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SOLUTIONS FOR STATE AND LOCAL GOVERNMENT
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AN INTERNATIONAL PERSPECTIVE ON TECH-POWERED PROBLEM SOLVING

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BRITISH COLUMBIA TACKLES THE ONLINE IDENTITY DILEMMA

CREATING A WORLDWIDE OPEN DATA NETWORK

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GETTING AHEAD WITH GRANTS

The federal government alone offers billions of dollars each year in IT grants that are often targeted to local governments.

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To answer this question, *Government Technology*, in partnership with CDW•G, created a comprehensive, interactive grants guide and held a complementary webinar. Download both for:

- A list of technology grants by vertical
- Tips on how to maximize your chances of being awarded grants
- Best practices to managing grant funding for successful outcomes

Download the webinar archive at www.govtech.com/webinars/Winning-Programs-A-Guide-to-Grants-for-Government.html

For a free download of the interactive grants guide, visit http://govtech.com/CDWG_Grants_Guide

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Privacy in Smart Cities
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By Steve Towns / Editor

A Global View of Technology

Last year, an international government IT group released a list of tech priorities distilled from a survey of 13 nations. Items on the list, published by the International Council for Information Technology in Government Administration, will look familiar to public-sector technology professionals here at home:

- Cloud computing
- Mobility
- Open data and analytics
- Innovation
- Performance measurements
- Cybersecurity

> **No matter where we live, we're all facing many of the same challenges.**

The list drives home the point that no matter where we live, we're all facing many of the same challenges: building livable communities, creating strong economies, and operating effective programs and services. Therefore, the next great idea for addressing these challenges is just as likely to come from Seoul as it is from San Francisco.

That, in a nutshell, is the idea behind this month's international edition of *Government Technology*. We tried to find a range of international ideas and projects that could spark conversations in cities, counties and states in the U.S.

For instance, we look at the Canadian province of British Columbia's move to issue a secure identity card that not only gives citizens access to the country's national health-care system, but also can serve as a driver's license and, ultimately, as the key to a growing number of online government services. We also cover the African nation of Kenya's efforts to use broadband connectivity to transform itself from a developing country into a knowledge-based, middle-income society. And our global roundup of technology deployments features everything from real-time analytics in Buenos Aires to cloud computing in China.

Besides offering an international array of ideas, this issue may well serve another purpose too: gauging your standing in a world where economic competition comes from both across the state and across an ocean.

Thanks to the global economy and rapid technological advances, it's easier than ever for talented people and desirable employers to locate anywhere in the world they want to be. In this hyper-connected environment, it's not such a bad idea to see how your community measures up on an international stage. GT

FROM OUR SISTER PUBLICATION:

The international focus continues in Governing, with a look at public policy innovations and issues in countries around the globe at **governing.com**

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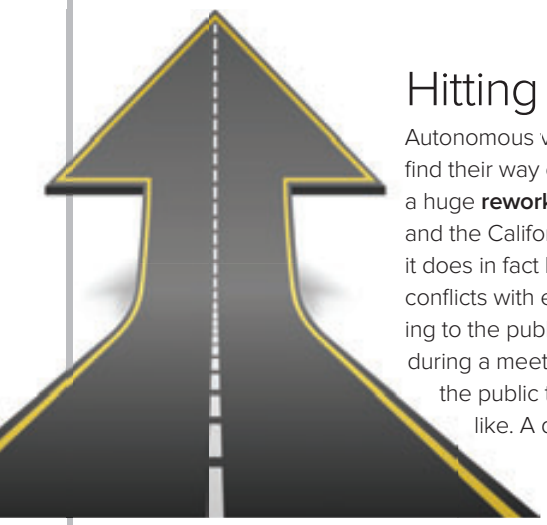

Hitting the Road

Autonomous vehicles are headed for the commercial market, and they may find their way onto roadways as early as 2015. But that reality would require a huge **rework of today's operational regulations for personal vehicles** — and the California Department of Motor Vehicles is moving fast to see that it does in fact become reality. Accounting for the multitude of issues and conflicts with existing regulations is a big job, so the department is looking to the public for help. In March, the DMV workshopped its regulations during a meeting with representatives of industry, advocacy groups and the public to determine what the future of autonomous vehicles will look like. A draft of the regulations will be released this summer.

Beyond Open Data Portals

While many jurisdictions in state and local government have established open data portals in the past few years, only a handful have formalized their commitment to this brand of transparency with legislation, an executive order or an official resolution. *Government Technology* editors pored through the list of formal policies and one thing that each policy made clear is the fact that there's a whole lot more to open data, than, well, the data. See our insights at **www.govtech.com/data-policies**

The top three cities based on the type and quality of their open data efforts, according to the U.S. Open Data Census.

1 / San Francisco
2 / Boston
3 / Sacramento, Calif.

WHO SAYS?

"Right now, we have difficulty attracting new employees. The state isn't considered a sexy place to work."

www.govtech.com/quote-May14

MOST SHARED STORIES

Open Data: What Is It and Why Should You Care?	200 SHARES
San Francisco Picks 6 Startups to Partner with City Agencies	179 SHARES
Are Governments Committed to Open Data? (Interactive Map)	168 SHARES

MOST READ STORIES ONLINE:

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2,836 VIEWS
Is Government Ready to Say Goodbye to Windows XP?

2,640 VIEWS
Will Streetlamps Become Information Hubs for Cities?

reader/**comments:**

"I wonder if law enforcement should be able to press the 'kill switch' on a car remotely. Could this be the end of high-speed chases?

JasonPoley in response to *California Preparing for Self-Driving Cars by 2015*

"I really wish people would stop referring to themselves as geeks. There are so many challenges for IT getting to the right level in the organization, and these labels are not understood in context by people outside the IT community. It makes the hill that much harder to climb.

JohnMadCity in response to *SF's Chief Data Geek Prepares to Roll Up Her Sleeves*

"Biometric data will be stolen when bad guys figure out how or where to use it to make it profitable. How does one defend themselves against false accusations if biometric evidence is left behind? I'd think a fingerprint scan file and a 3-D printer would be all you need. In fact, it's already been done.

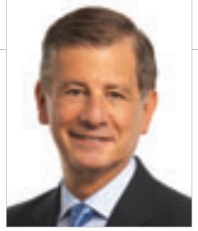
SirChuck in response to *Biometrics May be Banned in Florida Schools, Flourish Elsewhere*

"As much as we security professionals object to spending the budget on avoiding fixing the problem, we must realize that cyberinsurance can be a cost-effective way to reduce any residual risks. Once we've done our best to get our organization secure, it's all about the business.

Michael Scheidell in response to *Cyberinsurance: Do You Need It?*

"It's understandable that private businesses don't want to compete with state-funded networks that don't worry about turning a profit and can dip into general taxpayer revenue sources if they don't raise enough revenue from customers to cover network costs. I'm for community broadband when there's no private provider or the private provider isn't investing in the network, but starting a network to directly compete with a private provider on an unlevel playing field isn't fair.

SamH in response to *Telecom Providers Need to Embrace the Broadband Evolution*



Leading Data-Driven Breakthroughs

Creativity and a willingness to take on risk can help unlock data's value.

I recently had the opportunity to speak to the National Association of State Chief Information Officers at a leadership meeting in Indianapolis. I have been involved in applying data to solve public problems for some time, but I felt the need to brush up on some of the most current technical issues because of the sophistication of the group.

It turns out, though, that those present were so sophisticated that they did not need to discuss technology at all — they wanted to discuss leadership in an analytics-driven government. The vast majority of those present identified legal, leadership and structural issues, not technical ones, as the barriers to significant data-driven breakthroughs in state government. The questions went to Indiana CIO Paul Baltzell, who under Gov. Mike Pence has made substantial progress in unlocking value with data. His response centered more on how to organize users and techies, how to apply the mandate of his boss and how to overcome various legal interpretations.

Baltzell took up the issue of child mortality when he became Indiana's CIO at the beginning of 2013 — an area in which the state sadly exceeds nearly all other states. Baltzell is building upon the foundational work of others, who got tablets into the hands of every case worker to deliver information in the field. Now, he is attempting to bring in more disparate data sets and analytical methods to make the system predictive so caseworkers can make the right decisions on the spot. He's taking risks to attempt an untested solution, a big step that requires him to be entirely committed, while also utilizing the talents of his IT professionals, the contributions of case workers, and data resources scattered across government departments.

As governments begin the complicated transition to becoming truly responsive, embracing the digital tools and new approaches necessary, we see time and time again that every step forward is pushed both from the top down and the bottom up. The elected leader authorizes someone close to him or her to carry the banner — overcoming operating and data silos, refereeing among agency lawyers who tend to overinterpret federal data-sharing laws, and developing an appetite for unlocking big answers. Use cases originated in many instances from the bottom, from the field workers and their managers responsible for a solution.

We saw this formula of top-down leadership coupled with a broad-based, bottom-up appetite for answers in all the cities leading this drive: New York's Michael Bloomberg, Chicago's Rahm Emanuel and Boston's Tom Menino. These strong mayors supported key tech leaders like Mike Flowers, NYC's first director of analytics, or Chris Osgood and Nigel Jacob of Boston's Office of New Urban Mechanics or first Brett Goldstein and now Brenna Berman in Chicago.

More importantly, perhaps, was that they all took risks — not just in untried technologies and innovative ideas, but also by using these very technologies to share decision-making and data in order to utilize the resources of their citizens and employees. The best leaders are willing to acknowledge that they are building stepping stones rather than final products and are enthusiastic to throw things out when someone else comes up with a new algorithm or app that does it better.

> **"The best leaders are willing to acknowledge that they are building stepping stones rather than final products and are enthusiastic to throw things out when someone else comes up with an algorithm or app that does it better.**

The leaders mentioned here — along with many more who are contributing the building blocks to the new responsive city, and many potential leaders yet to emerge — possess the same qualities. True leadership in the digital age means moving forward with commitment and sureness, yet driving innovation selflessly, willing to devolve power when needed. A good leader knows how to cultivate and channel citizens' energy toward providing answers to their own problems and sees the real potential of employees and citizens to innovate.

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

Debra Lam

Chief Innovation and Performance Officer, Pittsburgh

CHANDLER CROWELL

Debra Lam was selected by incoming Pittsburgh Mayor Bill Peduto to head up a newly created office that merges traditional IT functions with the city's sustainability and performance goals. Charged with helping transform Pittsburgh into a world-class city, Lam previously spent six years at multinational design and engineering firm Arup, where she advised cities around the world on sustainability in the face of climate change.

1 Why did you decide to come back to Pittsburgh? I advised a lot of cities, but I felt I should also be contributing to my hometown. Having worked with cities with different socio-economic development levels, geography, etc., I found that what makes a city successful is not so much development levels or GDP or even governance structure, per se. It's really the mayor. If the mayor is willing to push the city forward, it makes all the difference. I saw that with Mayor Peduto's vision for Pittsburgh, to make it a world-class city and create that culture of innovation and accountability.

2 Describe some of the lessons you learned from your international work. The Asia Pacific region is one of the most vulnerable areas in terms of climate change impacts — both in terms of the population density and the scale that are affected, but also in terms of the assets — historic, cultural and the infrastructure along the coast. Yet compared to other parts of the world, like the U.S. or Europe, their carbon footprint per capita is not as high. They've taken a very proactive approach in trying to address climate change impacts. I've worked with cities such as Ningbo, China, on a local resilience action plan, Ho Chi Minh, Vietnam, on developing flood and water management plans and Manila, Philippines, around the same area.

We can provide a lot of really sound, technologically robust engineering solutions around the hard infrastructure, and those can be effective, but if no one understands them and how to maintain them, and there isn't governance and leadership in place, it won't be as effective. We worked very closely with each of these cities to build capacity and understand the local context and knowledge distribution, so that there is a much better understanding of how best to address this.

3 Do international cities use technology differently than U.S. cities? Most cities, regardless of location, size and economic development levels, have similar urban challenges and similar goals. Ultimately the goal of any city is to try to improve the quality of life for its residents. And we all have similar challenges: trying to optimize the limited resources that we have against a growing demand and growing responsibilities, and changing context. And so, the exchange of knowledge is really important, and I think technology supports this. I always say that technology should be the means, not the ends. A lot of these issues are beyond any one technological solution. Talking about people, systems, processes and structure is a lot harder. Technology can certainly support it, but it can't solve it.

4 How are you bringing about a culture change in Pittsburgh? Internally we've tried to really empower our team to do more, to ask for more, to question more — just because it's been done this way in the past, doesn't mean that it needs to continue. For example, if something is broken, does it automatically need to be replaced with that same thing, or should we be looking at something else? That critical assessment is really important — this was good to start with, but I know I can make this better, so let's meet and discuss how to improve it. GT

— Noelle Knell, Managing Editor

Collaboration begins here

and continues here...

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Nearly 53 million passengers went through the gates of Amsterdam's Airport Schiphol in 2013, ranking it the 14th busiest airport in the world. An automated border control system now helps process travelers, featuring electronic gates that use facial recognition to ensure people passing through match the passport photos they carry. The technology also detects forged passports and passengers wanted by authorities.

Rhydian Lewis, speaking here at the Open Data Institute's annual summit, is the co-founder and CEO of peer-to-peer lending platform RateSetter.

Linking Data Around the World

How the U.K.'s Open Data Institute is pushing open data onto the global stage.

Jason Shueh / Staff Writer

In the U.S., open data has its advocates in civic hacker groups, politicians and a small but passionate group of transparency organizations. In the U.K. and around the world, the sounding bullhorn might most readily be attributed to the Open Data Institute (ODI), a highly visible organization that's gaining influence across the globe.

The ODI was co-founded in 2012 by World Wide Web patriarch Tim Berners-Lee and Nigel Shadbolt, a professor of artificial intelligence and head of the Web and Internet Science Group at the University of Southampton. The two leveraged their experience coordinating the U.K.'s Data.gov.uk open data project to establish the ODI as a collaboration and education hub for open data initiatives — efforts that make public and private data digitally accessible and easy to use.

FLICKR/OPEN DATA INSTITUTE

Global Reach. The ODI forms partnerships with organizations around the world that share its vision for open government data as an economic driver. ODI officials say they're not looking to compete with existing groups, but rather complement their efforts by offering supportive resources, including open data certifications, courses and outreach tools.

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The **Moscow ODI branch** is based out of NGO Infoculture (Non-Governmental Informational Culture), a nonprofit supporting open government, data-driven journalism and open data education.

In **Buenos Aires, Argentina,** the ODI operates through the Center for the Implementation of Public Policies Promoting Equity and Growth, a research and public policy think tank.

The **Osaka, Japan,** node is headquartered inside Innovate Osaka, a startup incubator, educator and tech proponent.

Headquartered in London, the organization now has 18 branches or "nodes" worldwide, and works under the premise that government open data projects should be driven by private-sector businesses built around open data. From Moscow to Osaka, Japan, to Buenos Aires, Argentina — and now with a growing number of nodes in the U.S. — the ODI contends that if open data is to be sustainable, it must be about more than government transparency, but about hand-to-mouth realities, such as jobs, investment and cost savings.

Supporting this cause, the U.K. government furnished the ODI with more than $16.4 million at its start. The group's activities include incubating open data startups, crafting code for open data projects and pairing data sets with viable business models, through its nodes around the globe. As the ODI implements its marching orders, the defining challenges will be how far it can reach and how lasting it can become.

A GLOBAL UNDERTAKING

From the ODI's initial funding, $4 million is earmarked for international expansion of the node network. Evidence of ODI's international expansion strategy can be found in the 18 nodes established in just under two years, the last five of which were added in February. The ODI isn't looking to compete with or replace existing open data groups, but rather complement their efforts by offering supportive resources, including open data certifications, courses and outreach tools.

"The potential of the node network lies in the different strengths of the nodes themselves; however, they all come together around a common purpose and charter: to foster an open data culture and bring about tangible business benefits. The freedom of operation helps them provide tailored services to their local markets," said Richard Stirling, the ODI's international director, who manages the nodes.

In Moscow, the ODI branch is based in Non-Governmental Informational Culture, a nonprofit group supporting open government, data-driven journalism and open data education. In Buenos Aires, the ODI operates through the Center for the Implementation of Public Policies Promoting Equity and Growth, a research and public policy think tank. And in Osaka, the node is headquartered inside Innovate Osaka, a startup incubator, educator and tech proponent.

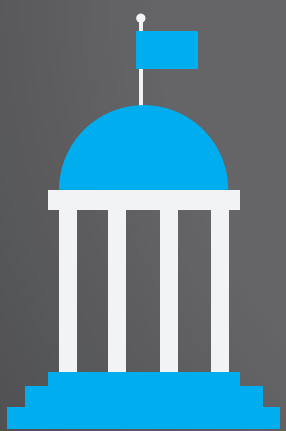
Despite diverse backgrounds, the ODI unifies nodes through regional and city charters promoting open data projects, training, research and outreach. Direct communication is done with node advisory boards through quarterly video conferencing and in-person gatherings in London.

"It is still early days," Stirling said. "We had our first node gathering [in February],

Tim Berners-Lee, inventor of the World Wide Web, is co-founder of the ODI.

YOUR TECHNOLOGY KEEPS RUNNING,

NO MATTER WHAT ELSE STOPS



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ODI Chairman Nigel Shadbolt is a veteran of government transparency efforts in the U.K. The group's annual summit took place in the Museum of London in October 2013. (right)

where we brought all the nodes over to London for two days to form a shared view of what the next three months will bring for the network, identifying the priorities and dividing up the work between us."

Resources, he said, will be put toward defining impact efforts and identifying metrics to gauge success.

"There are certain things we will need to measure on a unified basis to be able to check the health of the network — things like reach and impact. In time we hope to publish these on a public dashboard so everyone can see how the network is performing and the impact it is having around the world," he added.

The parent ODI organization estimates that during 2013, it created more than $27.8 million in value. Examples of this work include hackathons, consulting, classes, open data startup investments and research projects, like the DaPaaS platform that publishes open data and hosts applications; and the OpenDataMonitor, a program that lets users monitor and use analytics on open data across Europe.

THE ODI ON U.S. SOIL

The ODI is aggressively making its presence known in the U.S., devoting resources to new offices, including a national node.

In terms of numbers, the U.S. has a total of five nodes, the most of any nation affiliated with the ODI. These include Chicago, Philadelphia, North Carolina, Hawaii and an experimental national node that hopes to be a government "super collaborator" on open data efforts nationwide.

Financially, the national node has garnered endorsement from the Knight Foundation, a major philanthropy known for its civic technology investments. Knight made an initial $250,000 investment for a six- to nine-month experimental trial and, depending on results, could provide additional funding for up to four years of activity.

The U.S. initiative is led by technologist Waldo Jaquith, who sees open data as a valuable yet fragile movement in government. Jaquith said the national node won't be a lobbying effort pointed at a bill's passage or channeled at a single project, but a large-scale, multistate collaboration effort that brings open data resources to government.

"In the U.S. [federal collaboration] doesn't get you much. State governments are so important, so powerful here, that you can't just have one great relationship with one great government and really accomplish much," he said, contrasting the U.S. against Europe, where countries are often smaller and more unified.

Launched early this year, the national node has two yet-to-be-disclosed projects under way with two jurisdictions and is collaborating weekly with other notable U.S. organizations such as the Sunlight Foundation and Data Transparency Coalition.

Waldo Jaquith

Other collaborators, of course, include nodes in states and cities.

"There's a shortage of people who do what we do. If you look at cities around the U.S. they all need open data specialists and there are not that many of us," said Jason Hare, founder of the North Carolina node that's based in the Open Raleigh program.

Statistics back up Hare's statement. According to a 2013 study by Gartner Research, demand for data and analytics expertise will represent 4.4 million jobs globally by 2015, yet only one-third of those positions will be filled. The North Carolina node will eventually offer open data education and certification to support that need.

"Five years down the road, we'd like to be a nonpartisan data advocacy group that helps state agencies and municipalities — and any public-sector jurisdiction — to join the open data marketplace we're creating," Hare said.

FLICKR/OPEN DATA INSTITUTE

"We're currently working with [Gov. Pat McCrory's] innovation office to have the office use the ODI as a vehicle to create a statewide open data policy and to create a statewide open data program."

ODI nodes in Philadelphia and Hawaii are among the newest and were announced in February alongside Osaka; Sheffield, England; and Seoul, South Korea. Hawaii's node works within Hawaii Open Data, a 501(c)3 organization dedicated to advancing open data, API standards and the economic benefits of transparency. In Philadelphia, the node is headquartered in Azavea, a data mapping company and creator of OpenData Philly.org, a community open data portal.

"For us, becoming an ODI node was a way to more effectively support the promotion of open data," said Azavea President Robert Cheetham.

Azavea is a B-Corporation — a for-profit company that works to solve social and environmental problems (similar to civic technology businesses or urban impact companies) — Cheetham noted, and the ODI node aligns with the company's social change efforts. In the past, such undertakings have included technical support for the Haitian Earthquake Registry project, food donation delivery maps, crime map testing and numerous other humanitarian data mapping projects.

"Our mission is applying geospatial technology to improving communities as well as advancing the state of the art through research. For us the ODI is a logical extension of our mission," Cheetham said.

Like Cheetham, Hare said what prompted him to establish an ODI node is the tangible structure and inclusive nature of the ODI's open data mission, one that he envisions will eventually extend to every state.

OPEN DATA SUPER-CONNECTOR

Jaquith said the U.S. ODI's top goal is to act as a super-connector in the space, uniting the hundreds of companies that rely on open government data, from small vendors with expertise in parsing, analyzing and managing open data to the many nonprofits, community groups and civic hackers. The overarching goal, Jaquith said, is to connect all these efforts and submit the network to government officials as an economic resource for private and public growth.

For state and city nodes, the mission is similar, but scaled down in geography.

"We want open data to be a sustainable and widely used concept throughout the U.S., in government and the private sector," Jaquith said.

Hudson Hollister, the executive director at the Data Transparency Coalition based in Washington, D.C., said the ODI has been instrumental to the ongoing effort of open data. Specific to the coalition's mission, to lobby for data transparency, Hollister said the national ODI has been a valuable reference point to identify important data sets and use cases to influence legislation.

"They're helping businesses create value and building an ecosystem that would be very hard to dislodge," said Hollister.

"It's much harder for a government to stop publishing machine-readable data that is being used by somebody to create value and so we're really excited that the U.S. ODI has been founded and that Waldo and his team have begun their work."

As open data efforts in the U.S. and across the world continue to gain momentum, the ODI will likely call on additional open data advocates for support. Jaquith emphasized that the ODI aspires to support sustainable advocacy for open data over empire building and transparent data practices over politics.

"What the ODI has established as a model, is one where you can have an organization that can be connected and do meaningful work," Jaquith said. "To establish and treat open data, not as a lark, but as something serious that's here to stay. And this organization is going to help make that happen." GT

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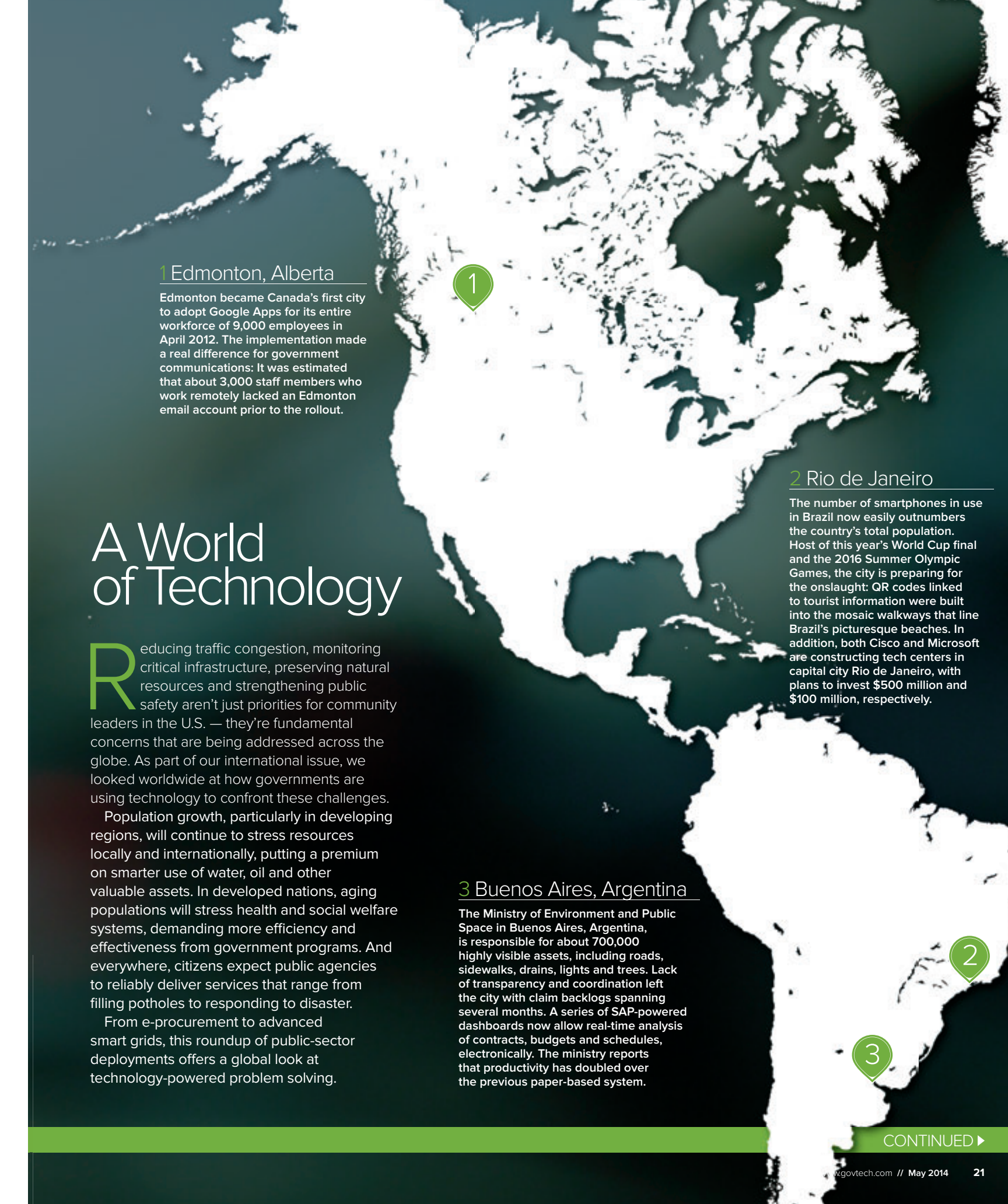


A World of Technology

Reducing traffic congestion, monitoring critical infrastructure, preserving natural resources and strengthening public safety aren't just priorities for community leaders in the U.S. — they're fundamental concerns that are being addressed across the globe. As part of our international issue, we looked worldwide at how governments are using technology to confront these challenges.

Population growth, particularly in developing regions, will continue to stress resources locally and internationally, putting a premium on smarter use of water, oil and other valuable assets. In developed nations, aging populations will stress health and social welfare systems, demanding more efficiency and effectiveness from government programs. And everywhere, citizens expect public agencies to reliably deliver services that range from filling potholes to responding to disaster.

From e-procurement to advanced smart grids, this roundup of public-sector deployments offers a global look at technology-powered problem solving.

1 Edmonton, Alberta

Edmonton became Canada's first city to adopt Google Apps for its entire workforce of 9,000 employees in April 2012. The implementation made a real difference for government communications: It was estimated that about 3,000 staff members who work remotely lacked an Edmonton email account prior to the rollout.

2 Rio de Janeiro

The number of smartphones in use in Brazil now easily outnumbers the country's total population. Host of this year's World Cup final and the 2016 Summer Olympic Games, the city is preparing for the onslaught: QR codes linked to tourist information were built into the mosaic walkways that line Brazil's picturesque beaches. In addition, both Cisco and Microsoft are constructing tech centers in capital city Rio de Janeiro, with plans to invest $500 million and $100 million, respectively.

3 Buenos Aires, Argentina

The Ministry of Environment and Public Space in Buenos Aires, Argentina, is responsible for about 700,000 highly visible assets, including roads, sidewalks, drains, lights and trees. Lack of transparency and coordination left the city with claim backlogs spanning several months. A series of SAP-powered dashboards now allow real-time analysis of contracts, budgets and schedules, electronically. The ministry reports that productivity has doubled over the previous paper-based system.

CONTINUED ▸

4 Scotland

A national e-procurement program in Scotland boasts 75,000 federal government and school system users, who together purchase goods and services from more than 90,000 vendors. The Amazon-style approach from Elcom allows online purchasing in three clicks, and has reportedly saved the government nearly $1.5 billion. The government also will incorporate historical purchasing data into decision-making and ramp up electronic invoicing to streamline relations with small and medium-sized suppliers.

6 Stockholm

By aligning road demand with supply, IBM helped Stockholm, Sweden, reduce traffic congestion and pollution even as the number of people and vehicles increases. Roadside control points charge vehicles different toll rates depending on the time, with optical character recognition software identifying license plates. Launched in 2007, it was reported in 2009 that traffic and vehicle emissions in Stockholm were both reduced by up to 18 percent.

5 Netherlands

The Netherlands' Digital Delta project, launched last year, uses data from disparate sources to help manage water and improve flood control. The IBM-led project is driven by a foreboding number: 55 percent of the country's population lives in areas prone to large-scale flooding. The new system will address concerns about drinking water quality and the impacts of extreme weather events.

8 Issy-les-Moulineaux, France

In the French town of Issy-les-Moulineaux, a smart-grid demonstration project, called IssyGrid, collects energy consumption data for homes and commercial buildings, processing the information in real time using Microsoft's Windows Azure cloud platform. Residents and building owners can view the findings, and more importantly, they have been acting on the data, reducing their energy consumption by up to 20 percent. The program launched in early 2012 with about 200 homes. It was announced last year that an additional 1,600 homes would be joining, with the ultimate goal to connect the whole town.

10 Rome

Cotral SpA provides bus service to 100 million passengers in 376 Italian cities, including Rome. An info-mobility portal from Oracle uses real-time data from vehicle sensors to inform riders about routes and schedules, while linking to external data like weather forecasts. Tracking information, combined with highway sensors and video feeds, also alerts staff to maintenance needs, which helps keep the fleet operating at peak efficiency.

12 Pune, India

Rapid population growth in Pune, India, was causing some unwelcome environmental issues, so in order to help stay "clean and green," the city built a tree census app on the SAP platform. The app helps Pune keep tabs on the urban forest, enabling transparent decision-making. Photos, tree measurements, precise location and scientific names are captured and layered over a GIS map to enable effective urban planning.

9 Barcelona, Spain

Aiming to become an example of sustainable urban development, Barcelona, Spain's citywide network of Wi-Fi and sensors allows for environmental management. Besides tracking the weather, the system monitors the flow of people, water and waste, parking, noise and traffic. As a Cisco Smart+Connected Community, Barcelona seeks to use tech to make people's everyday lives easier and improve the efficiency of government functions.

11 Saudi Arabia

Orange Business Services is working with the Rayadah Investment Co. to develop two digital neighborhoods in Saudi Arabia, which in addition to telecom services like fiber and VoIP, will also have smart buildings and metering. A full-scale pilot with 25,000 participants is planned to test possible electrical systems of the future and to determine the effectiveness of solutions for managing energy consumption.

◀ CONTINUED

7 Estonia

The only country in the world successfully conducting elections online, the small country of about 1.3 million uses a simple system of personal ID codes across all official transactions, from banking to health care, to passports and other government documents. Early adoption of digital signatures using a public key infrastructure standard makes digital signatures equal to paper ones in the eyes of the law.

13 Singapore

A one-year Safe City pilot in Singapore incorporates analytics software from Accenture into the city-state's extensive video monitoring network. Aimed at enhancing public safety using computer vision and predictive tools, the system will help authorities monitor traffic, crowds and environmental threats and respond more quickly. Led by the Singapore Safety and Security Industry Programme Office, Singapore officials hope the test holds lessons for their nation and beyond.

2012 United Nations E-Government Survey

E-Government Development Index (ranked)

1 / Republic of Korea	6 / France
2 / Netherlands	7 / Sweden
3 / U.K. and Northern Ireland	8 / Norway
4 / Denmark	9 / Finland
5 / United States	10 / Singapore

E-Participation Index (ranked)

1 / Netherlands	6 / United States
2 / South Korea	7 / Israel
3 / Kazakhstan	8 / Australia
4 / Singapore	9 / Estonia
5 / U.K. and Northern Ireland	10 / Germany

14 Qingdao, China

A bustling seaport of about 3.5 million citizens, Qingdao has the first cloud-based e-government platform in China built by EMC. Officials were drawn to the flexibility and scalability of cloud hosting, as well as its disaster recovery advantages. Qingdao's "active-active" data center setup means backup is up and running almost instantly. New resources for city departments can be deployed within minutes, rather than hours, as in their previous environment.

16 Tasmania, Australia

The Department of Health and Human Services in Tasmania, Australia, now has an electronic version of the static patient status board. The Web-based Clinical Information Portal offers anytime, anywhere access to patient data, customizable based on user needs. Developed by Deloitte with plenty of clinician input, touchscreen monitors adorn hospital walls and community nurses can access the system from the field.

15 Victoria, Australia

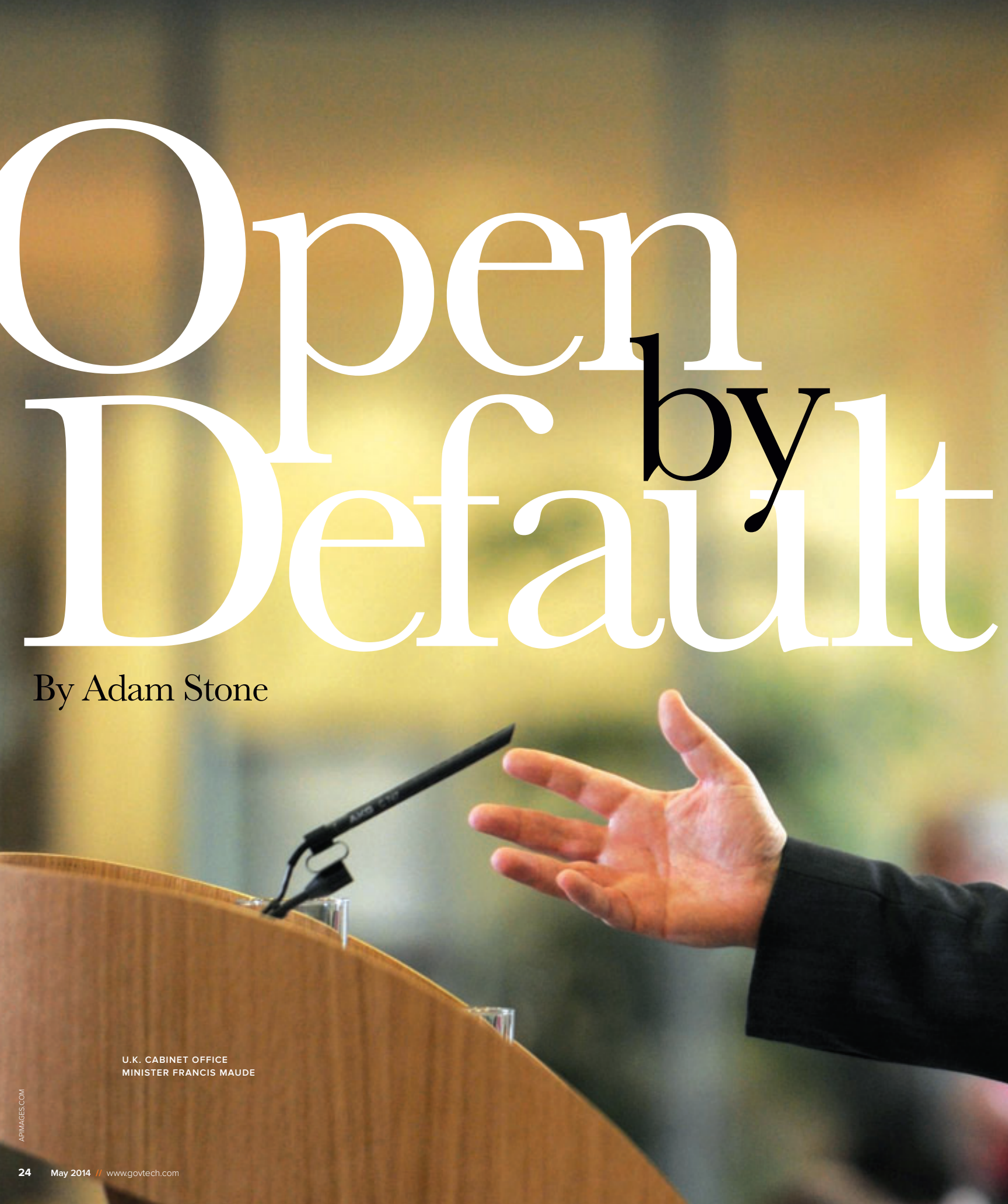
The Vote Victoria iPhone app supports mandatory voting requirements for citizens of Victoria, Australia. Working with the Victorian Electoral Commission and state Web managers, the app from Deloitte points voters to the closest voting centers and provides a live election results feed. Since replicated in many other Australian jurisdictions, the project's primary goals are to engage younger voters and make voting information available to voters living abroad.

17 Auckland, New Zealand

Predicting that its population of 1.4 million people will double by 2040, Auckland, New Zealand, is preparing its transportation network to handle the increase. Auckland Transport worked with Microsoft to consolidate and standardize its IT infrastructure, and then developed public-facing Web apps for services like reporting potholes, accessing real-time bus schedules and refilling ticket cards. Internally the department enlisted mobile devices running Microsoft Office 365 to improve productivity and cross-agency collaboration.

Open by Default

By Adam Stone



U.K. CABINET OFFICE MINISTER FRANCIS MAUDE

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Governments outside the U.S. have embraced the OpenDocument Format as the new way of doing business. What should state and local governments know about it?

What's wrong with this picture?

Before Washington, D.C., attorney John Mitchell argued a case in front of the Federal Court of Appeals for the Second Circuit, he wanted to listen to the argument made in a similar case a few weeks earlier. He received sound files on a disc and was told he'd need proprietary software from an Australian firm to hear the testimony.

Being a Mac man, he couldn't make the Windows software work. "Since I planned to listen to it on the train on my way to New York, I had to borrow someone else's Windows laptop and ask someone else to play it through the speakers and record it into my iPhone," Mitchell said.

Governments worldwide "should be as freely accessible to the people as possible," Mitchell said. Clearly this episode didn't pass the test.

and can get their work done without having to buy a particular brand of software," Cabinet Office minister Francis Maude told the British media.

Open format also would better serve the general population, according to a government statement. "Citizens, businesses and delivery partners, such as charities and voluntary groups, need to be able to interact with government officials, sharing and editing documents. ... Users must not have costs imposed upon them due to the document format in which editable government information is shared or requested."

The Danish Parliament implemented ODF for government in 2011; Portugal in 2012. In Slovakia, all materials from public authorities must be readable ODF.

If transparency is the essence of democracy, why would

Too often, government data can't be shared from agency to agency, much less to ordinary citizens. Proprietary formats can make it virtually impossible to exchange documents, spreadsheets and databases between disparate systems.

But that may be changing. Many nations, most notably the United Kingdom, are adopting open format solutions, meant to enable the ready transfer of data regardless of software or systems.

GLOBAL SHIFT

The U.K. is on the verge of mandating OpenDocument Format (ODF) across all major government functions. (As of press time, a comment period was just coming to a close.) The use of a common format makes it possible to employ a broader range of software: A government office might tap into OpenOffice, for example, instead of a proprietary platform.

"I want to see a greater range of software used, so civil servants have access to the information they need

The Netherlands requires ODF format as the standard for reading, publishing and exchanging government information. Malaysia likewise requires the use of ODF in the public sector.

U.S. adoption has been slower. The standout example is Massachusetts, which took an early lead in moving to ODF in 2007.

FLAVORS OF OPENNESS

To appreciate the shift to ODF, it's important to distinguish between open format and open source, two concepts that often get conflated.

Open format, also known as open platform, refers to the bedrock upon which an IT system is constructed. Open source on the other hand describes software tools developed by collaborative communities and distributed for free. One is infrastructure, the other is an application.

It's possible to have proprietary software run on an open platform (the data still will be fundamentally accessible by

all ODF-based systems). You don't need open source software, but in practice those who pursue ODF frequently turn to open source software in the spirit of openness and ready interoperability.

What exactly are the advantages of an open platform? Advocates point to a number of potential benefits.

GREATER TRANSPARENCY

Advocates of open format say this approach speaks directly to a fundamental mission shared by governments worldwide: citizen service. "If citizens are forced to use one company's word processor to read the proceedings of a legislature, that creates barriers to participation and gives an awful lot of power to the owner of that tool," said Gunnar Hellekson, chief technology strategist at open source developer Red Hat.

That call for openness resonates with many inside government as well as those trying to access public data. "If you make a Freedom of Information Act request, you get boxes of paper. You can call that 'open,'

OPEN FORMATS PROMOTE PARTICIPATION, SAYS GUNNAR HELLEKSON, CHIEF TECHNOLOGY STRATEGIST FOR RED HAT.

On the one hand, having interchangeable choices should lead to financial savings. "In the civil service, there was a sense that if you hired a big multinational, who everyone knew the name of, you'd never be fired," Maude told the British press. "We weren't just missing out on innovation, we were paying top dollar for yesterday's technology."

If openness drives competition, that would seem an unadorned positive in the financial sense. "Budget pressures are real in every country in the world," said Dave Lounsbury, CTO of developer The Open Group. "The ability to trade out a vendor, to trade out a component, that is what happens when you have moved to a standards strategy."

Yet money is a bigger question mark than some might expect. Just as open source software is distributed literally for free, open format-based solutions are presumed

the tools we use not be as transparent as our system?

but you can't really say it is accessible," said Deborah Bryant, a board member with the Open Source Initiative advocacy group and founder of the Bryant Group, an IT consulting practice in Portland, Ore.

"There are institutions, nonprofits, social advocates and businesses too that may have the tools to extract information, but only if it is made available," she said. "If it is sitting in an Oracle database someplace, it becomes very difficult to access."

By putting data in a commonly readable format, open platforms should make information more readily available to citizens.

Then there's the matter of budgeting. Governments have an obligation to get the best value in their procurements, and platforms like ODF may bring an advantage by opening the doors of competition. "Open standards encourage a fair market by making the rules public and easy for everyone to follow," Hellekson said. "A proprietary standard, on the other hand, distorts markets and reduces competition by putting one company or organization in charge of the rules."

By leveling the playing field, open formats free end users to switch allegiances, if they become disenchanted with a vendor's offerings. "If everyone is compliant with a standard, I can always just go to another supplier," said Mark Driver, research vice president at Gartner. "So it becomes a buyer's market rather than a seller's market."

In practical terms, open formats can help ensure that governments meet their longer-term objectives of preserving archives and records over time. "When you use something proprietary, you don't know whether people are still going to be using that technology a dozen years from now," said Driver. "The open document format is great for the need to have archived documents that don't depend on a product."

MONEY ISSUES

Certainly it's hard to argue with openness, competition and interoperability. But that doesn't make ODF a slam dunk.

to save money. By creating more choice in the marketplace and cutting users free from the dominant market players, ODF should bring down costs. Or so goes the theory.

In practice it's a bit more complicated. "The costs of acquiring the technology may be lower, but there are still the costs of maintenance to consider," Hellekson said. Open format systems still require upkeep, and agencies may not always have the skilled staff needed to work with these systems.

Conversion also can be problematic. "Agencies have documents that are in Microsoft Word format or IBM Lotus format, and you always have to look at the migration strategy to go from what you have now to this future vision of interoperability," Lounsbury said. "There is going to be a transition cost."

SOFTWARE OPTIONS

While it's true that ODF may help a government agency break out from the chokehold of a few mega-vendors,

that doesn't mean the agency will be entirely without vendor support. Users don't have to pair their open platform with an open source software solution and risk shouldering the entire burden of support. In fact, many software vendors actively develop their products on open platforms for global use.

"The proprietary solutions work fine and people continue to use them," said Laurent Liscia, CEO of OASIS, which developed ODF. "It's not like people suddenly stop using these solutions."

Software that supports ODF includes Corel WordPerfect Office X6, IBM Lotus Symphony and Microsoft Office 2013. This last may seem ironic, given Microsoft's stance on the pending U.K. mandate.

In an open letter, Microsoft's area vice president for the U.K., Michel Van der Bel, said that while the company has no objection to ODF in principle, any mandate ought to also include OpenXML, the open platform developed by Microsoft.

The choice of ODF "shows the government risks increasing costs and reducing interoperability by ignoring the fact that the vast majority of citizens and businesses already use OpenXML as their preferred document format," he wrote. "While including ODF is a choice that Microsoft supports, ignoring and omitting OpenXML will ensure that the very things the government is trying to avoid are actually more likely to happen."

If there's a whiff of ambivalence there, it's not surprising. Vendors may fear open platforms for the flexibility and fluidity such formats offer to potential clients. At the same time, they may see opportunity here. "When it comes to the technology providers who support these standards, their best interest is to continue to have some exclusive relationship with their customer that affords them a way to do business long term," Driver said.

Thus, while the fundamental open architecture may heat up competition, vendors can still add value in the realm of specialized products and services that, thanks to the open environment, would now become available to more broader users.

So, what are government IT leaders supposed to do about it all?

WADING IN

The first step is education, Bryant said. Because of the proximity of open source, there lingers the perception that open format is a no-man's land where government IT managers are left to fend for themselves without the support of a paid vendor. Also, people may equate "open" with "not secure," a universal concern for government agencies.

"There are still a lot of misconceptions floating around," Bryant said.

Government leaders who opt for an open platform also should brace themselves for possibly having to rethink how new systems are brought into the shop. "Typically, procurements are written in a way that starts with the software the agency already knows, rather than describing the function that they need. So it becomes easiest to find an existing vendor and give them the technical specifications," Bryant said. To adopt an alternative platform, IT managers likely will have to drive basic changes in the procurement process.

A key to success for government agencies looking to adopt ODF is engagement in the open standards community through organizations like the International Organization for Standardization and the International Electrotechnical Commission.

"Having governments in there to talk about technical requirements and procurement needs is gold to the vendors who want to help solve the problems," Lounsbury said. "When the client can bring the problem, that is what enables the vendors to bring the solution."

Just as with open source, the open platform agenda is one of transparency and collaboration. The greatest strength of an open platform, its universality, is best served when all interested parties share their input. "Community is the real secret behind any open format project. You are not doing it all by yourself," said Driver.

When doing the pro-and-con analysis, global governments may well count user satisfaction among the upsides. In a very literal way, open formats support the growing trend of autonomy and bringing one's own device to the workplace. Open platform applications that run on laptops and tablets will be readily accessible to an agency's open platform systems. "This stuff opens up like a charm on anybody's machine," said Liscia.

And, he added, that's just how it should be. "Governments need a format that allows them to pass data from one place to another transparently. If transparency is the essence of democracy, why would the tools we use not be as transparent as our system?" GT

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Open Format vs. Open Source

With so many "open" technology terms, there is some confusion about the difference between them.

AN OPEN FORMAT describes an underlying software system based on open standards that allow the software to function in other ways than the original programmer intended, without requiring modification of the source code. Rather than controlling development, the sponsoring company creates a standardized interface and enables other companies to build products and services on top of it.

OPEN SOURCE refers to a software program in which the source code is available to the general public for use and/or modification free of charge. Open source code is typically created as a collaborative effort in which programmers improve upon the code and share the changes within the community.

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Playing Their

British Columbia's new high-tech Services Card may services in the future. **By Justine Brown**

FORMER BRITISH COLUMBIA HEALTH MINISTER **MARGARET MACDIARMID** AND MINISTER OF CITIZENS' SERVICES AND OPEN GOVERNMENT **BEN STEWART** LAUNCHED THE BC SERVICES CARD IN FEBRUARY 2013.

Cards Right

give access to a plethora of e-government

FLICKR/PROVINCE OF BRITISH COLUMBIA

The government of British Columbia, Canada, had a problem. The province's CareCard technology — the identity card BC residents use to access health services — was more than 20 years old and had never been significantly updated. Even worse, the number of CareCards issued significantly outnumbered the population of the province (4.5 million).

"The CareCard was designed in the late 1980s," said Ian Bailey, assistant deputy minister of technology solutions for British Columbia's Ministry of Technology, Innovation and Citizens' Services. "There was no photo on the card, just a number and a name, and no expiry date. It was a very weak credential, and while we knew 9 million had been issued, we had no idea how many of the cards were still in play."

Weak security made illegal practices possible such as selling the cards, especially in communities close to the United States border to Americans looking to access free health care. And on the payment side, poor security made it easy to charge for services without proof such services were actually provided.

Given the lack of security, the potential for fraud, and to improve patient safety, the British Columbia Ministry of Health began searching in 2011 for a way to replace the CareCards with a smarter credential integrating better identity-proofing technology.

The province of British Columbia is no slacker when it comes to e-government. According to a 2012 Stratford Institute study of e-commerce in Canada, British Columbia ranks first overall among all the provinces for its e-government initiatives. "B.C.'s overall first place ranking comes as a result of its dedicated customer-centric approach in providing online services, sharing online information, and encouraging online engagement," says the report.

Therefore, if the province were going to replace the CareCards, it was going to do it right.

Dave Nikolejsin, now deputy minister for BC's Energy and Mines, was CIO of the Ministry of Technology, Innovation and Citizens' Services in 2011. As such, Nikolejsin was working with a senior group of deputy ministers on a strategy to take on some of the bigger e-government challenges.

> "We needed to find a way to do transactions that were more complicated. We wanted a general-purpose way to identify people securely that was reusable across multiple programs."
>
> **— Dave Nikolejsin,** former CIO, BC Ministry of Technology, Innovation and Citizens' Services

"We had already tackled much of the cool online stuff like booking a campground, paying for government services online, etc., but we wanted to be able to do more of the things citizens really cared about — the types of interactions that you can only do if you know authoritatively who someone is online," said Nikolejsin. "That's where we bumped up against the identity problem. We needed to find a way to do transactions that were more complicated. We wanted a general-purpose way to identify people securely that was reusable across multiple programs."

This effort eventually brought the Ministry of Technology, Innovation and Citizens' Services and the Ministry of Health together.

"As we talked, we realized there was no sense in just putting a new, high-quality, tamper-proof health card out there and then issuing 9 million of those like we had the previous CareCard," said Nikolejsin. "So we combined our efforts. If we were going to solve this problem for health anyway, why not we solve it in a general purpose way and enroll people in an identity service that would work for health and also for any other program where we needed to identify people online?"

The two ministries therefore began planning how they could replace the CareCard with a secure card that could be used for multiple government services. Luckily, Canadian banks began replacing their mag stripe credit cards with chip and PIN cards around the same time.

"Today, it's rare to find a Canadian merchant or retail outlet that does not use chip and PIN," said Bailey. "Canadians are now used to using strong security every day. That was a big aspect of making the new health cards a reality. We wanted to make sure the public was ready for more advanced authentication technology, and we saw that they were."

As the idea of issuing a new, more secure CareCard using chip and PIN technology

began to gel, the two ministries had another issue to tackle: how to execute the replacement. They needed a way to positively identify people in person using biometric facial recognition technology, enroll them, and then issue them the new secure credential. For the solution, they turned to the BC Insurance Corp., the Canadian equivalent of a U.S. Department of Motor Vehicles.

"Our drivers' licensing processing counters already existed, and the Insurance Corp. of British Columbia already had procedures in place to positively identify people," said Bailey. "They already had all of the machinery needed and all the storefronts for taking photos, as well as contracts in place to create high-quality, tamper-proof credentials."

Working together, the three organizations developed and began issuing the new BC Services Card in February 2013. The new card combines a driver's license and a CareCard into one credential (although citizens can still choose to have separate cards if they prefer) utilizing one enrollment process. The cards now include a photograph of the beneficiary, anti-forgery features, identity proofing and an expiration date, and utilize chip and PIN technology similar to what Canadian banks currently use.

To get a new BC Services Card, eligible British Columbians simply enroll when renewing their driver's license. People who do not drive can still enroll at the nearest location where drivers' licenses are issued. Once a person enrolls, he or she is issued a new BC Services Card, or the combined card. Although the cards can be combined, the information is held in separate databases. Citizens must then re-enroll every five years.

As of Feb. 5, 2014, British Columbia had issued 1 million new BC Services Cards.

Privacy was one of the biggest challenges the province faced in introducing the new BC Services Card. Pre-emptively, the three ministries ensured that the government privacy commissioner was closely involved in the project from the beginning.

"Our privacy commissioner was brought along through the whole process, which helped nullify a lot of citizen

New Card Sparks Privacy Worries

The BC Services Card's introduction last year sparked a backlash from privacy advocates, who worried the provincial government was integrating citizens' personal information and creating a national ID card without adequately consulting the public.

"If the government has its way, the card will be used not just for access to government services, but also for credit card and as transit passes. That's a lot of access to personal information," wrote Vincent Gogolek, executive director of the BC Freedom of Information and Privacy Association (FIPA), last year in the BC edition of the Huffington Post.

Both FIPA and the BC Civil Liberties Association criticized the scope of public input for the card, noting that most comments came via email instead of face-to-face interaction. The groups also panned the citizens panel assembled to review the card technology.

"The panel will only be allowed to make a limited range of recommendations," the groups contended in a joint letter sent last August to Andrew Wilkinson, minister of Technology, Innovation and Citizens' Services for the BC government. "In particular, the panel will not have the option of recommending either the elimination of the combined BC Services Card or of the government's ID management plan."

In April, BC Information and Privacy Commissioner Elizabeth Denham praised the quality of recommendations from the citizens' panel, as well as from a group of experts brought in to review the Services Card system. Denham said advice coming from these groups should guide the expanding use of the card.

"These consultation reports should be the blueprint, and we will be measuring the government's future design against the recommendations made by citizens and experts in this consultation," she said.

VINCENT GOGOLEK

CARMINE MARINELLI/QMI AGENCY

"If the government has its way, the card will be used not just for access to government services, but also for credit card and as transit passes."

— Vincent Gogolek, executive director, BC Freedom of Information and Privacy Association

FIPA
BC FREEDOM OF INFORMATION AND PRIVACY ASSOCIATION

What's in the Card?

1 / Magnetic stripe

Used by card readers, the stripe contains the same information that appears on the card.

2 / Personal health number

A unique number assigned by the Ministry of Health to eligible beneficiaries.

3 / Barcode

Used by scanners, it contains the same information that appears on the card.

4 / Chip

Every card has an embedded chip to enable future access to secure government services in person and online. The chip does not store any personal or medical information. If the card is lost or stolen, the chip can be deactivated to prevent someone else from using it.

5 / Driver License Restrictions

Details in this area relate to the card holder's driver's license.

HEALTH.GOV.BC.CA

concerns," said Nikolejsin. "It was essentially important that we had our privacy commissioner involved from day one."

Last winter, the BC government also conducted a public forum focused on the BC Services Card and privacy. Citizens were invited to visit a website where they could share their opinions and concerns about the new endeavor. Privacy and civil liberties specialists from around the world were then invited to Vancouver, where they dedicated a couple of days to talking to citizens about the technical solution and the policy framework around it.

The forum also featured a citizen's panel. Twenty-six thousand letters were sent to citizens around the province inviting them to be part of the panel. Based on the responses, 36 people were selected and brought to Vancouver for two weekends, where they were shown the technology and what could be done with it, and then asked about their opinions and concerns. The information collected is currently being collated and the BC minister plans to issue a report on the results soon.

"We found the citizen panel to be a pretty important endeavor and we learned a lot," Bailey said. "For the most part, people are behind this effort. I think that 10 years ago it would have been extremely controversial, but not now. People understand what we are trying to achieve — that we are trying to protect privacy and that we are making sure information is portioned appropriately in different segments of public services."

Nikolejsin said the BC Services Card is actually a privacy-enhancing set of solutions. In other words, if criminals were somehow able to access secure data, they would not have enough information to provide them any further access.

"Just having bits of information cannot elevate your access to the point where you could commit identity or payment fraud," Nikolejsin said. "Privacy actually ends up better than it was before with this solution."

In addition to acting as a driver's license and health ID card, the BC Services Card also provides the foundation to authenticate citizens for a growing number of online services. For example, the education sector is exploring using the Services Card to authenticate students, parents and others who will use the BC Government's new student information service.

The BC Services Cards also contain a near field communication (NFC) contactless payment chip.

"When we were looking at what chip to use, we were aware of the emergence of NFC in the mobile space, so we decided to go with an NFC contactless chip," said Bailey. "The price point per chip was very low, and the chip has a whole global industry around it to ensure it's secure and standards-based, and it is going to have continuing investment. At the same time, NFC readers are becoming more and more available on computers and in mobile devices, so we saw it as a great investment for the future."

Potential future applications could include contactless transactions and data exchange. BC has a contract with Toronto-based SecureKey Technology to authenticate chips online using the Visa back end.

While the BC government does not yet have services available that can utilize the chip, it expects to soon.

"That's going to take some time, just like it did on the payment side here. We all got our credit cards with chips in them long before we could use the chips," Bailey said. "It took a while for merchants to get caught up with new devices and new payment terminals."

For now, BC will continue to issue the new BC Services Cards knowing they are more secure and less prone to fraud than the previous cards. According to Bailey, it will take five years to issue cards to everyone in the province.

In the meantime, the Ministry of Technology, Innovation and Citizens' Services is juggling inquiries from other Canadian provinces that are eager to follow in its footsteps.

"We are talking to all the other Canadian jurisdictions about the project and they are interested," said Bailey. "I think these types of cards are going to be a big part of the future." GT

justinebrown@comcast.net

"We saved enough energy to bring a new middle school off the drawing board."

Loudoun County Public Schools Superintendent Dr. Edgar B. Hatrick

NAME: Loudoun County Public Schools, Virginia

IMPROVING ENERGY PERFORMANCE BY: Earning EPA's ENERGY STAR® certification for 46 schools

SAVINGS: More than $40 million, plus a nearly 360,000 metric ton greenhouse gas emission reduction

RESULTS: Energy savings equaled cost of building their newest middle school

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ENERGY STAR

Smart Cities from A to Z

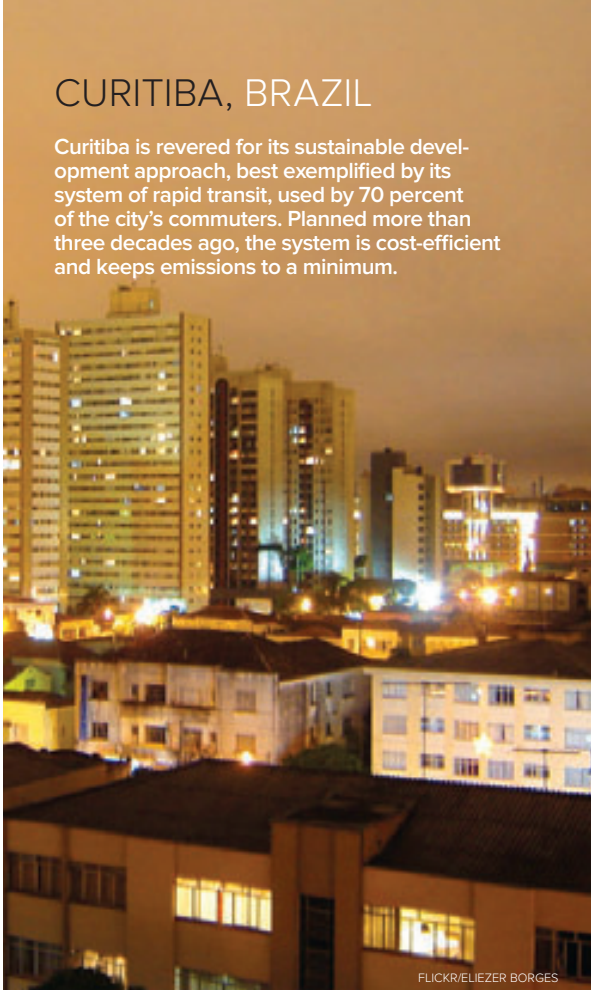
More and more citizens of the world are choosing to live in urban settings over rural ones. The percentage exceeded 50 in 2010, and it's only expected to rise. The smart city movement taking hold across the globe aims to ensure the long-term viability of these major population centers using intelligent technology and sustainable urban planning.

New Economy recently named 20 global cities to watch as models for the 21st-century smart city. They're thinking beyond just avoiding the crush of maxed-out resources and infrastructure. Can other forward-looking cities learn something from their examples?

ACCRA, GHANA

A flourishing oil and gas industry in the African country of Ghana explains the inclusion of capital city Accra on the list. Smart city advocates will be watching to see if the infrastructure can keep pace with the economic changes that are expected as a result.

FLICKR/INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE



CURITIBA, BRAZIL

Curitiba is revered for its sustainable development approach, best exemplified by its system of rapid transit, used by 70 percent of the city's commuters. Planned more than three decades ago, the system is cost-efficient and keeps emissions to a minimum.

FLICKR/ELIEZER BORGES

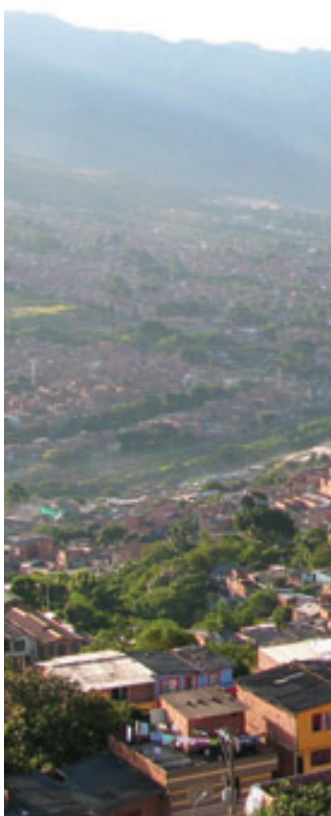
Rounding out the Top 20:

Eindhoven, Netherlands
Groningen, Netherlands
Luxembourg (City), Luxembourg
Manila, Philippines
Mannheim, Germany
Riga, Latvia
San Francisco
Singapore
Taipei, Taiwan
Toronto, Ontario, Canada
Utrecht, Netherlands
Vancouver, British Columbia, Canada

ZAGREB, CROATIA

Abandoning ties to socialism some 20 years ago, Croatia officially joined the European Union last year, promising political and economic reforms. Funding is now being funneled into power management, environmental protection and urban modeling in capital city Zagreb, generating optimism about where the city is headed.

FLICKR/CHRISTINE ZENINO



SONGDO, SOUTH KOREA

Known for stringent environmental regulation, the South Korean government has invested billions into solidifying Songdo as a high-tech powerhouse. Its smart city features include an underground tube system for garbage collection, smartphone-controlled appliances and green spaces large enough to offset emissions.

FLICKR/TRAVEL ORIENTED

ROTTERDAM, NETHERLANDS

Sustainable practices were a necessity for Rotterdam, as 90 percent of the city is below sea level. Facing climate change head on, the city counts a sophisticated transportation network, water plazas and green rooftops among its strategies to render it flood-proof.

FLICKR/MOYAN BRENN

MEDELLIN, COLOMBIA

While probably best known for its association with the drug cartel that bears its name, Medellin, Colombia, is now getting attention for sustainable environmental policy and smart transportation planning. In 2012, Medellin was named the world's most innovative city by the Urban Land Institute.

FLICKR/BEN BOWES

VILNIUS, LITHUANIA

Considered an Eastern European city on the rise for its rapid growth, Vilnius' management approach is attracting notice and foreign investments. Home to some of the world's fastest Internet speeds, the city is capitalizing on its potential to support the development of innovative technologies.

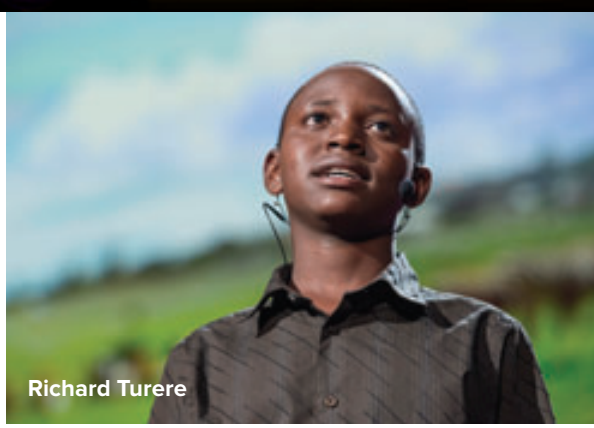
FLICKR/DAVID HOLT

OSAKA, JAPAN

Also noted for environmentally responsible urban planning, Osaka has dedicated a geographic area to incubating energy and environmental industries. A major economic center, its population of 2.6 million people grows to 3.7 million during the day.

FLICKR/LUKE MA

iHub, shown here, is the largest of five innovation facilities in Nairobi.



Richard Turere

By Colin Wood / Staff Writer

A Connected Future

Does a national broadband strategy position Kenya for second-world status?

Richard Turere used to hate lions. From the age of 6, his job was to protect his family's cattle from predators. One morning he awoke to find that his family's only bull had been gutted by a lion. He began his search for a solution. He tried fire, but the lions weren't afraid. He made a scarecrow, but the lions were too clever. Then, at age 11, he noticed the lions ran away from his flashlight at night, so he re-created the effect with a solar panel, a car battery, a turn indicator from a motorcycle, a light switch and an old light bulb. It worked.

Turere's neighbors asked about his invention, and he ended up installing it on seven houses. The idea caught on and is now used all around his nation of Kenya. Two years later, his family hasn't had any lion problems and he now participates in an awareness and education campaign to help homeowners protect their livestock and families from predators. This is the promise of technology.

And this is why Kenya is building broadband.

In July 2013, Kenya's Ministry of Information, Communications and Technology along with the Communications Commis-

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sion of Kenya launched the National Broadband Strategy, one piece of the nation's ambitious Vision 2030 program. Vision 2030 "aims to transform Kenya into a newly industrializing, middle-income country providing a high quality of life to all its citizens," by 2030, by focusing on economic, social and political reforms. Broadband is identified as a keystone of the program.

The plan also aims to increase opportunities for women in government employment and decision-making, and to create an independent commission charged with investigating human rights violations. Kenya is considered a relatively stable nation in a troubled continent, and one of the African nations best poised for nationwide broadband deployment, but to be fair, the bar is rather low.

Just as one wonders if a mere 16 years is enough time to bring about meaningful social change, it also casts doubt on whether the nation is ready to give its people the power of the Internet. Some fear broadband could become a tool of the powerful in Kenya, further dividing the classes.

There also are fundamental infrastructure barriers to the success of a broadband rollout. A 2011 World Bank survey found an average of 6.9 power outages in Kenya monthly, and the lack of reliable electricity was cited as a major constraint by more than 25 percent of Kenyan businesses.

Calestous Juma sounds hopeful when it comes to Kenya's technological future. A Kenyan-born professor of the Practice of International Development at Harvard's Kennedy School of Government, Juma co-chairs the African Union's High-Level Panel on Science, and wrote *The New Harvest: Agricultural Innovation in Africa*. Engineering and technology can help Africa turn the agriculture industry into a driver of major economic growth, he said.

In the book, Juma called on policymakers to consider technologies that support farmers' existing practices, and for ISPs to lower prices. The entire continent could benefit from technology if it can figure out how to apply it to existing industries, he claimed. There also needs to be "closer cooperation between the government, academia, the private sector and civil society," he said.

In 2013, Juma wrote a guest editorial for CNN in which he envisioned technology transforming Kenya in the coming years. By consolidating gains already made in the mobile industry and receiving proper guidance from high-level leadership, the nation can turn the success it has seen toward new market sectors, he said.

"The key to doing this is building new research universities whose curriculum and teaching are directly influenced by the evolution of the mobile industry," he wrote, citing some progress, including the establishment of the Multimedia University in 2008, with support from the ministry of telecommunications. More direct links to the telecom industry, however, would help advance mobile technologies.

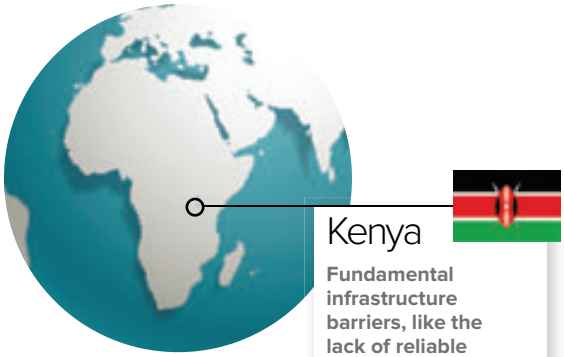
Juma used the word "revolution" to describe broadband's potential for Kenya. In fact, a study of Kenya's broadband efforts by Mark Graham, senior research fellow at the Oxford Internet Institute, found that news articles detailing the arrival of fiber-optic connectivity to the region were more than twice as likely to reference a "revolution" than to offer any critical analysis about connectivity strategy and economic growth. There's something about the idea of new technology in a troubled region that excites people. Such "unbridled optimism" is good and bad, Graham wrote in an email to *Government Technology*.

"When you tell someone, 'I'm taking my software project to a company in Africa,' there's something wrong with that sentence. We're not known for software, yet.

"The optimism spurs outsiders to see East Africa as a tech-savvy, well connected part of the world; thus, dispelling earlier imagery that was associated with the place," he wrote. "However, this can also be harmful as people often have unrealistic expectations about just what is possible and probable."

The world can read that Kenya has been connected to the global network and think that means the average Kenyan now has broadband access, when in fact those rollouts are still waiting to happen in most places.

At an information and communications technology (ICT) summit in Kenya's capital city of Nairobi in November 2013, one ISP CEO, Abdirahman Sheikh, called for an open access model wherein firms could share infrastructure and offer better coverage to the whole nation. "I've seen streets in Nairobi where there are up to six fiber connections belonging to different players," he said, adding that this competition is leaving areas deemed unprofitable unserved.



Technology has shown that a small group of determined people or even an individual can use the tools that have been made available to them to do nearly anything. Some, like Graham, say that sort of empowerment isn't happening on a broad scale in Kenya. "We're not seeing much evidence that the poorest or most disadvantaged are able to use better connectivity to reduce inequality," he wrote. "There are examples of better connectivity being put to use for the poor, but by and large, it is those in privileged and powerful positions that are able to extract the most value."

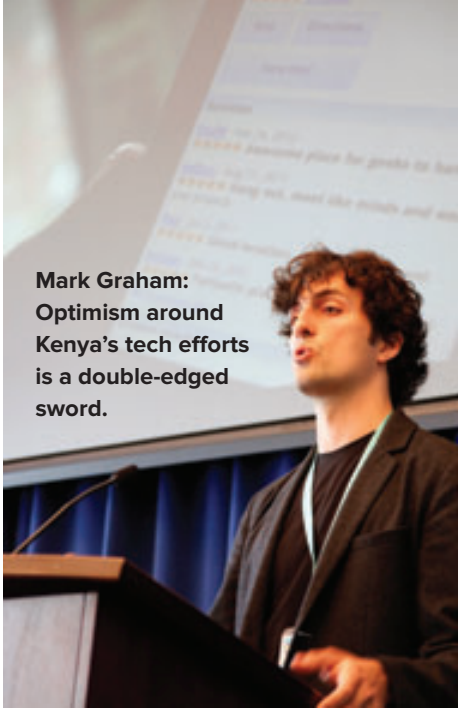
The western technology empowerment model can be seen to a small degree in the capital. There are five innovation facilities in Nairobi: iHub, Nailab, Fablab, iLab and the Human IPO's Startup Garage. The largest, the iHub, was launched in 2010. As of March 2011, iHub had 3,000 members, 1,000 of which are software developers. At least 12 companies have also been formed through connections at the iHub.

More prominent, however, is the government's investment in organizations for business process outsourcing (BPO). Two Kenyan BPOs, Horizon and Verviant, are the type of organizations that fit well into the Vision 2030 plan, according to Graham's analysis. They are companies that provide businesses in the U.K. with outsourced

services like transcription, customer service, Web development, software design or mobile application development.

Through his interviews, Graham found that the image of social instability was a deterrent when Kenyan BPOs tried to attract new clients. Vervi-ant's CEO, Agosta Liko, explained that the first year of business was difficult. "We told people, 'I'm in Kenya.' They tell you, 'Your product is good, and everything, but let me talk to other providers, then I'll talk to you.' They're worried. You think Kenya is Ethiopia. You think Kenya is Rwanda. You know, people think Africa is a big country. ... Look, when you tell someone, 'I'm taking my software project to a company in Africa,' there's something wrong with that sentence. We're not known for software, yet."

It's unclear whether Kenya's broadband efforts will have enough impact to reach its lofty Vision 2030 goals, Graham said, but it's good that the government is thinking proactively about global connectivity.



Mark Graham: Optimism around Kenya's tech efforts is a double-edged sword.

FLICKR/DFID

"For somewhere like Kenya, it might be most useful to see technology as a necessary, but not sufficient condition for economic development," said Graham. "The country, without a doubt, needs fast and affordable broadband access. But broadband alone isn't going to solve structurally embedded issues like mass unemployment, poverty or income inequality. ... Unless there is a conscious effort to tackle inequality, the winners and losers will likely be very predictable."

It's hard to imagine equality in a place where some violent criminals get marginal sentences and movies featuring prostitution are banned, yet tens of thousands of children work as prostitutes. But the signs of ingenuity and desire for progress are there.

With funding from the World Wildlife Fund, locals are implanting the horns of live rhinos with microchips as a way to catch poachers. Another organization, Poachers Exposed, created a website to publicly shame poachers who have been caught and convicted. Locals are using the tools they have to solve problems, and if the boy who stopped the lions had had a laptop with an Internet connection growing up, who knows? He could have started the next Facebook. GT

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By Miriam Jones | Chief Copy Editor

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Belkin's Samsung Galaxy Tab 4 Keyboard Case and Cover is a folio-style cover and Bluetooth keyboard in one. It has well spaced TruType keys for responsive, accurate typing, and the stand allows for multiple viewing angles. In handheld media mode, the keyboard tucks away flat for touchscreen use. Users can recharge the keyboard with the included USB cable. It will stay charged for up to 67 hours of active battery life and up to 2,021 hours of standby battery life. **www.belkin.com**

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MANY PHONES, ONE CHARGER

Anyone with a drawer full of tangled chargers from smartphones and devices long abandoned might appreciate a recent vote by the European Parliament to incorporate a universal phone charger standard into law by 2017. The specs will apply to all charger components, including the connector and the plug. While consumers will surely benefit from charger interoperability, environmental concerns were behind the decision too. Worldwide mobile communications industry group GSMA estimates that 51,000 tons of duplicate chargers are produced every year.

SOURCE: INTERNATIONAL ELECTROTECHNICAL COMMISSION

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BYPASSING CENSORSHIP

Increased violence and rising inflation in Venezuela has the government concerned about its image, leading it to block Twitter images and other sites depicting anti-government protests. A VPN service called **Hotspot Shield** from AnchorFree is offering affected Venezuelans its premium iOS app free of charge, allowing users to go online securely without being pinned to a specific location, effectively side-stepping site-blocking. The Silicon Valley-based company bills itself as a disruptor of censorship and a proponent of a democratic Web.

SOURCE: BUSINESS INSIDER

Does Network Matter?

Regulators in Holland have cleared the way for companies to produce network-neutral SIM cards that aren't tied to a specific carrier. If the idea catches on, companies like Apple would sell connectivity directly to iPhone users according to their needs. The switch could make overseas travel easier, since the carrier could reassign the SIM card to a local network, instead of roaming. A more flexible SIM card would also impact drivers of new cars equipped with LTE connectivity, allowing drivers to link to their carrier of choice, rather than the operator chosen by the vehicle manufacturer.

SOURCE: GIGAOM

Hong Kong
World's Fastest Internet

65.4 Mbps

SOURCE: AKAMAI TECHNOLOGIES

Protecting Pedestrians in London

Mayor Boris Johnson is using technology to make it safer to walk in London. The Pedestrian Split Cycle Offset Optimisation Technique, or SCOOT, uses cameras to detect the number of people waiting to cross a given street. Traffic signal times are extended to allow more pedestrians to safely cross. Officials hope that the trial will help meet stated goals to cut the number of deaths and injuries in the U.K.'s capital city by 40 percent by 2020. SOURCE: CITIES TODAY

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

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