

Airline Performance and Route Insights

Report (2019–2023)

Executive Summary

Analysis of 3 million flights reveals strong post-pandemic recovery, high hub efficiency, and significant improvement opportunities centered around delay reduction and seasonal planning. While overall cancellation rates remain industry-competitive at 2.64%, delays affect one in every four flights. Seasonality, airline performance gaps, and route network optimization represent major levers for operational gains.

Metric	Value	Performance
Total Flights Analyzed	3,000,000	Scale
On-Time Arrivals	2,000,000	Good
Delayed Flights	767,000	Needs Improvement
Cancelled Flights	79,000	Competitive
Cancellation Rate	2.64%	Industry Standard
On-Time Arrival Rate	77%	Good
Diverted Flights	7,056	Minimal

Key Insight: Cancellations are low—but one in four flights faces delay, highlighting a substantial operational risk and a vital area for improvement.

1. Key Performance Indicators

- Southwest Airlines Co. operates the highest flight volume.
- Delta Air Lines and Alaska Airlines are elite performers with the lowest cancellation rates (1.51% and 1.93%).
- American Airlines and Endeavor Air are solid but need focus to improve.
- Allegiant Air and regional carriers show the highest cancellation rates and performance variability.

Airline performance comparison showing Delta leading with 1.51% cancellation rate while Allegiant has the highest at 4.52%.

Short-haul, high-frequency routes drive system capacity. Hub-to-hub and leisure markets form the system’s backbone.

Top 10 busiest flight routes showing SFO–LAX as the highest volume corridor with 5,358 flights.

2. Route Network Efficiency

- SFO–LAX and LAX–SFO are the highest volume corridors.
- LGA–ORD, OGG–HNL, and LAX–LAS are other key hub and leisure routes.
- Even small disruptions in these arteries can cause system-wide cascading delays.

3. Flight Distribution Patterns

By Day of Week

- Saturday is the busiest day (487K flights; 14.55%).
- Monday/Friday: High business travel.
- Thursday: Least busy (384K flights).

Weekly flight volume pattern showing Saturday as the busiest day with 487,000 flights.

By Airport

ATL, DFW, and ORD serve as top originators, reflecting a classic U.S. hub-and-spoke system.

4. Seasonal & Temporal Trends

Season	Volume/Month	Cancellation Rate	Delay (Avg)
Summer (Jun–Aug)	~287K	-	8.6 min
Spring	-	4.6%	-
Autumn	-	1.1%	0.4 min
Winter	-	2.7%	4.0 min

Spring has the highest cancellations (4.6%), while Summer records the highest delays (8.6 minutes).

5. Delay and Cancellation Analysis

Root Causes of Cancellations

Cause	% of Cancellations	Controllability
National Air System	46.09%	Moderate
Airline Issues	25.19%	High
Weather	20.29%	Low
Security	8.19%	Low

71% of cancellations originate from controllable causes, emphasizing immediate operational focus.

Seasonal Patterns:

- **Summer:** Capacity-driven delays
- **Spring:** Operational/NAS challenges
- **Winter:** Weather-related disruptions
- **Autumn:** Stable performance

6. Strategic Insights & Recommendations

Metric	Value
Avg Flight Duration	112 minutes
Avg Distance	809 km
Max Daily Flights	6,775
Quietest Hour	00:03
Avg Early Arrival	14.06 minutes
Avg Delayed Arrival	39.75 minutes

Targets

Weekly, monthly, quarterly, and annual cycles established for trend monitoring and strategic review.

Immediate Actions (Next 90 Days)

- Launch a Spring Operations Task Force to reduce seasonal cancellation spikes.
- Review and standardize airline performance gaps.
- Optimize critical corridors, especially SFO–LAX.

Medium-Term Initiatives (6–12 Months)

- Deploy seasonal capacity adjustment models.
- Implement delay prediction and airline partnership programs.

Long-Term Strategy

- Invest in infrastructure and integrated weather response systems.
- Shift toward performance-based scheduling and continuous monitoring.

7. Operational & Success Metrics

Goal	Current	Target
Delayed Flights	767K	650K
Spring Cancellations	4.6%	3.0%
Summer Delays	8.6 min	6.0 min
Airline Gap	3.0%	1.5%

Impact: Improved passenger experience, lower costs, and stronger market positioning — enabling airlines, airports, and partners to navigate future challenges with resilience and agility.

8. Conclusion: Path Forward

- Delay reduction (particularly in controllable categories)
- Spring operation optimization
- Cross-airline standardization
- Proactive seasonal and infrastructure planning