CENTER FOR DIGITAL GOVERNMENT

Issue Brief

Declaring Urgency for Next Generation 911

The importance of moving forward on data, image and text-enabled emergency communications

Emergency Situations, Outdated Technology

In 2010, the Federal Communications Commission (FCC) announced the Text-to-911 program, part of a larger and ongoing modernization of emergency communications known as Next Generation 911 (NG 911), which began in 2003. The Text-to-911 program was a response, in part, to the Virginia Tech tragedy in 2007, in which a shooter killed 33 people. That day, students and staff tried desperately to text 9-1-1 to the local dispatch center, but those messages were never received. Outdated infrastructure at U.S. public safety answering points (PSAPs) were only equipped for voice calls originating from landlines and mobile devices.

This incident, and others that occurred because legacy e911 systems have not kept pace with technology advancements, only reinforced the need for NG 911 and the fact that outdated technology slows down or even stops critical emergency communication. For example, Terry Hall, chief of emergency communications for the York-Poquoson-Williamsburg Emergency Communications Center in Virginia, said more than 30,000 text-to-911 messages went "in the bit bucket" and were never answered at his call center in 2013 alone.[1]

When the current analog e911 systems were designed decades ago, their primary purpose was to respond to medical, fire and criminal emergencies. The world has changed significantly in the post-Sept. 11th era. The degree and types of threats are different, potentially more complex, and may require the deployment of different resources and responses to address the emergency situation or situations.

While these systems have been a tremendous asset to public safety and emergency response departments for over a decade, their shine has long worn off and it's time for a more robust and reliable system, built for a world that has gone digital, to take their place. PSAPs and emergency responders should have capabilities beyond a voice-only solution that will better serve the emergency community and citizens.

Recently, the Center for Digital Government (CDG) surveyed over 150 state and local government IT professionals regarding their current 911 systems, their modernization plans for the future and their progress on NG 911. This issue brief will discuss the results of those findings and provide guidance on how jurisdictions can move forward in creating the emergency communications infrastructure that best serves citizens needs today.

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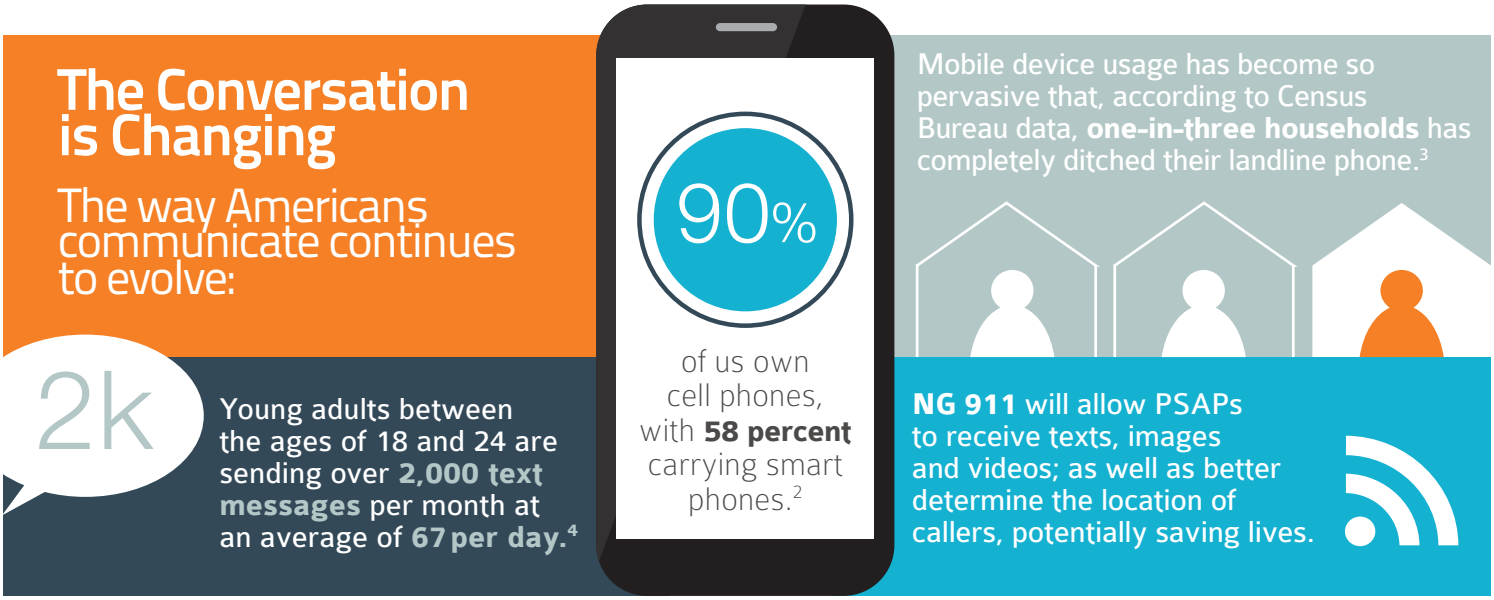

What is NG 911?

The goal of NG 911 is to fix issues similar to what happened at Virginia Tech and provide a foundation for a wireless mobile society. Once implemented, PSAPs will be able to accept calls from any networked device; receive useful forms of non-verbal communication, including texts, images and video; and locate callers with greater accuracy.

In situations where a caller cannot use verbal communication, such as a domestic violence event where the victim is hiding from an abuser, a text message can be a lifesaving silent call for help. The ability for callers to provide images and video to emergency dispatch gives police officers and first responders invaluable information regarding the layout of the scene and what they might encounter upon arrival. Not only does this allow them to better help the person in need, but it helps keep them safe by being prepared. One CDG survey participant noted: "(NG 911) will allow this agency to have more information in a quicker time-frame. It will allow this agency to bring the correct assets and contact the correct resources resulting in quicker and more efficient resolution to the event."

For individuals with hearing or speech disabilities, texting and the use of images provide better ways to communicate without using additional and outdated technologies like a teletypewriter. "The biggest benefit so far is allowing our citizens to have that extra access point, in particular our hard-of-hearing and speech-impaired community," said Judy Flores, director of the Black Hawk Consolidated Communications Center in Waterloo, Iowa, which launched the first text-to-911 program in the U.S. in 2009. "They have the same access as anyone else (now)."[5]

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Additionally, NG 911 increases reliability and helps reduce system outages — a situation that happens more than one would think. For example, in late 2013, the city of Austin, Texas, experienced a 911 outage that lasted nearly six hours. Normally during such an outage, a back-up system would take over. In this case, both the 911 system and the backup system failed. According to a news report following the incident, three days before this occurred, neighboring Georgetown also had a 911 system outage that lasted three hours. Five days after the Austin outage, Williamson County, Texas, experienced a 45 minute outage.[6] The IP-based architecture of NG 911 will help solve these issues as it provides more flexibility and resiliency than the legacy circuit-switched 911 system.

Ready to Launch ... Or Not

After more than a decade, NG 911 is poised to take off and the four largest telecommunications carriers have agreed to provide text-to-911 service by May 15, 2014.

However, challenges remain. While the wireless carriers will provide the capability for citizens to text to 911, the infrastructure at the PSAP needs to be able to receive that text. This modernization is the responsibility of states and municipalities across the country, but it isn't easy. Funding challenges and system interoperability problems have stalled progress.

Research from the CDG survey indicates that many jurisdictions will be unprepared in May, and may not be ready to launch NG 911 services for many months or even years to come. When asked

if they were considering replacing their e911 system, 73 percent of respondents said no or that they didn't know. It seems despite the fact that planning for NG 911 began in earnest over 10 years ago, many jurisdictions are still unsure of the steps to take or are encountering obstacles like funding constraints that are difficult to overcome. Twenty-six percent of respondents indicated they were still researching what steps they should take.

When asked if they would be ready for text-to-911 service by May 15, 26 percent said they had no confidence they would be ready and 44 percent said it was "hard to say" if they would be ready. Only 6 percent of respondents had already implemented a NG 911 system.

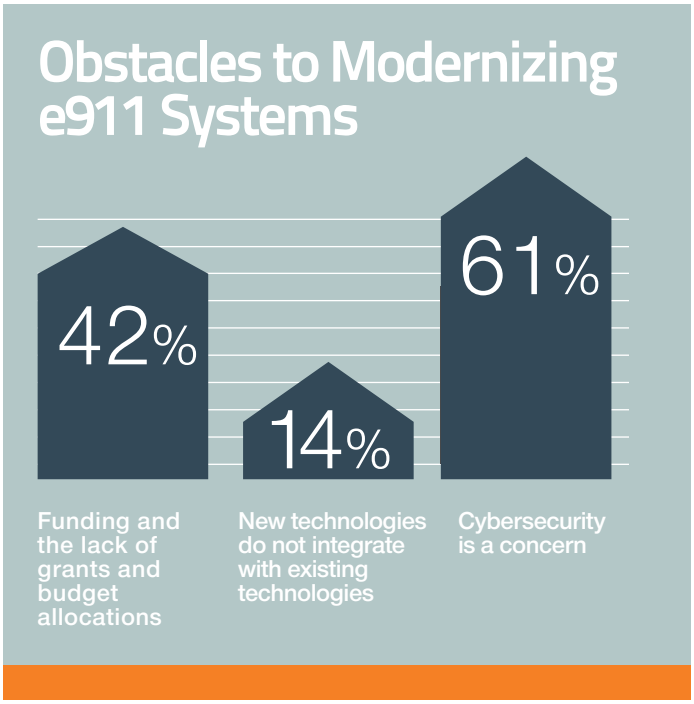
Obstacles to Overcome

It's clear that agencies face significant obstacles to overcome as they work to modernize their e911 systems. The largest hurdles include:

Funding

Never a surprise, lack of funding is one of the biggest issues stalling NG 911 adoption. Forty-two percent of respondents to the CDG survey said funding and the lack of grants and budget allocations was their No.1 challenge. One of the reasons money is in short supply is because of the outdated way in which e911 systems are funded. Most e911 system funding comes from subscriber fees on landline phones — a problem because, as previously noted, one-third of Americans don't even have a landline anymore. This has created funding shortfalls that make it difficult for agencies to maintain the status quo, let alone upgrade.

Additionally, money for e911 systems can be diverted to other pressing needs, such as ensuring there are enough police officers on the street or teachers in a classroom. It is sometimes easy to put planning for a future initiative on the backburner in favor of a fire that needs to be put out in the here and now.



System Interoperability

Fourteen percent of CDG respondents said their greatest challenge was the fact that new technologies do not integrate with existing technologies. Indeed, current e911 architecture was designed more than 40 years ago when wireline telephony voice was the only form of communication. While the platform has been modified to accept calls from mobile phones, it was never designed to receive text, data or video. These changes require technical upgrades, and standards are critical. While the National Emergency Number Association (NENA) has rolled out numerous standards, there is still work to be done.

Additionally, it's important that PSAPs are able to easily transfer calls to each other or even reroute calls to a more appropriate location or agency if needed. Transferring a 911 caller's information between jurisdictions is much easier when agencies are on the same Internet Protocol, as they will be with NG 911.

Cybersecurity

Much like funding, cybersecurity being an issue is never a surprise. An overwhelming 61 percent of respondents to the CDG survey said cybersecurity was a concern of implementing NG 911. Forty-one percent of respondents said they were aware of NG 911 security requirements, but were still preparing for them.

Moving to an IP-based system creates additional vulnerabilities and raises concerns that these systems could be compromised or hacked. For example, a terrorist group could target 911 systems during an attack, thus creating a one-two punch in which it inflicts disaster and then hinders officials to help respond to that disaster.

However, centralization gives agencies the ability to establish safeguards that can protect data in a significantly greater manner than largely dispersed local instances of data.

Moving Forward with Urgency

Despite these challenges, it is critical that agencies and PSAPs move forward in modernizing their infrastructures to allow for NG911. In early January 2014, FCC Chairman Tom Wheeler made an impassioned and firm statement regarding the progress of NG 911: "Since wireless carriers

serving 90 percent of all the wireless subscribers in America pledged to do text to 911, the response from the PSAPs has been underwhelming — only a handful of PSAPs have put this capability in place," he said. "As we begin this process, we call on the PSAPs to get with it."[7]

While the chairman's remark might come off as harsh, it is also a testament to how vital these upgrades are when lives may depend on it. Agencies need to move forward on a path to overcome the associated challenges stalling progress.

However, as noted in this issue brief, the challenges are many, the hurdles are great and public sector agencies' resources can be lean. Agencies will confront numerous complexities that will require IP network expertise. They will need to integrate new standards-based solutions and manage the eventual retirement of legacy systems.

Some agencies are managing these disparate challenges by working with a systems integrator in the process. A systems integrator can help agencies ensure interoperability among systems and are well-versed in the standards implemented by NENA.

Additionally, system integrators have often worked with tried and true vendors and systems and can provide support and advice on what solution will be the best fit for a jurisdiction's particular needs. System integrators can provide expertise in areas like cybersecurity that an agency may not have expertise in.

While the majority of agencies are still preparing to launch their NG 911 systems, there are some frontrunners whose experiences can provide guidance. The Black Hawk Consolidated Communications Center in Waterloo, Iowa, mentioned previously, implemented the first text-to-911 program in the country. Other examples include Frederick County, Md., which piloted text-to-911 in early 2013, and Neshoba County, Miss., which plans to open a state-of-the-art emergency communications center featuring an NG 911 system in spring 2014. In Vermont, over 90 percent of residents have the capability to text to 911. Maine, Tennessee and Iowa are also making headway in statewide rollouts.

As FCC Chairman Tom Wheeler said, the time is now. The technology is available. Agencies must continue pushing forward and overcoming the obstacles to implementing NG 911.

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Endnotes

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