

# Are You Ready for Next Gen 911?



# New Technologies Create Challenges & Opportunities for Public Safety

The move toward next-generation communications presents enormous challenges for public safety agencies. As is often true with technological innovation, it can be difficult to distinguish challenge from opportunity because one creates the other.

Such is the case with Next Generation 911. With next-generation communications, emergency call centers can use voice, text, video, photos, and social media to deliver information to public safety answering points (PSAPs) and request emergency assistance.

But that's not all. With the explosion of connected sensors in homes, vehicles, and cities, next-generation PSAPs will also receive information from third-party sources, including alarms, vehicle telematics, video cameras, and intelligent roadway systems. This also includes data services, such as citizen medical or hazardous materials location information.

To make next-generation communications a reality, an emergency services Internet Protocol (IP) network must be available and every PSAP must connect to it. Jurisdictions must physically replace existing copper telephone lines with high bandwidth connections capable of supporting IP-based communications. Because this upgrade can be costly, few call centers have the infrastructure to connect with such a network. However, governments support this move, so PSAPs must prepare.

## Next Gen Data Types



Data  
Services



Message  
Services



Photos



Videos

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## Demands on the PSAP

PSAPs must manage, prioritize, leverage, and respond to a larger volume of diverse information that will flow at increasing rates into their centers. However, the information will provide little value unless call-takers and dispatchers have the technology and training to use it intelligently. Internal hardware and software must be in place to receive and respond to new emergency communications. These systems can access data in its native format to increase situational awareness.

In terms of software, communications and computer-aided dispatch (CAD) systems will require substantial capability upgrades to fully exploit next-generation information. The IP-based technology will make additional call-related information available to the PSAP, provided the communications and CAD systems can access it. Both communications and CAD vendors will have a variety of new demands, including tighter integration in a common environment, with CAD software providing call management functionality seamlessly.

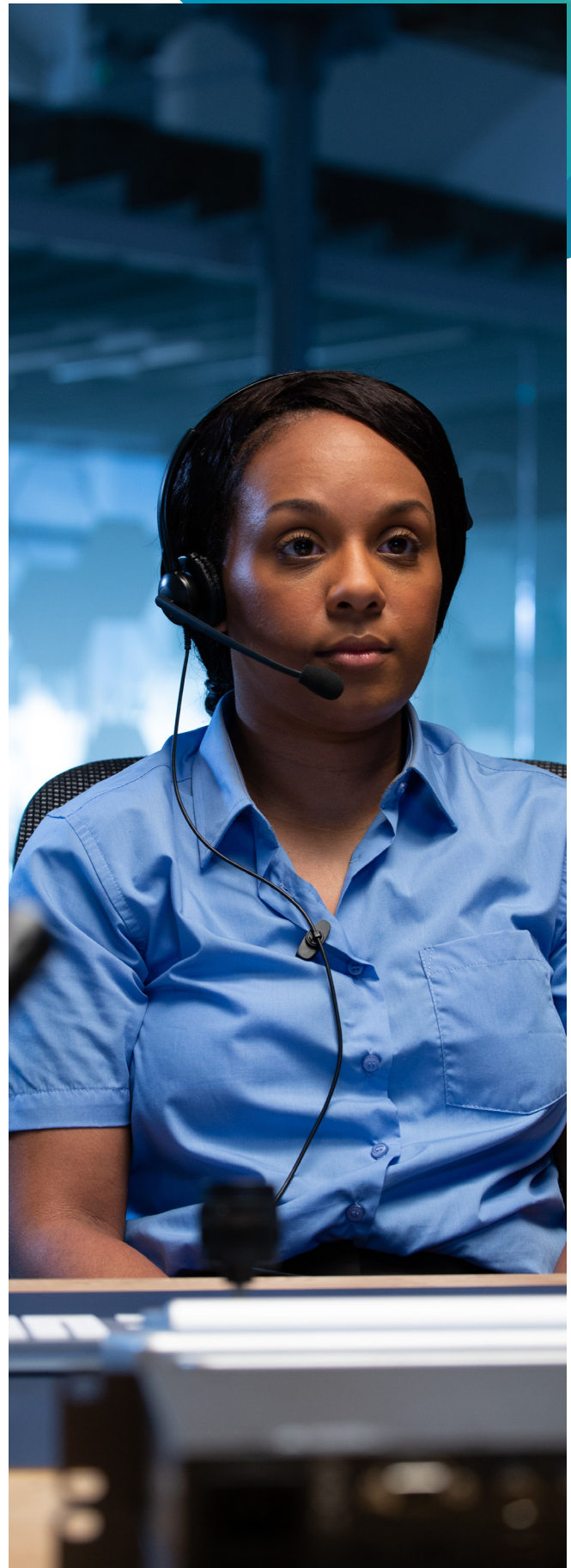
## Integrating Call Control

Call-handling and CAD software should work together to display different types of communications with unique icons on the CAD map screen before they are answered. This process would accelerate how PSAPs handle multiple calls relating to the same incident. It also would allow call-takers to see incoming emergency calls in a specific geographic location and prioritize the order of response.

Instead of only answering calls in the order received, integrated call-handling and CAD systems will give call-takers the option to select calls based on location. For example, after receiving several wireless calls about a traffic accident, a call-taker may decide to answer incoming communications from the same geographic area, where photos or videos are available. The call-taker will have better situational awareness and more fully understand the seriousness of the incident. As a result, call-takers and dispatchers can make smarter response decisions.

With the right programming, an integrated call control and CAD system can recognize clusters of calls that pertain to the same event. More importantly, they could identify incoming calls outside the cluster – even if they are near the incident.

When call control is integrated with CAD, the system will link the text conversation to an event. These systems will acknowledge receipt of the text and allow call-takers to carry on a text conversation as they would with a voice caller.

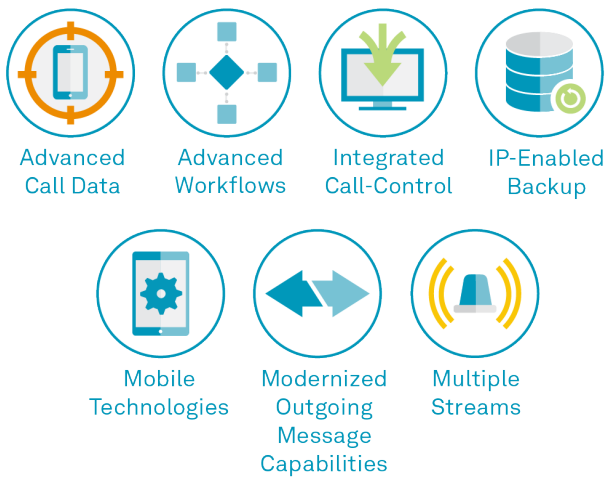




## Receiving Call Data

One of the biggest functionality advancements of next-generation communications is the ability to receive data associated with a call. This includes data received from the caller, such as an image or a video clip, or data attached by services on the next-generation network. When an emergency call occurs, the network will search and query all available data services for call-related information by the device's phone number, person's name, and location of the caller.

### Features of a Next Gen-Ready CAD System



Existing services allow individuals to store personal details, such as health conditions, contact information, or pictures of their loved ones. Another service combines hazardous materials and weather information at the location of a spill for plume analysis and diagrams. New services will also store building information, such as blueprints and utility shutoff locations.

This wealth of information can improve response decisions and increase the safety of first responders, but may also overwhelm the PSAP. It is critical that CAD systems manage this data so call-takers, dispatchers, and first responders can do their jobs more effectively. This includes interfacing to records management and multimedia logging systems for data capture, search, and archiving.

The ease of two-way communication will require PSAPs to modernize outgoing messaging capabilities – and not all messages will be voice. It is now common for PSAPs to distribute recorded messages by phone to geographic areas where floods, fires, or other emergencies demand public action. Also, SMS and social media are now the preferred method for keeping the public informed. The day is rapidly approaching when public safety officials also will rely on the PSAP CAD to blast photos, videos, and other information to every smartphone in a specific area.

## Connecting to Sensors

The IP-based technology behind next-generation communications will also open the floodgates to incoming data from a wide variety of sensor networks. Some jurisdictions are already experimenting with sensors that deliver warnings to the communications center when a road floods or traffic comes to a standstill. This warning, which may sound like an alarm tone, alerts the PSAP that trouble is brewing.

Agencies should expect more innovations in the future, but also anticipate a more sophisticated response from the CAD system. Most citizens don't realize the extent to which sensors have already been deployed in major cities. Environmental sensors can detect airborne radiation, poisonous gas, and biohazards in large

**With Next Generation 911, call-takers and dispatchers can make smarter response decisions.**

entertainment venues and mass transit facilities. Homes and office buildings also feature various security system sensors. Even certain vehicles have built-in systems that detect and report impacts.

Most, if not all, existing sensor networks trigger notifications or alarms received by third parties before the PSAP is ever involved. For example, the U.S. Department of Homeland Security monitors most hazardous materials detectors, and the first line of response for home security systems are the alarm companies. Likewise, automobile makers have their own call-taking centers to handle emergency messages from vehicles in accidents. In all cases, these organizations filter calls before engaging public safety authorities.

### **Delivering notifications directly to dispatchers can shave minutes off response times.**

The technology already exists to integrate CAD systems with multiple third-party sensor networks so dispatchers receive the notification when the sensor operator does. Delivering the notification directly to a dispatcher can shave minutes off response times by eliminating third-party operators and emergency call-takers from the sequence. Built-in layers of intelligence help direct sensor notifications to the correct police, fire, or ambulance dispatcher, while filters logically discern false alarms.

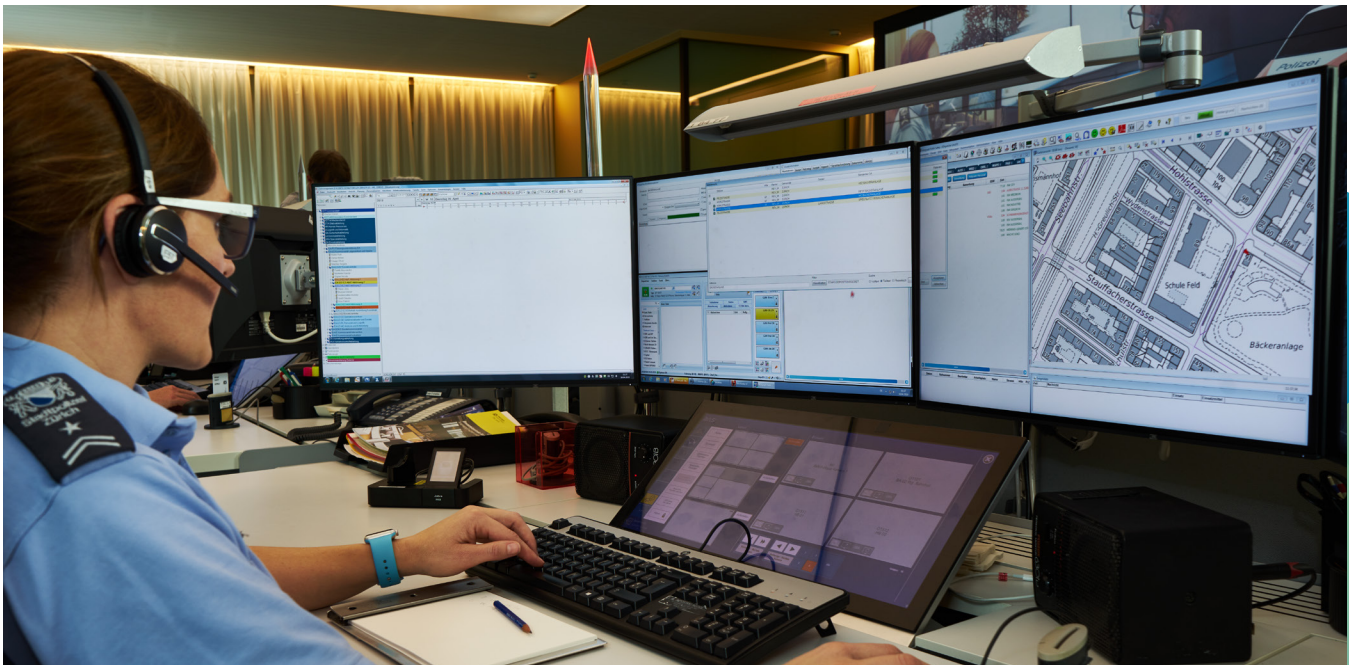
The ability to understand that sensor information may need to be delivered to multiple communications centers over a wide area assists with regional response coordination.

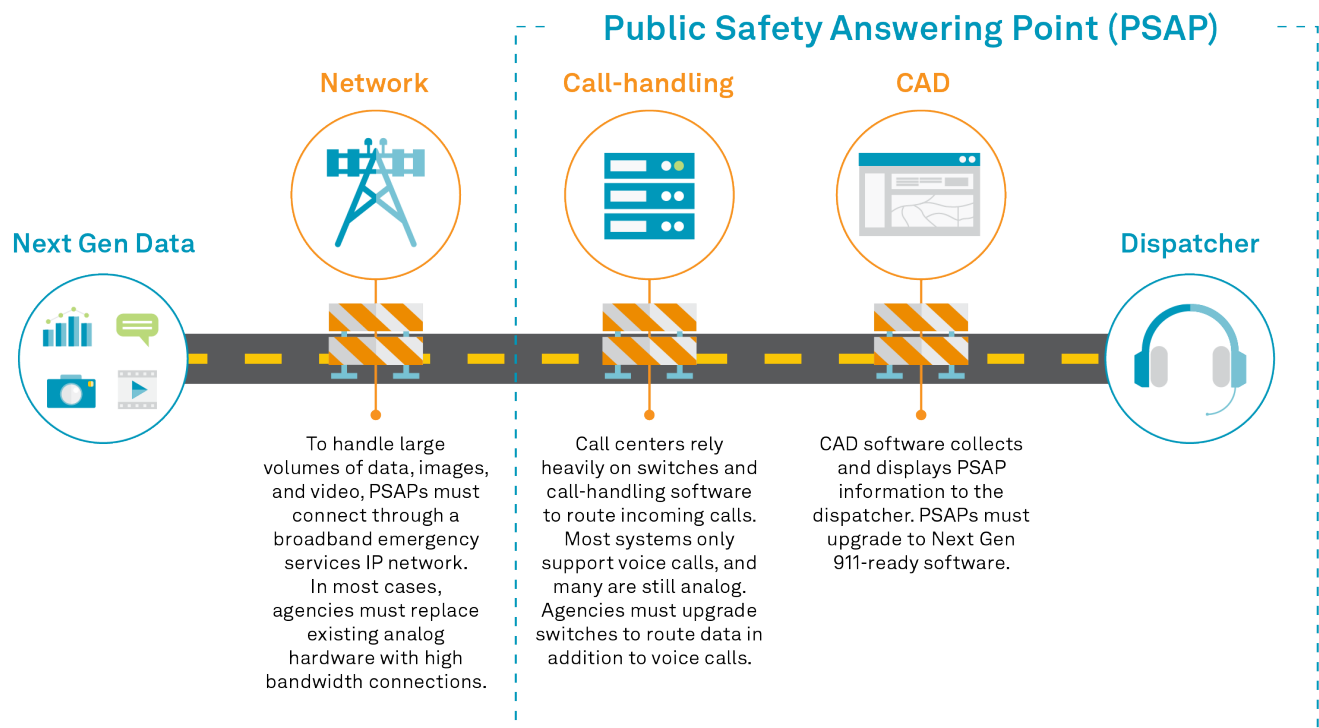
## **Improving PSAP Operability**

Data and system interoperability must also be part of the plan as PSAPs transition from legacy infrastructures and move toward Next Generation 911. It makes sense to consider flexible, shareable technology configurations between PSAPs. Driven by the need to improve quality of service, operate within limited budgets, and follow state mandates, PSAP interoperability is becoming more common across the U.S.

Interoperable PSAP architecture offers improved service quality, lower long-term costs, and better collaboration between agencies. Today's technology can bridge the gap between current emergency response capabilities and what's available in the consumer market, while also extending technology benefits to multiple PSAPs.

Next Generation 911 technology comes at a higher cost, making it difficult for some agencies to afford as state funding dwindles. As emergency response expectations change, agencies experience dramatic increases in technology, training needs, and PSAP costs. By pooling technology budgets across multiple PSAPs, it is possible to significantly drop redundant expenditures.





Many standards being developed around Next Generation 911 strongly support PSAP interoperability. While specific legislation requiring interoperability has not been implemented in the U.S., many states have passed laws promoting shared services frameworks. Incentives are also available for PSAPs considering upgrading to an interoperability model.

A related topic is emergency backup. Next-generation communications deliver a flexible IP-based technology that provides backup during overload situations or when a major disaster knocks a communications center offline. IP-based technology will make it possible to instantly shift call-taking to a designated backup facility, such as a partner agency's facility.

## Moving Forward

With next-generation capabilities, PSAPs can offer public safety services that are dramatically superior to what is possible today – provided each communications center has the internal technology and training to manage, filter, and understand valuable information streams. A combination of infrastructure upgrades and advances in communications and CAD technologies will help agencies take advantage of one of the most challenging and exciting opportunities for the public safety industry in decades.

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