



# Airline Accident EDA + Recommendations

BY: FLIGHTDATA FUSION

# Objective/Goal

- ▶ To find the safest commercial and private options for aircraft purchases based on exploratory analysis of airplane accident data

# Recommendations

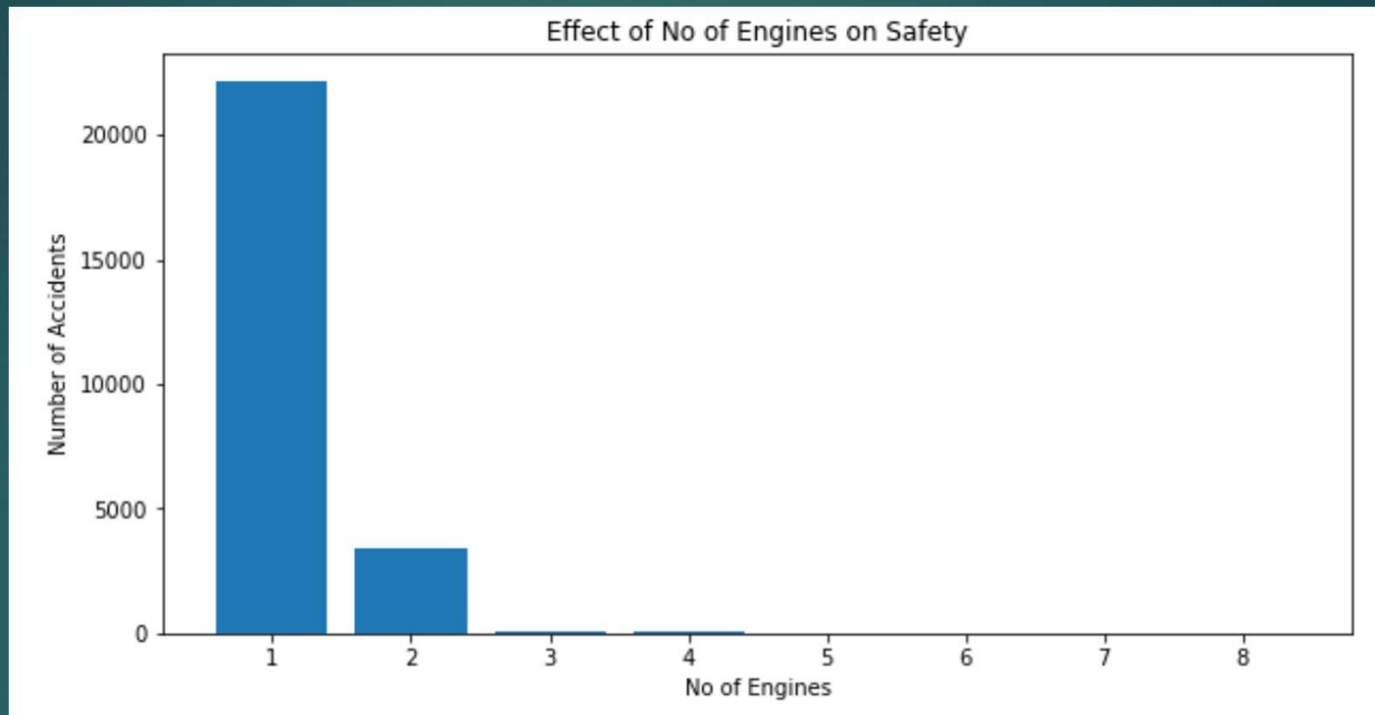
- ▶ Boeing 737-800
  - ▶ Commercial Airplane
- ▶ Gulfstream IV
  - ▶ Private Airplane



# Data Cleansing/Filtering

- ▶ Scrubbed various portions of the dataset to clean it up
- ▶ Filtration:
  - ▶ Streamlined to airplanes only
  - ▶ Based observations on last 20 years of data
  - ▶ Included only data on accidents with substantial damage / destroyed planes
  - ▶ After cleaning, approx. 28,000 incidents included in analysis
- ▶ Normalization:
  - ▶ Created ratios for each type of injury sustained in the accidents

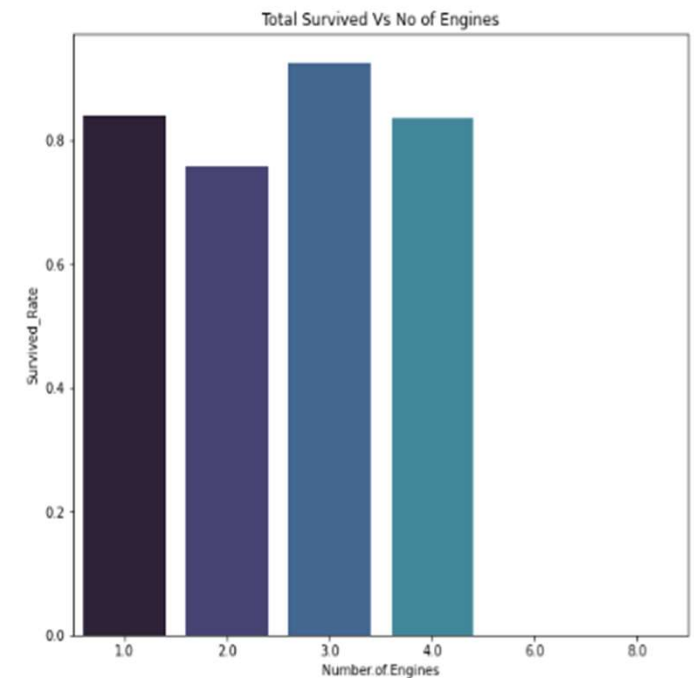
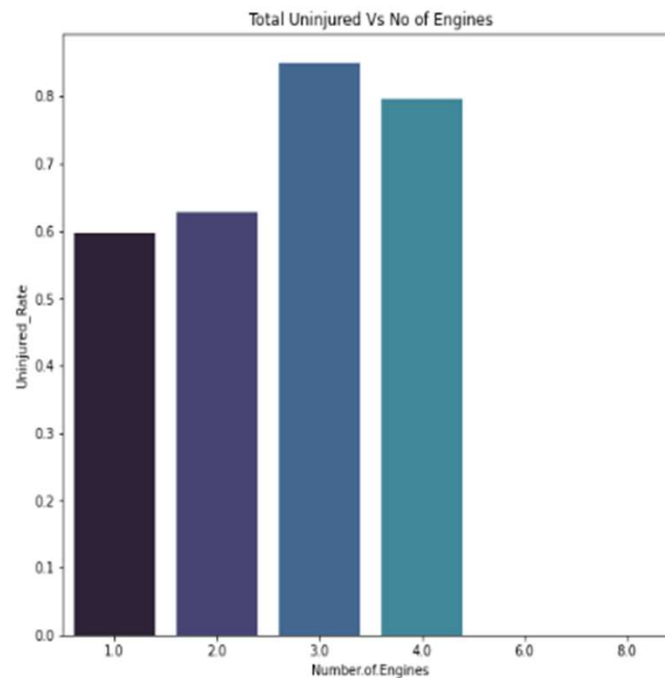
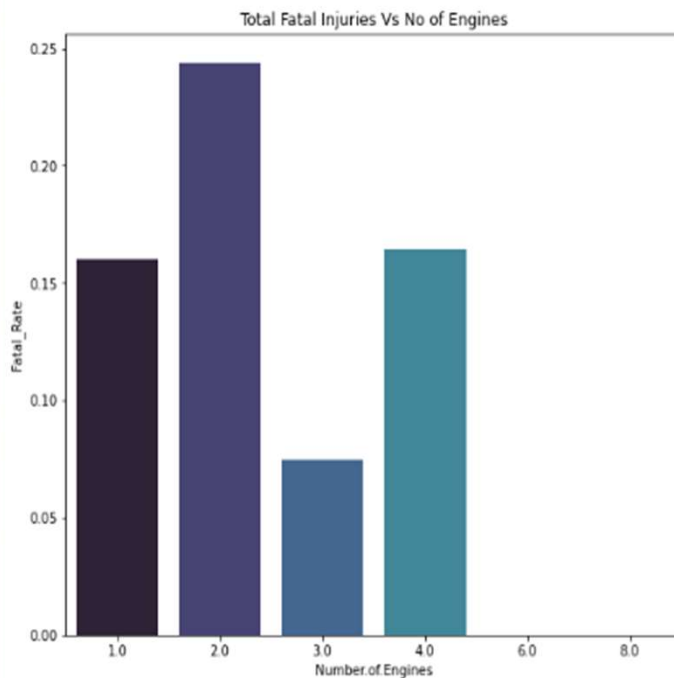
# Effect of No. of Engines on Safety



Limited data reported for 3+ engined planes

# Effect of No. of Engines on Safety

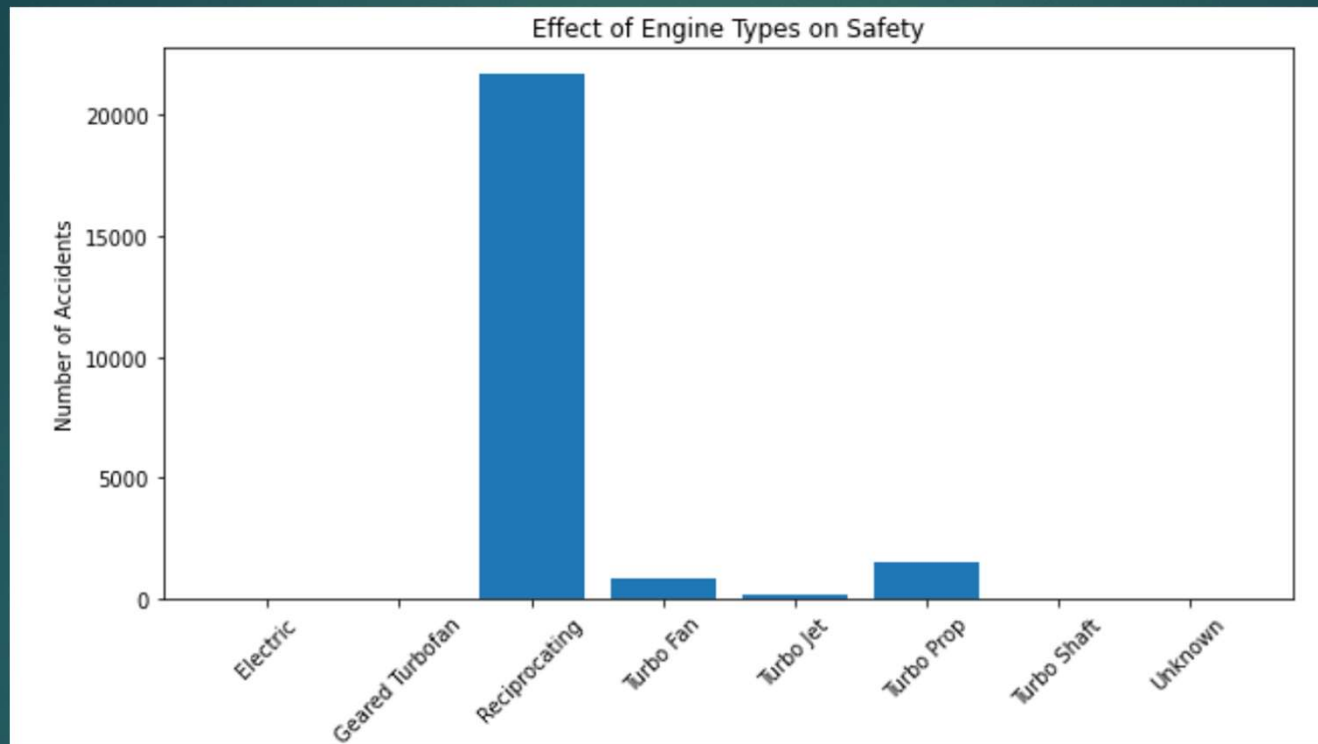
- ▶ Normalized for Injury Ratios



Due to limited data on 3+ engines, our current visualizations are skewed

Number.of.Engines	0.0	1.0	2.0	3.0	4.0	6.0	8.0
Aircraft.damage							
Destroyed	0	2249	636	2	7	0	0
Substantial	4	19787	2175	23	27	1	1

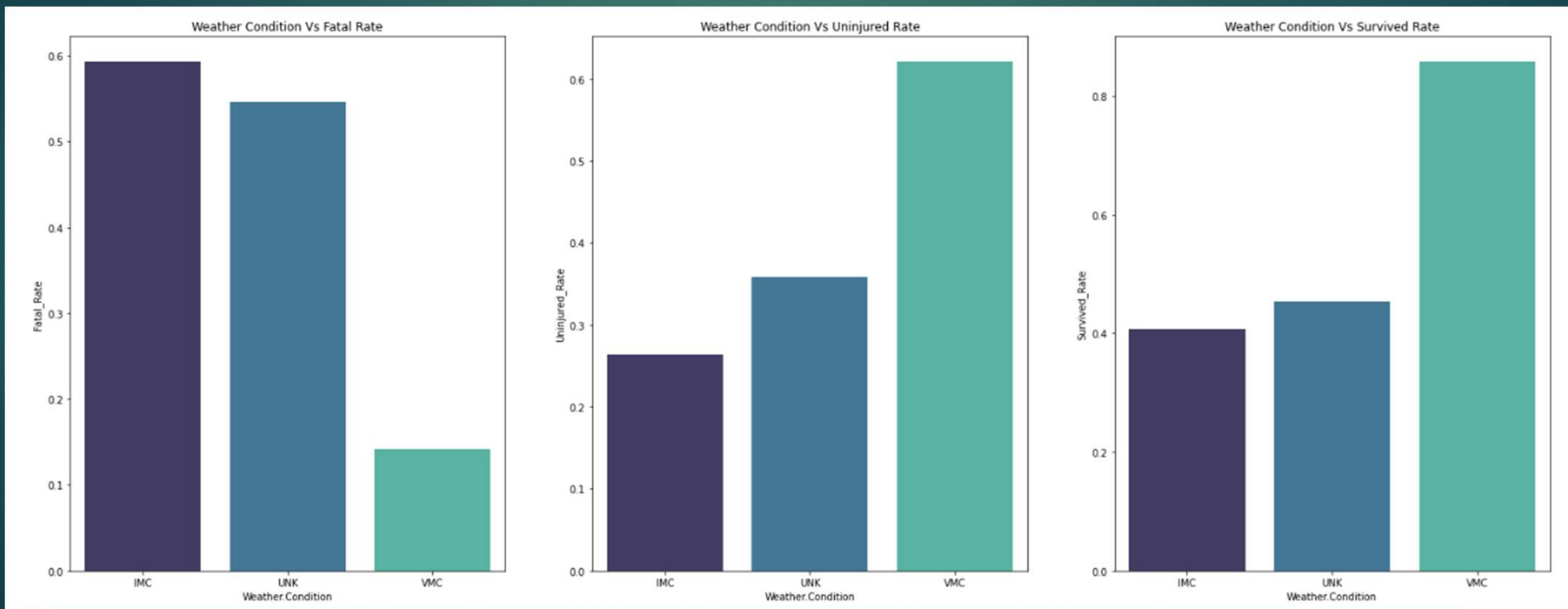
# Effect of Type of Engine on Safety



- Found through online analysis that Turbo Fan and Turbo Jet engines are the safest options on the market

# Effect of Weather Control Instruments on Safety

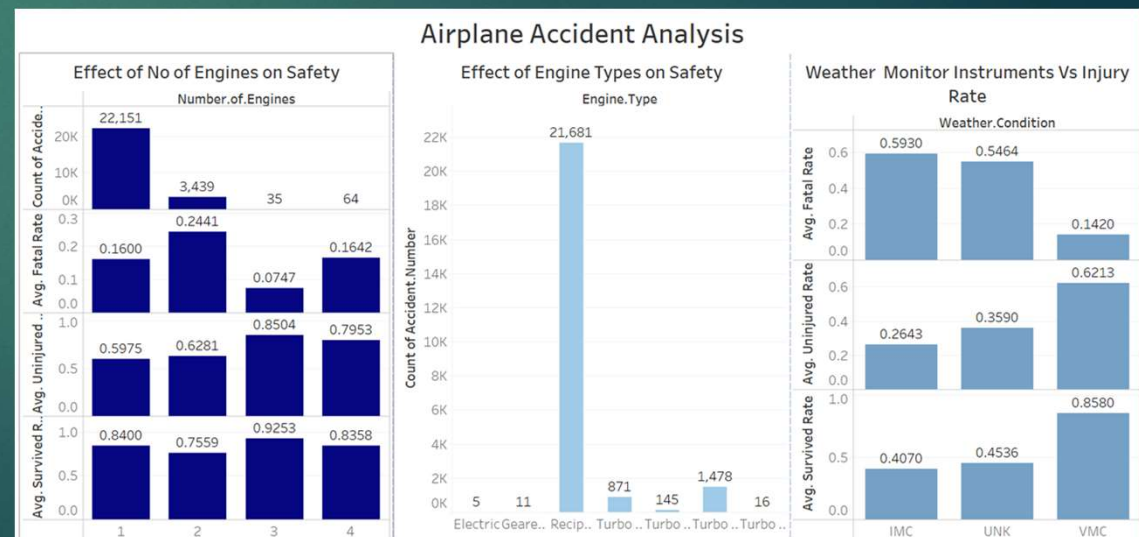
- ▶ Analysis of Weather Instrument Availability against Types of Injuries (Fatal, Total Injured, Survived)
- ▶ Recommendation: VMC Instruments





# Specifications for Recommendations

- ▶ 2 Engine Limit
- ▶ Avoid Reciprocating Engines
- ▶ VMC Instrument Features in Aircraft



# Recommendation Tables

Private (Passenger  $10 < x < 30$ )

Make_Model	Survived_Rate	injury_ratio
AEROSPATIALE ATR-42-300	1.0	0.022727
BOMBARDIER CL600 2C10	1.0	0.030769
SAAB-SCANIA AB (SAAB) 340B	1.0	0.032787
EMBRAER ERJ 190 100 IGW	1.0	0.033333
EMBRAER 140	1.0	0.040000
FAIRCHILD Dornier 328-300	1.0	0.041667
GULFSTREAM G IV	1.0	0.047619
MCDONALD DOUGLAS DC-9-87	1.0	0.047619
BOMBARDIER, INC. CL-600-2B19	1.0	0.053571
DORNIER 328	1.0	0.071429

Commercial (Passenger  $75 < x < 200$ )

Make_Model	Survived_Rate	injury_ratio
BOEING 757 223	1.0	0.001942
BOEING 787	1.0	0.002153
MCDONALD DOUGLAS MD-88	1.0	0.002179
BOEING 737 3H4	1.0	0.002381
BOEING 757	1.0	0.002722
BOEING 737-932ER	1.0	0.002817
BOEING 737-824	1.0	0.002853
BOEING 787-9	1.0	0.003033
EMBRAER-EMPRESA BRASILEIRA DE ERJ 170 200 LR	1.0	0.003049
BOEING 757 232	1.0	0.003077

- ▶ Reasons for ruling out several of the top listed:
  - ▶ Passenger Capacity
  - ▶ Overall Cost
  - ▶ 2 Engine Limit

# Finance and Final Recommendations

## Financial Recommendations

- ▶ Boeing 737-800 (Commercial)
  - ▶ Overall: \$106,100,000 USD per plane
  - ▶ Cost to maintain / run: \$3,354,280 USD / Year
- ▶ Gulfstream IV (Private)
  - ▶ Overall: \$2,247,661 USD per plane
  - ▶ Cost to maintain / run: \$678,432 USD / Year



Questions?