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Transforming Airports with Next Generation 5G & Wi-Fi

#WirelessSimplified



eBook

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What's driving digital transformation at airports

Cutting-edge technologies are revolutionizing the airport industry and empowering airport IT executives to create smarter, more efficient and passenger-centric airports. With the advent of 5G and the continuous evolution of Wi-Fi, airports are entering an era of unprecedented connectivity, transforming the way we travel and enhancing the overall airport experience.

Digital transformation at airports is accelerating, especially over the past five years. In 2018, only 21% of airports had an airport innovation strategy. In 2022, this number leapt to 44%. By 2025, 93% of all airports will implement an innovation strategy according to a new SITA report. Priority technology investments include 5G, Wi-Fi, IoT, cloud computing and artificial intelligence (AI) to create smarter, safer, more efficient operations and faster, easier, more entertaining travel.

DIGITAL TRANSFORMATION DRIVERS

- Passenger experience
- Operational efficiency
- Security and safety
- Turnaround time
- Actionable data insights
- Economic development



"As air travel continues its post-pandemic recovery, the industry is undergoing continuous transformation, innovating with partners to implement key technologies. Airports must stay agile and innovate to future-proof their businesses."

SITA, Air Transport IT Insights Report

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Emerging airport technologies



"LAWA is committed to innovation at every step of the passenger journey. We continue to look to groundbreaking technology to deliver high-quality, safe experiences for our global community of travelers."

Ian Law, Chief Digital Transformation Officer, Los Angeles World Airports (LAWA)

From AR to AI, airports are modernizing. Fast, reliable wireless networks enable airport IT teams to take advantage of emerging technologies and lay the foundation for an intelligent, connected travel hub. Smart digital infrastructure creates smart interconnected airports.

TECHNOLOGY	AIRPORT USE CASE
AI and Machine Learning (ML)	Predictive maintenance, baggage tracking, security screening, customer service chatbots
Augmented Reality (AR) and Virtual Reality (VR)	Wayfinding, entertainment, retail
Internet of Things (IoT)	Security cameras, smart lighting, biometrics, contactless check-in, self-service kiosks, mobile boarding passes
Blockchain	Flight data, cargo tracking, supply chain management, payment processing
Digital Twins	Safety and disaster recovery, predictive modeling
Parallel Reality	Personalized flight and gate information, interactive advertisements

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5G use cases ready for takeoff

5G has arrived and it's transforming the way airports operate. 5G technologies unlock a wide range of new use cases, while maintaining the highest standards of efficiency, safety and security.

Wireless digital signage
Deploy signage anywhere to drive tenant traffic or critical PAX information

Asset/vehicle tracking
Real-time access to asset location

Cargo
Continuous sensor connectivity of cargo transportation and storage

Tarmac vehicles
Autonomous vehicle connectivity, real-time data on towing, refueling and maintenance

MECs
On premise compute and storage capabilities for airport-owned data



Passenger flow management
Beacons, sensors and cameras optimize traffic flow within airport

Location-based services
Indoor wayfinding support, proximity alerting, and occupancy alerting

Turnaround time
Reduce turnaround time to maintain on-time performance

Ground crew access
Reliable, mobile voice communication for ground crews

Security
Separate and isolated operations network supports CCTV, environmental monitoring and surveillance

"In the airport, the arrival of 5G and the maturation of AI solutions will see connected autonomous robots, vehicles, and mobility equipment to support passengers and staff."

SITA, Meet the Megatrends

A Turning Point

5G plays a role in reducing turnaround time by enabling faster and more efficient communication between airport personnel and airline crews. With 5G sensors, staff can track the status of aircrafts, ground equipment and baggage in real time. The risk of lost or delayed baggage is also reduced.

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FASTER, SMARTER, SAFER NETWORKS

Connecting airports with 5G & Wi-Fi



Separate, siloed networks are a thing of the past. For a truly connected airport that supports travelers, staff and IoT, cellular and Wi-Fi must work in unison across a neutral host model. **Convergence of DAS, private 5G and Wi-Fi technologies is key.**

DISTRIBUTED ANTENNA SYSTEMS (DAS) AND SMALL CELLS improve LTE and 5G cell service at airports, eliminating dead zones and boosting signal strength for all wireless carriers including AT&T, T-Mobile and Verizon Wireless. This solution provides a dedicated network for first responders and emergency communications.

PRIVATE 5G AND ONGO/CBRS powers IoT and critical airside/landside communications with reliable and secure networks.

WI-FI 6/6E connects passengers to work, entertainment and flight information.

PASSPOINT hotspot technology automatically balances network load by roaming passenger cellular traffic to Wi-Fi with enterprise-grade encryption.

What is convergence?

Network convergence is the consolidation of licensed, unlicensed and shared spectrum deployments. It unifies network management of cellular and Wi-Fi under one platform, reducing interference, consolidating physical hardware and simplifying network management.

Boingo Wireless brings together cellular, Wi-Fi, CBRS (Citizens Broadband Radio Service) and IoT solutions through convergence to enable scalable, secure and data-driven digital transformation.

Convergence at ORD

Chicago O'Hare International Airport relies on DAS, Wi-Fi 6, private networks and Passpoint solutions from Boingo to connect passengers, staff and IoT operations. Read the case study.

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How private 5G ensures network security and data protection

Cyberattacks are highly coordinated and more advanced than ever before. Airports require layers of network security and zero-trust architecture.

CHALLENGE

- 61.5% of airports were targeted by cyberattacks in 2022, according to ACI World.
- Major airport technologies including reservation systems, airplane information management systems (AIMS), flight traffic management systems, ticket booking portals and cabin crew devices are particularly vulnerable.
- On average, a critical infrastructure data breach costs $3.86 million.

SOLUTION

- A new level of security is achievable with private 5G, multi-access edge computing (MEC) for on-premise data processing and borderless infrastructure that moves content from edge to cloud to a data center seamlessly.
- Zero-trust architecture assumes no implicit trust in any user, device or network within an airport's network infrastructure. It enforces stringent access controls and authentication.
- Highly secure data environments ensure that sensitive data does not leave the premises or intended users.
- Ultra-low latency networks process data in near real time.
- Encrypted systems and perimeter policies help protect data.

Secure networks for the U.S. Department of Defense

The private 5G network Boingo installed at Naval Air Station Whidbey Island delivers secure, zero-trust connectivity for smart aviation hangars, warehouses, flight line operations, AR/VR operations and training, asset tracking and advanced supply chain management. Learn more.



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The advantage of IoT data and insights

Does the baggage cart need maintenance? Is the mobile ticketing machine due for an update? Airports generate vast amounts of data, but IT executives are challenged on how to use it for predictive maintenance and informed decision-making.

The solution lies in owning the operational data.

With private 5G, airports retain full ownership of their operational data—from terminal occupancy and gate utilization to boarding processes, aircraft movements, maintenance schedules and more. This data provides invaluable information for identifying bottlenecks, streamlining processes and optimizing resource allocation.

DATA DRIVES INFORMED DECISIONS

Computer vision: AI and ML analyzes visual data captured by cameras using algorithms to better understand security screening wait times, automated passport control operations, baggage control, crowd monitoring and more.

LiDAR*-based crowd analytics: LiDAR technology uses lasers to measure distance and create 3D imagery of objects and environments. This data can be used to monitor crowds and foot traffic. Queue management software can output live data like queue lengths, wait times, passenger flow rates, processing times, occupancies and asset utilization.

Wi-Fi-based analytics: Next generation networks capture Wi-Fi data to provide a holistic view of passenger activities and experiences including heatmapping and passenger demographics.

*Light detection and ranging



"Armed with the right data, IoT can create new sources of revenue for airports."

Deloitte

Network ROI accelerates airport success



DAS, Wi-Fi and private 5G networks are strategic investments that hold immense potential for airports to transform their operations, enhance passenger experiences, and drive revenue growth.

IMPROVED PASSENGER EXPERIENCE

By offering reliable and fast internet connectivity, airports can create personalized digital experiences, including real-time flight information, interactive wayfinding and immersive entertainment options. This enhanced passenger experience fosters customer loyalty, drives engagement, and increases the likelihood of generating additional non-aeronautical revenue through targeted advertising and e-commerce partnerships.

ENHANCED OPERATIONAL EFFICIENCY

Advanced networks facilitate the deployment of smart sensors, automated systems and real-time analytics, leading to streamlined operations, optimized resource allocation, and improved safety and security measures. From baggage tracking to crowd management and predictive maintenance, these efficiencies not only enhance passenger satisfaction, but also reduce operational costs and increase overall airport productivity.

REVENUE GENERATION OPPORTUNITIES

Networks can be monetized via advertising, tenant services, retail and revenue share programs. Such revenue streams not only offset the initial investment, but also pave the way for long-term profitability.

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Network models that support your airport's goals



"Many airports are undergoing redevelopments and asking how to implement turnkey, fully managed cellular and Wi-Fi networks. A NaaS approach places the complexity of network operations into the hands of a dedicated service provider like Boingo to ensure connected airport ecosystems run as smoothly as possible."

Michael Zeto, Chief Commercial Officer, Boingo Wireless

An effective airport IT strategy requires a strong wireless network foundation that supports operational goals and passenger priorities.

With resource strapped IT teams and network operation complexities, network-as-a-service (NaaS) is a long-term strategy that provides a turnkey, cost-effective converged connectivity solution. A NaaS model means any 5G or Wi-Fi technology—DAS, small cells, Wi-Fi, private 5G—can be fully managed by an experienced neutral host network service provider. This allows executives and IT teams to concentrate on their core IT functions and strategic initiatives.

BOINGO'S NaaS MODEL DELIVERS END-TO-END NETWORK SUPPORT

DESIGN

In-house design team and NaaS approach deliver best-in-class neutral host networks.

INSTALLATION

Full-service equipment procurement, logistics management, testing and deployment.

OPERATION

Boingo's global Network Operation Center (NOC) monitors your network 24/7/365 and ensures 99%+ uptime.

SUPPORT

A dedicated account manager, powerful insights and preventative maintenance means you have support when you need it.

SECURITY

Prevent cyberattacks with Boingo's threat monitoring and detection.

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WORLD-CLASS AIRPORTS FLY HIGH WITH BOINGO DAS, WI-FI AND PRIVATE 5G

Case studies



EWR

The newly renovated Newark Liberty International Airport's Terminal A relies on Boingo's best-in-class DAS, Wi-Fi 6 and private LTE for an amenity-rich passenger experience. For operations, the network powers bag reconciliation systems, baggage scanners, a full digital signage journey, staff iPads, terminal operations, contractor delivery logistics, airport concessions and retail.



BNA

Nashville International Airport boosts cellular coverage and data capacity with Boingo's neutral host DAS and Wi-Fi networks. The solution delivers seamless connectivity airport-wide, including cell phone lots, internal roadway systems, aircraft parking areas and car rental facilities.



AUS

At Austin-Bergstrom International Airport, Boingo designed, built and manages a neutral host, converged network combining DAS and Wi-Fi with Passpoint technology. The network is supported by all Tier One carriers and helps "Austin's Airport of the Future" deliver a superior passenger experience.

"Boingo Wireless has deployed a world-class network [at EWR] that fulfills passenger demand for fast, seamless connectivity, while also providing a robust connectivity backbone to support digital airport operations."

Robert Galvin, Chief Technology Officer, Port Authority of New York and New Jersey

Want more case studies?

Go deeper on Boingo's resource center.

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DIGITAL TRANSFORMATION IS COMPLEX. BOINGO SIMPLIFIES IT FOR YOU.

Why partner with Boingo?

There's a reason why Boingo is the largest operator of airport DAS, Wi-Fi and private networks in the U.S. Here's how we work as a full-time partner to support your airport's goals.

COLLABORATE
Bring us your digital transformation vision, use cases and desired outcomes. Boingo makes that vision a reality with next generation connectivity.

DESIGN
Boingo custom designs 5G infrastructure with cellular, Wi-Fi and private networks based on your needs.

BUILD
Our end-to-end connectivity platform is technology agnostic, neutral host and interoperable. We deliver voice, data and IoT network solutions.

MANAGE
Boingo's neutral host NaaS model offers 24/7/365 monitoring, maintenance and customer care with a full security service suite. As your long-term partner, we grow with your needs and ensure timely upgrades. Innovation never stops at Boingo. Our new Boingo Innovation Center serves as a launch pad to test and demonstrate 5G, Wi-Fi 6/6E, Wi-Fi 7 and IoT pilot programs.

Leading organizations trust Boingo.

DUBAI INTERNATIONAL AIRPORT · TISHMAN SPEYER · Heathrow · PORT AUTHORITY NY NJ · CDA CHICAGO DEPARTMENT OF AVIATION · ONE WORLD TRADE CENTER · GRU AIRPORT AEROPORTO INTERNACIONAL DE SÃO PAULO · MTA · LIVE NATION · LAX · ROCKEFELLER CENTER · petco park · U.S. ARMY · U.S. AIR FORCE · U.S. NAVY · U.S. HOMELAND SECURITY · SOLDIER FIELD

BOINGO'S WIRELESS FIRSTS

1999	2001	2002	2014	2018	2019	2022
FIRST DAS Network Commercial Deployment	FIRST Wi-Fi Connectivity Software	FIRST Airport-Wide Wi-Fi Network	FIRST Passpoint Network Commercial Deployment	FIRST CBRS Private Network in an Airport	FIRST Wi-Fi 6 Network in an Airport	FIRST OpenWi-Fi 6E Network Commercial Deployment

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LET'S GET STARTED

Transform your airport with Boingo's world-class connectivity solutions

GET A 5G ASSESSMENT

Talk to the Boingo team. Email at **sales@boingo.com** and visit **www.boingo.com/airports-transportation.**



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#WirelessSimplified

Boingo Wireless, Inc. simplifies complex wireless challenges to connect people, business and things. We design, build and manage converged, neutral host public and private networks at major venues around the world. Boingo's vast footprint of distributed antenna systems (DAS), Wi-Fi, small cells and macro towers securely powers innovation and connectivity in airports, transit stations, stadiums, military bases, hospitals, commercial properties and enterprises worldwide. Learn more at boingo.com. © 2023 Boingo Wireless

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