The Future of 5G in Public Safety

Real-time communications through 5G is reshaping public safety.

5G is dramatically helping public safety and emergency services organizations gather information, deliver services and respond to emergencies. This eBook delivers insights on 5G adoption and plans in the public safety industry, based on 5G research conducted across North America and Western Europe by IDC Research, sponsored by Sierra Wireless, in Q1 2021.

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Introduction

5G will deliver a significant upgrade in connectivity when compared with existing 4G cellular networks. Connection speeds for 5G are 10 to 20 times faster than 4G networks, and latency is significantly reduced supporting real-time communication for a wide range of applications. 5G also enables massive numbers of devices to be connected in a small geographic area, supporting large Internet of Things (IoT) deployments.

Public safety and emergency services are areas that will be transformed through the use of 5G. The speed, throughput and data capacity of 5G networks is enabling a range of use cases that are making citizens and the environments they live in more secure.

In the IDC 5G Industry Insights: It's Go Time for Real Time, sponsored by Sierra Wireless in Q1 2021, IDC surveyed 421 organizations across North America and Western Europe, as well as completing a number of in-depth qualitative interviews, exploring their views on 5G adoption in their respective industries.

The results showed that 42% of public safety organizations surveyed are currently using, piloting or testing 5G, with a further 11% planning to implement a solution in the next 12 months.[1]

5G

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5G Market Drivers for Public Safety

Technology and digitalization are having a major impact on how public safety organizations gather information, deliver services and respond to emergencies. By the end of 2021, it is estimated that there will be one billion security cameras installed worldwide.[2] Meanwhile, smartphone footage is playing an increasingly central role in investigations, from traffic accidents to criminal incidents. Managing this deluge of digital information is one of the most pressing challenges facing the public safety sector.

67% of public safety respondents claimed that **5G** adoption was being driven by the need for real-time communications.[1]

Common sources of digital information for public safety organizations

- Connected surveillance cameras
- Aerial drones
- Body cameras
- Dashcams
- Prison and jail surveillance video
- Smartphones

Quantity and quality

The quality and richness of transmitted public safety organization media is continually increasing. Ultra-high definition (UHD) surveillance cameras with digital zoom capabilities and advanced analytics are becoming commonplace. IoT sensors can relay a surplus of detail about the urban environment to city planners. Next generation 911 (NG 911) initiatives allow members of the public to send text messages, images or video to emergency responders, rather than dialing a number.

58% of respondents

cited better device coverage as a mission-critical benefit of 5G.[1]

Existing cellular or Wi-Fi networks frequently struggle to handle the data volumes required to support these applications. As a result, public safety organizations are starting to rely on the huge processing speeds and capacity offered by 5G networks.

According to IDC, 67% of public safety respondents claimed that 5G adoption was being driven by the need for real-time communications.[1] This is understandable as public safety organizations need to instantaneously transmit and process information to provide an effective service, whether it's monitoring traffic or getting situational awareness of an emergency.

According to IDC, 58% of respondents cited better device coverage as a mission-critical benefit of 5G. 5G can provide widespread and reliable connectivity without the need for cables as long as there is a cellular signal.[1] This offers great potential for autonomous drones and vehicles.

Enabling the future of public safety

5G has the potential to revolutionize public safety. Imagine a highway that has thousands of sensors recording how fast vehicles are moving and how drivers are behaving. Public safety agencies could use predictive analytics to assess when accidents are likely to happen and put measures in place to help prevent them. 5G's high data rates could usher in a new era of augmented or virtual reality-based solutions. 3D laser scans can be used to create virtual reality models of a crime scene, with investigating officers able to walk around and explore the situation from their office.

5G Use Cases in Public Safety

The use cases for 5G networks in public safety are growing. We look at four of the leading current applications as identified by IDC.

Pre-emptive signaling for emergency vehicles

Emergency vehicle pre-emption (EVP) allows first responders to interrupt normal traffic signaling. As an example, emergency vehicles would automatically be given a green light when responding to an emergency. Meanwhile, other vehicles that may cross their path are pre-emptively given a red light, holding them back until the emergency vehicle has passed. This improves response times and also reduces collisions involving emergency vehicles by 70%.[3] Such a system requires a large network of IoT sensors as well as real-time analytics and will rely on the large data throughput provided by 5G.

Provisioning of unmanned vehicles and deployable devices for connectivity during natural disasters

Due to its reliable, ultra-low latency communication links, 5G is putting unmanned aerial vehicles and other deployable devices at the front line of emergency response activities. Drones with mounted cameras can investigate sites of natural disasters and transmit real-time video footage back to relief teams.[4] This makes it safer for responders and enables them to better organize their relief efforts. AI-enabled aerial drones can monitor the power lines that cover an area prone to wildfires. By checking for corrosion or other signs of failure, it could be possible to prevent fires from occurring.[5]

Mobile surveillance (in-car and body-worn)

5G can also revolutionize the use of body cameras and other wearable devices. 5G enables high-resolution images to be sent in real time, and can be integrated with real-time facial-recognition technology. In addition, 5G can maintain connections and support the transmission of UHD live-stream video and other data in vehicles moving at up to 300 miles an hour,[6] making in-car cameras much more reliable and effective.

Crowd monitoring

A major use case for 5G is monitoring and managing large crowds of people. Smart cameras, combined with IoT sensors, can track how many people are in an area and how they are moving. This allows planners to better gauge occupancy, flow, wait times or even social distancing in times of pandemic. 4G and Wi-Fi networks can easily become congested in high-density areas, but 5G massive machine type communications allow up to a million devices to be connected per square kilometer.

Barriers to 5G Adoption in Public Safety

While the potential use cases for 5G are expanding, there are still a number of barriers preventing adoption. IDC's research has identified some key areas of concern.

67% of respondents in public safety claimed the reason they were not moving forward with **5G** was lack of budget.[1]

BUDGETARY ISSUES

Public safety initiatives are facing budgetary restraints with a situation that has only been made worse by the COVID-19 pandemic. According to IDC, 67% of respondents in public safety claimed the reason they were not moving forward with 5G was lack of budget.[1] In particular, organizations were concerned about the costs of setting up a dedicated 5G network for private applications.

Action point – It is important to remember that 5G is a force multiplier, which means that it allows public safety organizations to do more with less. In this respect, 5G can help alleviate budgetary pressures, while improving the reach and quality of services provided. In addition, a single 5G solution can address multiple use cases, such as body cameras, dashcams and deployable devices.

LIMITED SANDBOX CAPABILITIES

Many public safety organizations are concerned about introducing cutting-edge technologies such as 5G because they feel they have limited sandbox capabilities to experiment and test the technology.

Action point – Partner companies and vendors should work closely with public safety organizations, providing the support needed to effectively test and pilot use cases.

BACKWARD INTEROPERABILITY WITH EXISTING DEVICES

Another core concern is the perceived lack of backward interoperability with current devices, meaning that a large amount of existing equipment may become obsolete.

Action point – With 5G it is not a question of if it will happen, but when. By acting now, organizations can get ahead of the curve and prepare themselves for the coming decades. Delaying implementation could cause greater integration challenges in the future.

1. IDC Info Brief, Sponsored by Sierra Wireless, 5G Industry Insights: It's Go Time for Real Time, Doc #CA47634921BROI, May 2021
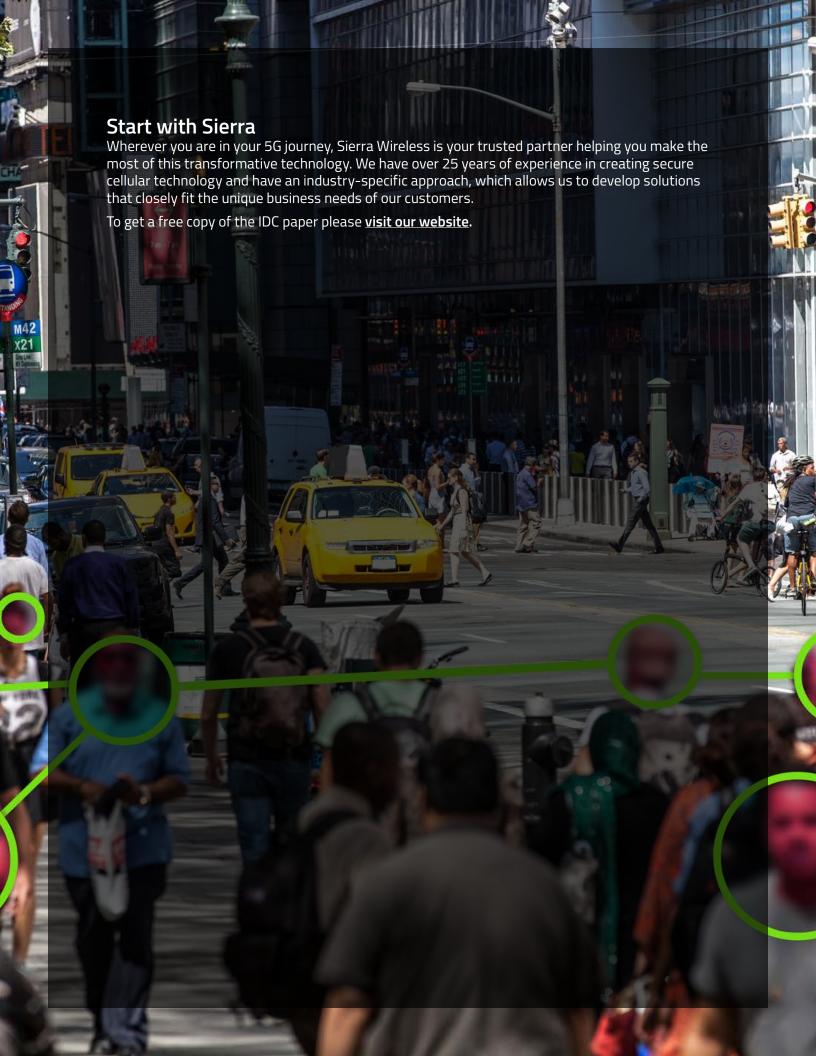
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3. TSMO, 'Emergency vehicle pre-emption.' Available at: https://tsmowa.org/category/signal-operations/emergency-vehicle-preemption. Accessed September 2021.

4. BT.com, March 2021. 'How 5G is pushing drone technology forward.' Available at: https://www.globalservices.bt.com/en/insights/blogs/how-5G-is-pushing-drone-technology-forward. Accessed September 2021.

5. WSJ, September 2020. ' California Utilities Hope Drones, AI Will Lower Risk of Future Wildfires.' Available at: https://www.wsj.com/articles/california-utilities-hope-drones-ai-will-lower-risk-of-future-wildfires-11599816601. Accessed September 2021.

6. Deloitte, August 2020, '5G in government – The future of hyperconnected public services.' Available at: https://www2.deloitte.com/us/en/insights/industry/public-sector/future-of-5g-government.html. Accessed September 2021.

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To get a free copy of the IDC paper please **visit our website**.

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