ABSTRACT

Large Neighborhood Search in Scheduling an Air Taxi Service
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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.