

# 4G Transforms 4CI

The next revolution in situational awareness.

In public safety, situational awareness is everything. Decisions must be made quickly — and they should be based on real-time information from a variety of sources. Communications must flow instantly, in all directions, for commanders and responders to truly have the complete picture. Information must be there at the right time — not six seconds later — because that can be the difference between life and death.

Fourth-generation (4G) communication networks and devices will transform situational awareness. Responders will have a common operating picture like never before. With 4G, everyone will be on the same page immediately because 4G is vastly superior to 3G in three key areas: upload and download speeds, bandwidth and latency.

That means faster sharing of information in any direction, on any number of devices — from firefighter to command, from dispatcher to squad car, from officer to officer. The lower latency and higher bandwidth will make video more useful than ever before. With 4G, streaming real-time video will be



much higher quality. Delay, jitter and low-resolution images will be replaced by stable, sharp, high-definition video that arrives almost instantly. And it can be easily sent to one or many, so everyone who needs to know what's happening can actually see it.

## 4CI and Public Safety

4CI is a well known military doctrine, used by public safety agencies in emergency response and other activities. It's often equated with situational awareness. 4CI consists of:

## NUMEROUS FUNDING SOURCES FOR PUBLIC SAFETY COMMUNICATIONS

Public safety agencies can find funding in a number of places for end-user devices, communications vehicles and other equipment that will help agencies make the most of 4G technologies. Michael Paddock is CEO of Grants Office, a Rochester, N.Y.-based company that helps grant seekers with fundability analysis, research, grant writing and more.

He cited three key sources of funds: 1) Security grants for specific sectors such as critical infrastructure, educational institutions or agriculture. Funds can come from the U.S. Department of Homeland Security,

but also from sources like the Department of Education, the Department of Agriculture and others. Some of these funds can be used for communications. 2) General types of security funding, which could support things like training, preparedness exercises and communications. 3) Funds meant specifically for public safety communications.

"My recommendation to any public safety agency is to take a balanced approach," said Paddock. "Look at all three types of funding rather than focusing just on those grants that are specifically for public safety communications, because that's only a small piece

of the overall landscape." When applying for grants, public safety agencies should omit terms such as LTE and WiMAX to allow for a more competitive environment.

While grants specifically for communications aren't increasing in number, there is still reason for optimism. "There has been growth in the number of funding sources that will support communications as part of a larger project," Paddock said. "The most important thing is that people apply for grant opportunities wherever they find them."

For more information, visit [www.grantsoffice.com](http://www.grantsoffice.com).

**Command:** The authority and responsibility for effectively using available resources, and for organizing, directing, coordinating and controlling personnel and equipment to fulfill a mission.

**Control:** The ability to issue orders or directions, with the result that those directions are carried out.

**Communications:** The most essential element. Communications between responders on the ground and command staff are critical to ensure that both groups have a common operating picture of the situation.

**Computers:** They process, display and transport information needed by commanders, analysts and responders. Today this increasingly includes mobile devices, such as laptops and smartphones.

**Intelligence:** The product of the collection, processing, integration, analysis, evaluation and interpretation of all available relevant information.

#### 4G Makes a Big Difference

Until now, 4CI depended on 2G or 3G technology. The inherent limitations prevented optimum situational awareness. Command and control weren't as effective, as there was often a disconnect between what was seen in the field and the information received at the command center. Communications weren't as strong because although radios are good for voice, they're not as effective as everyone seeing the same images and data simultaneously. Computers are more mobile now, and 4G optimizes their usefulness with rich-media applications such as video.

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**Danny Bowman**, president, Sprint Integrated Solutions Group

Intelligence gathering, too, is simply better now with 4G. Information flows much faster. Sending high-resolution mug shots or other large files, or sharing real-time surveillance video, is now

#### PARTNER PROFILE: FEENEY WIRELESS

*Wireless company sees strong future for 4G.*

Much is happening in the world of 4G communications. Sprint partner Feeney Wireless, provider of wireless/mobile broadband solutions, has witnessed firsthand the evolution from 2G to 3G, and is now working with 4G as it delivers solutions to a wide variety of governments and industries.

Feeney Wireless works exclusively with Sprint for wireless telecommunications. Bob Ralston, president of Feeney, sees 4G bringing great opportunities for public safety. Whether it's more robust sharing of video, better remote control of security cameras or more effective digital signage, Feeney Wireless knows 4G delivers superior performance.

Ralston praised 4G's ability to bring real-time video to numerous types of devices. “Streaming video can now be sent down into that small form factor, the handheld device — and simultaneously to a larger computer display inside a police cruiser or fire engine,” Ralston said.

The higher bandwidth and lower latency of 4G improve public safety in several ways. For example, operators can control

surveillance cameras much more effectively with 4G. “One of the things end-users really need is the ability to control these devices fluently,” said Ralston. “4G will provide that experience, where we couldn't do that before. It's a huge shift in the user experience.” 3G often brought delays, so a suspect moving through the frame might never be seen by the time the camera was panned, tilted or zoomed. With 4G, an officer in a squad car can control a camera remotely, in real time, while others watch the video at headquarters. It gives officers a better sense of being on the scene.

That's just one of many ways 4G improves communications. 4G even enhances digital signage, making it practical now for digital signs to carry more rich media and high-definition content.

Feeney has seen a strong contrast between user acceptance for 4G and 3G. With 4G, users are much more enthusiastic and are driving the development of new applications, and companies such as Feeney are giving them what they need to capitalize on 4G's many benefits.

much more practical. In addition to more speed, 4G also brings more reliability and better security.

“4G has great bandwidth, and we have a tremendous amount of spectrum,” said Danny Bowman, president of Sprint's Integrated

And it will mean better efficiency in any type of investigation.”

With 4G, a firefighter can download detailed maps using a mobile device. A dispatcher can send high-resolution photos or streaming video to an officer in a patrol car. Police officers on surveillance can see everything a suspect is doing, without gaps in the signal that would commonly occur with 3G video. Even services requiring lower bandwidth — such as voice or data from license-plate recognition systems — will be higher quality with 4G.

4G will bring unprecedented accuracy to situational awareness, making 4CI much more effective. It will allow commanders to make better use of resources, and it will help save lives. And it's an affordable solution, leveraging systems and devices already in use.

“You're now going to be able to create a convergence around all device types,”

Solutions Group. “That means we'll have lots of speed, and the bandwidth needed to run some of the most critical applications, such as real-time video for situational awareness. It will make people safer, officers included.

Bowman said. "You create a much more efficient capability with multiple types of devices, whether it's the device in the vehicle, the one you're carrying with you or potentially a device that is wearable. All of those pieces are going to come together in a very collaborative, converged way with 4G."

In fact, the ability to share information quickly across various devices with a large number of users could revolutionize the current concept of situational awareness, adding "collaboration" to the traditional 4 Cs of 4CI. That's because 4G allows for much greater information sharing than 3G. 4G's greater bandwidth lets more people look at the same surveillance video, for example, greatly enhancing the common operating picture. It will enable greater collaboration and interoperability among different agencies as well.

Sprint was the first commercial provider to offer 4G, thanks to years of research and development. As the industry leader in 4G, Sprint is able to offer its network to public safety agencies as a cost-effective alternative to building their own systems. With Sprint responsible for creation and maintenance of the network, public safety agencies can stay focused on their core missions.



### Bright Future

4G is already here in many markets, and its availability continues to increase. 4G is the future, along with more mobile devices. Smartphones have already become vital mobile computers. 4G will enable more of that.

Sprint is working on many improvements for the future of public safety, including smarter vehicles with more embedded technologies. "I like to call it the connected vehicle," Bowman said. "Think of the police car, fire engine or ambulance. We're spending a lot of time on making that vehicle, and the people in the vehicle, much more effective. So bringing the multiple technologies

together to convert the vehicle into a mobile hot spot, making sure the data is secure, collecting information about the vehicle for fleet management — we want to put all that together. We believe the connected vehicle will be a big part of the future."

Bowman said it's also about what people can take away from the vehicle — the different types of mobile devices responders can carry with them. With 4G, a lot of new methods will become possible. It points toward an expansive future. "It's going to create lots of innovation and creativity for situational awareness," said Bowman. "4G will really improve the safety of citizens."

### PARTNER PROFILE: CRIME POINT

*Former police officer creates mobile video surveillance technologies for 4G.*

Dan McLeod, founder and CEO of Crime Point, is a former police officer. His insight into the real workings of police departments helped him create his company, which offers surveillance equipment and vehicles.

"Crime Point grew out of my frustration for law enforcement with the equipment that was available," said McLeod, who started the company 10 years ago. Today better technologies are available, including 4G. "We're migrating to 4G, which amplifies the opportunity significantly over what 3G offered. With 4G, you can process a lot more information," he said.

Crime Point works closely with police agencies to provide equipment and customer support to fit their specific needs. That can include mobile and fixed surveillance cameras, surveillance vehicles and other tools.

McLeod said Sprint 4G combined with Crime Point surveillance solutions provides better situational awareness. An officer watching an undercover operation on camera in a van, for example, can quickly disseminate images to officers waiting nearby to make an arrest so they can see the situation before they approach, rather than entering a potentially dangerous situation with only a verbal description of the scene. Before going in, officers simply access the Internet from a smartphone to see real-time images of a location or suspect — images they never could have seen before.

With 4G, security cameras can send better quality video that's much closer to real time. Five second delays that were common with 3G are reduced to one second with 4G so security cameras can follow moving sus-

pects more effectively. "The huge advantage though, is that multiple people can watch simultaneously with 4G," McLeod said. "There is just not enough bandwidth available to have multiple users on 3G." Now more officers, commanders and others can follow a scene visually, rather than having to wait for an e-mail or hear about it over the radio.

And because the network is built by Sprint, 4G capabilities are available wherever Sprint's 4G networks are available — not just within the local jurisdiction — which can be beneficial in a wide range of public safety situations. "When there's a fire, you go to where the fire is," McLeod said. "The fire doesn't come to your ideal location, where you have communications already in place."

## CASE STUDY

## Fast Forward

4G helps a major county improve situational awareness.

DeKalb County is the third largest county in Georgia. It includes a portion of Atlanta and several other communities, for a total of more than 700,000 residents. The DeKalb County Police Department's narcotics unit has been using a video surveillance system provided by Crime Point with 4G capabilities, while the county CIO has been using the solution for other county business. Both parties have been extremely impressed with 4G.

"The improved ability to multi task, I think, is the No. 1 differentiator," said Darrell T. Black, CIO of DeKalb County. "And of course the speed of the video — that is truly outstanding."

Tim Donahue, a narcotics detective with the county police, also likes 4G. "The amount of bandwidth that these 4G systems have is just incredible," he said. "With 4G video, you see greater detail. You can see what kind of necklace the suspect is wearing, what kind of shoes, what the type on his shirt says. You get all that detail with the 4G versus the 3G. And you can allow multiple users because you've got so much bandwidth."

Donahue gave an example of how 4G can really improve situational awareness. "I observed on our camera system some suspicious activity. I was a good 10 miles away, but I was able to call a sergeant I know working in the area, and relay to him in real time where the vehicle was, the description, the tag. And because of the high image quality and high frame rate with 4G, you're getting 15 to 20 frames per second of good, quality video. So I was able to call out exactly what the suspect was doing, where he was, and constantly update the sergeant before he got there." Donahue also used the camera system to keep an eye on the sergeant once the sergeant arrived on scene,

making sure his fellow officer was safe until backup arrived.

"That gives you a whole new level of safety," Black said. "There's a huge difference from 3G to 4G, and I'm glad we're in the 4G world now." Black also appreciates the day-to-day business applications of 4G. He uses the video-conferencing feature from his cell phone to have face-to-face meetings with his network manager when they're in different locations.

### Making a Difference

But public safety is where 4G really makes a difference. "A picture is worth a thousand words, and I guess a video is worth about 10,000," said Black. "It gives you an abundance of information to analyze a situation."

The county created a partnership with Sprint in 2008 and began testing various wireless products. Initial testing was done with the Department of Watershed Management and included routing of telemetry traffic (meter, water and sewer-level reading) through a previous generation Sprint wireless network. Then the county put wireless 4G cards in the Public Safety division, along with a mobile virtual private network client, giving Public Safety access to real-time data from the county.

Prior to that, it took officers about 30 seconds to run a tag query and receive the data back from the Georgia Crime Information Center. Now, with the 4G broadband cards, it often takes around five seconds.

The technology also creates opportunities for more solutions to help Public Safety become more efficient and effective. It's also helping to create a mobile work force — which will allow Public Safety officers to remain in the field for longer periods, increasing their presence in communities.



With 3G, Detective Donahue had been getting two or three frames per second with the video surveillance system, compared to the 15 to 20 he now gets with 4G. The result is a more stable picture with much more detail. "It's a more accurate view of what's going on in real time," said Donahue. The low frame rate with 3G brought "stuttering" images and gaps in the action. "With 3G you have to wonder, what are you missing in those gaps in coverage? Did he shove a gun down his pants? Did he hide drugs? Did he just throw drugs on the ground before you got there? With 4G you're not getting those gaps in coverage," noted Donahue.

It's just one of many benefits. "4G brings not only much faster speed, but also more reliability, improved security and improved cost-effectiveness," said Black.

4G also helps because it's wireless. Officers no longer need to work with service providers to set up an Internet connection for a surveillance camera — a process that consumes valuable time. With the Sprint 4G system, Donahue can set up a camera just about anywhere — the side of a building, for example — and be up and running with it very quickly.

And once it's up, it sends that crystal-clear, highly detailed video Donahue needs to do his job. "The image quality that you're getting is just phenomenal," he said. "It's almost like you're watching the evening news in real time with the 4G."

**Sprint**

For additional information, visit [www.sprint.com/sgl](http://www.sprint.com/sgl).

