

Fleet Planning

Fleet planning (selecting the „right“ aircraft at the „right“ time) is one of the most important steps in the airline planning process. Fleet planning, in simple terms, needs to answer two questions: Which aircraft are needed? And: When to acquire them? When answering the “Which”-question an airline needs to consider a number of – partly conflicting – selection criteria, including aircraft economics, technical, operational and environmental performance and cabin comfort. Another important influencing factor is fleet commonality. It describes the number of aircraft of the same type, the same aircraft family or the same manufacturer in a fleet. When answering the “When”-question the airline will take into account the development of demand for transport capacity, the age and cost of its current fleet and the availability of new, more efficient aircraft. Airline fleet planning varies from airline to airline, depending e.g. on the airline’s business model and its operating characteristics.

The *objectives* of DLR Air Transportation Systems research on airline fleet planning are:

1. Modelling “static” (fleet selection and composition) and “dynamic” (fleet development) trade-offs in fleet planning (see figure below)
2. Estimating the effects of commonality on fleet planning
3. Analyzing differences in fleet planning subject to airline business model and operating characteristics
4. Analyzing the impact of changes in the economic, ecologic and technological environment

The *research approach* combines empirical analyses on real fleet planning data with mathematical modelling of core “logic-analytical” interrelations.

The *results of this research* may be beneficial to airlines as well as manufacturers/technology developers and “policy makers”. Airlines can use the fleet planning model as a high-level planning tool to estimate medium-/long-term fleet development and run sensitivity analyses. Manufacturers/technology developers can assess the market potential of new aircraft or technologies under different scenarios. Lastly, “policy makers”, e.g. government institutions, can analyse the effectiveness of environmental policies on airline fleets.

