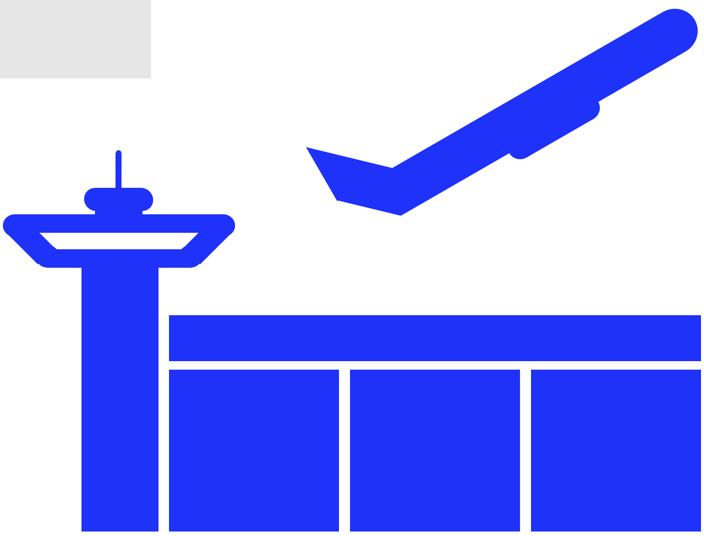
IN-DEPTH

Air Traffic Control Delays in the US

An overview of the economic consequences

July 2026

Air traffic control (ATC) delays in the United States have increased significantly over the past decade, far outpacing traffic growth. Between 2015 and 2025, FAA-related delays affecting scheduled passenger flights generated an estimated USD 10.9 billion in costs for airlines and passengers, with capacity constraints and staffing-related disruptions accounting for most of the impact. Delay costs are also highly concentrated, with just ten FAA facilities responsible for nearly two-thirds of the total. This concentration suggests that targeted improvements at a limited number of locations could deliver substantial benefits for passengers, airlines and the efficiency of the US National Airspace System.



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Introduction

The aviation ecosystem is supported by a range of entities that work together to provide a safe, timely, and reliable service to the passengers. Air navigation services or Air Traffic Control (ATC) are an essential part of the ecosystem and play a key role in ensuring that air transport remains not only the fastest but also the safest way to move people and goods around the globe.

The global performance of the aviation system inherently depends on a well-functioning and efficient airspace. Any delays are harmful to operations and can ripple across the local and global networks. While some delay is inevitable, ATC delays are costly for passengers, airlines, and related providers. Previously, IATA published a report on the costs of ATC delays in Europe,[1] and in this paper we turn our attention to the US.[2]

System overview

In the US, the Federal Aviation Administration (FAA) is responsible for managing and regulating the National Airspace System (NAS). As the sole Air Navigation Service Provider (ANSP) in the US, it establishes the rules governing the domestic airspace and provides air navigation services to its users. In practice, three main classes of FAA facilities communicate with and direct aircraft and pilots at different stages of their journeys:

- Air Traffic Control Towers (ATCTs): Manage aircraft on the ground and immediately around airports.
- Terminal Radar Approach Control (TRACON): Handles arrivals and departures within roughly 30-50 nautical miles of busy airports.
- Air Route Traffic Control Centers (ARTCCs): Manage aircraft during the en-route portion of flight. The continental US is divided among 21 ARTCCs, often called "Centers".[3]

Moreover, the Air Traffic Control System Command Center (ATCSCC) in Warrenton, Virginia, is the heart of the system and holds final responsibility for introducing traffic management initiatives (TMIs) that manage air traffic flow and improve capacity utilization.

The key TMIs used by the ATCSCC team to balance capacity and demands are:[4],[5]

- Airborne Metering, also referred to as time-based flow management, sequences aircraft by assigning times over fixes or runways, typically using speed control and minor vectoring, both en-route and in terminal airspace to optimize arrival throughput.
- Miles-in-Trail relates to interventions made to maintain appropriate spacing between aircraft over a particular fix, waypoint, or specific route. Most commonly, miles-in-trail restrictions are implemented via departure release intervals, speed control, or vectoring.
- Reroutes relate to a pre-departure or airborne request for a change of route, in order to avoid a particular congested area or weather event. Normally, this results in extra miles flown, which entails additional fuel burn and related expense and emissions as well as labor hours and expense.
- Ground Delay Programs involve strategic departure delays applied to sequence better the flow at the arrival airport.
- Ground Stops are the most restrictive class of interventions, most commonly introduced when a significant capacity challenge is present at the arrival airport.

[1] IATA (2026): Air traffic control delays in Europe. https://www.iata.org/en/publications/economics/reports/air-traffic-control-delays-in-europe/.
[2] This study estimates the direct cost impact of ATC delay on airlines and passengers. It does not include the strategic cost of airlines adding buffer to their schedules, nor passengers planning for expected delay. Nor does it account for knock-on passenger delays or implications of air transportation delays on the wider economy. Moreover, due to lacking standardized data, it is not possible to compare directly the findings across regions.
[3] FAA (2026): Air Traffic Control Facilities. https://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/air_traffic_services/atc-facilities.
[4] FAA (2025): Air Traffic Control System Command Center (ATCSCC). https://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/systemops/nas_ops/atcscc.
[5] NBAA: Tools used for Traffic Flow Management. https://nbaa.org/aircraft-operations/airspace/tfm/tools-used-for-traffic-flow-management/.

- Airspace Flow Programs are a coordinated set of capacity measures which are introduced if individual routes or restrictions are not sufficient.

In terms of reporting, the FAA only provides information on ATC delays (also referred to as NAS delays) of 15 minutes or more, a key difference from the approach taken by Eurocontrol in Europe, where any delay of at least a minute is recorded and reported. This means that for the US, we only see a part of the picture that involves more severely delayed flights. In Europe, 65% of all flights that incurred an ATC delay between 2015 and 2025 were delayed by less than 15 minutes.[6]

When such an ATC/NAS delay occurs in the US, it is assigned to one of five primary cause categories:

- Weather: The presence of adverse weather conditions affecting operations. This includes wind, rain, snow and ice, low cloud ceilings, low visibility, and tornados, hurricanes, and thunderstorm.
- Runway: Reductions in airport capacity due to runway and taxiway closure or configuration changes.
- Volume: When the airport is in its optimal configuration but current demand exceeds runway or airspace capacity.
- Equipment: An equipment failure or outage causing reduced capacity.
- Other: All impacting conditions that are not otherwise attributed. Importantly, this "other" category includes delay due to insufficient staffing.

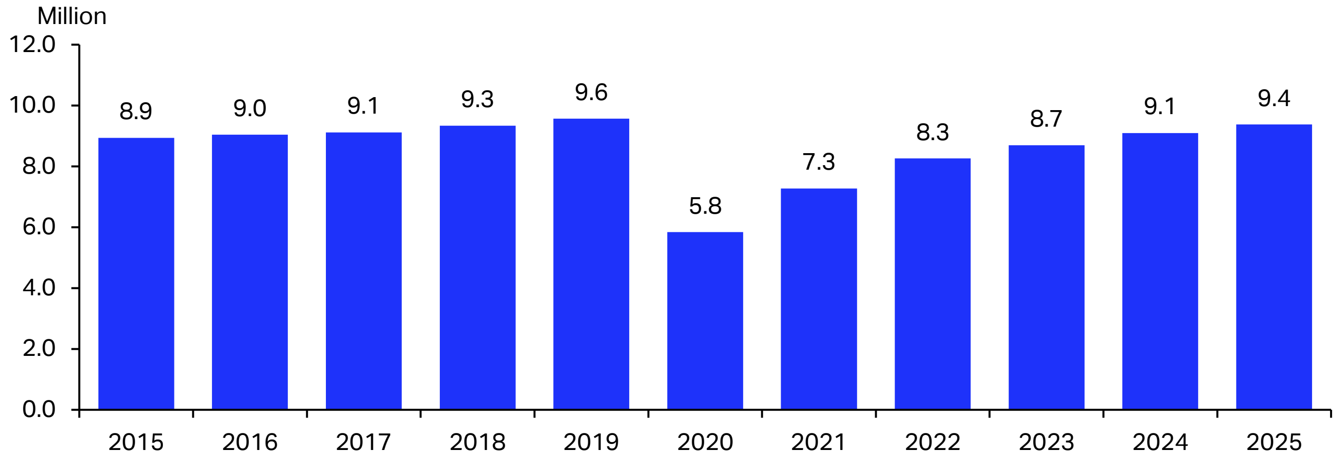
The size of the problem

US market overview

Considering all airspace users, in FY2024 (latest data available), the FAA managed an estimated 16.9 million IFR flights, including arrivals, departures, and overflights.[7] These flights have increased 0.3% per year on average since 2015, which is a rather remarkably low figure.

Growth in commercial scheduled passenger flights in the US has also been weak. The 9.4 million departures reached in 2025 is only 4.9% higher than in 2015, with an average growth rate of 0.5% per year over the decade (Chart 1).

Chart 1: Number of scheduled commercial passenger flights departing from the US, 2015 – 2025



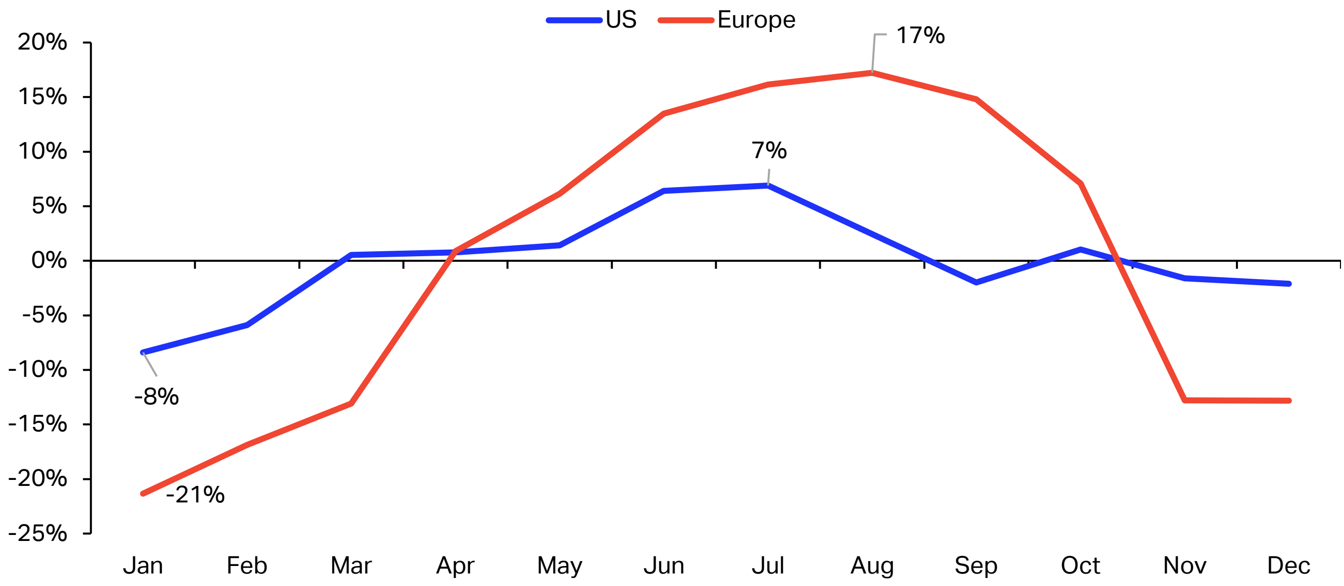
Source: IATA Sustainability and Economics, OAG

[6] IATA (2026): Air traffic control delays in Europe. https://www.iata.org/en/publications/economics/reports/air-traffic-control-delays-in-europe/.
[7] FAA (2025): Air Traffic by the Numbers. https://www.faa.gov/air_traffic/by_the_numbers/air-traffic-by-the-numbers-FY2024.pdf.

US scheduled passenger service is relatively stable throughout the year, with only limited seasonality. January was the slowest month in 2025, 8% below the annual average. July, on the other hand, was the busiest month and the total number of flights stood 7% higher than the annual daily average. In comparison, in Europe sees much more marked swings and daily traffic ranged from -21% in January to +17% in August 2025, relative to the annual average.[8]

Most US air passengers travel within the country all year round, for business or leisure. Europe, on the other hand, depends much more heavily on international leisure travel, which peaks in summer. From an airspace management perspective, lower seasonality translates into simpler staff planning, making it easier for the ANSP to plan the workforce effectively and efficiently to manage traffic.

Chart 2: Traffic seasonality in Europe and the US, monthly difference to yearly average, 2025



Source: IATA Sustainability and Economics, OAG.

The causes and magnitude of ATC delays

In spite of the modest 4.9% increase in the number of scheduled passenger flights in the US over the years 2015 to 2025, the total delay recorded by the FAA in the National Airspace System[9] (NAS) rose from 14.4 million minutes in 2015 to 22.9 million minutes in 2025, a 59% gain.

As much as 75% of all ATC delay minutes between 2015 and 2025 were reported as being weather-related (Table 1). Excluding such weather impacts, which of course are outside of anyone's control, the remaining delay incurred by commercial passenger services increased from 2.9 million minutes in 2015 to 7.1 million minutes in 2025, an astonishing rise of 142%. Furthermore, excluding delays due to runway issues, which are related to airport infrastructure, the growth in delay reported to be caused by Volume, Equipment or Other was even higher, at 159%.

[8] Eurocontrol PRU data for 2025, SES area.
[9] FAA OPSNET data, including all NAS delay incurred by air carrier, air taxi, general aviation and military operations.

Table 1: ATC delay share and growth by cause, 2015-2025

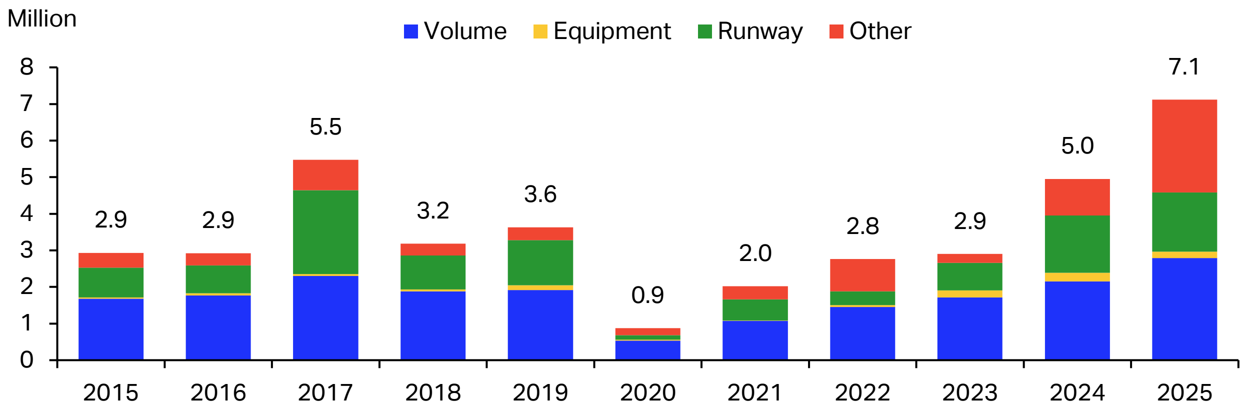
Delay Cause	Weather	Volume	Equipment	Runway	Other
% share	75%	13%	1%	7%	5%
% growth	+27%	+66%	+336%	+100%	+531%

Annual delay levels were relatively stable with some upward trend from 2015 to 2019. An exception to this was in 2017, when the Runway category caused an unusually large number of delays due to multiple months of runway construction at large airports, e.g., LAX, JFK, BOS.

The covid pandemic induced drop in traffic in 2020 obviously also led to fewer delays. Since then, delays have increased each and every year. Most worryingly, the problem is accelerating. Delays reached 5.0 million minutes in 2024, and jumped to 7.1 million minutes in 2025, up over 40% in just one year.

Staffing issues (which are recorded in the Other category) due to the US government shutdowns left many Air Traffic Controllers without pay for several weeks. Between 1 October and 12 November 2025, 27% of all non-weather ATC delays and 34% of non-weather ATC delay minutes were due to staffing.

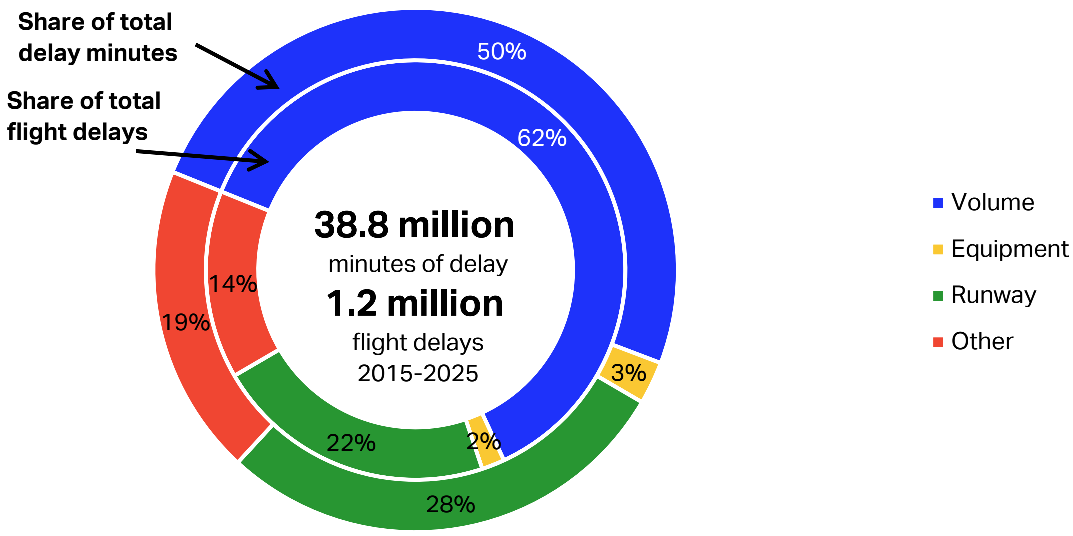
Chart 3: Total non-weather delay by cause, US, 2015 - 2025



Source: IATA Sustainability and Economics, FAA.
Note: Only includes delays incurred by scheduled commercial passenger flights of at least 15 minutes.

As many as 1,200,000 flights in the US were delayed by more than 15 minutes between 2015 and 2025, of which 22% was caused due to runway capacity shortages, 62% due to volume, 2% equipment and 15% 'Other". The average duration of delay was 33 minutes. Volume caused an average disruption of 26 minutes. The longest delays affected less than 2% of the total and related to equipment failures that left nearly 16,000 flights 50 minutes late. Runway capacity challenges affected 170,000 movements with delays of 44 minutes on average.

Chart 4: Number of flight delays by ATC related delay cause, share of length of delay, 2015 – 2025



Source: IATA Sustainability and Economics, FAA.
Note: Only includes delays incurred by scheduled commercial passenger flights of at least 15 minutes.

The cost of delay

Where do the costs come from?

It is unambiguously in the airlines' self-interest to avoid delays, if not out of concern for the passengers, then certainly for profit reasons, as every minute of delay adds to airlines' costs. Disruptions can happen in any flight phase and the related costs vary significantly, depending on the length of delay, and whether it is incurred "at-gate", during taxi, en-route, or during arrival management. In general, delay costs to airlines and passengers are incurred through:

- Costs related to passengers and passenger care:
    - Time lost for passengers has a value. The FAA estimates an average of USD 63.95 for all purpose air travel.[10]
    - Airline costs related to passenger care include rebooking in case of missed connections, hotel accommodation, food and beverage costs, and compensation.
    - Airlines' brand value can also be impaired if it becomes associated with frequent and significant delays. The airline can face a decline in demand if passengers switch to other airlines.
- Fuel: operational disruption can result in increased fuel burn, especially if delay is incurred in the en-route or arrival phases of flight.
- Maintenance: an extension of the operating time of the aircraft affects maintenance requirements. While most maintenance costs are fixed per cycle, there is a variable portion, which relates to every marginal minute of operation.

[10] FAA. https://www.faa.gov/sites/faa.gov/files/regulations_policies/policy_guidance/benefit_cost/econ-value-section-1-tx-time.pdf. Adjusted to 2025 prices using US CPI.

- Crew: more block time adds to crew costs. Although not all delays translate directly into crew pay, they will impinge on the available duty hours for remaining flights. Long delays are the most detrimental, where crews might reach their duty-time limit and a relief crew is required to operate the remaining flight legs of the day.

- Reactionary: where the late arrival of one aircraft results in delay of subsequent flights, creating cascading costs across the board.

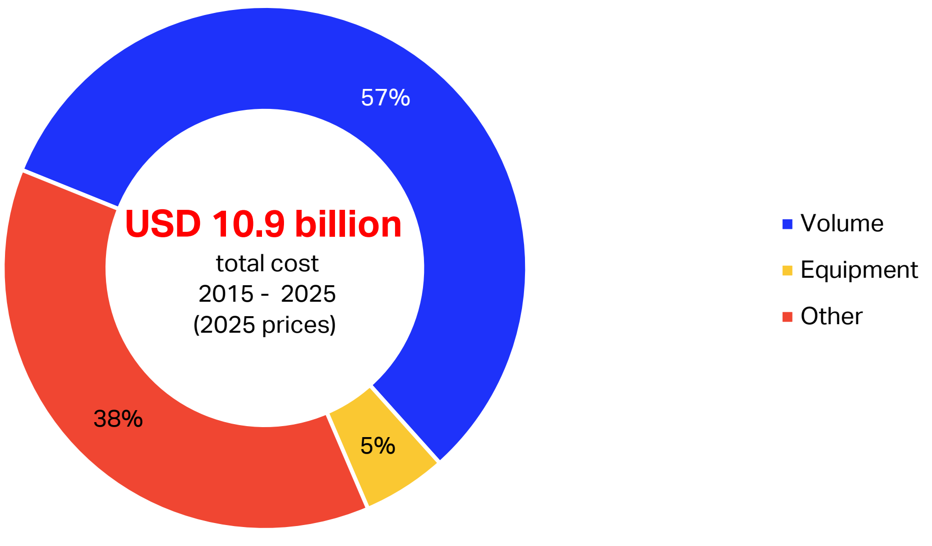
Generally, longer delays have higher per-minute delay costs than shorter delays, driven by passenger costs and reactionary delays.

Quantifying the cost

To quantify the overall impact of delays we look at the cost of the fleet, fuel, crew, maintenance, passenger care, value of time, the duration of delay, and the flight stage in which the delay is incurred.[11,12]

The total of the above is estimated at around USD 10.9 billion in 2025 prices (Chart 5). This figure includes the costs to airlines (USD 9.2 billion or 84%) and passengers (USD 1.7 billion or 16%) stemming from ATC delays caused by Volume, Equipment or Other reasons, incurred by scheduled commercial passenger flights between 2015 and 2025. Delays in the Volume category generated 57% of total costs, followed by Other causes at 38%, and the share of Equipment-related delays was 5%.[13]

Chart 5: Total FAA caused cost of delay, 2015 to 2025, in 2025 prices

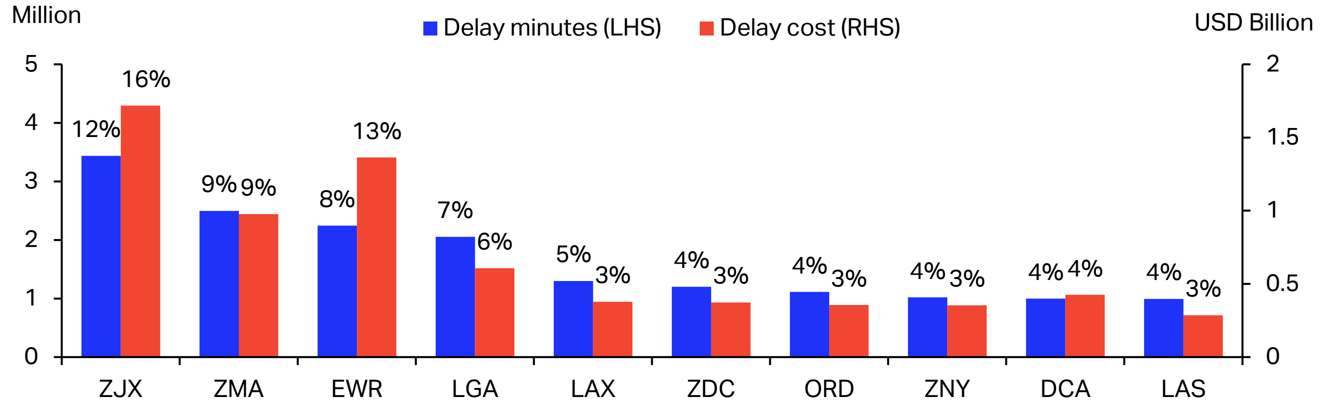


Source: IATA Sustainability and Economics, FAA, Westminster
Note: Only includes delays incurred by scheduled commercial passenger flights of at least 15 minutes.

Analyzing the 10 FAA facilities with the longest ATC delays shows where the main bottlenecks of the NAS are, and where the greatest negative cost impacts to airlines and passengers are generated (Chart 6). These 10 facilities cause around 61% of the delay minutes and 64% of the total cost to passengers and airlines.

[11] For more information on the methodology, please see the Appendix.
[12] The work accounts for the fact that longer delay results in non-linearly higher costs.
[13] Runway capacity shortage delays caused an extra USD 5.6 billion in costs.

Chart 6: FAA facilities with the longest total delay and highest share of total costs, %, 2015 – 2025



Source: IATA Sustainability and Economics, FAA, Westminster.
Note: FAA facility identifiers refer to either Air Route Traffic Control Centers (ARTCCs)—Jacksonville (ZJX), Miami (ZMA), Washington (ZDC), and New York (ZNY), or major airports: Newark Liberty (EWR), LaGuardia (LGA), Los Angeles International (LAX), Chicago O'Hare (ORD), Ronald Reagan Washington National (DCA), and Harry Reid International, Las Vegas (LAS).
Only includes delays incurred by scheduled commercial passenger flights of at least 15 minutes.

Comparison with ANSP delays in Europe

While the many differences in ANSP structure, delay categorization, data availability, etc., between the US and Europe prevent any direct comparisons, there are several observations that can be made. The US suffered a lower number of ATC delays (both operations and minutes) than Europe over the 2015-2025 period, even when only looking at the comparable metric of delays longer than 15 minutes. Europe's higher numbers can be attributed to the strong summer seasonality in air traffic. Another crucial difference is the fact that the FAA is the sole ANSP in the US airspace whereas Europe and Eurocontrol are served by many national ANSPs. This fragmentation of the airspace adds complexity and prevents improvements in efficiency.

While the US has seen a lower number of delays, the average cost per delay minute and per delayed flight is significantly higher in the US than in Europe. This relates to the following factors:

- The FAA only reports delays that exceed 15 minutes and longer delays incur proportionally higher per minute cost. In Europe, 64% of delay minutes were 15 minutes or less while only incurring 18% of the cost.
- While in Europe practically all ANSP-caused delays are incurred at-gate and therefore incur almost no fuel cost, around 18% of delays in the US are incurred en-route, leading to significant additional fuel cost.
- In the US, airlines' CASK (cost per available seat kilometer) and the passenger value of time are estimated to be higher than in Europe.

Conclusion

Air traffic control delays in the United States have become a growing source of cost and inefficiency for airlines and passengers. While scheduled commercial passenger traffic increased by only 4.9% between 2015 and 2025, non-weather ATC delays attributable to volume, equipment and other FAA-related causes rose by 159% over the same period, reaching their highest level on record in 2025. These trends suggest that ATC operational performance has not kept pace with the demands placed on the National Airspace System.

The economic consequences are significant. Between 2015 and 2025, FAA-related ATC delays affecting scheduled passenger flights generated an estimated USD 10.9 billion in direct costs to airlines and passengers.

Capacity constraints accounted for most of these costs, while staffing-related disruptions emerged as an increasingly important source of delay in recent years.

Compared with Europe, the United States benefits from less seasonality in traffic demand and a unified air navigation service provider structure, both of which should support more effective capacity and workforce planning. Yet despite these structural advantages, delays have increased rapidly over the past decade. Delay impacts are highly concentrated in the US. A relatively small number of FAA facilities account for most delay minutes and associated costs, and improvement plans that target these locations could deliver great benefits. As demand for air travel continues to grow, addressing capacity bottlenecks, ensuring adequate staffing levels, and maintaining resilient infrastructure are a must for improving system performance and limiting the economic burden of delays.

Appendix: Methodology

- The level and economic impact of delays caused by the ANSP are assessed, excluding delays caused by weather. Runway delays are analyzed separately as they pertain to issues relating to airport infrastructure rather than airspace management. While the FAA manages and directs any aircraft flying under Instrument Flight Rules (IFR) in its airspace, the analysis focuses on the impact on commercially scheduled passenger aviation operations, excluding pure cargo, general aviation and military flights.
- The main data source for the delay data is the FAA OPSNET database.[14] It includes all delays to instrument flight rules (IFR) traffic of 15 minutes or more, which result from the ATC system detaining an aircraft at the gate, short of the runway, on the runway, on a taxiway, or in a holding configuration anywhere en-route in the National Airspace System (NAS).
- The cost quantification is anchored in the research undertaken by the University of Westminster, which is the most comprehensive study in the literature pertaining to the costs to airlines of individual flight delays.[15] It captures delay costs by aircraft type (15 aircraft, including narrowbodies, widebodies, regional jets and turboprops) and delay duration intervals (9 duration intervals from 5 to 300 minutes). Cost components include costs of fleet, fuel, crew, maintenance and passenger costs. Total delay costs per delay are capped at 5h or 300 minutes of delay. The Westminster delay cost estimates are based on the European airline market. Using industry finance information about the cost structure of airlines, these estimates have been adjusted to the US market.
- The assessment considers the current aircraft mix and is based on OAG data for departures in the US.
- Passenger value of time cost calculations are the FAA recommended values.[16]
- The scope covered is FAA NAS delays for years 2015 to 2025.

[14]FAA. https://www.aspm.faa.gov/opsnet/sys/Delays.asp.
[15] University of Westminster (2015): European airline delay cost reference values. https://www.eurocontrol.int/sites/default/files/publication/files/european-airline-delay-cost-reference-values-final-report-4-1.pdf.
[16] FAA. https://www.faa.gov/sites/faa.gov/files/regulations_policies/policy_guidance/benefit_cost/econ-value-section-1-tx-time.pdf. Adjusted to 2025 prices using US CPI.