

PERSPECTIVE

HOW PRIVATE 5G IS RESHAPING THE CUSTOMER EXPERIENCE IN PUBLIC VENUES

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1. Why are owners of public venues adopting private networks?

Public venues bring together tens of thousands of attendees and can be supported by hundreds of operational staff and on-site vendors. This places a strain on public cellular networks and Wi-Fi networks that can limit their performance, causing financial loss for vendors, potential security risks and an inferior experience for attendees.

Event organizers that need a reliable and scalable connectivity solution are increasingly turning to private 5G networks to augment existing Wi-Fi networks. Analysys Mason estimates that more than 1,000 public venues will be equipped with a private network by 2028, and that the cumulative spend on these networks will exceed USD300 million between 2023 and 2028.¹ Major organizations, such as the NFL and Ryder Cup, are already using private 5G networks to transform their operations and many others will follow.

Operational efficiencies, improved security and enhancements to the customer experience are just some of the benefits of deploying private 5G at stadiums, entertainment venues and public spaces. Private 5G provides effective coverage in both indoor and outdoor settings, can be deployed and taken down quickly to support pop-up or temporary events, and can be easily integrated with existing technologies such as Wi-Fi.

2. Deploying private 5G in public venues delivers five key benefits

Private 5G networks can be deployed in many entertainment and hospitality settings. They can provide reliable connectivity at major events such as festivals and sporting events, support live broadcasts with greater flexibility than wired connectivity, or provide connectivity to venues that lack effective public network coverage, such as leisure parks (Figure 1).

¹ For more information, see Analysys Mason's [Private LTE/5G networks: worldwide trends and forecasts](#).

Figure 1: Benefits of deploying private 5G in public venues

Benefit	Details	Example
Improved operational efficiency	Private networks can connect an array of devices for venue staff to support the operation of events, without having to rely on congested public networks. These include point-of-sale terminals, digital signage, and prioritized staff communications.	A private 5G network deployed at a Major League Baseball stadium helped to deliver a 10% increase in food and beverage revenue and a 30% reduction in queuing times for concessions and merchandise.
Rapid network deployment	Portable private networks can be deployed and taken down quickly and require less cabling, making it well-suited to providing connectivity on a temporary basis to support pop-up events. It can also be used for Wi-Fi backhaul.	A private network was installed in just 2 days to provide connectivity to operational staff at one of the largest music festivals in the USA.
Enhanced customer experience	The in-venue experience can be enhanced with private 5G helping to reduce the time attendees have to spend waiting in line for ticketing, concessions, or merchandise. Private 5G can also be used to live stream events for fans who cannot attend in person.	A private 5G network deployed at the Ryder Cup in 2023 enhanced the customer experience by allowing them to virtually navigate the course, jump queues for merchandise and food, and track player locations throughout the course.
Improved security	Private 5G can support security surveillance in crowded spaces by connecting ad-hoc installations of CCTV cameras. Cellular drones can also be used to monitor public spaces or arrive quickly at the scene of incidents. Video and drone communications require deterministic coverage to deliver extremely low latency with seamless handoffs.	A private network deployed at Times Square improved security by used AI-driven video cameras for surveillance and supporting push-to-talk applications to improve communications between security and operational staff.
Pervasive wireless	A combination of private 5G and Wi-Fi can deliver wireless connectivity for a wide variety of use cases. An integrated private network solution can allow these devices to be managed in one place.	HPE Aruba Networking is working to integrate the management of Wi-Fi and private 5G networks under a single pane of glass and to simplify Wi-Fi roaming.

Source: Analysys Mason

2.1 Use cases for private 5G in public venues

Some of the use cases enabled by private 5G in public venues include the following.

- Dedicated wide area coverage.** Private cellular technology is designed to operate at high power levels and to cover areas 8-10x that of Wi-Fi outdoors and 4-5x that of Wi-Fi indoors. Since private networks are completely separate from public cellular networks, they are unaffected by congestion or outages that can occur on public networks with big crowds. Venue owners have full control over private networks, just as they do their Wi-Fi networks, unlike public cellular. Private 5G allows operational staff to stay connected with phones, tablets and other devices on a dedicated, congestion-free network for mission-critical business services and free up Wi-Fi for fans.
- Ticketing and payments.** Private 5G can provide a stable connection to point-of-sale terminals to maximize revenue for concession and merchandise vendors and improve the customer experience. It can also reduce queuing times and improve on-site safety by avoiding overcrowding. For example, a private

network deployed at a major sports stadium in the USA helped to reduce entry times by implementing an express entry service that uses facial recognition technology in place of tickets.

- **Surveillance.** Private 5G can connect CCTV cameras to keep visitors in public venues safe. For example, a private network was deployed at a large park in Las Vegas and used cameras and radar sensors to improve visibility of crowds and enhance public safety.
- **Live broadcasts.** Private 5G can support live streaming of major events. P5G networks can be deployed with much greater flexibility than wired networks and greater reliability and performance than proprietary radio or satellite networks. For instance, a private 5G network was used to successfully broadcast a rugby game, with cameras operating in a wider variety of locations compared to the previously used radio technology. The private 5G network was also able to support features, such as talkback and camera control, that were not supported with traditional radio solutions.
- **Coach-player communications.** Private 5G can support highly secure and reliable coach communications with players on the field. Private 5G relies on SIM identity and can cover wide areas, making it ideal for providing real-time coaching to players.

2.2 Private networks in action: optimizing staff operations at a Major League Baseball stadium

HPE Aruba Networking partnered with a large wireless network service provider to deploy a private network solution based on technology from Athonet, a Hewlett Packard Enterprise acquisition, at a Major League Baseball stadium which also hosts major concerts.

The venue had previously relied exclusively on public cellular and Wi-Fi networks to provide connectivity to visitors and operational staff, but these networks were overwhelmed by the large volume of traffic generated and subject to wireless dead spots. This resulted in slow or dropped connections to devices at concession stands leading to long wait times and reduced revenue and provided a sub-optimal fan experience.

A 5G-ready private network was deployed to offload mission critical applications from the crowded Wi-Fi network with just a handful of small cells, leaving the Wi-Fi network for immersive fan experiences. The private network provided:

- dedicated bandwidth that keeps mission-critical operational traffic separate from other wireless networks
- built-in layers of security to secure devices such as point-of-sale terminals
- full control over the network, allowing the venue owner to easily extend coverage and manage security policies, unlike with public cellular networks.

The private network was deployed in less than a month, providing reliable connectivity to more than 50 staff members equipped with iPads and mobile point-of-sale devices with immediate results:

- 10% increase in food, beverage and merchandise revenue
- 30% average reduction in queuing and wait times for concessions and merchandise
- 50% average reduction in line abandonment for concessions and merchandise
- new insights from operational data such as customer location and queuing times.

In the future, the venue plans to build on this successful deployment by adding additional 5G applications such as robotics and video surveillance to further enhance the enjoyment and security of visitors at the stadium.

3. About HPE

HPE Aruba Networking Private 5G offerings help organizations around the world to deploy mission-critical networks in even the most challenging environments. With market-leading technology based on Athonet, a Hewlett Packard Enterprise acquisition, HPE provides its customers with reliable and secure private 5G networks that can be deployed in minutes. By integrating all the components of a private 5G network from core to server to SIM, HPE brings the simplicity of Wi-Fi to private cellular networks. For organizations that require greater flexibility, we also offer choice of radios and on-premises/cloud deployments.

HPE has deep experience of enabling mission-critical enterprise IT networks and data centers from edge to cloud, including more than 500 000 customers who rely on HPE Aruba Networking infrastructure every day. HPE is also one of the world's leading telecoms suppliers, with a portfolio serving 300 service provider customers across 160 countries, connecting more than 1 billion subscriber devices.

To learn more about HPE's private 5G solutions, visit <https://www.arubanetworks.com/products/wireless/private5g/>

4. About the author



Ibraheem Kasujee (Senior Analyst) is a member of the *Operator Business Services and IoT* research team in London, and leads the *IoT Services* and *Private Networks* research programmes. He has written on topics including private LTE/5G networks, IoT eSIMs and iSIMs and LPWA networks, and has conducted research on IoT verticals such as smart metering and smart buildings. Ibraheem holds a BSc in economics from the University of Warwick, and wrote his dissertation on the impact of technology on sleep.

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