

Delivering more reliable airport operational communications and a better passenger experience with private wireless connectivity

NOKIA



From landing to ground handling to take-off — and every point in between — airport operators are dealing with more processes that require more data than ever before. To maintain and improve aircraft turnaround times, those processes will require a growing amount of network capacity, delivered with low latency and 100 percent uptime. That demands a dedicated, purpose-built LTE/5G network, separate from the Wi-Fi and cellular connectivity provided to passengers, that can offer reliable and secure wireless broadband connectivity for airport operational communications.

Challenges

Most airport operators today have implemented a shared wireless network to support both passengers and operations, using a combination of Wi-Fi and cellular connectivity provided by one or more mobile service providers to deliver a broad mix of landside and airside services and applications. In addition, they typically have a separate, dedicated PMR/LMR radio network for emergency services, predominately carrying voice communications.

While this kind of shared network environment has performed well in the past, airports are facing increasing concerns over the reliability and predictability of their wireless services. The shared Wi-Fi/cellular networks in use today are susceptible to traffic congestion and poor signal strength (resulting in non-predictable performance), are unable to prioritize bandwidth for critical applications, and cannot scale easily to support future growth. In addition, the individual

components that make up the shared environment can be costly and time-intensive to maintain — and some of the wireless technologies currently used at airports will soon reach the point where they become outdated, unable to meet changing operational requirements and unsuitable for today's bandwidth-hungry applications.

Given the growing demand for greater wireless service reliability, efficiency and security, airport operators are beginning to seek out alternative connectivity options as part of their ongoing digital transformation efforts. For those looking to reduce costs, improve operational service reliability and continuity, and further digitize processes to improve aircraft turnaround times as well as the passenger experience, that starts by changing the way they think about and use their current stack of wireless solutions.

Today

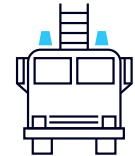
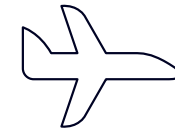
PMR/LMR

Service provider (public wireless services)

Wi-Fi



Passengers



Operations

Shared network

Wi-Fi experience
not optimized

Concerns: reliability,
non-predictable
performance

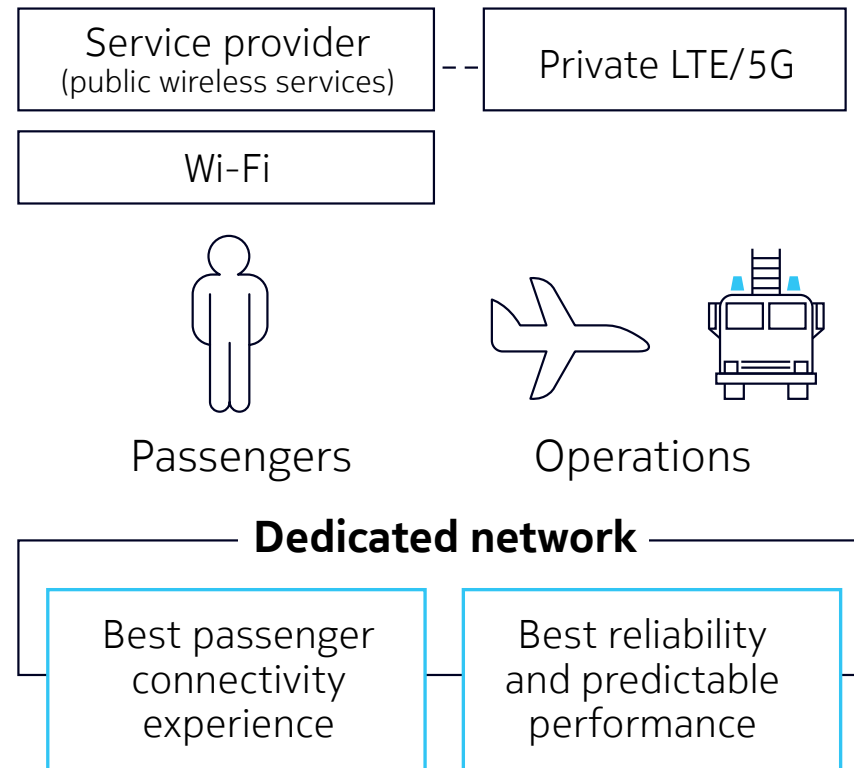
How we help you

Nokia's proposition to airports is to consider a dedicated voice and data wireless network for passengers plus a dedicated network just for operations. Such an approach would drastically improve operational wireless service reliability and deliver more predictable performance for critical services and applications.

Private wireless from Nokia makes it possible to implement a dedicated wireless network for airport operations, delivering critical services such as voice, video, broadband data, push-to-talk, push-to-video, Internet of Things connectivity and location services through a single multiservice, multitenant private broadband wireless solution that is purpose-built for reliability. The private wireless network prioritizes operational traffic and ensures it stays local and secure at the airport perimeter to deliver guaranteed low-latency performance.

Private wireless using LTE forms the foundation for the next evolution in wireless connectivity: 5G. A significant amount of the investments made today by airports on pLTE can continue to be used once 5G is commercially available, providing additional opportunities to further improve operational processes and the passenger experience.

Tomorrow



Benefits of private wireless

“We are delighted to be among the first using a private LTE network in Finland, supporting our current and future connectivity needs and strategy at the Helsinki airport. The Nokia solution currently being rolled out is unique; we expect it to provide unprecedented capacity and resilience for our critical airport services.”
Harri Karjalainen, CIO, Finavia

With private wireless connectivity, airport operators benefit from:

- Secure, reliable wireless services that allow for further digitization of airport processes to improve operational efficiency and speed up aircraft turnaround times
- Reduced total cost of ownership and improved investment protection with a clear roadmap toward 5G
- Increased situational awareness during emergencies
- More Wi-Fi capacity available to passengers by shifting operational processes from Wi-Fi to private wireless
- A greener airport by reducing the number of networks and technologies being used, driving down airport power consumption



Private wireless use cases

Use case 1

Aircraft turnaround processes

With private wireless, airport operations can access wireless connectivity anywhere at airside.

Real-time updates for aircraft and ground crews

Baggage and ground services managers can be equipped with tablets to do their below-wing jobs more effectively, with confidence that they can always count on secure, reliable connectivity. Pilots and onboard crew can also receive real-time data and updates on their mobile devices — even while inside the plane — thanks to the superior coverage of private wireless.

Vehicle connectivity

Private wireless routers can be integrated into a variety of vehicles that require reliable connectivity throughout the entire airfield. For example, Private wireless-enabled “follow-me” cars can give marshallers access to real-time updates on runway activity and projected flight traffic. With that information, they can more effectively and efficiently guide pilots unfamiliar with the airport to the correct parking spot.

Aircraft data offload

Airports can offer a private wireless-enabled data-transfer service to airlines, making it possible to cost-effectively offload aircraft diagnostic and operational data over a connection that is more secure and reliable than Wi-Fi.



Use case 2

Passenger experience

Once implemented, private wireless allows airports to offload operational services from the existing shared Wi-Fi service. The Wi-Fi network’s capacity can then be dedicated predominately to passengers, giving them a faster and better wireless connection in the terminal. Improving the connectivity experience in this way can also increase Airports Council International’s sponsored Airport Service Quality (ASQ) score for an airport.

In addition, with private wireless making the airport’s operational processes more efficient, passengers benefit from a more reliable, consistent and streamlined travel experience from check-in to take-off.

Use case 3

Emergency response

When emergencies occur, private wireless connectivity can help improve situational awareness and response times.

Better prepared incident responses

Security personnel can be equipped with bodycams connected to the private wireless network and outfitted with push-to-video capabilities. As an officer arrives at the scene of an incident, he can stream live video to his colleagues, preparing them better for what they're going to find when they get there.

Enhanced real-time insight into situations

Installing remotely controlled PTZ (pan, tilt, zoom) cameras on emergency vehicles such as fire trucks and police cars lets airport management receive video images to augment the verbal feedback they currently receive from first responders via smartphones or push-to-talk devices. These cameras can be fully controlled and viewed from the operations center — with the video streams recorded and stored on site for verification and compliance purposes — to provide a deeper level of insight and more informed decision-making in emergency situations.

Greater CCTV flexibility

CCTV cameras are a staple of airport security. Yet traditional fixed camera deployments are not always possible during construction and other circumstances — leaving potential blind spots. As an alternative, wireless CCTV cameras connected to the private wireless network can be installed practically anywhere and relocated at a moment's notice, making it possible to monitor construction zones and other areas on a temporary basis.

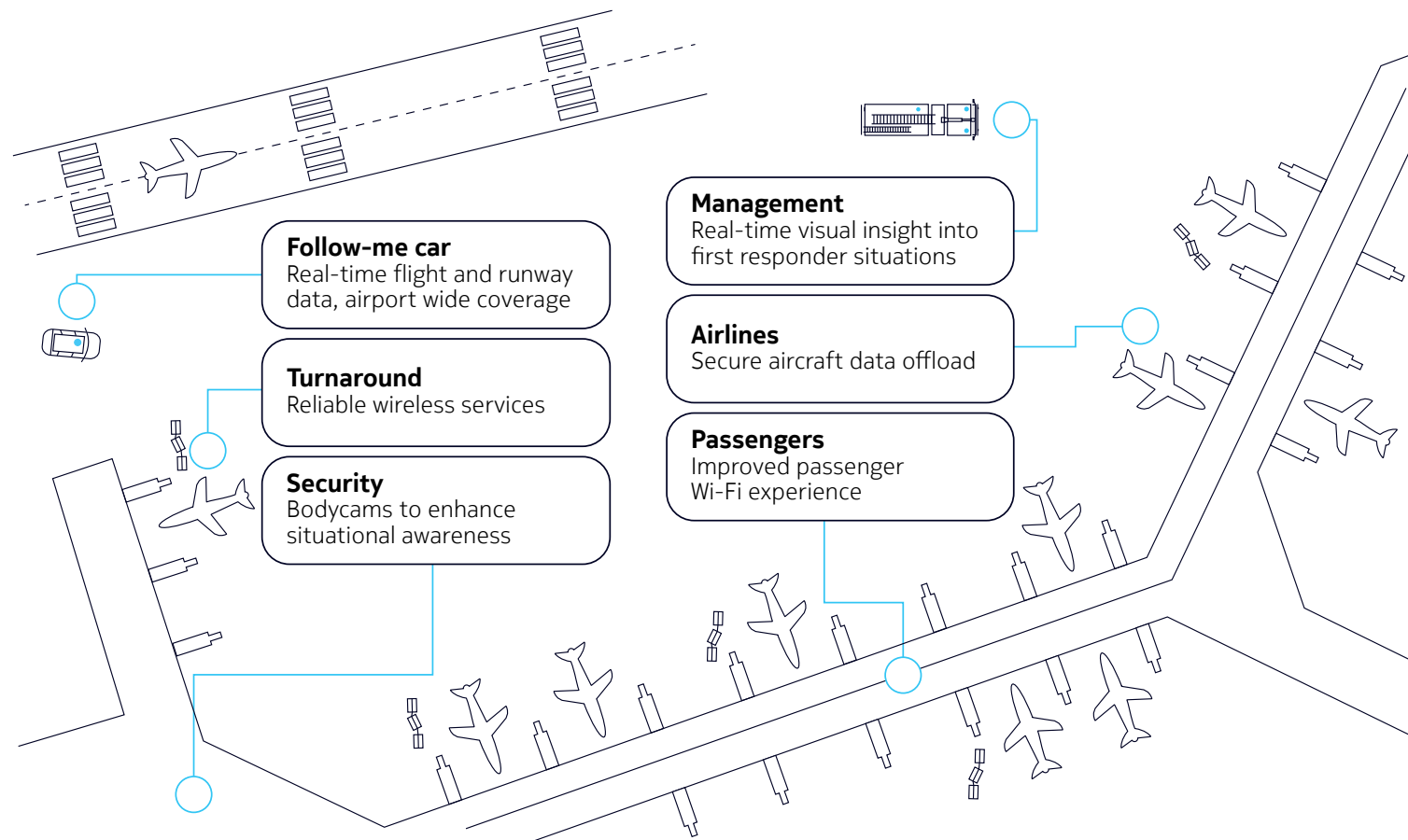


Use case 4

Non-aeronautical revenue

With private wireless, airports have the opportunity to monetize the network and turn their investment into a revenue-generating asset. Because private wireless allows for traffic segregation and prioritization, airport operators are able to commercialize specific wireless services toward customers such as airlines, ground handling and baggage handling systems companies, and aircraft maintenance, repair and overhaul (MRO) companies. For example, today's airlines might use Wi-Fi and/or their own cellular service provider to connect to airport services. With private wireless, airports can offer them a streamlined, unified wireless service — reducing operating expenses for the airline while securing a new revenue stream for the airport.

Private LTE/5G wireless makes it possible to implement a dedicated wireless network for airport operations, delivering critical services through a single multiservice, multitenant broadband solution purpose-built for reliability



How our approach is different

As a worldwide leader in mobile communications, Nokia brings unique solutions and technical expertise to wireless connectivity for critical services, ensuring total coverage across the entire airport to deliver dedicated capacity wherever it is needed:

- **Apron and gate zone coverage**

Award-winning Nokia LTE small cells provide dedicated per-gate capacity at the apron, ensuring guaranteed wireless services for each turnaround process — even during peak hours.

- **Airfield zone coverage**

Macro or micro radio cells ensure wireless services are delivered throughout the entire airfield and surrounding areas, including bodies of water along the airport perimeter.

- **Terminal coverage**

The airport's existing distributed antenna system (DAS) network can carry the private wireless service, ensuring dedicated wireless services for airport operations are available inside the terminal. Additional small cells can be deployed to cover for 'white zones' or deep indoor airport areas not covered by the DAS network.

- **Network operations**

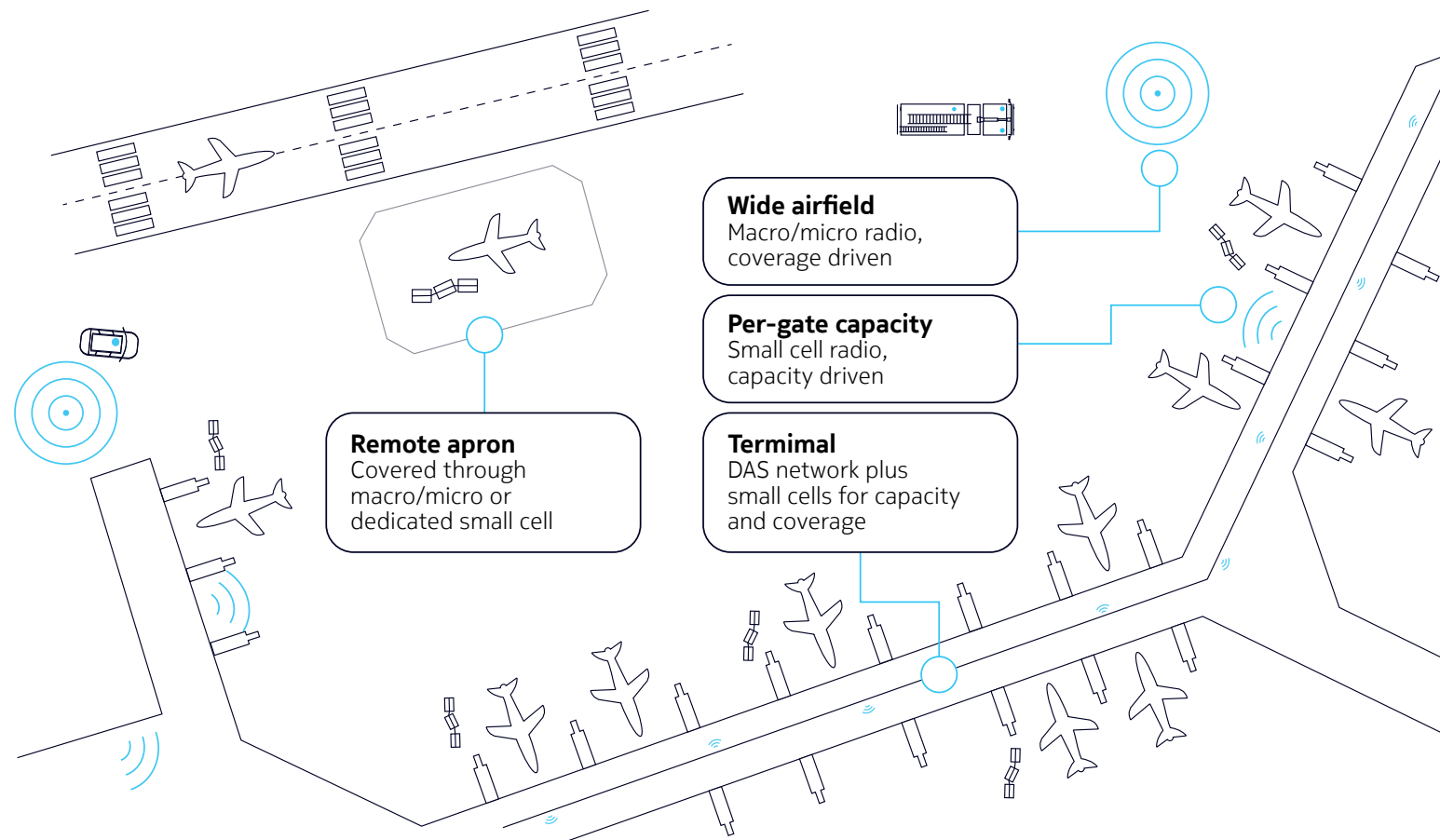
Airports can reap the benefits of private wireless without taking on the burden of network operations through our managed service offering — available from day one.

- **Trusted experience**

Nokia has extensive experience designing, building and deploying critical communication networks for transportation, utilities and public safety organizations. Through our leadership and our solutions, we have earned the trust of airport operators all over the world.

- **Standardized solutions**

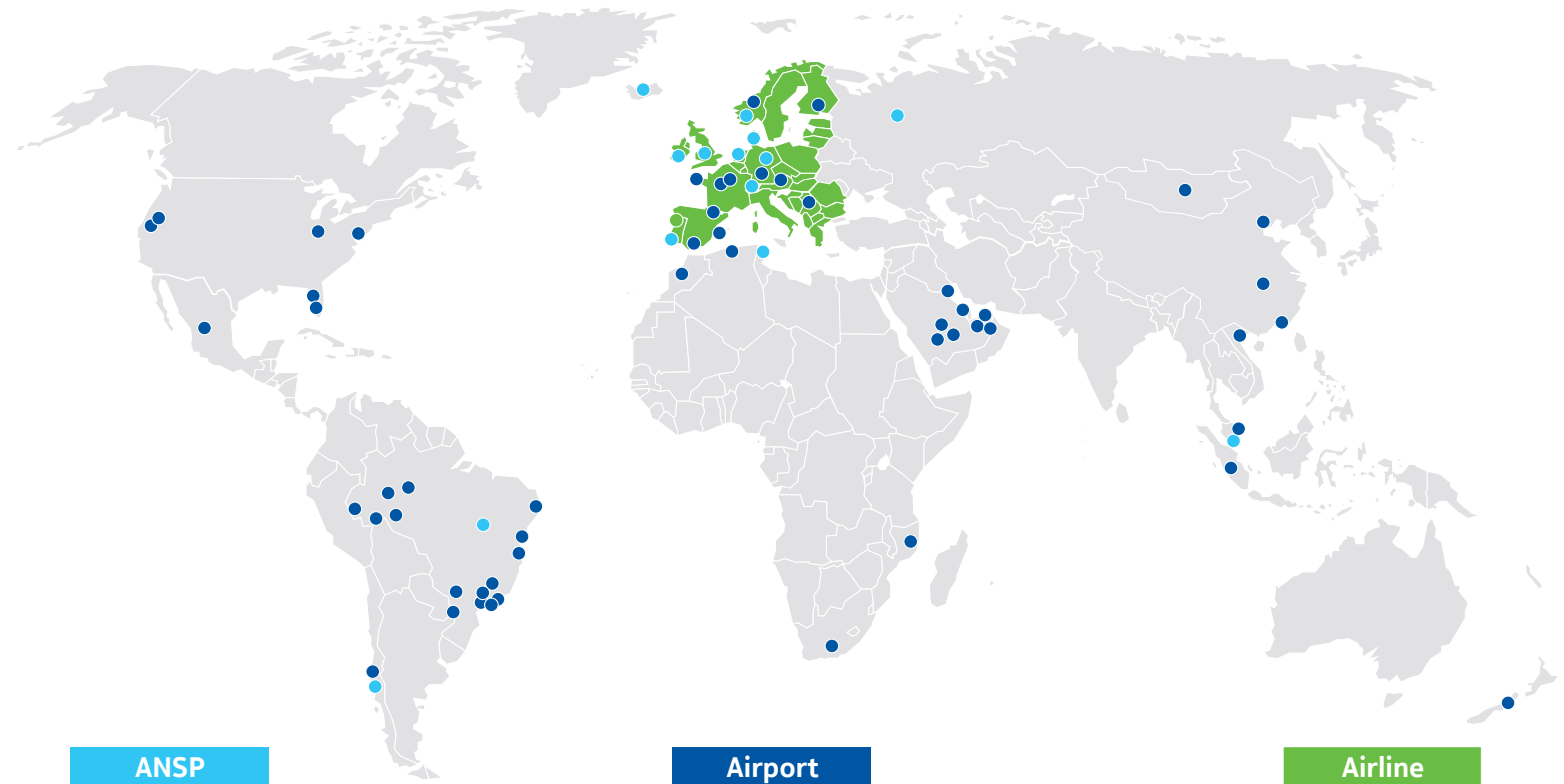
Private wireless from Nokia is based on standardized technology, meaning airports get access to a huge ecosystem of services and solutions while avoiding any vendor lock-in.



Let us help you

At Nokia, we're defining the fabric of the digital airport with solutions that provide the communications foundation for more reliable, efficient operational processes. Our unique offering of end-to-end, critical communications solutions for the aviation industry is built on deep relationships with airports, airlines and air navigation service providers around the world.

Nokia private wireless solutions have been deployed at several airports worldwide. Our team also implemented the European Aviation Network, which uses LTE to deliver high-speed, in-flight Internet connectivity to aircraft.



Meet your business imperatives with an intelligent airport communications system. Visit networks.nokia.com/use-case/aviation/mission-critical-airport-networks to learn more.

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About Nokia

We create the technology to connect the world. Powered by the research and innovation of Nokia Bell Labs, we serve communications service providers, governments, large enterprises and consumers, with the industry's most complete, end-to-end portfolio of products, services and licensing.

From the enabling infrastructure for 5G and the Internet of Things, to emerging applications in digital health, we are shaping the future of technology to transform the human experience. networks.nokia.com

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