Loading and Unloading Passenger Airliners: A Simulation Approach

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Summary

Grounded planes cost airlines money. A major factor in determining the grounding time of an airliner is the time that it takes to board passengers. An optimal boarding method would therefore reduce costs to the airlines and maximize profits by reducing the time the plane has to be on the ground and also enabling the airlines to offer more flights.

Our assumptions were made with the real-world situation in mind. The result is a model that behaves well and parallels the results of other contemporary research efforts. The considerations upon which our constraints are based reflect the deterministic nature of the model.

We performed a series of empirical tests to obtain acceptable ranges for parameters such as passenger walking speed and time required to stow carry-on luggage in an overhead compartment. Four different seating methods were tested: open seating, back to front seating, Wilma, and our own modified reverse pyramid seating.

Although each method has its own benefits, we concluded that Wilma outperformed the competing methods for the widest number of configurations. In our simulations Wilma offered an average decrease of 1.8 min in small planes, 5.1 min in medium planes, and 2.6 min in large planes. Our model performed very well with the tested scenarios and scales easily to cover other situations.

[EDITOR'S NOTE: This Meritorious paper won the Ben Fusaro Award for the Airplane Seating Problem. The full text of the paper does not appear in this issue of the *Journal*.]