Study finds rerouting of airplanes to reduce contrails not as expensive as thought

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A small team of environmental scientists has found via simulations that

rerouting commercial airplanes to reduce contrails would be less expensive than previously thought. In their study, published in the journal *Environmental Research: Infrastructure and Sustainability*, the group used data from prior studies to create simulations of airplanes routed to prevent the development of contrails.

Prior research has shown that high-altitude airplanes are disproportionate contributors to climate change due to the multiple ways they impact the environment. In addition to the greenhouse gases they emit, jets that fly at high altitudes can also create contrails, white vapor trails of ice, water vapor and particulate matter.

When several planes fly in the same general area over the same period of time, the contrails can combine, leading to the formation of cirrus clouds, which can act like a blanket, holding in heat. Prior research has shown that this accounts for approximately 35% of the total aviation contribution to global warming.

Prior research has also shown that just 2%–10% of flights create approximately 80% of contrails. And because rerouting of jet planes can prevent the creation of contrails, researchers have suggested that the commercial aviation industry could greatly reduce its environmental footprint by doing so. But some argue that doing so would be too expensive to justify its cost.

To find out if that might be the case, American Airlines, working with another team of researchers last summer, used weather and satellite data to create software models and AI prediction tools to determine whether it was feasible to divert planes from airspace that would lead to contrail formation. They found that it appeared possible to reduce contrail formation by approximately 54%.

In this new effort, the research team used the same data to create simulations of 85,000 high-altitude flights and found that reducing contrails by 73% would raise fuel costs by just 0.11% and overall operating costs by just 0.08%. They also noted that rerouting aircraft under such a scenario would only involve 14% of all flights.

More information: Alejandra Martin Frias et al, Feasibility of contrail avoidance in a commercial flight planning system: an operational analysis, *Environmental Research: Infrastructure and Sustainability* (2024). DOI: 10.1088/2634-4505/ad310c