

# Airport

*Athens International Airport S.A. (AIA)*



## Simulation Proves Essential for Airport Logistics

### Project Description:

Athens International Airport S.A. (AIA) selected the AutoMod™ simulation software suite for developing a Passenger and Baggage Flow simulation for the new Athens International Airport in Sparta. The project was divided into two parts:

- Baggage Handling System
- Passenger Terminal Flow

This airport opened March 1, 2001; the objective of the simulation was to complete a detailed analysis of system performance before airport opening. The study included an analysis of the basic design of the baggage handling system and the passenger terminal flow, utilizing flight schedules and passenger data for a peak day in August, the busiest period for holiday traffic.

AIA was particularly interested in the following key areas:

- The efficiency of the allocation of check-in desks, make-up chutes, EBS (Early Bag Storage) lines, gates and baggage claim tracks;
- The impact of using an extra transfer in-feed line in both baggage halls, and an extra manual coding line in each hall;
- Determining baggage throughput at different points in the system along with other relevant data;
- The performance and behavior of the baggage handling system under predefined failure modes;
- Determining the minimum connect time for transfer passengers, i.e. time between arrival and reaching the departure gate for the connecting flight;
- Queuing dynamics for key areas such as departure hall, check-in, security control, passport control, transfer desks, departure lounges, baggage claim, customs control and arrival hall;
- The effects of family and friends on the movement patterns of departing passengers in the departure hall and public retail area;
- The effects of greeters on the movement patterns of arriving passengers in the arrival hall; and
- Identifying potential areas of congestion where allocated space may be inadequate to accommodate traffic.

Two separate AutoMod Airport simulation models were developed, each capable of running as a stand-alone application. These include the Passenger Terminal Model (PAX) and the Baggage Handling System Model (BHS). These models have also been merged into a larger, more complex model to demonstrate interrelated effects.



The development of the models required the deep involvement of AutoMod Airport Consultants and Athens International Airport personnel. Since the airport was not in operation at the time the models were built, strong interaction was necessary to select appropriate data, validate assumptions and check Standard Operating Procedures.

Developing the models also helped AIA evaluate the control specifications provided by the multiple contractors and ensure that the underlying logic of every physical system was clearly understood before the airport opened.

The models were completed prior to the Airport Test & Trial phase. AIA staff were able to compare simulation data with real system test results. Having the simulation results already in hand allowed staff in charge of tests to understand and anticipate real-time events during the test.

Further developments are under way at Athens International Airport to utilize the simulation models as complete operational tools. Operations staff members at AIA will be able to use the simulation models even without any simulation background, due to the highly customized user interface developed during the modeling project.



Finally, the simulation models have proved to be an excellent means of training new employees at AIA. The models include 3D graphical animations of the baggage and passenger flow areas that allows trainees to view and interact with the operations of the whole system.

## Conclusions

This complex study project provided important results for AIA including:

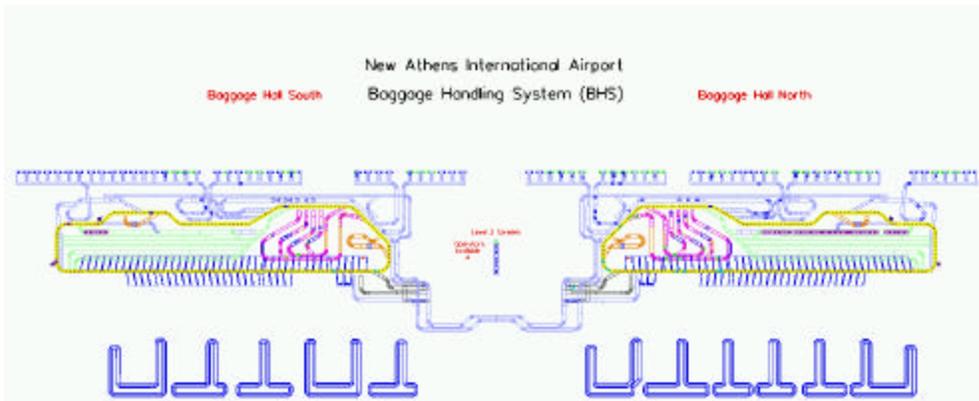
- Models which allow in-house teams to evaluate different passenger and baggage flows within the terminal.
- Tools for checking gate allocation.
- Tools to make-up chute allocation.
- Tools for allocating check-in desks.
- Tools for allocating baggage claim tracks.
- A failure simulator, and
- A complete training system.

Athens International Airport, in effect, now owns two airports: a real one with buildings, machines, and passengers and a fully operational "virtual" airport that lets them learn how to make air travel more convenient and pleasant for AIA's many users.

The Customer's final word:

*"The simulation work was justified long before we ever started using the models operationally! Even before the project was completed, the baggage model was used for a presentation to the Board of Executives. We were able to get approval to add two extra baggage in-feed lines to the baggage system. This expenditure of over DM2,5 Million will greatly enhance the service and convenience we will be able to provide for our users. In my book, this is what is called a good start!!"*

Colin COUSTON, Manager Passenger & Terminal Services, AIA S.A.



Some Airports Modeled with AutoMod:

- Air France Cargo
- Amsterdam Schiphol
- Athens International
- Brussels International
- Cincinnati/Northern Kentucky International
- Cologne/Bonn Airport
- Detroit Metropolitan Wayne County
- Dusseldorf
- Flughafen Leipzig-Halle
- Frankfurt
- Göteborg-Landvetter
- Hong Kong International
- London Heathrow and Gatwick
- Louisville International
- Madrid Barajas
- Manchester
- Milano Malpensa
- Munich International
- O'Hare International
- Oslo Airport Gardemoen
- Paris CDG
- Paris Orly
- Zurich International

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