Air passengers could enjoy more timely flights thanks to new planning technology developed by researchers at Strathclyde University and funded by EPSRC.

The system, which uses Artificial Intelligence (AI) technology in an automated planner, should help airports make the best use of their capacity through efficient scheduling of landings. It could also benefit the environment by reducing fuel usage.

**IMPACT ON AIR TRAVEL AND THE ENVIRONMENT**
- Passengers should benefit from more punctual flights.
- Airport managers should benefit from increased efficiencies and cost savings.
- Fuel usage should decrease as there should be fewer early flights and fewer late flights that have to circle overhead waiting for other slots.

**A balancing act**
Based on arrivals data from UK airports, the system uses a formula that strikes a balance between target landing times and ‘cost trade-off data’, such as the amount of fuel used and the impact on ground support staff. For example, an early landing saves fuel but could disrupt ground support staff. The system then directs when each plane should land while ensuring enough time is left between landings, explains Dr Coles. It can also help to clear backlogs if bad weather prevents planes from landing for some time.

**Busy, busy, busy**
At a busy airport schedulers must try to keep planes landing as close to their landing times as possible. Early, as well as late, landings incur penalties for airlines. They must also allow enough time for planes to clear the runway between landings and for ground staff, such as baggage handlers, to be on standby.

“This means that efficient scheduling is vital for the best use of airport capacity as well as ensuring landing times are met as much as possible,” says research fellow Dr Andrew Coles. “Reducing the number of late landings also reduces fuel usage, as planes waiting to land burn up more fuel while they’re in stacking.”

**In the real world**
“For the solutions to be useful in the real world, the important thing is the cost trade-off data,” explains Dr Coles. To this end, the team is now developing a ‘user interface’ that specifies cost trade-off data in terms of factors such as plane type or passenger load. Planners using this information should be able to schedule landings more efficiently because they will be taking into account a wide range of factors.

The novelty of this planning system is that a single problem-solving kernel can be used for a wide range of applications, explains Dr Coles, such as controlling electricity substation voltages or cost-effective investment in computer system infrastructure.

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AIR PASSENGERS COULD ENJOY MORE TIMELY TAKEOFFS AND LANDINGS