



NEWS RELEASE

American Airlines participates in first-of-its-kind research on contrail avoidance

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FORT WORTH, Texas — American Airlines announced today the findings of a first-of-its-kind study on contrail avoidance, with results verified by satellite imagery, aimed at reducing aviation’s environmental impact.

Contrails form when airplanes fly through layers of humidity, and they can persist as cirrus clouds for minutes or hours depending on the conditions. While these extra clouds can reflect sunlight back into space during the day, certain contrails can trap heat within the Earth’s atmosphere at night.

The study, led by **Google Research** and **Breakthrough Energy** and with support from American, tested whether it is possible to identify atmospheric zones that are likely to create contrails. The team then determined whether pilots could avoid making contrails in flight when supplied with data regarding the location of these zones.

“American is grateful for the opportunity to work with our partners at Google Research and Breakthrough Energy to help advance the science on contrail avoidance,” said Jill Blickstein, Vice President of Sustainability at American. “The results from this small-scale test are encouraging, and, while clearly there are more questions to answer about how to operationalize contrails avoidance across our industry, we’re excited to have played a role in establishing this first proof point. And we’re looking forward to sharing what we learned with stakeholders in the aviation industry and beyond.”

After collecting large data sets — such as satellite imagery, weather and flight path data —Google Research and Breakthrough Energy used artificial intelligence (AI) to develop contrail forecast maps. A small group of American pilots flew 70 flights over six months, using AI-based predictions to make small modifications to routes that were



projected to create contrails.

“Our contrails predictions combine the latest in AI research with massive amounts of satellite imagery, weather data and flight data,” said Juliet Rothenberg, head of product for Climate AI at Google Research. “We now have the first proof point that commercial flights can use these predictions to avoid contrails, as verified in satellite imagery. We’re grateful for our partnership with American Airlines and Breakthrough Energy – together we’ve taken a significant step towards understanding a high-potential climate solution.”

After the test flights, Google Research analyzed satellite imagery and found that flights where pilots used the AI predictions to avoid creating a contrail reduced contrail formation by 54%, as measured by distance, compared to flights where pilots did not use the predictions. This first proof point — albeit on a small number of flights — shows that a commercial flight can verifiably avoid creating a contrail. Additional research is necessary to determine if this success can be replicated and scaled.

“Avoiding contrails might be one of the best ways to limit aviation’s climate impact, and now we have a clear demonstration that it’s possible to do so,” said Marc Shapiro, Director of Breakthrough Energy Contrails. “This study is a great example of what happens when creative, ambitious organizations work together to better understand and solve a tough problem, and we’re grateful for American’s and Google’s partnership.”

American is working to make its operations more sustainable with more-fuel efficient aircraft powered increasingly by low-carbon fuel and new technology. To achieve net-zero greenhouse gas emissions by 2050, the airline has set a number of ambitious intermediate targets. Earlier this month, American issued **its 2022 Sustainability Report**, providing updates on the company’s strategy and progress on key issues over the year, including climate change.

Learn more in Google Research’s **video** and **blog post**.

About American Airlines Group

To Care for People on Life’s Journey®. Shares of American Airlines Group Inc. trade on Nasdaq under the ticker symbol AAL and the company’s stock is included in the S&P 500. Learn more about what’s happening at American by visiting **news.aa.com** and connect with American on Twitter **@AmericanAir** and at **Facebook.com/AmericanAirlines**.

Cautionary statement regarding forward-looking statements and information

Certain of the statements contained in this release, including goals for and projections of future results, the expected execution and effect of our sustainability strategies and initiatives and the amounts and timing of their expected impact, should be considered forward-looking statements. These forward-looking statements are based on the company’s current objectives, beliefs and expectations, and they are subject to significant risks and

uncertainties, many of which are outside the company's control, that may cause actual results and financial position and timing of certain events to differ materially from the information in the forward-looking statements. Please see the company's latest Quarterly Report on Form 10-Q and the company's other filings with the SEC for a discussion of risk factors as they may relate to forward-looking statements. The company does not assume any obligation to publicly update or supplement any forward-looking statement to reflect actual results, changes in assumptions or changes in other factors affecting these forward-looking statements other than as required by law. Any forward-looking statements speak only as of the date hereof or as of the dates indicated in the statement.