

Next-Generation 911: What You Need to Know

David Rath | April 9, 2014



On May 1, 2010, a terrorist attack in New York City's Times Square was thwarted when street vendors noticed smoke coming from a vehicle in which a homemade bomb had failed to explode. Imagine if those street vendors could have used their cellphones to send pictures or video of the vehicle and its license plate to a 911 call center. What if the 911 center could then push that data to first responders and police to get the location from GIS and buildings visual in the photos?

"They could really capture the dynamics of the event," said Brian Fontes, executive director of the [National Emergency Number Association](#) (NENA). "That is what I call an information-rich 911 call, which will be supported in a next-generation 911 system."

What Is Next-Generation 911?

Fifty-eight percent of Americans own smartphones and people now routinely send text messages, photos and videos from their mobile devices. And although 75 percent of all calls to 911 are wireless, most 911 centers today are still tethered to the voice-centered world of communications of the last century and are unable to receive text or photos.

The existing 911 system faces difficulties in supporting [text or multimedia messaging](#), according to NENA, and it lacks the capability to interconnect with other systems and databases such as building plans and electronic medical records.

The very structure of the current 911 system is rapidly going out of date. “It is analog network-based,” said Roger Hixson, technical issues director for NENA. “You can’t find people in the phone companies knowledgeable about the old technology anymore. We have to evolve to survive.”

There is a movement under way to move to a [next-generation 911](#) (NG911) system based on modern Internet protocol-based networks that take advantage of capabilities such as text and video messaging. And NENA has done years of work on developing the i3 architecture standard that vendors will follow.

“The intention is to have interconnected networks,” Hixson said. “That type of interoperability requires standards. People in public safety also indicated that they wanted more flexible systems not just in terms of multimedia versus voice, but also in terms of their ability to pick different vendors and have them operate together, so they weren’t locked in with just one vendor.”

The deaf and hard-of-hearing will especially benefit from an upgrade, because it will be easier for them to reach 911 with their phones without requiring additional devices. Looking not too far into the future, it could also harness the technology of biomedical devices, such as a defibrillator that could automatically call 911 during a medical emergency. Increasingly popular automatic collision notification systems, like OnStar, could be routed to 911 and change the way a dispatcher responds to a serious accident.

Beyond receiving and sending multimedia, there are other benefits to the new types of networks. Public safety answering points (PSAPs) will be able to transfer calls and activate alternative routing to share the burden during an emergency or when PSAPs are closed by disaster. For instance, during Hurricane Katrina, 38 call centers were disabled and people in those areas were unable to reach 911. In contrast, Vermont has implemented a modern IP-based network linking its eight PSAPs. When Hurricane Irene took one of them offline in 2011, the other seven were able to seamlessly answer calls for that area. The next-generation system promises to allow seamless information sharing between 911 centers, first responders, trauma centers and other emergency response entities.

Linked PSAPs will also be able to share resources like GIS databases rather than each having to purchase its own.

“From my perspective, it will allow our 911 centers to function in the 21st-century world of telecommunications,” Fontes said. “It will allow for information — voice plus video and data — to move seamlessly from consumer to the 911 center, and then ultimately to first responders participating in FirstNet, the wireless public safety broadband network.”

What Will it Take to Implement?

If the benefits of NG911 seem obvious, the transition itself is by no means easy. There are many issues that states and regions must work through relating to technology standards, the process of transition, governance and funding. Creating regional or state networks of previously autonomous 911 authorities raises many issues. Complicating matters is that each state handles 911 differently.

Progress is uneven across the country. Some regions, like King County, Wash., have been working on upgrading their emergency call centers with NG911 technology for almost a decade. Yet in many rural parts of the country, very little has been done.

There are more than 6,000 PSAPs in the U.S. and they all do things slightly differently, said John Chiaramonte, senior program manager with consulting firm Mission Critical Partners. "Whether these changes happen at a city, county, regional or state level depends on factors having to do with size, history and culture," he said.

For instance, Vermont has made progress on NG911 because it has only eight PSAPs statewide. Rhode Island has just one PSAP for the whole state. It is much easier to control funding and governance in those situations compared to someplace like Texas that has hundreds of PSAPs.

"Technology is not really the big issue," Chiaramonte said. "It is more the funding, policies and governance that must be worked through."

The 911 authorities also have to determine how they will maintain legacy systems while working on new ones. "There is not going to be a flash cut-over," he said. "For a while there is going to have to be a hybrid approach."

Regions around the country are developing Emergency Services IP networks (ESInets), which are the foundation on which 911 will be built. They are designed to expand [mutual aid](#) and allow for the sharing of applications and systems. For instance, they could provide internetwork access to databases such as hazmat information.

In one example, 17 emergency telephone system boards in southern Illinois have bound together through intergovernmental agreements to create a secure public safety broadband network. They will share voice and data associated with a next-generation capable 911 system. Instead of purchasing 17 separate sets of NG911 equipment that would each serve a limited geographic area, they are purchasing two redundant systems and connecting them through a secure IP network.

Some states, like Ohio, are planning a common statewide network structure for core functions. "That highlights an incredibly important point," Fontes said. "Everyone wants to know what the cost is going to be, and that is a valid question to ask. But there are cost savings associated with the investment. In Washington, where they have deployed the telecom infrastructure for NG911, they have a 48 percent savings in telecommunications cost. So looking at cost is just one side of the coin."

Colorado is a case study of the promise and challenge of NG911. Daryl Branson, executive director of the nonprofit [Colorado 9-1-1 Resource Center](#), explained that 911 is very much a locally controlled service in his state. Many states have some level of state coordination, such as a 911 office or board. But not in Colorado where the only oversight of 911 service at the state level is the Public Utilities Commission (PUC). And the PUC is tasked only with overseeing the quality of service provided by the carriers, Branson said. “That presents some challenges for local-control states,” he added, “when they want to try to transition to a type of network that is regional or statewide in nature, which is what NG911 would be.”

Stakeholders in Colorado are trying to define a new path because there’s no desire to give up local control or create a new regulatory or oversight body at the state level, Branson said. There have been investments in preparation for NG911 in many parts of Colorado.

“In the Front Range corridor from Fort Collins to Colorado Springs, there’s an understanding that this is the direction we have to go, and a lot of authorities have put in structures already to get themselves ready for an IP-based future,” Branson said. “But in rural areas of the state, in some cases they see the potential, but in other cases it seems very far away and I don’t think it is very high on their list of priorities.”

Speaking at a Feb. 25 PUC workshop, Matt Goetsch, 911 coordinator for the Montrose County 911 Authority, expressed concerns about going to the added expense for features that a smaller authority and PSAP may not need for some time.

Joseph Benkert, counsel for the Boulder Regional Emergency Telephone Service Authority, which has four PSAPs, said Boulder uses an IP telephone system provided by Intrado. “We could implement NG911 pretty easily at any time.” But he said there are several unanswered questions, including: When does it make sense to do so on a cost basis? And when are the features and services going to be available?

“Our concern is somewhat with the expense of those services and features that may only benefit a small number of people,” Benkert said. “And where would we take money from to pay for those services or features? Because it is a zero-sum game among the public safety agencies.”

System upgrades funded and coordinated by the [Larimer Emergency Telephone Authority](#) (LETA) have connected the five PSAPs in Larimer County with a next-generation-ready network. LETA plans to begin offering text-to-911 services in June, working with all four main mobile carriers in Colorado, said Kimberly Culp, the organization’s executive director. The five PSAPs can now communicate instantly online and reroute 911 calls to other communications centers during times of heavy call loads.

Culp agreed that funding can be a challenge, but she said that LETA had been planning for the changes for years, including setting aside funds for the upgrade. “You have to do it in steps,” she said. “You can’t do it all in one year. The biggest challenge for Colorado is how do we do it together? Here in Larimer County, we are good to go.”

The big question, Culp said, is how to connect to adjacent counties or to help them upgrade. “We don’t need state oversight. We just need to go ahead and do it on the local level.”

How Soon Will NG911 Become Reality?

Fontes and Hixson both estimate that NG911 should be fairly ubiquitous in the U.S. within five years, although there will be outliers that take longer. So what’s the main roadblock?

In some states, 911 is woefully underfunded, and the 911 community has expressed concern that the federal government has not made enough grant funding available for the transition. The federal government has spent just \$43 million on grants going back to 2008 for NG911 projects, and so far has designated \$115 million (in the Middle Class Tax Relief and Job Creation Act) for it going forward.

“If we really are going to ensure that our nation has a NG911 system, we have to make sure we are on par with other public safety services, and that we have a sufficient amount of money to enable this to occur,” Fontes said. “There are 250 million 911 calls made each year, and that is the first link to public safety. And to have that first link so critical to the whole chain of events underfunded is very unfortunate.”

No one at the local level wants to see the federal government do anything that looks like it’s taking over local provision of 911 service, Branson said, but he noted that the federal government is spending up to \$8 billion on the FirstNet network to connect first responder agencies with wireless broadband.

“Clearly, their priority is on FirstNet and not on NG911, but the way I look at it, those are really two sides of the same service. Getting information from the public to the PSAP is the NG911 part,” Branson explained. “They are spending money on the back end, which is getting information from the PSAP to the first responders. But if you can’t get that information from the public to the PSAP first, you’re missing half the equation.”

There are great opportunities for collaboration between NG911 and [FirstNet](#), Chiaramonte said. FirstNet is being designed as a wireless broadband network to connect all first responders. NG911 is a new network to connect all 911 systems. “These are parallel activities going on, and there needs to be more coordination and bridging between these two efforts,” he said. “There are finite resources and not enough funding for either so far, so it is imperative that the efforts be coordinated.”

Aside from funding, another hurdle is that legislative changes are needed in most states because the rules governing 911 haven’t been rewritten in 40 years, Chiaramonte said. “They often specifically reference legacy technology and might not be open to interpretation with newer technology.”

A 2011 report by the California Technology Agency noted that several state laws and regulations governing the type of devices and “calls” allowed to access the NG911 network might require modifications, including:

- reviewing laws and regulations concerning the eligible use of NG911 funds;
 - ensuring that laws or regulations do not require specific technology components for 911 service delivery that are incompatible with NG911 service;
 - eliminating laws and regulations that inhibit efficient sharing of NG911 data, but retain appropriate safeguards for privacy protection;
 - crafting uniform requirements for all NG911 service providers that meet accepted industry standards;
 - ensuring that laws and regulations are functional, standards-based and performance-based, without reference to any specific proprietary technology, manufacturer or service provider; and
 - ensuring that state and local government should be prohibited from reallocating funds intended for existing 911 and new NG911 services to other purposes.
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 - ensuring that state and local government should be prohibited from reallocating funds intended for existing 911 and new NG911 services to other purposes.

Government leaders need to treat 911 on par with police, fire and emergency medical services as a critical public safety service. Increasingly, Fontes said, consolidated emergency communications centers are operating independently and no longer tethered to police, fire or EMS. But policymakers have to understand their importance. “Of course, we would always like money,” he said. “But more importantly, we would like equal treatment for grants and funding that already exists for public safety.”

This story was originally published by [Emergency Management](#)

<http://www.govtech.com/public-safety/-Next-Generation-911-What-You-Need-to-Know.html>