# PAVING THE WAY TO AI-POWERED AIRPORTS

**HONEYWELL AIRPORTS BUSINESS**

**Interairports Europe 2025**

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# AI SPEEDS THE PATH TO AUTONOMY

Unlocking next-level outcomes to reliably **improve airport operations, safety, productivity, and sustainability**

## MONITOR

Manage assets and processes to make informed decision making with limited automation

## CONTROL

Deploy system-agnostic, **real-time visibility with advanced controls** to remotely manage operations

## OPTIMIZE

Intelligent systems using AI/ML to **optimize operations and outputs** for improved energy efficiency, reliability, productivity and profitability

## ADAPTIVE

**Continuous learning systems** that respond to unanticipated events with little human intervention using AI and automation

## COGNITIVE & AUTONOMOUS

Self-healing, closed-Loop systems for safe, sustainable operations

**Accelerate transformative outcomes and unlock KPI improvements across airport ecosystem**



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# ENABLING AN AIRPORT FOUNDATION FOR AI

To accelerate outcomes with speed and scale

AI powered by HONEYWELL FORGE

## DATA SIMPLIFIED

- Edge to cloud IoT connectivity
- Unify and protect data for easy access and enterprise insights
- Reusable data pipelines, easy configuration, visualization, modeling to gain insight in weeks, not months

## DOMAIN EXPERTISE BUILT IN

- AI-enabled applications built, tested and validated from decades of domain experience
- Lean on Honeywell domain-know how, data and skills
- Accelerate time to value

## READY TO USE AI

- Leverage foundational models
- Powerful compute and core platform processing, storage
- SaaS applications and architecture to quickly launch new AI use cases



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# A FUTURE-READY AIRPORT PLATFORM

AI powered by HONEYWELL FORGE

**Honeywell Forge is a platform delivering AI-enabled solutions and services for more intelligent, sustainable, and secure airport operations**

## COMPONENTS

1. **Honeywell Forge IoT Platform** Edge-to-cloud data aggregation and normalization for OT assets
2. **Honeywell Forge Services** Augments in-house capabilities with Honeywell's domain expertise to empower you to unlock value through prescriptive insights
3. **Honeywell Forge Applications** AI-enabled intelligent operations software that automates routine processes and centralizes operational decision-making to drive better outcomes and higher productivity
4. **The Honeywell Forge AI Engine** Enhanced insights and intelligent automation with purpose-built AI




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# BRINGING IT ALL TOGETHER TO ACHIEVE OUTCOMES

From Land to Air - From Sensors to AI-powered applications - Enabling a single pane of glass for total airport optimization

## 1 AIRPORT INSIGHTS TO MAXIMIZE AI POTENTIAL

- Unify and democratize data from all assets, processes, sites and systems
- Real-time, cross-functional insights and instant collaboration
- Secure, scalable, agnostic platform

## 2 EMBEDDED DOMAIN KNOW-HOW

- AI models built from Honeywell's decades of domain expertise in controls, automation, process optimization, asset reliability, cyber security
- Automated data contextualization
- Small language models at edge


AI powered by HONEYWELL FORGE

## 3 OUT-OF-THE-BOX MODELS FOR RAPID ROI

- Use pre-trained AI/ML models based on expert data
- Or bring your own data or machine learning (BYOML) models enhanced with Honeywell health and performance models

## 4 TRUSTED & RELIABLE AI

Explainable AI predictions and recommendations validated and continuously improving for accuracy

## 5 PARTNERING ON ROI

- Outcome based programs tied to achieving business results
- Benefit sustainment services including remote monitoring and model upkeep for continuous improvement



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# EVOLUTION OF AIR TRAFFIC CONTROL SYSTEMS

## Siloed Systems

- Multiple disconnected displays and data sources
- Manual decision making
- Heavy reliance of voice communication
- Significant cognitive load

## Integrated Systems

- Unified display interfaces
- Common situational awareness
- Enhanced Decision support tools
- Reduced voice communication (CPDLC)

## Intelligent Systems

- Autonomous Decision Support
- Predictive conflict detection/resolution
- Dynamic flow optimization
- Intelligent Input validation

**This evolutionary journey represents a shift from reactive to proactive and predictive operations, transforming how we manage increasingly complex runway and ground movements.**



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# NEXT-GEN AVIATION SAFETY SYSTEMS

## Predictive Analytics

**Anticipating operational issues before they occur through pattern recognition and historical data analysis**

## Autonomous Decision Support

**AI-augmented systems that recommend or execute optimal actions based on complex multi-variable scenarios**

## Real-time Coordination

**Seamless information sharing across all stakeholders, creating unified situational awareness**

**Building upon A-SMGCS foundation, next-generation systems leverage AI, ML, and advanced automation to create a comprehensive safety ecosystem that spans from gate to gate.**



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# ROUTE PLANNING & CONFLICT MANAGEMENT

## Dynamic Optimization

**AI-driven algorithms calculate optimal traffic sequence/ conflict free taxi routes based on**

- **Current and predicted traffic density**
- **Prevailing Weather/Visibility**
- **Runway & Taxiway Availability/constraints**
- **Adapt to traffic patterns and controller preferences**
- **Support for Trajectory based operation**

## Conflict Prediction & Resolution

- **Detects potential conflicts ahead of time with resolution options**
- **Verify controller inputs against the compliance and safety margin**
- **Adaptive & context sensitive alerts**




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# CONGESTION MANAGEMENT & COMMON SITUATIONAL AWARENESS

## Demand-Capacity Balancing

**AI systems continuously harmonize arriving and departing traffic with available infrastructure capacity, reducing holding patterns and taxi delays by up to 23% (Estimated).**

## Unified Operational Picture

**Integrated platforms synchronize information across controllers, pilots, and ground staff, reducing miscommunications by 78% (Estimated) in high-stress scenarios and improves operational predictability.**

# OPERATIONAL RESULTS | MIDDLE EAST & ASIA

مطارات دبي
DUBAIRPORTS

| | |
|---|---|
| SAFETY | ~ 70% Less Incursions |
| ATCO MENTAL WORKLOAD | ~57% Reduction (normal visibility)<br>~70% Reduction (Low Visibility) |
| SITUTATIONAL AWARENESS | ~22 % (normal visibility<br>~51% (Low Visibility) |
| LVO TRAFFIC FLUENCY | $6M Cancellation cost savings |
| COST EFFECTIVENESS | ~$800K Energy Cost Saved |

Incheon Airport

| | |
|---|---|
| TAXI TIMES | > 30% Reduction LVP<br>> 10% Reduction VMC |
| TRAFFIC FLUENCY | ~ 80% Less stops LVP<br>~ 50% Less stops VMC |
| FUEL BURN | ~ 50% Reduction |
| EMISSIONS | ~ 13,500MT<br>Reduced |
| MOVEMENT DELAY | ~50% Reduction in Pilot<br>reaction time. |



LVO: Low Visibility Operations
VMC: Visual Meteorological Conditions

LVP: Low Visibility Procedures
VMC: Visual Meteorological Conditions

# KEY TAKEAWAYS

1

## Enhanced Safety & Sustainability

AI/ML technologies can simultaneously improve safety margins and reduce environmental impact through optimized movement patterns and reduced idle times.

2

## End-to-End Integration

Maximum benefit comes from seamless automation across all flight phases and ground operations, creating a continuous safety and efficiency chain.

3

## Collaborative Implementation

Success depends on wider-stakeholder collaboration with shared objectives, data standards, and implementation roadmaps.

4

## Future-Ready Systems

Investments in intelligent aviation safety systems today will create scalable, sustainable ATM infrastructure capable of handling decades of growth.

By embracing advanced technologies and intelligent automation, we can ensure aviation growth is **scalable, safe, sustainable and predictable.**



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# IT TAKES MORE THAN AI

**DOMAIN KNOW HOW**

Domain-specific expertise to guide the path to automation, OT cybersecurity, and AI/ML

**PROOF OF VALUE**

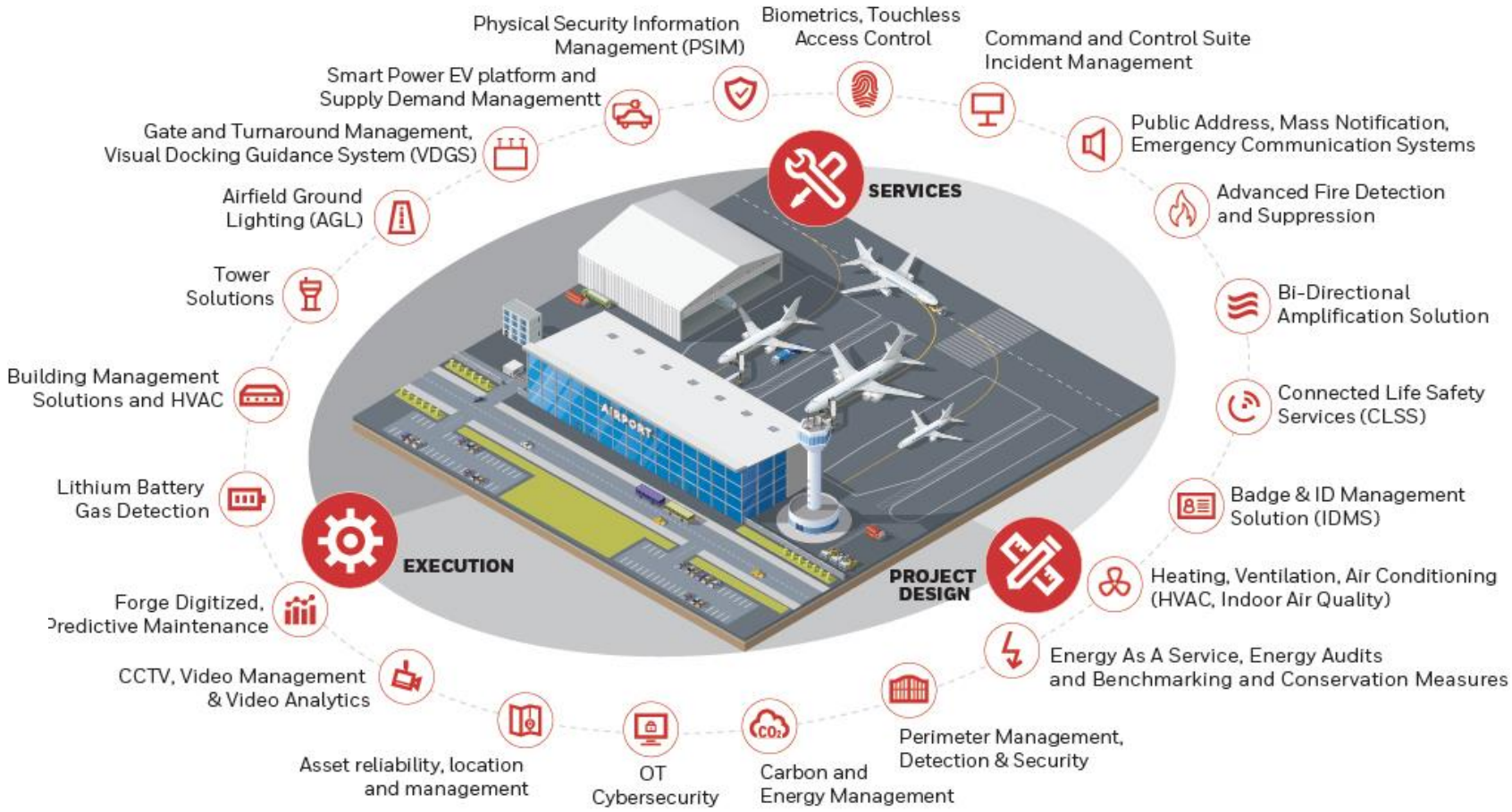
Prioritize transformation programs and prove value

**MISSION CRITICAL GRADE PLATFORM**

AI ready - Interoperable, agnostic and built to enable rapid value and scale

**BENCHMARK BENEFITS**

Benchmark benefits and scale airport-wide

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# PAVING THE WAY TO AI-POWERED AIRPORTS

## THANK YOU

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