ABSTRACT

Large Neighborhood Search in Scheduling an Air Taxi Service
George L. Nemhauser
Georgia Institute of Technology

An air taxi provides regional "on demand" air transportation
on small jet planes having a capacity of three passengers. A
request for travel specifies an origin, destination,
earliest departure time, and latest arrival time. Based on
requests already accepted for that day, the accept/reject
problem is to determine whether the new request can be
accommodated. A schedule for a jet is an assignment of
accepted requests and the pickup times for the passengers.
The overnight optimization problem is to determine a
schedule for each jet that minimizes total flying time.
Since we can only solve the overnight optimization problem
exactly for a small number of planes, we use large
neighborhood local search to determine a good solution for
the overall problem. In this talk we discuss the large
neighborhood search.
DayJet is a start-up company that will begin providing air
taxi service in 2006 using the new three-passenger Eclipse
500, which costs about one million dollars, is fuel-
efficient, and has a range of over one thousand miles. They
expect to have more than three hundred jets within two
years. Air taxis are especially useful for areas that are
not well served by large airports. By using small airports,
air taxis eliminate the hassles associated with long drives
to the airport, packed parking lots, security lines, etc.
For many travelers, the air taxis will yield huge time
savings in comparison to the alternatives of a scheduled
airline or driving.