

## 1. Analysis of passenger flow and its influences on HVAC systems: An agent based simulation in a Chinese hub airport terminal

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**Abstract:** Indoor occupants have a close connection with the energy consumption of heating, ventilation and air-conditioning (HVAC) in airport terminals which are characterized by passenger flow. In this paper, an on-site survey was performed to investigate movements of passengers and service counters on the departure floor of a Chinese hub airport terminal. The survey results were used as inputs for agent based simulation to figure out the characteristic of passenger flow. Only 3.6% of the occupant density data in simulation exceed their respective design value, which demonstrates that the design occupant density in each area can reveal the actual situation in this airport. However, the uneven occupant distributions both in time and space make the maximum occupancy rates to be only 54.8%–64.4% on the departure floor. Consequently, the maximum actual demand of cooling load for mechanical outdoor air (25 W/m<sup>2</sup>) is obviously lower than the design value (47 W/m<sup>2</sup>), which demonstrates a large energy saving potential of HVAC systems in airports by adjusting amount of mechanical outdoor air with variation of actual occupancy rates. © 2019 Elsevier Ltd (38 refs)

**Main heading:** Air conditioning

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**Database:** Compendex

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