

AIR FRANCE CARGO

OPTIMIZE ROAD TRANSPORT IN EUROPE



/issues B747-400 ERF(c) Steve Murez - Air France Cargo

Objective:

Optimize the weekly transport plan between European stations and the Roissy Charles de Gaulle hub, improve quality of service, overall operating costs and the durability of the solution

Solution:

A linear programming model based on EURODECISION's LP-TransportationPlanner software component

Results:

- Expected savings of 8% by setting up multi-stop rounds
 - Improvement of air cargo pallet pick-up frequency

“Airline trucking service is an important link for an air cargo carrier like Air France Cargo. EURODECISION’s optimization know-how, combined with LP-TransportationPlanner software to model transport plans, enabled us to call into question our approach to the problem and already provide our customers with greater frequencies for certain destinations.”, Florent Beretti, Truck Network manager, Air France Cargo

With 1,700 flights daily to over 200 destinations worldwide, Air France Cargo is currently the world's fourth international cargo carrier. With the Air France - KLM alliance, the new entity composed of Air France Cargo and KLM cargo will become the world's leading carrier (outside integrators) with 2.5 billion euros in cumulative revenues.

With G1XL at Roissy - Charles de Gaulle airport, Air France Cargo has the most modern hub in Europe able to process over a million tons of merchandise per year. The European system is supplemented by secondary road transport hubs in London, Milan, Hahn in Germany and Malmö for Scandinavian traffic.

Like all air carriers, Air France Cargo uses the services of companies specializing in "airline trucking service" for certain destinations. The trucks transporting the goods are specially equipped for air cargo pallets with roller trailers. This use is necessary for cost-efficiency and logistical reasons. Cost-efficiency because air cargo transport is very expensive on short distances with over-consumption and crew rotation problems. Logistically because long-haul

plane pallets are not compatible with the cargo compartments of medium-haul aircraft which means that the merchandise has to be repackaged for all-air transport.

Thus goods that leave from Madrid for Montreal will be dispatched by truck from Madrid to the Roissy CDG hub. The freight will then leave the Paris airport for Canada. Conversely, freight from North America arriving in Roissy is then carried by truck to Spain. All these ground routes are carried out under a specific flight number as a replacement for air transport and are shown on the contract of carriage called the Airway Bill.

For each air season, Air France Cargo draws up a transport plan to link the 60 European stations with the Roissy hub to connect with the long haul program. The transport plan features an originating station, a destination station, loading days and times and delivery times and totals 43,000 instances of airline trucking service per year!

In 2002, Air France Cargo entrusted EURODECISION with a study whose purpose was to optimize its transport plan in terms of cost-efficiency, quality of service and stability opposite the fluctuations of demand. The organization set up manually at the time showed significant discrepancies between the seasonal program's offer and the daily operating situation: additional, cancelled or under-loaded trucks.

The new plan had to meet precise criteria such as reducing overall operating costs and increasing pick-up and weekly delivery frequency, but without calling into question the existing organization. It was a question of minimizing the orders for additional trucks or cancellations due to operating contingencies.

The history of pallet movements over several weeks enabled EURODECISION to configure its LP-TransportationPlanner software (that uses Ilog's Cplex solver and all the power of the column generation technique). There were many constraints to be complied with to optimize the plan: truck capacity, driving time, agency and customs business hours, the processing capacity of Roissy's 8 bays. In the model, demand is expressed in pallets, and is characterized by an origin with a date of earliest availability and a destination linked to a latest delivery date that corresponds to the cargo plane's take-off time.

The study showed that it was possible, in a few hours, to generate efficient transport plans providing savings of about 8%, without calling into question the existing organization. Setting up multi-stop pick-up also contributed to improving frequencies on certain destinations that did not have daily stops. These line rounds enabled two Roissy – Nice and Roissy – Marseille routes three times a week to be replaced by a daily Roissy - Nice - Marseille route. The automated, rapid generation of transport plans also allows testing the impact of new demand, ranging from the creation of new agencies to sliding business hours, and overall provides a better understanding of the network.