Exam 3

 For this assignment, we researched the Boeing 747-400 plane for a flight from JFK to LAX. This plane can accommodate various amounts of passengers depending on how many sections or classes are offered on the flight, but we focused on a flight for 345 passengers. The maximum weight of the 747-400 is 875,000 pounds.

After considering various options to reduce the cost of the flight, we decided that reducing the overall weight would be beneficial in reducing the cost of operating the plane. In Newton’s Second Law of Motion, F=ma, F, or force, is proportional to m, or mass. Reducing the mass of the plane would result in the plane requiring less force to get into the air. We would reduce the weight of everything put into and on the plane, such as reducing the carry on weight allowed for passengers and the weight of certain items on the plane like magazines. The average carry-on weight is 22 pounds per person. We plan to reduce this weight to 20 pounds per person; including their pillow and blanket. We only decreased the weight of the carry-on by two pounds instead of the full 10% as a way to keep customers happy and comfortable on the flight. If each of the 345 passengers brought a carry-on weighing 22 pounds, that would add 7,590 pounds in carry-on luggage. However, reducing the carry-on weight of each passenger to 20 pounds would decrease the weight of the luggage to 6,900 pounds. According to research, each pound lost on a plane can save about 14,000 gallons of fuel a year. Reducing the carry-on weight by two pounds could save about 9,660,000 pounds of fuel a year. Included in each individual’s carry-on luggage would be blankets and pillows, meaning that the airline would no longer have to provide these for the customers. Also, not all passengers may choose to bring these items, which in turn would reduce the weight of the luggage on the plan even further. Removing the blankets, pillows, and magazines would save about 1,000 pounds. Even printing the pamphlets and magazines on thinner paper rather than glossy cardstock would help to reduce the weight on the plane.

We chose not to reduce the speed of the flight as a way to keep the customers satisfied. Reducing the speed of the flight would increase the time spent in the sky, which in turn, would burn more fuel, costing the company more money to fly the plane. We also chose to keep the cruising altitude of the flight the same as a way to conserve fuel. When the plane is at the recommended or maximum cruising altitude, it is using less energy or fuel then it would if the plane was flying below the cruising altitude.

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