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Helping First Responders Cut Through the 5G Hype

A Guide to Help Demystify What 5G Really Means for Public Safety

The next big thing in wireless communications is on the horizon. 5G mobile technology will soon be available, bringing the promise of compelling new capabilities to transform public safety. Providing new functionality and greater network management controls, 5G will enable diverse applications for the future of public safety.

So, what does 5G look like for first responders?

This eBook provides an overview of the future of critical mobile communications and improved applications that become possible with the advent of 5G technology, to better serve the community and protect first responders, including how it will change existing technology and workflows and what you need to know to prepare for 5G.

An aerial night photograph of a city, likely Los Angeles, showing a complex highway interchange with glowing light trails from traffic. The city lights are visible in the background under a dark sky. In the upper left foreground, the silhouette of a drone with its propellers is visible, suggesting the perspective is from the drone's camera.

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Defining 5G: An Evolution, Not a Revolution

5G technology is on its way, and it's about to change mobile connectivity as we know it. As the next generation of mobile connectivity, this 'fifth generation' of mobility promises to bring faster data speeds, more reliable connections and wider coverage.

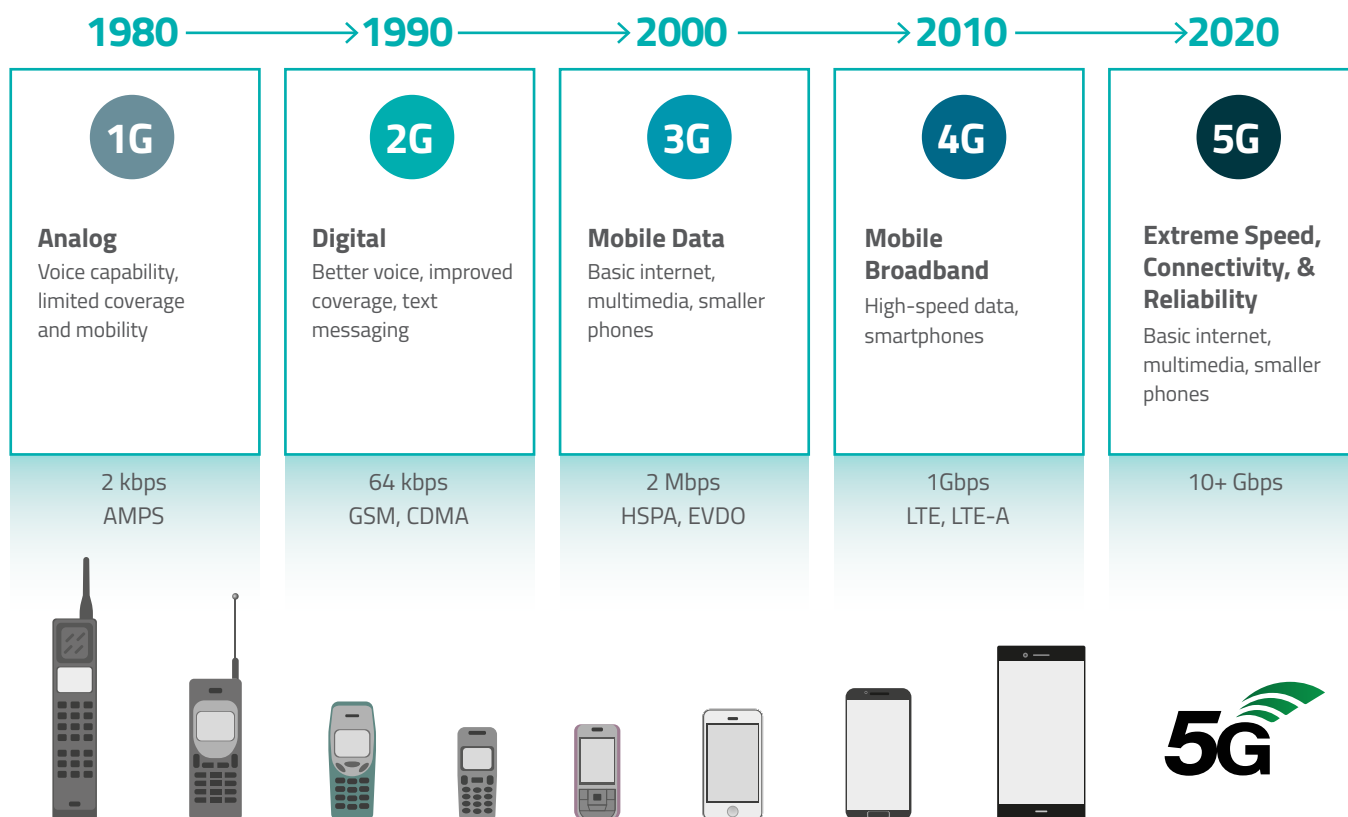
Built on the world's most innovative mobile technology, 5G is expected to offer download speeds up to twenty times faster than we currently have on 4G. Unlike its predecessors, 5G will be available in a fixed wireless capacity and mobile context.

Currently, 5G opportunities are likely to include video-based solutions such as real-time body-worn video camera monitoring, real-time applications such as location-based services and many mission-critical solutions such as remote control connectivity for unmanned aerial vehicles or drones.

For first responders, 5G is expected to improve functionality, enable greater networking management control and produce diverse applications for the future of public safety.



Evolution of Wireless & Networks



Expected Adoption of 5G in North America

The adoption of 5G across North America is expected to occur in waves or phases—beginning in 2020 and taking upwards of ten years to fully replace earlier generations. According to IDC, roughly one-third of all mobile connections will operate on a 5G network by 2023, while earlier generations will begin to decline at the end of the timeline forecast. So, as we can see, the impact of 5G will happen as an evolution of time, rather than an immediate revolution.



What 5G Really Means for Public Safety

Within public safety, the most immediate 5G applications to be launched will likely include unmanned vehicles such as drones, robots, and planes and infrastructure management that will allow for the coordinated and interconnected ability to control critical infrastructure during times of crisis, such as the ability to prevent a train from entering an earthquake zone.

Immediate Application to Public Safety



Unmanned Vehicles
(Drones, Robots, Planes etc.)



Infrastructure Management



Real-time Video Capture,
Analysis and Relay



Mobile-First Workforce and
Workflow



Augmented/Virtual/Mixed
Reality Applications



Deployables

Furthermore, 5G will have a dramatic impact on the usage of video applications by first responders. In the past few years, video has become an indispensable situational awareness tool for public safety agencies around the world. Yet, while the quantity and types of video sources continue to grow exponentially, it has become increasingly difficult for public safety agencies to manage the transfer, viewing and distribution of video, in a timely and actionable manner, on existing networks. The improved bandwidth and data transfer speeds of 5G will unlock a new world of video application potential for agencies.

Ultimately, 5G will improve what 4G networking has already provided, such as advancements in facial recognition, new sensor-based tools, fingerprint sensors and larger audio and higher-resolution video files that can be transmitted at much faster speeds.



How 5G Will Change Public Safety Technology Workflows

To understand how 5G cellular networks may impact public safety workflows, let's look at today's police car. Today, law enforcement is equipped with multiple applications and mobile technology—both inside and outside the police vehicle. The police car itself acts as a network (via Wi-Fi, FirstNet, satellite, LMR). The officer is connected to that network, both when he is inside and outside the vehicle.

An officer may be carrying a variety of devices that rely on connectivity to the car, such as a tablet, hand-held radio, e-ticketing system or a body-worn camera. Meanwhile, the car itself is loaded with a full assortment of applications, such as speed cameras, laptops, DVRs, ALPR cameras and even engine diagnostic tools. The devices and applications transfer data back to headquarters and the network—with varying speeds and reliability.

Vehicle Area Networks for First Responders

Police, fire and EMS are equipped with applications and mobile technology inside and outside the vehicle. They rely on a variety of technologies for mobile communications including LMR radios, tablets, laptops with embedded cellular modules, Wi-Fi hotspots or air cards and mobile phones.

A connected mobile router creates a local area network in and around a first responder's vehicle, to deliver a more robust coverage network in the field. This affords first responders the opportunity to communicate with the various applications and an expansive network of devices inside or outside the vehicle, such as situational triggers like road signage, surveillance and traffic cameras.

A connected in-vehicle router can bring these networks together into a unified collocated network hub that will allow more flexibility and capacity with high-bandwidth data back to central command, in a secure, reliable manner.

The future of 5G is expected to radically change data workflows for first responders.

Mission Critical Mobile Applications

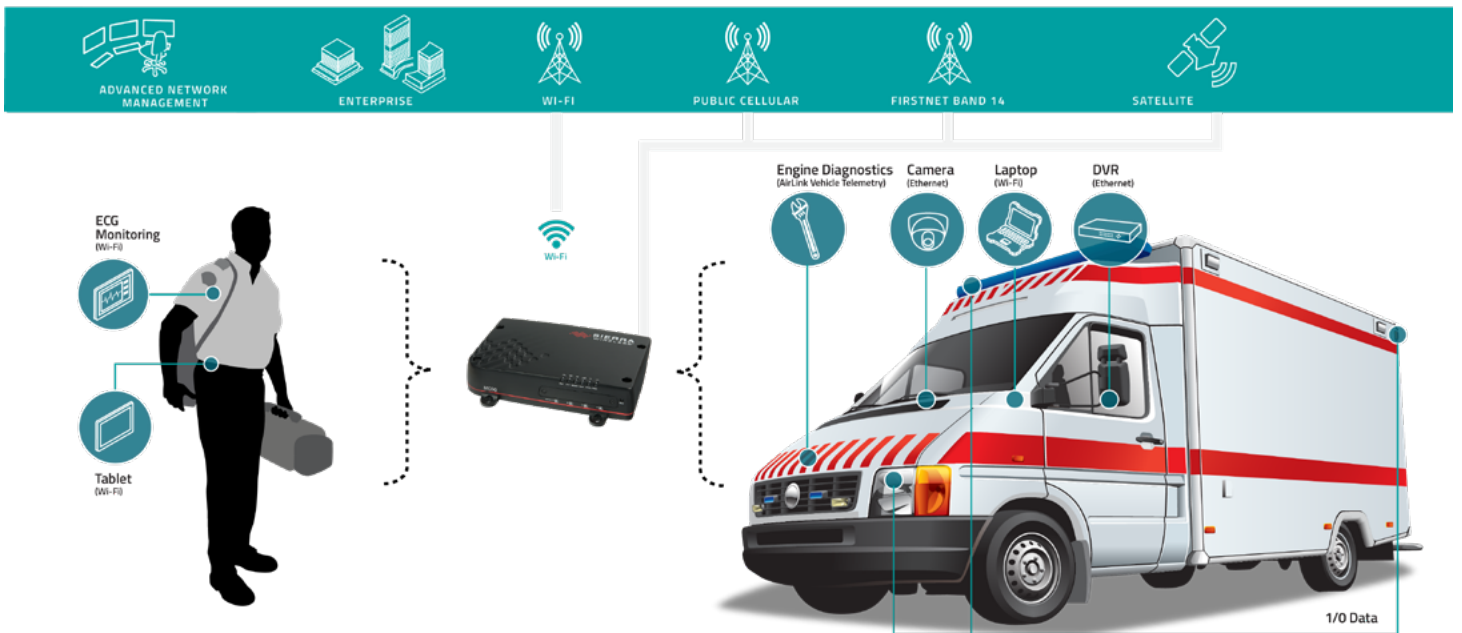
MOBILE MULTI-NETWORK SECURITY



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The Benefits of a Vehicle Area Network



Reduce
Operating Costs



Improve
Productivity



Optimize
Security



Enhance
Situational Awareness

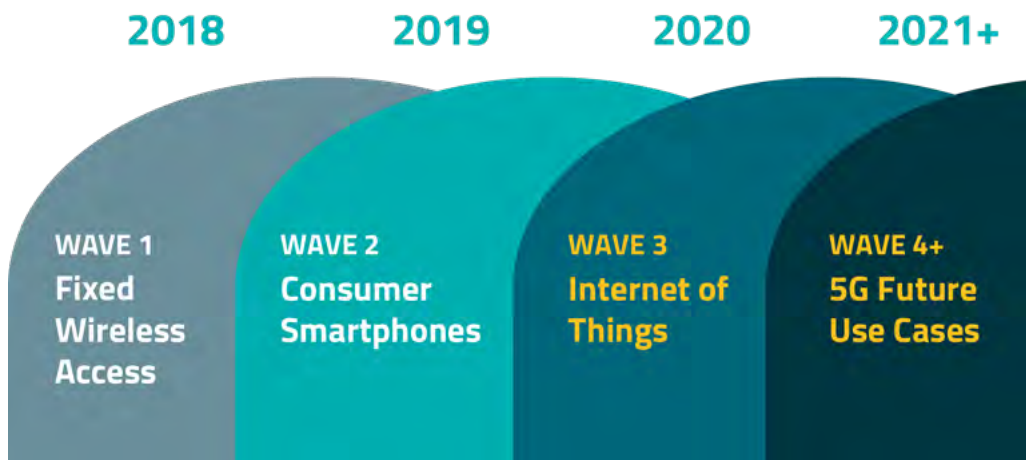


Preparing For 5G: What You Need To Know

The transition to 5G will likely occur in four waves. Wave one is where much of the 5G activity is being seen today is focused on fixed wireless access (FWA). In wave two, which will really begin to ramp up, will be focused on pushing a larger volume of consumer smartphones and devices over to 5G. The third wave is where the introduction of 5G into the IoT space will take shape and will result in more widespread importance of 5G. Lastly, in wave four, the emergence of new use cases enabled by 5G will begin to take shape, particularly around the Industrial IoT.

The Waves of 5G

You haven't missed the boat. 5G for IoT is not here yet.



So, as we've seen, 5G is here, but it will take some time before it is fully deployed (likely up to ten years). For public safety agencies preparing for 5G, the goal is to ensure an end-to-end communication solution that securely connects people, mobile assets and mission-critical applications to the agency's enterprise.

It's also important to note that 5G will evolve in tandem with 4G LTE and the two will likely co-exist for some time. As such, for public safety agencies currently operating on 4G, there will be no need to re-farm 4G in order to transition to 5G.



Key Recommendations for Transitioning to 5G

The goal is to ensure a platform for future innovation—extreme speed, connectivity & reliability.

1. **Ensure end-to-end communication solution** - by securely connecting people, mobile assets and mission-critical applications to the enterprise.
2. **Ensure network management** – by providing instant insight and remote, real-time control over the entire mobile network.
3. **Ensure security** - by delivering mobile multi-network security options that meet federal security standards such as CGIS, HIPAA and others.
 - A key component of the in-vehicle router is its ability to communicate with enterprise networks to configure fleets, monitor coverage in dead spots, troubleshoot bandwidth and speed, report issues and secure networks—delivering effective high-quality end-to-end communications to the enterprise—maximizing the effectiveness and the response times of public safety organizations.
 - Best-in-class in-vehicle routers typically have dual radios, and can connect via gigabit.
 - Wi-Fi WAN and Ethernet, and extensions to Land Mobile Radios and satellites. Low latency and high bandwidth performance are a must.
 - We know that vehicles can be tough environments for electronics. In-vehicle routers must survive extreme transient surges and maintains continuous power through cold cranking as low as 5V. They must also be resistant to dust and water ingress, and be able to handle high shock, vibration, temperature, and humidity conditions.
 - Gigabyte, Wi-Fi, WAN, LAN, Ethernet connections, extension to the LAN, mobile radio, satellites and obviously low latency and high bandwidths become critical. But these devices really need to be purpose-built down to 5-volt operations, extreme temperature conditions.
 - Once you deploy a real-time network, you need to have a centralized remote management solution. A remote management solution becomes critical to monitoring that real-time workflow. From a management solution, there are several key factors. You need to be able to configure the device, monitor the device, change configurations on the fly, troubleshoot issues, generate reports whether it's a fleet management report from the telemetry, or a mapping for carrier coverage, or understanding how long a particular vehicle is at a location.
 - And then you must be able to secure the devices. Most commonly, it's a VPN, and with some VPNs, you can get the sub-second switching in addition to network security which is important. In some applications that it's not a standard VPN, it must be a FIPS 140-2 compliant device.

Conclusion

5G mobile technology will soon be available bringing the promise of compelling new capabilities to transform public safety, and providing new functionality and greater networking management control. 5G will enable diverse applications for the future of public safety.

For agencies facing the 5G transition, begin by concentrating on the areas of your day-to-day operations where 5G is a must. Given the evolving roll-out of this new technology, the sooner agencies can start planning their transition, the more they'll set themselves up for success.

A trusted technology and implementation partner is essential to your success with 5G.

Sierra Wireless Solutions and Services

Whether you're connecting to commercial mobile networks or dedicated public safety networks such as FirstNet™, the IoT is transforming the applications first responders and law enforcement professionals need to do their jobs, while improving health and safety in their communities.

Sierra Wireless has more than 25 years of experience helping public safety organizations deploy reliable and cost-effective wireless solutions. We provide complete router and management solutions and are industry's first vendor to deliver a FirstNet Ready™ in-vehicle router for First Responders that supports the Band 14 spectrum. For more information visit: <https://www.sierrawireless.com/applications/automotive-and-transport/public-safety/>

Sierra Wireless AirLink Complete makes it easy to remotely deploy, monitor and maintain multiple routers. A single dashboard displays up-to-date information about all of your devices. You can easily manage your equipment, identify problems, reduce downtime and lower your cost of ownership. For more information visit: <https://www.sierrawireless.com/products-and-solutions/routers-gateways/airlink-complete/>



About Access Wireless Data Solutions

Access Wireless Data Solutions (AWDS) provides advanced cellular connectivity solutions for M2M and IoT fixed and mobile applications. We understand wireless and as an industry leading distributor and value-added reseller of cellular gateways and modems we work closely with our customers to implement technology to keep them connected.

Access Wireless Data Solutions is your premier value add reseller for the best in brand cellular routers and modems. Access is the first word in connecting your networks. These devices from industry distinguished OEM manufacturers are designed to fit your cellular application, both fixed and mobile, in our modern IoT and M2M world. Our professional consultative sales team is ready to assist with device recommendations for your project. Let us do the heavy lifting so you don't have to.



About Sierra Wireless

Sierra Wireless (NASDAQ: SWIR) (TSX: SW) is the leading IoT solutions provider that combines devices, network and software to unlock value in the connected economy. Companies globally are adopting IoT to improve operational efficiency, create better customer experiences, improve their business models and create new revenue streams. Whether it's a solution to help a business securely connect edge devices to the cloud, or a software/API solution to help manage processes associated with billions of connected assets, or a platform to extract real-time data to make the best business decisions, Sierra Wireless will work with you to create the right industry-specific solution for your next IoT endeavor. Sierra Wireless has more than 1,300 employees globally and operates R&D centers in North America, Europe and Asia.

For more information, visit www.sierrawireless.com.

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