GOVERNMENT TECHNOLOGY®
SOLUTIONS FOR STATE AND LOCAL GOVERNMENT
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Microsoft security pro turns his experiences into novels

Group Effort:
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Special Report:
What you need to know about unified communications

A LOOK AT HOW TECHNOLOGY IS TRANSFORMING SOME OF THE GRITTIEST TASKS IN GOVERNMENT.

DIRTY JOBS

PLUS:

Orlando, Fla., CIO Rosa Akhtarkhavari

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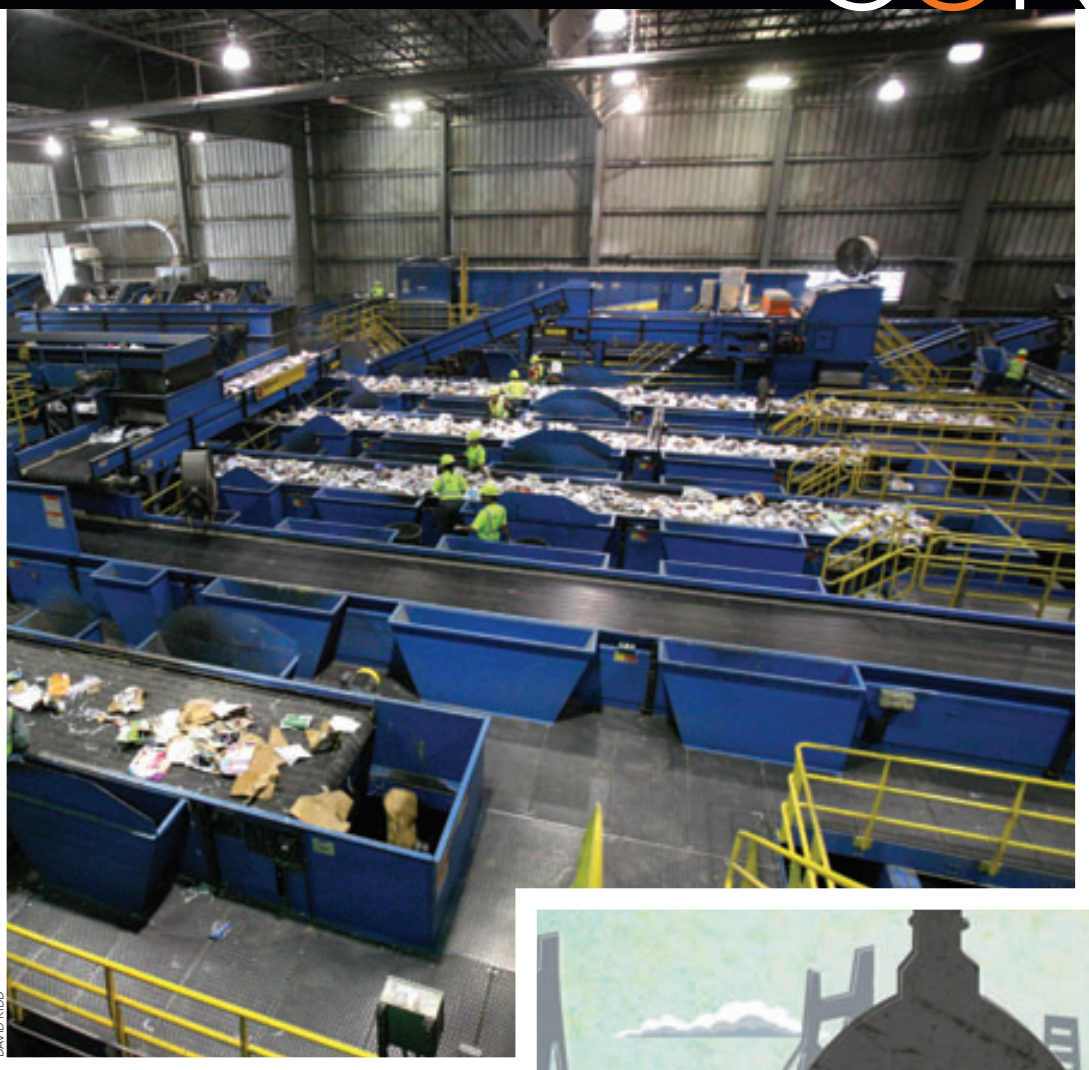

DAVID KIDD

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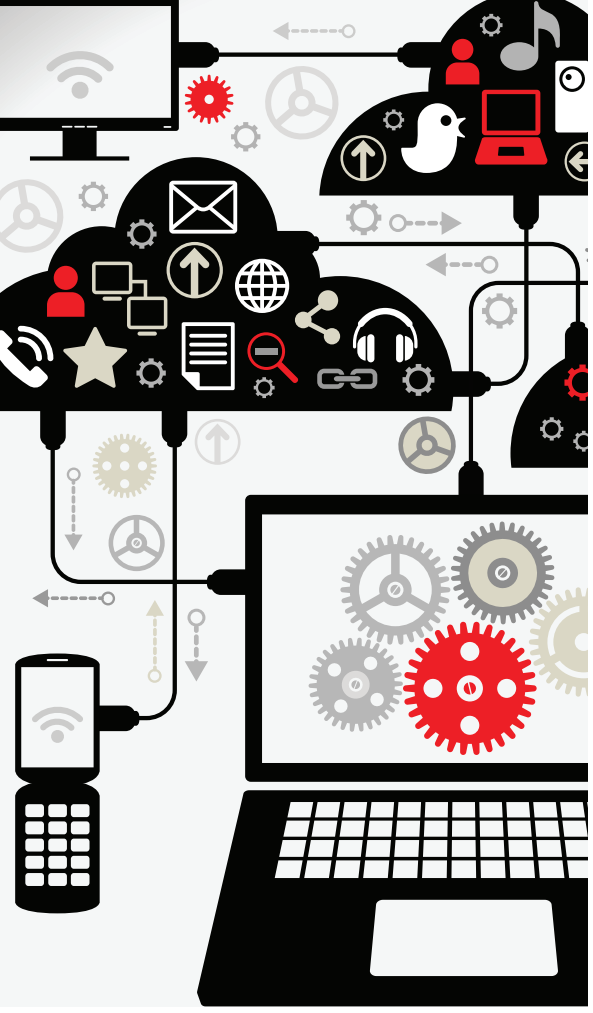

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Incubating Innovation
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Ready, Set, Install
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By Steve Towns / Editor

Re-engaging Your Staff

Can CIOs inject some "coolness" into government IT jobs? That's a question more public officials are pondering as the long-projected baby boomer retirement wave inches closer and the job market for private-sector technology workers heats up.

Our research shows that hiring and retaining qualified IT personnel ranks among the top priorities for state and local CIOs, which shouldn't really shock anyone. What did surprise us, however, is that technologists currently working in the public sector appear to be less engaged than employees in other areas of government.

When asked if they believe their job can "make a difference," just 71 percent of IT workers answered affirmatively. By contrast, the average for all public-sector job classifications surveyed was 85 percent — and some categories were markedly higher, like human resources professionals (89 percent) and elected officials (93 percent).

If current government IT workers don't view their jobs as particularly rewarding, that doesn't bode well for attracting a new generation of employees to these positions. Perhaps that's why we're starting to see people like Michael Cockrill fill CIO positions. Cockrill, a veteran of several Seattle tech startups, says Gov. Jay Inslee named him Washington state CIO to overhaul the government's IT culture.

"I kind of think about it as doing all the things it takes to create a culture that would attract a senior in college," Cockrill says. "You need a mobile worker, you need an agile culture, and you need a breadth of interesting new technologies. And it needs to be happening in the context of the 21st century."

Cockrill has only been on the job for a few months, and he admits that modernizing the state's IT bureaucracy and instilling a more entrepreneurial approach will be a heavy lift. But with almost 40 percent of his staff eligible for retirement, the state must develop an environment that attracts new employees and nurtures existing workers.

Ironically, Cockrill and plenty of others say the public sector could be an ideal employer for young IT workers if a few hurdles could be removed.

"Government has a lot of the things that young IT professionals want. There's tons of opportunity; there's upward mobility; there's a broad range of technologies," he says. "The issues are how do they live within a relatively narrow cultural box. And how does state government change itself to allow them to work the way they always have, and the way we know people will work in the future?"

Finding the right answers to those questions will be crucial as public agencies recruit a new generation of IT talent. GT

RAISE YOUR VOICE

Your opinions matter to us. Send comments about this issue to the editors at **editorial@govtech.com**. Publication is solely at the discretion of the editors. *Government Technology* reserves the right to edit submissions for length.

Urban Planning in the Digital Age

In Louisville, Ky., Ted Smith, chief of economic growth and innovation, is helping his fellow government agencies meet their goals by harnessing new approaches to open data in what he calls digital urban planning.

"Traditional city planning is just about the built environment — things that are made of atoms and molecules," he said. "Digital urban planning is looking at your same city, but strictly in its digital representation and planning for its digital future."

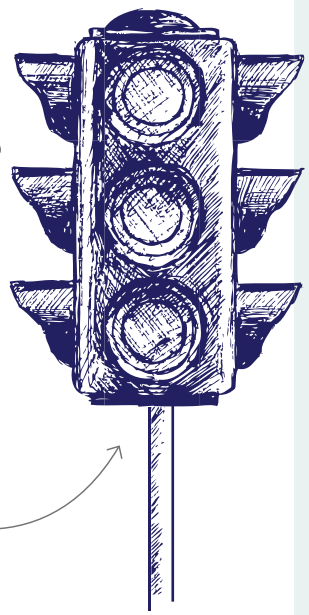
Scheduled to start this summer, the city will select two retail corridors and show the businesses how they appear on Google, Apple and Microsoft map platforms, and work with the companies to improve their online metadata. Smith's vision of digital urban planning in Louisville goes beyond maps — eventually it could include every aspect of local life, connected online and linked to the real world.

Double Duty Wi-Fi

For most cities, public Wi-Fi and smart meters are separate technologies. But **Santa Clara, Calif.,** has started combining them. The city's municipal electric utility, Silicon Valley Power, launched a program to provide a free, outdoor Wi-Fi network to the community that has a separate Wi-Fi channel for transmitting smart meter data back to the utility. The MeterConnectSM program, according to city officials, is the first of its kind to use Wi-Fi to read electric smart meters.

4,398

The number of traffic signals in Los Angeles that are connected to an advanced network that allows engineers to remotely communicate with and monitor the signals.



WHO SAYS?

"It's about building a lie detector, so if they're being less than truthful about one thing, what are the chances that they're being untruthful about other things?"

www.govtech.com/e-government/Can-Big-Data-Crack-Fraud.html

TOP-TWEETED STORIES

States' Free Online Tax Filing Services Going Underused — 118 tweets

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SF's Golden Gate Bridge Gets High-Tech
238 VIEWS

Kentucky Moves 173 School Districts to the Cloud
177 VIEWS

Houston Eyes Greener City with All-in-One Recycling
109 VIEWS

reader/**comments:**

"It is great that other states are getting on board. Ohio, an over-the-counter issuance state where elected county clerks-of-court process titles, has been doing it for years. In the near future, auto dealers across the state will be able to submit electronic title requests to the county clerks, as part of an overall modernization of the state's automated titling system.

***Tony in response to* Are Paper Vehicle Titles Facing Extinction?**

"Now the battle begins. Nearly every government entity starts a project like this, but to succeed you have to go up against an entrenched group of agency data centers that are very protective of their turf. Plus, there are numerous [operating systems] to deal with, different databases, versions of the databases, licenses and the knowledge workers in each agency that hold it all together. The project usually only succeeds in agencies controlled by the governor.

***Carlo in response to* New York State and SUNY Partner for Data Center Consolidation**

"This is a people game not a technological one. I believe people change is harder to accept or manage. I have seen people change and the collaboration stops cold. You need governance at a higher level than the collaboration staff to make sure the goal stated is met, sustained, measured to performance, etc. The board needs to oversee each transition of staff and hire the right person and create policy to make the collaboration endure — especially if the goal is a long-term shared service. Unfortunately when those in management or elected officials change at the governance level, all bets are off and then you need to rework the stated goals again. ... Collaboration is not the deliverable, it is the service driver or conduit to which some awesome goals can be obtained.

***Michelle H. in response to* 3 Forces Hindering Public-Sector Collaboration**

STEVE WILLIAMS

Rosa Akhtarkhavari

CIO, Orlando, Fla.

For 20 years, Rosa Akhtarkhavari has been serving government in various IT roles. Akhtarkhavari started as a programmer and later served as the deputy CIO of Orlando, Fla. She was named the city's CIO three years ago. In an interview with Government Technology, *Akhtarkhavari discusses her leadership style, career goals and technology trends in government.*

"My job is challenging and fun; I would not change it for the world."

1 You've been CIO for almost three years, what career goals would you like to achieve over the next three years?
Transformation is at the top of my list because without that we really cannot drive progress. We're focusing on partnering with departments as well as delivering projects. We have major projects that are in the works. We are doing the implementation of the city's ERP system that's a [software as a service] solution. We are in the process of releasing an RFP for a first-time joint CAD for police and fire. We are looking at replacing our permitting code enforcement system. We have many efforts that are moving forward so we're trying to get those done in a timely manner, within budget, but with a major focus on security and quality.

2 How are you sparking innovation in your department? A few years ago, I established what I call innovation teams. We give them a challenge, we ask them to select a lead for the group and we expect reporting. We allow them the time and some funding to address an issue or challenge that we have at the city. And we try to mix it with different age groups; we try to bring the drive of the youth with the wisdom of the senior staff members. I think it's always interesting to see those open discussions.

3 What principles or core values do you lead by? I value trust and honesty. Those are very important for me so I try to always be as honest as I can to my clients and build a partnership. The really important part for me is continuous learning. I don't think any of us can stop learning. The minute we stop learning, we stop growing and producing.

4 What are the top three technology trends you see in government and which do you think will stick around?
I don't want to beat a dead horse, but mobility. It's just going to grow. Big data is major. As it comes to government, we always deal with big data and analytics/predictive analysis. Those are the ones we really need to focus on. GT

— Karen Stewartson, Managing Editor

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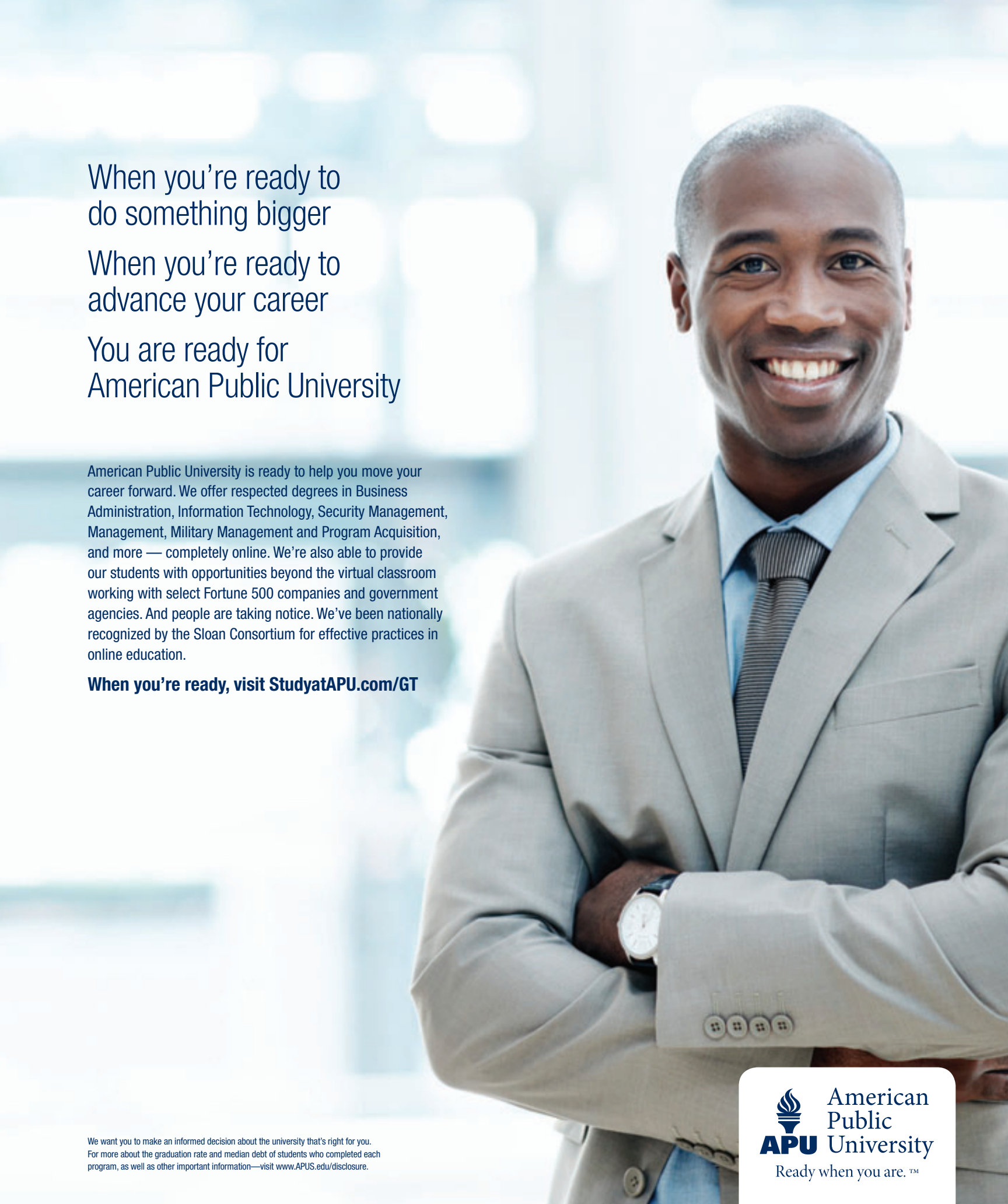
Trash and Treasure

Bomb-proof recycling bins like these are a mainstay in London's financial district, where free newspaper distribution is pervasive and traditional bins have been used in bomb threats. The digital receptacles double as content providers — displaying breaking news, weather and stock market information on LCD screens. The bins are made of fiberglass and are four times stronger than steel, according to the maker.

Bringing the concept to the U.S., London-based company Renew has installed one of the recycling containers near the New York Stock Exchange as part of a pilot project in Manhattan.

These high-tech bins could deter bombers from causing physical harm to the public and could potentially be used as Wi-Fi hot spots or to broadcast emergency alerts, proving that one man's trash is another's treasure.

RENEW



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DIRTY JOBS

The responsibilities of state and local government aren't always glamorous; in fact, difficult or dangerous. But it's those roles that keep communities thriving, and tech cases clean up — these important core functions. Here's how tech is transforming

sometimes they are downright dirty,
nology is helping advance — and in some
some of government's grittiest tasks.

ROAD MAINTENANCE

Sealing pavement automatically

GEORGIA TECH RESEARCH INSTITUTE

Is automation the future of road maintenance? While self-healing roads aren't yet feasible, systems that automatically detect and fix problematic issues on streets and highways could redefine one of government's traditional responsibilities — and increase safety in the process.

Sealing cracks in a road may sound simple enough: Send a crew to close the traffic lane, spray on a sealant, let set, reopen the lane and move on to the next crack. However, it requires an investment in manpower and creates a safety risk for the workers tasked with doing the job. Yet the benefit of cost avoidance makes it a task that can't be ignored.

"Crack sealing can be a tremendous money saver, if it's done right and done in a timely manner to prolong pavement life," said David Jared, acting chief of research and development for the Georgia Department of Transportation (GDOT).

With GDOT funding, researchers are proving that an automated system is feasible. The Georgia Tech Research Institute (GTRI) created a prototype for an automated pavement crack detection and sealing system that located and filled cracks smaller than one-eighth inch wide while moving at about 3 mph.

"We demonstrated the concept, and I think that GDOT looks to the future and looks at trying to be more efficient," said Wayne Daley, principal research engineer with the GTRI.

One key function was that the system needed to be able to seal cracks while in motion, an aspect that was solved with technology similar to inkjet printing. To locate cracks, LEDs illuminate the road while a stereo camera takes pictures, which are analyzed by algorithms. Within 100 milliseconds of taking the images, a computer generates a map detailing the location and shape of the cracks, according to the GTRI.

The prototype seals one square foot of a cracked area at a time. Production versions would be 12 feet wide to match the size of street lanes.

Jared said one of the greatest benefits is better safety for crews. With this machine, they can stay in the truck and operate the system (which is on a trailer towed behind the vehicle), instead of physically being in the roadway.

Now that the idea has been proven, GDOT hopes that industry will step in and take over further development. "It's a viable technology, and we're looking for assistance to take it to the next step," Jared said.

/ ELAINE PITTMAN

FLEET MANAGEMENT

Curbing distracted driving

FLICKR/WILL MERYDITH

Distracted driving isn't just a problem in personal vehicles. It's common in commercial and public-sector fleets too. Now technologies are reaching the market that will block drivers from texting or talking on cellphones while a vehicle is moving.

For instance, a local police department in Minnesota is deploying technology that puts any unauthorized mobile device onboard the vehicle into a blocked mode. The device — developed by Cellcontrol — plugs into a vehicle's onboard computer and immediately switches into "blocking mode" when the vehicle reaches a speed of 1 mph or higher.

Distracted driving is a common practice not only in commercial fleets, but also public-sector vehicles.

"There's no difference in the public sector," said Kevin Coppolino, Cellcontrol's vice president of corporate development. "Whether it's public transport, public safety, whether it's government based on federal and state. The same thing is happening there."

As legislation outlawing talking on cellphones and texting while driving spreads from state to state, Coppolino said police, state government and public safety fleets will most likely lead by example by putting a stop to mobile phone use while driving a vehicle.

/ SARAH RICH

WATER AND SEWER

Toilet to tap

Astronauts have been drinking recycled urine for some time, and according to *Wired* magazine, on the long trip to Mars, they'll be shielded from radiation by astronaut poop. That, in microcosm, is what's happening back here on Earth.

According to the "One Water Vision," all water is just the same H2O recycled over and over. Some of the water in your coffee, for example, might have been excreted by a Neanderthal, or been part of the iceberg that sank the Titanic — or both, although the chances of that seem fairly slim.

Following the Industrial Revolution, the human population spiked — from about 1 million to an estimated 7 billion in 2013, hammering freshwater supplies. The results? More waste entering the water supply, more incentive to recover potable water from that waste, and the discovery that pharmaceuticals and street drugs are entering the water supply. And if you think marijuana in the drinking water is "far out," you could be part of the problem.

Some of this waste has bad effects, like death. Canadian researchers suspect that birth control pill estrogen in drinking water is causing a spike in prostate cancer deaths. Traditional water-treatment technology does little to remove illegal or pharmaceutical drugs that have been excreted or flushed, and thus "what goes around comes around."

Global Water Senior Vice President Graham Symmonds suggests a "three-pipe" system, comprising a potable water pipe, a nonpotable water pipe for irrigation or industrial use, and a sewer pipe. The system reduces demand for potable water by 40 percent, he said. And while removing pharmaceuticals from water is expensive, only the potable system would need such treatment. "Your grass doesn't care if there is aspirin in the water," he said.

Advanced metering infrastructure (AMI), said Symmonds, can help struggling municipalities and utilities by letting customers monitor their consumption and reduce waste. AMI can also help recover "nonrevenue" water, he said, from missing or ineffective meters, leaks and errors. "You can find a lot of revenue by cleaning up your system."

> "WHAT GOES AROUND COMES AROUND."

What about ocean water? Desalination is expensive compared to traditional water treatment. Texas, for example — which already desalinates brackish groundwater — estimates that desalinating sea water would cost $800-$1,400 per acre foot, with each acre foot being equivalent to 326,000 gallons or roughly the amount used by an average household in a year.

As for recovering water from waste? "The technologies exist to produce high-quality water from sewage," Symmonds said, "and the regulatory framework is under construction, but some places do it already."

Luckily new ideas are flooding in for better desalination techniques, protecting fish from medication, extracting useful chemicals from sewage, and stopping the formation of hydrogen sulfide, a poisonous, explosive and smelly material that corrodes sewer pipes, costing the U.S. $14 billion annually. Sewage can even be used to generate electricity.

/ **WAYNE HANSON**

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RESTAURANT INSPECTION

Order with confidence

Social media review sites and mobile apps are all the rage when it comes to technology associated with restaurant inspections.

San Francisco recently posted its restaurant health inspection data on Yelp. The goal in partnering with Yelp was to link the city's restaurant health score data with customer reviews and ultimately start a trend of standardizing health score data across the U.S. New York City and Philadelphia are also getting involved.

To make posting inspection data a reality, a new national open data standard, called the Local Inspector Value-Entry Specification, was created. The standard enables any city to voluntarily share restaurant inspection scores on Yelp or other websites to make that data more transparent.

On the mobile app front, Sacramento County, Calif., and other municipalities are releasing smartphone apps that will make looking up inspection scores easier.

Launched in late 2011, the Sacramento County Food Facilities Inspections app shows a person's current location in the county and nearby retail food facilities, which are marked on a map and on a list. The color of the markers on the map indicate the most recent food inspection result, inspection date and links to more detailed information.

Food inspection data refreshes daily and is complete for all food facilities in the county, including restaurants, bars, grocery stories, convenience stores, school cafeterias and most facilities that dispense food to the public.

/ **BRIAN HEATON**

GRAFFITI REMOVAL

Tracking down taggers

Graffiti may be an ancient art form — even the Neanderthals etched figures onto cave walls. But it's a huge problem for state and local agencies tasked with removing tags from walls, buildings and vehicles.

Graffiti is more than just an eyesore. Homes in neighborhoods with graffiti can lose 25 percent of their market value. And government agencies can spend millions of dollars removing this "freedom of expression." In 2012, the Michigan Department of Transportation alone spent more than $500,000 on graffiti removal, according to Michigan.gov.

Cities are turning to technology to help clean up graffiti faster and catch those responsible. In 2008, Riverside, Calif., began using a GPS-enabled camera to capture graffiti images and location information so that city workers could create a database and help clean up the city. In 2011, Flushing, Mich., installed surveillance cameras in Riverview Park to monitor crime. Fast-forward to today and you'll find that many cities, such as Boston, Houston and Minneapolis, are using various platforms like SeeClickFix and other Web tools that citizens can use to report tags. To help combat the street art, Los Angeles recently launched its MyLA311 app, which allows residents to report graffiti via their mobile phone.

Not all graffiti is an urban blight, of course. Murals are a growing part of public art. There are even apps on iTunes for those who want to cultivate their skill. Taking things a step further, one local mayor in Australia is pondering having a fund that would discourage taggers by allowing graffiti artists to create murals instead.

So graffiti may now be part of the $64 billion global art industry, but many cities might rather see it restricted to the surfaces of caves.

/ KAREN STEWARTSON

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BUILDING INSPECTION

Spotting energy loss

Thanks to rising power costs and growing efficiency requirements, it's more important than ever to spot energy loss in homes and offices. Now technology makes it easier to find air leaks and thermal defects that run up gas and electricity bills.

Thermographic cameras let inspectors survey thermal efficiency from inside or outside a building by detecting infrared radiation. The cameras produce images called thermograms, which depict temperature variations. These tools aren't new, but technological advances have made them more affordable.

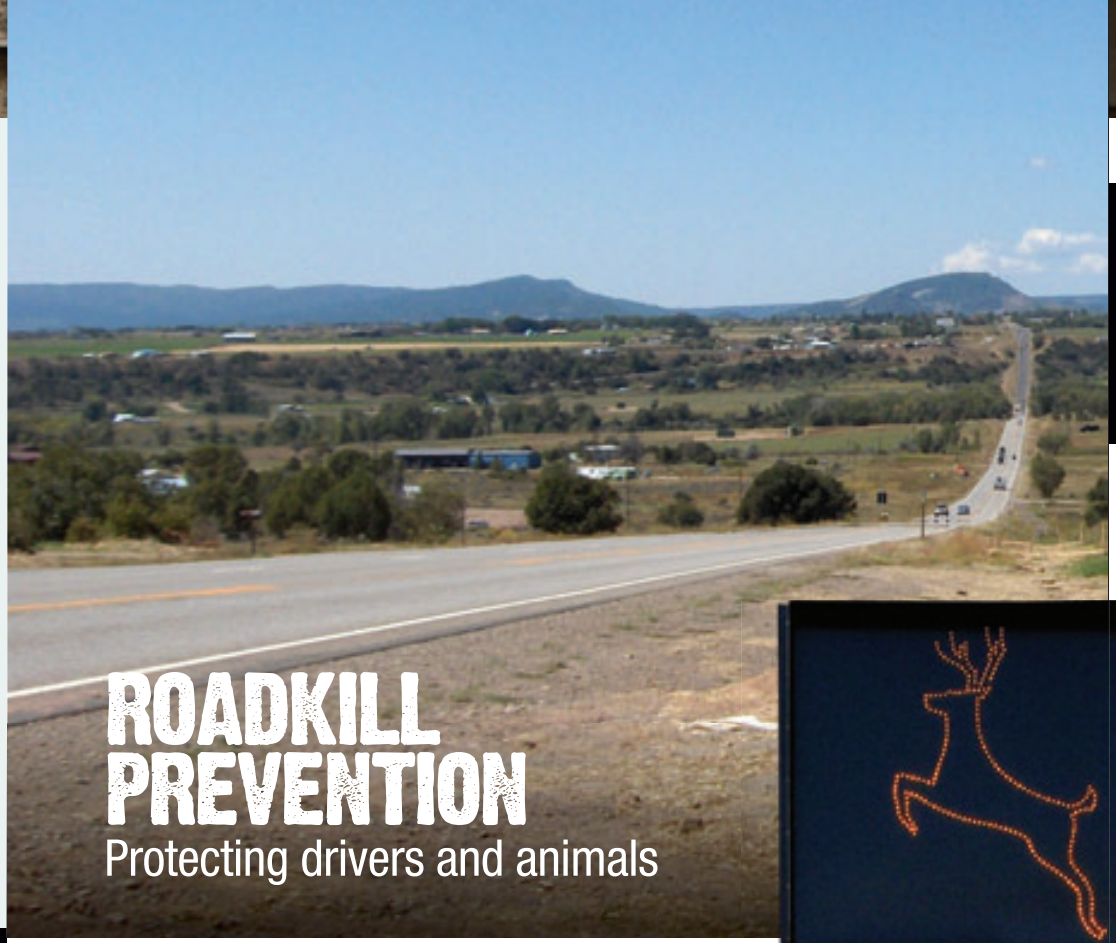
Jim Schwarz, a principal member of Center Grove Real Estate Inspections in Indianapolis said that thermal imaging is important to his business. He uses thermal cameras to investigate the heating components of HVAC systems in city buildings.

"I use it all the time trying to find hidden moisture," he said. "I like to make sure we're using thermal imaging technology [to] find out where we're dealing with energy loss in general."

Older thermographic equipment required heavy battery belts and huge cooling systems, said Bill Warner, educational director of the National Association of Commercial Building Inspectors. "Not many people provided it," he said.

Today's equipment is lighter, with batteries similar to those in video cameras. And prices have fallen dramatically, Warner said. "Twenty years ago, you were looking at a $60,000 investment or more just to buy the camera alone. Today you can get into the industry for around $8,000 for a decent quality camera."

/ HILTON COLLINS



ROADKILL PREVENTION

Protecting drivers and animals

Technology that's traditionally been used for perimeter security at prisons and airports is getting a new role in Colorado: detecting wildlife along highways and warning drivers in real time. A cable buried nine inches underground detects changes in the Earth's electromagnetic field, like the presence of a large animal, and transmits that information to a sensor. An onsite control then activates electronic signs to warn drivers that wildlife is nearby.

The Colorado Department of Transportation (CDOT) installed its first system on a stretch of US 160 where wildlife-vehicle collisions accounted for as much as 70 percent of all accidents. "We knew that area had a history of animal-vehicle collisions, so we decided to try that area first," said CDOT engineer Kevin Curry.

Wildlife detection systems have been installed in three other areas since the pilot began in 2008. Although fencing off roadways is the most reliable way to prevent these accidents, it's not viable on animal migration routes. At the latest installations, detection systems are placed at the ends of wildlife fencing, giving CDOT a multipronged approach to human and animal safety. The new sites also are less complicated — they don't use technology like data recording found in the pilot system, reducing costs and simplifying installation.

"WE FEEL WE'RE ON THE RIGHT TRACK."

A full analysis of the data from the US 160 project hasn't been completed, however, CDOT's preliminary information shows a 38 percent decrease in wildlife-vehicle collisions in that area.

While the system has garnered interest from other agencies, even internationally, CDOT is unaware of the technology being used this way anywhere else. Now the department is looking into a portable system to test in other areas prone to animal-vehicle collisions. "We feel we're on the right track," Curry said.

/ **ELAINE PITTMAN**

CRIME SCENE INVESTIGATION

Empowering responders

Technology is transforming crime scene investigation, but rapidly evolving high-tech tools and techniques make it tough for local law enforcement to keep up. The National Center for Biomedical Research and Training (NCBRT) helps first responders get up to speed, typically at little cost to their agencies.

Kelly Barcus, an officer for the Roseville, Calif., Police Department, recently attended an NCBRT training program on collecting evidence in a major incident like biological warfare or other potentially hazardous crime scene. Barcus, who is part of Roseville's Crime Scene Investigation team, said, "We go in and we know [hazardous materials] exist, but who is making them? How do we collect that evidence?"

The training gives local first responders the skills to deal with sophisticated and dangerous incidents. The NCBRT, located at Louisiana State University, says most training costs are covered through a cooperative agreement with the U.S. Department of Homeland Security.

Barcus learned about GPS devices for diagramming a crime scene that could be filled with volatile or hazardous materials. The tools help first responders determine if it's safe to enter a potentially contaminated area. She said the NCBRT training preps local police to combat terrorism and other major threats.

"If it was a major incident like 9/11, we could assist now that we've had major training," Barcus said.

/ **SARAH RICH**

SNOW REMOVAL
Winning the winter campaign

DAVID KIDD

What superhero would be good at clearing snow? "Lower Back Man," said Nick Lowe, a senior editor of X-Men comic books at Marvel Comics in a *New York Times* article. But for non-superheroes, snowblowers and heated driveways might defeat Mr. Freeze.

Meanwhile, Gotham must employ different tools. Blading snow onto the shoulder or into parking spaces is the first line of defense, but for a big snowfall, the stuff must be disposed of before it chokes off streets. Hauling it away is expensive, and dumping it into waterways puts road crud into the water.

Enter the Dragon, breathing diesel fire to melt snow, filter it and send it retreating into storm drains. One such machine can handle 30 tons of snow per hour and will save on trucking costs, even though it uses 40-50 gallons of diesel per hour for heating. Even the Russian winter — which defeated both Napoleon and Hitler — is now yielding to the heavy fist of jet-engine snow blowers.

DRAGON

When it comes to winter campaigns, lots of new technology has been enlisted in the fight against the white menace, which in 2005 cost New York City $1 million per inch. Automated vehicle locator technology, for example, tracks where plows have been and whether the blade was up or down. GPS enables efficient deployment of snowplows and lets residents follow what's happening as well as claim sidewalks for clearing. Real-time operations centers help monitor weather, road temperatures, snow or slush accumulation and other factors to help design the most effective response to storms.

And for the real deep freeze, Alaska is king, with some locations receiving 40 feet of snow and 140 mph winds. Under those conditions, snowplows operate with differential GPS, radar and other technologies to keep the plow in the correct lane and away from guardrails and other obstacles.

There are other far-out ideas also percolating, such as solar-heated roadways or moving to Arizona for the winter. Happily — for everyone but skiers and snowboarders — winter is over. But as Mr. Freeze might say, "I'll be back."

/ WAYNE HANSON

In 2009, two inmates at the Cummins Unit prison in Arkansas stole guard uniforms and escaped, prompting the Arkansas Department of Correction to place five guards on leave for letting it happen on their watch. The prisoners were later caught, but Arkansas took steps to prevent it from happening again.

The department installed fingerprint scanners later that year to track the movement of inmates and staff in several state correctional facilities. "At most of our facilities now, we have biometric enrollment of visitors and staff," said Sheila Sharp, the Correction Department's deputy director.

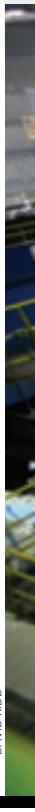
Biometric technology, which includes iris scanners and other biological identification devices, has been working its way into correctional facilities.

CORRECTIONS
Tightening prison security

But adoption of these new tools often is hindered by old offender management systems at many facilities. "We've found industrywide that there's a large amount of states still using legacy systems," said Ben Harrell, director of sales and marketing for corrections management software provider Marquis Software. He said COBOL systems in particular can't store images, which makes sorting pictures of prisoners difficult.

Doug Smith, CIO of the Florida Department of Corrections, agrees. His office runs a COBOL-based mainframe offender management system, and budget restrictions impede upgrade possibilities. "It would be nice to move to a newer platform, but that involves great expense," he said. "We're primarily general-revenue-funded. We don't have a lot of trust funding, so it's an enormous expense to the taxpayer."

/ HILTON COLLINS



DAVID KIDD

WASTE MANAGEMENT

Tracking trash

Waste collection could be seen by some as the epitome of a "dirty job," as workers pick up discarded items and haul them away to landfills. But behind the scenes, it's more high tech than most people realize.

For example, Republic Services, a national waste disposal service in the U.S., combines GIS and other public data in an advanced auditing service to give cities and counties a more accurate count of the number of units the company serves for them. For example, if a customer is placing additional trash bins in front of a vacant home, GIS-based auditing data enables the municipality to see where that extra refuse and cost are coming from and investigate the matter.

GIS-based auditing assists cities and counties in preparing tax rolls for billing. The more reliable numbers also help optimize collection routes, reducing emissions and improving the environment.

"From a reporting standpoint, it is absolutely critical for these municipalities to get it right and I believe it is becoming harder and harder for them with fewer staff members than what they have seen in the past," said Lance Carlson, senior manager of operations research and GIS for Republic Services.

While the auditing technology is used "quite a bit" nowadays, the company would like to expand its use to every municipality it serves. Most of the electronic information the company uses in its auditing is culled from public data sets, so additional effort from local governments is usually not required.

Carlson explained that the service primarily uses his team's GIS resources, and it covers a lot of the work that would traditionally be handled by municipalities.

"We want to make it as simple as possible for them," Carlson said. "We understand that with the way budgets are today, it is absolutely critical that if we are going to do something like this, that it doesn't have any impact on municipality staff."

/ BRIAN HEATON

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PEST MITIGATION

Drawing a bead on bugs

In the hot and humid Florida Keys, aerial spraying plays a vital role in controlling the mosquito population. The Florida Keys Mosquito Control District uses advanced computer modeling and sophisticated technology to attack breeding grounds for these airborne pests.

District activities are divided into two functions: spraying for existing mosquitoes, and spotting and eliminating larva sites in the water. Both tasks rely on helicopter flights and a sophisticated spray management system that guides the pilot to the right areas and records the concentration of pesticide being released.

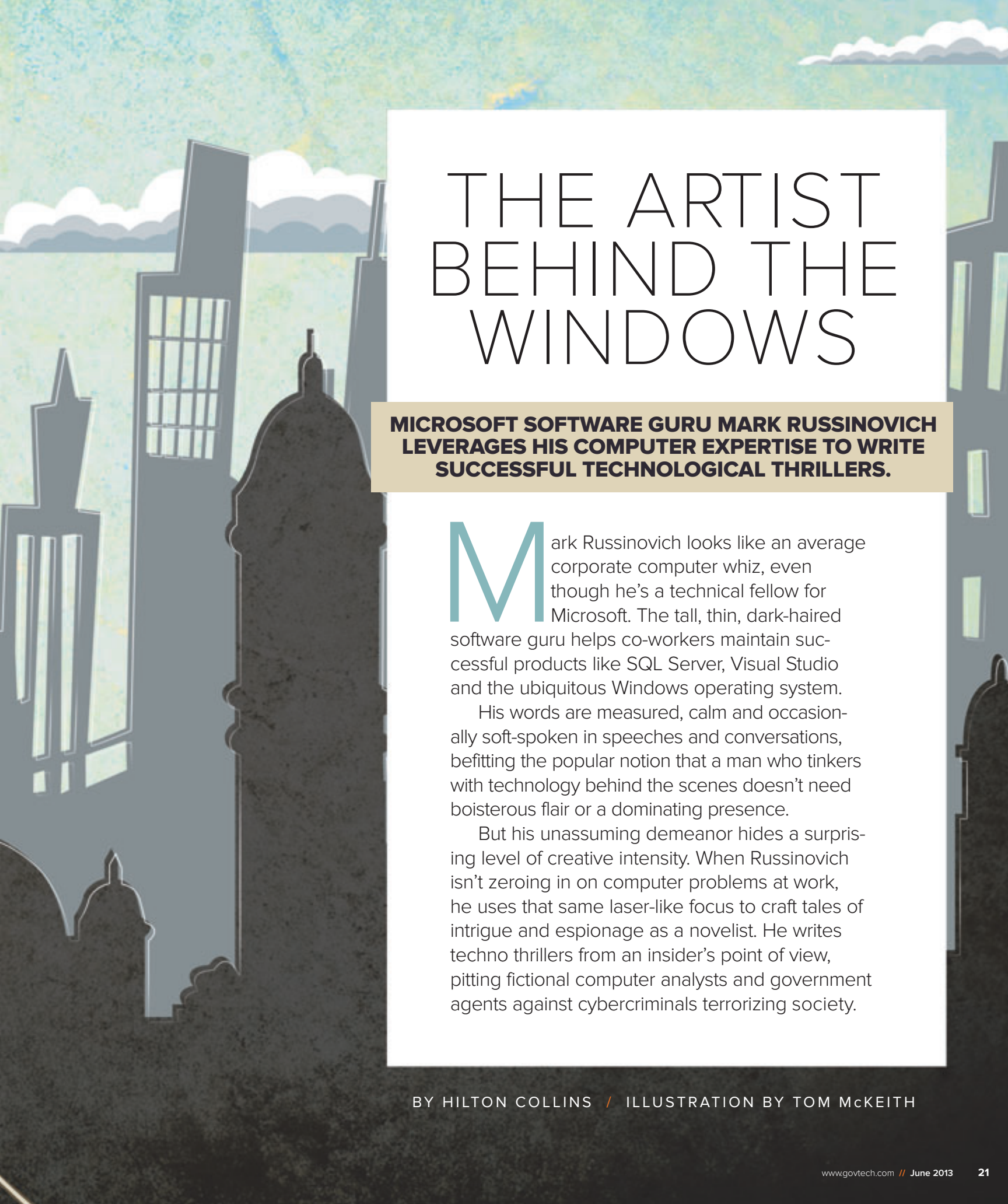
Flight and spray patterns are determined at the district office and saved onto a memory card, which is uploaded to the helicopter's onboard system. For larva sites, inspectors note locations by hand, and that data is placed on digital maps.

While in flight, an automated system consisting of two GPS antennae and a wind measurement probe records data and monitors the wind speed and aircraft direction. Spraying goes on and off automatically to ensure the cloud drifts over the appropriate area.

"The pilot just has to go to the spray area, activate the unit, and it'll set up the first line," said Stephen Bradshaw, the district's aerial operations supervisor. "It'll show the pilot where to go so the product will drift across the spray area and be more effective."

The district also plans to upgrade its land-based technology. Instead of having inspectors report larva site findings manually, the agency is seeking a tablet or smartphone system to enter the information digitally. This way, data is directly entered on the map pilots will use to direct their spraying. GT

/ BRIAN HEATON



THE ARTIST BEHIND THE WINDOWS

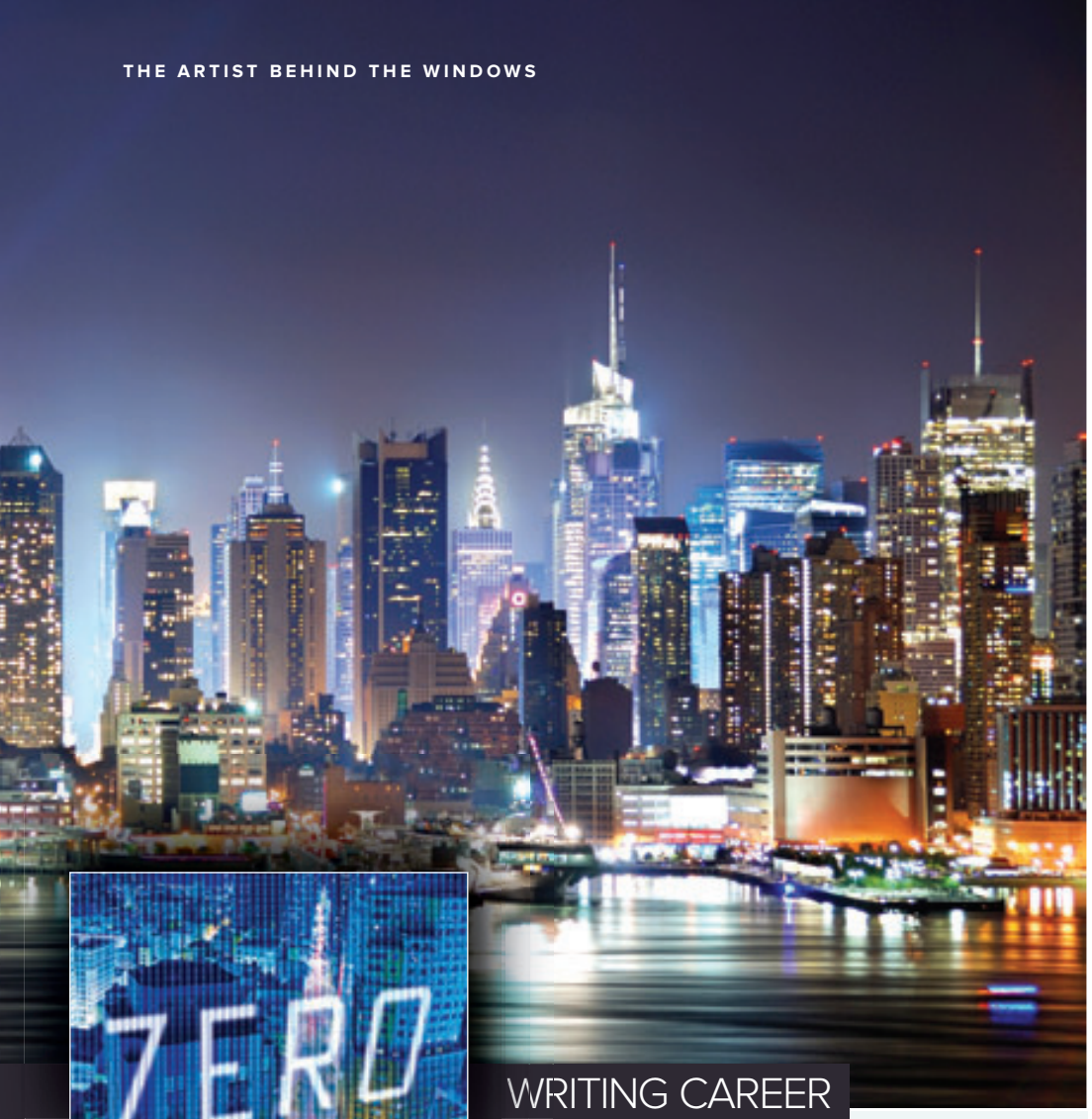
MICROSOFT SOFTWARE GURU MARK RUSSINOVICH LEVERAGES HIS COMPUTER EXPERTISE TO WRITE SUCCESSFUL TECHNOLOGICAL THRILLERS.

Mark Russinovich looks like an average corporate computer whiz, even though he's a technical fellow for Microsoft. The tall, thin, dark-haired software guru helps co-workers maintain successful products like SQL Server, Visual Studio and the ubiquitous Windows operating system.

His words are measured, calm and occasionally soft-spoken in speeches and conversations, befitting the popular notion that a man who tinkers with technology behind the scenes doesn't need boisterous flair or a dominating presence.

But his unassuming demeanor hides a surprising level of creative intensity. When Russinovich isn't zeroing in on computer problems at work, he uses that same laser-like focus to craft tales of intrigue and espionage as a novelist. He writes techno thrillers from an insider's point of view, pitting fictional computer analysts and government agents against cybercriminals terrorizing society.

BY HILTON COLLINS / ILLUSTRATION BY TOM McKEITH



WRITING CAREER

Although *Zero Day* launched Russinovich's career as a novelist, he has written extensively about technology. His technical prowess goes back to being a teen who tinkered with computers. Russinovich's debut novel took roughly six years to come to fruition, however, he has since published a second book called *Trojan Horse,* with a third pending release in 2014.

His stories paint a vivid, chilling picture of how digital wrongdoing jeopardizes activities that people take for granted. In his first novel, *Zero Day,* illegal hackers nearly cause a nuclear meltdown and disrupt a plane's control system midflight. In his second novel, *Trojan Horse,* state-sponsored cyberespionage infiltrates international networks and threatens global relations.

Each book currently rates an average of more than four stars on Amazon, evidence that Russinovich tells stories with just as much skill as he uses to develop Microsoft products. The possibility of negative feedback worried him in the beginning, but positive ratings relieved him after *Zero Day's* 2011 debut.

"I tried to set myself up for, 'OK, if I hit three stars, then I'll consider that a success as a first book,'" he said. "And the response has been way more positive than that."

His content entertains but also cautions. Digital networks support the world's food, power and water supplies, so cyberthreats shouldn't be ignored. "It's intended to be a warning," Russinovich said. "We are so dependent on computer systems and yet they're still vulnerable in so many ways that we're at risk of having a big problem."

Prescient Prose

Russinovich's tales thrill readers with intense opening scenes illustrating the dangers of cybercrime.

Pilots and nearly 300 passengers of a Boeing 787 Dreamliner are shell-shocked in *Zero Day's* first chapter when the airliner unexpectedly climbs tens of thousands of feet above the Atlantic Ocean. The jet's hacked computer takes on a life of its own, sending the 787 more than 43,000 feet into the air before stalling in the sky. Occupants panic when they suddenly plummet toward the water below.

In *Trojan Horse,* terror starts spreading through Yakima, Wash. A malware-infected power grid causes a hospital's electricity to go out during an operation to remove shrapnel from a girl's brain after a car accident. Elsewhere, a power outage stops one train dead on the tracks, while another train barrels toward it from behind. Will the power return in time for the doctor to save his patient? Will the engineer regain control of his train and move it out of the other's path before they collide?

These deadly scenarios plague characters early in Russinovich's novels, and they're striking examples of what illegal hacking may cause in real life. "I think the goal is to scare the government," he said. "The fact is, our nation's critical infrastructure is operated by private industry with very little regulation or oversight by the government."

The American media hasn't reported frightening events of this magnitude yet, but network infiltration grows at an alarming rate. Surprising statistics include the following:

- According to a federal report, companies in charge of the country's critical infrastructure experienced a dramatic increase in attacks on their networks from 2009 to 2011. The government fielded nine incident reports in 2009 and a staggering 198 in 2011 — a 2,200 percent increase.
- In September 2012, a software supplier to Canadian and American electrical systems reported that it had been hacked by Chinese assailants who accessed America's power grid.

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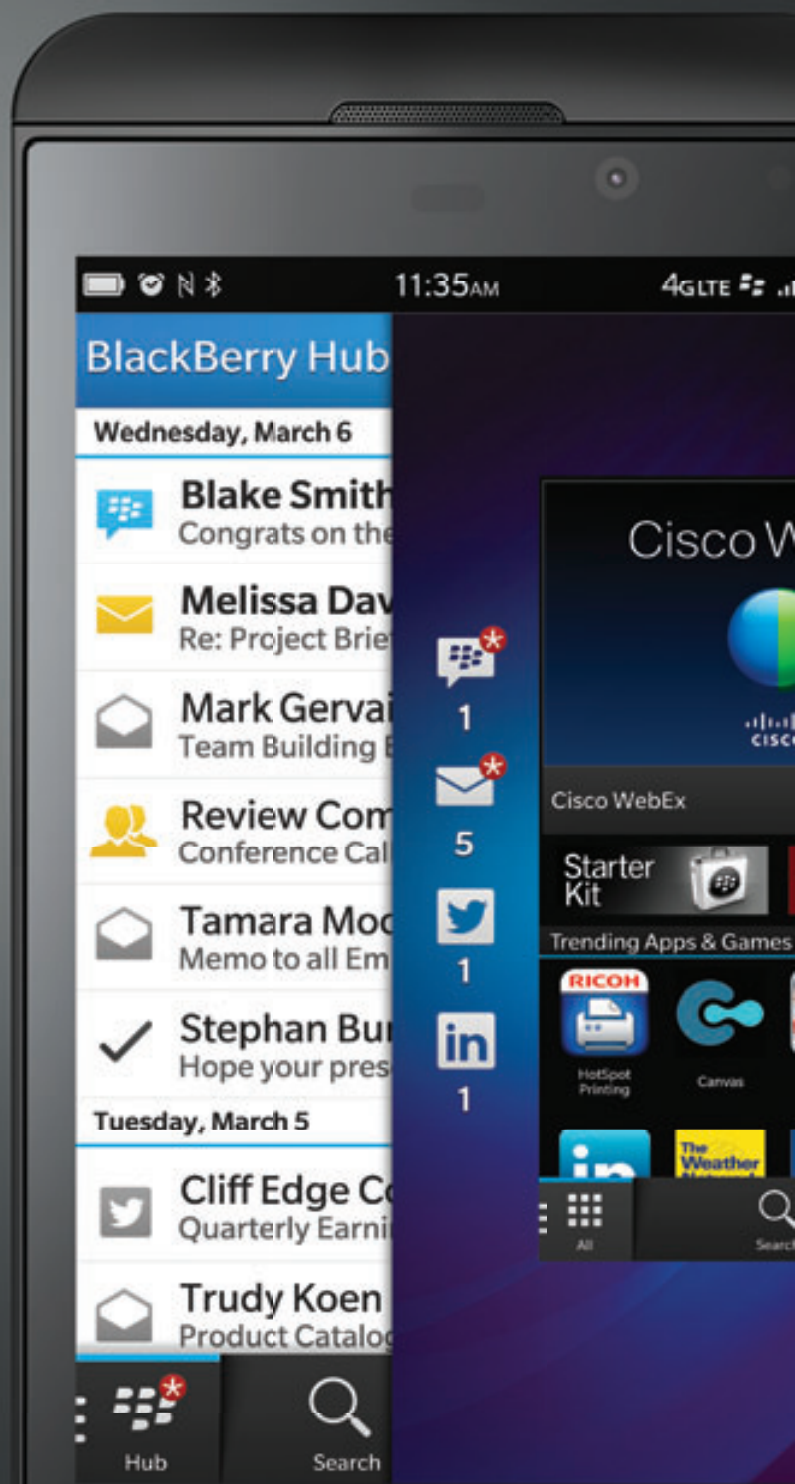

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EDUCATION

Russinovich earned a master's degree in computer engineering from Rensselaer Polytechnic Institute in 1990. He obtained his Ph.D. in computer engineering in 1994 from Carnegie Mellon, where he also earned his bachelor's degree.

> "THE PLOT WAS HUNG OFF THIS SCENARIO I CONSIDER A REAL THREAT: TERRORISTS REALIZING THE POWER OF CYBER-WEAPONS...

- In July 2012, a man exposed weakness in an air traffic control system during a conference demonstration by using $2,000 worth of store-bought equipment to fool the system into believing that a nonexistent plane was landing.

As a Microsoft employee, Russinovich is well aware that Windows, the world's most-used operating system, is constantly under attack. He raised the issue in a February speech at the 2012 RSA Conference, a popular destination for tech luminaries. Russinovich suggested that the world could be on the verge of the kind of cyberterrorism his fiction depicts, and he referenced testimony that then-U.S. Sen. Joe Lieberman gave to Congress earlier that month.

The senator likened today's cybervulnerabilities to the physical vulnerabilities that terrorists exploited on 9/11. "To me, it feels like it is Sept. 10, 2001. The system is blinking red, again," Lieberman said. "Yet, we are failing to connect the dots, again."

Russinovich created characters in his stories that are prepared for the worst. Computer security expert Jeff Aiken stars in *Zero Day* and *Trojan Horse,* and he fights criminals and enemy governments. Government agent Daryl Haugen joins him in the mission to protect America, and they handle the worst their adversaries throw at them.

Russinovich weaves drama into his stories with enough technical authority to keep them grounded in reality, and the result is so real it's creepy. Plots thicken once his characters detect malware wreaking havoc. In *Zero Day,* the first investigation pits them against terrorists operating under the *al-Qaida* label who outsource their hacking efforts elsewhere.

"The plot was hung off this scenario I consider a real threat: terrorists realizing the power of cyberweapons, outsourcing it because they don't have the knowledge themselves and carrying out this slow spreading attack on a certain day," he said.

A Technical Foundation

Russinovich's impressive technical background seems atypical for someone with artistic sensibilities. He earned a master's degree in computer engineering from Rensselaer Polytechnic Institute in 1990 before getting his Ph.D. from Carnegie Mellon in 1994.

His ingenuity after graduation caught Microsoft's attention. In 1996, he co-founded Winternals Software, a company offering software to help people manage computers running Windows. Microsoft bought the company in 2006 and hired Russinovich as a technical fellow, his current role. He's also one of the writers behind the *Windows Internals* nonfiction series that teaches readers how Windows functions.

Writing cyberthrillers may seem like an odd choice for someone so technical, but it's a natural fit: Who else but a computer whiz would have such a firm grasp on digital drama?

When Russinovich started his novelist career with *Zero Day,* he knew he would expose the insider world of software security and government bureaucracy to readers who may be unfamiliar with its intricacies.

"I was like, 'I'm going to write it for myself, which is a niche kind of audience. I know that audience will probably like it. I have no idea what people outside of that targeted audience will think of it,'" he said.

His risk paid off. Russinovich said in his RSA speech that *Zero Day* had sold tens of thousands of copies, an admirable debut for a first novel. The result gave him and his publisher, Thomas Dunne Books, the confidence to produce *Trojan Horse,* the second Jeff Aiken novel, released in fall 2012. Russinovich also

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wrote an Aiken short story, *Operation Desolation,* and his third novel in the series, *Rogue Code,* drops in spring 2014.

Surprisingly, being a successful and productive novelist hasn't changed Russinovich's life much, but his friends may see him differently now.

"I think friends don't really know what to think of it. I think they're impressed, but they're bemused because I'm one of them and yet I have this background activity of fiction going on."

Rewarding Journeys

Fiction writing was a natural evolution for Russinovich personally, who's been a science fiction and thriller fan since childhood. He enjoys stories by sci-fi and thriller legends Isaac Asimov and Michael Crichton, and he plays the Battlefield first-person shooter video game series. Russinovich has yearned to tell his own stories for several years.

"Wanting to write fiction is something that's been a thought of mine since I was young," he said. The fact that people used technology as backdrops for exciting adventures fascinated him. "I felt like I was learning something and getting smarter, and yet the story was also entertaining."

The 9/11 tragedy spurred him to write *Zero Day,* which launched his novelist career, but the road to techno thriller proficiency was long. He finished the book in 2006 and spent years searching for a publisher before Thomas Dunne Books released it in 2011.

The journey to publication was stressful and time consuming. When Russinovich decided to write fiction, he expected publishers to be welcoming. He'd already written nonfiction books about software, and his Sysinternals.com website garnered tens of thousands of hits. The thinking was that publishers would be impressed by his background, but things didn't go smoothly.

"I started by emailing a bunch of publishers and didn't get any answers, so I bought books on getting publishers, and what they really recommend you do is go find an agent," he said. "I went through three rounds of sending out packages to agents."

The packages explained why his background made him a viable candidate and included excerpts from the book. Russinovich struck out three times before he found a willing agent, which took more than a year after *Zero Day's* completion. The agent went through more rounds of submitting similar packages to publishers, and the rejection letters weren't very informative.

"It's like, 'Oh, we're going to pass at this time,' or 'This doesn't fit with our line-up,'" he said.

He was relieved when Thomas Dunne Books accepted him, but that wasn't the ordeal's end. Publishers take time preparing books and wait for certain time frames to release them. Delays frustrated Russinovich so much that he considered self-publishing, but his agent convinced him to tough it out. *Zero Day's* eventual release ended an agonizing process that lasted nearly six years.

Russinovich broke through a major barrier when his first novel finally came out, and publishing successive books has been much easier. But one thing that will always require hard work no matter how his career goes is the writing process itself.

He likened creative writing challenges to public speaking challenges he's faced in the past. "Public speaking was never easy for me. It's not for a lot of people, and that drew me to it because this is a challenge," he said. "I [thought], 'This is hard for me, so I would really love to conquer this, to attack it and get better at it.' And writing is kind of the same way."

But overcoming artistic hurdles doesn't scare Russinovich because he's a seasoned pro. He has years of experience attacking problems methodically — creative and technical.

"I don't feel like I'm the genius piano player that can just spit out a masterpiece. I am much more intellectual about what I'm doing, and that's harder than I think, to somebody who's natural at it, but it's also what draws me to it." GT

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PREPARING FOR A CYBERATTACK

At Microsoft's U.S. Public Sector CIO Summit in Redmond, Wash., in March, Russinovich asked attendees about their reaction to the 2012 South Carolina Department of Revenue's data breach, which exposed 3.6 million Social Security numbers, as well as credit and debit card data for hundreds of thousands of taxpayers.

Most attendees could sympathize with South Carolina's predicament in the wake of the breach, admitting to some degree of vulnerability in cybersecurity.

"The fact is that if you're in the public sector, you're as much of a target as anybody else," he said, outlining impacts to an organization's reputation and bottom line. Russinovich offered some practical advice to public-sector agencies:

1 **IDENTIFY, ISOLATE AND CONTAIN HIGH VALUE RESOURCES.** Social Security numbers and some credit card numbers were unencrypted in South Carolina's case. While officials explained that encrypting this personally identifiable information wasn't required, Russinovich calls the practice common sense.

2 **ARCHIVE LOGS AND EMPLOY OTHER FORENSICS READINESS PRACTICES.** The South Carolina breach was simple to reconstruct after the fact using forensic evidence, allowing security experts to pinpoint the source, timeline and compromised machines. Having these practices in place simplifies your response.

3 **HAVE AN INCIDENT RESPONSE PLAN.** "You don't want to be making things up on the fly — you want to be prepared."

4 **DO NOT PIECE-MEAL MITIGATE.** Quickly execute a holistic plan. Two weeks elapsed between the time the breach was announced, and when the state declared that the vulnerability was addressed — a critical window of time which represents an opportunity for the attackers to entrench themselves deeper within your network.

5 **RUN DRILLS AND "RED TEAM" EXERCISES**. Test your confidence in your cybersecurity defenses by hiring a penetration tester to look for weakness and potential entry points.

— NOELLE KNELL, ASSISTANT WEB EDITOR

STAY CONNECTED

Cities and counties use unified communications to build a new playing field for contact centers, mobile communication, computers and networks.

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A Look at Who's Using UC and Why

BY WAYNE E. HANSON | EDITOR, DIGITAL COMMUNITIES

In 2007, Bill Gates said that "taking the magic of software and applying it to phone calls," would transform communications and lead to the eventual death of the public branch exchange or PBX. "Once you get software in the mix, the capabilities go way beyond what anybody thinks of today when they think of phone calls," he told *Network World*. "This is a complete transformation of the business of the PBX."

The business of the PBX has been to provide voice telephone service to organizations like cities and counties at lower cost than purchasing individual lines from the phone company. Rather than buying 1,000 phone lines at $60 per month, the organization can buy a PBX telephone switch and connect those 1,000 phones to that switch using the organization's wiring. So the organization has phones for its own internal use. Then it can connect that switch to the external public switched telephone network with, say, 75 lines for making and receiving external calls. The cost drops to less than $5,000 per month plus the one-time cost of the PBX switch. So it was a very good solution at the time.

But times have changed. Voice no longer needs to run in a separate stovepipe. Cellphones and mobile devices provide one user-friendly interface for multiple forms of communication, such as voice, video, text and email. Skype, Google video chat and other services enable voice and video communication around the world — at no or very little cost and with no PBX.

Today, as cities and counties look at replacing aging PBX switches or upgrading their systems, they have some interesting options as voice yields to the magic of software and many different forms of communication converge in the same digital pipe. Unified communications (UC) offers enhanced capabilities and a new playing field for contact centers, mobile communication, computers and networks. What a smartphone or tablet does for the individual, UC does for organizations — it integrates multiple media types and provides a single user interface. And that functionality has the potential to reduce government costs, increase flexibility and boost efficiency.

"Typically with UC the desk phone is connected to a PC, or sometimes the PC serves as the phone as well as the computer," said Bill Schrier, former Seattle CTO. "In this fashion, email, voicemail and telephone directories are all integrated into the PC."

With UC, desk phones and smartphones can be integrated, so that during work hours, for example, an incoming call rings on an employee's desk phone and cellphone — a useful feature for workers in the field.

Another function that UC brings is "presence," the ability to look at an electronic directory and see a person's availability, reducing the amount of time wasted playing phone tag.

Some UC solutions are on-site systems purchased and owned by the jurisdiction. Others are hosted by a vendor and accessed via an Internet connection. In this special section, *Digital Communities* talked to a number of cities and counties about their experiences with UC, the lessons learned and what advice they have for other local governments.

About This Report

This report is based on the activities 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 local government IT professionals face.

More than 1,000 government and industry members participate in Digital Communities task forces focused on digital infrastructure, law enforcement and big city/county leadership. The Digital Communities program also conducts the annual Digital Cities and Digital Counties surveys, which track technology trends and identify and promote best practices in local government.

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

CHRISTOPHER MARDORF/FEMA

IP-based communications let Tuscaloosa deploy two emergency action centers a few hours after the city was devastated by a massive tornado.

Tuscaloosa, Ala.

On the afternoon of April 27, 2011, a huge tornado — estimated to be a half-mile wide at the ground with winds up to 200 mph — moved into Tuscaloosa, Ala. It cut directly through Tuscaloosa and Birmingham and left a trail of destruction for 380 miles across the state.

Forty-four Tuscaloosa residents died and untold others suffered injuries. It was a dark day, but the city had done advanced disaster planning and installed a unified communications system, without which things could have been much worse.

"We'd been preparing for emergencies for several years," said Doug Taylor, director of the Tuscaloosa Information Technology Department, "and the entire city had extensive training." Tuscaloosa implemented two emergency action centers in just a couple of hours, one at its City Hall and the other at the Police Department, he said. "Without it, I don't know what we'd have done."

The quick setup was enabled in part by a citywide IP communications system running on Tuscaloosa's fiber network. "The voice over IP enabled us to place telephones wherever we needed them."

That was extremely important, said Taylor. "We lost our Emergency Management Department. The whole building — which was formerly a General Motors factory — is extremely large and it was just blown away.

"We lost all of that and still maintained the ability to communicate on the rest of our systems," Taylor added. The system — which began as an upgrade to provide a 311 call center — was installed by ShoreTel and became the city's basic switchboard. "The actual installation was very easy, from an IT standpoint, because the phones plug into an IP network," he said.

Taylor said the system is on-premises — and he thinks that's better than a cloud-style subscription. "We have all our equipment here at our locations," he said. "The systems that you have replicate each other on the switches, so if you have good connections like fiber between locations — like a spider web — you can actually lose a system and stay operational."

Now, some 1,100 of the city's 1,300 employees are on the new system. "We don't have all the unified communications bells and whistles," Taylor said, "but what we do have here, we really utilize."

Palm Beach County, Fla.

Palm Beach County, Fla., is the largest county east of the Mississippi, based on total land area, and it spends $7.5 million annually for 80 legacy PBX systems and leased phone circuits connecting 367 facilities. The county wants to save costs and simplify operations, said Michael Butler, director of network services for Palm Beach County Information Systems Services. "Our intent is to unify everything, lower our maintenance costs, make staff more efficient in supporting all the various systems — down to one system — and leverage our network. We have a fairly sizable high-speed network, with about 450 miles of our own fiber, so we want to leverage that, and then cut our [leased line] costs

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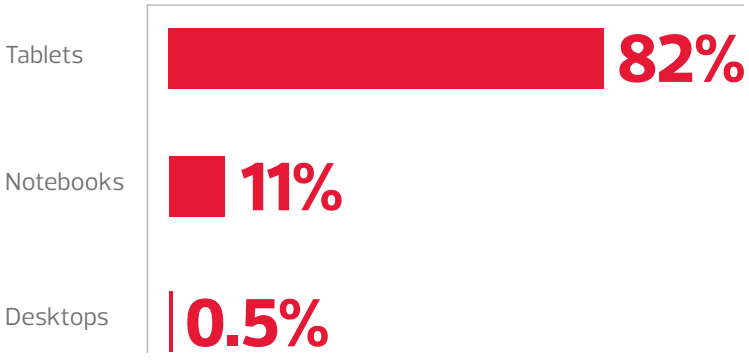

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[1]IC Insights, IC Insights Raises Forecasts for Tablets, Notebooks and Total PC Shipments [2]Center for Digital Government, "Mobilty and Security Research" September, 2012

as well. We anticipate saving about $3.5 million per year once the system is fully deployed." The project will encompass 10,000 phones.

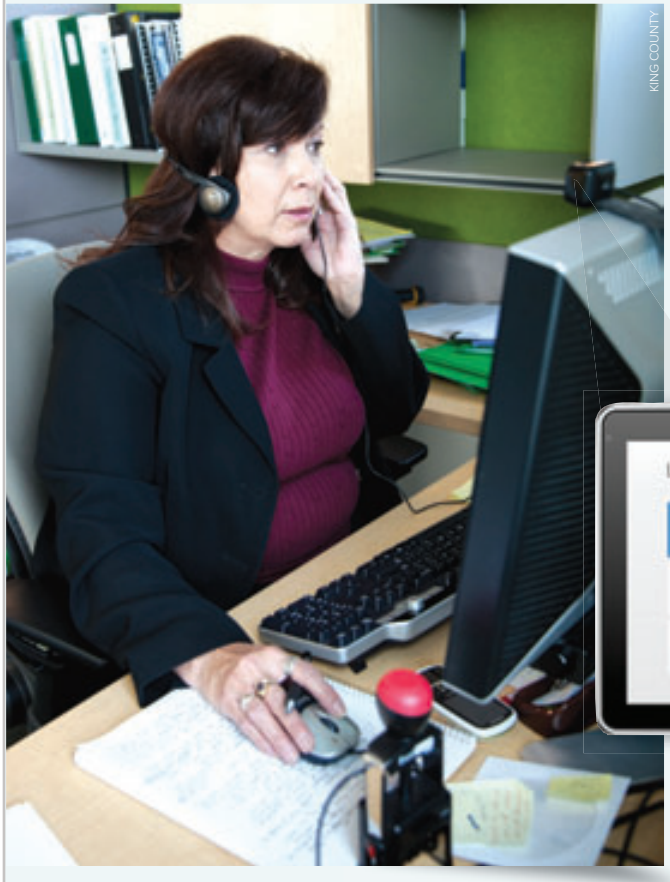
The county developed a 45-page list of needed features. "We selected five manufacturers for evaluation — ShoreTel, Cisco, Avaya, Siemens and Microsoft. We're going through a one-month evaluation with each of those manufacturers. We're running through the call processing engine, call center solutions, how they handle 911 — all of those various features."

The evaluations will conclude in August, and the county will select a company. Butler said Palm Beach County will use one of its existing contracting vehicles such as the Western States Contracting Alliance to avoid going out to bid.

"We have a fairly sizable high-speed network, with about 450 miles of our own fiber, so we want to leverage that, and then cut our [leased line] costs as well. We anticipate saving about $3.5 million per year once the system is fully deployed."

One of the goals is to be able to do video from any endpoint within the county. "We currently have about 1,000 licenses of Microsoft Lync for instant messaging and video chat, and one of the criteria we're evaluating is should we expand our Lync presence and integrate it with whatever solution we choose for call processing."

Butler said that he underestimated the amount of work required to prepare the network for the upgrade. "We're having to go out and do stand-alone phone surveys in all of our facilities, so we know where we need to upgrade cabling, we know where we need to add additional switchboards. We have to upgrade about 900 of our switches throughout our facilities to power over Ethernet." But the work goes beyond this. "We're doing a comprehensive wire-mapping project for 911 purposes, so that we can map directly to the location of the phone. When the 911 call comes in, we can hand it off to the PSAP [public safety answering point] with the correct location information. So there's a lot of preliminary work that's gone into the project," Butler added. "I think once we select a manufacturer and start the deployment, we'll all breathe a sigh of relief."



Cathy Ortiz, with King County's Department of Permitting and Environmental Review, uses Lync to help customers locate parcel numbers.

King County, Wash.

Occupying 2,300 square miles, King County, Wash., is home to about 2 million residents and its county seat is Seattle. In 2010, when Bill Kehoe became CIO, the county was preparing to upgrade a 25-year-old PBX — with 43 fixed-cost contracts — to a voice over IP service. Kehoe suggested the county should instead move to a UC architecture. "I felt that's the way the industry was going," said Kehoe, "and it would give us much greater benefits."

King County had an enterprise agreement with Microsoft, and so it decided to go with Lync, the Redmond, Wash., firm's UC product. The county

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TERMINOLOGY CHEAT SHEET

- **Unified Communications (UC):** The integration of real-time communication services, such as instant messaging (chat), presence information, telephony (including IP telephony), video conferencing, data sharing, call control and speech recognition with non-real-time communication services like unified messaging (integrated voicemail, email, SMS and fax). UC is not necessarily a single product, but a set of products that provides a consistent unified user interface and user experience across multiple devices and media types.

- **PBX:** A telephone exchange (public branch exchange) that serves a particular business or office, as opposed to one that a common carrier or telephone company operates for many businesses or for the general public. PBXes make connections among the internal telephones of an organization and also connect them to the public switched telephone network via trunk lines.

- **Centrex:** Centrex is a PBX-like service providing switching at the central office instead of at the customer's premises. Typically the telephone company owns and manages all the communications equipment and software necessary to implement the Centrex service and then sells various services to the customer.

- **Contact Center:** A contact center handles letter, fax, live chat, email, etc., in one location.

- **Public Switched Telephone Network (PSTN):** The PSTN consists of telephone lines, fiber-optic cables, microwave transmission links, cellular networks, communications satellites and undersea telephone cables, all interconnected by switching centers, thus allowing any telephone to communicate with any other.

- **VoIP:** Voice over Internet protocol refers to communications services that are transported via an IP network, rather than the PSTN.

- **Presence:** A function that tells you if the person you want to contact is available to receive a call or text message, etc. *— Source: Wikipedia*

is two years into a four-year deployment, and has 3,000 of 13,000 staff on the Lync system, with the aim to have everyone connected. "We're phasing it in and learning lessons with each deployment," Kehoe said.

He says the county is already seeing improved efficiency and productivity from the partial deployment. "You can work anywhere you have a network connection, attend meetings ... and you are always able to efficiently communicate as long as you have a connection, whether you are flying at 10,000 feet, or in Starbucks or in the office. From a mobility perspective, it's going to give King County employees incredible efficiency in terms of where and when they can work, and make them much more productive on the job because of the communication efficiency."

Video conferencing via Lync Meeting is another benefit, he said. "We can set up Lync meetings where half the attendees are in the room and half are at home or somewhere else. It's very easy from your calendar and Outlook to establish a Lync meeting — it sets up all the links automatically. You click on the Lync meeting and you're in."

Kehoe holds quarterly meetings in which up to 200 people attend via video. "We don't have to rent a big conference room," he said, "people don't have to travel to the location, so there are a lot of efficiencies there. They can attend the meeting from their desks so they can continue to work if they need to, and that's happening all around the county now, where before we didn't have a good solution for meetings and video conferencing. ... Now we have more efficient communication and more ad hoc meetings."

In addition, county staff members use the system to assist residents. For example, public health workers are using video to view and document patients taking medication.

Permitting staff members also are using the system to talk with their customers, Kehoe said. "It's not just an internal efficiency, it's also helping our residents based on the business processes they have."

The UC system earns kudos for flexibility as well. "I have a mobile device and if Bill is talking to me about

Q&A: Communicating through Chaos

Helping response and recovery personnel keep talking during times of crisis

When disaster strikes, governments and businesses alike need fast and powerful communications tools to maintain operations and implement emergency response plans. One of the leading providers of disaster and emergency communications tools is Sprint. Tanya Jones, operations manager for Sprint's Emergency Response Team, explains how Sprint can help organizations of any size prepare for and respond to disasters effectively using Sprint's solutions.

Tanya Jones
OPERATIONS MANAGER, SPRINT'S EMERGENCY RESPONSE TEAM

Q: What does Sprint offer in the field of disaster recovery and emergency response?

TANYA JONES: Communication is the foundation of response and recovery. We can help anyone — from the smallest agencies to some of the largest multinational corporations and federal, state and local governments — with their emergency communications plans. We can provide WiFi hotspots, mobile broadband, cellular and Android devices, smartphones and more. Taking it one step further, we can provide an enterprise messaging gateway, which gives you the ability to "chase" a person through multiple forms of media — cell phone, email, text message — if you need to send them an immediate notification and cellular failover for wireline networks.

Among other resources, Sprint's Emergency Response Team (ERT) provides SatCOLTs (Satellite Cell on Light Truck) "ERT Go Kits™," which are caches of devices kept on premise at the customer's location. They are pre-programmed and ready to go in the event of an emergency deployment. When disaster strikes, Sprint's ERT brings in the equipment and the personnel to assist response and recovery efforts, both in places where communications infrastructure may have been damaged and in remote areas with little or no existing communications infrastructure.

Q: What's a real-world situation where your emergency response solutions were used to good effect?

TANYA JONES: One of the things Sprint ERT does is field exercises. We actually don't charge a fee for it. We do these every year, because it's important for us to work with agencies to prepare for emergencies before they happen.

In 2011, we took part in a national-level exercise along the New Madrid fault line in Missouri, funded by the Department of Homeland Security (DHS) and the Federal Emergency Management Agency (FEMA). We participated in it with the state of Missouri, and it was a great event.

Two days later, an F-5 tornado hit Joplin and leveled half of the town. We were able to bring equipment and assets into the area that responders could use for communications. Most importantly, we were able to reconstitute communications at the hospital there by providing cellular coverage, and high speed, mobile IP internet service. Because they had the critical communications that they needed, in a matter of days they were able to erect a makeshift hospital in the parking lot of a destroyed hospital building, and were seeing up to 250 patients per day.

Q: What sets Sprint's emergency response offerings apart?

TANYA JONES: We are a very tactical team, comprised of predominantly former and current public safety and military personnel. So we're not sitting behind desks; we're there in the field. We provide the communications element that allows customers to focus on their primary mission, assisting the public or getting their businesses back on line, during those times of crisis. But what really sets us apart is experience. We've been there, done that and had the after action reviews to improve ourselves post incidents. We've deployed over 5,600 times and counting, so our folks are used to being in these very severe, disaster-type environments. And all of the equipment, personnel, infrastructure assets and procedures that we use are rooted in the idea of rapid deployment — and the ability to deploy even more rapidly the next time.

something late on Friday, I can transfer him from my computer to my mobile device as I run out the door," said Communication Director Terra Strouhal.

The phones that are being installed include a presence indicator, which shows if individuals are available. Employees can decide if it's best to communicate with one another via IM, email or video chat based on the presence function. It includes other useful features, too.

"If I really need to talk to Bill, but he's away," Strouhal explained, "I can set up an alert so I get pinged when his presence turns back to green, meaning he's available. Another feature that I love is getting my voicemail in my email. It's very nice to have a visual representation of your voicemail so you can take a quick preview, and if you're busy, see what messages you really should look at."

Kehoe said the UC system's cost penciled out to about the same price as the original PBX voice replacement.

"I love getting my voicemail in my email. It's very nice to have a visual representation of your voicemail so you can take a quick preview."

But during implementation, some unexpected challenges arose, including a big commitment of staff time as well as considerable network and wireless upgrades necessary to support the new system.

"Because of the diversity of UC implementation, you have to spend a lot more time with customers training them, helping them understand how to use the various components," Kehoe said. "We have, I believe, four deployment teams on the project now. So the staff costs associated with UC deployment are probably double what you would find for just a straight hardware VoIP solution."

Although the county had a robust network, it still had to upgrade wiring and network capacity inside some of its buildings, according to Kehoe. "If we were doing this again, we probably would have done more work looking at the requirements and making sure that we knew which buildings weren't up to snuff in terms of their infrastructure and their networking backbone."

Wide area may need additional capacity too, he said. "If another county or city is going to do this, they are going to want to go through that evaluation and make sure they have those costs in their project fund," Kehoe said.

In addition, Kehoe said unified communications promotes mobility, and that means wireless infrastructure must be beefed up — an issue King County is still struggling with.

What's more, many older county laptops and desktop machines couldn't load the Lync client. Finally, the county needed to purchase additional products to handle some of its call-routing needs. "We have a bunch of call centers mainly in each department, and each one of them has various levels of sophistication, so you really need to analyze the workload and routing for each of those as part of your requirements gathering, and then determine whether Lync has the functionality to handle that."

For other jurisdictions creating an RFP for unified communications, Kehoe has some suggestions. "You want to talk about your desktop and laptops, the age of those — making sure you have specifications for that, so the client can work with the type of device or phone you are going to install. [You also need to talk about] your network connectivity, wireless capacity, your infrastructure and buildings, call center requirements, and 911 requirements. That requirements phase, that RFP, and technical/business requirements are a key phase of the project."

Northwest Tri-County Intermediate Unit

The Northwest Tri-County Intermediate Unit provides specialized services to 17 school districts in three Pennsylvania counties. Director of Technology Solutions and Services Vincent C. Humes said the unit has a nomadic workforce, with 400 people typically in the field and less than 100 in the office. Consequently bring your own device is a big topic of discussion because staff have a mix of personal and unit-provided mobile devices. "We've taken the position: Here are the protocols that your device has to support, and if it does that then we're OK with you making that connection," Humes said.

"We have the traditional IP phones on our desks, and we used to have a lot of BlackBerrys, but recently we've gone to more of the iOS and Android-type devices. The vast majority are iPhone-based."

The unit's IP telephony is tied to its Active Directory, said Humes, allowing

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"Don't build a system you will use today. Build a system that will support you five years out. Otherwise, by the time you get it in, it is outdated. We are going to move more channels to Facebook, Twitter and the Web, and with tools that Cisco brings to bear, I can do that now. I have the ability to do it, because it's inherent in the product."

for features including voicemail that shows up in email and a single number that rings both the office phone and cellphone, but doesn't ring cellphones after 5 p.m.

The unit provides video bridging for the school districts and also provides "firewall traversal," said Humes, as that can be an issue when video conferencing. The firewall — designed to stop unauthorized access to an internal system — will sometimes do its job too well and cut off video, he said. Some districts run college-level courses via video, and the unit runs video staff meetings.

"We use Avaya for all our video stuff — bridges, firewall traversals," Humes said, "and we just started using the Avaya endpoints."

If a jurisdiction is moving to UC, Humes said IP-based systems are the way to go. "But there are caveats. A lot of people have traditional PBXes, and when they have power outages, they don't have the distributed power issues they might have when they start to roll out an IP-based system, where they might have multiple wiring closets with POE [power over Ethernet] switches. Another thing is that total cost of ownership."

In one example, Humes said a vendor beat another on a short-term comparison, but in a five-year analysis, the other vendor came out with a $100,000 advantage. "Look at those long-term total cost of ownership numbers, because they can certainly make a difference. Some of the players have great stuff, but you are going to pay dearly for it over time."

Charlotte, N.C.

Charlotte, N.C., handles about 3 million calls annually across its call centers, including 311 for the city and Mecklenburg County. In 2011, about the time the city's voice system was nearing the end of its life, Charlotte learned it would host the 2012 Democratic National Convention with an estimated 50,000 communications-hungry delegates, members of the press and public.

"We had an existing system that was primarily our contact center," said Bellverie Ross, senior program manager of Charlotte. "We had about five contact centers, but this was our 311, Where's My Bus [app] and so forth. The actual call center applications and the platform itself were going to expire. It wasn't just about support, those applications were

Meeting the communications demands of the 2012 Democratic National Convention was one driver behind Charlotte's decision to deploy a hosted UC solution.

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UC PROJECT RESOURCES

To provide a detailed example of specific requirements for a UC system, Palm Beach County's UC plan might serve as a model. The full report is available at http://tinyurl.com/ucplan and includes an evaluation plan, project summary, executive presentation, project funding and manufacturer questionnaire.

Key questions that may help to outline a UC project, as suggested by city and county employees, include:

Mobility:

- **Are your staff members already using mobile devices for work?**
- **Are staff carrying multiple mobile devices for work, personal or specialized functions?**
- **Is there a benefit to allowing telecommuting?**
- **What infrastructure upgrades would be required to provide expanded wireless service?**
- **Would expanding mobility provide business, cost or other benefits?**

Legacy:

- **Do you use PBX switches that are 20 or more years old?**
- **Are cumbersome communications systems slowing down service or stopping implementation of 311 or other enhanced services?**
- **Do you have old call center routing and business processes that would need to be updated?**

Unified Communications:

- **Will you be replacing PBX switches or updating VoIP systems within the next three years?**
- **Is there a business case for providing video and video conferencing?**
- **Do office desktops and laptops have the capability to load a UC client?**
- **What switches and building wiring would need to be upgraded?**
- **What changes and upgrades would need to be made to the existing network to run UC?**
- **Do you have the resources to train staff members to use UC system features?**
- **Is your current communications system subject to disruption or outages?**
- **Do you have IT staff to run an on-premises UC system, or would you look instead at a hosted system?**
- **Would you need to do wire-mapping to enable 911 location information?**
- **Can you make a case for upgrading to UC based on total cost of ownership?**

gone, and we couldn't do maintenance or anything on the platform as of December 2012." Ross said that components had been upgraded piecemeal and parts of the system were "fighting one another."

Charlotte decided to go with a Cisco/NWN hosted UC platform, and Ross said the city was one of the first to do so. "We made the decision on the platform in September, we started the planning in February and we went live in June. That is pretty much unheard of in the public sector," she said.

"The hosting made it go faster, because it was all within NWN's data center. So we didn't have to put anything in our data center, we just needed to connect to them." Ross said that city staff needed to replace phones in the call center and prepare the network, which she called "normal project work."

Ross had some 100 projects running leading up to the convention, but the UC system was not one of the trouble spots. And since that time, a hosted interactive voice response system, an enhanced Web presence and mobile apps are reducing the call center traffic volume.

Ross has some advice for her colleagues: "Don't build a system you will use today. Build a system that will support you five years out. Otherwise, by the time you get it in, it is outdated. We are going to move more channels to Facebook, Twitter and the Web, and with tools that Cisco brings to bear, I can do that now. I have the ability to do it, because it's inherent in the product."

In addition, make sure you understand your business processes. "When you start putting in a phone system, particularly in a call center, you think of the business processes of the workflow of how a call comes in. But on the back end, you support business processes. How will this affect your internal IT staff? Your help desk staff? The end users? And think about that, because that's where the 'gotchas' are in the processes and learning to work with one another, particularly in a hosted environment."

Ross said the relationship with NWN has been going well, but it has been a learning curve for both sides. Finally, she suggested building one major upgrade into the cost. "That way you know you've got the longevity to take you out probably seven years."

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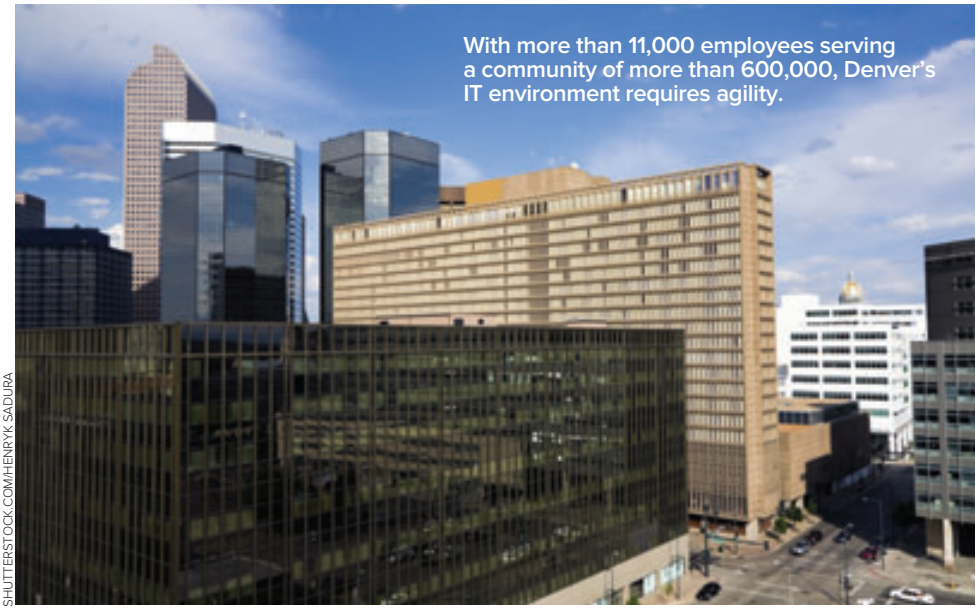

With more than 11,000 employees serving a community of more than 600,000, Denver's IT environment requires agility.

SHUTTERSTOCK.COM/HENRYK SADURA

In Colorado's state capital of Denver, more than 11,000 employees provide services to a community in excess of 600,000 people. With population growth upward of 10 percent over the past decade, it's an environment that requires an agile work force, since change is the rule, rather than the exception.

Technology leaders in the Mile-High City are charged with finding solutions that help them efficiently manage change in the fluid environment in which they work. Denver uses PeopleSoft to support a wide variety of operations, including its enterprise portal, CRM, financials and human resources. The IT staff responsible for maintaining these application modules need cost-effective tools that help ensure they are at their peak performance at all times.

Denver uses Stat from Quest Software, the only application management solution to have received Oracle Validated Integration for PeopleSoft and E-Business Suite, to manage change in all the PeopleSoft modules it utilizes. Stat for PeopleSoft delivers transparency and control to the change process. Stat also saves time by automating the patching process and simplifying other vital updates to PeopleSoft.

Far-Reaching Impact

IT Manager Renee Salois is part of a 17-member team charged with supporting the PeopleSoft applications that includes another manager, developers, administrators and systems analysts.

Denver also has a highly knowledgeable group of PeopleSoft users it refers to as "super users." Located in departments throughout the organization, these super users provide expertise and feedback to IT staff on the PeopleSoft functionality their department uses. Stat allows for streamlined communication between department representatives and IT staff on change requests, development, testing and approvals.

But it's not just these core groups that use PeopleSoft. The majority of employees in Denver use the application to access their paycheck information. Either directly or indirectly, most members of the organization benefit from the efficiencies Stat brings.

Shortcuts to Solutions

One key advantage Stat offers is the option to revert to earlier versions of application modifications when an issue arises. This prevents developers from having to re-create code that has been overwritten by a more recent version. Stat takes a number of snapshots of the code at various stages of production. "If we have a problem in production, we can easily roll back to how the coding existed before we accomplished that migration," said Salois.

She adds that Denver is now taking advantage of features Stat offers to limit access while a particular piece of code is being worked on. "Before, we had multiple developers working on the same piece of code at the same time," Salois said. "Inadvertently we could migrate changes into production that hadn't been fully vetted."

Yet another benefit Denver's IT team gets with Stat is a documented history of issue resolution. When an error message comes up in PeopleSoft, IT staff conducts a search through Stat that leads back to the last time that error message appeared. Reviewing the old Stat ticket quickly tells staff how to clear up the error, so it can avoid repeatedly troubleshooting the same problem.

Auto Migration Saves Time

Stat provides numerous time savings benefits to PeopleSoft administrators. For example, Stat provides a detailed analysis of impacts that patches and modifications will have as those changes trickle down through the system, saving time in the testing process. Salois points out that Stat's auto-migration feature allows IT staff to spend roughly one-third of the time migrating changes that they would in a manual environment.

"Anytime you can achieve a 66 percent time savings, you're doing really well. And that's repeated over and over every month."

Renee Salois, IT Manager, Denver

Up to 40 changes are implemented in Denver each month through auto-migration. "Anytime you can achieve a 66 percent time savings, you're doing really well. And that's repeated over and over every month," she said. "It's a substantial savings."

Stat also allows users to create projects, then assign all relevant tickets to be grouped together using that project's ID. Managers also can document all work related to a project so they can better account for staff resources.

Audits Made Simpler

In a scenario familiar to many public organizations, each year the City and County of Denver undergoes an audit performed by an external group. Among the key data requested by auditors is a list of all changes made to the financial system during the year in question. Stat makes gathering this information very efficient.

City staff provides a list of every Stat ticket that was opened to move something into production. From there, auditors select a random sample and verify that the process followed in each of those cases matches Denver's documented process.

Salois notes that absent the Stat tool, they would have to keep manual logs of the changes, generating extra work for staff and introducing the risk of human error into the process. "The whole key is having physical proof that someone provided approval to move something into production," she explained. "Stat gives us that, and it's all in one place."

Standardizing the Workflow

Denver's PeopleSoft support team continues to find new ways to benefit from Stat. The staff developed a very detailed workflow with controls in place to ensure that its documented processes, including necessary approvals, were always observed. An unintended consequence of these comprehensive steps, however, was limited flexibility for quick responses to change requests in emergency situations. Using Stat, however, Denver has found ways to simplify the workflow while maintaining the necessary protocols, even under tight time constraints.

One such emergency requiring a quick response is the case of a data issue for payroll. A complicated workflow could result in delays with the payroll completion, and in turn, a delay in payment to employees. In another example, errors can sometimes occur during overnight processing of vendor payments. When these payments stall in an "in process" status, errors need to be cleared up quickly, without being bogged down by an overly cumbersome approval process.

Stat allowed Denver's IT team to reduce the steps in its workflow by more than half, and even when a quick turnaround is needed, necessary quality controls are preserved. Based on the success of this effort with Stat, Denver officials are aligning their workflow processes in all of their domains.

"The integration between Stat and PeopleSoft enables us to meet our requirements for change management," Salois concluded. "It definitely expedites our migrations and puts us in control. I think that without this tool, our organization would suffer."

Recently, Denver upgraded its PeopleSoft Financials solution, which was not compatible with the current version of Stat the city was using. However, the upgrade to Stat to make it compatible was completed in less time than anticipated, and without error. "The Stat tool has been solid for us. It is one of the most stable tools we own," said Salois. "I can't recall a single time the product was down unless it was planned."

Salois and the IT team in Denver enjoy a long-standing relationship with Quest. They first began using Stat in 2000 and added additional licenses several years later. Denver also uses Quest's Foglight solution to monitor application performance.

"Quest has gone above and beyond the standard contract for support," Salois said, explaining that during rollouts, Quest makes staff available for on-site demonstrations and support. "Our relationship with Quest is built on them helping us obtain the most out of the products that we've purchased from them."

Building 21st-Century Communities

Digital Communities are real places that understand and value the transformative power of broadband connectivity, core computing technologies and interoperable applications to improve the way government conducts business and interacts with citizens. The Digital Communities Program showcases solutions from leading technology companies that are specifically designed for communities and local governments that want to exceed the expectations of their citizens. In addition, the program provides a collaboration forum where community officials discover and share emerging best practices and innovative community technology deployments.

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Calculating Crime

A unique approach to crime analysis may allow police officers to predict illegal activity.

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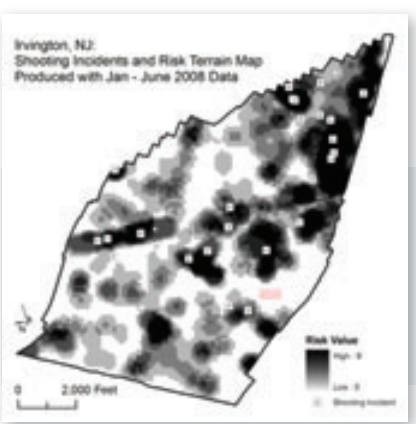
By Hilton Collins / Staff Writer

Police officers sometimes feel like they're playing Whac-A-Mole — they work to decrease illegal activity in a high-crime area, only to have it pop up somewhere else. This is how Joel Caplan, an assistant professor in Rutgers University's School of Criminal Justice, described the feelings of some of the police officers that he works with on crime research.

"They identify a hot spot, they suppress crime in that location, and they realize that it emerges in other places or comes back the moment they leave," Caplan said. "They're trying to figure out how to manage crime in a way that produces long-term positive outcomes."

To solve that problem, Caplan partnered with two Rutgers colleagues, professors Eric Piza and Leslie Kennedy, to research risk terrain modeling. The approach takes an area and blends its history of crime with data on local behavioral and physical characteristics to create a map of locations with the greatest crime risk.



Whereas law enforcement's traditional hot-spotting approach focuses mainly on the historical concentration of crime, risk terrain modeling examines the factors that contribute to this concentration and helps police officers predict where new hot spots could arise using data that's often ignored or taken for granted.

"It paints a picture of those underlying features of the environment that are attractive for certain types of illegal behavior, and in doing so, we're able to assign probabilities of crime occurring," Caplan said.

The new approach will soon be put to the test. In February, the National Institute of Justice (NIJ) awarded Rutgers a two-year, $500,000 grant to conduct risk terrain modeling research in U.S. cities.

Caplan and his colleagues in the Rutgers Center on Public Security are working with police forces in Arlington, Texas; Chicago; Colorado Springs, Colo.; Glendale, Ariz.; Kansas City, Mo.; and Newark, N.J., to map and analyze local crime as part of a pilot project. The project's collaborators hope the data will help officers suppress crime efficiently, and that law enforcement agencies in other jurisdictions will adopt risk terrain modeling once the technique is proven.

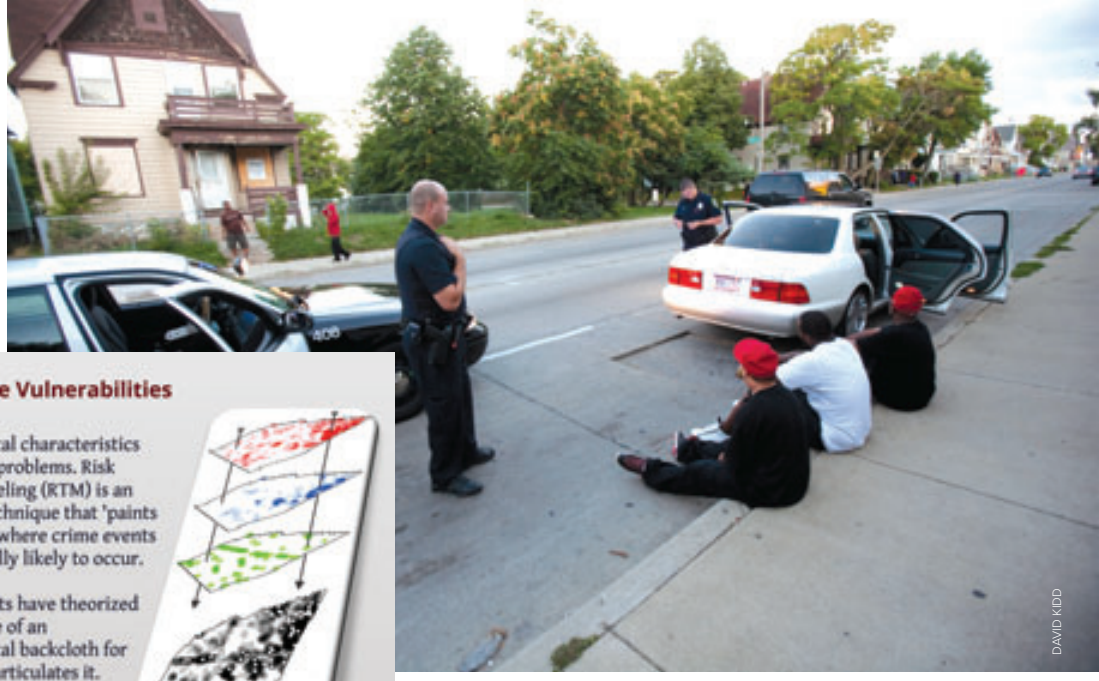
Caplan is confident that risk terrain modeling will support officers' existing opinions and hunches about local crime. "It makes sense to them at this basic level of being able to articulate and standardize their own gut feelings and perspectives," he said. "Information can be communicated in a consistent way among other officers in their department and across jurisdictions and provide useful information that might have otherwise been difficult to articulate or convey prior to this mapping technique."

2014
The year that Rutgers researchers will deploy risk terrain modeling in pilot cities.

Demystifying Risk

Risk terrain modeling examines how the environment affects illegal activity. In December 2012, Rutgers researchers applied their approach to the crime data displayed on old maps of Irvington, N.J., to demonstrate the method. They merged Esri's GIS software with police data and city maps to create new maps displaying the migration paths of neighborhood shootings in 2007 and 2008.

In one portion of their demonstration, the researchers analyzed maps displaying spatial relationships between shooting incidents in 2007 and nearby clusters of bars, clubs, liquor stores and fast food



restaurants, which were designated as crime risk factors. All shootings occurred within blocks of those crime risk factors, so researchers concluded that the presence of these businesses caused higher crime rates.

In another set of maps, researchers displayed the migration paths of shooting incidents throughout 2007 and 2008. Those results suggested that criminals shift their illegal activities from one high-risk area to another over time.

The Rutgers researchers said that this modeling approach allowed them to objectively predict the ebb and flow of Irvington's criminal activity.

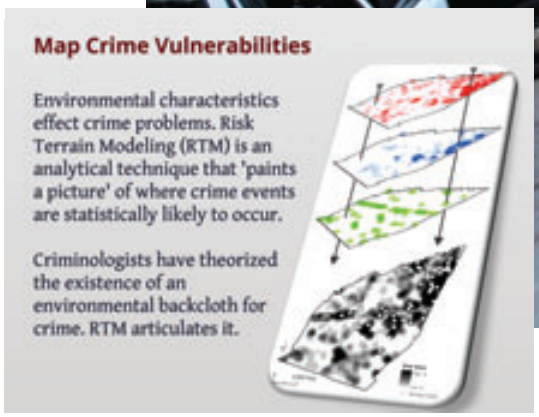
"It allows you to not make any assumptions about what the underlying qualities of crime are," Piza said. "The technique allows you to tangibly collect data about whatever features that you suspect may be contributing to the crime problem and then empirically test whether or not that's actually the case."

The researchers were careful to use software that was within the financial reach of the average police department. They gathered data using IBM's SPSS predictive analytics software and Epi Info, statistical software developed by the Centers for Disease Control and Prevention, before they applied Esri GIS tools. Caplan said that other GIS tools could also handle the mapping functionality.

The Rutgers researchers provide a wealth of risk terrain modeling resources openly to taxpayers and law enforcement, regardless of whether they're partners in a project. The Rutgers Center on Public Security website, www.rutgerscps.org, features videos and more than 5,000 downloads that educate readers and viewers about the modeling approach and its potential benefits.

Putting Theory Into Action

Over the next two years, the researchers hope to produce results from the pilot that will prove risk terrain modeling's worth to other crime researchers and police officers around the nation.



"We're not selling just a methodology. We're selling something that's much more complete, that's theoretically driven, that has empirical tests involved and that creates a product that people can use," Kennedy said. "I think that type of rigorous evaluation, self-analysis and peer review has really helped us a lot in terms of the credibility of the product."

Over time, Rutgers' School of Criminal Justice has built relationships with crime analysts and law enforcement officers. Some of those relationships led to partnerships for the current pilot project. For instance, Sgt. Jonas Baughman of the Kansas City Metro Patrol Division said his jurisdiction had a professional relationship with Rutgers for at least three years before agreeing to become one of the pilot sites. Baughman first contacted Caplan several years ago, after reading one of the professor's articles on risk terrain modeling.

"Dr. Caplan reached out to me about his NIJ project, extending the invitation with some of the other law enforcement agencies to collaborate in the larger group project," Baughman said.

The project will be in the planning phase for most of 2013, with deployment occurring the following year. Kansas City is still determining exactly how the city's personnel will be working with Rutgers and the NIJ on the project details.

"Most likely it's going to be a select few people who are going to actually do the data work, but it's meant to be a patrol-centered project. I'm sure our robbery detectives will be involved at some point," Baughman said. "It's meant to be a very open project where it's not just people crunching numbers and computers. It's meant to be little bit of work in the office, but then we're applying that work from the office to the field."

More Research to Come

Caplan, Kennedy and Baughman didn't specify how they will gauge the project's success rate, but said their overall goal with the NIJ grant is to see how valuable risk terrain modeling will be in stopping crime.

"The second part of this grant is to assess how well the information produced from risk terrain modeling can be used to develop and implement risk-based interventions, and then to evaluate the outcomes in terms of how well crime is affected, suppressed or prevented in response to the risk terrain maps and information that's produced," Caplan said.

Ultimately they won't know how valuable their data will be for a while, but Kennedy is confident that they'll be pleased with the results.

"That's something we're waiting to see, but we have six sites, and they're different-sized cities, and they're different types of police forces," he said. "We're confident that we're going to come up with convincing results from this whole process." GT

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Group Effort

Oklahoma cities collaborate to set mobile technology and social media standards for government agencies.

By Brian Heaton / Senior Writer

Implementing a technology program takes funding and manpower — items that often are in short supply in government agencies these days. But a group of local government IT directors in Oklahoma are stretching resources by working together, and the effort is paying dividends throughout the state and the U.S.

Formed six years ago, the Oklahoma Government Information Technology Association (OGITA) has developed a number of guidance documents for iPad and social media use that have been adopted by public entities nationwide. Approximately 400 city technology departments in 25 states now rely on OGITA's policies and procedures.

OGITA is spearheaded by its president, Craige Baird, who also is the technology services director of Ponca City, Okla. The nonprofit group consists of 100 representatives and limits participation to two individuals per municipal organization. So whether big or small, all local governments are equally represented and can ask questions and get tips on technology matters they are troubleshooting.

In-person meetings occur monthly in central Oklahoma, and government agencies can join the organization for free. OGITA holds an annual conference and various small conferences where it invites vendors to discuss topics of interest to the members.

Baird says the meetings are helpful, but much of the discussion on technology issues occurs electronically. The group created a listserv so that questions and answers can be exchanged on the fly. OGITA also has a Dropbox account so members can easily share files and tools with one another.

The initial idea behind OGITA was to help member cities deploy internal computing networks more efficiently. Smaller local governments with little or no IT staff also got assistance from OGITA members in larger cities.

"We were able to help them and get their networks up, and improve and enhance their city and, in turn, they helped their citizens who helped economic development," Baird said. "That is really where we started. It was just to help each other and not really gain anything, but just to improve government technology as a whole."

iPad Expertise

The group's goals expanded when Apple's iPad tablet debuted in 2010. OGITA created a task force consisting of members from cities that had budgets to allow them to evaluate multiple tablet devices.

The group concluded that the iPad showed the most promise for use by public officials and set to work on writing a policy that would help government organizations use an iPad from the moment they removed it from the box.

The first incarnation of OGITA's iPad Recommended Configurations document was published in 2011, about a year after the device hit the market. The document is now on version 5.1.

Topics covered in the policy include what types of cases and keyboards can be used with the device. The group also created a small set of applications for business users and another set of tools for IT support teams. Training sessions were developed for using the iPad and software tools developed by OGITA members. And the group crafted policies that spell out appropriate uses for the device.

Enid, Okla., was one of the first cities to implement an iPad program

for local government officials in the state. Dana Watkins, IT director of the city, said she helped develop the apps and the configuration document — a tool used frequently by her team.

"We are always referencing that document when we want to know something about iPads," Watkins said. "That is the biggest thing about this organization — when you get ready to do something, get out there and find out if somebody has already done it before you, so that you don't have to reinvent the wheel."

Building Trust

But that sort of unity wasn't always present among the IT departments of Oklahoma's municipalities, according to Baird. Cities and towns often competed with one another. Multiple cities frequently tested the same product from the same vendor.

Forming OGITA helped build trust between local IT organizations, primarily through the establishment of task forces. Besides the iPad task force, OGITA has groups focusing on mobile technology, social media and application development. Each of them present their findings to the overall group, fostering a collaborative environment.

Baird says mayors, council members and city managers in Oklahoma have recognized the value of OGITA and strongly support the organization. "They realize that if they give us time to work as a partnership on these task teams, what they get in return is something much greater and faster than what they would probably have gotten with just their own staff to do all that research by themselves," Baird said.

> **"Those informal conversations that we have, in my opinion, are the biggest benefit I get from the organization.**

The organization will revise its iPad document whenever the Apple operating system is updated. In addition, OGITA published a social media policy in early 2012, which it updated last September.

Like the iPad materials, the social media document will be revised as new concerns arise. For instance, a new version of the social media policy will be released later this year because of expanding federal regulations that apply to public-sector use of platforms, such as Facebook, Twitter, Pinterest and YouTube.

For Enid's Watkins, products like these are useful. But she also values the personal connections fostered by OGITA's monthly meetings.

"[There] are these informal chat sessions where we talk about what we are working on and how we solved problems," Watkins said. "Those informal conversations that we have, in my opinion, are the biggest benefit I get from the organization." GT

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SUN FLYER

Meet **Elektra One Solar**, a second-generation solar-powered aircraft that is close to being mass produced, according to its manufacturer. Developed by SolarWorld in partnership with PC-Aero, the one-seater prototype can carry a payload of roughly 220 pounds and cruises at about 87 mph. The aircraft is powered by a lithium-ion battery and also is equipped with solar cells on its wing surface, which PC-Aero says provide about half the energy required for flying. SOURCE: THE TELEGRAPH

> "Our aim is to seed wild mosquito populations with bacteria through a controlled number of releases of Wolbachia-infected mosquitoes that will then breed with the wild mosquito population."
>
> **Peter Ryan, Program Manager**

Fighting Dengue Fever:

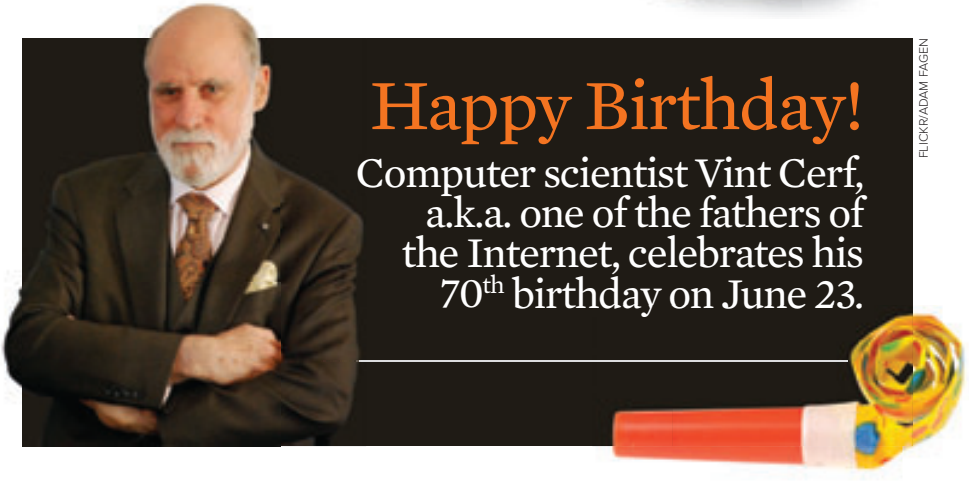
Australian scientists have created a vaccine that they believe could eradicate dengue fever — a fatal disease spread by mosquitoes — which more than 2.5 billion people are at risk of contracting, according to the World Health Organization.

Scientists discovered their ammunition in the Wolbachia bacteria found in fruit flies. In a two-year trial conducted in Australia, the Wolbachia bacteria was transferred to mosquitoes and successfully suppressed transmission of the disease. SOURCE: HEALTH.INDIA.COM

Mobile Water Sensor

Researchers at the University of Illinois at Urbana-Champaign have developed a low-cost sensor called MoboSens that lets users test water quality. MoboSens connects to the audio jack of a smartphone, allowing an app running on the phone to collect the sensing data and send it to the cloud for storage and analysis.

SOURCE: UNIVERSITY OF ILLINOIS



Happy Birthday!

Computer scientist Vint Cerf, a.k.a. one of the fathers of the Internet, celebrates his 70th birthday on June 23.

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Send Spectrum ideas to Managing Editor Karen Stewartson, kstewartson@govtech.com, twitter@karenstewartson

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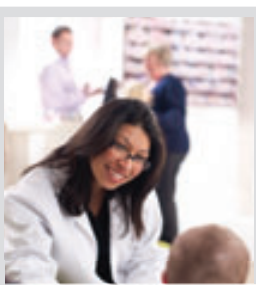

www.mesconference.org

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By Paul W. Taylor

Automation Is a Dirty Job

CIOs aren't Mike Rowe, but their job can get really dirty at times.

Meet Mike Rowe, public CIO. Actually, no — that episode of the longtime host of *Dirty Jobs* was never shot. But just because the CIO's role doesn't fit neatly into the premise of the show — a celebration of skilled labor — doesn't mean that CIOs don't have dirty jobs. Yes, it's a management gig or, if you do it right, it is about thinking, leading and innovating. That said, if new technologies bring the promise (or threat) of disruption, CIOs can hardly play the role of disrupter without the attendant mess splashing back on them.

In real life, Rowe testified before Congress on the genesis of the *Dirty Jobs* TV series on the Discovery Channel, saying, "It occurred to me that I had become disconnected from a lot of things that used to fascinate me. I no longer thought about where my food came from, or how my electricity worked, or who fixed my pipes, or who made my clothes. There was no reason to. I had become less interested in how things got made, and more interested in how things got bought."

Paul Taylor is the chief content officer of e.Republic, *Government Technology's* parent company.

The stuff of government is made at the intersection of a deliberative legislative process and modern technologies. That puts public CIOs, CTOs and their kin in the kitchen when the sausage is being made. The often-paraphrased caution that "Laws, like sausages, cease to inspire respect in proportion as we know how they are made," suggests that the transition from manual and mechanical processes to their digital successors can be off-putting.

So despite glass house data centers of an earlier era and the idiosyncratic tendency among some computer scientists to wear lab coats, the work of the CIO is buggy, grungy and downright difficult. CIOs have had to be truth-tellers to tradition-bound government institutions that needed to change — and were about to change — whether they were ready or not.

Indeed, a quick review of the last 15 years provides multiple reminders of what happens when digital technologies and automated processes are applied to the work of government. Central stores, a longtime fixture in government for provisioning agencies with office supplies, furniture and equipment, have been outsourced to online providers. At the other end of their useful life, surplus property is now liquidated through online auctions. Paper has had a rough ride during the modern CIO era. Many state printing and mail operations have been downsized or shuttered altogether as volumes declined with a deliberate shift to digital communication channels and online forms to support routine transactions between government and the public it serves.

> **"It occurred to me that I had become disconnected from a lot of things that used to fascinate me.**

Online bidding and contract management, automated license renewals and one-stop business renewals have gone a long way to increase capacity and improve accuracy within the bureaucracy and shorten lines and wait times for businesses and citizens.

All of this has changed government's footprint in many capital cities. Warehouses have been closed, office space has been consolidated and the need for new buildings have been reassessed, with many plans being left on the drawing board. Even the state fleet has been reduced owing to changes in the way the public's business is getting done.

CIOs have not done all of this by themselves. Sometimes they are only bit players in a larger drama starring political actors and their consultants, other cabinet members and budget directors. Sometimes the only role left for CIOs is that of the villain. In the end, despite repeated assurances that the introduction of technologies will liberate public employees to be reassigned to higher-value jobs, the underlying calculus is now a very poorly kept secret. Automation trades technology for labor. Labor savings — that is, layoffs, reductions in force, fewer hires — have been instrumental to changing the cost structure of government.

The fiscal crisis forced us to confront the question of how to balance the kind of government we want with the kind of government we can afford. CIOs have helped show that we can do government with fewer people. That can be a hard mantle to carry and has the makings of a dirty job. GT

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Next Gen, Next Gov

Six ideas next-generation leaders have for transforming government.

The next generation of government leaders is coming. With the retirement tsunami finally beginning, more and more government agencies are seeing their generation X and Y employees move into leadership roles.

> **We need fresh ideas and energy to solve these challenges.**

So what are these young leaders passionate about? What inspires them, and where are they interested in making changes?

Luckily for you, I have some answers.

GovLoop recently held a speaker contest for its Next Generation of Government Training Summit that's being held July 25-26 in Washington, D.C. It was fascinating to sort through the 100-plus entries and 15 finalists spanning more than 50 different federal, state and local government entities.

While analyzing the submissions, I observed six major trends:

1 / **Why Government Matters** — Numerous entries focused their proposed talks on why government work matters. These talks often focused on how government is perceived and how we need to show the public the good work government does. Proposals such as "How to Love Your Government Career" and "The S.O.U.L. in Public Service" provided insight regarding how to tap into government's mission.

2 / **Perseverance** — Another common theme was the difficulty of change and innovation in government. Multiple submissions proposed sessions on how to navigate bureaucracy, influence without authority and create successful change initiatives. These sessions consisted of everything from changing the analytical culture of a statistics agency to creating a change campaign in a CIO shop. As IT leaders, we all know that the technology is the easy part; the difficulty is in the change management.

3 / **Power of New Approaches** — Many submissions shared a case study of how new technology had radically changed an agency, whether it was social media, big data, mobile technologies or a new analytic approach. Others discussed taking new approaches to making changes, including a proposal on the power of improvisation in government work and the value of design thinking to transform delivery.

4 / **Mission Focused** — The breadth of government is extensive, and it was amazing to see the diversity of submissions that were entirely mission focused. There were countless new ideas and approaches to solve very specific mission problems from sessions discussing all-hazards emergency preparedness at zoos to a proposal on biomimicry to a new model for agency learning.

5 / **Overcoming Adversity** — I was impressed with the number of leaders who already had overcome adversity in their careers. One proposed session, called Overcoming Obstacles, featured a young government employee who prevailed after years of injuries from an incident in which his federal vehicle was hit by a stolen pickup truck that was being chased by a police task force. Other proposals consisted of a public official who became the first openly gay elected representative in his state to a former convict who now helps lead reintegration efforts of former inmates from state and local prisons.

6 / **New Ways of Working** — Young leaders also were excited about new ways of working. Sessions had topics like "Work Smarter, Not Harder" and proposed rethinking how government agencies do internal collaboration and how to take a human-centered design approach to learning. Others included how a fellowship program is creating a cohort of sustainability experts across an agency, and how an employee launched an internal mentoring program across departments to facilitate collaboration.

I'm enthused to see what the next generation of leaders brings to government. As we deal with shrinking budgets, increasing citizen demands and an aging workforce, we need fresh ideas and energy to solve these challenges. The good news is: Your next leader is probably already in your agency. You just need to tap into that creativity and focus it on mission results. GT

Steve Ressler is the founder and president of GovLoop, a social networking site for government officials to connect and exchange information.

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