

WHY DO FLIGHTS KEEP GETTING DELAYED? VISUALIZING THE HIDDEN PATTERNS OF U.S AIR TRAVEL.

**AN INTERACTIVE DATA ANALYSIS OF
FLIGHT DELAYS & CANCELLATIONS IN
THE UNITED STATES**

MP2

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A. DATA SOURCES

THE FOLLOWING DATASETS WERE USED TO CREATE MY RESTRUCTURED FLIGHT DELAYS DATASET:

- **BTS ON-TIME PERFORMANCE (TRANSTATS DELAY CAUSE DATA)**
OFFICIAL DEPARTMENT OF TRANSPORTATION SOURCE
CONTAINING FLIGHT-LEVEL DETAILS INCLUDING CAUSES OF
DELAY (CARRIER, WEATHER, NAS, SECURITY, LATE AIRCRAFT).

LINK: [HTTPS://WWW.TRANSTATS.BTS.GOV/OT_DELAY/OT_DELAYCAUSE1.ASP](https://www.transtats.bts.gov/OT_DELAY/OT_DELAYCAUSE1.ASP)

- **KAGGLE — U.S. FLIGHT DELAYS & CANCELLATIONS (2015 SNAPSHOT).**

LINK: [HTTPS://WWW.KAGGLE.COM/DATASETS/USDOT/FLIGHT-DELAYS](https://www.kaggle.com/datasets/usdot/flight-delays)

- **KAGGLE — FLIGHT DELAY & CANCELLATION DATASET (2019–2023).**

LINK: [HTTPS://WWW.KAGGLE.COM/DATASETS/PATRICKZEL/FLIGHT-DELAY-AND-CANCELLATION-DATASET-2019-2023](https://www.kaggle.com/datasets/patrickzel/flight-delay-and-cancellation-dataset-2019-2023)

B. ANSWERABLE QUESTIONS

1. WHICH AIRPORTS IN THE U.S. HAVE THE HIGHEST RATES OF DELAYS AND CANCELLATIONS?
2. WHICH AIRPORTS ARE THE MOST RELIABLE WITH ONTIME DEPARTURES AND ARRIVALS?
3. WHICH ROUTES (ORIGIN-DESTINATION PAIRS) ARE MOST DELAY-PRONE?
4. WHICH AIRLINES CONSISTENTLY PERFORM BEST, AND WHICH PERFORM WORST, WHEN IT COMES TO ON-TIME FLIGHTS?
5. WHICH AIRLINES HAVE THE HIGHEST CANCELLATION RATES?
6. DO LOW-COST CARRIERS EXPERIENCE MORE DELAYS THAN MAJOR LEGACY AIRLINES?
7. HOW DO DELAYS VARY BY TIME OF DAY AND DAY OF THE WEEK?
8. DO FLIGHTS SCHEDULED EARLIER IN THE DAY HAVE FEWER DELAYS THAN THOSE LATER IN THE DAY?
9. WHICH MONTHS OF THE YEAR SEE THE HIGHEST AVERAGE DELAYS?
10. WHAT PERCENTAGE OF DELAYS ARE CAUSED BY WEATHER COMPARED TO AIRLINE-RELATED OR SYSTEM-RELATED ISSUES?
11. WHICH AIRPORTS EXPERIENCE THE MOST WEATHER RELATED DELAYS?
12. WHICH AIRLINES FACE THE MOST CARRIER RELATED DELAYS?
13. ARE WEATHER DELAYS GENERALLY LONGER THAN CARRIER OR SYSTEM DELAYS?
14. ARE THERE CLEAR SEASONAL PATTERNS IN DELAYS, SUCH AS WINTER STORMS OR SUMMER THUNDERSTORMS?
15. DO HOLIDAY TRAVEL WEEKS LIKE THANKSGIVING OR CHRISTMAS HAVE HIGHER CANCELLATION RATES?
16. ARE SHORT-HAUL FLIGHTS MORE LIKELY TO BE DELAYED THAN LONG-HAUL FLIGHTS?
17. ARE INTERNATIONAL FLIGHTS MORE LIKELY TO BE DELAYED THAN DOMESTIC FLIGHTS?
18. DO CONNECTING FLIGHTS FACE MORE DELAYS THAN NONSTOP FLIGHTS?
19. HOW MUCH TIME DO PASSENGERS TYPICALLY LOSE DUE TO DELAYS?
20. WHICH AIRPORTS AND AIRLINES PROVIDE THE MOST RELIABLE TRAVEL EXPERIENCE FOR PASSENGERS?