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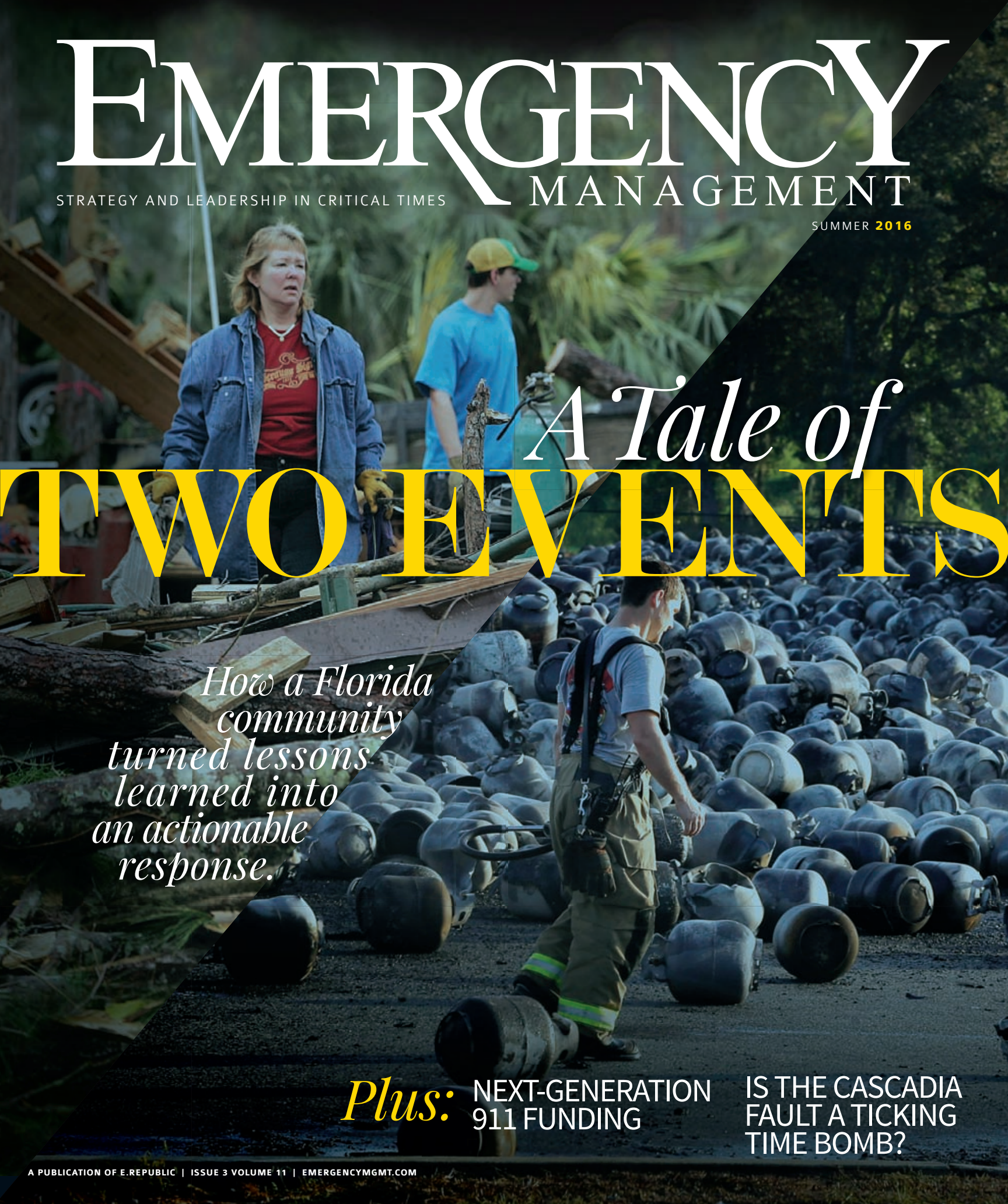

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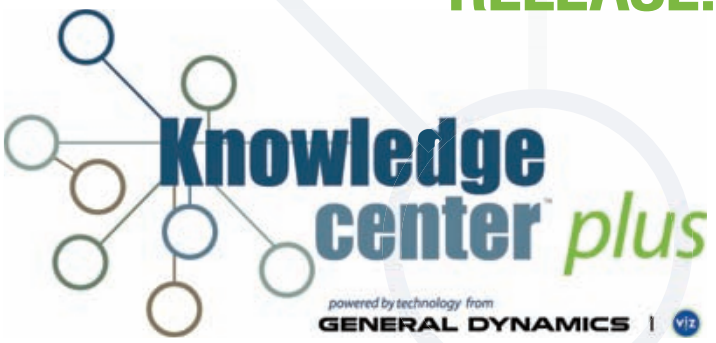

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"Unfortunately, federal and state governments are in the business of being reactive rather than proactive. The water systems, and worse yet the aquifers, are in serious need of evaluation now, not when large numbers of people become ill. In addition, our entire critical infrastructures (roads, bridges, sewer systems, electrical systems, nuclear reactors and rail systems) are all archaic and very much in need of repair and upgrade. Our legislators seem totally disconnected and their priorities totally [askew] with what any reasonable person would do to address this most critical issue."

PH Dad — in response to *Water Crisis* in the Spring 2016 issue

Anything to please the feds, but when it hits the fan, that pocket card will soon replace the 200-plus-page resource manual. OK, but you can't plan for everything.
Dennis Wolf — in response to *All Hazards Covered* in the Spring 2016 issue

It'd be interesting to see the age of the participants and the level of "danger" they felt during the simulated emergency. I'm stereotyping my fellow millennials, but most don't see smoke in a building as an emergency, especially when they know they're in a controlled environment. I think it's culturally a millennial response to being a test subject, not necessarily an indicator of trusting the robot itself.
Bella Dzaster — in response to *Trust a Robot? Think Again* in the Spring 2016 issue

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I like how the study mentioned that in the past, tornado considerations were thought of as a safe room addition to blueprint plans. I believe it is time for buildings to be built that can withstand EF5 tornadoes. The whole building needs to be a safe place for people, not just a room or two.
MXM — in response to *Joplin Study Spawns Recommendations* in the Spring 2016 issue

FEMA 320, first published in 1999, already urges that a safe room be the preferred method of protection for all homes and small businesses in Joplin; it has maps and a worksheet so readers can see which zone they are in and what advice FEMA gives. It just needs to have legislative teeth. FEMA 361 is about community shelters. Again it needs teeth. Use of properly reinforced concrete for the building envelope will usually give protection against EF3 tornadoes. The windows and doors remain the challenges. I'm not aware of openable windows that are acceptable in a safe room, but admit I've been wanting to make tornado incidence maps showing isolines of density, using Voronoi diagrams.

Jean Smiling Coyote — in response to *Joplin Study Spawns Recommendations* in the Spring 2016 issue

It is encouraging that you have utilized the all-hazards approach to actively prepare for emergencies. I see a positive element in your community (versus "event amnesia" in others) that allows you to speak honestly about shortcomings and how you are dealing with them. I also appreciate the fact that you are sharing that information with so many other communities. I have read many accounts of the events of May 22, 2011, and have been impressed with the involvement of so many government and NGO agencies (as well as local businesses and private citizens) in the response and recovery. It sounds like you have taken a worst-case scenario and turned it into a positive for your city.
Tammyrt — in response to *It Happened to Us* in the Spring 2016 issue

We appreciate your feedback, and we invite you to join the conversation at www.emergencymgmt.com or on our Facebook page at www.facebook.com/emergencymgmt

By Jim McKay

Was Orlando an Intelligence Failure?

After the worst mass shooting in the country's history, there is no shortage of bluster, nonsense and political theater surrounding some legitimately appropriate context.

Matt Mayer is a visiting fellow with the American Enterprise Institute and a former senior official with the U.S. Department of Homeland Security. His views have appeared in this magazine before. His column on CNN days after 49 souls were lost to a crazed gunman in an Orlando nightclub is as close as we can come to a list of what I think are the key elements of what could be called a failure.

EXPERTS HAVE BEEN ASSERTING FOR YEARS THAT THE DIFFERENT LAW ENFORCEMENT ENTITIES MUST COMMUNICATE MORE EFFECTIVELY.

The shooter, Omar Mateen, had twice been investigated by the FBI. Twice the FBI thought enough of his possible terrorist ties that the agency looked into it. Then it moved on. As Mayer said in his column, at a minimum a red flag should have been raised after Mateen bought two guns in the two weeks prior to the massacre.

Mayer wrote, "How an individual whose actions twice prompted the FBI to investigate — including a 10-month preliminary investigation — can purchase guns and ammunition without any alert being triggered with law enforcement suggests a failure of our intelligence system."

Ya think?

It's a failure on the FBI's part not to continue to monitor this individual. As Mayer pointed out, how many people have the distinction of having been interviewed twice by the FBI? And it wasn't an interview and then a follow-up. In two different years, 2013 and 2014, Mateen said or did something that perked the ears of the FBI. And then the agency lost track of him. If the FBI didn't share information with other entities, why not?

At the very least, his interest in purchasing a long-rifle, a Sig Sauer MCX, June 4, then a Glock 17 handgun the next day should have raised a red flag — somewhere. But there apparently was no connection between the FBI investigation and local law enforcement or any intelligence system.

That has to change. Experts have been asserting for years that the different law enforcement entities must communicate more effectively. Did the FBI inform local law enforcement of Mateen's investigation? Are fusion centers really doing what they originally set out to accomplish?

Mayer advocates reforming the domestic intelligence system by consolidating state and local information and intelligence fusion centers with the FBI's Joint Terrorism Task Forces. That, he said, would make sure there is no disconnect between federal, state and local law enforcement entities.

We've written for years about the disconnect in intelligence, and it's still there. You wonder, in the face of the worst mass shooting in modern U.S. history and the worst terror attack on the country since 9/11, if anything will change.

QUESTIONS OR COMMENTS?
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In the News

An Orlando, Fla., nightclub was the site of the worst terror event since 9/11 when Omar Mateen killed 49 people and wounded more than 50 others on June 12. It was also the worst mass shooting in U.S. history and stoked arguments for and against gun control, law enforcement surveillance and communication of intelligence among public safety agencies.

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Australia Buckles Under the Cost of Disasters

According to *The Guardian*, the costs of disaster in Australia tip the scales in more ways than just dollars. The increase in social devastation is taking its toll in the form of family violence and mental health as a result of the bushfires, flooding and earthquakes that have plagued the country. Last year, natural disasters cost Australia $9 billion. But that is projected to increase to $33 billion by 2050 because of the effects of climate change and the social ramifications. The report said investment in resilient infrastructure is needed, as well as an investment in long-term social care.

CYBERTHREAT INTEL

In post-9/11 America, states have accepted more responsibility in protecting their citizens. And as the firm grip of technology tightens around our daily lives and the most basic operations of government, one state is stepping up to the proverbial plate as a leader in the cybersecurity field.

In May 2015, the New Jersey Cybersecurity and Communications Integration Cell took root within the state's Office of Homeland Security and Preparedness as a counterpunch to the escalating online threats posed by a widening cast of bad actors. The mission: Find and mitigate the threats, and share the intelligence gathered in the process with everyone else.

According to Chief Information Security Officer Dave Weinstein, the statewide program is modeled after the Department of Homeland Security National Cybersecurity Communications Integration Center and leverages a multipronged strategy to head off potentially damaging attacks.

In addition to monitoring cybersecurity in the state, the shop also builds in coordination with other agencies. Engineers, analysts and communications experts are all on hand to address issues as they arise. — *Eyragon Eidam*

Smarter Emergency Response

Emergencies are, by definition, unexpected occurrences — but one Florida county has a new 911 system that aims to remove some of the guesswork by putting data in the hands of decision-makers who can make smarter choices about emergency response.

In Manatee County, an aging legacy 911 center kicked off conversations about how to improve emergency services, and late last year, officials launched the new, more efficient next-generation 911 call center. The upgrades give dispatchers modernized communication tools and will allow for multimedia communications, but perhaps most significant is that officials now have the necessary ammunition to make life-saving decisions: data analytics.

Public Safety Director Bob Smith said that hard data has allowed for more precision in staffing first responders on the streets and on the county's barrier island, which is connected to the mainland by two bridges.

"We have an ambulance on that island, but we [found that] the call times and call volumes on that island were longer than what we were targeting for our response times. So what we looked at was, 'What is our busiest call frame and our busiest call volume on the island?'" Smith said. "Because of the data we were able to pull from the system, we actually stood up a new quick-response vehicle for our EMS units." — *Eyragon Eidam*

AMERICANS ARE NERVOUS ABOUT BIOLOGICAL WEAPONS

Results from a survey on biosecurity conducted by the Alliance for Biosecurity, the Blue Ribbon Panel on Biodefense and Trust for America's Health include:

8 of 10 Americans are concerned that naturally occurring diseases like Ebola and Zika pose a threat to the U.S. and other countries they travel to.

9 of 10 are concerned that terrorists might use chemical or biological weapons against the U.S. or its allies.

61% of Americans were surprised to learn that preparedness funds are experiencing a shortfall.

50% of Americans are confident that the government is prepared to address the next biosecurity threat, such as Ebola, pandemic flu or smallpox.

SYNTHETIC DRUGS POSE LETHAL THREATS FOR FIRST RESPONDERS

FOR NEARLY 50 YEARS, America has been fighting a war on drugs. Beyond the detrimental effects drugs have on users and their loved ones, they're proving to be a silent but potentially lethal threat to first responders. Methamphetamine, cocaine, marijuana and heroin are commonplace — it's the increasingly popular and potent synthetic compounds that have officers and public safety agencies on edge. This Q and A with Brian Escamilla, forensic chemist at NES, highlights the new threats first responders face and how agencies can help protect them.

BRIAN ESCAMILLA,
Forensic chemist at NES

Q: What synthetic drugs present the most significant threats to police officers, firefighters and other first responders?

A: Fentanyl, fentanyl analogs and other emerging synthetic drugs have not only killed users, but are serious threats to first responders. These drugs are extremely potent, and in the case of fentanyl, they are transdermal and readily absorb through the skin. Because they are potent in small doses, they are commonly mixed with and masked by other compounds, making them difficult to identify.

Many of the chemicals used to manufacture drugs are toxic, flammable and explosive. On an average week, three to five illicit drug labs burn down or blow up. Extremely toxic gases and vapors are also produced during production. These toxic, flammable and explosive scenes are a serious risk to all first responders.

Q: What risks do these drugs pose to first responders and law enforcement officers?

A: Exposure can be lethal – there are instances over the past year where officers have been exposed to fentanyl and came under medical duress. Naloxone was administered to subside these effects, which is the best antidote for any opioid drug — but it must be administered quickly. Exposure to fentanyl will cause respiratory depression, which can quickly escalate into other life-threatening medical conditions.

Q: How have synthetic drugs changed a first responder's job? How can they better protect themselves?

A: First responders must wear proper protective equipment and take steps to avoid contact with drugs as well as the chemicals used to manufacture them. Some of these drugs can be absorbed quickly. Depending on where fentanyl contacts the skin, 46 to 66 percent of a dose can be absorbed into the body. If a drug is extremely potent or toxic, a first responder could start feeling ill within minutes of an exposure, maybe even seconds.

First responders should wear personal protective equipment when handling evidence, suspects or overdose victims in case potent synthetics are present. These synthetic drugs can be in the air, on the individual's skin or clothing, or on any surface or item at the scene. If first responders are exposed, they could suffer serious health effects.

Q: What can public safety agencies do to better protect the health and safety of their first responders?

A: The most important action to take is to provide first responders with awareness training. Anyone who could handle narcotics or be present in an area where narcotics are synthesized, packaged, dispensed or used needs training and the proper protective equipment. First responders need to recognize these new synthetics drugs, narcotic manufacturing trends, and the signs and symptoms of exposure to the drugs or chemicals. Rapid recognition can save a life.

THE NG911 F

By David Raths

While FirstNet gets $7 billion, next-gen 911 gets $150 million from the feds.

The First Responder Network Authority (FirstNet), designated to modernize telecommunications networks for first responders, is slated to receive $7 billion in federal grants, with funds derived from radio frequency spectrum auctions. But if first responders are going to take advantage of new broadband infrastructure and multimedia capabilities, they are going to need partner agencies in public safety access points (PSAPs) with corresponding networks and capabilities. So far, however, the federal grant funding to help PSAPs transition to next-generation 911 has been minuscule. Organizations advocating for 911 agencies have formed the NG911 NOW Coalition to focus attention on the urgency of the situation.

The current 911 infrastructure has difficulty supporting text or multimedia messaging, and it lacks the capability to interconnect with other systems and databases such as building plans and electronic medical records. There is a movement underway to move to an NG911 system based on modern Internet protocol-based networks that take advantage of capabilities like text and video messaging. Beyond receiving and sending multimedia, there are other benefits to the new types of networks. PSAPs will be able to transfer calls and activate alternative routing to share the burden during an emergency or when they are closed by disaster. Linked PSAPs will also be able to share resources such as GIS databases rather than each having to purchase its own.

To date, progress toward replacing legacy systems has been spotty across the country. Some states have switched to IP networks

UNDING GAP

and begun work on receiving 911 calls via text message, yet in the most recent nationwide survey, fully half the states had made no progress yet. The members of the NG911 NOW Coalition are the National Emergency Number Association (NENA), the National Association of State 911 Administrators and the Industry Council for Emergency Response Technologies (iCERT). They have set a target date of 2020 to have NG911 deployed across the country. That year was selected because most of the major telecom carriers, both wireline and wireless, have

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indicated that in 2020 they want to convert all their networks to IP technology, said Brian Fontes, NENA's CEO. Also, FirstNet, which will be rolling out in the 2022-2023 time frame, will be all wireless IP broadband.

"We believe that in order to make a smooth transition from consumers, who will obviously be on IP networks, through to the first responders who will be on wireless IP networks, it is essential we have that same capability in our 911 centers," Fontes said. "They must be capable of pushing and pulling data and be able to utilize videos and photographs, both to prepare responders for responding and to have a better understanding of an event itself."

FCC Chairman Tom Wheeler has been a vocal advocate for NG911. In March 2 testimony before the U.S. Senate Committee on Commerce, Science and Transportation, Wheeler noted that "in too many communities, the communications technology behind the 911 system is dangerously out of date," and that "PSAPs also face constant challenges to maintain adequate funding for ongoing operations." He urged the committee members to do all in their power to make sure the nation's PSAPs have the tools and resources they need to accelerate the transition to NG911.

Patrick Halley, executive director of the NG9-1-1 Institute, an organization supporting the coalition's work, said the coalition was formed to shine a light on the fact that the U.S. needs to accelerate the deployment, both for the consumer benefits it will bring, as well as because communications networks are being upgraded and the legacy 911 infrastructure will soon be outdated and unsupported.

Setting a target date may lend some urgency to the funding issue, Halley said. "Look at the digital television transition. They set a date-certain to transition analog stations to digital. Having that date pushed everybody in the same direction, focused on how they were going to achieve that transition, and basically it worked."

The 911 providers derive their funding from fees paid on wireless and wireline phone bills, although in many states prepaid wireless phones don't pay a 911 fee. But many people are convinced that this recurring source of revenue is not going to be sufficient to pay for maintenance and use of the current system while simultaneously allowing PSAPs to invest in making the transition.

"Some people would say the PSAPs are getting surcharges to provide the funding for the transition, but what they are missing in that argument is that those surcharges are applied to wireless and wireline and voice over IP lines. So it is sort of like a bucket of water with a huge hole in it, and that is the wireline side," said Darrin Reilly, iCERT's chair.

"People are disconnecting their wirelines, and the surcharges are going down, so as you have to go through this transformation, you are losing money," Reilly said. "We should modify the wireless charge to make up for the loss, but of course that would be challenging politically."

An example of a state that has made good progress is Minnesota. Managed by the Department of Public Safety's Division of Emergency Communication Networks, the 911 Program in Minnesota is completely funded by 911 fee surcharges and receives no revenue from the state's general fund. The NG911 ESInet (Emergency Services IP Network) deployment to its 104 PSAPs costs $9 million. The time from migration of the first PSAP to completion was two years and four months. The transition was funded exclusively from 911 fees.

So do jurisdictions already have enough money to pay for the transition? "In many states, the answer is no," Halley said. (The FCC has studied how much each state collects in 911 fees and sought to determine the percentage each was spending on components of an NG911 system, and nationwide the average is less than 10 percent.)

Another reason a coalition was needed to raise awareness, Halley added, is that the 911 system basically works today. When you dial 911, the call goes to the right center and gets you help. There are not wide-scale failures. That fact may lower the sense of urgency on the part of policymakers.

"But the PSAPs' capabilities are completely limited compared to what they could be, and as infrastructure providers sunset their legacy networks, it is going to be 911 systems that are out on an island," Halley said. "So I don't think policymakers feel that urgency to say we need to start moving forward now. We are in an era of pretty tight budgets at the state and local level. That is part of the reason we're stalled. There is a need for a one-time infusion of money for that transition, and there is a role for Congress."

There is an NG911 Caucus in Congress that launched in 2003. It is led by Sens. Amy Klobuchar, D.-Minn., and Richard Burr, R.-N.C., and Reps. Anna Eshoo, D.-Calif., and John Shimkus, R.-Ill. They have been champions for 911 and are the most likely to lead the effort on funding, but it remains difficult to get significant funding bills through Congress these days.

Jeff Cohen, chief counsel for the Association of Public-Safety Communications Officials (APCO), said his organization believes that initially a significant amount of targeted funding is going to be necessary, especially from the federal government. "There also need to be mechanisms put in place so that after the grant funding runs out, the systems remain sufficiently funded and sustained."

Cohen said APCO's position is that the country needs clear definitions and standards for all aspects of NG911. "They should be created by a nationally accredited standards development organization that uses a consensus-based approach and preserves local options for deployment, but ensures that no proprietary technologies are implemented that would limit interoperability."

APCO wants to maximize opportunities for national-level economies of scale for 911 equipment and services, which right now no one enjoys, he said. "We want to preserve local control, so states and localities have flexibility on technology choice. We want PSAPs to leverage innovation to the fullest extent."

Laurie Flaherty is coordinator of the National 911 program in the U.S. Department of Transportation. One of her office's responsibilities is overseeing the NG911 grant program. The amount of money that has been allocated for this grant program thus far has been relatively small, she said. From 2009 to 2012 there was $43 million from a spectrum auction that went to NG911 pilots and planning. The same spectrum that yielded $7 billion for FirstNet allocated $115 million for NG911. "They will transfer that money to us in the relatively near future," Flaherty said. "We can start in earnest to write the regulations and set up the infrastructure to oversee the grant program. I would say in about a year from now we will make announcements about applications for these grants."

Her office is in the middle of a two-year project to determine how much it is going to cost to implement the nationwide NG911 system. Directed by Congress to do the study, the office will issue that report in September 2017. Although she doesn't have any specifics yet, the cost range will likely be in the billions rather than the millions.

Although federal grant funding has been limited, some states and regions have made significant progress on NG911 already, including Vermont, Tennessee, Minnesota, Maine and Washington. "A state like Vermont is so much simpler than a state like California or a home-rule state where they are so much more decentralized and just trying to agree on a plan is difficult," Flaherty said. "In the states that have made progress, I think they have stronger leadership and have figured out a way to find the resources to do it."

Another funding challenge that 911 systems have faced is the tendency of some states to divert money to address other emergencies such as firefighting. To obtain grant funding, 911 organizations must certify that for the 180 days immediately prior to the application they have not diverted funds to any other purpose. Flaherty said she understands why Congress made that part of the statute, "but on the other hand, I feel bad when that happens, because it penalizes the 911 system twice. They lose their own surcharge funds and then are not eligible for federal funds."

Also, she said, if the grant funding isn't for a considerable amount of money, it doesn't serve as a deterrent from diverting funds. The NG911 grant program had the authority to allocate $250 million a year for five years. "Had it been appropriated at the level it was authorized," Flaherty said, "then it might have been a more effective deterrent."

Although the funding for the two systems is separate, Halley sees a clear reason for the FirstNet and NG911 deployments to be closely coordinated. Once we have NG911, consumers will have the ability to transfer voice, video and data directly to a 911 center. Today we can do voice only, he said. Tomorrow we will be able to share images from a phone and real-time video. It could be an image of a burglar or someone injured in an accident.

"The 911 center ought to be able to distribute that to responders in the field via a mobile data network. It is crazy to invest billions to put high-speed mobile data in the hands of first responders and invest in upgrading the 911 center so it is capable of receiving the information from consumers, and not make sure there is integration between the two," Halley added. "This is a great opportunity. It is going to happen. It is just a matter of when and how high a priority it is."

Flaherty also sees the importance of aligning NG911 and FirstNet. "The example I always give is if you want the photograph of the bank robber to go from the citizen's cellphone to 911 to the emergency responder, all three components need to be operating off the same infrastructure," she said. "So while lots of people are focusing on FirstNet, I don't think we reach the full potential of that system unless NG911 is right next to it."

She said her office is working to make sure the state 911 executives are present at the FirstNet consultation meetings and the FirstNet people are on the 911 boards. "Unless the right people are talking to each other, we are not going to end up with a seamless system, which is what everybody assumes is going to be in place."

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TALE of TWO INC

How the first incident spurred changes that helped response to the second.

BY MARGARET STEEN

Communications lessons from the Groundhog Day tornadoes in 2007 in central Florida led to a more efficient response several years later.

IDENTS

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In the early hours of Feb. 2, 2007, a squall line in central Florida spawned strong tornadoes in Lake County.

"It was a very localized tornado outbreak, but it was pretty hardcore as far as the damage that it did," said Jason Matthews, a corporal with the Lake County Sheriff's Office who is assigned to the 911 communications section.

The aftermath of the tornado would teach Lake County's emergency responders valuable lessons about communications and training — lessons that would be put to good use in a different type of disaster six years later.

A tornado first touched down near the Sumter County line, damaging more than 1,000 homes and destroying about 200, Matthews said. Then, in the community of Lady Lake, it damaged 200 homes and destroyed 100 — and killed eight people. Shortly after that, a second tornado touched down near Lake Mack, killing about a dozen people and affecting hundreds of homes.

One casualty of the tornadoes: a 1,700-foot-tall communications tower that served an entire region of the county. The tower housed equipment for several different radio systems and a couple local radio stations. When Matthews responded to a phone call saying there had been a terrible tornado and communications were down, he and his colleagues responded to see if they could fix it.

"We found the tower completely destroyed. The tornado knocked it to the ground," Matthews said. "It was in a pretty rural area, and at that time we didn't have a backup tower. We never would have thought that tower would come down."

As they worked to recover from the tornadoes, law enforcement and other emergency responders in the county realized that they were lacking not only backup communication towers, but also common training that would enable them to work together.

"The Groundhog Day tornadoes in 2007 were a call to action," Matthews said. "Our communication system wasn't really equipped to handle that incident. It also gave us a wake-up call to the lack of common training between police and fire and EMS."

The problems had not been obvious before the tornadoes.

"Everybody thought we all worked together really well, but after 2007 we realized we could do better," said Thomas Carpenter, emergency management division manager for Lake County. "When the tower went down and the communications went away, it accentuated how we were working in silos. That's when we started working on our training and the new communications system."

One key to better training: making sure everyone was using FEMA's national framework for emergency management, the National Incident Management System (NIMS). NIMS includes the Incident Command System (ICS), which is a standard, on-scene, all-hazards incident management system. The goal is to make it easier for agencies to work together on short notice, as when neighboring departments come to the aid of a community that has experienced a disaster.

"NIMS and ICS don't tell local and state governments what to do," said Matthews. "It really gives them a set of management tools, ideas and common terminology to bring to agencies that don't normally work together to accomplish a goal."

In the aftermath of the 2007 tornadoes, Lake County officials asked neighboring counties for help bringing mobile communications towers to the affected area. In 24 hours, a team of radio technicians, vendors and county personnel was able to remove the equipment from the destroyed building and rebuild a temporary radio system.

But despite the cooperation, the path to success was not smooth.

"Our county was the last county in Region 5 that was using the VHF and UHF radio spectrum — we were not on 800 MHz as the rest of the region was," Matthews said. "In the

In 2013, an explosion in Lake County, Fla., called for the response of 19 different agencies that benefited from a new communications system and other major improvements.

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MARK WOLFE/FEMA

Some of the damage caused by the Groundhog Day tornadoes, which set off a series of reforms.

initial response phase, the first 12 to 24 hours, as other counties were sending people in to help us, we had a lot of difficulty with agencies being able to communicate with each other."

And technological incompatibility was only part of the problem.

"We focus a lot on the radio system that didn't work, and we tend to shift our focus away from the underlying factors," Matthews said. "There are a lot of agencies that don't talk together on a regular basis. They don't train together." It's more fruitful, he said, to have people from different agencies who know each other and have worked together, even in a training exercise, before a disaster.

The lack of training on NIMS and ICS protocols showed, as well.

"Fire and EMS had been training and using NIMS and ICS protocols for a long time," Matthews said. "When they show up at a scene, they know to go to the check-in and get their orders for the day before they go to work. At that time, on the law enforcement side of the house, it was more, 'Just show up and go to work.'" This left the command staff without a clear picture of who was working on what, who was on their way and who was on standby to come if necessary.

The Lake County Sheriff's department took stock of its response to the tornadoes and implemented a number of changes:

- Created a full-time emergency management coordinator position. This person's job included setting up training on NIMS and ICS so that personnel would be better able to work with other public safety responders and more efficiently use their resources.
- Established an agency incident management team. This group, a mix of people from around the agency, plays a crucial role in managing emergencies, such as by checking in personnel from outside the county.
- Increased communications training. The U.S. Department of Homeland Security was rolling out courses for communications unit leaders and communications technicians. "I was fortunate enough to get to attend one of those, and I brought back the training and knowledge," said Matthews. This allowed all the radio personnel to be trained on incident response, something that hadn't traditionally been part of their training.
- Participated in regional and statewide communications exercises. This helped in two ways: The players from different agencies got to know each other, and the communications staff got in on the early part of the disaster response. "In the past, communications folks didn't get called until communications were really bad," Matthews said. "Anytime there's a major incident now, we jointly respond." That way, they can find out which outside agencies are coming to help and anticipate any special communications needs they will have. And the communications staff now has "a relationship and a trust factor" with the battalion chiefs and shift commanders who are working on emergency response.
- Upgraded the radio system. "In 2009, we purchased a brand-new radio system to replace the antiquated VHF technology," said Matthews. "It put us on a level playing field with everyone else in the region." The county also increased the number of communications towers, making the infrastructure much stronger.

Matthews attributes the smooth purchase of the new radio system to the problems

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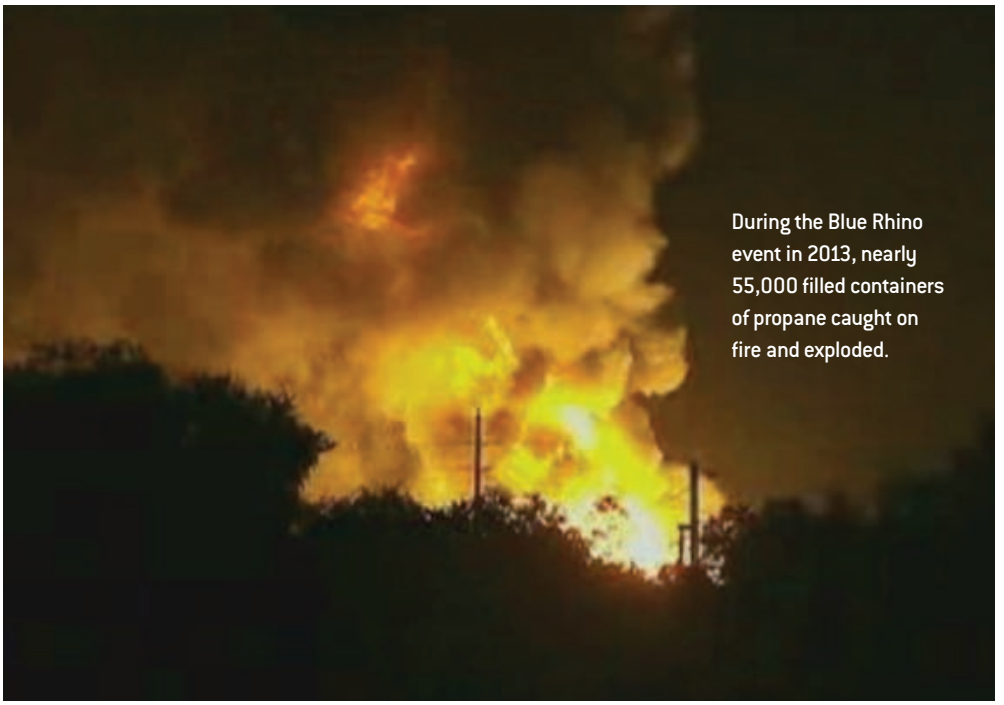

During the Blue Rhino event in 2013, nearly 55,000 filled containers of propane caught on fire and exploded.

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that resulted from using the old system during the aftermath of the tornadoes.

"The elected officials came out and saw that tower lying in the grass" in 2007, said Matthews. "It spurred the discussions to get things moving."

Would all this training, reorganization and new technology actually make a difference in an emergency? Lake County had an opportunity to answer this question — and see how well all these changes were working — a few years later.

The county is home to a company called Blue Rhino, which refurbishes and refills the propane canisters used for gas grills. The refurbishment facility operates 24 hours per day.

On July 29, 2013, a malfunction with a forklift caused a fire, which in turn caused a small explosion, Matthews said. Over half an hour, the situation worsened. As the initial fire engine companies were responding, the fire spread to 55,000 gas grill tanks that were stored — filled with propane — on the property. About 300 to 500 of the canisters rocketed away from the facility, some landing more than a mile away.

"Almost the entire inventory of 55,000 filled containers caught on fire and exploded," said Matthews. "It was quite a scene."

Hundreds of people called 911, saying they could see the fire, reporting propane canisters landing in their yards and asking if they should evacuate.

"It was quite a scary situation for a lot of the residents," Matthews said. "It called for a very large public safety response."

About 19 different agencies responded: multiple law enforcement agencies, fire and rescue departments, and the county's emergency management services department. The agencies ranged from the local level all the way to the federal level. There were also aircraft from air medical transport agencies preparing to transport victims to hospitals.

Some critically injured employees were flown to trauma centers, but the numbers weren't as bad as was initially feared. Although they were first anticipating the possibility of hundreds of wounded people, the actual number was more like two or three dozen.

"We were very lucky," Matthews said. "We attribute that to the quick response and evacuation of the immediate area. Also, it happened at 11 p.m. in a light industrial area that is not heavily populated during that time."

Matthews and his colleagues learned the value of all the training, improved communications and standardized systems that had been put in place.

The best proof that the training worked well was how the communications team responded even though Matthews wasn't there for the second incident. Because the agency personnel had been sharing knowledge and a lot of employees had been trained, they weren't hindered by the absence of one person.

"I was out of town when it happened — on a canoe trip, so far out that I didn't have cell service. I didn't even know about it until the next day," he said. "The incident management team folks that I had trained to be able to step in did their jobs, and they did a wonderful job of handling it."

Having 19 agencies working together also showed the value of the NIMS and ICS frameworks, Matthews said. The training and planning work paid off as well.

"When everybody got there, they knew each other — they were used to seeing each other," Carpenter said.

The incident was also a key test of the new communications system. "The voice communications piece of it was seamless," said Matthews. This was true not only for the agencies in the county that worked together regularly, but also for outside groups.

"Orange County responded to help us out, as did several state agencies, the aircraft entities and the Florida Wildlife Commission," Matthews said. "We were able to communicate with all those people at the push of a button."

The contrast between the 2007 tornadoes and the 2013 propane canister incident clearly showed the value of the training and upgraded communications systems.

"In between the two incidents, it completely changed the way we do things," Matthews said.

And although the improvements centered around getting better technology, Matthews said the goal is actually for technology not to be the focus. When communications systems operate smoothly, emergency responders can focus on what needs to be done to help people and recover from the disaster — not on whether they are able to reach their colleagues on the radio.

"It lets us concentrate less on the technology and more on the problem at hand," Matthews said.

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Setting the Stage

Early Builder projects provide FirstNet education.

By Adam Stone

In June 2014 the Adams County, Colo., Communications Center (Adcom911) went live with an LTE network in the 700 MHz band 14 spectrum. In so doing, it became the first successful Early Builder in the congressionally mandated FirstNet program, an effort to deploy and operate a nationwide dedicated public safety broadband network.

Much has been learned since Adams County made its early entry into FirstNet, the First Responder Network Authority. "The most important lesson here is that if this is done right, it works," said Adcom911 Executive Director Joel Estes. "It really is a significant improvement for public safety people out in the field."

Getting there is no small feat, however, as other Early Builder projects have shown. Funded in part by the Broadband Technology Opportunities Program administered by the National Telecommunications and Information Administration, these programs make it clear that public safety authorities can expect to meet a range of technical and cultural hurdles on the road to FirstNet deployment.

The Los Angeles Regional Interoperable Communications System (LA-RICS) deployment has drawn high visibility, thanks in part to a successful demonstration of the network at the 2016 Tournament of Roses Parade in Pasadena, Calif. With hundreds of thousands of spectators on hand, LA-RICS staff joined with county sheriff and fire departments to demonstrate interoperable communications among more than 120 law enforcement, security, crowd control and emergency response personnel.

During the parade, the network incorporated 90 handheld mobile devices. Planners deployed multiple video applications, along with situational awareness applications. To further test the network, the configuration included eight fixed cameras installed along the parade route, as well as six mobile camera units, all delivering live video feeds.

At the height of the parade, the system delivered service two to three times faster than the service available from commercial networks, FirstNet reported.

Planners first had to wrangle with a mass of misinformation that caused a significant network redesign. "There is a great deal of misunderstanding about electromagnetic emissions," said former LA-RICS Executive Director Patrick Mallon.

In order to develop its $154.6 million network, LA-RICS, along with partner Motorola, identified 230 likely sites for telecommunications equipment, including primarily public facilities like firehouses and police and sheriff's stations. This already was a significant reduction from an original list of 750, most of which were dropped in exchange for the state Legislature agreeing to waive a range of costly environmental impact studies.

Those 230 sites would need to cover 620 square miles. (By comparison, Verizon operates more than 1,000 towers in the county.) Then the hitch arose. The firefighters' union cried foul on the grounds that the radio frequency waves emitted by the towers would represent a potential health hazard for firefighters.

According to the American Cancer Society, "most scientists agree that cellphone antennas or towers are unlikely to cause cancer." Public concerns persist, however, and union objections ultimately pared back 230 sites to a final list of 77. "We know we have some coverage gaps, and we are going through a process to identify sites that can provide additional coverage, probably 25 to 30 additional sites," Mallon said.

In retrospect, "an education of the rank and file of what we were trying to build would have helped, but we didn't have the time or resources to do that," he said. "We had just over two years to issue an RFP, go through an evaluation process, negotiate a contract, develop a final

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system design, conduct an environmental assessment, execute site access agreements and then get it all built and turned on."

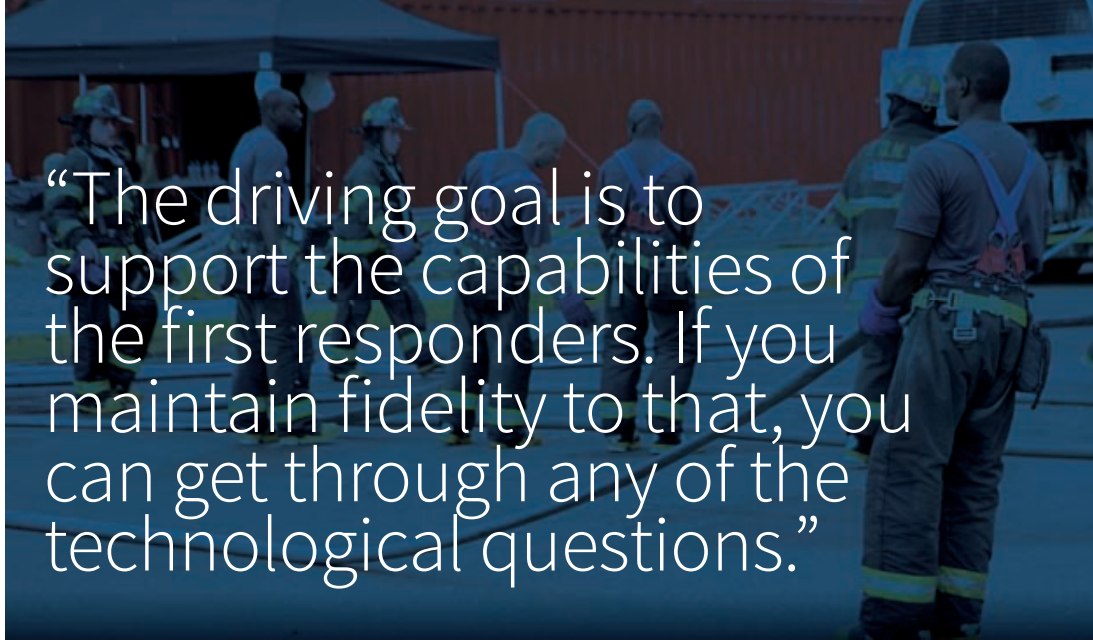
FirstNet leadership meanwhile said that much was learned from the L.A. experience that could be used by other builders down the line. "That was a great lesson for us," said FirstNet Chief Technology Officer Jeff Bratcher. "We saw that we would really need to think about how we would put this together in the future — how we would not be able to rely just on public assets."

Builders met other hurdles. They wanted utilities on the system, for instance, but the utilities already had their own networks and declined to get involved. LA-RICS also encountered some user pushback on the logistics of field deployment. Technicians needed to pull police cars and fire trucks out of service to install the new communications devices, and departments worried about the temporary loss of assets. LA-RICS countered the problem by performing installations on vehicles that were already in for repairs, whenever possible.

Despite the hurdles encountered early on, Mallon said, the network has proven successful in its ability to open up channels of communication not just among traditional emergency personnel, but also outside the typical front line of responders.

Los Angeles can experience earthquakes, forest fires, flooding rains, coastal activity — any of which may raise the need for outside partners. "In fires we may bring in animal control or the Humane Society to evacuate livestock. The Red Cross can provide emergency housing. We bring in public works to help remove mud from the roads," Mallon said. "So how do you communicate with those?"

Much as promised, the LA-RICS high-speed network has helped to solve the problem. Secondary responders are linked into the network and lie dormant until needed, thus leaving bandwidth untouched, but still readily accessible in times of crisis.



"The driving goal is to support the capabilities of the first responders. If you maintain fidelity to that, you can get through any of the technological questions."

DAVID KIDD

Just as L.A. leverages its new network investment to loop in secondary responders, Adams County gets double duty from its system through a core-sharing arrangement with New Mexico. Under the terms of the agreement, New Mexico will help to pay for the upkeep and maintenance costs for the Adcom911 host core, a plan that makes sense, according to FirstNet's Bratcher. Neither entity needed a very expansive array, in which case a shared arrangement seemed most economical. "Why invest in building a separate network core for a relatively small number of sites?" he said.

New Mexico authorities say the hosted core will let them focus on issues such as technical, scheduling and cost concerns that may arise in the integration of remote Radio Access Networks to core networks.

The core sharing plan was mandated by Adcom911's spectrum lease agreement with FirstNet, which called for Adcom911 and its partner General Dynamics to implement the core share as a key learning condition. Adcom911 put $4 million toward the $16 million project, with the rest coming from a Broadband Technology Opportunities Program grant.

The learning condition "was actually a good thing, because it forces you to branch out and look at alternative ways of accomplishing whatever you are trying to accomplish," Bratcher said. In addition to core sharing, FirstNet also asked that Adcom911 report back on the operational and governance outcomes of its real-world testing, the validation procedures used in device testing and its live operational processes.

The New Mexico Department of Information Technology said the hosted-core arrangement will allow it to address issues along the southwest border with Mexico, with the hope that enhanced public safety communications will better support border security.

Both parties have suggested the shared core might serve other purposes down the road, perhaps as a failover for either user or as a source of enhanced interoperability between systems.

In the more immediate term, the network is bringing dramatically enhanced capabilities to the field, Estes said. Where commercial carriers may be delivering 3 Mbps download speed and 1.5 up, the Adcom911 network is humming along at 40 Mbps down and 25 up in densely populated areas. In less populated areas, the system still runs 5 up and 2.5 down, a considerable improvement over past solutions. A launching event for the network included a patrol car, fire vehicle and mobile command post.

Adams County's success as an Early Builder may be due in part to Adcom911's status as a quasigovernmental body, one positioned outside the usual bureaucracy. "We are not a huge government agency. We make decisions relatively quickly," Estes said. "It is probably because of that structure that we were able to move faster than some other agencies. We did not have to go through lots of layers."

The presence of an existing infrastructure also helped to move things along. "We already had our own radio system in place," Estes said, "so we were able to collocate much of our infrastructure with those existing radio sites."

This also proved true in situations in which other entities' existing deployments could be expanded upon, for example in Adcom911's deployment of three sites at Denver International Airport, Estes said. "The airport did have coverage, but they were looking to improve what they had for their emergency response people."

Perhaps the biggest hurdle to this early effort came in the realm of deployment. While Los Angeles met resistance from end

users reluctant to part with their vehicles, Adcom911 encountered some technical setbacks in installing a system that was new to everyone. "Getting the equipment into the cars, getting it wired in, that was a somewhat slower process," Estes said. "The techs aren't used to installing these things, so getting everything put in the right place, getting the antennas situated, it can take a while for that to happen."

An LTE training center, presently under development, presumably will help to alleviate some of that stress. The center will also provide a venue for testing new devices, software and hardware in order to continue developing the system. "We are always looking for new and innovative ways to leverage this technology," Estes said.

For Early Builders in New Jersey, meanwhile, a FirstNet spectrum license came with the request that authorities take on the key learning task of constructing a network that would rely heavily on mobile assets. "We are not going to be able to build towers in all locations across the country, there is going to have to be some portion of the network that comes through deployable systems," Bratcher said. FirstNet was eager to see how that would play out.

The result is JerseyNet, whose fixed assets cover three key regions at all times: the Route 21 Corridor, Camden and Atlantic City. PMC is the prime contractor, and Oceus Networks and Fujitsu are subcontractors on the network, which is complemented by deployable assets in the form of antenna trailers that act as fixed towers when deployed. They can extend JerseyNet connectivity anywhere in the state or even beyond state borders.

This notion of deployable networks may prove critical in areas where fixed assets are impractical. At the same time, this early effort in New Jersey will likely offer a valuable model for others down the road.

In a deployable network, "there are hundreds of nuggets you want to make sure that you take into account," said Ray Lehr, Maryland's former state interoperability director and now an independent consultant working with FEMA Region III on FirstNet issues.

"What vehicles will you need to erect an antenna? Can you drive it into a parking garage to get that antenna onto the highest levels?" Lehr said. "These things are small and they aren't obvious — just looking at the equipment and how you put it to work — but they are going to be important for everyone."

JerseyNet has shown broad success in tackling these questions, for example, by providing critical coverage during a papal visit to Philadelphia in September 2015. In that early demonstration, JerseyNet delivered secure communications and live streaming security video via two system-on-wheels trailers stationed in the upper levels of parking garages.

In August 2015, the Atlantic City Police Department in conjunction with the New Jersey Office of Homeland Security and Preparedness (NJOHSP) turned to JerseyNet to provide reliable, uninterrupted transmission of video, voice and radio communications for two major concerts — Maroon 5 and Rascal Flatts — with a combined audience of nearly 100,000 fans.

Success at such large-scale gatherings provides a critical proof-of-concept for FirstNet. "At the big events, you can have a lot of people using the commercial system," Bratcher said. "There needs to be a solution where public safety can be the only users on the system, so it is free and clear and there when they need it."

Despite such early wins, JerseyNet planners say the system's implementation hasn't been a slam dunk, especially when it comes to engaging the participation of first responder agencies that were not always up to speed on the program, said Eric Tysarczyk, director of policy and planning for NJOHSP. "We want to be able to say to everyone, 'It is going to be important that we all are using this,'" he said. "The problem is that that national backbone will not come to fruition for five to 10 years."

As FirstNet moves toward a broader vision of interoperability, planners are working to keep partners engaged. Tysarczyk's team keeps up a steady flow of information, reaching out across the spectrum of public safety agencies, even attending first responder training events to share the word. "Anytime there is external opportunity, we always try to make ourselves available," he said.

On the technical side, builders in New Jersey are moving ahead despite uncertainties about which implementations will be used in FirstNet's long-term deployment. As they move ahead, they are working on the premise that technologies will align over time, as long as any solution sticks to the fundamentals.

"The driving goal is to support the capabilities of the first responders. If you maintain fidelity to that, you can get through any of the technological questions," Tysarczyk said. "We have strategic assumptions about what the FirstNet program will deliver, and we are doing our proof-of-concept so that it can embrace that national effort."

In examining these diverse First Builder programs, it may be the act of scrutiny that turns out to be most significant.

When commercial carriers roll out their networks, deployment often happens under the cloak of proprietary information: Outsiders may get a peek at how networks are built and operated, but they likely don't get a deep dive.

With FirstNet on the other hand, "it is all very visible," said Lehr. Given FirstNet's insistence on key learning conditions, the lessons of the Early Builders likely will roll out rapidly and effectively among the next wave of municipalities to come on board, as they draw from the experiences of the Early Builders.

"That is a very valuable premise," Lehr said. "This is going to be visible to the public safety community, to Congress, to every state. Getting as much information as possible not just about the technology but about the politics and the process — those things are going to help FirstNet and its potential partners quite a bit."

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The Smart City Tech Summit in Kansas City, Mo., showcased how integrated technologies can aid the response to an active shooter.

BOPC/KCPD

The Technology Suite

Together these technologies can provide a better response.

By James Careless | Contributing Writer

The FBI confirms it: Active shooter incidents are on the rise. According to the FBI document *A Study of Active Shooter Incidents in the United States between 2000 and 2013*, an average of 6.4 of these incidents occurred annually from 2000 to 2006.

"In the last seven years of the study, that average increased to 16.4 incidents annually," said the FBI study. "This trend reinforces the need to remain vigilant regarding prevention efforts and for law enforcement to aggressively train to better respond to — and help communities recover from — active shooter incidents."

The Smart City Tech Summit in Kansas City, Mo., in March was a showcase for technologies that when deployed as an integrated suite can give law enforcement a leg up on an active shooter scenario.

The Scenarios

A vacant Kansas City school served as the stage for two active shooters who roamed the halls seeking targets. Starting with a flash-bang explosion to start the simulation, the hypothetical attack illustrated how various technological solutions could enhance police response to the incident.

For example, the initial gunshots were detected by ShotSpotter sensors mounted in the area. By comparing the delay times of the rifle cracks as they arrived at each sensor location, the ShotSpotter system was able to triangulate the real-time position of the gunshots and relay this data to police and emergency management command centers. This allowed the Kansas City Police Department (KCPD) to respond immediately by dispatching vehicles to the area of the shooting, rather than waiting for someone to call it in to 911.

As the KCPD cars rolled to the school, the department launched a 12-pound drone made by UAV Solutions to get over the reported active shooter scene fast. Capable of hovering 50 feet above the scene, the drone used its HDTV and infrared cameras

to provide police with real-time video of the situation, including displaying heat signatures of moving shooters and possible victims.

This overhead video gave first responders advance situational awareness of what they were heading into. Both headquarters and the people on scene were able to assess what was happening and plan accordingly.

Once the first responders were at the school, an electronic grid pattern was overlaid on an overhead view of the campus, with the coordinates defined by letters and numbers. The Smart ImageMap was produced by AllSource Analysis, a commercial intelligence company.

"Using this grid, we could accurately tell the responders where to go, simply by saying things like, 'You're in sector B-3,'" said Herb Sih, managing partner at consulting firm Think Big Partners.

All the while, simulated citizen-generated social media posts — the kind that regularly clog the Internet during such events — were collected and categorized by the data mining platform DataCapable, which sifts through posts to find the most useful ones and displays their locations on a map to provide first responders with relevant public-sourced information.

Working in concert, these technological tools helped KCPD's incident command get a handle on the situation and direct officers to the best locations to take down the shooters as quickly and safely as possible.

The Technology?

It was not the equipment itself that made the difference: "Much of the technology that was showcased — drones, IoT [Internet of Things] sensors, shot-detection sensors, personnel tracking sensors, social media monitoring, satellite imagery, streaming video and readily accessible facility data — have all been around for a number of years," said Mike Grigsby, KCPD's information services director.

"The overall effect of technology on public safety services can be a compounding positive if they are strategically integrated with the purpose of rendering a community safe. They can extend the capabilities of public safety resources in ways we haven't even dreamt of," Grigsby said.

What made the difference was the combination of these technologies into an integrated threat response suite. "The Smart City Tech Summit endeavored to showcase the aggregation of all of these technologies in a single space and what they could do collectively for public safety agencies," he said. Put together, this aggregation created "the ability to know where resources and personnel are at a scene and to gather intelligence from the scene almost immediately upon incident trigger is invaluable to first responders. Incident intelligence is good; smart and immediate intelligence is best."

The Smart City Tech Summit tied into Kansas City's $15.7 million Smart City project — in association with Cisco Systems Inc., Sprint Corp. and Think Big Partners — that is currently upgrading the city's downtown area with a large public Wi-Fi access and sensor network to improve government-delivered services. The Smart City program will also install 25 digital kiosks around Kansas City's 2.2-mile streetcar line, providing users with information on local attractions, city services, 911 assistance and real-time data collected by the sensor network.

"Beyond the obvious link to the Smart City initiative, Kansas City was a logical choice for the Smart City Tech Summit given the city's narrow escape from a planned terrorist attack in 2015," said Sih. "Only effective undercover work by the FBI prevented a planned pressure cooker bomb/rat-poison-dipped shrapnel attack on the popular Kansas City Stair Climb, where local firefighters climb stairs in honor of the firefighters who perished on 9/11. Preventing terror attacks, and coping with them when they do occur, is a big priority for everyone who attended the Smart City Tech Summit."

Combating an Active Shooter Attack Using Technology

Other topics covered included "critical incident response, intelligent response, big data and near-real-time analysis of streaming video," Grigsby said. "Intelligent response to critical incidents results in faster resolution and greater capabilities in identifying ways to rebound and learn from experience; improve adaptive resiliency. Smarter, more connected public safety results in more highly thriving communities."

BOPC/KCPD


POLK COUNTY
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Disaster Gypsies

Communications begin again when Ben Holycross and his team arrive on scene.

Ben Holycross has been the radio systems manager for Polk County, Fla., for 18 years. In all, he has more than 40 years of service in public safety, law enforcement and emergency management, but has spent the last 25 developing optimum communications for first responders. He was instrumental in the design and construction of Polk County's Motorola 800 MHz SmartZone radio system and maintains management of it.

By Jim McKay | Editor

Tell me about all your interoperability "weaponry."

We bought the original 800 system in December 1997, and acquired an Aluma tower trailer, five-channel trunking system and some conventional repeaters in 1999. As part of our rebanding we were left with some Quantar repeaters and had them upgraded. We now have a six-channel P25 system, a five-channel analog with three, 800 conventional repeaters, three UHF conventional repeaters and three VHF conventional repeaters in the Aluma tower.

When we pull into a disaster area, we put our P25 system on the air, and all of the Central Florida Task Force radios — fire, EMS and law enforcement from Polk, Seminole, Orange and Osceola counties — have the system programmed into their mobiles and portables so they are immediately operational as soon as we get our tower on the air.

So you're set for just about any disaster that comes your way?

I don't know that anybody is ever all set. I will make the claim that we are ahead of anybody else that I know of as far as being able to go into a major disaster area and bring full-spectrum communications on the air, and that's everything from high-frequency radio to land mobile systems to satellite communication. We're about as good or better than anybody else I've seen. There are folks that have some bigger or better items, but as far as a full capability to deploy it and operate it in the field and support the logistics, including the people requirements, I think we're at the top end of the pyramid.

What led to all that capability?

After responding to Hurricane Andrew in 1992 and finding communication nonexistent, I said, "We're never going to do this again." I'm never going to be in a position where my first responders are going into a disaster without some means of communications.

Then in [early August] 2004 we got hit with Hurricane Charley. Then we got hit by Frances [mid-August 2004] and then did our first Polk County deployment up to Pensacola Beach when they got hit by Hurricane Ivan in early September.

So we had two hurricane impacts here, and my folks had worked through those, then got up to Pensacola Beach and operated there for 10 days. While we were there I got an email from one of my counterparts saying, "You're about to be the only radio manager to have his system hit by the eye wall of three hurricanes in one season." I said, "No way, Ivan didn't hit us. We're up in Pensacola." He said, "Have you looked at the weather forecast?" Then came Hurricane Jeanne. We took three eye wall hits in six weeks. It was incredible — a learning experience from being both the victims and responders simultaneously.

What changed after that?

Our mobile radio trailer at the time was in its infancy. It wasn't too far from having been just an open box trailer. We had lights, air conditioning and power, and four bunks in there, but it was very rudimentary. We didn't have CAD installed when we deployed up to Pensacola the first time.

But it was superior to having to sleep out in the heat on the dirt. That was the lesson from that deployment — we needed significant improvements inside the trailer and a data network to connect all the radio programming computers, as well as a head in the shower and a complete water system, so that when we go into the field we actually can take care of our people. That's a very important thing and came from lessons learned from having deployed at Hurricane Andrew. We had folks deployed and had absolutely

Polk County can bring full-spectrum communications on the air from any location.

PHOTOS BY STEVE WIDOFF

no way to support people in the field as far as housing and it was very trying.

In 2005 we got hit with Hurricane Dennis in Pensacola Beach, and we wound up back up there for about another 10 days. We came back from that again with a laundry list of improvements that we needed to make. So we had three in-county hurricane hits, two in-county responses, and after each one of those events we improved our capabilities. Then Katrina hit.

We wound up deployed over to Hancock County, Miss., which was actually ground zero, where Katrina came ashore. We operated there for 30 days. When we got there the day after the storm came through, we had the only communications in that county.

It was a very interesting experience. While we were there we got hit from some of the outer bands of Hurricane Rita and had to pull the tower partway down and secure everything. We survived that and after 30 days had enough system in place until they brought in another system. After that we deployed to Broward County, for Hurricane Wilma.

For two years we were sort of like disaster gypsies, going from one to another.

Can you discuss the other types of disasters you've responded to, including Katrina?

We've done quite a few of the wildland fires supporting ground operations and supported two law enforcement situations with law enforcement officers killed that involved one- or two-day-long manhunts. It was exceptionally chaotic. In one case, they had a two- or three-square-mile area where the perpetrator was. They had a perimeter established, and all the law enforcement [officers] were on foot maintaining the perimeter all night long. When their portable radio batteries die they're in a fix because their vehicles may have been parked six or eight blocks away and they can't leave the line. We had to make rounds out there to get them batteries.

One of the dilemmas early on during Katrina was fresh drinking water. We had on our radio shop tower a 200-gallon water tank. The water was gone by day two; we needed showers bad by day seven. FEMA had been sending water into the area, but it was one-liter cases of drinking water. We had eight people on staff with four responding to the event. We found ourselves uncapping the bottles of drinking water and pouring them all into the holding tank on the tower so we could take showers. I said we'll never do this again, and we bought a military water purification system from Aspen Water. You can take any fresh-water source — lake, stream, ditch — and it will crank out 5,500 gallons a day.

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Time Bomb

One of the most 'terrifying' disasters in the offing is a Cascadia Subduction Zone earthquake in the Pacific Northwest.

By Jim McKay | Editor

The Weather Network identified in a March report four "terrifying disasters waiting to happen."

One was deadly, exploding lakes in Africa. These are rare events known as limnic eruption and happen when CO2 builds up over time from nearby volcanic activity. Another potentially catastrophic event would be the onset of giant space rocks hitting the Earth. This would be a global catastrophe, because particles in the atmosphere would block up to 70 percent of sunlight for the first couple of years. Besides that, particles suspended in the stratosphere would warm, stripping the Earth of about 55 percent of its ozone layer.

Two of the potential catastrophes would take place in the U.S., including the eruption of the supervolcano that rests beneath Yellowstone National Park. The report said that if the volcano were to erupt, it would produce enough ash to bury nearby cities and dust those on the coasts. The good news is that the last time this happened was 70,000 years ago and the "repeat" time would be 700,000 years.

The other disaster potentially in the offing is the Cascadia Subduction Zone earthquake. This scenario involves a magnitude 9.0 or worse earthquake in the Pacific Northwest that would be felt all the way down to Northern California. The Pacific Coast would have perhaps an hour of warning before the tsunami hit. As a reference point to how bad this earthquake will be, the recent earthquake in Japan that registered magnitude 6.2 lasted 20 seconds. The Cascadia quake would shake the earth for three to six minutes.

The devastation would be great: If it happened tomorrow, there would be perhaps more than 10,000 deaths and 30,000 injuries. Whole cultures of people could be wiped out and the recovery would take decades. The good news? There's probably ample time to prepare, and that preparation has begun. A similar quake is thought to have occurred in or before January 1700.

Scientists estimate that a recurrence would be due in about 500 to 600 years. But they don't know for sure. They also don't know how much seismic slip occurred during that quake in 1700. Did the subduction zone save anything?

"Faults tend to be pretty good at this. They don't always spend everything they have," said Brian Atwater of the U.S. Geological Survey Earthquake Hazards Program. There may have been a lot of "breakage" during the last quake or there could be parts of the fault that didn't break. That would be a way to get "better than 500 years' worth of slip in 300 years," Atwater said. Or maybe the earlier quake spent the "whole bank account" and the future event won't amount to much.

"That's part of the challenge of trying to present to a public audience scenarios for future earthquakes and their unknowns," said Atwater. "They don't happen like clockwork."

Rebekah Paci-Green is the director of the Resilience Institute and a professor at Western Washington University. She helped put together *Cascadia Rising*, a 182-page document that goes into alarming detail about the impending Cascadia earthquake and tsunami.

The document takes you through the scenario of The Quake. The daytime quake will sneak up on the region's population, feeling somewhat like a semi-truck passing by. As the shaking continues, some will forget their initial training. Some may run, but will make it only a few steps before falling. After about a minute, the shaking will begin to toss people about. Things not anchored will fall. Some people will have gotten under chairs, tables or something they think will protect them. Many will not.

The document says that coastal areas will likely feel it the worst. But down in Oregon and even Northern California, residents will know something is afoot.

The Damage

Besides the dead and injured, the damage to infrastructure would be enormous. One of the big threats during such a quake is liquefaction. Many critical structures stand on silt and sand that become unstable. The grainy soil will begin to act like liquid, and structures — such as bridges, ports, airports and industrial facilities — may shift position or sink.

Local residents will have 20 to 30 minutes to get to high ground and away from the effects of the inevitable tsunami, which will consist of multiple waves over several hours. Some areas will remain flooded even as the tsunami retreats.

There are complete cultures in Washington that could be completely wiped out. "It's a catastrophic event that will affect a wide swath of our state and Oregon, British Columbia and Northern California," said Paci-Green. "It is absolutely catastrophic for outer-coast communities, and beyond catastrophic for some of the tribes where a large percentage of their reservation is in the inundation zone."

The area will be prone to landslides and falling rock. The effect on transportation would be immense as the shaking and tsunami could damage 16,000 miles of highway and 7,000 highway bridges. The resulting economic losses could exceed $80 billion.

But those are estimates. Paci-Green said things could be worse. "The concern among the engineering community is that we don't have a lot of data on how infrastructure, especially buildings and bridges, responds over that very long period of shaking," she said. "We don't know what we don't know. The other fear is that these events are so far apart, that it's much harder to get people's attention and we're only recently understanding the significance and the potential for a major Cascadia event."

The Effort Begins

The immediate impacts will be devastating, but the bigger issue is long-term recovery. That means a consistent and sustained effort to build a more resilient community. "In terms of how to plan for this, it's long term," Paci-Green said. "Our best strategies for earthquakes and tsunamis are not response and preparedness, but mitigation, mitigation, mitigation. The six minutes of shaking are going to be really, really terrible. But it's the decades of recovery that we actually need to be worried about."

As Paci-Green said, it's difficult to develop a plan for something that may not happen for 100 years, but recent attention has sparked interest. "The risk is so overwhelming and so large, but also so infrequent that just the slow movement of mitigation is more likely going to put us in good stead," she said.

Washington is slowly seismically upgrading its bridges. Oregon is working on seismically upgrading its schools, and outer-coast communities are creating bonds and funding structures to do vertical evacuations or move critical assets out of inundation zones.

Vertical evacuation is used when there's no way to walk or drive out of the inundation zone. It consists of creating berms or multistory structures, strategically placed in communities where people can climb up and out of danger.

The Ocosta School District in Washington state is building a gym for vertical evacuation that will hold not only students and staff but also the local community. The Quileute Tribe, which is completely in the inundation zone, has spent the last 10 years fighting with the

federal government about treaty boundaries and reservation boundaries, and was recently granted a land swap to be able to exit the inundation zone, according to Paci-Green.

The Native American tribe is swapping with the federal government some of its reservation, which happened to be an access point to one of the state's most scenic beaches, for about 750 acres of National Forest where its members can get to high ground. As a whole, tribes struggle to compete with other jurisdictions in the state when it comes to hazard mitigation grants funding and developing mitigation plans. "They're very small jurisdictions and these kinds of tasks are overwhelming," said Paci-Green. "At the same time, this is beyond catastrophic for the tribes because they may literally lose everything in their community."

Paci-Green said the region needs to look at "innovative resilience solutions," a lot of redundancy and also smaller-scale solutions such as developing local food production. "We may struggle to get food in across the mountains and up Interstate 5, and so more localized meeting of basic needs like food and water [is important]."

The trouble is that scenario is not similar to the San Andreas Fault in California, where there's a long history and considerable knowledge. "This is literally a new concept," she said, "and our codes and planning and all that have not considered it for the vast majority of development in our communities, so we have a whole lot of small towns in the inundation zones."

So When Will It Happen?

Paci-Green said things are moving slowly and that's OK. It's best not to engineer a response based on fear.

Plus, there's time — but how much?

"The fault doesn't have a good memory in terms of when the last event happened," Atwater said. "So when the next one happens is independent of how much time has elapsed since the previous one."

The previous quake occurred in the Lewis and Clark era. But Atwater looks at it this way: His granddaughter, who is 2, has about a one in 10 chance of experiencing the next one if she stays in Seattle for the next 50 years. But it could be 200 years.

Most of the knowledge about the Cascadia Zone has been garnered relatively recently. "When I first showed up here in 1985, it was really a hot question among scientists as to whether this fault produces any earthquakes at all," said Atwater. "And it's only been during the past 30 years that a series of discoveries have been made that convinced earth scientists that it does pose a threat."

The fact that the last one happened some 300 years ago makes it difficult for people to understand the potential. "The earthquakes that have happened in the last decades haven't approached the kind of thing that the big faults are capable of doing," said Atwater. "People don't get the full sense of what nature can do. But that's part of the detective story."

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PATSY LYNCH/FEMA

Meeting Future Challenges

Capabilities, competencies and accreditation in emergency management education.

By Valerie Lucus-McEwen | Contributing Writer

The world of emergency management is becoming increasingly interconnected and interdependent, and as the emergency management profession grows, the risks become more complex. From 9/11 and Katrina in the past to the Cascadia fault in the future — how and with what is the emergency manager in the future going to ... manage?

Nobody is more interested in that question than academia. After all, most emergency manager positions require a college degree as well as training and experience in the field. The number of programs offering degrees has increased from just a few in 1995 to almost 300 today.

The debate has been one of consistency and content — what knowledge and skills should emergency management higher education programs integrate into their curriculums to meet the future challenges of the profession?

Core Capabilities

To help in the process, FEMA leadership issued the National Planning Frameworks, which include the National Preparedness Goal (NPG) that lists the 32 core capabilities intended to assist all emergency managers in protecting our communities. They are listed by major area (planning, intelligence and information sharing, etc.) and tied to the five mission areas (prevention, protection, mitigation, response, recovery) detailed in the frameworks. The capabilities listed within the NPG are functions FEMA would like to see emergency management organizations adopt and integrate, and they are "intended to assist everyone who has a role in achieving all of the elements in the goal."

Core Competencies

FEMA's Emergency Management Institute Higher Education Program sponsored a year-long focus group to identify an individually centered kind of capability — a core competency. Those core competencies, reported at the 2016 FEMA Higher Education Symposium in June, enumerate 12 more personal aspects important to all future emergency managers.

"It is important to explore how to best prepare the next generation of professionals to address continually evolving risks," said Steve Jensen, a professor at California State University, Long Beach, and one of the FEMA moderators for the next-generation core competencies focus group. "We are educating a new breed of worker to align with these changes."

The focus group came up with a list with four main aspects and 12 core competencies for future leaders:

Emergency management leadership

- Operate within the emergency management framework and principles — all necessary actions to prevent for, prepare/protect, respond to, recover from and mitigate threatened or actual threats.
- Facilitate community risk understanding and ownership — support the need for the community to "own" the risks its residents are exposed to.

- Community leadership team building and resource management — with an emphasis on team building, collaboration and collective leadership.

Organizational expertise

- **Understand complex systems** — understand and manage interdependencies that reduce risk.
- **Risk governance** — advocate for risk awareness, assessment, measurement and reduction.

Problem solvers

- **Critical thinking** — innovative thinking to help decision-making in complex environments.
- **Professional ethics** — standards of expected and appropriate conduct, principles and moral/ethical values.
- **Continual learners** — operating in a dynamic and continually evolving risk environment requires more than the simple acquisition of new skills and fact accumulation.

Broad knowledge base

- **Scientific literacy** — the ability to make decisions about the natural world and human activity based on scientific knowledge.
- **Geographic literacy** — having a foundational understanding of the geographic configurations of hazards, vulnerability and risk.
- **Sociocultural literacy** — understanding human behavior and how people increase their own vulnerability.
- **Technological literacy** — knowing how to incorporate emerging technologies.

Emergency Management Triad Model

We can theorize the emergency management triad as education (formal and informal acquisition of knowledge), training (application of acquired knowledge in a controlled setting) and experience (application of knowledge and training in uncontrolled settings). Doing that, almost all the FEMA NPG core capabilities are clustered into the first group of emergency management higher education (EMHE) core competencies: emergency management leadership. What's missing in the NPG capabilities are those competencies and attributes professional emergency managers use every day, like team building, critical thinking, ethics and understanding the science (such as risk and hazard) behind what they're doing. These are filled in by the core competencies.

The focus group studied past research that defined core competencies, including the one published in 2005 by Wayne Blanchard, the director of the higher education program from 1994 to 2010.

However, the heated discussions during this FEMA higher ed symposium didn't revolve around capabilities or competencies as much as how to get them integrated into the profession. If degrees are being required for most emergency management jobs these days, wouldn't it make sense to integrate those capabilities and competencies as standards applied to higher ed programs?

Standards are rather simple — they are a set of key rules applied to a program, defined as a value established by authority, custom or general consent as a model or example to be followed. Curriculum standards are generally voluntary but become mandatory for programs seeking accreditation.

Accreditation

FEMA higher education also sponsored a different focus group "to explore whether accreditation for EMHE programs was warranted and, if so, to what standard(s)." The Emergency Management Higher Education Accreditation Focus Group also reported its findings at the 2016 symposium.

Consistency has been at the core of the discussion of academic programs for many years. While the problem of what core competencies/capabilities has revolved around specific aspects of emergency management — the educational foundations and personal attributes a future emergency manager should have — the discussion about EMHE programs has revolved around standards.

The report from the focus group determined that accreditation of EMHE programs was not only warranted but also feasible, and desired by more than 100 campuses surveyed during the process. The focus group stressed it would not be the accrediting body; rather, its members were generating and recommending standards for others to use. The scope was pretty clear:

"These standards are voluntary for degree program accreditation. These standards are intended for degree programs that are face to face, blended/hybrid and wholly online. While the standards language was drafted primarily for application to B.A. programs, the standards language is written broadly in terms of curriculum content to allow for application in associate, bachelor's, masters and doctoral degree programs assuming appropriately advanced learning objectives and expected level of expertise at each higher level of degree."

The standards proposed by this FEMA focus group are very detailed and fall into three areas:

Institution and administration

Asks for documentation about the primary institution, facilities, equipment, technical support, the library, organization, budget, faculty, etc.

Program objectives and curriculum structure

Asks for documentation about consistent program objectives and learning outcomes, a degree plan, an ongoing process of assessment, etc.

Program content

Asks for documentation about foundational topics addressed in each curriculum including, for example, hazards analysis, vulnerability theory, historical awareness of disasters; international dimensions; key topics across the mission areas of mitigation, prevention, preparedness, response and recovery (social dimensions, political contexts); opportunities for students to gain practical emergency management experience, skills in communication, stakeholder engagement, leadership.

The emergency management profession has principles, goals, a framework, core capabilities, core competencies and standards. It is now up to students to demand that the courses they pay for fulfill these requirements, and it is up to academia to meet the challenge.

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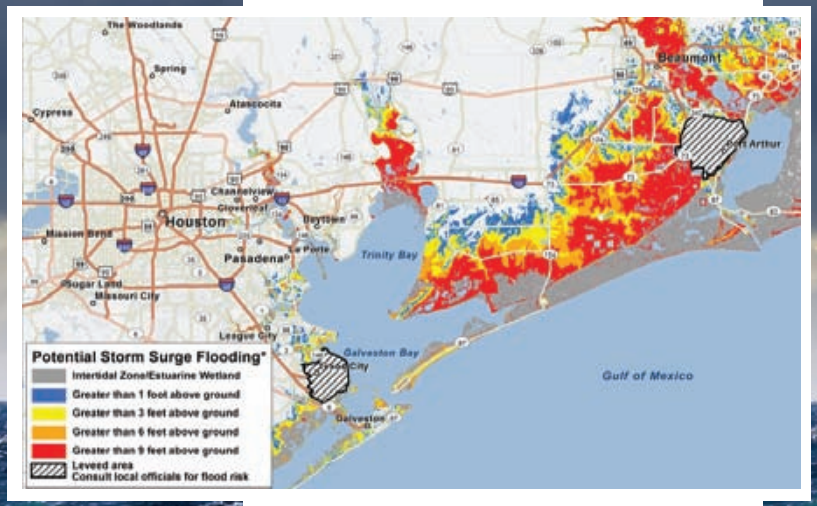

Spotlight on the Surge

Storm surge maps may help emergency managers enforce evacuation orders.

By Adam Stone | Contributing Writer

The National Hurricane Center (NHC) has begun producing storm surge maps intended to give the public early warning of potentially devastating high water effects.

The new maps predict likely flooding in advance of incoming storms, showing exactly where and how deep the waters will rise. They're meant to take away some of the public confusion surrounding the storm surge phenomenon.

"Most people would never think that a storm surge can get 20 miles inland. In the past we could tell you that in a public advisory, but until people see it on a map they don't necessarily realize it," said NHC Storm Surge Specialist Brian Zachry. "Now we can show people clearly: This is the storm surge that you should plan for."

The center spent two years developing the new maps, which could assist emergency managers in their efforts to enforce evacuation orders in times of crisis.

Real-Time Maps

Surge occurs when storm winds push the sea toward the shore, raising water levels above astronomical high tide, Zachry said. It is a life-and-death matter, responsible for roughly half of all hurricane fatalities.

In their efforts to create an at-a-glance warning, planners devised a four-color map: Blue represents 1 to 3 feet of surge; yellow is 3 to 6 feet; orange is 6 to 9 feet and everything over 9 feet is in red.

Designers saw no point in making further delineations. "If you have 9 feet of storm surge, you might as well have 15 feet of storm surge," said Zachry. "Either way, you need to get out of there at that point.

The hurricane center will generate the maps in real time when there is an active hurricane threatening the U.S. East and Gulf coasts. The maps will be available roughly 48 hours before the arrival of the storm surge hazard and will show up in the NHC website (hurricanes.gov) under the active storms for the "Atlantic - Caribbean Sea - Gulf of Mexico," where a thumbnail or icon will take visitors to the interactive maps.

The NHC has been developing the new surge maps, using a supercomputer to churn through vast volumes of hurricane forecast data, including real-time information generated during two significant weather events. In July 2014, Hurricane Arthur made landfall in North Carolina, with a peak storm surge of 4.5 feet. In June 2015 Tropical Storm Bill produced widespread rainfall across east Texas, Oklahoma, the Midwest and the mid-Atlantic.

In each case, planners asked the computer to generate 500 to 1,000 alternative scenarios in the face of the approaching storm. Maps were then based on the reasonable worst-case scenario. For both Hurricane Arthur and Tropical Storm Bill, the mapped predictions "validated very well" against the actual impact of the storms, Zachry said.

'Tools We Need'

Drew Pearson finds this encouraging news. As director of emergency management in Dare County, N.C., where Hurricane Arthur made landfall, he describes the new maps as a valuable tool for coastal emergency managers.

"As an emergency manager, I know there might be 6 feet or 9 feet of water above the ground. But now our citizens will know that as well," he said.

On North Carolina's Outer Banks, most local residents already are aware of the dangers inherent in storm surge, but they

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may not have sufficient information to make sound decisions during an actual weather event. "If you talk to somebody who lives on Hatteras Island, they know what storm surge is; they have lived with it," Pearson said. "What they don't know is: When is it going to come? When is it going to get here or how deep is it going to be? That is what is really new with these products."

While the new, detailed information may help individual citizens, it will be especially useful to emergency managers trying to motivate whole populations. "These are exactly the tools we need, something that enables me to go to a citizen or visitor and say: Here are the orders and this is why. This is exactly what is going to happen," he said.

Even prior to the hurricane center's latest push, various state emergency offices have mounted efforts to inform the public about the potential hazards of storm surge. Virginia offers storm surge maps and a tool for identifying surge risk, and Florida has detailed maps by county.

While these maps are based on historic surge data, the hurricane center's product differs in that it's generated in real time. During a storm event, maps will be refreshed within an hour of any new weather advisory, said Zachry.

In the absence of such clear guidance in the past, storm surge has led to disastrous outcomes, according to the NHC's running tally. Over recent years, catastrophic storm surge events have included:

2011 — Tropical Storm Lee made landfall in early September along the coast of southern Louisiana, with tides reported at 4 to 6 feet along the coasts of Mississippi and southeast Louisiana. The storm surge at Lake Pontchartrain inundated more than 150 houses. The storm killed three people and may have caused $1 billion in damages, mostly due to storm surge or fresh water flooding.

2011 — Hurricane Irene pushed water over a large portion of the western Atlantic basin for several days, with storm surge estimated at 8 to 11 feet within portions of Pamlico Sound, N.C., and 4 to 6 feet along the coast from New Jersey northward. A storm surge of 3 to 6 feet caused hundreds of millions of dollars in property damage in New York City and Long Island.

2010 — Hurricane Earl didn't make landfall in the U.S. but still drove storm surge over 4 feet in North Carolina, with surge of up to 3 feet along the U.S. coast from North Carolina to Maine.

2008 — Hurricane Ike caused storm surges of 15 to 20 feet above normal tide levels along the Bolivar Peninsula of Texas and in much of the Galveston Bay area, "with almost every structure on parts of the Bolivar Peninsula completely wiped from their foundations due to the surge and accompanying waves," the NHC reported.

2005 — Hurricane Katrina's surge measured in at 24 to 28 feet along the Mississippi coast across a swath about 20 miles wide. The surge drove 6 miles or more inland along much of coastal Mississippi and up to 12 miles inland along bays and rivers. As a result of the surge, levees and floodwalls overtopped or were breached, ultimately flooding about 80 percent of New Orleans with depths up to about 20 feet.

The NHC's earliest noted surge event offers a telling example of the dangers of storm-driven flooding. In 1889 a hurricane off the mid-Atlantic coast was downgraded to a tropical storm, and even at this lower intensity it didn't make landfall. Yet the impact of the surge was staggering. Stalled near Hatteras, N.C., the storm caused surge and flooding from New England to North Carolina. The meadows along the Atlantic City, N.J., waterfront were swamped. In Lewes, Del., the life-saving station, located 40 feet above the high water mark, was flooded. Some areas were completely submerged and hundreds of residents had to evacuate.

Faced with more than a century's worth of evidence of the destructive power of storm surge, NHC planners say they wanted to ensure their early warning maps would be not only useful, but also legible to the average person. To make that happen, they brought in social scientists.

Easy to Read

A professor of sociology at Florida International University, Betty Morrow specializes in the effectiveness of warning messages in times of natural disaster. She collaborated with the NHC on the production of the new maps.

"We would give the maps to ordinary citizens and ask them to try to interpret what they saw, to explain what they would do with the map," she said. "The best forecast is only as good as how well it is communicated. Do people really understand their vulnerability? Do they understand the hazard itself?"

Getting the presentation right was especially important, considering the circumstances in which an individual might be likely to encounter these maps — that is, in a time of high anxiety. "When we are talking about leaving your home, this is not easy; it is a very onerous action," said Morrow. "People don't want to leave their homes unprotected; they may not know where to go. They don't want to go unless everyone is going. They are thinking through all of that and weighing it against how afraid they are."

To make the maps as accessible as possible, Morrow and the planners worked through a range of variables like type font, size and color. The biggest surprise: People couldn't find the legend on the map, at least not when it was placed on the upper right. When designers dropped it to the lower left corner of the map, users knew just where to look. A seemingly small change, but substantial when trying to connect with a user under stress.

At the urging of a test group of emergency managers, planners made an additional design change. Rather than use blue to indicate zero-to-3 feet of water, the map defines that flood potential as beginning at 1 foot. Emergency managers found it distracting to be notified of a zero-foot storm surge.

Looking ahead, the NHC hopes to expand on the project in the near future by designating these maps as the foundation of a future surge-watch and surge-warning system like one that's now used to indicate the approach of tropical storms and hurricanes. Such a system of watches and warnings could go live on the hurricane center's website by 2017 in a collaborative effort with the National Weather Service and local weather forecasters.

Watches and warnings are "the most powerful thing we have to get that information out there," Zachry said. "That's what goes across those local media channels, and it's where we ultimately would want to be with this."

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By Eric Holdeman

Presidential Prognostications Shaping Our Disaster Future

This presidential election cycle has been full of surprises, so I'm wondering what the future might hold for 2017 and beyond for emergency management.

Electoral candidates would have us believe that they and their policies are what will make for a new, improved and brighter future. At this writing there are two presumptive major party candidates vying for your vote in November. Let's explore what these two contenders might do for or to emergency management.

If elected, Donald Trump is sure to be as unpredictable as a president as he was as a candidate. The first priority would be building "The Wall," and when Mexico refuses to pay for it, he will turn to the Canadians and tell them they need to pay for it. The U.S. Army Corps of Engineers might be commissioned to build the wall, justifying its involvement with the thought that the wall would function as a levee against the "flood" of immigrants coming into the country.

FEMA's Emergency Management Institute would be renamed Trump University, and all of us would have the opportunity to max out our personal credit cards to become "Trump Certified" in our profession.

Finally, the phases of emergency management that everyone I know still uses — preparedness, mitigation, response and recovery — would have one more added to the list: retribution. This would ensure that anyone complaining about emergency management policies would be "put in their place."

If elected, Hillary Clinton would quickly issue a number of presidential executive orders. The first would allow the use of personal email servers for conducting official business — retroactively.

Interns would be banished from the White House, and a good place to send them would be to FEMA. They would be safe there, or at least out of sight, out of mind.

I'm sure there are some elements of what I've detailed here that will come true in some small way. However, we know it is not presidents who shape our future as emergency managers, it is disasters — especially the really big, costly ones.

Look to our past. Hurricanes Hugo, Andrew, Katrina and Sandy have given our programs twists and turns as funding was increased for special programs and then dwindled with time.

The 9/11 terrorist attacks were the big daddy of disasters that took emergency management in a hard right turn toward terrorism preparedness. They also funneled billions of dollars to state and local programs in 10 years of full funding. Now that is all winding down, and we are waiting for the next calamity that will reorient us via congressional funding and FEMA policies toward a new direction.

It is a crazy way to prepare our states and communities. What about strategic planning that actually determines how funding should be allocated? Eventually there will be a catastrophic earthquake, for example, that will provide a clarion call to action.

Japan is spending a billion dollars on a seismic warning system. China, without having had such a catastrophe, is spending $300 million. Earlier this year people here in the U.S. were slapping one another on the back when they got $8 million for one year of funding toward what is essentially a seismic detection system. I say "seismic detection" because the program is still lacking a coordinated, multifaceted, multistate and cross-jurisdictional approach for distributing a warning to systems that can then protect people and property.

You really don't need to fear what Donald Trump or Hillary Clinton will do. Emergency management and disaster preparedness are the furthest things from their minds — now and when one of them gets elected.

ERIC HOLDEMAN IS THE FORMER DIRECTOR OF THE KING COUNTY, WASH., OFFICE OF EMERGENCY MANAGEMENT. HIS BLOG IS LOCATED AT WWW.DISASTER-ZONE.COM.

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Mobile Chemical Detection

Recently there's been an uptick in individuals combining supplies commonly available at hardware stores to create weapons of mass destruction. Criminals can turn everyday materials into often-deadly delivery systems for more vicious attacks while also introducing a more diverse collection of materials into the equation.

908 Devices' portable chemical detection device provides first responders, civil support teams and the military with capabilities to detect and identify priority chemical warfare agents, toxic industrial materials and precursors. The white, crystalline explosive TATP, which was confiscated by Belgian authorities after the March attacks in Brussels and also used in the November Paris attacks, is an example of a substance that the M908 can detect. www.908devices.com

COPsync911 Deployed at School District

The Iberville Parish School District in Plaquemine, La., will deploy COPsync911, a threat-alert system, in 14 buildings. COPsync911 is a real-time information sharing and data communication network for schools or at-risk facilities. School staff can activate the system, which triggers a silent alert to other employees, the local law enforcement dispatch center and the closest patrol officers. www.copsync.com

Saving Unnecessary ER Visits

Panasonic recently worked with the Houston Fire Department on its Emergency TeleHealth and Navigation (ETHAN) project. Using Panasonic Toughpad rugged tablets on the Verizon Wireless 4G LTE network, Houston Fire's ETHAN has avoided ambulance trips and ER visits in 80 percent of the cases it was utilized.

During non-life-threatening situations, when appropriate, Houston Fire first responders use the tablets to set up a teleconference between the patient and a trained emergency medicine physician. By reviewing the patient's vital signs on remotely and asking him or her a series of questions, the physician can make an informed determination on whether a trip to the ER in an ambulance is needed. www.business.panasonic.com

RUGGED TABLET

Juniper Systems' new Windows 10 Mesa 2 Rugged Tablet is equipped to perform reliably in a wide variety of industries with harsh environments — including law enforcement. As an IP68-rated Windows tablet, the Mesa 2 is designed to withstand water, dust, impact and chemicals, and has a wide operating temperature range for extreme cold and heat. The Mesa 2 also features all-day battery life, an extra-bright display and a lightweight, ergonomic form for minimal fatigue — all important benefits to law enforcement professionals. www.junipersys.com

5 QUESTIONS TO CONSIDER
WHEN IT COMES TO BODY-CAM STORAGE

Approximately **1/3 of the 18,000 police departments** in the United States are using body cameras.[1]
While body cameras bring transparency and accountability to police interactions, one downside is the amount of storage required.
According to the Police Executive Research Foundation, the cost of data storage can reach **$2 million per year for a department**.[2]

HERE ARE 5 QUESTIONS TO CONSIDER TO BETTER PREPARE FOR THE IMPACT.

1 HOW MUCH DATA SHOULD A DEPARTMENT PLAN TO STORE?

Oakland Police Department's 600 body cameras produce **7 terabytes of data per month**, which equals approximately 1,500 feature-length films.[3]

600 BODY CAMERAS PRODUCE 7 TERABYTES OF DATA PER MONTH.

2 WHERE SHOULD BODY-CAM DATA BE STORED?

Cloud requires ongoing operating costs but is easier to scale and implement, while on-premises storage has a higher capital investment but offers higher throughput and may be more secure. Depending on a department's needs, budget and chain of custody requirement, either could be a viable option.

"WE ARE PLANNING FOR **OFF-SITE VIDEO STORAGE** BECAUSE IT WILL BE EASIER TO MANAGE AND WE WON'T NEED TO INVEST IN SERVERS."[4]

— Officer Mike Tanner, Police Department, Clarksville, Tenn.

3 HOW LONG SHOULD VIDEO BE STORED?

Some jurisdictions say non-evidentiary video should only be kept for **60 to 90 days**, but the Oakland Police Department retains video for **5 years**. If a video becomes evidence in a court case, the retention requirements can be even longer.[5] However, less than **6 percent** of stored video is actually used for evidentiary purposes.

LESS THAN 6% OF STORED VIDEO IS USED FOR EVIDENTIARY PURPOSES.

4 HOW SHOULD VIDEO STORAGE BE PROTECTED?

Departments need to prevent tampering with and unauthorized access to stored video files, which are both FBI CJIS requirements. For the 36 departments where body cameras captured an officer-involved shooting in 2015, 5 departments have policies saying they will **never release video without a court order**, 5 say they will always release the footage and the rest fall somewhere in between.[6]

5 DEPARTMENTS HAVE POLICIES SAYING THEY WILL NEVER RELEASE VIDEO WITHOUT A COURT ORDER.

5 WILL VIDEO FILES BE EASILY SEARCHABLE AND ACCESSIBLE?

With just 11 cameras in use, the Duluth, Minn. Police Department stores **8,000 to 10,000 videos per month**.[7] With this many videos, it becomes critical to easily search them when needed for criminal investigations or records requests.

THE DULUTH, MINN. POLICE DEPARTMENT STORES

8,000 TO 10,000 VIDEOS PER MONTH.

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Endnotes:
1. http://wgntv.com/2015/02/04/police-body-cameras-in-action/
2. http://www.govtech.com/public-safety/Storage-Costs-Cloud-Police-Cam-Issue.html
3. Ibid.
4. Center for Digital Government interview with Mike Tanner, August 6, 2015
5. http://www.govtech.com/dc/articles/Body-Worn-Camera-Data-Storage-The-Gorilla-in-the-Room.html
6. http://www.washingtonpost.com/sf/national/2015/10/08/police-withhold-videos-despite-vows-of-transparency/
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By Bill Gibbons

The Public Safety Subcabinet Model

When then Gov.-elect Bill Haslam asked me to join his cabinet as commissioner of the Tennessee Department of Safety and Homeland Security, he also asked me to chair a Public Safety Subcabinet charged with developing one common plan within the executive branch of state government to improve public safety.

This was something that had never been accomplished before but made a lot of sense to me. I'd spent my public career as an assistant to former Gov. Lamar Alexander, a member of both the Memphis City Council and the Shelby County Board of Commissioners, and district attorney in Shelby County working to bring various partners together behind common goals and objectives.

Since 2011, the Public Safety Subcabinet has been a collaborative group composed of the commissioners and directors of 11 departments and agencies of the state's executive branch. In 2012, we began a team effort to implement an initial Public Safety Action Plan for Haslam.

Of the 47 steps in this plan, 83 percent were accomplished by July 2015. Examples include: curbing the sale of pseudoephedrine products to reduce meth production; mandatory incarceration for repeat domestic violence offenders; creation of a real-time database for prescribing and dispensing prescription narcotics; and effective data-driven enforcement efforts by state troopers to reduce traffic fatalities.

Since implementation of the first plan, we've seen encouraging trends. The overall crime rate has steadily dropped the past five years — a total decline of 12.8 percent. That includes a 19.3 percent decline in major property crimes and an 11.7 percent decrease in reported domestic violence offenses. Meth lab seizures dropped from more than 2,000 in 2010 to fewer than 600 in 2015. The amount of prescription narcotics dispensed to Tennesseans has declined for three years in a row.

Yet many challenges remain. Major violent crime has remained steady. Domestic violence makes up about half of all reported crimes against persons. As in other parts of the country, heroin-related arrests have skyrocketed, with an increase of nearly 700 percent since 2010. We have a repeat offender rate that remains far too high.

In January, Haslam announced a Public Safety Action Plan developed by the subcabinet. This new three-year road map focuses on:

- changes in the sentencing structure to achieve smarter use of prison beds for serious offenders and more effective alternatives for other offenders,
- steps to reduce the number of offenders and repeat offenders,
- greater assistance to victims of crimes, and
- an emphasis on homeland security to help ensure the safety of our state and its citizens.

To advance the plan, the Public Safety Act of 2016 imposes tougher sentences for repeat domestic violence offenders, drug traffickers and home burglars. It also creates effective alternatives to prison for those who have violated conditions of probation or parole, short of committing a crime. In addition, it includes steps to make it easier for victims of domestic violence to obtain orders of protection.

Passage of the Prescription Safety Act this year will ensure continuation of the controlled substance database, which doctors and pharmacists must check before prescribing and dispensing narcotics. And as part of the plan, we're providing significant additional drug treatment court funding.

The Public Safety Subcabinet model is one that's worked well in our state. Keys to its success have been the governor's personal involvement by attending subcabinet meetings regularly, the development and implementation of key performance indicators as a way of increasing accountability, and inclusiveness of all the key players within the executive branch. Tennessee is a safer state as a result.

BILL GIBBONS IS COMMISSIONER OF THE TENNESSEE DEPARTMENT OF SAFETY AND HOMELAND SECURITY AND CHAIRS GOV. BILL HASLAM'S PUBLIC SAFETY SUBCABINET.

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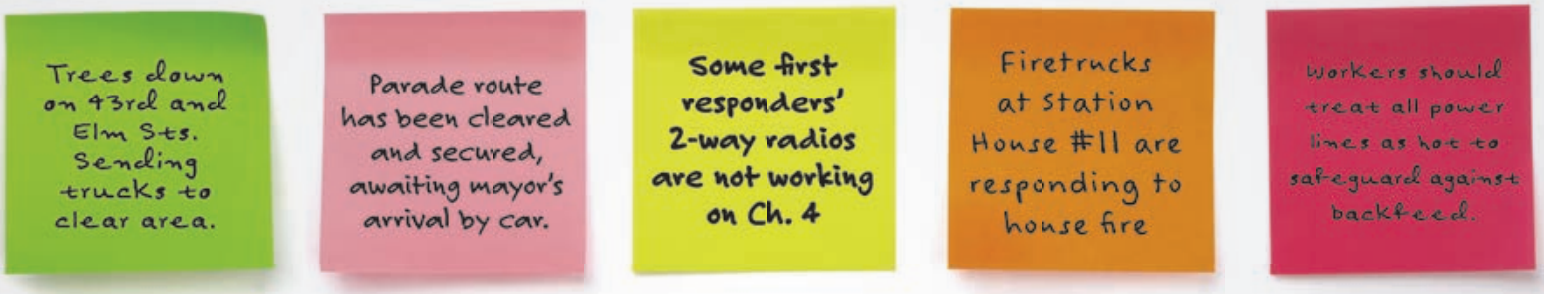

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