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GOVERNMENT TECHNOLOGY 20 YEARS

VOL20 ISSUE07

JULY 2007

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plus:

Mobile devices improve social worker safety

MILLIONS FLOCK TO **VIRTUAL WORLDS** — SHOULD GOVERNMENT FOLLOW?

REALITY CHECK

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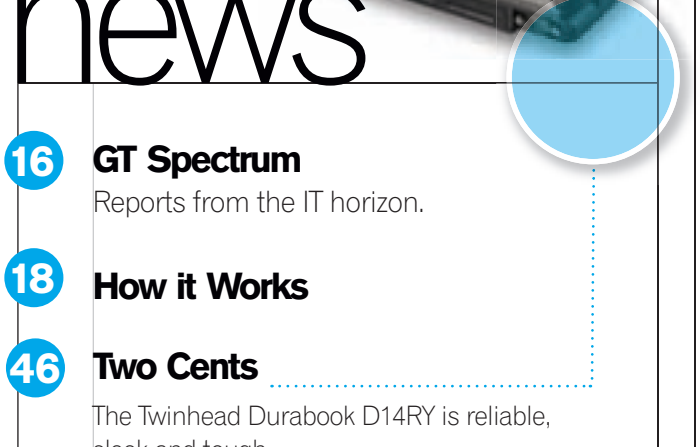

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next month:

Grant Shift
In the '90s, the federal government flooded states with Community Oriented Policing Services (COPS) grants that put cops on the streets and technology in their cruisers. But after 9/11, much of that money dried up or was shifted for homeland purposes. Now the crime rate has taken an upward turn for the worse nationally.

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As of June 17, more than 7.2 million people "live" in *Second Life* — the three-dimensional virtual world that's built and owned by its residents. And yes, I'm a *Second Life* resident. I don't, however, frequent the land of the Linden dollar, which actually has monetary value in real life.

I'll be honest — I don't really understand *Second Life*. I've only logged in four times since signing up five months ago. I've changed my appearance to somewhat resemble my true self. I've gone through the tutorial, I've flown around — yes, you can fly — to explore some of what this virtual world has to offer. I even attempted to skydive.

Granted, one U.S. dollar will get you 186 Linden dollars, but still, my true self can't bask on the virtual beach, so really, what's the point?

Oh wait, that's right — after buying your island, you can build apartments and homes to sell or rent to other residents. You can also build commercial properties to rent to entrepreneurs who want to open shops to sell their virtual skirts, tops, shoes and jewelry to *Second Life* residents.

The last time I checked, *Second Life* residents had spent more than $1.4 million — yeah, real U.S. dollars — during a 24-hour period. So by spending all the time, effort and energy in a virtual world, you can make bank in real life. But … what kind of real life does a *Second Life* investor have, I wonder?

> My virtual self could laze around on my own beach and get a **fantastic tan** … while my real self gets fat and pasty in front of my computer.

The thing is: I can't bring myself to pay real money for virtual skirts, tops, shoes or jewelry. I could even buy land there if I wanted to — I could have my own island! My virtual self could laze around on my own beach and get a fantastic tan … while my real self gets fat and pasty in front of my computer.

After working at a desk all day, however, I just couldn't bring myself to go home and stare at the computer monitor even more. I wanted to go outside, take a walk on the real bike trail, play softball or get out on the lake. And I'd rather take a week's vacation in Puerto Vallarta, on the beaches of Belize or Maui or in Miami Beach than buy a virtual island for my avatar to "enjoy" every time I get online.

I read a story on an airplane about a guy who got so involved in *Second Life* that he got cozy with female avatars. They became his friends. They plotted business ventures. They canoodled. And because he spent so much time in *Second Life*, he lost his real-life girlfriend.

I know *Second Life* is supposed to be the next big thing, but seriously, what the hell? GT

JESSICA JONES
ASSISTANT EDITOR

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big picture

Greensburg, Kan., seen from the air on May 7 after a category F5 tornado swept the town, causing massive damage.

FEMA PHOTO BY MICHAEL RAPHAEL

Swept Away

For residents of "Tornado Alley" — the Great Plains area nestled between the Rockies and the Appalachians — tornado sirens are a godsend.

On May 4, 2007, before a 1.7-mile-wide category F5 tornado destroyed 95 percent of Greensburg, Kan., residents said sirens alerted them for 20 minutes before the touchdown — giving them ample time to take shelter in cellars and basements.

The death toll, 12, would have been greater without the siren warnings. Response efforts, however, are under scrutiny. Kansas Gov. Kathleen Sebelius said the federal government's response to the tornado was weakened by ongoing National Guard deployments to the Middle East and that State National Guard equipment sent to Iraq hadn't been replaced, which slowed rescue and recovery efforts.

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BY CHAD VANDER VEEN
TECHNOLOGY AND POLITICS EDITOR

The Plot Thickens

Early on April 29, the world unwittingly fell prey to another diabolical plot conceived by the Bush administration. Like the Twin Towers and the Pentagon on 9/11, the intentional destruction of a small section of a freeway in Oakland, Calif., is another example of Bush and his gang of thugs inventing nefarious schemes for reasons unclear.

In the wake of this highway disaster, tens of thousands of Bay Area commuters were left to travel on surface streets, or even worse, use public transportation. Perhaps it is another attempt by Bush to wrest control of oil riches from the Organization of Petroleum Exporting Countries. Or maybe there are more sinister motivations. You probably think this is some sort of conspiracy lunacy — so I've set out to prove that the San Francisco-Oakland Bay Bridge collapse is part of an ongoing global plot.

To get to the bottom of this, I dialed the White House to request an audience with Mr. Bush. As expected, he obliged and we met at his ultra secret fortress cleverly disguised as a Waffle House. Mr. Bush was incognito, masquerading as a foul-smelling hobo, and was almost unrecognizable. Being a gentleman, I offered to buy the president's breakfast — a deal to which he eagerly agreed, and say what you will about him, but this guy can really wolf down free waffles.

To prepare for my interview, I consulted several bulletproof sources, including Rosie O'Donnell, the film *Loose Change,* <www.911truth.org> and the ravings of various Internet goons. My sources confidently explained that fire simply cannot melt steel, whether in a building, a freeway or a steel mill. In fact, on a recent episode of *The View*, Ms. O'Donnell said 9/11 was "the first time fire ever melted steel." We can only assume she is correct because if we can't trust people who are famous for reasons no one can really remember, who can we trust?

Now that I had proof 9/11 and 4/29 were parts of a massive government conspiracy, I was ready to question Mr. Bush who, oddly, was busy searching under his seat cushions for errant coins. I tried to get his attention by asking some hard-hitting questions.

"Mr. President," I said, "how were you able to pull off the largest conspiracy ever conceived? Your plot involved tens of thousands of co-conspirators, thousands more fictional victims, remote-controlled airplanes, cruise missiles, the cooperation of all media outlets, foreign intelligence, law enforcement agencies and Osama Bin Laden. And why did you decide to take out a section of freeway in Oakland using a method you and I know to be impossible? And, Mr. President, why didn't you plant WMDs in Baghdad? Surely this would have been the simplest part of your villainous game."

The president said nothing. Instead, he started licking the syrup from his plate — a cunning move to **avoid answering**.

The president said nothing. Instead, he started licking the syrup from his plate — a cunning move to avoid answering. Meanwhile, his very authentic hobo stink was becoming more than I could bear. Finally when I thought I would succumb to his malodor, the president shouted "potato feet!" and ran screaming from the Waffle House/secret hideout. Was this some sort of cryptic clue or another clever ruse meant to throw me off? Perhaps Rosie O'Donnell will have the answer. GT

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reports from the IT horizon

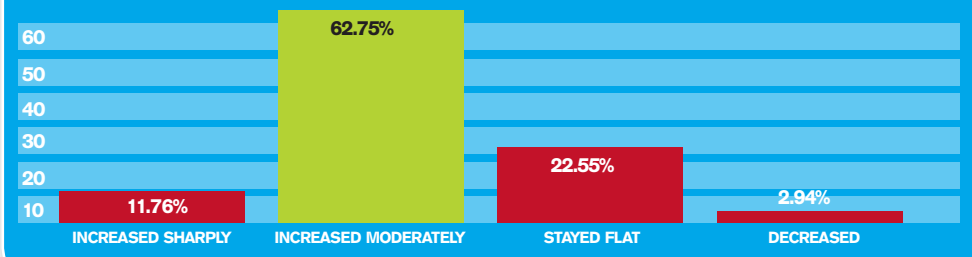
Top 12

The office of the U.S. Trade Representative's 2007 *Special 301 Report* named 12 countries that deny adequate and effective protection of intellectual property rights, or fair and equitable market access for U.S. entities that rely on intellectual property protection:

- China
- Russia
- Argentina
- Chile
- Egypt
- India
- Israel
- Lebanon
- Thailand
- Turkey
- Ukraine
- Venezuela

Stomping Out Stovepipes

The Government Futures report 2012 – *How Will Government Perform Its Mission?* — includes more than 100 responses from across Government Futures leaders. Forty-four percent of respondents were from government, 41 percent were from industry and the remaining 15 percent were from academia, nonprofits and other backgrounds. Between now and 2012, respondents believe federal spending to support the mission of overcoming stovepipes will have:



Porn Prosecution

In a ground-breaking case in Hong Kong, a man has been fined 5,000 Hong Kong dollars (US$ 640) for incorporating a pornographic link in an Internet message.

Woo Tai-wai pleaded guilty to publishing links to eight obscene photographs via a local Internet forum in the first prosecution related to Internet porn sites under Hong Kong's obscene and indecent laws. Internet Society chairman Charles Mok Nai-kwong said the court case could damage the freedom of information on the Internet. — SOUTH CHINA MORNING POST

Public Awareness

The U.S. Army is sharing videos and photos of soldiers in action around the world, whether it's fighting, guarding the Southwestern border, assisting others during natural disasters, partnering with homeland security first responders or providing humanitarian assistance.

The videos, many of which are produced by Army broadcasters, are on YouTube. Photos taken by Defense Department photographers are available on Flickr. And Del.icio.us — a social-bookmark site that offers links sharing — contains links to Army sites on subjects ranging from Army sports and the Army campaign plan to installation home pages. — *U.S. Army*

Send spectrum ideas to associate editor **Shane Peterson** <speterson@govtech.com>

Gettin' Hot

In 2007, worldwide Wi-Fi hotspots will grow by nearly 25 percent, to 179,500, according to ABI Research. Though 72 percent of these sites are still found in North America and Europe, Wi-Fi hotspots in the Asia Pacific region are growing rapidly.

Parking Power

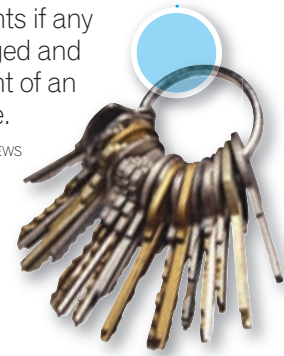
Privately employed "super" parking attendants wearing head-mounted video cameras went on patrol in Greater Manchester, UK, in May 2007.

The 20 parking attendants were to be the first in the country to have the equipment. The attendants' main role is to issue parking tickets. But under legislation passed in 2006, they also have powers to give on-the-spot fines for antisocial behavior.

The Salford City Council asked the attendants to issue penalties up to £80 for offenses, which include littering, hanging fliers or posters illegally and allowing dogs to defecate on the pavement.

The company employing the parking attendants will use the video as evidence to back up parking tickets issued by the attendants if any fine is challenged and also in the event of an attack or abuse.

— MANCHESTER EVENING NEWS



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how it works

Turning technology inside out

This area contains primary antenna controller/tracker and modems for the UCV. These components provide the truck's **primary satellite connectivity**.

This power distribution panel provides **circuit breakers** for all major subsystems of the vehicle. At the bottom right of this section is an **antenna controller** for the smaller satellite dish on the roof of the UCV.

This section contains the patch panel, spectrum analyzer and primary power amplifier control for the UCV's **satellite communications system**.

The Land Mobile Radio (LMR) section contains the different LMRs that are part of the truck's interoperable communications capability.

The **smaller triple screens** at the top of this area can display a wide array of the camera images or video sources. The **larger screens** connect to a keyboard/video matrix that allows users to tap into any computer resource in the vehicle.

Mobile Command

Chicago's Unified Command Vehicle delivers emergency operations center functions to disaster sites.

BY ANDY OPSAHL | STAFF WRITER | **ILLUSTRATION BY** TOM McKEITH

IN 2006, THE CHICAGO Office of Emergency Management and Communications (OEMC) unveiled its Unified Command Vehicle (UCV), a technology-packed truck designed to deliver the functions of the city's emergency operations center (EOC) directly to disaster sites.

Satellite equipment mounted atop the vehicle gives it video and voice over Internet protocol (VoIP) capabilities, as well as secure Internet access. The OEMC essentially owns and operates its own telephone company that connects all agencies critical to first response. The OEMC owns more than 500 miles of fiber-optic cable and 850 miles of copper cable that connects every police, fire and strategic government location to OEMC headquarters.

The vehicle's satellite connects to the OEMC's self-healing fiber network, which carries VoIP signals back to agencies participating in the response. The truck also has its own cellular switch, which can utilize the satellite for cellular functionality. That becomes especially useful if Chicago's normal telecommunications infrastructure fails.

The truck pulls a 16-foot trailer, carrying a tent that self-erects in four and a half minutes, and accommodates up to 100 staff, who won't exactly be roughing it — the tent is outfitted with heating and cooling equipment, and power from the truck can supply 120 laptops and VoIP phones, along with 35 cellular phone connections.

The truck can access 128 responder frequencies for the areas surrounding Chicago. The vehicle's users can tap into those frequencies to communicate with the regional responders using them.

Lastly, the vehicle can house dozens of rack-mount servers, giving it the ability to serve as a redundant data center and remote command facility, as an alternative to traditional brick-and-mortar facilities. GT

To read more about the Chicago Office of Emergency Management and Communications, visit <**www.govtech.com**>.

AS MILLIONS OF PEOPLE FLOCK TO ONLINE ALTERNATE WORLDS, CAN GOVERNMENT AFFORD TO BE VIRTUALLY NONEXISTENT?

BY CHAD VANDER VEEN | TECHNOLOGY AND POLITICS EDITOR

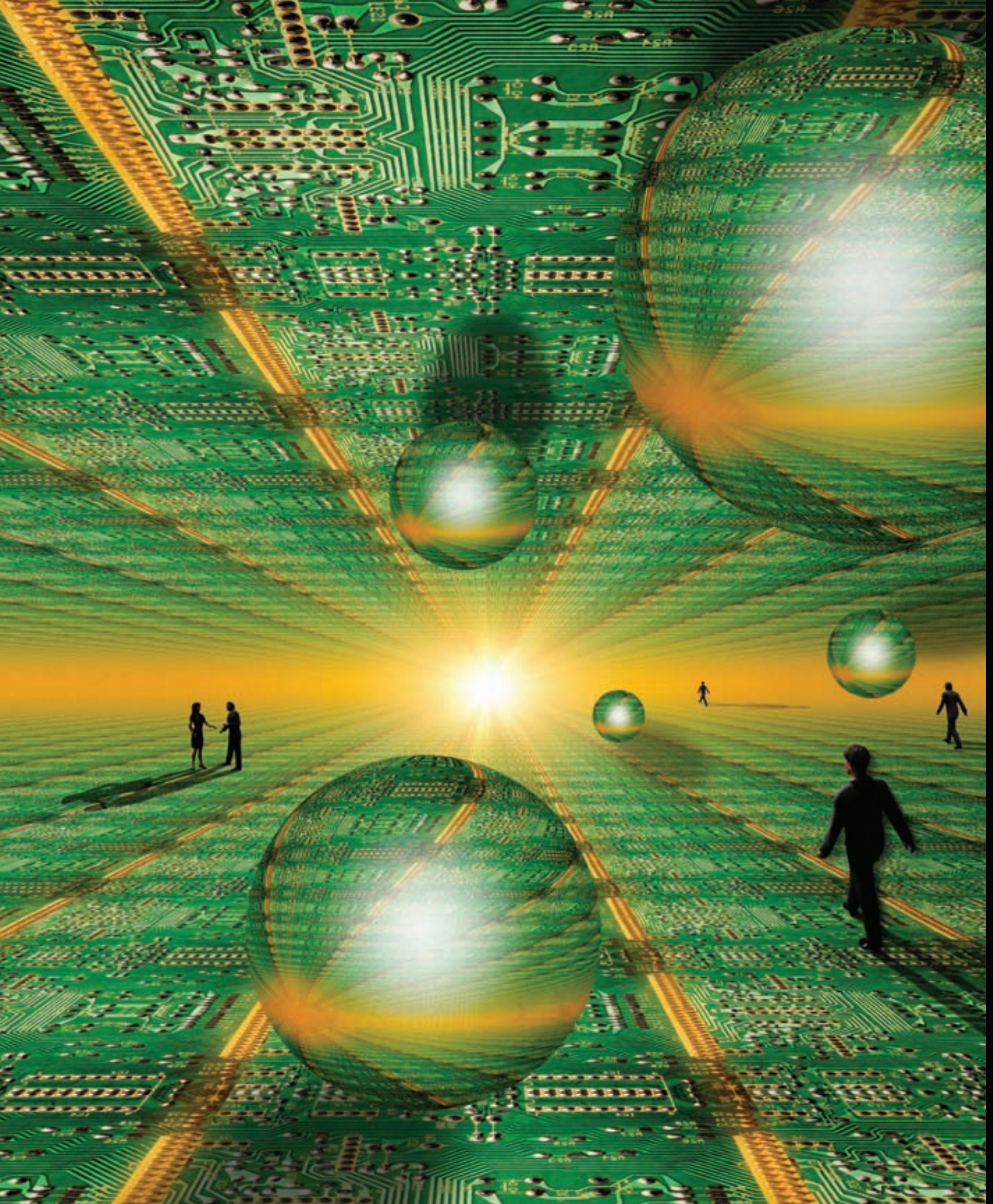
REALITY CHECK

IT WAS AN ORDINARY DAY as far as ordinary goes in this place. I met a few people — some looked normal and others looked, well, different. By different I mean some of them sported dragon wings, others had blue skin and some weren't human at all. I even encountered a kind of panda bear-type humanoid wearing what looked to be a leather diaper.

But the unusual is usual here in *Second Life*, an immense virtual world where almost anything goes. *Second Life* is an MMORPG — a massive multiplayer online role playing game — though most of its "residents" would bristle at the term "game."

More than 7 million people inhabit this rapidly expanding digital realm, fulfilling the dream of being and doing whatever they want. With a fully functional economy, media and an evolving social contract, *Second Life* is becoming a bona fide, albeit bizarre, alternate universe.

I recently spent a few days there for this article, and it was almost impossible to find something that wasn't odd somehow. For instance, flying and teleporting are favorite modes of transportation. There are few laws, and residents seem to live by a code of conduct rather than a long list of rules. Those who live here have built some extraordinary homes, many of which defy the laws of physics.



One of the most unexpected abilities I gained upon arriving was the power to create objects out of nothingness. Sadly my God-like capability went underutilized. The steep learning curve combined with my short visit to *Second Life* afforded me only enough skill to make a useless blue board.

Maximizing my time meant a lot of exploring. I visited an island reminiscent of Las Vegas. I found a skyscraper that reached into the clouds and overlooked a vast ocean. Nearby was a shopping mall floating in midair. I soared over a barren island and its owner who stood on the shore peering toward the setting sun. I even stumbled across a Reuters news bureau — a pillar of reality in an unreal world.

Reuters opened a virtual news agency in *Second Life*, and it will be staffed by Reuters media correspondent **Adam Pasick,** who will report on the lives and business dealings of *Second Life's* residents. An avatar resembling Pasick, called Adam Reuters, has been created to act as a virtual reporter in the world for the news agency.

The freewheeling and free market nature of *Second Life* is propelling the virtual world from obscurity to household name. Real estate can be bought and sold, merchandise of any imaginable (and unimaginable) sort can be had, and entertainment is everywhere. People's obsession with sex also is on ample display, thanks to the anonymity inherent to *Second Life*.

And this is just one of a growing number of virtual worlds that range from practical to utterly fantastic.

Inner Space

If governments want to be relevant in the future, they'd be well advised to start finding ways to go beyond a mere online presence and establish a virtual one. At least one government already has. Earlier this year, the Swedish government announced it would create an embassy in *Second Life* — a place for virtual tourists to find information about visiting the real country.

Others also are discovering practical reasons for inhabiting the virtual world. As I walked around the Reuters building in *Second Life*, I ran into a fellow (well, his avatar) who heads up a tech staffing firm. We got to chatting, and he said he was exploring the possibility of establishing a virtual recruiting facility — wisely figuring that many tech-savvy people maintained a persona in *Second Life*.

These two disparate examples show how a virtual world can do more than entertain. A growing number of *Second Life* users make a living entirely by selling virtual real estate or manufacturing virtual products.

It can be hard to wrap your head around. How does one make a product that doesn't really exist and sell it for actual money? Who would buy property that is nothing more than a collection of pixels? And who would exchange real American dollars for virtual money to be used in a virtual world, to be given to virtual people to buy virtual things?

Lots of people would. Millions of people have found value in a virtual existence, and millions more will follow suit in coming years. From virtual shopping to virtual friendships to virtual lovemaking, many people are deriving real benefits from virtual places.

The phenomenon of virtual worlds is all around us. There are hundreds of MMORPGs. For example, *World of Warcraft* (WoW), an expansive fantasy world of elves, wizards and warriors, boasts a population of nearly 9 million users. Other MMORPGs, such as *Ultima Online, Everquest* and *World War II Online* bring hundreds of thousands more users to the virtual table.

Other virtual worlds are designed for more practical tasks. Take Microsoft's *Virtual Earth*. Instead of creating a fantasy world, Microsoft is building a virtual replica of the world we exist in now. Earlier this year, at the O'Reilly Emerging Technology conference in San Diego, Calif., Microsoft *Virtual Earth* general

Technology and Politics Editor **Chad Vander Veen's** virtual self explores the Reuters virtual news bureau in *Second Life.*

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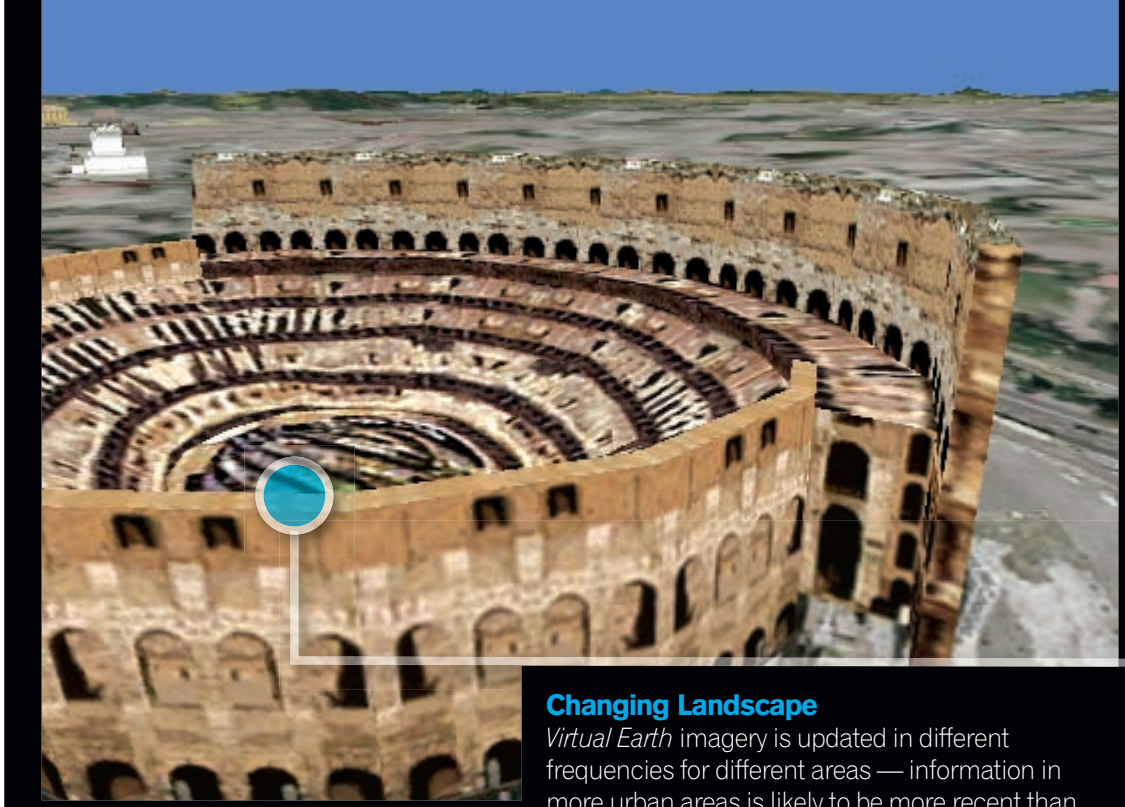
manager John Curlander presented a compelling look at the future of realistic virtual worlds. Curlander showed videos of fully rendered cities, including Philadelphia and New York. The cities were presented from an immersive, 3-D perspective. Some 50,000 structures, complete with accurate exteriors, made it feel as if the real Philly was up on the projector screen.

In a follow-up interview, Curlander discussed some of the ways governments might use *Virtual Earth*.

"The data quality is high enough that it meets a large percentage of the applications that an urban planner or any city user would need," he said. "They won't need to have custom flights done to collect their data. They won't need to have custom processing done to create their products. They can simply access the *Virtual Earth* databases through our viewer and get most of what they need from that — if not all. Potentially it's a huge savings for cities to be able to access these kinds of databases and not have to commission them themselves."

While not as enchanting as *Second Life*, urban planning is vital to the well-being of a community. Additionally emergency response, homeland security and even tourism could reap benefits from *Virtual Earth*.

"We have a lot of inquiries from cities — police departments, fire departments and so on about the data and using the models," Curlander said. "With accurate, detailed 3-D models of cities, that's a valuable asset for emergency responders."



Changing Landscape
Virtual Earth imagery is updated in different frequencies for different areas — information in more urban areas is likely to be more recent than area in more rural areas, and the 3D urban areas are generally less than one year old. As of November 2006, *Virtual Earth* includes geospecific, photorealistic and accurate 3D city models, such as the Coliseum in Rome, shown here. Current coverage is approaching 100 cities, mostly in the United States, but with a handful of those in the UK. *Virtual Earth* also includes digital elevation models and orthophotos in Europe.

Microsoft's Virtual Earth is building a virtual replica of our real world, and has completed replicas of places such as **New York City**; Philadelphia; Sacramento, Calif.; and Seattle.

Microsoft's goals for *Virtual Earth* are lofty. The company wants to render all major population centers in exquisite detail. In fact, Curlander said the plan is to distinguish one brownstone home from another. Having this level of detail could, for example, help firefighters find the best avenues to rescue a trapped victim.

"I think if you talk to emergency responders, they would say having that kind of detailed knowledge would be incredibly valuable — including knowing where the windows are and other kinds of structures that might impede a vehicle from getting close to the building," Curlander said and, in a nod to *Second Life*, added, "What we're building is the 'first life' — we're building the real-world framework."

That real-world framework will, for now, take some tremendous computing muscle — a fact Curlander readily admits. But he said there are plans to host some of the burden so users can realize the power of a highly detailed, 3-D world.

"We're planning to process the data as a service and make the finished product available to the government," he said. "We're trying to free the government from having this big infrastructure that's required for geospatial data."

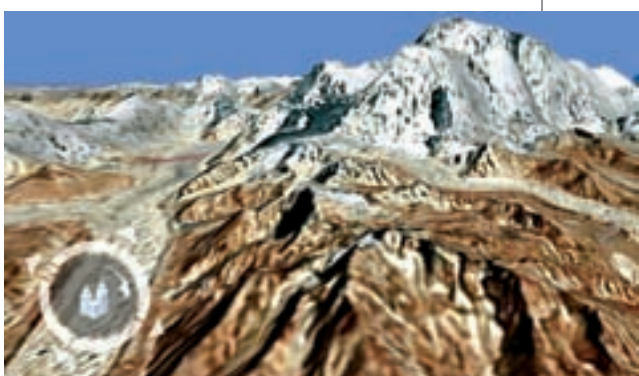
Reel Worlds

For more than a century, movies have served as a virtual world. With cinema, however, your stay in the virtual world is unchanging and brief. And once it has been experienced, that world gradually loses whatever power it possessed that compelled you to visit it. But movies today employ a technology that may further blur the line between the real and virtual worlds.

Motion capture technology is rapidly becoming a staple in film production. Though its roots can be traced back to military experiments, motion capture truly came into its own thanks to a creepy little fellow named Gollum. Gollum is Frodo Baggins' infamous antagonist in the *Lord of the Rings* trilogy. In director Peter Jackson's film version of the famous book, Gollum was created using motion capture technology. The actor and voice behind Gollum, Andy Serkis, was fitted with numerous sensors that recorded his physical movements. These movements were then processed using high-end software to generate a skeletal figure that perfectly replicated Serkis' actions. Next, the computer-generated skeleton was transformed by the digital visual effects team at Wellington, New Zealand-based Weta Digital to create Gollum. Since Weta's breakthrough in producing an extremely lifelike character, motion capture has grown ever more commonplace in moviemaking.

Now, motion capture experts are speculating about the possibilities beyond film. For example, professional athletes' movements are routinely captured. This is usually done for one of two reasons — either to study how the body moves in order to treat or prevent injury or, on the lighter side, to make sports video games more realistic by assigning a player's actual movements to his or her digital counterpart.

Ron Brinkmann is a digital visual effects expert who founded a company called Nothing Real. Prior to being acquired by Apple in 2002, Nothing Real created Shake, one of the leading visual effects and digital composit-



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Creating Gollum
Motion capture technology came into its own during the creation of Gollum in the *Lord of the Rings* trilogy. Andy Serkis was the motion and voice behind the character, and was fitted with a number of sensors that recorded his physical movement, which were then processed with high-end software to generate a skeletal figure that mimicked Serkis' actions. That skeleton was then transformed by a digital visual effects team to create the on-screen character of Gollum.

ing software applications. Now with Apple, Brinkmann explained how motion capture technology can be useful for tasks like traffic and crowd control. For example, if a transportation department needs to visualize a busy downtown intersection, motion capture can help create a virtual world where pedestrians and automobiles move just as they would in reality.

"It allows you to understand in much more detail how people interact," he said. "It becomes a more accurate simulation because it's no longer just this sphere or this simplified block that represent a human interacting, it's somebody who has arms and legs and you can put in rules — if there are too many legs in the same place people fall down, people can push off of each other."

But motion capture is just that — motion. In order to make motion realistic, there has to be motivation driving the motion. That's where artificial intelligence (AI) comes in. If you've ever played the popular Electronic Arts *Madden Football* video games, you know that the computer-controlled players seem to act with intent. In fact, Electronic Arts has one of the world's largest studios where entire teams from every professional sport come to have their motions captured. Then Electronic Arts programmers add AI to make the sports simulation more authentic — linemen attack your quarterback, receivers know their routes, and referees run the field with seeming intelligence.

Likewise, if a city is trying to analyze why so many accidents occur at a given intersection, modeling humans would be useless if they didn't act like humans.

"The simulation can get more accurate because you can really deal with people and the way people move instead of how some idealized point moves," Brinkmann said. "That was the problem with most crowd simulations in the past; people were basically considered a dot, sphere or square, and you couldn't go to the level of detail of how they really react in terms of arms and legs."

Motion capture technology coupled with AI is poised to accelerate the already rapid growth of virtual worlds. Brinkmann said it won't be long before those with online personas can capture and import their actual movements to their virtual selves. Furthermore, he said, users will be able to program their virtual selves to speak and act just as they would in reality. He suggested a user might be able to program an avatar to interact with the online world independent of the user.

"As people build more of these online environments and want to interact inside of them, I really think you're going see tools where people can set up their avatar to behave like they do even when they're not there," he said. "So when I decide to go to bed for the night, I may have an online avatar that's running — sort of an artificial intelligence version of myself. And I can totally see that within some reasonably short time period. You won't know — at least not for the first few minutes — is that really the person or is it just their avatar that's online and programmed to answer some of these questions?"

Motion is a trait highly specific to individuals. Chris Bregler, associate professor of computer science at New York University, has been researching motion capture under various circumstances. One interesting development was the discovery that people are quite adept at recognizing others based exclusively on how they move. Bregler said this "move-

CONTINUED ON PAGE 44

About 500 visual-effects specialists worked on *The Polar Express*, a computer-generated film starring **Tom Hanks**, for three years.

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– Roger Fahnestock, Director of Information Technologies
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GOVERNMENT TECHNOLOGY'S

WAY BACK MACHINE

Revisiting 20 years of *Government Technology* magazine.

1989


GOVERNMENT TECHNOLOGY

MANAGING STATE AND LOCAL GOVERNMENT IN THE INFORMATION AGE VOLUME 2 NUMBER 5 AUGUST 1989

A Model For Interagency Cooperation

GIS Sparks New City-County Synergy

"G

Census Bureau Map Tapes Are Ready

Department of Information Technology

Texas Legislation Favors Technology

INSIDE...

Boston Harbor Cleanup

Setting Standards For Excellence

1 With 1990 being a census year, we reported on a U.S. Census Bureau project that would largely lay the groundwork for modern-day GIS applications — even the Web-based mapping tools we now take for granted. The effort, in conjunction with the U.S. Geological Survey, produced a database called TIGER (Topologically Integrated Geographic Encoding and Referencing). TIGER maps included the name of every street in the largest 345 urban areas, the range of addresses on those streets, every railroad route and operator and thousands of geographic features. The TIGER database covered nearly 4 million square miles.


VISIONS

GIS: A Misnomer

2 Ironically in that same issue, we ran an editorial contending that GIS was not only a "misnomer … begging for a new name," but was also in desperate need of a "new rationale for its existence." But then, who would've imagined how integrated into our lives GIS would become?

In 1989, *Government Technology* transitioned from a bimonthly magazine to a full-fledged monthly publication. As the 1990s beckoned, many of our stories hinted at up-and-coming technologies. In the January/February issue, we reported on the growing movement toward issuing electronic food stamps, or what we know today as Electronic Benefits Transfer (EBT). Back in those days, the EBT system was still in its pilot stages and available in just a handful of states.

WAY BACK FACT

1990 was an extraordinary year. Panamanian dictator Manuel Noriega was captured, German Reunification began, Nelson Mandela was released from prison, Lithuania voted to secede from the USSR, Ryan White died from AIDS, British Prime Minister Margaret Thatcher stepped down, the Hubble Telescope was launched, Iraq invaded Kuwait, French and English Chunnel builders met under the seafloor, Buster Douglas defeated Mike Tyson and the first McDonald's opened in Moscow.

BY CHAD VANDER VEEN | TECHNOLOGY AND POLITICS EDITOR

3 In the July issue, the cover stories included an article about the role of GIS in the infamous Alaskan oil spill clean up, a bit about closed-circuit television arraignment systems and one story about the "final" implementation phase of the California Department of Motor Vehicles' brand new Tandem computer system. The $49 million project would eventually be scrapped and go on to become one of the highest-profile technology-in-state-government debacles of the decade.


GOVERNMENT TECHNOLOGY

GIS Plays Strategic Role in Alaska Cleanup

TV Arraignment Breaks New Ground to Streamline Courts

Vehicle Data Conversion Project is Under Way


Steve Wozniak

WAY BACK FACT

While GTC 88 featured then Apple-CEO John Sculley as a keynote, **GTC 90** boasted **Steve Jobs**, estranged from Apple (and Sculley) at the time. Recently, GTC 2007 featured Apple co-founder **Steve Wozniak**. All we're missing now for our Apple superfecta is the rarely-recalled third co-founder, Ronald Wayne.


Steve Jobs

1990


Texas Gallops Toward 21st Century

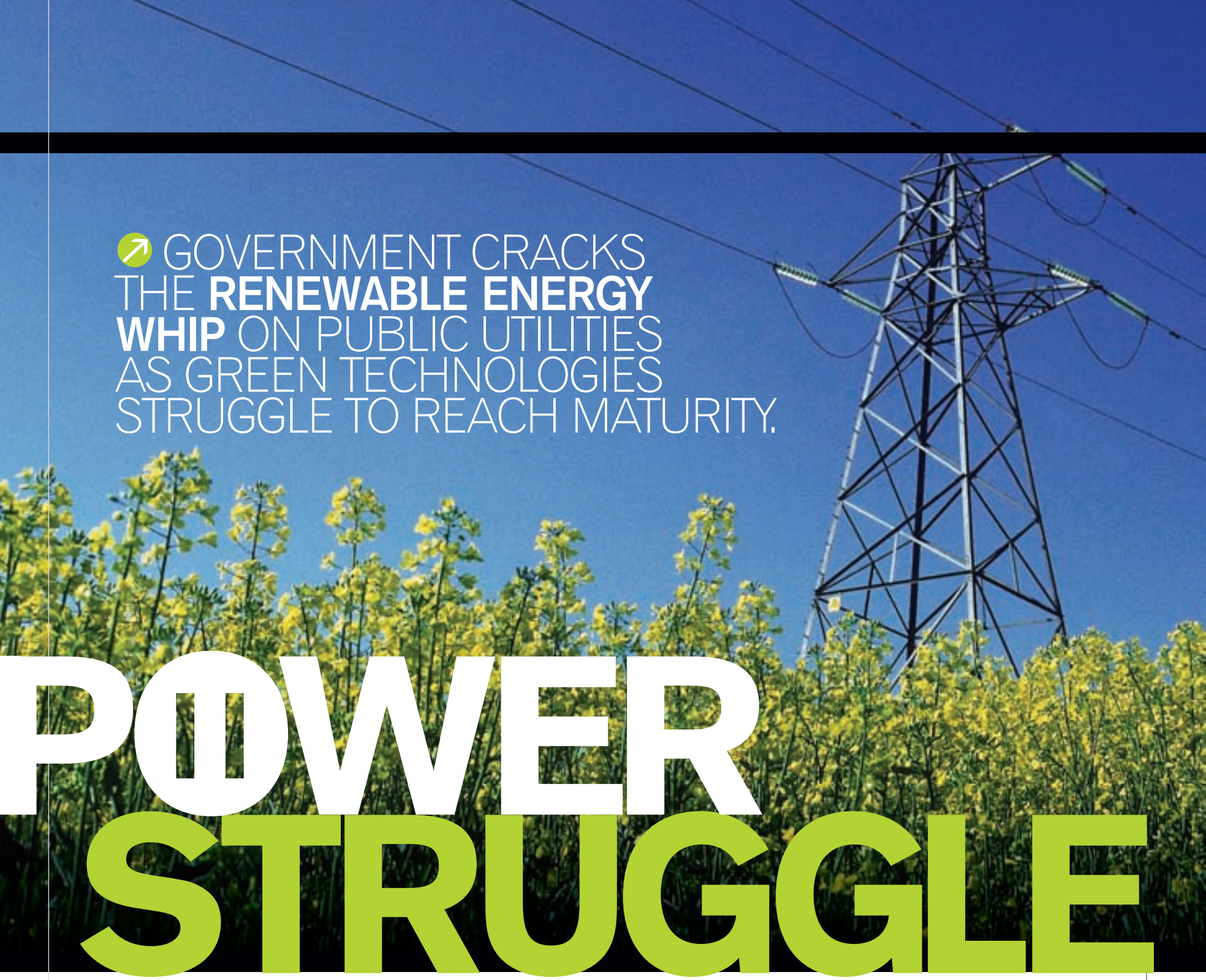
4 In the September issue, we interviewed then-Texas Rep. Richard Williamson, who authored legislation creating the Texas Department of Information Resources — nowadays a go-to source for our sister magazine *Texas Technology*.

5 As the new decade drew closer, the evolution of technology could also be seen in the ads. Many servers boasted up to 1,300 MB of storage, CDs were growing increasingly popular and laptops began to resemble their modern-day descendents. Why, a slim, 12-pound, 286 laptop with 1 MB of RAM, a 2400-baud modem and a 20 MB hard drive could be had for just a few thousand dollars! Furthermore, these magnificent machines were powered by scaled-down lead-acid batteries that, if need be, could be jump-started in emergencies.


What we lost in pounds we gained in power.

In Touch with Tomorrow
TOSHIBA

With *Government Technology* establishing itself as the leading industry magazine, the staff at e.Republic was growing, too. And here's a bit of inside dirt on those early days at the magazine: One of our staff writers, a Mr. Fred James, wasn't a real person. In order to make our staff list seem more expansive, our editor, the late Al Simmons, conjured up Fred, and our phantom writer would remain "on staff" until 1998. GT



GOVERNMENT CRACKS THE **RENEWABLE ENERGY WHIP** ON PUBLIC UTILITIES AS GREEN TECHNOLOGIES STRUGGLE TO REACH MATURITY.

POWER STRUGGLE

ANDY OPSAHL | STAFF WRITER

The fantasy of a renewable energy revolution may be coming true now that government is goosing one forward. States across the nation are implementing ambitious targets for generating power from renewable sources, often as part of efforts to combat global warming. Now the questions are: Can public utilities meet the challenge, and can technology keep pace?

California, for instance, will require its public utilities to generate 20 percent of their power using renewable energy sources by 2010. The state also enforced an auto emissions reduction and is cleaning up its smokestacks. The cumulative effort will push greenhouse gas emissions in California back to 1990 levels by 2020, according to Gov. Arnold Schwarzenegger.

The landmark initiative prompted other states to crank up their own efforts to reduce global warming. The Washington Legislature recently passed a law mandating goals similar to California's. And New Hampshire and Minnesota both passed the highest renewable energy usage requirements of public utilities to date — 25 percent by 2025. But bragging rights may be short-lived because the California Public Utilities Commission announced that it's considering ways to reach 33 percent renewable energy usage by 2020.

In all, more than 20 states require that public utilities generate some portion of their electricity from renewable sources. At the national level, a federal standard of 20 percent by 2020 also is gaining momentum, due to the recent state requirements and party-leadership change in Congress, according to the Union of Concerned Scientists (UCS).

Meeting these renewable energy goals won't be easy for public utilities, many of which require drastic infrastructure changes to meet

the surging power demands. They already face massive costs as they prepare for an imminent new building cycle. The Energy Information Administration projects that electricity generation in the United States will increase by 40 percent in the next 25 years.

"We need to make decisions today about how to meet that demand, and that is to include the construction of new base-load generation, meaning big power plants that run 24 hours a day, seven days a week, uninterrupted," said Dan Riedinger, spokesman for the Edison Electric Institute (EEI).

Aggressive renewable energy requirements will make that expansion even costlier, he said. Hydropower is currently the most widely used renewable energy source in the United States, producing nearly 7 percent of the nation's electricity, according to the EEI. But it's not as popular as it once was. Many environmentalists now oppose hydropower because it threatens fish and other wildlife.

Other options, such as wind and solar power, have experienced growing activity. But they have their own pricey obstacles.

Rise of Renewable Power

Renewable energy usage standards — which hovered in the low single digits when originally implemented during the late 1990s — recently doubled, putting pressure on utilities to generate cleaner power, according to Jeff Deyette, energy analyst with the UCS.

"States with existing standards have increased their requirements," he said. "That's where you see the 15 percent to 20 percent range, which has been the trend over the past two to three years. The new states considering standards are bypassing the lower percentages and just going straight for the 10 percent to 20 percent range."

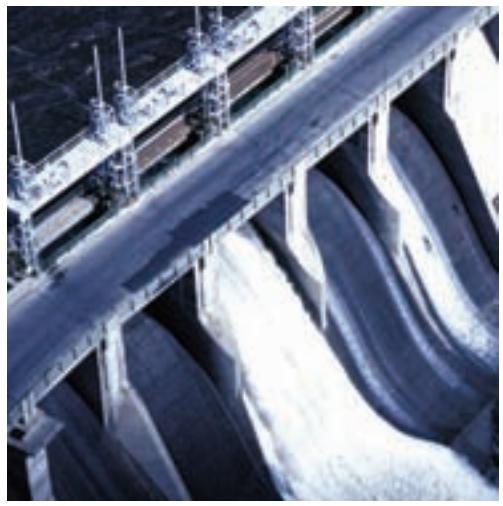
SustainLane, a San Francisco-based online media company that promotes sustainable energy, released a top 10 list of U.S cities ranked by their use of renewable energy.

Oakland, Calif., hit the top with 17 percent of its electricity produced by solar, wind and geothermal energy. Altamont Pass, a wind-swept mountain pass in Northern California that is home to one of the nation's largest wind-power facilities, provides some of the city's electricity.

"Wind and solar were the two main sources," said Warren Karlenzig, chief strategy officer of SustainLane.

The list skewed heavily toward the Golden State, with Sacramento, San Francisco and San Jose sharing the No. 2 spot, San Diego, clinching the fifth, and Los Angeles, the seventh. SustainLane credits that success to the state's ambitious renewable portfolio standards.

The UCS expects renewable energy initiatives to produce a significant environmental impact. The group projects that 21 states and the District of Columbia will collectively reduce their greenhouse gas emissions by 108 million metric tons of carbon dioxide by 2020, due to renewable energy requirements. That amount is equivalent to taking 17.7 million cars off the road, according to the UCS.



What is Renewable Energy?

Renewable energy is inexhaustible energy generated by natural phenomena, like wind, heat and natural water pressure. Nonrenewable energy burns finite natural resources, like coal and natural gas.

Governments implement portfolio standards for public utility renewable energy usage to reduce strain on natural resources, clean the air and eliminate carbon dioxide emissions to prevent the "greenhouse effect."

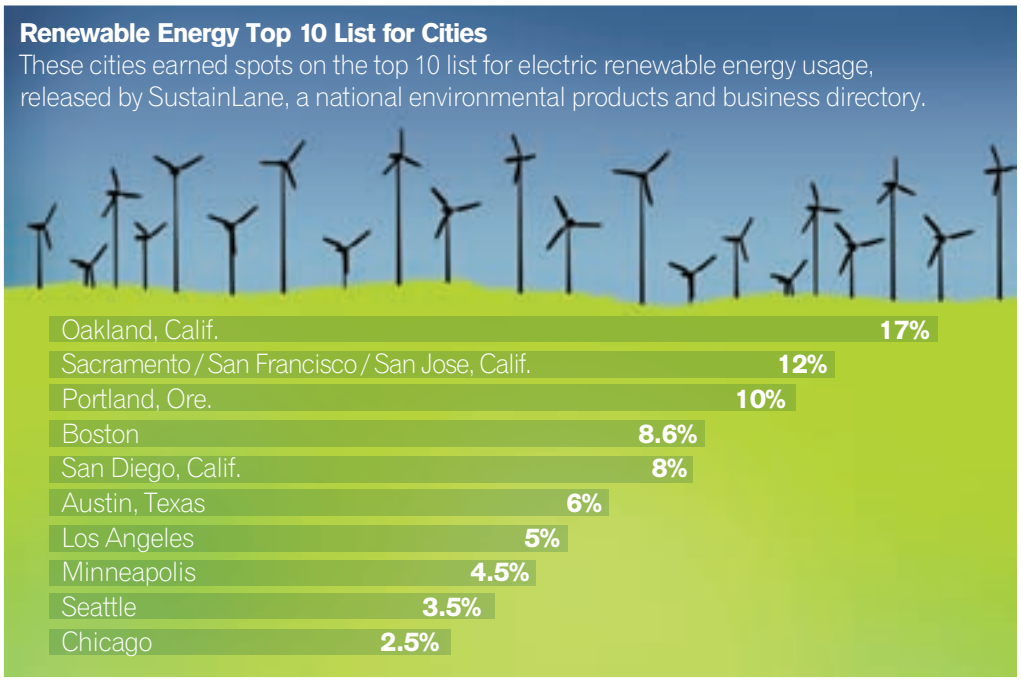
Wind, biomass, hydro, geothermal and solar energy are America's mainstream renewable resources. However, many environmentalists oppose allowing large-scale hydro dams to qualify as renewable energy under government portfolio standards. Hydro dams can threaten fish populations and reduce riverbeds, due to the turbines allowing little sediment to pass. Many public utilities could also satisfy their renewable requirements without expanding their renewable capacity, according to many environmentalists.

But while the leading states are making progress, the nation as a whole has plenty of work to do. Excluding hydroelectric power, just 2.5 percent of electric power generated in the United States currently comes from renewable sources, Deyette said. At the current growth rate, that number would reach 6.3 percent by 2020.

That portion could expand if efforts to establish a federal standard of 20 percent succeed.

"I don't think 20 percent is a stretch, but it's aggressive," Deyette said, "particularly for a state that's currently at 2 percent."

He said the U.S. Senate passed three 10 percent requirements that ultimately failed during the past several years, but thanks to the 2006 Democratic congressional takeover, several 20 percent requirement proposals now brew in Congress.



A New Energy Landscape

Rising electricity consumption and mounting pressure to develop renewable energy sources put public utilities in a bind because most new energy technologies remain immature and relatively expensive.

Wind, a seemingly ideal source of renewable energy, is among the fastest growing alternative power sources. But not all areas of the country have access to the reliable air currents needed for that type of power generation. Furthermore, wind farms aren't that easy to set up.

"It's not just a matter of siting a wind turbine or establishing a wind farm," Riedinger said. "Typically where there is wind — and somewhat steady wind so you can get the most out of each turbine — you're nowhere near the electric grid. You also have to establish the transmission lines to carry the electrons from the turbine to where they can be used.

"Siting those lines is often more difficult than siting a wind farm," he continued, "whether it's off the shore of Cape Cod or on mountain peaks in Vermont."

Local resistance often stalls a utility's ability to establish wind power transmission lines. "Siting one line can take more than a decade," he explained. "Everybody wants the electricity, but no one wants the lines running near their homes or where they can see them, which is understandable."

Utilities also actively pursue solar power. San Francisco voters passed a $100 million bond for solar research in 2001. The measure succeeded in response to government findings that Enron and other electricity traders suppressed power plant operations in California, causing rolling blackouts and price hikes.

But solar energy remains too expensive to commercially compete with other sources, and government efforts to promote solar tech-

Dynamic Doo-Doo

Cow manure produced on dairy farms each year releases massive amounts of methane gas with carbon dioxide into the atmosphere. Pacific Gas and Electric (PG&E), a California utility, plans to use that methane to produce electricity for 50,000 homes annually.

"Think about the toxicity of all that gas going into the atmosphere. On a massive scale, methane can be very toxic," said Keely Wachs, environmental communications manager for PG&E.

The utility needs to meet California's 20 percent renewable energy portfolio standard by 2010, and is currently at 13 percent.

PG&E signed a contract with BioEnergy Solutions to convert the dung into methane. The company will flush manure from 3,000 Fresno, Calif., dairy cows into covered lagoons that trap the methane gas produced as the manure decomposes. BioEnergy Solutions will "scrub" the methane to remove carbon dioxide and corrosive materials, and then deliver it to PG&E through the utility's pipeline.

Wachs points out that the process creates a new revenue source for dairy farmers, in addition to reducing carbon dioxide emissions and improving local air quality.

The utility currently produces 1.1 million watts of electricity from wind, solar, geothermal, biomass and small hydro resources — enough power to serve roughly 800,000 customers, according to Wachs.

Biomass produces 5 percent of that output, and small hydro represents 4 percent. Geothermal and wind technologies each produce 2 percent.

Wachs said he couldn't comment specifically on the costs of PG&E's renewable energy facilities, but he said producing energy from cow waste was "cost-competitive" with other renewable energy technologies.

nology may be having a mixed impact, according to Lori Bird, senior energy analyst at the National Renewable Energy Laboratory.

"Some state policies say a certain fraction of renewable energy has to come from solar," she said. Those policies spurred solar energy development, but they also increased competition for critical materials.

"There's been so much growth in the industry during the last couple of years that there's a shortage of silicon," Bird said. "The industry has been somewhat constrained by that. The global demand for solar is very strong, and the U.S. has to compete with Germany and Japan and so forth in trying to get solar panels."

Jerry Taylor, senior fellow at the Cato Institute, said high costs will prevent solar energy from playing a significant role in near-term renewable energy conversions.

"It's going to be nowhere on the radar screen unless the government just mandates that people build it, regardless of price, or subsidizes the living hell out of it, as we're doing for residential use of solar energy in California and other states," he said.

Renewable energy initiatives also may be rekindling interest in using biomass — wood, livestock waste, garbage, yard waste and other materials — to generate power.

"Biomass projects, overall, were on the decline," Bird said. "They may be reversing that some now. It's been up and down."

She said biomass could be cost-effective in certain areas of the United States, especially the South. But the practicality of using biomass to generate power rests on a complex web of factors.

"A lot of it depends on costs, what happens with federal incentives for biomass sources and so forth," Bird said. "Biomass plants also compete with other uses of the biomass feedstock."

One advantage of biomass-powered utilities, however, is their tendency to fortify local economies. These generating plants need nearby biomass providers. Biomass as renewable energy is only profitable if the fuel travels no further than 50 miles to the plant, Deyette said.

Geothermal power — using hot water or steam from deep beneath the Earth's surface to generate electricity — represents another option for some regions. "Geothermal is cost-effective in the Western part of the U.S.," Deyette said. "We're seeing more and more geothermal projects proposed and built."

Ultimately a single renewable energy source won't cut it for the entire country. Instead, the nation must develop a diversified landscape of individual localities powering themselves with whatever renewable sources their geographies provide. Furthermore, states lacking access to renewable energy sources will need a way to purchase excess "green" electricity produced in other regions, Deyette said.

A Dirty Solution

Despite the focus on renewable energy, spiraling demand for electric power is prompting

utilities to consider coal to power massive generators needed to sustain future needs. Coal may be one of the dirtiest sources for electric power, but it offers a cheap and abundant energy source.

A proposed federal standard would require that **20 percent** of all power be generated from renewable sources by 2020, an aggressive target given that just **2.5 percent** of electric power generated in the United States currently comes from renewable sources, excluding hydroelectric power.

Complicating the problem is the fact that natural gas — a cleaner-burning alternative to coal-fired energy plants — is becoming difficult to acquire.

"We have constraints on pipeline capacity, the availability to deliver gas to where it's needed, as well as our ability to explore and take advantage of additional natural gas reserves in the U.S. and off the U.S. coast," Riedinger said.

A process called co-firing could help reduce dependence on coal-fired power generation. The technique turns an existing coal-fired plant into a coal/biomass-burning hybrid.

"It's relatively easy to retrofit an existing coal-powered plant and burn a clean renewable energy source in that facility," Deyette said. "You get a lot of environmental benefits from it. It's cost-effective, and you're directly displacing coal-powered generation."

Co-firing typically enables 5 percent to 10 percent of a plant's energy to come from biomass, Deyette continued, adding that it would offer an easier renewable energy conversion to the southeastern United States, which lacks abundant wind.

Force-Feeding the Market

Regardless of the power-generating method, current development of alternative energy sources hinges on government support. Taylor even goes as far as to say the renewable energy industry would collapse without government tax breaks and subsidized loans. "The industry is booming for a reason," he explained. "Government is mandating that these people build this stuff, and they're subsidizing to such an extent that there's an artificial profit opportunity there that wouldn't otherwise exist in the market."

But Riedinger said utilities must have government assistance to reduce the financial risks of implementing new technologies, particularly for attracting capital from Wall Street. "[The more] signals sent by the federal government [showing] their willingness to help utilities shoulder some of that risk," he said, "the more quickly we can deploy some of these technologies and get them to market."

At the same time, however, dependence on government bucks is cramping the alternative energy industry.

For instance, many projects depend on the federal Renewable Electricity Production Credit (REPC). However, the credit must be renewed by federal lawmakers every few years, making it hard for the industry to plan ahead.

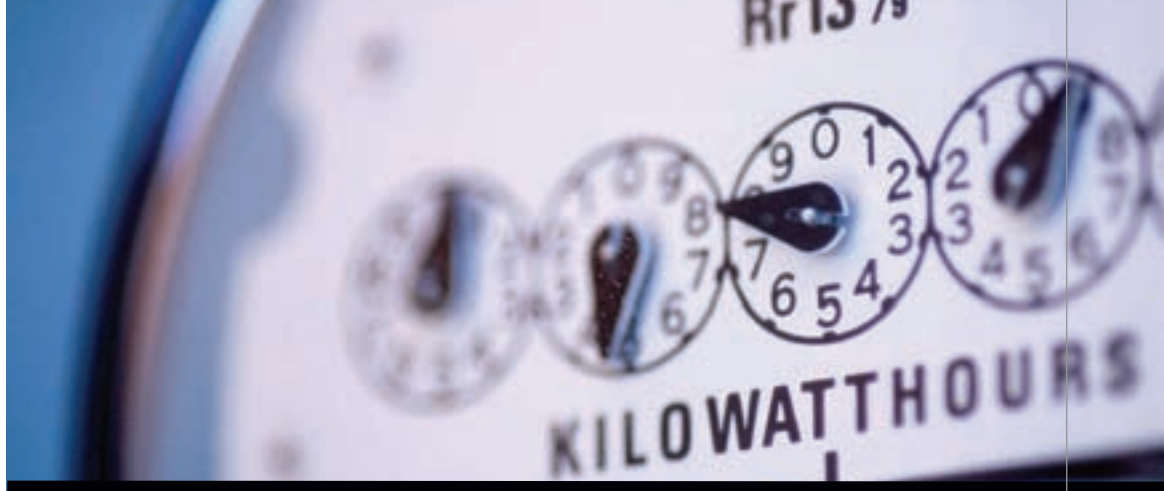
Uncertainty over the REPC limits geothermal power development, Bird said. "There have been some geothermal projects, but probably not as many as there would be if there was a long-term extension of the production tax credit."

Even the booming wind power industry has been impacted. Wind turbine manufacturers base their production on Congress' renewal of the REPC, and fears that the credit would expire led to a turbine shortage.

But Deyette said the REPC was becoming more stable. "Congress hasn't let it expire since 2004," he noted. "It's in place until 2008, and everybody expects it to continue. Congress has strong bipartisan support for it to be renewed for at least another three years — maybe longer."

He added that tax breaks and subsidies are nothing new in the energy industry, and that renewable energy deserved its fair share.

"Look at all of the subsidies that went to the nuclear power industry and things like that." Deyette said. "[Government] supports were



Renewable by Request

Citizens impatient with renewable energy conversions in their states can often accelerate the process for themselves. More than 600 public utilities nationwide offer programs allowing customers to pay extra for receiving more of their electricity from renewable energy.

More than 500,000 customers participated in these programs in 2006 — up more than 10 percent from 2005, according to the National Renewable Energy Laboratory (NREL).

The organization partially credits these customer choice programs with stimulating the national renewable energy supply. In 2006, the programs' cumulative sales exceeded 3.5 billion kilowatt-hours (kwh), roughly a 30 percent increase from 2005, according to the NREL.

Research shows that these programs boost the popularity of utilities, according to Lori Bird, senior energy analyst at the NREL. "Consumers feel better about the utilities that offer these kinds of programs because they feel like they're greener, even if those consumers don't participate in the programs themselves."

The NREL released four different top 10 lists ranking utilities that offered these programs. The first list ranked utility programs based on their total sales of renewable energy to participating customers. Texas public utility Austin Energy topped that list, selling more than 580 million kwh. The second list ranked each utility's total number of customer participants. Minnesota's Xcel Energy won the top honor with 63,028 participants. The third list measured a utility's customer participation rate, placing California's City of Palo Alto Utilities at the top, with 16.9 percent. The fourth list ranked the lowest price premiums charged. Austin Energy also topped that list with a price of negative 13 cents per kwh.

there for the more conventional resources. They should be there for renewables."

However, he argued against including traditional hydroelectric power in renewable energy goals and subsidies, saying the method already is well established and may be essentially built out.

"Many, if not all, of the large-scale opportunities for hydropower have already been developed," he explained. "With a renewable portfolio standard, the intent is to try to increase the development of emerging technologies."

Instead, a federal standard should allow existing hydropower plants to get their government-designated percentages from a process called "incremental hydro generation." That would enable a traditional hydropower plant to produce additional energy by installing more efficient generators.

Federal Standard Concerns

As the federal standard gains momentum, experts are uncertain how it would impact existing state renewable energy requirements.

Riedinger called a federal mandate unnecessary and said it shouldn't pre-empt already existing state requirements. He contended that a one-size-fits-all federal renewable energy requirement would hurt states with geographies lacking enough mature and affordable renewable energy resources. Utilities in those states would be forced to either pay fees to the federal government, or purchase renewable energy credits from electricity generators in other states with excess renewable capacity.

"In either case, this is going to increase costs for electricity providers in regions without whatever level of renewables is designated as appropriate by the government," Riedinger said. "They'll simply end up paying a fee on top of the costs already incurred in generating electricity for their own customers."

Riedinger also wonders how revenue collected through fees and penalties would be spent. "What happens to the money? Is it used to advance energy research and development? That's at least intellectually defensible. Or will it amount to just another source of revenue for the federal government?"

Deyette, on the other hand, said a federal requirement could function as a minimum standard that all states must meet. But states could implement stricter requirements if they choose.

And states buying electricity from other states with abundant renewable energy would be no different than states importing fossil fuel for electricity, he added. "A state without a lot of renewable energy also might not have a lot of fossil fuel resources, and import that fuel. You'd just be importing a different, but cleaner and more sustainable source."

The UCS projects that the United States could cumulatively produce enough renewable energy for the entire country to meet a 20 percent standard.

"The targets don't start out at 20 percent," Deyette said. "They gradually ramp up over 13 years, so that provides time for other technologies to develop and mature."

Cooling Hot Air

Taylor said the details in forthcoming renewable energy requirements will reveal just how dramatic the "revolution" truly is.

"It may very well be that we'll be throwing wood chips into co-fired power plants," Taylor said. "What's the big deal? That won't mean we'll have turned ourselves into a nation of windmills and solar voltaic."

He added that generating electricity with renewable energy would do nothing to reduce the nation's dependence on foreign oil.

"You could build 100 massive wind power and solar power plants in the U.S. and not reduce oil imports a drop," he said. "They're just two different industries. We don't use oil to make electricity."

Oil produces only 1.6 percent of all electricity generated in the United States, according to the EEI.

But, all seem to agree that technology leaves no bet safe.

"I would not want to make predictions about what the electricity system would look like 30 years from now, based on prices and technology today," Taylor said. "Anything could change." GT

Behavior recognition technology adds intelligence to surveillance cameras.

The Unblinking Eye

Synopsis: Behavior recognition software makes surveillance a smart way to reduce crime.

Agency: Rapid City, S.D., Regional Airport and Johns Hopkins University.

Technology: video analytics software.

Contact: Mason Short, Executive Director, Rapid City Regional Airport, 605-394-4195, <mason.short@rcgov.org>.

BY JIM McKAY | JUSTICE EDITOR

Surveillance cameras can serve as an effective deterrent to crime, provided security personnel actually watch the video streams from the cameras. But having the staff resources to monitor dozens of cameras at once is beyond the reach of many organizations.

With behavior-recognition software, however, it all becomes possible. By layering video-analytics software over an existing closed circuit TV (CCTV) system, law enforcement can use video as a preventive measure because officers get alerted to crimes as they occur, instead of monitoring dozens of video screens at the same time or just using the video as forensic evidence.

The technology is being used successfully at Johns Hopkins University in Baltimore, where a runaway crime rate was significantly reduced. At the Rapid City, S.D., Regional Airport, the technology effectively replaced Transportation Security Administration personnel in some areas.

The software can be configured to recognize people's movements, such as someone running, and changes in landscape, such as a package left behind, and then alert appropriate personnel. A behavior-recognition system can free up staff to take on other tasks until there is an alert, or allow a smaller staff to monitor dozens of cameras.

"It is programmed to recognize a wide variety of things based on what you, as a law enforcement person, would care about," said Nik Gagvani, chief technology officer at Cernium, which manufactures a behavior recognition system called Perceptrak. "You can customize it to create what we call a 'behavior profile.' It would just report those behaviors to you."

A behavior-recognition module can be programmed to recognize up to 18 different behavioral patterns, including slow-moving vehicles; erratic movement; a person falling down; an abandoned object; or a number of people converging. The module can be programmed to assign a score to each alert based on the significance of the behavior.

The score is influenced by factors such as time of day and others programmed into the system. All alerts are then stored automatically, giving investigators forensic evidence.

How It Works

"If you think of video, it's really a series of images one after the other over time," Gagvani said. "If you look at any pair of successive images, and you subtract or find the difference of these images, you would see where it's changed over time."

The analysis is done by looking at how the pixels in the video change over time. The software is configured to recognize certain changes that correspond to movement.

It can also recognize, through a process called segmentation, if something has been left behind, such as a backpack that isn't part of the landscape.

A video scene includes ambient props such as trees, buildings and other permanent structures. That's all considered background. Anything that moves through the scene is considered foreground. Segmentation is the process of separating the background from the foreground. If a bag was left in a scene, for instance, it would not be part of the background and would trigger an alert from the system.

"Now the question is, 'Do the differences mean anything from a security point of view?'" Gagvani said. "That's what behavior recognition is all about. It's not just about what is referred to as motion detection, which has been around for a while, but now trying to qualify that motion and make sense of it. It gives you information you can act on. You don't have to

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look at the video until one of these things you care about is discovered by the behavior recognition module."

Then it's up to law enforcement personnel to look at the video feed and assess whether action needs to be taken.

"Basically the technology is trying to be the unblinking eye, so to speak," Gagvani said. "It's not as sophisticated as a human, but it doesn't experience fatigue like a human would. What it does not do is tell you that there is a threat. That qualification has to be made by a human. It is an assistant, and given the magnitude and widespread deployment of CCTV and surveillance technology these days, it's simply an intractable problem to look at all that video manually."

The British are using CCTV cameras equipped with behavior recognition software to curb bad behavior. In Middlesbrough, London, 158 cameras are fitted with loudspeakers through which control room operators yell at citizens who are seen littering, fighting or engaging in other unseemly acts.

While the system doesn't recognize a certain individual or identify a threat, it will recognize behavior it has been programmed to recognize and then alert someone. It's resilient to rain, wind and blowing debris but doesn't work in dark settings. It doesn't work well in extremely crowded conditions, when there's just too much movement.

"In airports, it's used for a very specific purpose: to monitor the exit lanes where you expect people to be going from the gate area to the terminal," Gagvani said, referring to the deployment of the technology at the Rapid City Regional Airport. "This technology works like a champ when you define specifically what you care about and not have it do 20 different things."

The system can be expanded to yield more or fewer alerts by being configured to respond to more or fewer behaviors or movements. "The trick is to balance false alarms versus true alarms," Gagvani said. "And to keep the false alarm rate as low as possible because if this is alarming all the time, you might as well just look at the video all the time."

Keeping the false alarms at fewer than 10 percent of the total alerts is the goal, he said. "A well run behavior recognition system should give you no more than 100 alerts a day."

A system includes the cameras, the cabling that brings the video back to the security center or wherever it's being viewed and the video processors.

A Safer Campus

At Johns Hopkins University, a state-of-the-art communications center houses the brains of 89 "smart" cameras positioned strategically around the campus, and the 14-member staff that monitor the cameras.

"They installed a fairly elaborate video surveillance and emergency communications system and put our video analytics functionality into it," said Cernium CEO Craig Chambers. "It's now their primary source of dispatching officers on campus based on potential threats or interesting situations."

When the system recognizes behavior that it's been programmed to read as unusual, it alerts a the staff member by framing the scene with a yellow rectangle. Staff then decides whether to send campus police or not.

Since its deployment in March 2005, the system has alerted staff to numerous thefts in progress, vandalism, minor traffic accidents and helped catch an armed robber. Campus bike thefts dropped from 25, during the fall 2005 semester, to three in fall 2006. The total number of crimes reported on campus in 2003 was 536. That number grew to 703 in 2004 then dropped to 279 after the installation of the new system in 2005.

Looking Out

Though the goal at the 140-acre Johns Hopkins University campus is to reduce crime overall by honing in on specific behaviors, the Perceptrak system deployed at the Rapid City Regional Airport has one function: to "watch" over the safety checkpoint areas and make sure nobody bypasses security.

"All we're looking for is wrong-way motion, which is a simple application, but it's a tremendous labor savings," said Mason Short, executive director of the Rapid City Regional Airport. "There's nothing more irritating for me than to walk out into the checkpoint and see screeners sitting on their butts doing nothing other than making sure somebody doesn't walk through. It's a waste of labor and manpower."

Two of the three cameras used at the airport are configured to sense wrong-way motion, and the third is a monitor that allows for Internet access from virtually anywhere. It's used to review incidents.

The setup cost approximately $100,000, but the airport spent an additional $80,000 on construction of a physical structure in the checkpoint area to replace the glass barriers. The glass inhibited the behavior recognition system because the camera responded to reflections from the glass. Short said the setup results in a savings in checkpoint personnel of between $100,000 and $120,000 a year.

"It's a narrow passageway where we put everybody through past the checkpoint," Short said. "There's a pre-alarm area so that if people are just mistakenly walking the wrong way, we've got a camera that will sense the wrong-way motion and scare them out of their pants with a screaming, 'Stop! Halt! Back up.' If they proceed past the pre-alarm area, they go into the full alarm area, where there's another camera doing behavior recognition."

> "If people are just mistakenly **walking the wrong way**, we've got a camera that will sense the wrong-way motion and scare them out of their pants with a screaming, **'Stop! Halt! Back up.'**"
>
> **Mason Short,** *executive director, Rapid City, S.D., Regional Airport*

If a full audible alarm goes off, airport security personnel and local police respond to the call. The system also stores any alerts, allowing investigators to go back and review incidents or submit video as evidence as was the case following a 2006 airport incident

"We had an incident last year where an individual ran through the checkpoint to go back to an aircraft," Short said. "He set off the pre-alarm, and it didn't faze him. Then he fully alarmed the system, became belligerent when law enforcement showed up, and he was actually incarcerated for violating federal airport security regulations.

"The key was being able to bring this piece of evidence, this video evidence, to the judge and say, 'This is what he did.' Without that, we wouldn't have had a case." GT

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Distress Signal

Synopsis: States begin to use GPS-enabled cell phones as an extra safety measure for social workers.

Jurisdictions: Jefferson County, Ala.; Mississippi; Kentucky.

Technology: GPS-enabled cell phones that track social workers.

Contact: Bud Douglas, chief systems information officer, Mississippi Department of Human Services, <bdouglas@mdhs.state.ms.us>.

Three states respond to recent social worker slayings by equipping field workers with GPS-enabled cell phones.

BY JESSICA WEIDLING | STAFF WRITER

Fishing for king crab in Alaska's bitterly cold Bristol Bay on ice-laden boats or harvesting timber with axes and gas-powered chainsaws count among some of the world's deadliest vocations.

Yet the hazards of other, ostensibly safe jobs, like social work, often go ignored. Until someone gets killed, that is.

In October 2006, Kentucky social worker Boni Frederick, 67, died after being stabbed and beaten while taking a 10-month-old boy — in state custody because of neglect — to visit his mother and her boyfriend. Both have since pleaded not guilty to murder charges. In Kansas, 26-year-old social worker Teri Zenner was killed in August 2004 during a home visit to a teenage Johnson County client who was diagnosed with mental illness and has been charged with the killing.

In response to the grisly slayings, a few states — Mississippi, Alabama and Kentucky — are churning out initiatives to improve social worker safety. One component of those initiatives is GPS-enabled cell phones, which allow supervisors to view field worker movements. Some phones give front-line social workers the option to hit a panic button to call for help.

An added bonus: The phones offer an audio-recording option to replace tedious note-taking, and enable social workers to photograph clients and their environments. The phones' GIS application can also give directions to offsite destinations.

Before debuting in social workers' cell phones, GPS tracking technology has been used by law enforcement and in the corporate world to monitor workers. The standard cell phones the social workers use contain a GPS device that triangulates with low-lying satellites.

Safe and Sound

Though killings aren't common, a surprising number of social workers indicate they experience some form of violence in their daily work environment.

Out of a sampling of 1,129 social workers, 58 percent reported incidents of violence in the workplace — of that 58 percent, 50 percent reported threats; 25 percent reported property damage; and 24 percent reported physical attacks, according to a 1993 survey conducted by Christina Newhill, associate professor in the School of Social Work at the University of Pittsburgh.

In a 2006 National Association of Social Workers (NASW) study of 10,000 social workers, 44 percent reported facing safety issues on the job.

GPS-enabled cell phones may offer social workers extra protection in the difficult environments they face. Verizon presented the idea of deploying the phones to the Mississippi Department of Human Services (MDHS) after working with the MDHS on a post-Katrina mobile communications operation, said Bud Douglas, chief systems information officer at the MDHS.

After piloting 50 of the GPS-equipped cell phones during a two-month period beginning in October 2006, Mississippi unveiled a statewide program in March. The state deployed 400 phones, in addition to the 50 pilot phones, at an estimated $450,000 annual cost. Though Verizon provided the phones for free, the state pays a month-to-month contract for minutes and the accompanying Web-based application.

"The big selling point to the caseworkers," Douglas said, "is that we give them a panic button that says, 'If you push this button, we know you're in trouble, and we know where you are.'"

To call 911, social workers hold down a button, which prompts an E911 operator to dispatch local authorities to the location,

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> "It's **safety, communication** and **quick ability** to transmit information to and from the home base to the social worker in the field."
>
> **Page Walley,** *commissioner, Alabama Department of Human Resources*

Douglas said. The MDHS has not yet tested how long it takes for reinforcements to arrive on scene following the signal for help.

The Verizon Field Force Manager, a Web portal connected to the phones, enables office staff to view and trace a map of field worker movements, and continually tracks personnel

when the phones are on. The portal can also be programmed to issue alerts generated by certain field worker activities.

This application is especially important to let supervisors know where workers are, and how long they've been there, said Angela Lacy, assistant director for child welfare in the Jefferson County, Ala., Department of Human Resources (DHR).

"If a worker is at a home where there is documented domestic violence, and the supervisor sees by her computer that the worker has been there for more than two hours," Lacy said, "the supervisor can call and check on the worker and alert the authorities."

Stamping Out Fraud

In addition to GPS-enabled cell phones for social worker safety, Mississippi uses tracking technology to prevent food stamp fraud. With GPS, the Mississippi Department of Human Services can see if food stamp recipients repeatedly drive long distances to the same grocery location — which may indicate that the retailer is buying food stamps at a profit, and allowing food stamp recipients to buy nonfood items, such as cigarettes or alcohol.

Helping Social Workers

Say a social worker visits five houses in one shift, the worker can dial the addresses into the phone, and a GIS application calculates the best route. Social workers can record audio observations in lieu of taking notes, and a built-in camera can snap digital pictures of notable marks and bruises on bodies or of desperate living conditions — solid evidence if ever needed in court. Back at the office, the digital files can be uploaded on computers and organized under a case number.

"We wanted to give our direct-care workers the most efficient tools we could possibly give them because of their caseloads," said Col. Don Taylor, executive director of the MDHS.

In the last two years, social workers have reported an increase in caseloads, client problems and paperwork; all the while job safety has suffered a decline, according to the NASW survey.

The added barriers can fatigue social workers, leaving them less attentive to red flags, said Newhill, author of *Client Violence in Social Work Practice*. Although Newhill lauds the new phones for the safety mechanism they offer, she worries agencies will pile on yet more cases to growing workloads if the cell phones allow social workers to complete tasks more quickly.

But governments can't afford to shun the technology because social workers visit unsafe environments where drugs, alcohol or weapons may be present, said Page Walley, commissioner of the Alabama DHR. Walley learned of the cell phones from Douglas in neighboring Mississippi and made a case to use the devices following Frederick's death.

"It's safety, communication and quick ability to transmit information to and from the home base to the social worker in the field," he said.

A mid-January pilot with Verizon was spawned in Jefferson County (Alabama's largest urban county) with 15 GPS-enabled cell phones. Lacy said the pilot didn't incorporate the panic buttons, but did use the GPS tracking technology.

Although the Alabama DHR received proposals from an April RFP to equip all Jefferson County social workers with the technology, state laws may force the Alabama DHR to choose a different state-preferred provider, which would mean a second pilot. But Walley said he's hoping for a countywide, and even a statewide, deployment of the phones, suggesting an announcement should come early summer.

In Kentucky, the state Legislature, prompted by Gov. Ernie Fletcher, passed the Boni Frederick Bill in late March — a $6 million appropriation that will hire more state social workers, enhance safety measures and could include radios with panic buttons, according to local news reports.

Gradually states are implementing cell phones and other safety measures, such as allowing social workers access to criminal justice records or simplifying violence-reporting requirements. But Newhill cautioned against using the phones as a Band-Aid for the larger issue at hand: the lack of appropriate social worker training.

"I think what's important to communicate is the cell phones and GPS devices are great," she said, "but you still need to take precautions; you still need to have training. That will help the devices work best for you.

"But I think it's a great step — a step in the right direction," said Newhill, who was a practitioner for eight years in California at a time when even mobile phones weren't an option. Unfortunately, she said, it takes a high-profile murder to give governments the wherewithal to adopt safety measures.

> "Agency by agency, state by state, people are doing things. But **the reality is** that action isn't taken until a social worker is killed. And that's a **terrible thing to see**, but it's true — that often that's the only thing that really mobilizes people."
>
> **Christina Newhill,** *associate professor, School of Social Work, University of Pittsburgh*

"Agency by agency, state by state, people are doing things," Newhill said. "But the reality is that action isn't taken until a social worker is killed. And that's a terrible thing to see, but it's true — often that's the only thing that really mobilizes people." GT

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CONTINUED FROM PAGE 26

ment signature" has piqued the interest of some law enforcement agencies.

"We've had, for five years now, federal funding for very high-resolution sensors that track the subtleties of motion changes of different people," Brelger said. "We talked to police officers, and when they drive down the road and see somebody walking around the corner, they can already smell, 'Oh, there's something wrong with this person or it's suspicious.' Several agencies are interested if you can write software that can do that."

Bregler said motion signatures were first thoroughly studied by Swedish researcher Grunner Johanssen. In the 1970s, Johanssen conducted an experiment in which a number of subjects affixed to their bodies up to 40 lights at key movement points, such as joints, feet and hands. The subjects were put into a dark room, leaving only the lights visible. Observers were asked to identify whether the moving lights were attached to a male or a female. More than 80 percent of observers answered accurately.

Bregler is also investigating a new type of lie detector based on capturing human motions and analyzing them.

"Some body parts will reveal you are not telling the truth, and we suspect that a similar thing is also true when you use the entire body," he said. "It's very, very hard for humans to hide the motion signature."

Virtual Reality 2.0

Motion capture alone can bring a new level of authenticity to the online worlds people inhabit today. It'll be likely that within a few years, a user will be able to create a near replica of him or herself — sans the blood and guts. Everyone, it seems, is staking a claim in a new virtual reality. Nintendo, and Sony to a lesser extent, have made headlines with their next-generation video game controllers that capture the motions of the user. Aerospace and automobile manufacturers are rolling out elaborate virtual worlds to test their products and train end-users. The military is building virtual battlefields to train soldiers. Even medicine is on board as more surgeons hone their abilities by performing surgery in virtual operating rooms.

The question is whether government is going to get into the virtual act. Every day these virtual worlds attract new visitors who live, work and play in environments that can be whatever they want them to be. And every day new worlds appear, expanding the online multiverse. From inside a Sherman tank to wizard school, from battling alien invaders to building a replica of New York City — virtual worlds can offer just about anything. One day, users in a virtual world may want to access their government — but will government be there? GT

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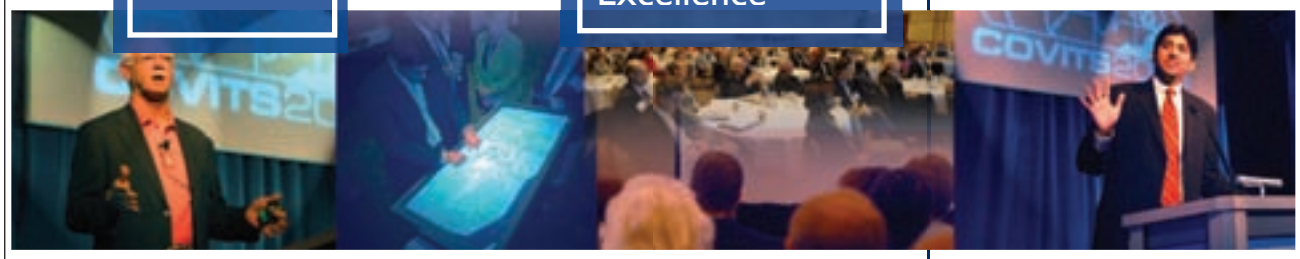

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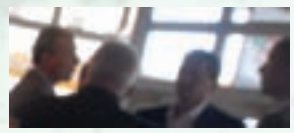

NVTC

two cents
our take on the latest technology

The Twinhead Durabook D14RY meets military standard 810F for weathering drops and shocks, and the keyboard and touchpad area are spill resistant. I put these features to the test, and the D14RY performed impressively.

A lot of notebooks, however, can make this claim. What makes the Durabook such an impressive laptop is that it's tough and lightweight. It's not just for building inspectors or code enforcement officers working at construction sites and other "rugged" environments.

Because of its slim design, the D14RY is a desirable option for everyday professionals who want a machine that can withstand the traumas that users risk whenever they drag their notebooks on the subway and in airports, or throw them in the back seat of their cars.

At just under 6 pounds, the Durabook compares to other consumer notebooks on the market and is easy to pack away with paperwork. Users sacrifice nothing in the areas of reliability and power.

In the couple of months that I used the Durabook, it was decidedly unquirky. Only once did it fail to wake from sleep mode. I used the power button to restart, and the machine didn't suffer any further trouble.

Battery life allowed for ample work time away from a power source, and I really appreciated the advance warning when the battery was low. I've had the unfortunate experience of losing data on laptops that shut down with little or no warning of a looming battery shortage.

The D14RY also adapts to the desktop. Though the model I used did not come with a docking port, the notebook had many ports to easily attach home or office peripherals.

My one complaint: the touchpad. The touchpad offers a navigational feature I found to be annoying and virtually useless. Using a designated area on the right side of the touchpad, the user can quickly scroll up or down.

For me, this scrolling often occurred in the midst of typing — which was quite disruptive — since in the typing position this area of the touchpad falls under the base of the thumb.

I attempted to use the scroll feature and could never do it to my advantage because it moved too quickly and unpredictably. After contacting Twinhead, I discovered this feature won't work properly with Microsoft Vista until a driver is produced by a third-party vendor. As of press time, the driver had not yet been released.

Nevertheless, I found the occasional interruption was a small price to pay for the favorable features the Durabook offers. GT

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BY EMILY MONTANDON
EDITOR, *TEXAS TECHNOLOGY*

Send product review ideas to chief copy editor **Miriam Jones** <mjones@govtech.com>

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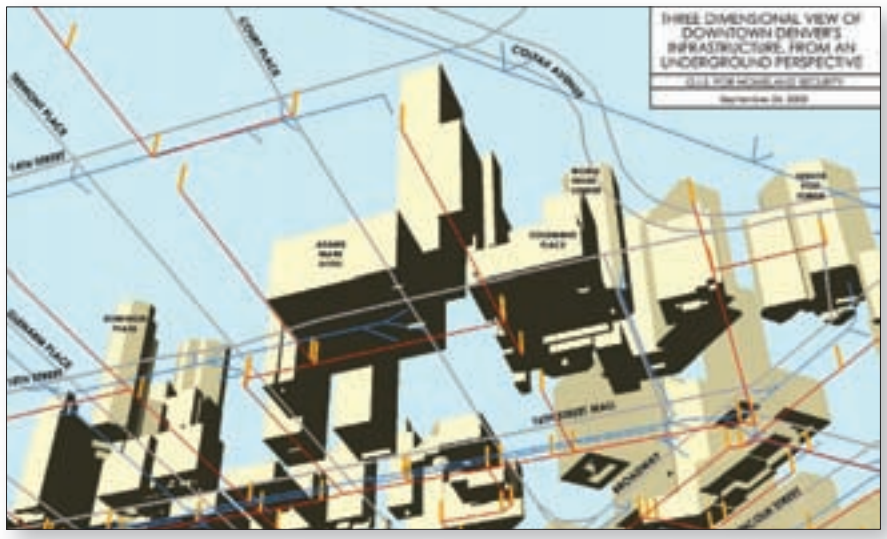

3D view of downtown Denver's infrastructure from an underground perspective

"GIS and related Web services are integral to daily business operations, strategic decision making, public communication and provide the foundation for the implementation of Denver's 311 service delivery."

David Luhan,
GIS Manager, DenverGIS

"DenverGIS provides enterprise-class services to our internal and external customers and plays a leadership role in Denver's technology strategy."

Michael Locatis,
Chief Information Officer, City and County of Denver

DenverGIS is the centralized geographic information system (GIS) department for the city and county of Denver. It uses ESRI's ArcGIS® software to provide GIS services that are aligned with the mayor's service delivery goals. More than 34 city and county departments use the GIS for applications to generate a real return on investment. Applications range from tax assessment, community planning and development, and public works to public safety. Visit www.denvergov.org/gis.

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Pocketable PC

Trimble's Juno ST handheld has a built-in high-sensitivity GPS receiver and Wi-Fi/Bluetooth for wireless connectivity to office networks, cameras and mobile phones. It weighs 4.8 ounces and measures approximately 4.3 x 2.4 x 0.7 inches. The handheld has 128 MB of nonvolatile flash data storage and a Secure Digital card slot for additional data storage. The rechargeable lithium-ion battery lasts up to six hours. <www.trimble.com>

Pleasing Prints

OKI Data Americas' C5550n multifunction product (MFP) delivers black-and-white copy speeds of up to 32 pages per minute (ppm); and color speeds of up to 20 ppm. The C5550n MFP delivers 1200 x 600 dpi print quality and includes 8.5 x 47.24-inch banner capability. It also includes a 50-sheet auto document feeder and offers 400-sheet standard paper capacity, expandable to 930 sheets with an optional second tray. The unit features an analog fax and the ability to scan to network, FTP or e-mail. <www.okidata.com>

Noteworthy Books

The **Malibal Veda Series notebooks** include 20.1-inch, 1680 x 1050 WSXGA LCD active matrix widescreen display and an AMD Turion 64 X2 dual-core mobile processor. The basic configuration includes a 40 GB hard drive and DVD/CDRW combo drive. The notebook packs a built-in CMOS 1.3-megapixel camera with 640 x 480 VGA resolution, 512 MB RAM, internal 802.11g Wi-Fi/Bluetooth wireless cards and a 7-in-1 card reader, as well as dual graphics processing units.
<www.malibal.com>

Tremendous Tablet

The **Motion Computing LE1700 Tablet PC** contains a 30 GB hard drive (with 60 GB optional), a 12.1-inch SXGA+ high-resolution LCD screen, Intel Core 2 Duo processor and up to 4 GB of 667 MHz memory. The optional WriteTouch display gives users the choice of digital pen or touch input. The unit has integrated wireless wide area networking as well as 802.11g and Bluetooth.
<www.motioncomputing.com>

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BY PAUL W. TAYLOR
CHIEF STRATEGY OFFICER
CENTER FOR DIGITAL GOVERNMENT

"Lablogatories" of Democracy

Supreme Court Justice Louis Brandeis famously labeled state legislatures "laboratories of democracy." It was recognition that American government was a work in progress, and that lawmaking bodies were testing grounds for innovative approaches and for sustaining the republic.

Brandeis would've paid attention to a growing phenomenon that has largely gone unnoticed. With legislatures incubating ideas online, lawmaking bodies can also be "lablogatories of democracy."

The National Council of State Legislatures' *The Thicket* keeps a running tab of legislative blogs from both political sides and in all parts of the country. Virginia Delegate Kristen Amundson blogs at *7 West* <www.7-west.org> with her colleague Bob Brink from the commonwealth's General Assembly. In a post that Brandeis would've surely applauded, Amundson wrote: "Most of us got into public service because we care about issues. Blogging gives us a way into policy debates."

her last election by only 337 votes. In Minnesota, only 20 votes meant victory for fellow blogger State Rep. Ray Cox. That margin grew to 600 in Cox's most recent election, even in his highly competitive district, thanks largely to constituent contact through his blog.

Legislators win and lose in every-vote-counts environments, and some are betting that the margin of victory lies in the blogosphere. Blogging reaches the generational cohort who's put off by traditional institutions, but would engage in vital public conversations if the conversations take place on their home turf.

Although lablogatories of democracy aren't the exclusive domain of the legislative branch, other public institutions face greater blogging dilemmas.

The judicial branch has a long tradition of being circumspect on matters that may come before the court. But a growing number of judges now weigh in on the merits of blogging, even if only through surrogates, such as the Law Professor Blogs Network.

The ability to **voice opinions** and **jump-start debates** gives blogging legislators great promise and definite advantages.

The ability to voice opinions and jump-start debates gives blogging legislators great promise and definite advantages.

First, unlike corporate or institutional blogs in which there is still a tendency to edit the spontaneity, authenticity and eccentricity out of a good idea (or even an excited utterance), individual blogs reflect the personality and relatively unvarnished views of the author. The second advantage is that legislators *are* individuals — for whom old-school party loyalty has become much more like a franchise relationship.

And that brings us to the promise. Candidates in this new environment win elections by the narrowest of margins — Amundson won

Then there's the still nascent practice of blogging in the executive branch where smart people serve, but whose voice is expected to harmonize with that of the executive, if heard at all.

However, California Gov. Arnold Schwarzenegger may be pointing the way forward with his Web site's blog. Dozens of administration officials post comments on the events and issues of the day. The governor himself, most famous for his onscreen performances, is conspicuously absent — an especially curious fact given that the online journals on the site are exclusively vlogs, more formally known as video blogs. GT

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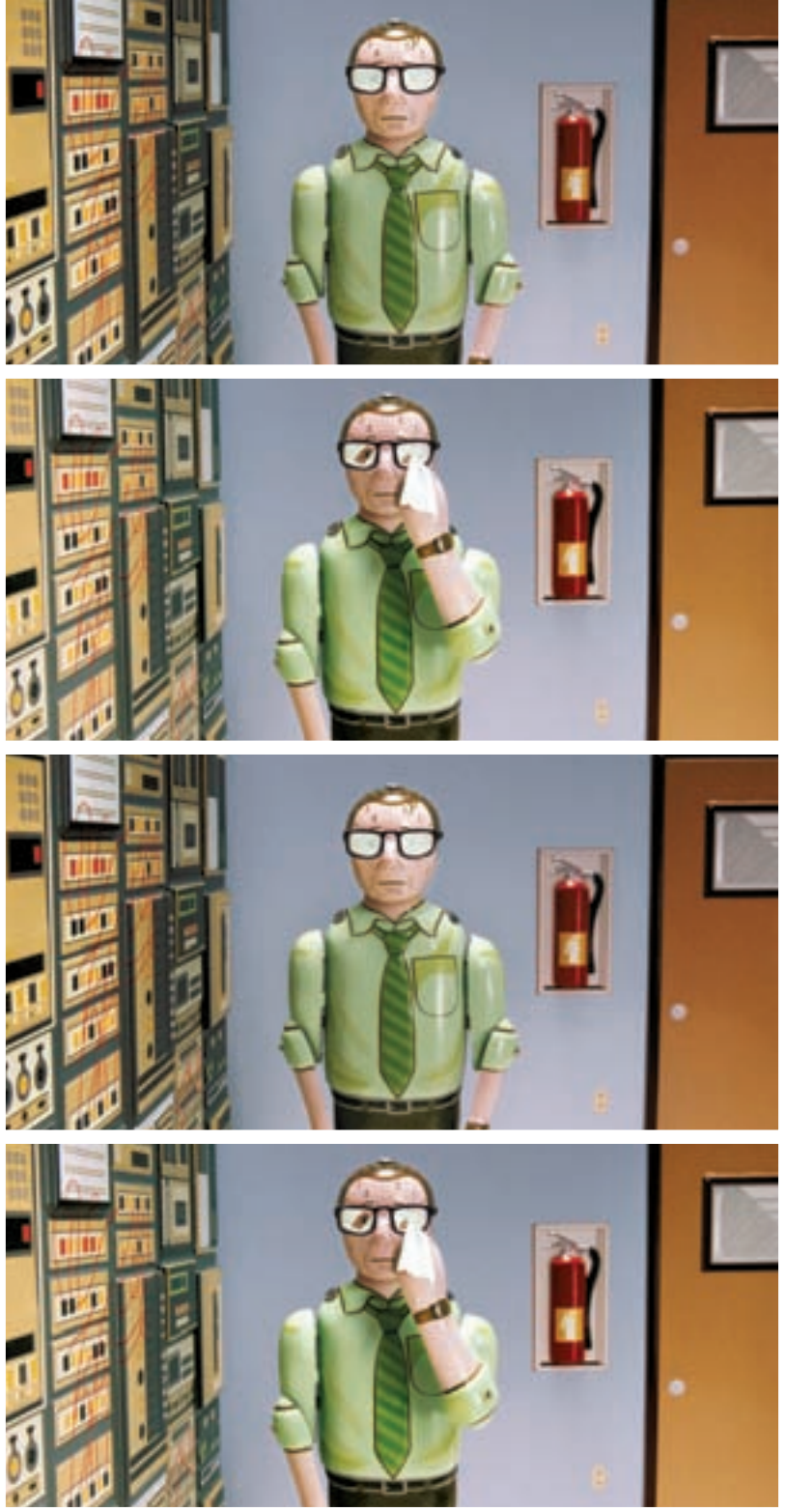

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