

Air Transport versus High-Speed Rail: From Physics to Economics

Task for a *Bachelor Thesis*

Background

Passenger air transport uses passenger aircraft to connect airports via airways. Aircraft burn kerosene in gas turbines. High-speed rail (HSR) is a form of rail-bound mobility with a speed of more than 250 km/h. Most high-speed trains are electrically powered via an overhead line. The electricity may come from dedicated power plants. Power plants may use different forms of energy. HSR has been expanded significantly in past decades, especially in China. An increasing number of travelers favor to journey using HSR over air transport on certain routes because of shorter total travel time, shorter access time to station, shorter unproductive waiting time in station, lower travel expenses, higher service frequencies, and more space and comfort in the train compared to the aircraft. Accordingly, air transport lost already some market share to HSR services in certain cases. The situation is different in each country so that regional peculiarities need to be addressed.

Task

Compare air transport with high-speed rail. Start with a literature review. In your further investigation consider:

- physical fundamentals,
- energy consumption,
- environmental impact,
- infrastructure and investment,
- market situations,
- passenger's selection criteria to choose transportation options,
- overall economics.

The report has to be written in English based on German or international standards on report writing.