A Simulation-Driven Approach for a Cost-Efficient Airport Wheelchair Assistance Service

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Summary

Although roughly 0.6% of the U.S. population is wheelchair-bound, the strain of travel is such that more than twice that amount relies on wheelchairs in airports [Haseltine Systems Corp. 2006].

Two issues have the greatest impact on the cost and effectiveness of this service: the number of wheelchairs and how they should be deployed. The proper number of escorts and wheelchairs is not only a question of the airport but of the volume of passengers, which can vary greatly. If escorts determine their own movements within the airport, lack of coordination could result in areas being unattended; however, fluctuation in requests could be so great that a territory-based plan could overwork some escorts and underwork others.

We present an algorithm for scheduling of the movement of escorts that is both simple in implementation and effective in maximizing the use of available time in each escort's schedule. Then, given the implementation of this algorithm, we simulate the scheduling of requests in a given airport to find the number of wheelchair/escort pairs that minimizes cost.

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