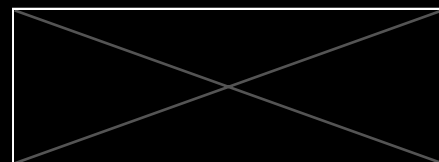


# Unlock airport capacity with private 5G

Enhancing passenger flow with seamless connectivity



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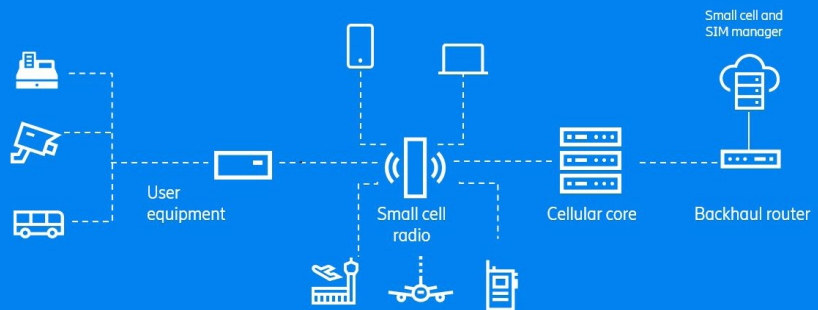
Passenger traffic has [surpassed pre-pandemic levels](#), and the numbers are expected to continue to climb. While airports stand to benefit from higher revenue potential, many terminals are struggling to keep pace. With limited real estate for expansion and constrained operational capacity, airport leaders are turning to new technologies—automated baggage systems, biometric check-in, AR/VR-assisted wayfinding, and more—to boost efficiency and enhance the traveler experience.

Each of these innovations is designed to maximize resources and streamline passenger movement. However, few airports have the necessary technological foundations and framework to support them. Existing Wi-Fi and public 5G networks alone often lack the capacity and reliability needed to sufficiently power these technologies, which can lead to costly breakdowns or delays. As a result, many facilities are turning to private 5G networks, which provide the advanced capabilities necessary for sustainable growth and modernization.



# What is a private 5G network?

Private 5G networks are wireless coverage networks that complement Wi-Fi and public 5G by providing the ensured bandwidth, coverage, and control that are required for applications and use cases where “good enough” wireless connectivity will not suffice. They are purpose-built to offer the superior performance, security, and cost-effective scalability needed to power connectivity for critical applications that affect passenger experience and throughput at today’s airport terminals.



Using small cell radios and a dedicated network core, private 5G networks provide dedicated wireless connectivity coverage across the entire airport footprint. The setup is akin to a “cellular network in a box,” and Ericsson’s private 5G solution offers the same leading technological capabilities

and security it provides in public cellular networks and around the world, with the control of a private network. Private 5G can equip an airport with an on-site, secure cellular infrastructure that enables customizable traffic prioritization and full indoor/outdoor coverage.

## How private 5G streamlines the passenger journey and drives higher throughput

Private 5G forms the connectivity foundation for next-generation passenger technologies—from automated baggage handling to biometric check-in. With a reliable, high-speed network in place, airports can operate more efficiently while enhancing traveler satisfaction. Even small improvements in experience can yield significant gains. [Industry figures indicate](#) that even a 1% improvement in customer satisfaction can lead to tangible increases in non-aeronautical revenue.

Here’s how private 5G networks are shaping smarter airports that leverage connected technologies to optimize passenger throughput and capacity:

### Smart queuing and crowd management

Within an airport, congestion is one of the top causes of inefficiency and passenger frustration. That’s why airport leaders are looking to AI-driven analytics that can dynamically allocate security and facilitate smart queuing.

Such a powerful tool requires a powerful network. Digital twins of the airport, powered by live data from sources such as private 5G-connected smart cameras, provide airport staff with better real-time visibility. This allows them to adjust for passenger volumes, manage peak traffic, and prevent congestion before it becomes a problem.



## Biometric check-in and border control

Air travelers have typically had to stop at a traditional border control kiosk or a more updated self-service barrier gate (such as an eGate or SmartGate) to scan their documents and wait for a match. However, a new “on-the-move” biometric model, used by the U.S. Customs and Border Protection (CBP) Seamless Border Entry (SBE) and Enhanced Passenger Processing (EPP) programs, can process [up to 20 travelers per minute](#) compared to one or two with traditional methods.

These systems rely on real-time video feed analysis and instant data verification—tasks at which private 5G networks excel in handling. With its high bandwidth, ultra-low latency, and secure on-site data handling, private 5G can transmit the video and data required for facial recognition almost instantly, supporting frictionless, mobile biometric screening while reducing queue times and missed connections.

Furthermore, wireless connectivity allows airports flexibility in arranging or repositioning screening kiosks without having to address wiring for network connectivity. In the future, private 5G-enabled solutions could create a largely self-service journey from the moment passengers enter the terminal through departure.

## AR/VR-Assisted Wayfinding

[Easy navigation consistently ranks](#) as one of the most valued airport features. Augmented reality (AR) and virtual reality (VR) wayfinding is transforming how airports deliver it. Dynamic, data-driven signs update in real time, helping passengers stay on course and reduce congestion. Additionally, they can provide data such as flight schedules in preferred languages, which can improve passenger flow.

To deliver quality AR/VR interactions that offer a responsive experience, high bandwidth and low latency connectivity are a must-have to avoid AR/VR content lag, which can cause reduced realism or user discomfort. 5G delivers the ultra-low latency and reliable high bandwidth needed to power these immersive, real-time experiences seamlessly across the airport for their passengers.



## Automated baggage systems

Automation helps airports cut costs, improve operational performance, and address labor shortages. However, these systems depend on robust, low-latency connectivity and cannot be run effectively without a strong wireless network to power seamless operations. When introducing automation to baggage handling workflows, which span landside and airside journeys, legacy wireless network options like Wi-Fi often struggle with congestion and limited bandwidth, risking costly disruptions and delays.

When running automated baggage handling on wireless networks, private 5G ensures uninterrupted communication between automated tugs, scanners, and tracking systems—keeping operations running smoothly. It also enables real-time baggage tracking, AI-powered smart cameras to prevent luggage damage claims, and autonomous transport robots, such as [Pattern Labs’ Pathfinder](#) baggage tugs, designed to transport luggage across airports. Each application requires ultra-reliable connectivity and low-latency, reliable connections to operate safely and efficiently.



# What airport leaders need to know about private 5G networks

Private 5G delivers benefits that go far beyond better connectivity:

**Superior performance**—The biggest advantage of private 5G networks is seen in the best-in-class performance of its dependable, uninterrupted wireless connectivity—with indoor/outdoor coverage, high bandwidth and uplink capacity, and ultra-low latency. These networks offer large-scale mobility and do not compete with passenger devices for bandwidth at peak times. With a private 5G solution, airports can bypass these common issues.

**Enhanced security**—Security is of the utmost importance, especially when handling sensitive data. That's why many airports are switching to private 5G solutions that have built-in 3GPP security standards and zero trust architecture. They go well beyond standard username and password protection, making them less prone to interference and cyber vulnerabilities.

Private 5G solutions can also keep data in airport control, helping airports avoid compliance and sovereignty issues. They leverage enterprise-grade encryption, SIM/eSIM authentication, and on-site traffic management, which offer enhanced security. Additionally, they integrate encrypted communication, localized traffic control, and a zero-trust approach. These networks use on-premises servers, which allow airports to keep critical IoT and corporate data

within their own network. All communications remain within the airport's private core.

**Cost-effectiveness at scale**—Private 5G networks are also more cost-effective than other network options. For example, private 5G usually requires less infrastructure. They need just one radio per 30 access points, eliminating the need for cabling. That's why so many airports rely on private 5G, especially in large areas.

Airports can also eliminate recurring fees tied to public cellular service. This can be immensely helpful when adding sensors to monitor different areas of an airport. Dallas-Fort Worth International Airport, for example, installed IoT sensors to monitor trash bins and other supplies. On their existing network, each device carried an individual cost, which reduced profit margins. But a private 5G network eliminates per-device charges, making large-scale IoT deployments more cost-effective.



# Private 5G considerations: Choosing the right spectrum requirements

Spectrum is an important factor that will determine how a private 5G system will work, and it's important to work with a trusted partner to evaluate the advantages of your spectrum choices against the context of an airport's geography, operational requirements, and existing IT resources.

All private 5G networks utilize designated ranges of frequencies, also known as spectrum bands or channels. There are three categories of spectrum bands that a private 5G system can use (low-band, mid-band, and high-band), and spectrum is available in both licensed and unlicensed forms:

**Licensed spectrum** is controlled and auctioned by regulatory bodies such as the FCC and priced in accordance with a high market demand. This spectrum is reliable as it is dedicated to use by a single provider. Most licensed 5G spectrum has been purchased by major mobile carriers or is in use by defense

organizations.

**Shared spectrum**, which is provided for use by the commercial industry in countries such as the U.S. and Germany. Shared industry spectrum may be a cost-effective option to use for deploying private cellular networks in some cases; however, it may be preempted for real-time use by military and government entities or simultaneously used by other industry applications. Use cases that are non-mission-critical could be used in this spectrum, though access to shared spectrum is not guaranteed and varies by country. Mid-band CBRS (3.5 GHz Band 48), for example, is an example of shared spectrum available only within the U.S.

[Read more about spectrum categories here.](#)

## Private 5G: The runway to future-ready airports

As passenger volumes continue to climb, private 5G will be the key to powering the next generation of airport innovation. With unmatched speed, reliability, and security, private 5G enables airports to deliver a quality experience by expanding capacity, enhancing passenger experience, and optimizing operations—all without having to expand terminal facilities.



