Power BI - Airline Delay Causes Analysis

DAX Queries (Power BI Measures)

Flight Performance Measures

```
1. Average Delay per Flight =
DIVIDE(
    SUM('gold fact_flight_performance'[arr_delay]),
    SUM('gold fact_flight_performance'[arr_flights]),
    0
)

2.Total Flights =
SUM('gold fact_flight_performance'[arr_flights])

3.Total Delayed Flights =
SUM('gold fact_flight_performance'[arr_del15])

4.Total Cancelled Flights =
SUM('gold fact_flight_performance'[arr_cancelled])

5.Total Diverted Flights =
SUM('gold fact_flight_performance'[arr_diverted])
```

Delay Minutes and Counts

```
6.Total Delay Minutes =
SUM('gold fact_flight_performance'[arr_delay])

7.Total Carrier Delay =
SUM('gold fact_flight_performance'[carrier_delay])

8.Total Carrier Delay Counts =
SUM('gold fact_flight_performance'[carrier_ct])
```

```
9.Total Weather Delay =
SUM('gold fact_flight_performance'[weather_delay])

10.Total Weather Delay Counts =
SUM('gold fact_flight_performance'[weather_ct])

11.Total NAS Delay =
SUM('gold fact_flight_performance'[nas_delay])

12.Total NAS Delay Counts =
SUM('gold fact_flight_performance'[nas_ct])

13.Total Security Delay =
SUM('gold fact_flight_performance'[security_delay])

14.Total Security Delay Counts =
SUM('gold fact_flight_performance'[security_ct])

15.Total Late Aircraft Delay =
SUM('gold fact_flight_performance'[late_aircraft_delay])

16.Total Late Aircraft Delay Counts =
SUM('gold fact_flight_performance'[late_aircraft_ct])
```

Derived & Analytical Measures

```
17.On-Time % =
DIVIDE(
    [Total Flights] - [Total Delayed Flights],
    [Total Flights],
    0
)

18.Selected Delay Minutes =
SWITCH(
    SELECTEDVALUE('Delay Cause'[DelayCause]),
    "Carrier Delay", SUM('gold
fact_flight_performance'[carrier_delay]),
```

```
    "Weather Delay", SUM('gold
fact_flight_performance'[weather_delay]),
    "NAS Delay", SUM('gold fact_flight_performance'[nas_delay]),
    "Security Delay", SUM('gold
fact_flight_performance'[security_delay]),
    "Late Aircraft Delay", SUM('gold
fact_flight_performance'[late_aircraft_delay])
)
```

Busiest Airport Analysis

```
19.Busiest Airport Flights =
MAXX(
    VALUES('gold dim_airport'[airport_name]),
    CALCULATE(SUM('gold fact_flight_performance'[arr_flights]))
)

20.Busiest Airport Name =
MAXX(
    TOPN(
        1,
        SUMMARIZE(
            'gold fact_flight_performance',
            'gold dim_airport'[airport_name],
            "Flights", SUM('gold
fact_flight_performance'[arr_flights])
        ),
        [Flights], DESC
    ),
    'gold dim_airport'[airport_name]
)
```

Carrier Performance

21.Carrier with Most Delays Name =

```
MAXX(
    TOPN(
        1,
        SUMMARIZE(
            'gold fact_flight_performance',
            'gold dim_carrier'[carrier_name],
            "DelayMinutes", SUM('gold
fact_flight_performance'[arr_delay])
        ),
        [DelayMinutes], DESC
    ),
    'gold dim_carrier'[carrier_name]
)
```

Worst Performing Airport

22..Worst On-Time Airport Name =

```
MAXX(
    TOPN(
        1,
        SUMMARIZE(
            'gold fact_flight_performance',
            'gold dim_airport'[airport_name],
            "OnTimePct",
                DIVIDE(
                    SUM('gold fact_flight_performance'[arr_flights])
                    - SUM('gold fact_flight_performance'[arr_del15]),
                    SUM('gold fact_flight_performance'[arr_flights]),
                    0
                )
        ),
        [OnTimePct], ASC
    ),
    'gold dim_airport'[airport_name]
```

)

VIEW 1: Flight Performance & Delay Overview

Objective:
To provide an overview of overall flight performance, delays, and their causes over time.

KPIs (Cards):

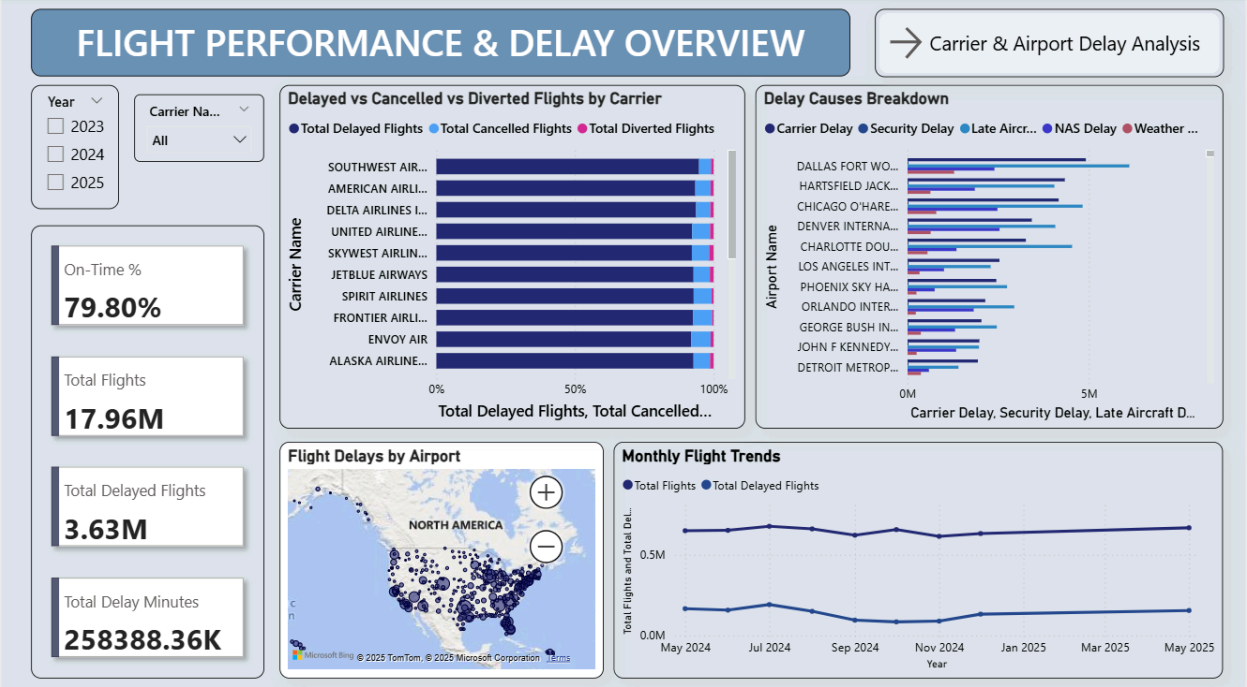
1. **Total Flights** → `[Total Flights]`
2. **Total Delayed Flights** → `[Total Delayed Flights]`
3. **On-Time %** → `[On-Time %]`
4. **Total Delay Minutes** → `[Total Delay Minutes]`

Visuals Built:

Visual Type	Description	Fields / Measures Used
Line Chart	Shows monthly trends of Total Flights vs Delayed Flights across time.	X-axis: Date - Year, Month Y-axis: [Total Flights], [Total Delayed Flights]
Map	Displays airport-wise total delay minutes with bubble size proportional to delay.	Location: Airport Name Size: [Total Delay Minutes] Tooltip: [Total Delayed Flights]
Clustered Bar Chart	Breakdown of delays by different causes.	Y-Axis: Airport Name X-Axis: [Total Carrier Delay], [Total Weather Delay], [Total NAS Delay], [Total Security Delay], [Total Late Aircraft Delay]
100% Stacked Bar Chart	Comparison of delayed, cancelled, and diverted flights by carrier.	Y-Axis: Carrier Name X-Axis: [Total Delayed Flights], [Total Cancelled Flights], [Total Diverted Flights]

Slicers Used:

- Year
- Carrier



VIEW 2: Carrier & Airport Delay Analysis

Objective:
To analyze carrier and airport performance in terms of delays and efficiency.

KPIs (Cards):

1. **Busiest Airport (Name)** → `[Busiest Airport Name]`
2. **Worst On-Time Performance Airport (Name)** → `[Worst On-Time Airport Name]`
3. **Average Delay per Flight** → `[Average Delay per Flight]`
4. **Carrier with Most Delays (Name)** → `[Carrier with Most Delays Name]`

Visuals Built:

Visual Type	Description	Fields / Measures Used
Bar Chart	Top 10 Carriers by Total Delay Minutes.	Axis: Carrier Name Value: [Total Delay Minutes] Filter: Top 10
Treemap	Distribution of total delay minutes by cause.	Category: Delay Cause (from Delay Cause table) Values: [Selected Delay Minutes] Tooltips: [Selected Delay Minutes], [First DelayCause]
Scatter Plot	Compares flights vs delay minutes by carrier.	X-axis: [Total Flights] Y-axis: [Total Delay Minutes] Size: [Total Delayed Flights] Color: Carrier Name

Slicers Used:

- Year
- Carrier
- Airport
- Delay Cause