The Unique Best Boarding Plan? It Depends...

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Summary

We devise and compare strategies for boarding and deboarding planes of varying capacity. We clarify what properties a good strategy should have. We apply the same assumptions regarding basic boarding procedure, inner structure of planes, and behavior of passengers to all the cases.

For boarding, we study prevailing strategies and a seemingly excellent strategy, seat–by–seat, proposed in past literature, and categorize them into two types, assigned–seating and open–seating. We develop a model and a simulation for each type . Our criteria identify two good candidates, reverse-pyramid and open-seating. We develop our own comprehensive strategy, simulate it, and compare it with those two. However, the optimal boarding strategy is not the same for different planes. Some values of parameters, such as the passengers' luggage size and weight, greatly influence the final result. Based on these discoveries, we suggest how to modify a boarding procedure in practice to make it optimal.

For deboarding, a simple strategy beats a complicated one; but we still give a theoretically optimal model, then modify it to achieve a concise strategy applicable in practice.

The text of this paper appears on pp. 385–404.