

Flight Operations Report

SQL Script Insights

Overall Flight Performance

Over 5.8M flights, with ~1.54% cancelled and ~0.26% diverted.
Operations are highly reliable; disruptions are rare.

Cancellations by Reason

Weather causes 54% of cancellations; airline and ATC account for 28% and 18%.
Security issues are negligible; operational planning is crucial.

Delay Patterns

Avg. departure delay: 9.3 mins; arrival delay: 4.4 mins.
Most flights are on-time or early; extreme delays are rare but disruptive.

Delay Contributors

Late Aircraft (40%) and Airline delays (32%) dominate.
Efficiency in turnarounds can improve on-time performance (OTP).

Airline Performance

Best: Hawaiian, Alaska (high OTP, low delays).
Worst: Spirit, Frontier (high delays).

Airport-Based KPIs

Small airports show better OTP and early arrivals.
Major hubs experience moderate delays due to congestion.

Time-Based Performance

Winter (Feb) and Summer (Jun) have most delays.
Mondays show highest delays; weekends are more punctual.

Route-Level Metrics

West Coast short-hauls and mountain/remote routes face highest delays and cancellations.
Aspen→DFW route leads in both delay and cancellation rate.
Caribbean/mountain routes are diversion-prone.

Outliers & Consistency

Few flights see extreme delays (>33 hrs).
Diversions and delays are common in small/regional airlines.
Best consistency in Hawaiian & Alaska; worst in regional carriers.

Overall Observations

Operational delays dominate; weather is a seasonal disruptor.
Focus on high-traffic routes and regional carriers for improvement.
Best performers (Hawaiian, Alaska, Southwest) set benchmarks.

Power BI Insights

KPIs

Total flights: 6M | OTP: 81% | Avg arrival delay: 4.4 mins | Cancellation rate: 2%.

Key Patterns

- Delays: Mostly from Late Aircraft (4.37 mins) and Airline issues.
- Cancellations: Dominated by weather, peaking in Feb and Dec.
- OTP Trends: Highest in Sep–Oct; lowest in Feb.
- Daywise OTP: Saturday best (~84%), Monday worst (~79%).
- Airlines: Southwest leads in volume; Spirit/Frontier lead in delays.
- Airports: High variability; remote airports like Wilmington show high delays.
- Volume vs Performance: Airlines like Delta and Alaska maintain low delays.

Recommendations

Airlines

- Improve turnaround and fleet readiness.
- Emulate high performers (Hawaiian, Alaska).
- Prepare buffers for Feb and Jun.

Airports

- Focus on peak days (Mon, Thu).
- Prioritize enhancements at high-volume and weather-sensitive locations.

Air Traffic

- Reroute and reallocate slots in winter.
- Improve air system efficiency.

Policy Makers

- Support remote airports and incentivize OTP improvements.

Limitations

- Invalid airport codes in some months.
- Missing data in delay fields.
- Logical inconsistency in ~287K records (arrival before departure).