

1989: The Aircraft Queueing Problem

A common procedure at airports is to assign aircraft (A/C) to runways on a first-come-first-served basis. That is, as soon as an A/C is ready to leave the gate (“push back”), the pilot calls ground control and is added to the queue. Suppose that a control tower has access to a fast online database with the following information for each A/C:

- the time it is scheduled for pushback;
- the time it actually pushes back;
- the number of passengers on board;
- the number of passengers who are scheduled to make a connection at the next stop, as well as the time to make that connection; and
- the schedule time of arrival at its next stop.

Assume that there are seven types of A/C with passenger capacities varying from 100 to 400 in steps of 50. Develop and analyze a mathematical model that takes into account both the travelers’ and airlines’ satisfaction.

Comments by the Contest Director

The problem was contributed by J. Malkevitch (York College (CUNY), New York, NY) and myself (Ben Fusaro).

The Outstanding papers were by teams from Drake University, Harvey Mudd College, North Carolina School of Science and Mathematics, Ohio State University, and University of Dayton. Their papers, together with commentaries, were published in *The UMAP Journal* 10 (4) (1989): 343–415.