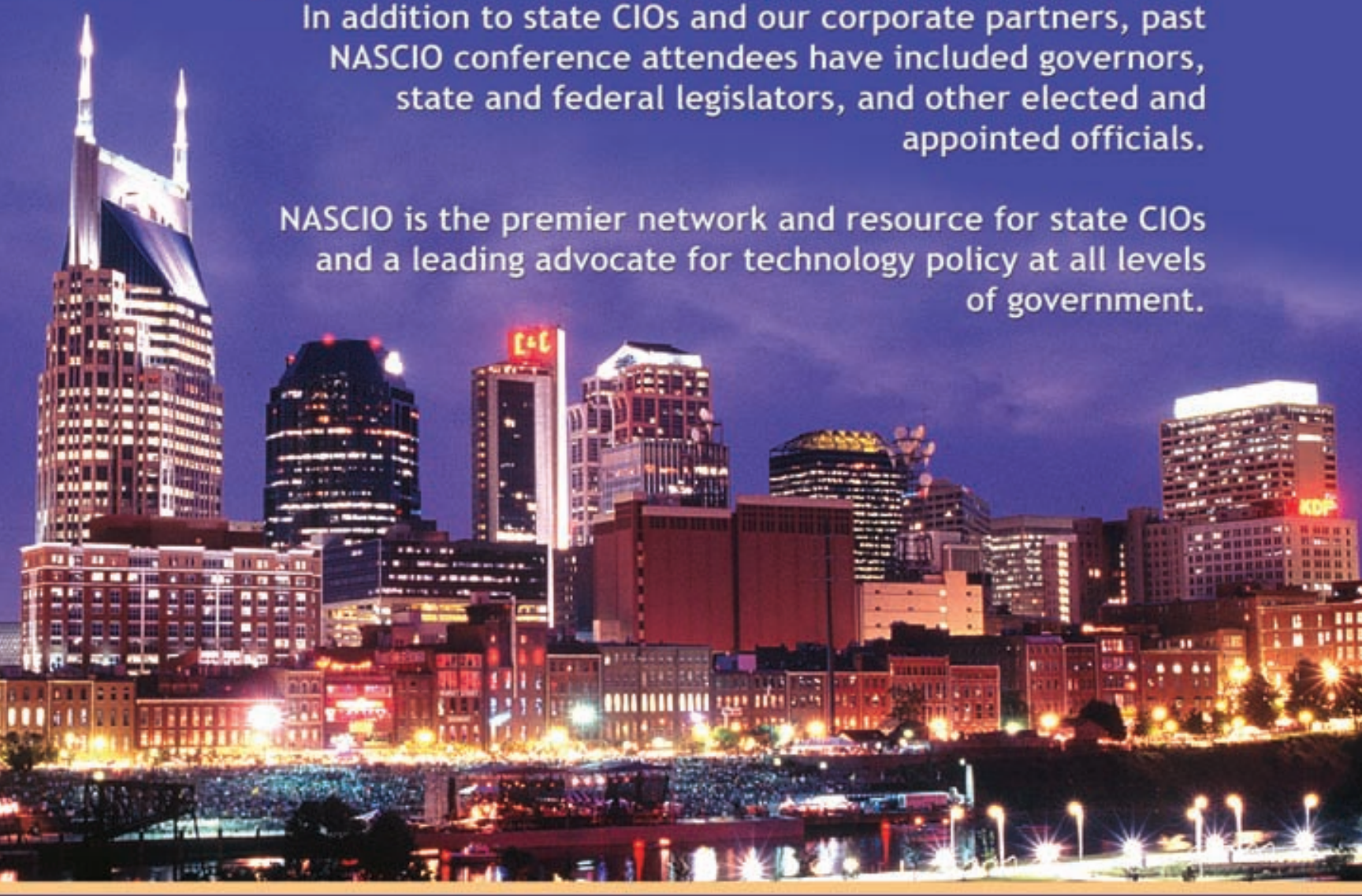

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Preparing for the Rising Tide

Climate researchers predict sea-level rise will eventually submerge 316 U.S. coastal cities. How are government data center managers planning for the future?

By Justine Brown / Contributing Writer

According to a study by the Proceedings of the National Academy of Sciences (PNAS), the future looks wet. The study, *Multimillennial Sea-level Commitment of Global Warming,* found that the mean sea level has risen steadily over the last century and will continue to rise unless the current global mean temperature trend is reversed. What this means, according to PNAS, is that more than 1,000 cities will be all or partially under water within the next century.

Benjamin Strauss, vice president for climate impacts and director of the Program on Sea Level Rise at Climate Central, recently produced his own study based on the PNAS data. Strauss said the greenhouse gases we've already pumped into the atmosphere have "locked-in" an eventual sea-level rise of more than four feet — enough to submerge more than half of the current population in 316 U.S. coastal cities, or more than 4 million people.

By 2020 (using a 50 percent threshold for defining an impacted city) Strauss predicts that Florida and Louisiana could be significantly affected by sea-level rise. Florida could have 150 threatened towns with a total population of 2.7 million, while Louisiana would add another 1.2 million people and 114 towns to the list. Hundreds of thousands more would be affected across California, New Jersey, North Carolina and other states, predicts Strauss.

But sea-level rise isn't the only concern. Strauss said higher sea levels raise the "launch pad" for coastal flooding. Long before the ocean tide is at a city's doorstep, he said, coastal floods become much more common.

"Sea-level rise has already doubled the chances of extreme flooding in locations around the U.S., and that will only accelerate in the coming decades," he said. "We look at these events as floods, but they are actually floods aggravated by sea-level rise. The way we experience sea-level rise is more floods reaching higher ground."

In light of sea rise predictions, *Government Technology* spoke with several local governments that could be affected by flooding to find out if they are preparing their IT operations to deal with climate change. Here is what we found:

CAMBRIDGE, MASS.

Cambridge is working on a comprehensive climate change vulnerability assessment it hopes to complete by the end of 2014. The assessment will examine the vulnerability of critical city services, including IT systems, and will use models to project scenarios as far out as 2070.

FORT LAUDERDALE, FLA.

Officials would not specify its exact location, but Fort Lauderdale's data center is located within city limits. At this point, the city has no plans to move or modify its data center to account for potential climate change-induced flooding.

GALVESTON COUNTY, TEXAS

Galveston's data center is located on the second floor of a building on the island, with backup in Lake City, which is inland and about 250 miles away. The county plans to move its entire data center to Lake City soon, primarily in response to hurricane threats, like those the data center sustained when Hurricane Ike hit the Texas Gulf Coast in 2008.

LONG BEACH, CALIF.

The downtown building where the city's data center is may be replaced in the next several years, officials said. The city contracts with a major IT company for mainframe services and disaster recovery, with a backup system in Colorado. The building for the city's 911 operations, located near the Long Beach Airport, is an additional backup site.

SHUTTERSTOCK

Should these projections come true, the implications are far-reaching. Beyond triggering potentially severe public safety and health concerns for coastal communities, they threaten IT systems powering critical municipal services. When Hurricane Sandy hit the East Coast in 2012, it left a number of data centers underwater, damaging equipment, putting critical data at risk and threatening to interrupt Internet service nationwide. Before the storm hit, data center operators in New York, Philadelphia and Washington, D.C., tested emergency backup generators and prepared to maintain services during power outages caused by the hurricane. But generators began running out of fuel after several days, and data center companies told customers to shut down servers and move workloads elsewhere. In other cases, flooding submerged diesel pumps and prevented them from pumping fuel to generators.

Ultimately, if a data center is in the wrong spot at the wrong time, even the most extensive preparations may not be enough to keep it online. But planning can help and may certainly be worth the effort. Strauss suggests that those working on contingency plans think broadly, as elements outside the data center itself ultimately can be the data center's downfall, as he found out during the course of his research.

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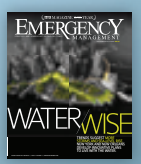
Check out our sister publications for more on resiliency efforts across the country.

Governing: The newfound enthusiasm for "resilience" is changing local policy across the country. In coastal cities such as Norfolk, Va., as well as inland places like Dubuque, Iowa, resiliency efforts are helping address longstanding problems and anticipate new ones.



Emergency Management: Moving beyond traditional flood remediation efforts, New York City and New Orleans are learning to "live with the water." By reimagining their cities as flexible networks relying on natural processes, officials plan to mitigate heavier concentrations of rain and flooding.

See more at govtech.com/resiliency.

LOS ANGELES

Los Angeles' data center is located downtown, with a disaster recovery site in Las Vegas. According to Steve Reneker, chief technology officer of Los Angeles, relocating or building a new data center is cost-prohibitive, but the city has standardized its network, server and storage systems in a hot/cold aisle configuration, making sure all are earthquake-braced and have redundant power.

NEWPORT NEWS, VA.

Newport News' primary data center is on the fifth floor of a downtown building. Currently the city has no plans to make changes to the location of its data center, but it does plan to increase its security.

SACRAMENTO COUNTY, CALIF.

Sacramento County's data center is located on the sixth floor of a downtown building, where it's been for the past 16 years. CIO Rami Zakaria said flooding is always a risk in Sacramento County, and the county took that into consideration when it built its dedicated data center in 1997. The facility has all the necessary environmental safeguards (water pumps, generators, batteries) to operate in the event of a "reasonable flooding situation."

"We analyzed the vulnerability of a broad array of infrastructure, but we couldn't examine everything," he said. "For example, we did not think it would be meaningful to analyze things like radio towers or cellphone towers because the equipment is at the top of a tower and therefore would not be affected by a flood."

But Strauss said that in talking to FCC officials, he learned that a lot of those towers have backup generators designed to keep them going in the event of a catastrophe. Many backup generators are located underground and therefore would be affected by a flood.

"If you are thinking about the vulnerability of a data center, you have to think not only about the location of the servers, but also about the location of everything else — the cooling equipment, backup generators, etc. If you want to make a facility floodproof, you have to make all its critical components floodproof as well." GT

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MORE THAN A NUISANCE: A new report from the National Oceanic and Atmospheric Administration details significant increases in flooding since the 1960s, due in large part to rising sea levels stemming from climate change. Here are the cities making up the top 10 in average number of "nuisance flooding" days between 2007 and 2013:

CITIES	AVERAGE NUISANCE FLOOD DAYS 2007-2013	PERCENTAGE INCREASE OVER 1957-1963
Annapolis, Md.	39.3	925
Baltimore, Md.	13.1	922
Atlantic City, N.J.	24.6	682
Philadelphia, Pa.	12	650
Sandy Hook, N.J.	23.9	626
Port Isabel, Texas	13.9	547
Charleston, S.C.	23.3	409
Washington, D.C.	29.7	373
San Francisco	9.3	364
Norfolk, Va.	7.3	325

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CONTINUED FROM PAGE / 16

platform's app. The car owner makes a bit of money, while the person in need gets access to a vehicle for a designated amount of time.

In the case of an emergency, cars already registered on the site would still be available for use, but owners could make them available free of charge. People who suddenly find themselves without transportation due to the disaster could then find and use a vehicle as needed. In addition, people or companies that own trucks or other large vehicles (which would not normally be available on Getaround.com) could quickly register them on the site, making them available for doing things such as moving materials or getting people out of harm's way.

Airbnb also has been a big proponent of working with local governments on emergency response. In the hours after Hurricane Sandy hit, Airbnb engineers quickly made changes to their site, allowing hosts to open their homes to displaced people for free.

"In the span of a week, over 1,400 New Yorkers responded by opening their homes. They housed neighbors, relief workers that came from all over the country, etc.," said Molly Turner, head of public policy at Airbnb. "It inspired us to respond to those types of disasters in other parts of the world."

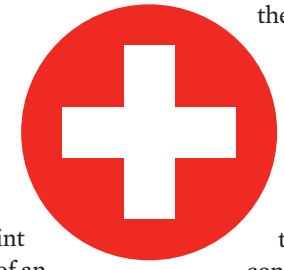
The company recently launched a dedicated emergency housing platform. Working closely with local governments, Airbnb can launch a URL specific to a disaster should the need arise. People who have space to offer can then list the information quickly and easily, while those looking for housing can log on and search for accommodations that meet their needs.

"It's something I think we are uniquely positioned to help with in an impactful way," Turner said.

Airbnb announced in July that it had developed memorandums of understanding with Portland, Ore., and San Francisco to work with the cities before, during and after an emergency. "What we have now is a document that pledges our intention to work together," said Alicia Johnson, San Francisco's resilience and recovery manager. "We still have to figure out the finer points, such as how we will notify each other."

The partnership is grounded in increasing emergency preparedness at the local level, and Airbnb will work to: identify hosts who will house emergency workers and survivors; provide preparedness materials to hosts; provide emergency alerts to hosts and their guests; and provide community response training to hosts, helping them to become community leaders.

"One thing we've discussed with Airbnb is to talk to hosts about retrofitting their homes so that they are more resilient," said Carmen Merlo, director of the Portland Bureau of Emergency Management. "We saw after Hurricane Katrina that once people are displaced from their homes, the chances of return afterward are slim, which affects the city's recovery."



Airbnb already has information about its users, including location, amount of space and contact information, which makes it easier to pinpoint appropriate hosts in the event of an emergency. For example, in the case of a disaster, Airbnb officials can look at maps to identify hosts located in safer parts of a city.

"We've shared our hazard layer, which includes areas near fire potential, flood plains and other risks, with Airbnb so it can overlay that with its host information," said Merlo. "Before or during a disaster, we can do special messaging to those folks."

The 34,000 cities worldwide where Airbnb operates will likely be watching the partnerships closely as disaster preparedness at the local level becomes more important.

"We see the sharing economy as a real potential solution to helping with disaster response," Turner said, "and we want to work with more cities to help them leverage us in times of need."

THE TURNING TIDE

On May 30, President Obama convened his annual hurricane brief at FEMA headquarters. In what may be the clearest evidence of the growing acceptance of the sharing economy's potential in emergency response, the brief focused on technology innovations and mobile applications developed by federal, state and local agencies that are designed to better inform and involve the public in preparedness and response activities.

Clearly the tide has turned, and technology's role in disaster response will only get bigger in the future. But making it work well will take involvement from both local governments and sharing economy companies.

"We have the ability to get thousands of local residents to open their homes, but our initiative is much more effective if local agencies are aware of it and are familiar with the resources we have available," Turner said. "Local governments play a crucial role in connecting the people they are providing the emergency services to with those who are offering space. If we can educate and train the local agencies on how our initiative works and where the resources are, and they can conversely train us on local concerns and contacts in advance, it's much easier for our hosts to be matched with people in the most need during an emergency."

Murphy of Getaround.com said in most cases it's all about making connections. "Smart and forward-looking government officials want to figure out how to leverage private companies for public good," he said. "This is a great example of a public-private partnership that can help people in time of need, and it's not hard to do. It just takes initiative, reaching out and being willing to help."

Zamora in San Francisco agreed, explaining that the effort has been well worth the reward thus far.

"Sometimes it takes time, and there may be a long lead time in terms of getting things done, but you can't let it discourage you. Be patient and focus on the big picture," she suggested. "We like to say that real emergencies look more like people coming together than cities falling apart. Together we can figure out what to do to make ourselves more prepared before, during and after an emergency." GT

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Jessica Napier contributed to this article.

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The next time a severe storm hits Nags Head, N.C., nearby cities are ready to help keep critical services running through inter-city backup arrangements.

Mutual IT Aid

Governments team up to develop backup arrangements for tech services in the event of an emergency.

By Adam Stone / Contributing Writer

Nags Head, N.C., barely skims the ocean surface, a town of about 3,000 people built on sand just 10 feet above sea level. Over the decades, hurricanes have cut a rough path here, taking down homes, roads and piers.

As city planners look toward the inevitable next big blow, they're thinking about infrastructure. What happens when emergency phone lines no longer function or when the data center goes down? To meet that challenge, Nags Head is teaming up with other municipalities to create inter-city backup arrangements.

"[If] we should have a storm and the area has to be evacuated, essential personnel generally would be required to stay here. But [if] we have a very severe storm, essential personnel would be evacuated, and this arrangement gives us a place to set up shop," said Allen Massey, IT coordinator of Nags Head.

The arrangement he refers to involves Cary, a city of 146,000 people that's much farther inland. For call services in particular, Cary is Nags Head's fallback position.

Cary boasts strong municipal infrastructure, said Bill Stice, director of the city's Technology Services Department. His office operates a 911 system, emergency radio network and two fiber-connected data centers. Cary also makes a place for Nags Head's nonemergency call lines, in case of a disaster.

"They have a need for people to take nonemergency calls, but if there is a hurricane or major event, they don't want to keep their staff in the local area because of the dangers," Stice said. Nags Head paid to install six phone lines in Cary's building, with the agreement that space would be provided in the facility for its staff to answer calls.

In 15 years, Nags Head hasn't needed to take advantage of that offer. Still, planners in several municipalities see it as a model for something bigger: the inter-city backup of entire data centers.

Rack Room

Over the past few years, Cary has built a relationship with Jacksonville, N.C., hosting a data center rack for the purpose of disaster recovery. "We give them the space, we don't charge them for the power or HVAC," Stice said. "They pay the connection cost from Jacksonville to Cary, using our facility to handle a storage device and backup server." Cary also could serve as a 911 backup center if needed.

Cary is developing a similar relationship with Kernersville, N.C., located two hours west. Stice said that as surplus equipment shifts out of his data center, he'll make room for Kernersville's needs, presuming the city will return the favor to others that need it.

That sense of municipal reciprocity lies at the heart of many such backup arrangements, where instead of money changing hands, planners exchange mutual good will and support.

"We are basically just doing each other favors at this point," Massey said. "Local government obviously does not have the resources that the federal government does, we don't have those kind of budgets, and yet we all have the same concerns."

Stice said the model has grown from the kinds of mutual-aid initiatives seen in the North Carolina Local Government Information Systems Association, whose members pledge to share 911 calling and other systems in case of an emergency. "If we all did this, all of us would have backups at essentially a lower cost than it would cost to have a third party do it," he said. "You hope there will be a domino effect."

In the West

While backup agreements unfold locally in North Carolina, across the U.S., whole states pursue a similar course.

In Montana, CIO Ron Baldwin is confident in his recovery arrangements. His main data center in Helena is backed up by a facility in Miles City, nearly 400 miles away. But he also makes room for the neighbors, leasing out space in his data center since 2012 for Oregon to secure its backup needs.

In an emergency, "processing can be switched over to our data center more or less in real time, depending on exactly what Oregon needs and wants," Baldwin said. "We can provide all the capabilities, from a backup site to services and equipment that can be brought up within a specified time."

Oregon benefits primarily from state-of-the-art floor space, but Montana also has

a suite of other capabilities to offer. "For example, if they need some technical hands to do something specific to their equipment, they can call us and we will physically go to that equipment," Baldwin said.

This goes beyond the strictly favor-for-a-friend approach to reciprocity. Montana bills its neighbor for these added services, which it can do thanks to an intergovernmental services contract implemented in 2013, a tool that Baldwin said is invaluable in making this arrangement work.

Under the contract's terms, the two states can buy from each other's catalogs without having to jump through hoops, making purchases from a broad list of categories without needing special permissions.

"Without that, we would've had to put some very specific items into the data center agreement. It would have become not just an equipment lease, but an equipment and services lease," Baldwin said. The arrangement's streamlined nature is especially helpful given that services in the backup center may well need to be purchased on the fly, in the case of a major emergency.

"Here you have two states, one with need and one with capacity, and now both have laws that allow for this sharing," Baldwin said. "With that they can enter into agreements that are very well priced and are harmonized between the two states."

While Montana may not need backup services for itself, Baldwin can see such a purchasing tool as an aid to his IT operation in several arenas. "If we would want to share mainframe capacity, well, mainframes are very expensive," he said. "If this would allow us to utilize services on one another's mainframes, this could be a cost-effective way to do that. It isn't something we have done yet, but we have talked about it."

Pieces in Place

As Baldwin considers future ways to purchase IT backup services, Massey in Nags Head continues to expand his cost-free reciprocity arrangements. He's exploring a possible data center arrangement with nearby Kill Devil Hills. Though it's a small town, Kill Devil Hills might be able to back him up, thanks to ever-decreasing server needs.

"Our physical space requirements have shrunk greatly in the last four or five years as we've virtualized nearly all of our servers," Massey said. "Space requirements for servers are probably a tenth or a fifteenth of what they were."

The technology behind these backup agreements is rather straightforward, Baldwin said. "Just like we built the interstate highway system, there is now a fiber-optic system between states and across the United States."

More challenging, however, are the political mechanics.

"Cities are often in competition with each other: for the latest factory, the latest office complex. So there is always a challenge in trying to overcome that inherent competitiveness and go to the point of mutual sharing," Stice said. "Our county here has been very good about creating that environment, about setting the tone for that, and it has caught on among the municipalities." GT

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By Miriam Jones | Chief Copy Editor
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The **Acer** Chromebook 13 is powered by an NVIDIA Tegra K1 mobile processor and features a 13.3-inch display and 802.11ac Wi-Fi. The laptop uses an NVIDIA Tegra K1 4-Plus-1 quad-core ARM Cortex A15 CPU and is available in two options — one with a full HD display with 1920x1080 resolution and another model with a 1366x768 display. Laptop models are available with either a full HD 1920x1080 display that shows video in lifelike 1080p resolution (and has up to 11 hours of battery life) or a 1366x768 resolution display that provides 13 hours of battery life.

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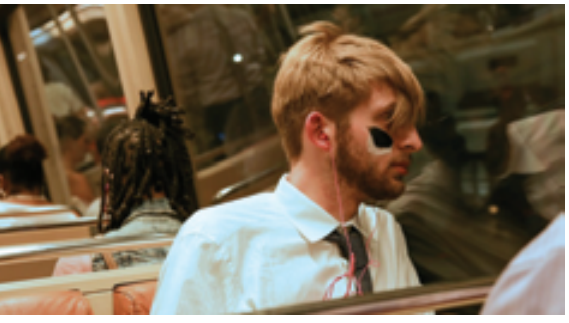
How to Beat Biometrics

While some people have made peace with the fact that cameras in public places record many of the things you do in your private time, others are determined to buck the system — or at least see if it can be bucked. Robinson Meyer of *The Atlantic* set out to camouflage his face in precisely the right way to foil facial recognition technology that might seek to track his movements around the nation's capital.

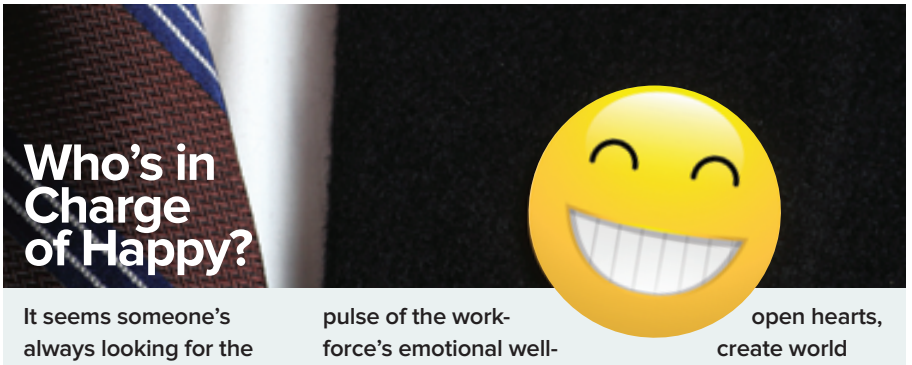


He styled his hair to obscure his eyes and the bridge of his nose, and painted his face in a pattern called computer vision dazzle, aimed at keeping facial recognition algorithms from identifying him using the patterns of light and dark and color found in the human face. The term "CV dazzle" has its roots in the patterns employed by navies in World War I and II to disguise the size and movement of their ships, a method of protecting them from foes.

In the end, Meyer didn't quite achieve the anonymity he sought, as while he may have confounded the algorithms behind facial recognition technology, he caught more than his share of attention from the humans around him, confused by his unusual face paint. "The very thing that makes you invisible to computers makes you glaringly obvious to other humans," he reported.

KNOW THYSELF:

Does your smartphone know you better than you know yourself? University of Michigan researchers are testing an app that can alert family members and medical personnel to a bipolar episode based on clues collected by your phone. A study funded by the National Institute of Mental Health monitors the user's voice, picking up clues to manic or depressive episodes. Computer scientists Zahi Karam and Emily Mower Provost, and psychiatrist Melvin McInnis think the technology has the potential to help with schizophrenia and post-traumatic stress disorder. SOURCE: TECHCRUNCH



Who's in Charge of Happy?

It seems someone's always looking for the next three-letter acronym to hit corporate America. Who knew it would come from the age-old quest for happiness? Chief happiness officers are cropping up in Silicon Valley tech companies and other organizations. CHOs are charged with having a finger on the pulse of the workforce's emotional well-being, and advocating for policy and cultural changes that create conditions for happiness.

One early CHO equivalent is Google's Chade-Meng Tan, whose official title is Jolly Good Fellow. Fueled by his self-penned job description to "enlighten minds, open hearts, create world peace," Tan's work is inspired by a Buddhist monk who took a 180-degree turn after earning a Ph.D. in molecular genetics, choosing instead to meditate his way to happiness. Could we soon see CHOs in government?

SOURCE: MASHABLE

Outsourcing Peter Piper

Robots are threatening yet another largely manual task: hand-picking produce. Roboticists from the European Union participating in the CROPS (Clever Robots for Crops) study have prototyped machines that can tell if fruit or vegetables are ready for picking. Using multispectral, fluorescence and thermal imaging, robots detect ripeness, evaluate foliage and even spot people in their vicinity.

Still years away from widespread use, it's not winning any speed contests just yet, and navigating 3-D crops like grapes and apples remains out of reach, so far.

SOURCE: GIZMODO:

Send Spectrum ideas to Managing Editor Noelle Knell, nknell@govtech.com, twitter@GovTechNoelle

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