In January 2011, Northern Airlines merged with Southeast Airlines to create the fourth-largest U.S. carrier. The new North-South Airline inherited both an aging fleet of Boeing 727–300 air-craft and Stephen Ruth. Ruth was a tough former secretary of the Navy who stepped in as new president and chairman of the board.

Ruth’s first concern in creating a financially solid company was maintenance costs. It was commonly surmised in the airline industry that maintenance costs rise with the age of the aircraft. Ruth quickly noticed that historically there had been a significant difference in the reported B727–300 maintenance costs both in the airframe and engine areas between Northern Airlines and Southeast Airlines, with Southeast having the newer fleet.

On February 7, 2011, Ruth called Peg Young, vice president for operations and maintenance, into his office and asked her to study the issue. Specifically, Ruth wanted to know whether the average fleet age was correlated to direct airframe maintenance costs and whether there was a relationship between average fleet age and direct engine maintenance costs. Young was to report back by February 21 with the answer, along with quantitative and graphical descriptions of the relationship.

Young’s first step was to have her staff construct the average age of Northern and Southeast B727–300 fleets, by quarter, since the introduction of that aircraft to service by each airline in late 2003 and early 2004. The average age of each fleet was calculated by first multiplying the total number of calendar days each aircraft had been in service at the pertinent point in time by the average daily utilization of the respective fleet to total fleet hours flown. The total fleet hours flown was then divided by the number of aircraft in service at that time, giving the age of the “average” aircraft in the fleet.

The average utilization was found by taking the actual total fleet hours flown at September 30, 2010, from Northern and Southeast data, and dividing by the total days in service for all aircraft at that time. The average utilization for Southeast was 8.3 hours per day, and the average utilization for Northern was 8.7 hours per day. Because the available cost data were calculated for each yearly period ending at the end of the first quarter, average fleet age was calculated at the same points in time.

The fleet data are shown in the table below.

