

## : Why are transportation problems popular applications for DSS?

In the early 1970s, many researchers were trying to apply mathematical programming to business problems. The transportation problem was often discussed as an application that would benefit from computerization. Why? I think it is because this type of problem can be formulated quantitatively and because such problems are often complex enough to benefit from using a model. Also, the allocation of transportation resources among competing uses is of interest to business decision-makers in a number of different industries. In general, real-world transportation problems are often important!

We have seen many different software programs for solving transportation problems, but the basic need remains the same. Managers want help in allocating a scarce resource. The basic problem formulation (cf., Hitchcock, 1941) has been adapted and expanded to a number of situations. A major application is scheduling airline routes. The following examples help explain why solving transportation problems are important to airlines.

David Field in USA Today on April 19, 1999 explained briefly how airlines make decisions about adding flights. Continental Airlines bases its route and schedule decisions on daily ticket data. Continental uses a computer program developed by American Airlines' Sabre unit. Field quoted Robert Merz, director of network operations at United, "You schedule to maximize profit ..." At about the same time, Jessica Davis reported in InfoWorld that using the "Broadbase data mart, United's staff of 60 analyst/schedulers, typically MBA/economists, can load 'what if' scenarios -- testing whether a new flight to Chicago would be more profitable using a larger or a smaller aircraft". She noted schedulers take into consideration passenger demand, constraints of airports, the maintenance needs of the aircraft, the cost of flying individual aircraft, crew resources, and other factors. Davis quoted Bob Bongiorno, United Airline director of research and development, "Scheduling is the single most important thing we do at this airline." Bongiorno said "We've got to fly to the right places with the right frequency at the right times to make money."

Recently, Southwest Airlines implemented CALEB(TM) Technologies' CrewSolver DSS to reduce the cost from traffic control delays and mechanical and weather-related disruptions. For more information, check the April 9, 2001 press release from CALEB Technologies at [DSSResources.COM](http://DSSResources.COM).

So using Model-Driven DSS to solve transportation problems can improve profitability!! On a cautionary note Professor N. K. Kwak noted almost 30 years ago that "mathematical programming provides quantitative bases for management decisions -- bases with which management manipulates and controls various activities to achieve the optimal outcomes of business problems. Management can make better and more effective judgment by use of mathematical programming. However, it is no substitute for the decision maker's ultimate judgment." (p. 6) AND in response to a related question: What is a computer-aided routing system (CARS)?

In reply to a question posted by Fred Njankou on March 28, 2001. Computer-aided routing is a broad term for a set of Model-Driven DSS that use heuristic or optimization models to create "routes". Check a product like I/CAD (Intergraph/Computer Aided Dispatch System). An "intelligent" interactive mapping and data entry system to dispatch, monitor, and manage emergency services utilizing IPS' expertise in both public safety and geographic information systems. Check URL <http://www.intergraph.com>.

### References

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