AEROWISE

RE-ENGINEERING POSSIBILITIES

Waisl

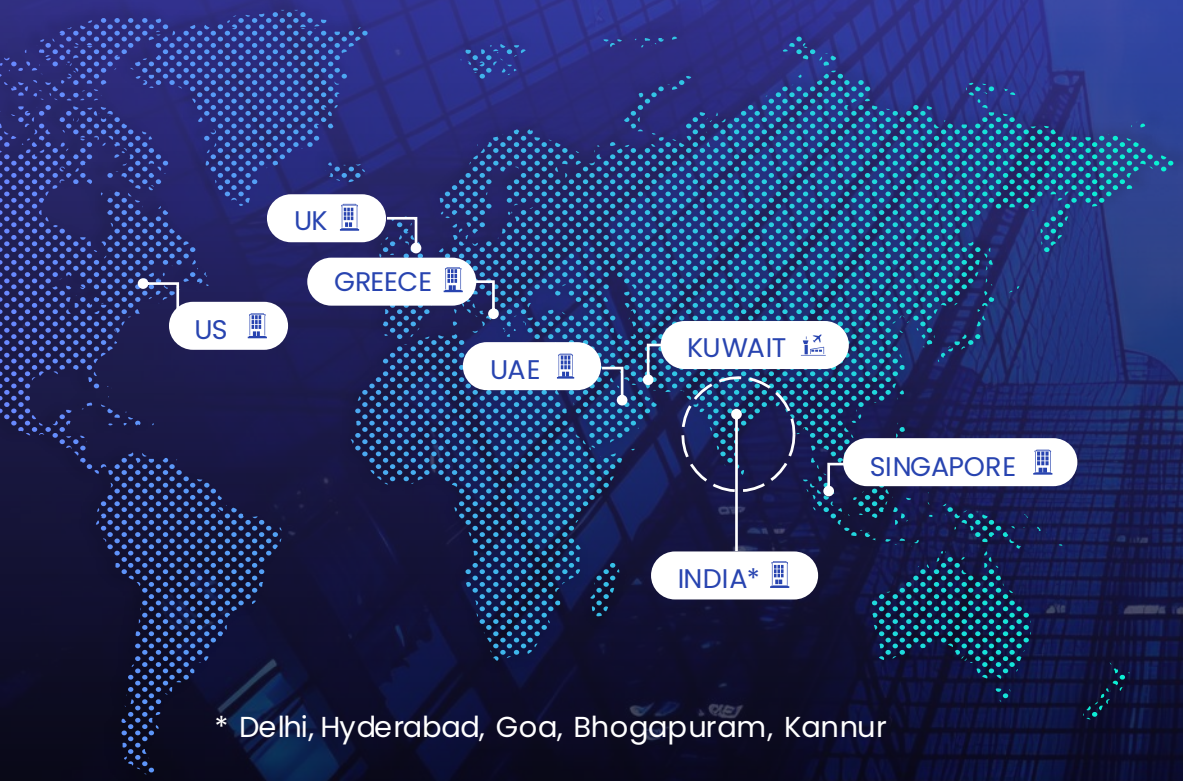
ISO 9001, 20000, 27001, 22301

CMMI ML3 APPRAISED DEV SVC

Software Development and IT Operations

INDIA | UAE | US | UK | SINGAPORE | GREECE | KUWAIT

WAISL @ a Glance



* Delhi, Hyderabad, Goa, Bhogapuram, Kannur

15+ Years Of Expertise	**800+** Strong Global Team	**200+** OEM Partners & Vendors
06 Airports Currently Managed	**80+** Airlines Served	**2000+** Applications Integrated
135M+ Passengers Serviced	**2500+** Air Traffic Movements Per Day	**7+** Countries Presence

Recognitions

- BC Business Connect — Best Airport IT Company 2024
- Frost & Sullivan — Leadership Award 2023 Technology Innovation
- Forbes India — Global Business Potential
- The Times — Business Award North 2023
- ASSOCHAM (Ideate · Innovate · Impact) — Best Aviation IT Solution Provider
- ET HRWorld (From The Economic Times) — Organization Future Ready

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5

Key reasons why WAISL is your preferred partner for digital first airport operations

1. Full-spectrum airport digitalization, with 2000+ application integrations & 200+ OEM vendors /system partners

2. Scalable and globally deployed, supporting 135M+ pax and 2500+ daily ATMs across 6 airports.

3. Deep synergy with operations, supported by experience in digital twin deployment at airports such as Hyderabad, Delhi.

4. Cost-effective execution backed by an 800+ strong team; offering high value at optimized cost

5. Trusted industry leader, recognized as Best Airport IT Company 2024 (Business Connect) & acknowledged by Forbes, among others

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/ Our Expertise

Delivering comprehensive technology solutions within complex ecosystems

Airport IT & Passenger Systems

- Biometric & Facial Recognition
- Self-Service Kiosk
- Self-Baggage Drop
- Flight Information Display Systems
- Baggage Reconciliation Service
- Airport Resource Management Solutions (ARMS)
- Airport Operations Database

Digital Twin & Integrated Operations

- Digital Twin & AI/ML Solutions
- Integrated Operations Command & Control Center
- Video Analytics
- Security Command Center
- Smart Building Management Solutions
- Retail Billing Solutions & Analytics
- Payment Solutions

Tech Infrastructure & other solutions

- Data centers
- Security & Surveillance
- Data & WiFi networks
- Communication system
- Cybersecurity
- Consulting & Advisory
- Master System Integration

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DIGITAL - TWIN POWERED

AEROWISE

Ushering in a new age of Total Airport Management



AIRSIDE

- Advanced Air Traffic Analytics
- Smart Airside Operations and Safety
- Runway Efficiency Monitoring
- Foreign Object Detection & Perimeter Security

TERMINAL

- Real-Time Passenger Insights
- Passenger Flow & Utilization Analytics
- Intelligent Crowd Management
- Advanced IT Operations

LANDSIDE

- Smart Traffic Surveillance
- Enhanced Parking Intelligence
- Forecourt Analytics
- Cloud-Based Access Control

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Digital Twin

Our Digital Twin Powered Airport Predictive Operations Command Center, transforms end-to-end airport operations & processes.







40+ **Modules** across safety, analytics, operations and pax engagement

100+ **KPIs** monitored across Airside, Terminal, and Landside ops



Powered By AEROWISE

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Terminal-to-Landside Situational Awareness



Key value drivers

1. Early warning signals **minimizing LoS slippage instances**
2. Real-time insights driving creation of **new revenue streams**
3. **Faster incident resolution** minimizing disruption cost
4. **Increased dwell times** and **better pax experience** driving **higher non-aero revenues**

Digital twin enabled real-time dashboards, KPI monitoring, alerts and post-ops reports

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How Digital Intervention Becomes Possible with AEROWISE

AEROWISE

First-of-its-kind E2E Integrated Solution

Visualization Layer

- KPI Reporting
- Real-time dashboarding
- Simulator
- Digital Twin

Business Intelligence Layer

- Plan of the Day (Inc Monitoring & Reporting)
- Aircraft Turnaround Time
- Baggage (FB/LB)
- Landside Management
- Terminal Management
- Passenger Turn up
- Airside Management
- Optimizer

Data Layer

LISA Platform

Integration Layer

WAISL Middleware

Foundational Source Systems*

IT Systems

- AODB
- Cameras
- Google Maps
- Xovis - LIDAR
- Airline DCS
- EPOS
- Weather
- E-Gates
- BHS
- BRS
- Wi-Fi APs
- ATRS
- CUSS
- LDM & PTM
- Check-in
- SBD
- ITOM/ ITSM
- ADSB

OT Systems

- Power Fence
- Access Control
- Solar Plant
- PBB
- Elevators
- BMS
- Escalators
- FAS
- Telematics
- Travelators
- GPU/ PCA
- Smart Trolley
- Light Monitoring
- Telemetry
- Water Levels
- VDGS

WAISL System/IP Integrated

External Systems Integrated

*Non-Exhaustive

Highly Configurable as per Airport Needs

A **Future Ready:** Next-gen capabilities such as AI/ML-powered predictive analytics and digital twin with 3D visualization and interaction enabling Real-time, intuitive operational view.

B **Plug and Play use cases:** Pre-built and customizable solutions designed to adapt to evolving airport needs.

C **Flexible Platform:** Seamlessly integrate with existing airport platforms to enable data collection from diverse devices and video feeds. Unify, clean, and manage IoT and vision data.

D **AI & ML-Driven Insight :** Deploy independently or with tailored use cases, real-time analytics across data streams for predictive and prescriptive decision-making.

E **Modular Middleware :** Equipped with 40+ pre-built connectors for seamless integration with legacy, IT, and OT systems scaling effortlessly with pax growth.

Flexible deployment models—on-prem, cloud-based, and hybrid—supporting multi-airport systems with remote central management

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Next-Gen Plan-of-the-Day

Real-time forecasting, intelligent resource allocation, and effortless collaboration

Dynamic passenger presentation curves: show-up forecasts to plan staffing and resources

What-If Scenarios: Instantly model disruptions or surges for rapid, data-driven decisions

Proactive Resource Allocation: Deploy manpower and equipment in advance based on predictive analytics

Frequent Data Refresh: Updated every few hours, ensuring near real-time accuracy and responsiveness

Collaborative Planning: Shared dashboards and metrics keep all stakeholders aligned and informed



Key value drivers

- **Improve resource planning and utilization**
- Dynamic adjustment of resources to **drive lower wait time for high SPP pax categories** (non-aero revenue)
- **Streamline maintenance schedules** basis pax flow patterns
- **Reduce manpower required** through better rostering based on pax flow patterns

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Aircraft Turnaround Manager

Real-time monitoring ensuring on-time performance

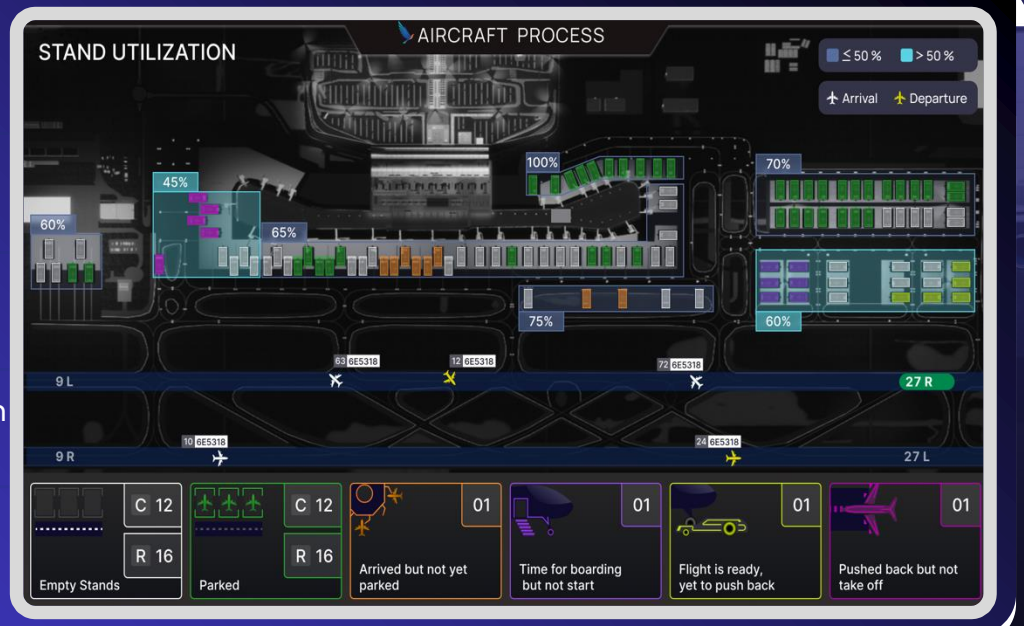
Real-Time Tracking: Monitor critical path activities—from arrival to departure—in one centralized view (e.g. cleaning, fueling, etc)

Predictive Alerts: AI—driven insights spot potential delays early

Collaborative Dashboards: Shared visibility across airlines, GHAs, and ground teams for rapid decision-making

Root-Cause Analysis: Identify and address bottlenecks swiftly, cutting down on recurring delays

Improved Passenger Experience: Ensured on-time departures, reduced disruptions, and higher satisfaction



Key value drivers

- **Improve stand utilization** through enhancement in A/C turnaround efficiency
- **Predict potential delays** and provide airline/ GHAs granular visibility into issues impacting PTS

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Proven Impact - Success Story

AEROWISE at Hyderabad Airport enables real-time dashboards with predictive analytics and post-ops analysis



Launch of **India's first Digital Twin Powered Airport Predictive Operations Center**

- **Real-time Dashboards** for Proactive Monitoring
- **Predictive & Prescriptive Analytics** to Optimize Resource Allocation with Scenario Simulators
- **Management by Exceptions**
- **Post-ops Process Analytics**
- **Best –in Class Video Analytics**
- **Con – Ops Driven**
- **35+ Systems Integrated** (Includes Airport IT & OT Systems)

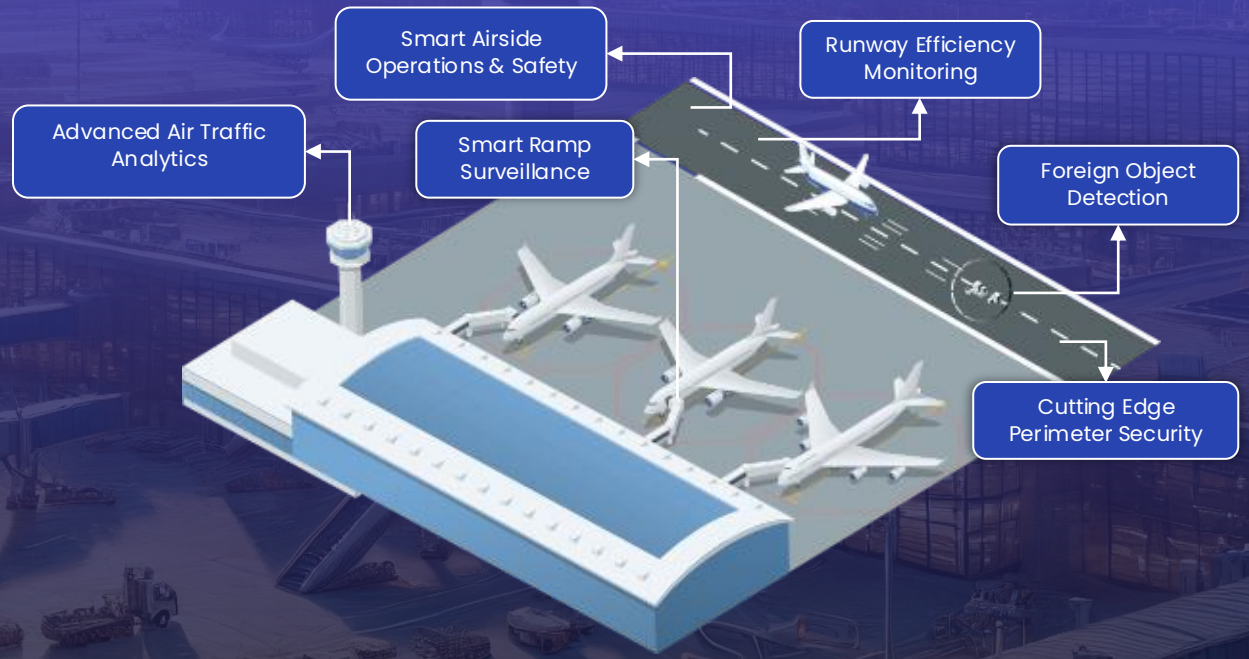
Potential to have a unified view of operations across multiple airports

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Powered By AEROWISE

AeroWise – Airside overview







Advanced Air Traffic Analytics

Monitor variances in air traffic movement and ensure timely operations with real-time delay and OTP insights.



Runway Efficiency Monitoring

Utilize precise granularity matrices to optimize runway occupancy times and peak hour management.



Cutting-edge Perimeter Security

Secure the airport's boundaries with electrical fence monitoring, automated PTZ camera tracking, and real-time video analytics.



Smart Airside Operations and Safety

Elevate airside efficiency with RFID and ANPR-based tracking, gear compliance, and optimized aircraft servicing.



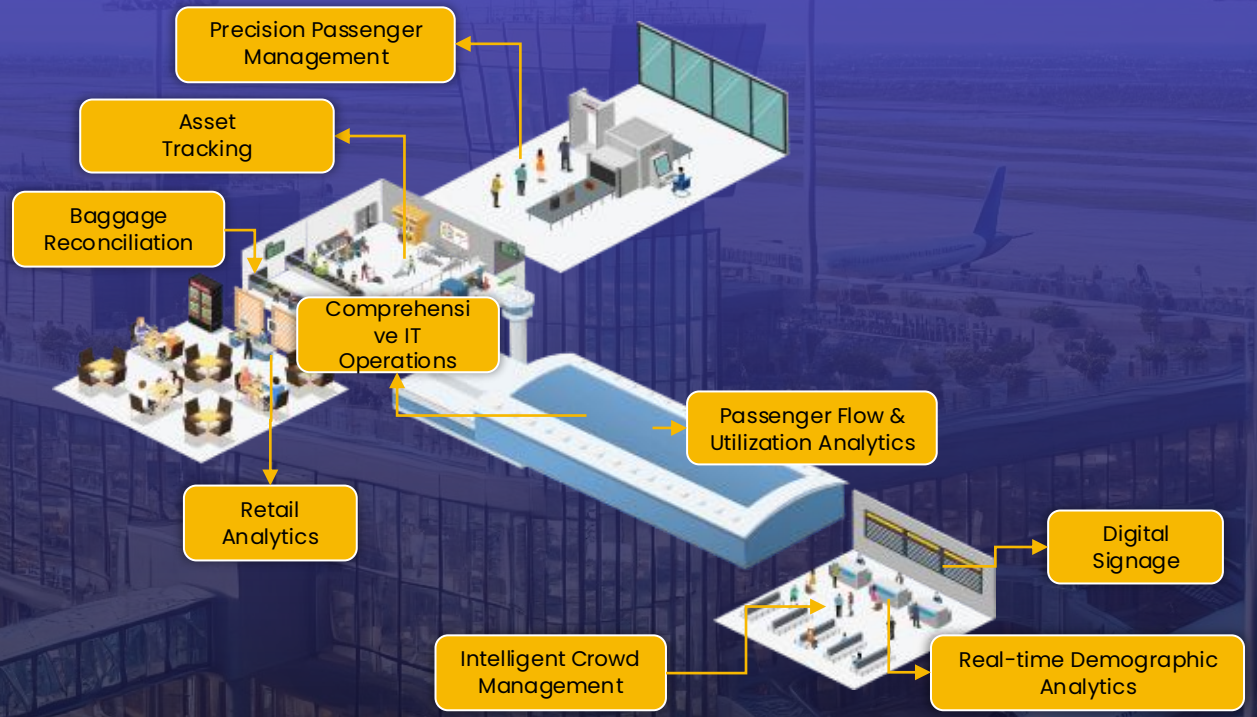
Next-Gen Object Detection

Enhance safety with advanced foreign object detection on all zones of the airside.

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AeroWise– Terminal side overview







Passenger Flow & Utilization Analytics

Optimize terminal operations with insights on throughput, process times, gate and belt utilization, and dwell times.



Comprehensive IT Operations

Ensure seamless IT operations with state-of-the-art monitoring tools for servers, networks, and assets.



Intelligent Crowd Management

Enhance security and passenger flow with crowd metrics, intrusion detection, and behavior analytics.



Real-time Demographic Analytics

Personalize terminal experiences using gender predictions, emotion analysis, and insights into passenger demographics.



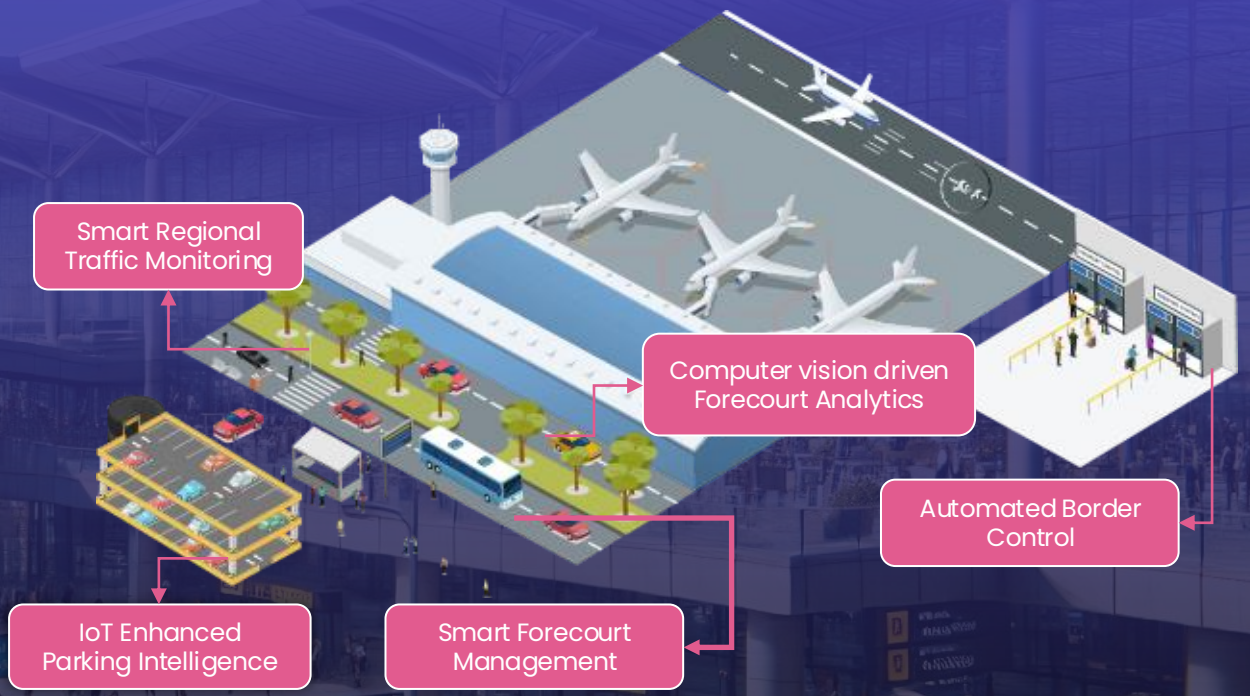
Precision Passenger Management

Elevate passenger experience with accurate counting, wait time analytics, and desk manning reports across key touchpoints.

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AeroWise – Landside overview







Vision-Driven Forecourt Analytics

Leverage real-time insights for smooth vehicle flow, preventing forecourt bottlenecks.



IoT-Enhanced Parking Intelligence

Harness advanced analytics to manage vehicle count, ensure safety, and monitor camera health.



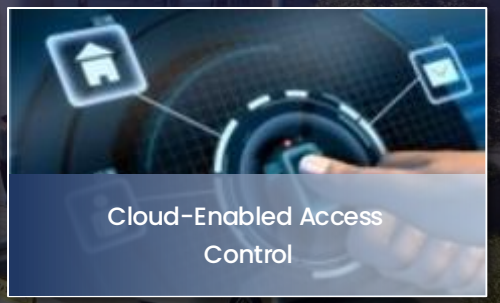
Intelligent Crowd Management

Boost ramp safety with behavioral pattern detection, suspicious activity alerts, and uniform recognition.



Smart Regional Traffic Monitoring

Monitor a 10km radius with integrated camera systems, predicting patterns and ensuring road safety.



Cloud-Enabled Access Control

Streamline airport traffic flow, classify vehicles, and pinpoint illegal parkings for an enhanced passenger experience.

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High-Performance, Flexible DT Platform with Seamless Integration

Leveraging existing infrastructure for efficient data ingestion and enhanced functionality

Our Digital Twin Architecture

Flexible Deployment

Cloud/ On-prem

High Availability and secure

Enterprise-grade, modular & scalable

Standards based Integration interfaces

MQTT, kafka, BACnet, LoRaWAN, Modbus, TCP / IP, webhooks

Open Standards Based Deployment Architecture

HELM, docker

Leverage Existing Infrastructure

RFID, Smart Energy, FIRE ALARM SYSTEMS

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40+ Use Cases & 100+ KPIs Across Airport Ops

Enhancing landside, airside, and terminal efficiency with actionable insights

Real-time Monitoring & Exception Alerts	AHU (Air Handling Unit)	2
	ATRS	1
	Baggage Belt	2
	BHS	2
	Check-in Process	2
	Desk Manning	1
	Electromechanical Equipment	1
	Entry Gate	2
	Fire Alarm	3
	Pax Heat Map	1
	Pax Turnup profile & Journey Mapping	1
	PESC	2
	Security Threat Alert	1
	Transfer Pax Wait Time at Immigrations	1
	Trolleys	1
	Utilities Monitoring	1
Predictive & Prescriptive Analytics	Pax Turnup profile & Journey Mapping	1
	Plan of the Day	2
Post-ops Analysis & Utilization Reports	ATRS	1
	Boarding Gates	2
	Desk Manning	1
	Pax Flow	4
	Self-Service	1
Grand Total		36

Terminal

Real-time Monitoring & Exception Alerts	Aerobridge	3
	Arrival Baggage Belt	1
	ATM	1
	Flight Schedule	1
	Fuel Leakage Detection	1
	GPU	1
	Maneuvering Area	8
	OTP	3
	PCA	2
	Perimeter Intrusion Prevention	1
	Power Fence	1
	Runway	2
	Slots	2
	Stand	1
	Taxi Time	2
	VDGS	1
Post-ops Analysis & Utilization Reports	Aerobridge	1
	Arrival Baggage Belt	1
	ATM	1
	OTP	2
	Pax-Load Factor	1
	Runway	3
	Slots	3
Grand Total		43

Airside

Real-time Monitoring & Exception Alerts	Cab Availability	2
	Car Parking	1
	Crowd Behaviour	1
	GT Counter Manning & Assets	2
	Incident Response	2
	Landside Traffic	2
	Public Transport	4
	Ramp Overcrowding	1
	Security Threat & Alerts	1
	Utilities- Water, Power	2
	Vehicle Throughput & Flow	7
	Wildlife Hazard	1
Grand Total		26

Landside

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Best-in-Class International Airports – KPI Tracking

Achieved through 8 Primary Processes

25+ KPIs tracked

1. Wait time
2. Processing time
3. Minimum Connect time
4. ATRS productivity
5. Pax dwell time
6. Counter utilization
7. Vehicle Wait Time
8. Vehicle Count and Type
9. Vehicle congestion
10. Baggage Delivery Time & throughput
11. Baggage belt utilization
12. Misplaced Baggage
13. Boarding Gate Utilization
14. Stand Utilization
15. Aircraft Turnaround Time
16. Runway Occupancy Time
17. Taxiing Time
18. Runway Utilization
19. OTP
20. Total Flight Delay Minutes
21. TSAT Compliance
22. Slot Utilization
23. Slot Adherence
24. # days w/o major incident
25. # Incidents by Incident Types
26. SPP (By Type, Airport Areas)
27. Penetration (Type, Areas)
28. Pax NPS and sentiment
29. Parking slot utilization

8 primary processes deployed at global best-in-class airports

1. Pax flow related (incl. security)[2]
2. Baggage belt allocation
3. Stand & gates allocation

Plan of the day

4. Aircraft turnaround
5. Airline management
6. Slot management
7. Disruption Response and Resolution
8. Non-aero revenue optimization – *Strategic long-term process*

Note: KPIs map across multiple processes

1. Tracked at check-in, security, and immigration touchpoints; 2. Includes entry gates, check-in counters, security belts, immigration and emigration desks, transfer

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Unlocking Value with AEROWISE

Enhancing Efficiency, Revenue, and Cost Optimization for Smarter Airports

Value buckets	Potential Value from AeroWise implementation
Operational efficiency	1 Improve resource planning and monitoring to manage higher pax throughput while maintaining Los
	2 Establish and trigger Early warning signals to minimize Los slippage instances
	3 Improving stand usage through enhancement in A/C turnaround efficiency by providing airline and GHAs granular visibility into issues impacting PTS performance
Non-aero revenue increase	4 Improving planning and dynamic adjustment of resources to drive lower wait time for high SPP pax categories
	5 Assist in designing new revenue streams by providing real-time insights for data-driven decision-making
Cost reduction / avoidance	6 Reducing manpower required per million pax through better rostering based on pax flow patterns
	7 Faster incident resolution minimizing disruption cost

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Aerowise will Unlock value in 6 key Areas

$15 Mn+ annual value at stake observed for certain airports

5-10%	5-10%	1-3%	1-3	10-25%	5-10%
Sweating existing assets	**OpEx reduction**	**Driving revenue through better pax experience**	**Increase airside capacity**	**O & M efficiency1**	**Incident management**
Enhance peak throughput by better pax flow and queue management across touchpoints	Smarter workforce planning and flexible deployment, reducing manpower required per Mn pax	Prevent erosion in non aero value by eliminating LoS breaches using Early warning signals Increase non aero revenue via concessionaire ops interventions	Accurate EOBT predictions and faster turnarounds drive better stand planning and increased peak-hour ATM handling	Improved workforce productivity with first time right allocation and less time spent on waiting/ admin tasks	Faster response to incident to minimize disruption time and prevention of future repeat of incident (data analytics on root cause leading to issue addressal)

1. Contingent on starting baseline

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Flexible Commercial Models

Tailored to align with the strategic priorities of your airport

1. Fixed Price Model

One-time project cost for full implementation

Covers software, integration, and initial deployment

2. Subscription-Based (SaaS) Model

Recurring fee (monthly/ annually) for continued access to WAISL's APOC platform, cloud hosting, and updates.

3. Consumption-based Per-Pax Model

Pay-as-you-go pricing linked to actual usage, priced as per number of pax

Hybrid Model: Custom combination of one or more models (e.g., Consumption-based with fixed base fee)

Tailored Engagement Model: Collaborate with your existing IT partner or leverage our global partner ecosystem for streamlined implementation

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/ Next Steps

Understand Strategic Priorities: Preference of PoC and timeline

Assessment of Technical Landscape for PoC: Understand current systems, integrations, and operational constraints – virtual or physical

Plan On-Site Visit: Visit to Airport to assess tech landscape for PoC

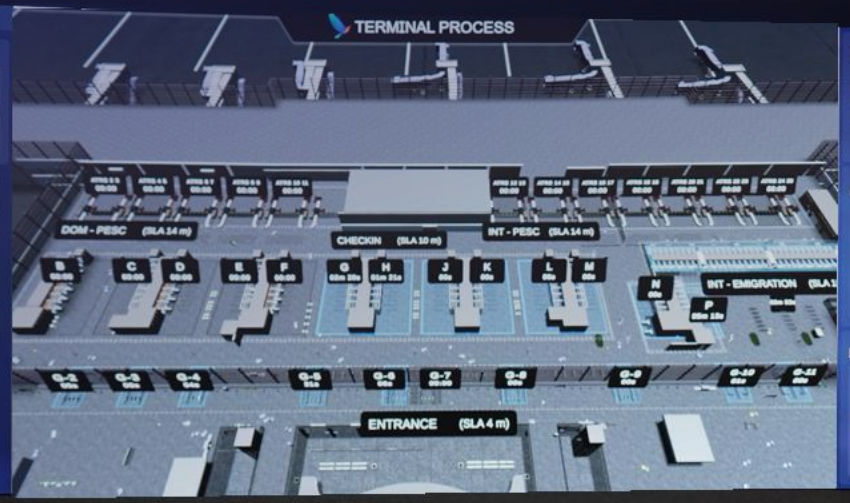
WAISL to share a **Tailored Proposal** basis ongoing discussions

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Waisl
Innovate / Transform
RE-ENGINEERING POSSIBILITIES

Demo Use Cases







#	Demo Use Cases	Area	DT Capabilities
#1	Ops team using Digital Twin's predictive and simulation capabilities for seamless pax flow management across terminal	Terminal	Predictive & Proactive Management, Simulation & Forecasting, Crowd Mgmt.
#2	Airside operations team performing a detailed route cause analysis (RCA) for low OTP over last one week. The team leverages UTAM module's computer vision enriched detailed PTS.	AOCC	Post Ops Analysis - Analytics, AI/ML
#3	Security/ Law Enforcement utilizing real-time insights and auto-alert capabilities to decongest approaching traffic, track and monitor suspicious vehicle activities and violations	Security	Predictive & Proactive Management, Crowd Mgmt.
#4	APOC Room Operations	APOC	All

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Demo 1

Terminal

Demo 2

AOCC

Demo 3

Security

Demo 4

APOC Room

Demo 1

Area: **Terminal**

2 AOCC

3 Security

4 APOC

Ops team using Digital Twin’s predictive and simulation capabilities for seamless pax flow management across terminal

Digital Twin Capabilities	Predictive & Proactive Management, Simulation & Forecasting, Crowd Management

1

Terminal

Demo 2

Area: AOCC

3

Security

4

APOC

Airside operations team performing a detailed route cause analysis (RCA) for low OTP over last one week. The team leverages UTAM module's computer vision enriched detailed PTS.

Digital Twin Capabilities	Post Ops Analysis, Business Analytics, AI/ML

1

Terminal

2

AOCC

Demo 3

Area: **Security**

4

APOC

Security/ Law Enforcement utilizing real-time insights and auto-alert capabilities to decongest approaching traffic, track and monitor suspicious vehicle activities and violations

Digital Twin Capabilities	Predictive & Proactive Management, Crowd Management

1 2 3

All | Terminal | AOCC

Demo 4

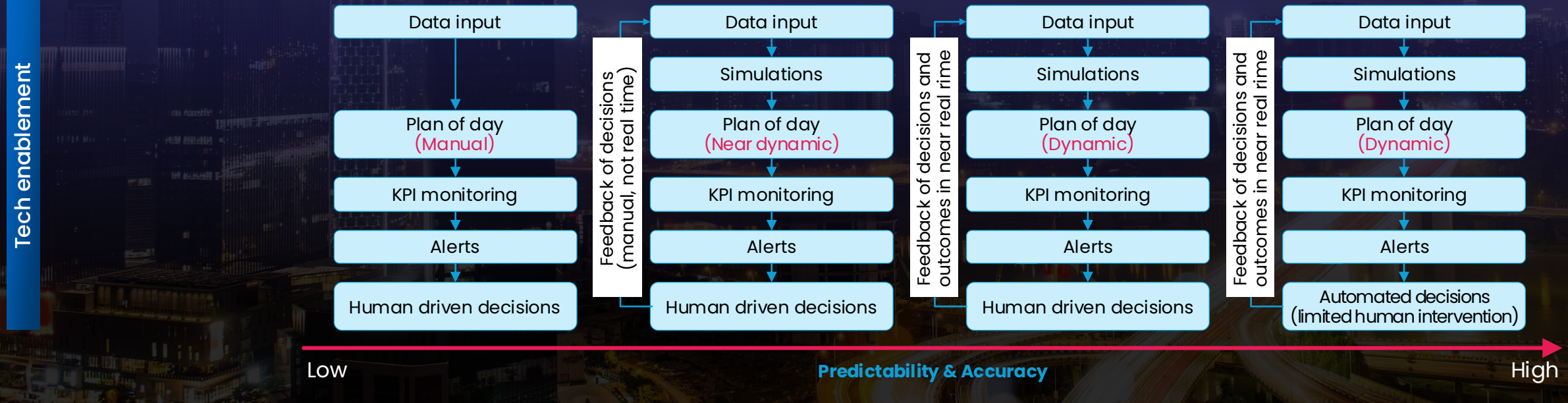
Area: APOC

Operations inside the APOC room

Digital Twin Capabilities	All

Airports are Advancing Along a Tech & Process Maturity Curve

		L1: Reactive basis alerts	L2: Predictive	L3: Prescriptive & proactive	L4: Autonomous
Process maturity	Must have	Planning & resource allocation	Static plan developed	Near dynamic planning with predictions	Dynamic planning with scenarios	Fully dynamic and adaptive planning
		Day of ops	Real time KPI tracking and alerts post LoS breach	Proactive Early Warning Triggers before LoS breach	Prescriptive execution supported by scenario-based recommendations	Fully autonomous with human overrides for critical scenarios
	Good to have	Collaboration protocol	Telephone/ message based	Alerts and Notifications	Mobile app integrated with real-time data	Automated workflows with notifications
		Feedback loop	Dependent on manual reviews	Driven by base model adjustment	System driven - scenario based adjustment	Near automated adjustment
		Pre-tactical planning horizon	D-0	D-0 to D-15 days	D-0 to D-60 days	D-0 to D-60 days



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RETAIL & MALLS

Virtual Assistant & Payment Solutions

Crowd Management & Analytics

Integrated Command Centers

SHIPPING

Cargo Tracking & Scheduling

Video Analytics & Surveillance

TRANSPORTATION

Logistics & Scheduling

Video Analytics & Surveillance

Integrated Command Centers

HEALTHCARE

Patient Engagement

Smart Triage

Asset Tracking

SMART CITIES

Traffic & Parking Optimization

Smart Infrastructure/BMS

Integrated Command Centers

METRO & RAILWAYS

Crowd Management & Analytics

Video Analytics & Surveillance

ENERGY

Video Analytics, Drone & 3D Printing

Integrated Command Centers

INNOVATE / TRANSFORM

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