



AVIATION RISK ASSESSMENT

A detailed analysis of aviation data by NTSB Aviation Accident Data (1962–2023)

Presented to: Head of Aviation Division, Stakeholders

Presented by: Analyst Stella K



Overview

- ▶ As a company, you have been looking forward to diversifying your operations into the aviation industry. However, there is no information available on the potential risks associated with this new venture.
- ▶ Therefore, this project aims to analyze historical aviation accident data utilizing the NTSB data from 1962 to 2023 to identify aircraft models, makes, and engines that have the lowest risk profile based on injury fatalities.
- ▶ The results of this data analysis should assist the Head of Aviation Division in determining which is the most appropriate venture within the aviation industry.



Business Understanding

- ▶ The company has prospered in the Electric vehicle industry over the past 10 years. To combat the potential decline of the company, the stakeholders have sought to venture into the aviation industry. The aviation industry, however, is exposed to significant risks, one of which is accidents. For success within this industry, the company needs to understand the accident risks associated with different aircraft makes and models.
- ▶ The NTSB provides a relevant dataset collected over a period of time that new companies can rely on for better decision-making as they venture into the aviation industry.
- ▶ Research shows that data-driven decision-making results in better and informed decisions.



Business Understanding

Main Objectives

- ➡ To analyze Aircraft Makes with the Lowest Fatality Rates
- ➡ To identify which Aircraft Engine types are more prone to damage in case of accidents
- ➡ Which Purpose Flights are less risky to fatal accidents



DATA UNDERSTANDING

- ▶ Data Source: Aviation Data from 1962 to 2023 on civil aviation accidents across accidents and selected incidents across the United States and international waters
- ▶ Data from the National Transportation Safety Board
- ▶ The dataset contains 90348 rows of data and 31 columns of data
- ▶ Some significant columns for the company's risk assessment include:
- ▶ Aircraft Make- different aircraft makes, i.e., Cessna,
 - ❖ Aircraft Model- different makes such as Cessna, PIPER, Beech, BOEING
 - ❖ Aircraft Damage- extent of damage substantial, destroyed, and others not given
 - ❖ Purpose of Flight- various uses of flights (personal, business, skydiving, executive, firefighting), etc.
 - ❖ Total Fatal injuries- total number of fatal injuries in a specific accident event
 - ❖ Injury Severity



Data Analysis

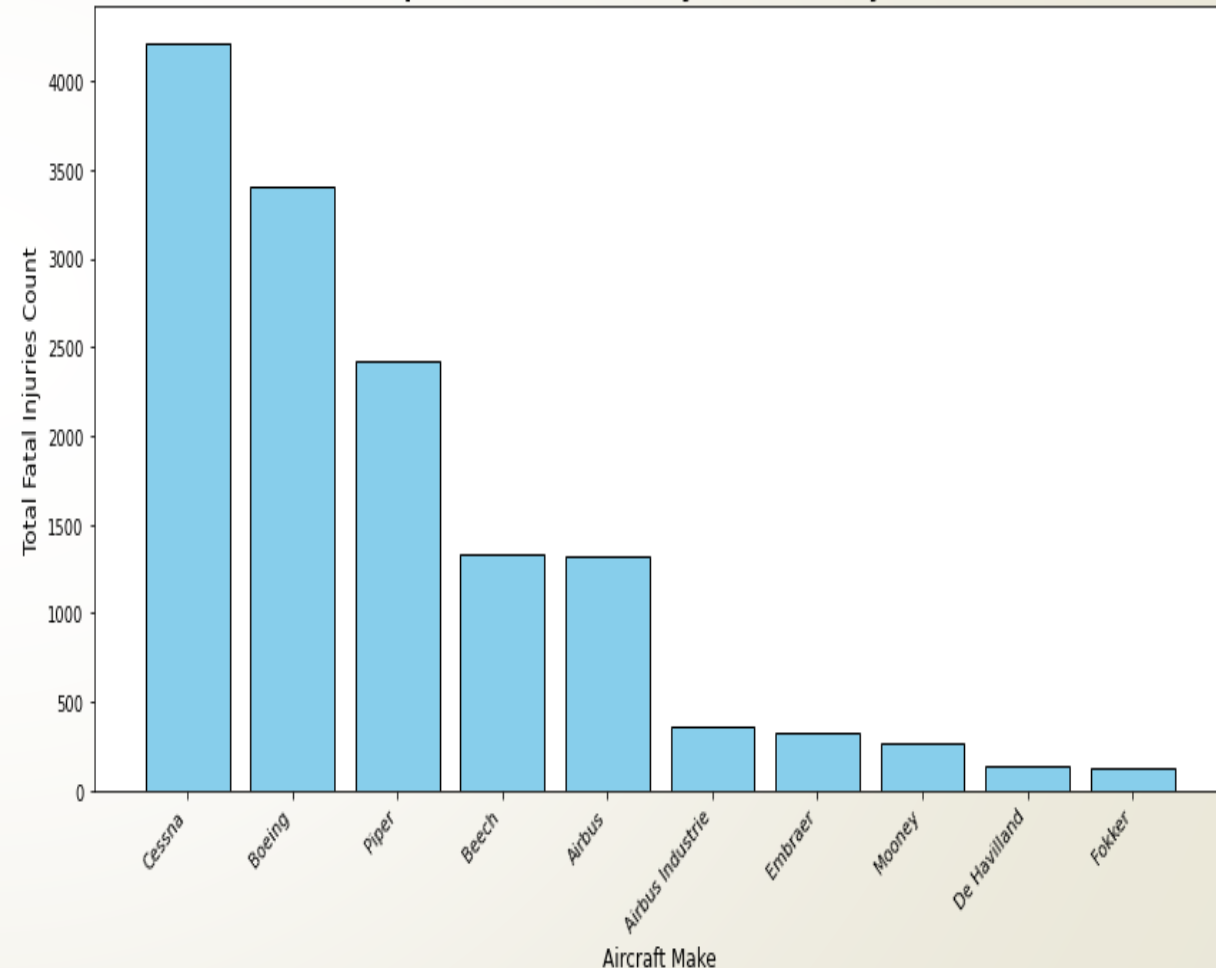
Which Aircraft make has the lowest total fatal injuries

From the visual on the top 10 makes by total fatal injuries, it is evident that Cessna has the highest risk of fatal injuries, with models such as FOKKER having the lowest fatality

Recommendation

It is hence recommended that, as the Head of Aviation Division, Fokker aircraft make are advised as they have low total fatal injuries.

Top 10 Aircraft Makes by Total Fatal Injuries





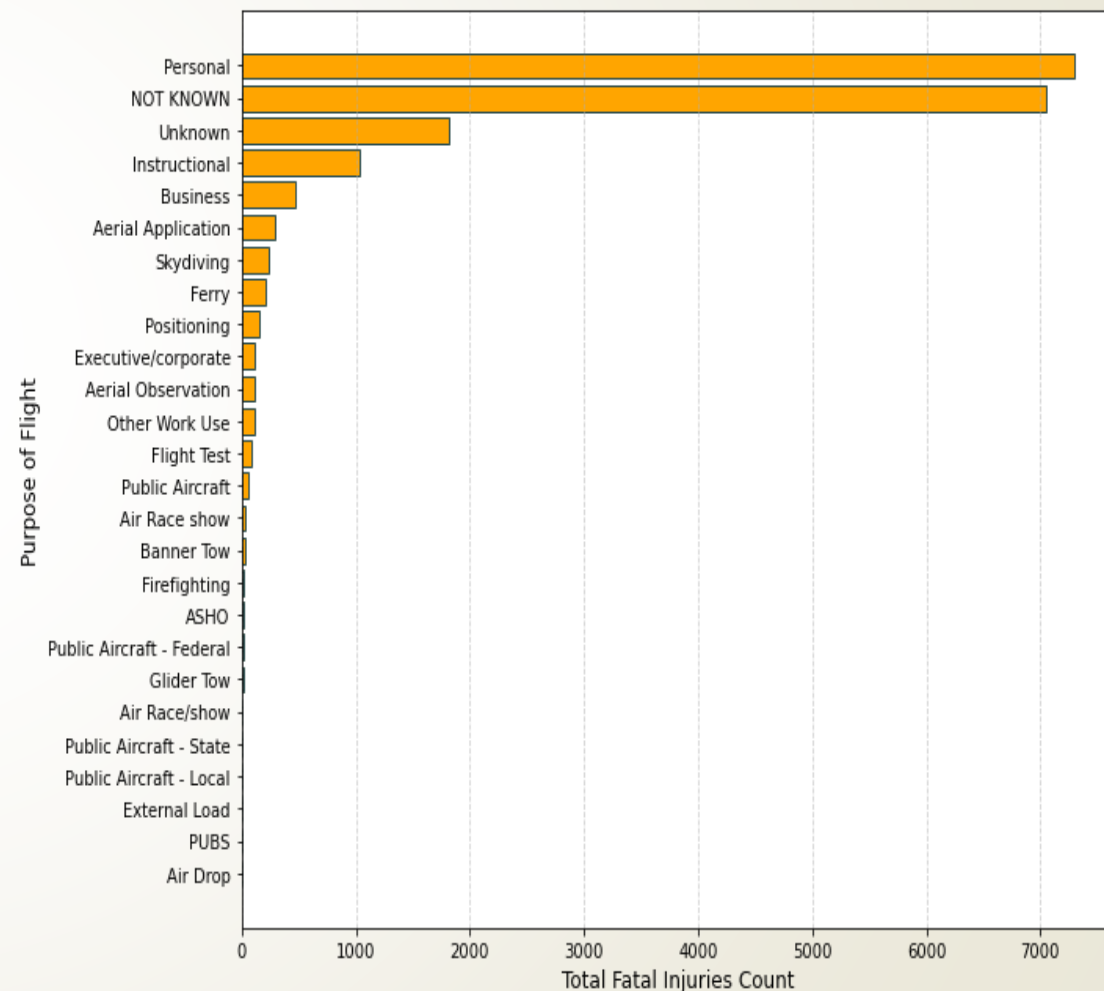
DATA ANALYSIS

Which flight purposes are less exposed to fatal injuries?

From the data analysis, aircraft used for personal purposes are highly exposed to fatal injuries. Therefore, I do not recommend the company to venture into air travel used for personal purposes.

The company should consider venturing into the aviation industry for other purposes, such as Airdrop, Firefighting, Business, Skydiving, and for corporate purposes.

Total Fatal Injuries by Purpose of Flight





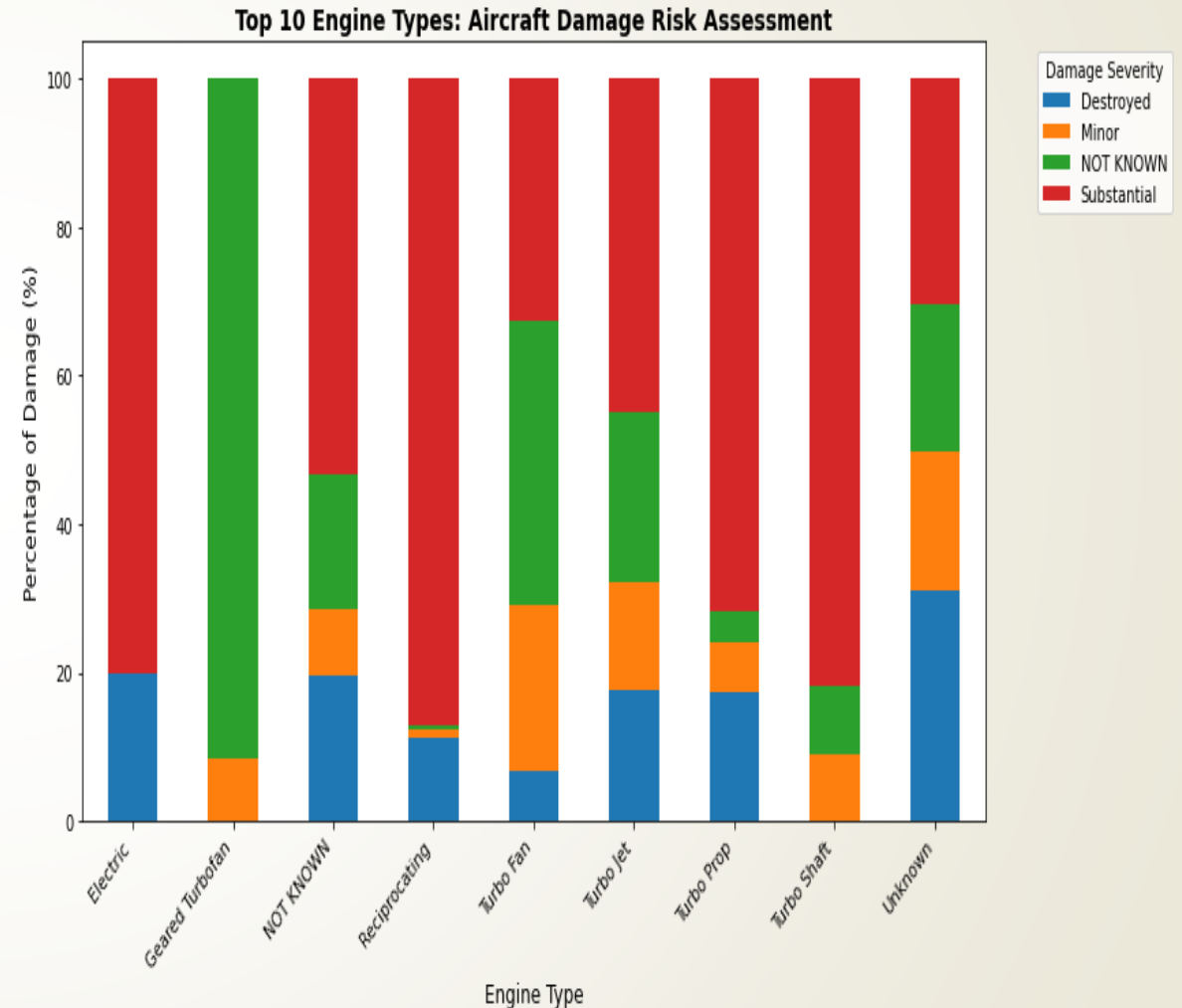
Data Analysis

Which engine types have the lowest damage risk?

Aircraft with Reciprocating engines have the highest risk of substantial damage in accidents.

Most engines have a moderate risk of damage, such as the Electric, Turbo Prop, and Turbo Shaft.

However, an aircraft such as a Turbo Fan has a minimal risk of exposure to damage.





Conclusions and Recommendations

To conclude:

From the insights gathered from the aviation action dataset by NTSB, there are key factors that must be considered before venturing into the new industry.

Through the analysis, I identified FOKKER and DE HAVILLAND as the best aircraft makers with Turbo fan engines.

Additionally, aircraft for private enterprise are highly discouraged, as aircraft used for personal purposes have had the highest fatality injuries.

This data-driven insight is a great starting point for aviation industry analysis. However, to justify the decision, further analysis is required to determine factors such as performance, reliability, operational aspects, and regulatory compliance.



NEXT STEPS

- ❖ Gather public and private operational data within the aviation industry to define other risk factors associated with aviation industry ventures.
- ❖ Consider utilizing the most recent datasets. With revolution, data from 1962 is too outdated to refer to for decision-making.
- ❖ Develop models to predict the performance of the aviation industry in the next few years

