

제8회 세계항공컨퍼런스

WORLD AVIATION CONFERENCE 2025

The Future of Aviation Industry: Advanced Tech and Sustainability

September 2(Tue) - 4(Thu), 2025

Grand Hyatt Incheon, Republic of Korea

NEXT-GENERATION AVIATION SAFETY SYSTEMS

**ENABLING SCALABLE AND SUSTAINABLE GROWTH
THROUGH AI, ML, AND ADVANCED AUTOMATION**

MAKSOOD KADIKE
Director | Technology
Honeywell Airports Business

Honeywell

GLOBAL AVIATION | A GROWTH TRAJECTORY



CAGR **4.5%**
Over **15B** By **2029**



CAGR **3.9%**
43K Deliveries By **2037**



65% Growth
Over Last **10 Years**



Global air traffic expected
to double by 2035



Constraints: environmental,
spatial, financial



Need for smarter, scalable
solutions



CURRENT SURFACE OPERATION CHALLENGES



Capacity Constraints

- Limited runway and taxiway availability creating bottlenecks during peak hours



Surface Traffic Optimization

- Lack of automation in ground movements causes inefficient infrastructure use and operational delays.



Low Visibility Challenges

- Fog and poor visibility increase ground separation, impacting flow rates and safety.



Safety Concerns

- Increased risk of runway incursions and ground conflicts with growing traffic density



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.

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.



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

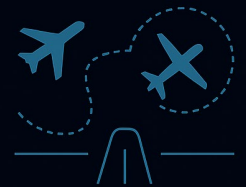


Conflict Prediction & Resolution

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



Intelligent
Route Planning



Conflict
Prediction
& Resolution



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).



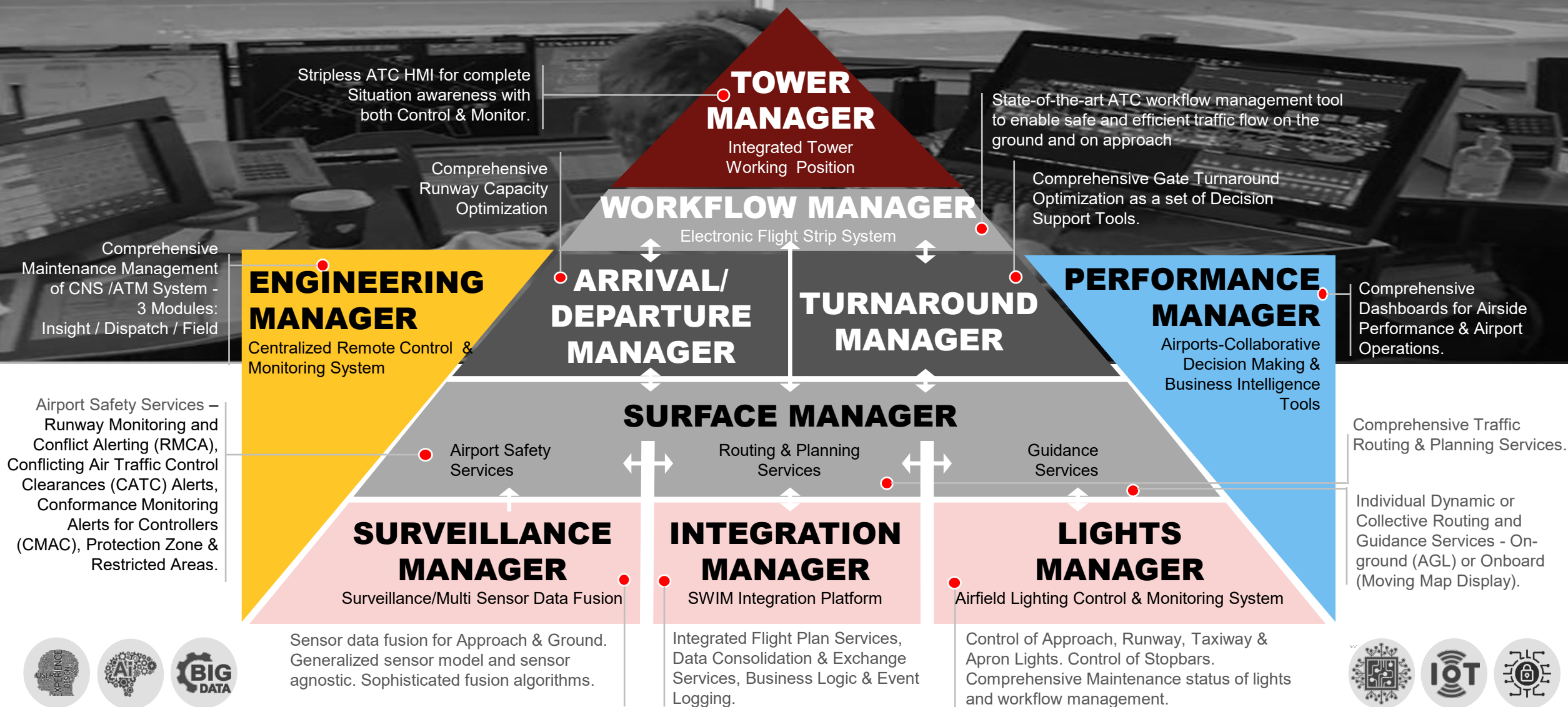
Unified Operational Picture

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



HONEYWELL NAVITAS™ | TOWER SOFTWARE SUITE

DELIVERING AUTOMATION & DIGITIZATION OF GROUND TRAFFIC MANAGEMENT



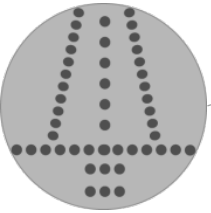
HONEYWELL NAVITAS™ TOWER MANAGER

ENHANCED ATCO PRODUCTIVITY & EFFICIENCY



VDGS

Gate/Apron Status Information.



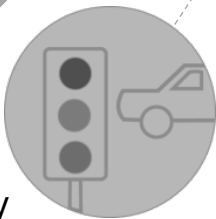
AGL

Lights Control & Guidance



VIDEO

Augmented views



GSE

Improved safety for ground vehicle movement



AIR & GROUND SITUATION DISPLAY

Efficient tracking and enhanced situational awareness



SAFETYNETS, ROUTING & GUIDANCE

Alerts/Alarms, Individual & Collective Routing, On-Ground Guidance



EFPS

Harmonized workflow, effective clearance handling



AMAN/DMAN TOOLS

Reduced workload through optimized operations



MET

Improved situational awareness, enable faster reaction to weather change, reduction in preparation for AOM changes



ACDM

Increased milestone adherence

Striking Balance between Cognitive Workload, Interaction & Automation

OPERATIONAL RESULTS | INCHEON AIRPORT

SAFETY	↓	~ 70% Less Incursions
TAXI TIMES	↓	> 30% Reduction LVP > 10% Reduction VMC
TRAFFIC FLUENCY	↓	~ 80% Less stops LVP ~ 50% less stops VMC
FUEL BURN	↓	~ 50% Reduction
EMISSIONS	↓	~ 13,500MT Reduced
MOVEMENT DELAY	↓	~50% Reduction in Pilot reaction time.



OPERATIONAL RESULTS | DUBAI AIRPORT

SAFETY	↓	78% reduction in route deviations
TAXI TIMES	↓	~57% reduction VMC ~70% reduction LVO
SITUATIONAL AWARENESS	↓	~22 % VMC ~51% LVO
LVO TRAFFIC FLUENCY	↓	\$6M Cancellation Costs savings
COST EFFECTIVENESS	↓	~\$800K Energy Cost Saved



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.

3

Collaborative Implementation

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

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.

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.**

**THE
FUTURE
IS
WHAT
WE
MAKE IT**

Honeywell

