

Case 30

Supersonic Service?

by

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The Concorde

The Concorde is the only supersonic jet ever to enter commercial airline service. It was developed, at the cost of £1.134 billion (British Pounds), through a partnership between the British and French governments by firms that are today part of European Aeronautic Defense & Space Co. and Britain's BAE Systems PLC. The program produced 20 aircraft with the first 4 classified as “pre-production” that never entered regular service. The other 16 aircraft were produced at the cost of £654 million (M). The first aircraft from each of the two production lines were used for testing and also not put into service. Of the remaining 14 produced (between 1976 and 1980), 5 were sold to British Airways and 4 to Air France for £23 M each. (An additional £71 M was paid for spare parts and technical support.)

The Concorde's appeal was its maximum speed of Mach 2.04 (about 1350 miles per hour). It had a maximum range of 4500 miles, but only 3700 when fully fueled with passengers and cargo. Fuel usage was 302 gallons/hour when idle, 2885 gallons/hour normal flying, and 6180 gallons/hour when moving from subsonic to supersonic (about ten minutes per flight). Because of its high fuel consumption, over 75 orders from various airlines (including Eastern, United, American, and TWA) were cancelled when oil prices rose as a result of the oil crisis of the 1970s. The remaining aircraft were sold for the meager price of £1 each, with 2 going to British Airways and 3 to Air France.

In 2003 Air France and British Airways retired the Concorde. British Airways had 5 aircraft in service, 1 out of service, and 1 being used for spare parts. The airline had spent £75 M to upgrade the 5 aircraft as a result of safety issues. Of Air France's 7 aircraft, 4 were in

service, 1 crashed, and 2 were being used for parts. They spent a similar amount to upgrade their 4 serviceable aircraft. All aircraft that were in service were donated to museums throughout the world.

Supersonic, or Near Supersonic, Again?

In March of 2001, Boeing announced the development of the Sonic Cruiser and diverted \$4 billion (B) in funding from the development of an extended 747. The Sonic Cruiser was to travel just under the speed of sound (Mach 0.98) to avoid the noise pollution of sonic booms. This would cut travel times by nearly 20% over conventional aircraft, which travel at Mach 0.8. Designed for 200 to 250 passengers, it would have allowed point-to-point operations rather than the hub and spoke route design required for large aircraft like the Airbus 380. However, Boeing scrapped the program in December of 2002 as the plane's expected high operating cost did not appeal to potential customers.

Questions from the Developer's Perspective

Although development was stopped, it was expected that the Sonic Cruiser would cost \$10 B to develop over a number of years. Consider the following:

1. If development costs are evenly spread over five years, each plane costs \$280 M to build and sells for \$300 M, how many planes must be sold each year for 10 years (following development) in order to achieve an 18% annual return? Assume annual cash flows and each plane is sold in the year it is built.
2. If the market can only bear 100 planes per year over the 10-year span, what is the minimum selling price?

Questions from an Airline's Perspective

The costs to operate and maintain the Sonic Cruiser are expected to be similar to other conventional two-engine aircraft. A 777-300ER carries about 365 passengers, while the Cruiser was designed to hold 225 passengers. Given these numbers, consider the following questions:

3. If the average one-way fare from New York to Tokyo is \$825 on the 777, what is the required average fare on the Sonic Cruiser to achieve similar returns? Assume both planes fly at a 70% load factor (30% of the seats are not sold).
4. What is the tradeoff between the required fare and the load factor (between 50% and 100%) for the Sonic Cruiser?

5. The flight is expected to take two less hours in the Sonic Cruiser (roughly 11 hours as opposed to 13 hours). This will allow the Sonic Cruiser to make a round trip each day (with schedule revamps), while the 777 would require two aircraft to meet the same schedule. What is the economic advantage of buying the Sonic Cruiser?

References

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