

## 21st Century Airport Challenges

Duane Edelman

Aircraft Data Fusion Inc.

T: 952.646.9260 C: 952.292.3151 E: [duane@aircraftdf.com](mailto:duane@aircraftdf.com)

---

## CONTENTS

---

Introduction	3
The Challenge	3
The Solution	4
Deliverables	5
Justification	7
AOMS Partners	8
Summary	9

---

## Introduction

Airports of the 21st century (Airports 2.0) are being challenged to prove that they are not in existence only to provide essential air services but also demonstrate their contribution to the economic growth and prosperity for the community(s) they serve as well as being an essential and viable contributor to the overall air transportation system. This new definition requires airport managers to view airport operations as a business using operations to execute their business plan; safely and efficiently while at the same time validating their business model.

Tracking of airport operations key performance indicators in real-time becomes essential to track business and operations initiatives/assumptions to detect early trends or problems with policy, process or execution. Real-time operations data tailored to meet user needs is essential to create a performance awareness culture within the operations and management teams. This performance culture is created by actionable intelligence in a network environment that leads to improved collaboration in management and operations teams.

## The Challenge

The introduction creates the hypothesis from which a framework can be built to address the needs for:

- Real-time performance (actionable intelligence) tracking
- Real-time forecasting and planning tools
- Visual (dashboards) and automated alerts when predefined variances are exceeded
- Historical references for detecting trends and analysis

Airports, dependent on their size, business and operations requirements, have varying levels of data collection and analysis tools. Generally these tools have been added on an-as needed basis or when it could be justified basis. In many cases this has led to systems that are very effective on a stand-alone basis but are either non-compatible or costly to integrate with other systems for an upgraded or new capability.

Additionally, some of these systems acquire data from different sources that creates a variance in the data leading to the question, which one is right? Data disparity, unstructured data and non-compatible data formatting is common place with systems that have evolved over time. The challenge is to create a clear, low risk migration path to improved data integrity and reliability.

### NEEDS:

- ▲ REAL-TIME PERFORMANCE TRACKING
- ▲ REAL-TIME FORECASTING AND PLANNING TOOLS
- ▲ VISUAL AND AUTOMATED ALERTS
- ▲ REDUCED COSTS OF MAINTAINING MULTIPLE DATA FEEDS
- ▲ CONSISTENT DATA ACROSS MULTIPLE SYSTEMS
- ▲ HISTORICAL DATE REFERENCES

## The Solution

As airports transition into the new 21st Century, Airport eco-system, they will need to establish a baseline platform to build and scale from. The first step is to select a single reliable and accurate source for your fundamental operations data for both scheduled and actual airline/aircraft operations. This is essential to building a platform that will support current operations and business needs as well as creating a migration path to transition data to or from existing systems while building the eco-system that meets the airports needs.



The source of scheduled and actual data must provide timely, reliable and accurate operations data, as the value of AOMS is determined largely by the quality of its data it receives. It will be the comparison of key performance indicators that will validate or identify problems/issues with business and operations assumptions. Early detection and resolution will minimize the negative impact on airport operations.

The Airport Operations Management Suite (AOMS) suite of applications developed by Lockheed Martin Mission Systems & Training and partners, offers the flexibility, scalability and affordability to meet airport needs for all sizes and categories of airports. The AOMS suite is hosted on the Microsoft Cloud Computing platform that provides the highest levels of security and flexibility.

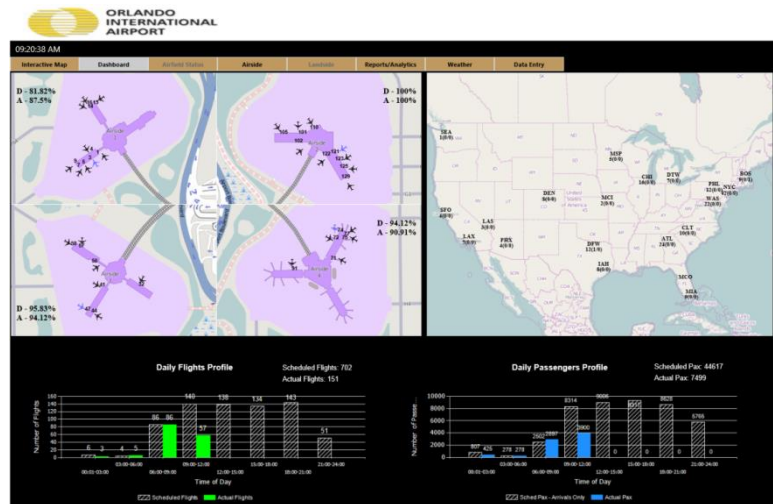
Lockheed Martin has determined that partner solutions are more powerful than individual solutions. Selecting partners that employ leading edge technologies creates business and operations solutions that create value proposition greater than the sum of the partners. The power of the AOMS platform is its ability to explore conjoined data and present in a tailored composite presentation of information that is tailored to meet the users needs. AOMS mixes the right level of data sourcing that meets Lockheed's rigorous requirements for simplicity of presentation.. The AOMS platform has been architected to accept data feeds from a wide range of data types, e.g., unstructured, structured, disparate, etc. This data is then organized and given the appropriate structure, content and context before it sent to the AOMS suite. The AOMS suite stores, processes and presents rendered intelligence tailored to meet users needs. State-of-the-art technologies and proprietary algorithms are used to accomplish these tasks.

AOMS products and services are accessed and delivered via the internet. Access and distribution of the data and services provided is managed by the airport management team and is accessible anytime, anywhere and on any device that has internet connectivity. This is the most efficient method of distribution while still maintaining control and creating collaboration by all users having the same information.

## Deliverables

The AOMS system has two component parts. The first is the core data storage and processing. The second is configuration management that allows for configurable solutions for airports and users. This configuration facilitates the maximum flexibility using manageable tools. Applications, dashboards, reports, analysis and analytics create the following AOMS attributes:

- Real-time status of operations
- Situational awareness
- Facilitates collaboration
- Trends
- Forecast
- Performance measurements
- Scalability
- Flexibility
- Affordability
- Expandability (growth)



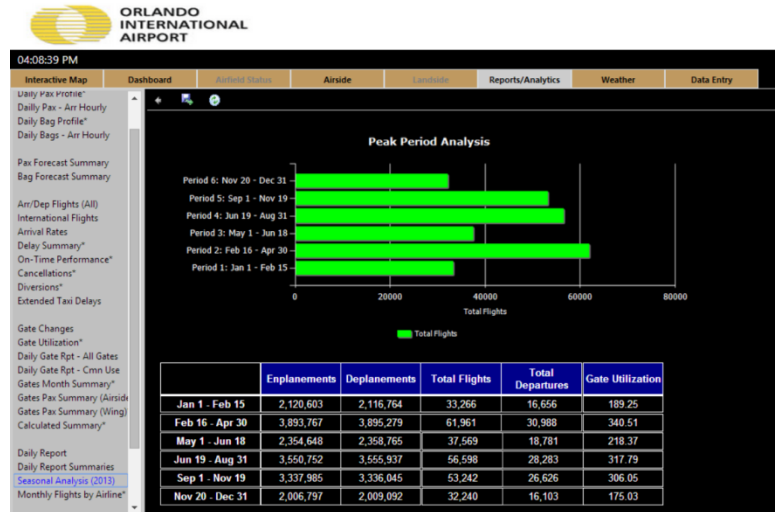
The Current Offering and configuration of AOMS focuses on:

- Managing the increasing complexities of airport dynamics
  - Airport/Airfield status dash boards
  - Geospatial operations intelligence
  - Airside Operations Dashboard
  - Landside Operations Dashboard
  - Reports/Analysis
    - Flights (schedule vs actual)
    - Passengers (schedule vs actual)
    - Bags (schedule vs actual)
    - Arriving & Departing flights & Passenger forecast
    - Gate delay summaries
    - Cancellations
    - Diversions
    - On-Time performance
    - Average taxi times
    - Extended taxi delays
    - Notification and alerting
    - International flights
    - Customs/Immigration & Border Patrol Dashboard
    - Gate utilization summaries
    - Daily summaries & Reports
    - Daily, weekly, monthly and annual summaries
      - Gate
      - Airline
      - Delays

- Performance
- Etc.
- Vendor dashboards
- Duty free dashboards

The Near Term additions:

- Automation of usage notification for billing
- Irregular Operations
  - Detection
  - Forecasting and notification
  - Gate management tools
  - Automated notifications
- Incident Management
  - Geospatial view of event
  - Operations management during and through the recovery period
  - Data capture and distribution
  - Each phase or level of incident process in the same way
  - Automated reporting
  - Event reconstruction
- Airport managed services:
  - Vendors/concessionaires
  - Airfield support
  - Facilities support



Future

- Customer data mining tool suite
- Regulatory Compliance
- Simulated Incident Management environments
- Integrated neuro-networking of operations and business operations

## Justification

Hosted and web enabled environments provide the solution to migrate from existing systems to a much more affordable and scalable airport operations management system with minimum interference and disruption of current operations. Based on the size and complexity of an airports operations management systems will determine the time required to make the transition to a state-of-the-art system. During and after completion of this transition added capability and scaling to meet operations need's can be added at anytime.

The AOMS solution is ready and executable on the day an agreement is reached. AOMS is offered for customer trials and evaluation before a formal purchase agreement is signed affording the users to validate the value proposition it creates and its ease of use. The display and interaction with the system is intuitive and little if any training is required. Its design facilitates and encourages users to explore all areas they are authorized to access to gain further knowledge of the systems capabilities.

Justifications for consideration include:

- Exploring new business or operations opportunities
- New revenue opportunities:
  - Better tracking of usage creating revenue recovery from unreported use
  - Time based usage of assets
  - Revenue Recovery
  - Activity based revenue models
  - Frequency based revenue models
  - New service offerings
  - Analytics and forecasting is 10X faster
- Minimize the impact of non-routine operations
- Web based
- Ready to use eliminating development and implementation costs
- No seat license requirements
- Maintenance costs included
- Purchase only what you need
- Added capability can be added at any time
- Data access and distribution controlled by airport user, administrator

## AOMS Partners

Lockheed Martin Mission Systems and Training provides oversight and contacting of the Airport Operations Management Suite (AOMS) of applications. Partners bring their unique technologies, intellectual property and subject matter expertise to the AOMS solution. Partners also retain their product and services brand for their contribution to the offering. Partners may be added or deleted for a specific airport solution based on requirements. Partner contributions:

- LMMST
  - Contracting
  - Solution oversight
  - Team coordination
- Aircraft Data Fusion
  - Microsoft Cloud services procurement
  - Cloud and Solution Management
  - New offering development
- FlightStats
  - Single source of Flight Data provider
    - Real-time
    - Historical
- Rhodium
  - Incident/Emergency Management tool suite
  - Geospatial geographic references for incident management

### BUSINESS BENEFITS:

- ▼ Develop insights and new ways of viewing your operations and business that lead to improved competitive advantage and risk management.
- ▼ Supports quick reaction to changing conditions for Improved & consistent operations decisions.
- ▼ Improved response and scalability of your IT investments.
- ▼ Provides the right combination of technology and business intelligence to test and validate new business model initiatives.
- ▼ Scaling, upgrades, maintenance and the development or upgrade of capability provided by service provider.



## Summary

The Airport Operations Management Suite (AOMS) is the foundation platform (baseline) for the 21st Century Airport Eco System. The Amadeus Research Paper titled: Reinventing the Airport eco-System, has provided some guidance and validation of the strategy and tools that have been and are going to be built for the AOMS system.

Airports business and operations strategies and models for the 21st Century Airport must be adaptable and scalable to meet the ever changing airline business models and cultures of airline travelers. The eco-system used to meet operational and regulatory requirements must be sufficiently adaptable to accommodate change in the basis use of airport. Changing from hub airport to origin & destination airport requires the business model be revised to meet the new realities.

AOMS in it design and delivery as well as its contracting policies accommodates these requirements.