



*Wireless Need Help? Call 911! But will they find you in time?*

# Need Help? Call 911! But will they find you in time?

[Computer Dealer News](#)

In an emergency we have an expectation that when we call 911, first responders will quickly be on the scene to assist. Unfortunately, the reality of E911 can be complicated and more disconcerting than this. Sometimes the truth hurts and in the case of [what is happening in Canada and the U.S. today](#)...there is reason to be concerned. People are dying!

## **Background of E911**

The first 911 call was completed in Haleyville, Alabama in 1968 and in the early 1970s; cities were adopting the number universally. The 911 telephone networks were designed to carry voice calls from one location to another. Services were regionalized, and the local phone company managed the entire infrastructure from end-to-end. People had landlines and the service worked well because one location was attached to that land-line.

In the subsequent years, technology advanced and people moved away from landlines. Today, over 70 percent of 911 calls are placed from wireless phones and this percentage is growing. For many people, the ability to get help in an emergency is one of the main reasons they own a wireless phone. However, today's cellphone system does not automatically send location data when you dial 911.

After the call comes in, the dispatcher's computer transmits a digital request to the cellphone network seeking the phone's location. This exchange of data can take seconds or minutes. Sometimes, it doesn't return a location at all. If the system can't locate the device, the carrier systems will use nearby towers to estimate the location. Often, 911 calls end before the specific location is provided for emergency responders.

### **Impact on lives and why doesn't it work**

It is estimated that 10,000 lives could be saved in the U.S. alone with better cellphone location information.

Unfortunately, we cannot provide you with specific Canadian information due to the fact that we have not consolidated source data across municipalities or provinces, let alone a national view!

If you are like me you probably said, "***but wait...my mobile phone has GPS, what's the problem?***" Since wireless phones are *mobile*, they are not associated with one fixed location or address...like the land-line was.

While the location of the cell site closest to the 911 caller may provide a general indication of the caller's location, that information is not always specific enough for rescue personnel to deliver assistance to the caller quickly. Often the cell tower is anywhere from 10 to 20 miles away from where you are actually located.

### **Challenges with the current telecom network**

According to Mark Fletcher, [Avaya's](#) Chief Architect for Worldwide Public Safety Solutions, "Popular communication channels commonly used today simply do not work over the legacy telecom provider 911 environment."

What callers don't realize is that they are dialing on an antiquated emergency telephone network, a system that struggles to deliver geographic location. As hard as it is to believe, other than adding Automatic Location Identification (ALI) to the number identification, the 911 systems has not been overhauled since the 1970s!

Popular communication tools like text, video and chat, which are now part of our every-day lives will not work over the legacy 911 environment. With text we are not even talking about accuracy...no location data is delivered to the 911 centers.

### **Challenges for next generation devices**

To recap, there are several major deficiencies with E911 services today - location accuracy, situational awareness and misroutes.

Location information provided by smartphones is not accurate enough for emergency situations. The first challenge is that the tower information may be miles from your actual physical location. Another challenge is that information passed on to 911 centers can vary depending upon the carrier.

If your GPS (X and Y coordinates) are provided you may still not be found if you are in a building with multiple floors. WHY? There is no way of telling where within the structure the call is coming from. This is called the Z axis and it is another missing ingredient in the puzzle.

Situational awareness refers to the type of information the 911 responder needs about the nature and severity of an incident before they arrive on the scene so that they can speed response times and enhances outcomes.

One very relevant and real example is the recent (July, 2015) explosion at the Runxing chemical plant in Tianjin, China, where 67 firefighters died and another 37 are missing; while 11 policemen died or are missing.

This is the worst disaster for first responders in recent Chinese history. In this incident it is believed that the firefighters used water to douse the flames. They did not know that the chemical on-site was calcium carbide, which reacts with water to create highly explosive acetylene.

Another common problem is that calls “misroute.” This typically happens when a caller calls 911 from one jurisdiction, but the call goes into another because of the location of the cell tower.

This happened with tragic consequences in Atlanta in December, 2014, when Shanell Anderson drove off the road. Shanell knew the cross streets, even the ZIP code. She called 911 and repeated her location over and over, but it didn’t help.

Her call was routed through the nearest cellphone tower to a neighboring county’s 911 system. The dispatcher couldn’t find the streets on her map. Worse yet, the system couldn’t get a fix on the cellphone’s location before the call ended. It took 20 minutes for rescuers to get to Anderson. She died a week and a half later in hospital.

People watch TV and they believe that first responders can easily locate them – unfortunately that is not always the case.

### **Can this be true?**

In studies conducted by USA Today, more than 40 Gannett newspapers and television stations in 2015 looked at 911 call records from seven large states as well as many additional cities between 2010 and 2014.

Here are some of the results:

- In California in 2014, 12.4 million, or 63 per cent of California’s cellphone calls to 911 didn’t share location.
- In Colorado, 42 per cent of the 5.8 million cellphone-to-911 calls didn’t transmit location information – meaning 58 per cent did!
- In Fairfax County, Virginia, outside Washington, D.C., 25 per cent of cellphone calls included precise location data in 2014; 75 per cent did not!

*Note: The FCC doesn’t collect data, and neither do some of the 911 centers. This makes it difficult to look at consistent statistics from state-to-state. The same thing applies for the CRTC and our provinces and territories.*

## **Why has the E911 network technology fallen so far behind?**

The simple answer is money. It takes a lot of money to upgrade national systems and have them work together so that tragedies like Shanell Anderson don't repeat.

## **Next Generation 911 (NG911)**

NG911 represents the technology, processes and capability needed to update emergency networks. While the tools sitting on top of the 911 network have been updated throughout the years, the fundamental core technology – analog based, 1970s phone switching – has not.

Next Generation 911 technology solutions will be able to handle the additional information smartphones contain, as well as IP telephones, text messaging, video and on-line chat. There are a few exceptions to this situation such as the state of Colorado which has rolled out IP delivery of text-to-911 calls over an IP network and where they also deliver the centroid (mathematical center) of the cell sector.

## **So when will NG911 be implemented in the US and Canada?**

In the US the FCC recently approved guidelines, cell phone carriers (leading four carriers only) will have to provide accurate Phase II information on more than 40 per cent of all calls in two years. Within six years, the FCC wants all carriers to provide 911 centers with useful Phase II information on 80 per cent of all calls. This still means that one out of every five calls in 2021 won't have to provide 911 operators with accurate location information.

In Canada NG911 promises the ability to transfer calls, messages and data, like pictures or video between any interconnected NG911 systems or responder communication system anywhere in the country or beyond. It's about the ability to share data and become interoperable with other systems. It's about more efficiently responding to life and death situations.

The CRTC regulates the provision of telecommunication services by TSPs (Telecommunications Service Providers). In the 911 contexts, the Commission's role is to exercise regulatory oversight over the telecommunications access

provided by Telematics Service providers (TSP) to enable Canadians to contact 911 call centers, also known as public safety answering points (PSAPs).

Note: In Canada, the TSPs would be organizations such as [Bell Canada](#), [TELUS](#), Bell Mobility, TELUS Mobility, [Rogers](#), Bell Aliant, etc.

Provincial, territorial, and municipal governments are responsible for emergency responders (such as police, fire, and ambulance) and for the establishment and management of PSAPs that dispatch them.

In 2015-16, the CRTC will conduct a comprehensive examination of NG911 services, which will include the establishment of the regulatory framework for implementing NG911.

In the U.S., the Federal Communications Commission (FCC) has several requirements to wireless or mobile telephones.

- **Basic 911** – All 911 calls must be relayed to a call center, regardless of whether the mobile phone user is a customer of the network being used
- **E911 Phase I** – Wireless network operators must identify the phone number and cell phone tower used by callers, within six minutes of a request by a PSAP
- **E911 Phase II** – 95 percent of a network operator's in-service phones must be E911 compliant (location capable) by December 31, 2015

Wireless network operators must provide the latitude and longitude of callers within 300 meters, within six minutes of a request by a PSAP.

### **Future Forward – Vendors developing next generation E911 solutions**

There is hope that these challenges can be overcome using solutions that one of the longstanding 911 telecom vendors is developing.

A new service call “iLoc8” from Avaya was just introduced in Lakewood, N.J., and holds great promise. When a citizen calls or texts 911 from a mobile device, Lakewood dispatchers receive information that the call is originating from a cellular network.

iLoc8 then allows the dispatcher to send an SMS message to the device with a web link. With the click of a button, the browser-to-browser data connection is established between the mobile device and the 911 centers, which allows the mobile user and the dispatcher to share multimedia information in real time.

From the browser window, dispatchers can see a [Google Map](#) location of the caller, along with the default language of the caller's operating system and the phone's remaining battery power, which will alert them if they need a translator or need to keep communications brief to conserve power.

The dispatcher can push images and videos to the caller's phone. A diagram or video describing how to do the Heimlich maneuver or perform CPR is often more effective than spoken instructions. Likewise, mobile users at a tanker accident can take a photo of the chemical symbol on the back of the truck and send it to a dispatcher for interpretation.

According to Mark Fletcher, "Avaya is taking common technology that's utilized in commercial applications, and we're applying that to the public safety use case. We're making tremendous advances by doing that."

**Note:** This is not the only E911 solution available, but is one of the most innovative in that it is able to integrate with more of the next generation communications interfaces automatically, without human intervention, compared to some of the current E911 solutions.

### **Tips for Calling 911 with a Mobile**

If you are making a 911 call from a mobile device here are a few tips to help the first responders:

- Tell the emergency operator the location of the emergency right away
- Provide the emergency operator with your wireless phone number, so if the call gets disconnected, the emergency operator can call you back

### **Why is Canada so far behind?**

In the mid 1990s many of us lobbied for competition (Roberta Fox was a former CBTA member and vice-chair and chair telecom public policy committee). CBTA also spent 14 years pushing to get number portability for our mobile phone.

We are all paying monthly fees to our various telecom providers (wired and wireless) to have safe, reliable 911 support, and yet these fees are not going into upgrading the provider networks to be able to automatically consolidate information to enable emergency responders to find and respond with the least amount of time and effort.

### **Call to Action**

We at FOX GROUP believe that now is the time to join together and put our voices forward to get our various government departments and vendors to “wake up, pay attention!” to E911.

As a large, distributed mobile economy, it is critical that we have the ability to have appropriate technologies network together to enable us as Canadians to have timely, accurate 911 support from the various government bodies that help us when emergencies happen.

### **Our Role in the Future Development of E911 in Canada**

Having given this a lot of thought and consideration over the past few years, we have invested in pulling together a team of specialists who bring the telecom carrier view, enterprise telephony view and IP network views together.

*We have submitted an application for Roberta Fox and Bill Elliot to join the National Emergency Number Association ([Nena911 Association](#)). Once approved, Bill Elliot will work on becoming the ENP Certified FOX GROUP professional. We will also be able to extend our current VoIP, telecom, network and contact center advisory services to include the latest 911 offers, alternatives and strategies, policies, procedures and providers.*

We will also be reaching out to the various Canadian vendors that work in this space to provide the opportunity to share their product offers, services and



future plans. We will consolidate this information to our internal benchmarking/best practices libraries for future analysis work.

This enhanced next generation NG911 advisory services is applicable to all organizations, disregarding size or location. It could include emergency responders, community distress centers, municipalities, government agencies, schools, universities or enterprises.

### **Closing thoughts**

It is critical for all Canadian organizations to have appropriate policies and procedures in the short term to ensure that they are providing the best possible information for their employees to enable emergency responders to be successful.

*Bill Elliott and Susan Dineen of Fox Group Technology contributed to this article. Roberta Fox and her team will start to share there recommendations on some short-term alternatives on its Web site. As always, Roberta look forward to your thoughts, [feedback](#) and support on this important matter to Canadians.*