

SURFACE OPERATIONS MANAGEMENT

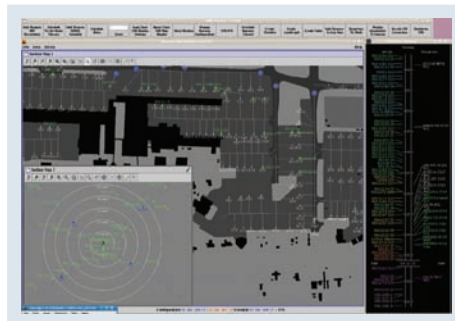
SURFACE MANAGEMENT SYSTEM

FedEx is the world's largest airline in terms of aircraft and freight tons flown, delivering time-sensitive packages and cargo to more than 375 destinations in over 220 countries each day. Located at Memphis International Airport (MEM) in Tennessee, FedEx's global hub is the nerve center of one of the most complex, fast-cycle logistics operations today.

THE CHALLENGE

Every week, more than a thousand flights deliver cargo to FedEx's automated, state-of-the-art, package-sorting system at MEM. FedEx has two main arrival/departure banks, one during the day and one at night. Each weekday, approximately 100 FedEx flights arrive between 7 a.m. and 1 p.m., departing again between 2:30 p.m. and 4:30 p.m. after all packages have been sorted. The fast-cycle logistics push is even more compressed at night, when more than 150 flights arrive between 10:30 p.m. and 1 a.m., departing again between 2:30 a.m. and 4:15 a.m.

A delayed FedEx arrival into MEM may cause packages from that flight to miss the sorting process and thus miss its scheduled departure. Further, a delayed departure disrupts operations at the destination, resulting in additional couriers, employee overtime and other related costs. The cost of delays to a FedEx flight is significant, as it includes package delay fees that are much higher than fuel and crew costs alone. With no direct insight into Memphis operations, FedEx's Global Operations Control (GOC) had to monitor frequencies and rely on disjointed data from a collection of legacy systems.



Metron Aviation's Surface Management System provides FedEx with real-time data and predictive decision support tools.

$$z = \sum_{(f,j) \in A} x_{ij} + \sum_{(h,j) \in A}$$



RESULTS

IMPROVED SITUATIONAL
AWARENESS FOR ALL
USERS

DECREASED TAXI TIMES
BY 2.8 MINUTES
PER FLIGHT FOR
U.S. \$8.3 MILLION
IN SAVINGS PER YEAR

INCREASED
DEPARTURE CAPACITY
BY 7.8% PER YEAR

REDUCED EXCESSIVE
TAXI TIMES (> 40 MIN.)
BY OVER 50%



THE SOLUTION

In 2002, FedEx partnered with NASA to provide its ramp tower facility as a testbed for Metron Aviation's Surface Management System, in an effort to reduce delays and optimize its operations in Memphis. The system integrated aircraft track and flight data from the airport's ASDI data feed and airport surface surveillance from ASDE-X (A-SMGCS), as well as RMAS gate management system data and ACARS messages from FedEx. For the first time, FedEx GOC users were given an "out-the-window" view and direct insight into MEM operations.

Based on the performance of the Surface Management System, FedEx worked with Metron Aviation to deploy and enhance the system to provide a broader scope, which included the incorporation of new data feeds, such as Traffic Management Advisor (TMA) for sequencing arrivals. Metron Aviation's surface system provided FedEx with real-time and forward-looking information that improved surface resource allocation, allowing strategic decisions to be made for arriving aircraft as much as 30 minutes prior to touchdown.

Since the deployment of the system at the FedEx Ramp Tower in 2004, the system has grown to support the Memphis Airport Authority and many additional FedEx users, including the Hub Control Room, Aircraft Service Attendant, Global Operations Center, Gate Desk, Line Maintenance, Crew Bus Dispatch, Flight Coordination and Corporate Aviation.

ABOUT METRON AVIATION

Founded in 1995, Metron Aviation provides concept engineering, advanced research, software development, Air Traffic Flow Management (ATFM), Collaborative Decision Making (CDM), surface operations management, airspace design and environmental analysis solutions to the global aviation industry. Metron Aviation fuses advanced science and mathematics with unparalleled subject-matter expertise to turn groundbreaking Air Traffic Management (ATM) research concepts into operational capabilities. Customers include the FAA, NAV CANADA, NASA, ATNS, FedEx, Air Canada, Memphis International Airport, Delta Air Lines, Southwest Airlines, American Airlines, Airservices Australia and many more.

“ FEDEX CONTINUALLY INVESTS IN CUTTING-EDGE TECHNOLOGY. THE SURFACE MANAGEMENT SYSTEM IS A POWERFUL TOOL THAT HAS DRAMATICALLY IMPROVED OUR OPERATIONS EFFICIENCY AND ULTIMATELY TRANSLATES INTO BETTER SERVICE FOR OUR CUSTOMERS. ”

STEVE VAIL,
SENIOR MANAGER,
**FEDEX AIR TRAFFIC
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THE SCIENCE OF HARMONIZING AIR TRAFFIC

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