



The impact of weather on U.S. aviation:

A data-driven look at how weather influences safety, schedules, and costs.

Weather conditions impacting flight phases

<p>Taxi & takeoff:</p> <ul style="list-style-type: none"> CROSSWINDS THUNDERSTORMS ACTIVE VOLCANOES HEAT <p>Adverse weather often contributes to delays during the takeoff phase, affecting both safety and timing.</p>	<p>Cruising:</p> <ul style="list-style-type: none"> TURBULENCE JET STREAM SHIFTS ICING VOLCANIC ASH PLUME <p>Turbulence remains a significant factor in in-flight disruptions and operational challenges.</p>	<p>Landing:</p> <ul style="list-style-type: none"> LOW VISIBILITY VOLCANIC ASH WIND SHEAR <p>Weather conditions like volcanic ash, and wind shear impact landing schedules at major airports.</p>
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Weather's share of flight delays

74% of U.S. aviation delays exceeding 15 minutes from June 2017 to May 2023 were caused by weather.¹

Thunderstorms:

These are the most disruptive weather events for aviation, primarily due to the severe turbulence, lightning, and potential for wind shear.

Winter weather:

Snow and ice are major contributors to delays, especially at airports in northern states.

Hurricanes and tornadoes:

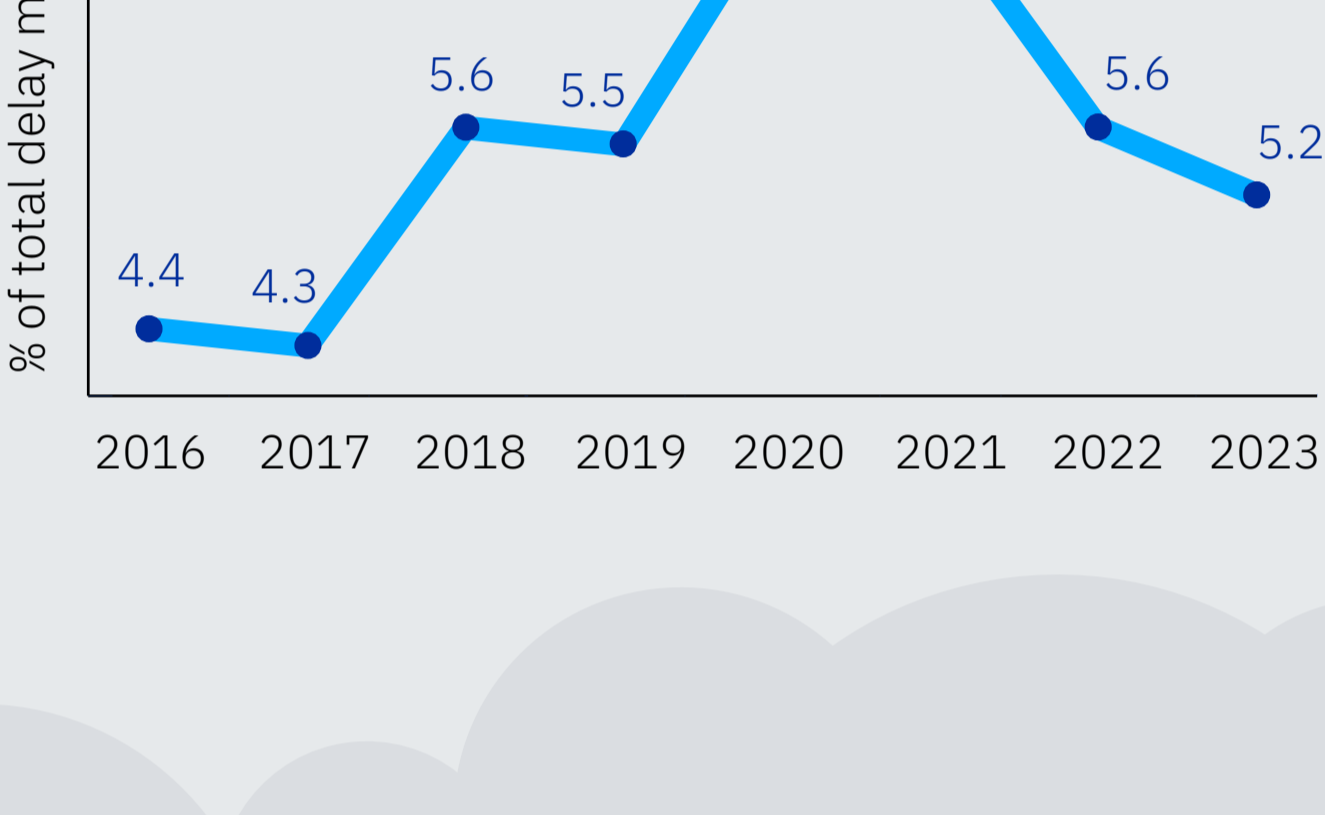
Severe weather events such as hurricanes and tornadoes can shut down entire airports and airspace regions, leading to extensive delays and cancellations.

Excessive heat:

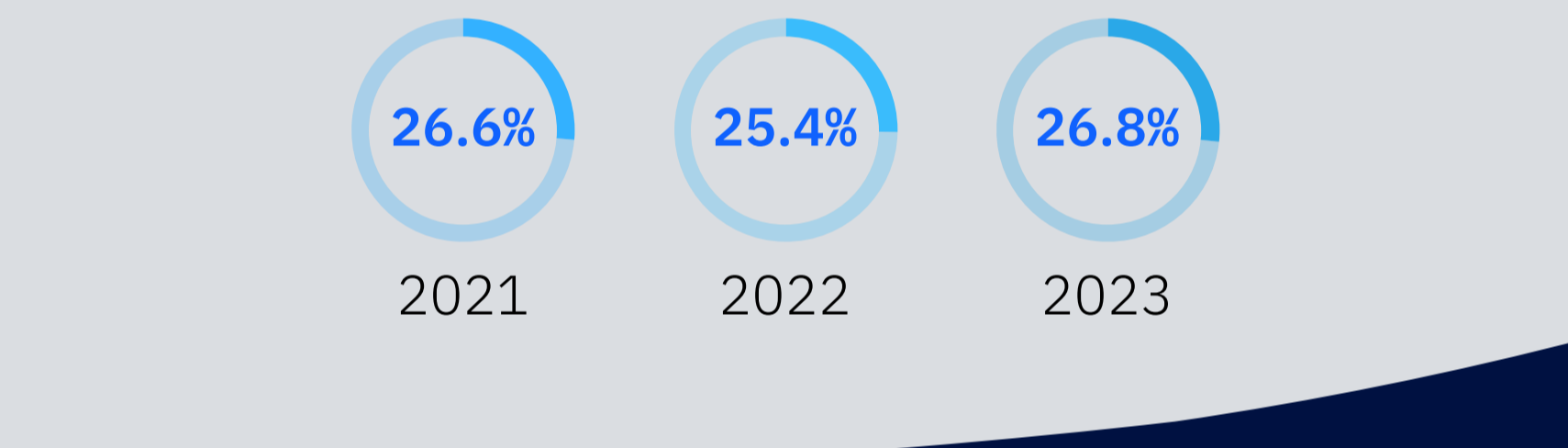
High temperatures affect aircraft lift, particularly during takeoff and landing.

Trends in extreme weather flight delays²

Percentage of extreme weather flight delays that may develop into IROP events



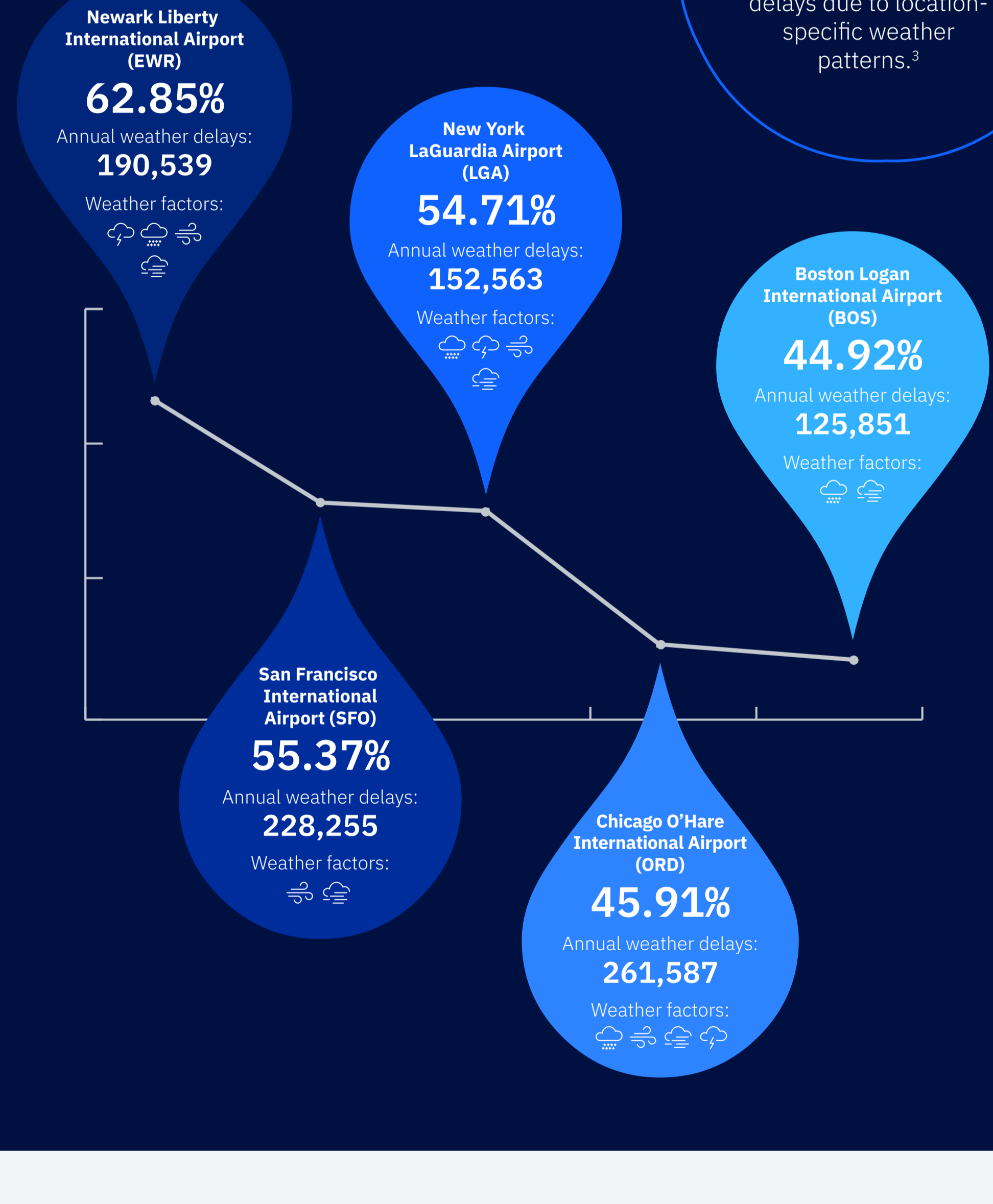
Weather's share of delay as percent of total delay-minutes, by year²



Weather and airport performance

The U.S. Airports Most Delayed by Extreme Weather

Based on 10-year arrival data, these airports experience the highest percentage of weather-related flight delays due to location-specific patterns.³



Safety and operational efficiency

Real-time weather monitoring benefits

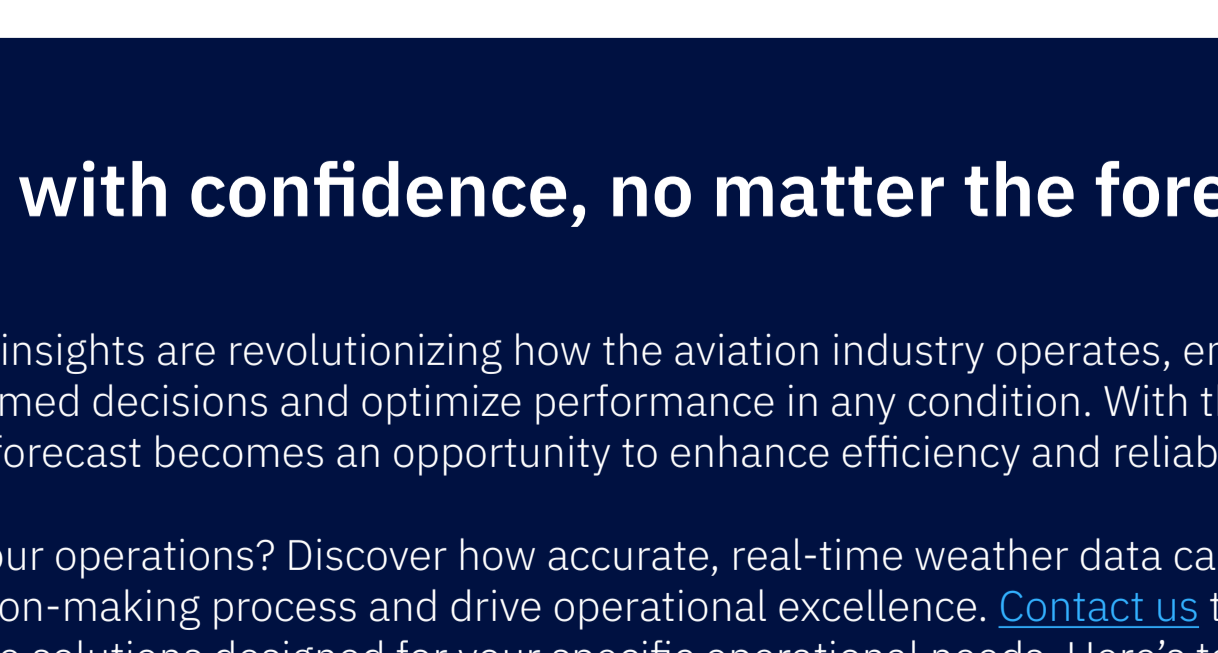
Less fuel, fewer delays: Real-time weather data helps airlines fly smarter and greener.⁴

<p>5%</p> <p>less fuel consumed on long-haul routes by avoiding turbulence and altitude adjustments</p>	<p>567 lbs</p> <p>of fuel saved per long-haul flight by reducing taxi time by 5 minutes</p>	<p>388 lbs</p> <p>of fuel saved per mid-haul flight by improving arrival management and reducing holding patterns</p>
<p>1,878 lbs</p> <p>of fuel saved for wide-body aircraft by cutting holding patterns by 10 minutes</p>	<p>11,023 lbs</p> <p>of fuel saved annually per aircraft by optimizing flight paths and avoiding turbulence</p>	

Analyzing the causes of flight delays

This analysis of on-time performance and delay causes from October 2023 to September 2024 highlights key challenges airlines face, including weather-related disruptions.⁵

Causes of national aviation system delays (October, 2023 - September, 2024)



Take flight with confidence, no matter the forecast.

Advanced weather insights are revolutionizing how the aviation industry operates, enabling airlines to make more informed decisions and optimize performance in any condition. With the right weather intelligence, every forecast becomes an opportunity to enhance efficiency and reliability.

Ready to elevate your operations? Discover how accurate, real-time weather data can transform your airline's decision-making process and drive operational excellence. [Contact us](#) today to explore weather intelligence solutions designed for your specific operational needs. Here's to clearer skies and smoother operations ahead.

¹ Federal Aviation Administration (FAA), *FAQ: Weather Delay*, 2024. Available at: [FAA](#)
² Bureau of Transportation Statistics (BTS), *Understanding Reporting of Causes of Flight Delays and Cancellations*, 2024. Available at: [BTS](#)
³ Weather.com, "America's Worst Weather Airports," November 20, 2024. Data sourced from the U.S. Department of Transportation's Bureau of Transportation Statistics. Available at: [Weather.com](#)
⁴ EUROCONTROL, *Rate of Fuel Burn*, 2024. Available at: [EUROCONTROL](#)
⁵ Bureau of Transportation Statistics (BTS), *Airline On-Time Statistics and Delay Causes*, 2024. Available at: [BTS](#)