

LOW-RISK AIRCRAFT

Project to identify Low-Risk Aircraft



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Thank you

A thank you message

01: Introduction



Low- Risk Aircraft identification strategy achieved through:

- Obtaining and Cleaning Data
- Comprehensive Data Analysis
- Creating relevant Visualisations
- Using visuals to draw conclusions
- Giving Recommendations

02: Business Understanding



Business Objective:

The core objective is to minimise risks associated with safety regulations and operational risks.

Stakeholder:

- Head of the new Aviation Division – Recommendations and findings will guide decision-making on aircraft to purchase.

Business Questions:

- What Engine types present the lowest overall passenger injury risk for commercial and private use?
- Which aircraft makes historically have the lowest overall risk?
- Which aircraft makes present the lowest aircraft damage and the lowest injury severity after an incident?

03: Data Understanding



Source of Data:

Data for this project was obtained from a [GitHub repository](#).

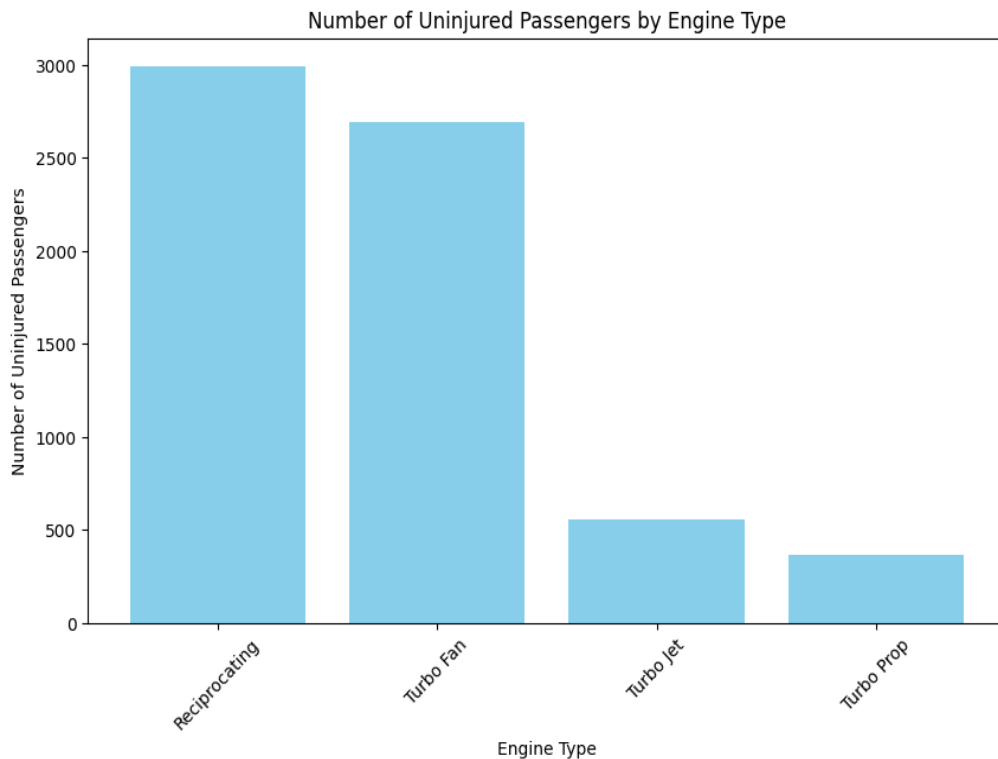
Key Variables:

- **Aircraft** Category (airplane, balloon, Helicopter, etc.)
- **Make** (Cessna, Boeing, etc.)
- **Engine Type** (Reciprocating, Turbo prop, Turbo Fan, Turbo Jet)
- **Aircraft damage** (Minor, Substantial, Destroyed)
- **Injury Severity** (Fatal, Non-Fatal)
- **Total Fatal Injuries, Total Minor Injuries, Total Serious Injuries**

The aircraft category was filtered to airplane only to fit stakeholders' requirements.

4.1: Data Analysis and Visualisation

Business Question 1: What Engine types present the lowest overall passenger injury risk for commercial and private use?

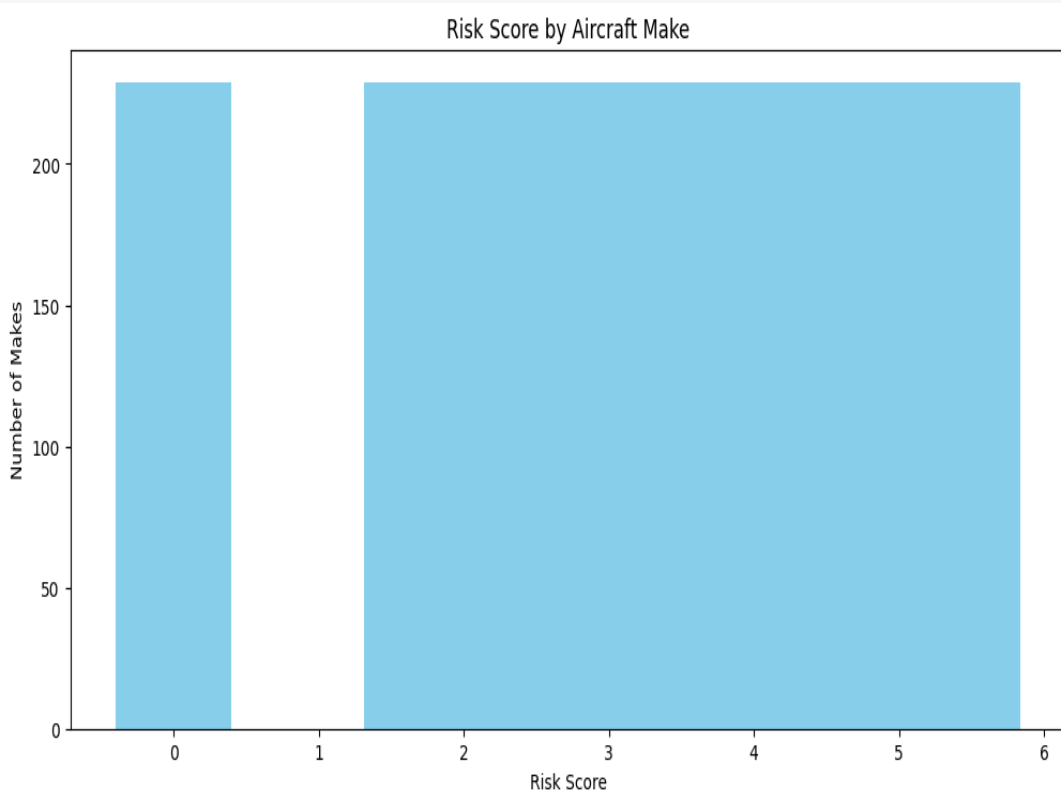


Comparing engine type with number of uninjured passenger after accident shows that Reciprocating and Turbo Fan engines present the lowest passenger injury risk for commercial and private use.

Airplane makes with these engine types are recommended.

4.2: Data Analysis and Visualisation

Business Question 2: Which aircraft makes historically have the lowest overall risk?

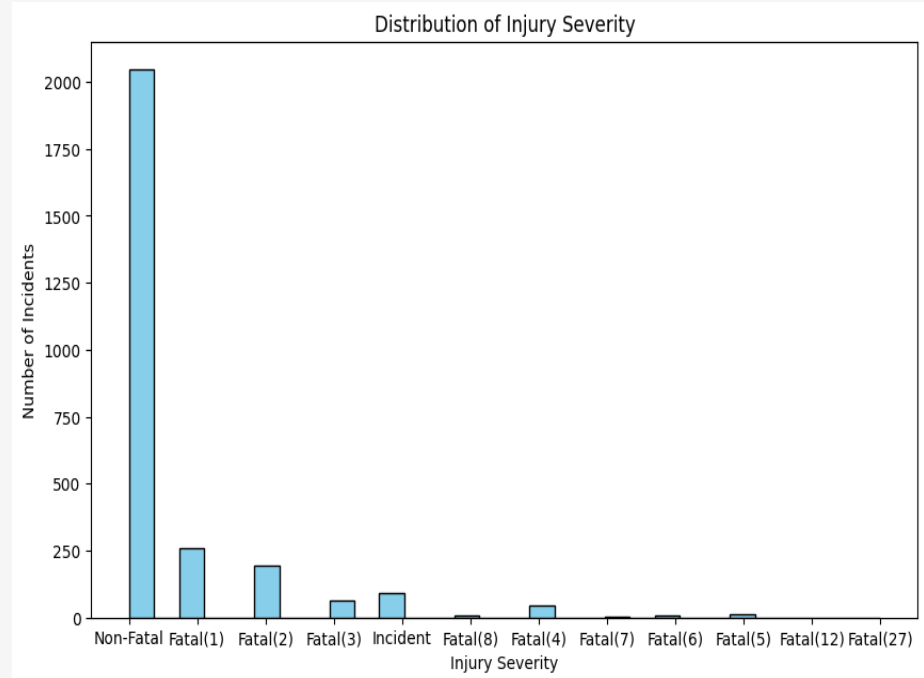
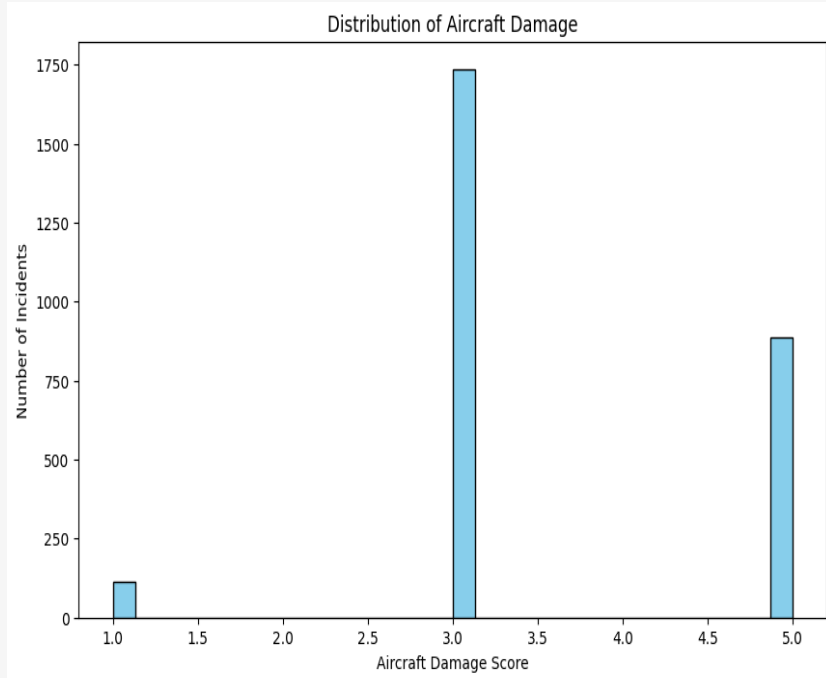


The distribution of airplane makes by risk score(calculated) shows majority of the makes carry a risk score between 1.6 and 5.8 where a risk score of 10 is the riskiest and that of 0 carries the least risk.

Airplane makes that fall under a zero-risk score are recommended.

4.3.1: Data Analysis and Visualisation

- **Business Question 3: Which aircraft makes present the lowest aircraft damage and injury severity after an incident?**



4.3.2: Data Analysis and Visualisation

Distribution of Aircraft Damage and Injury Severity



The two figures in the previous slide tell us there are a few airplane makes whose damage is minor and several whose injury severity is non-fatal.

An airplane make that falls in these two categories carries the lowest after-incident risk and is recommended.

Combining the four criteria, we can create a list of recommended makes that satisfy all criteria. This is shown in the next slide.

4.4.1: Data Analysis and Visualisation

Combining all Criteria:

During analysis, four lists were created, which are described below:

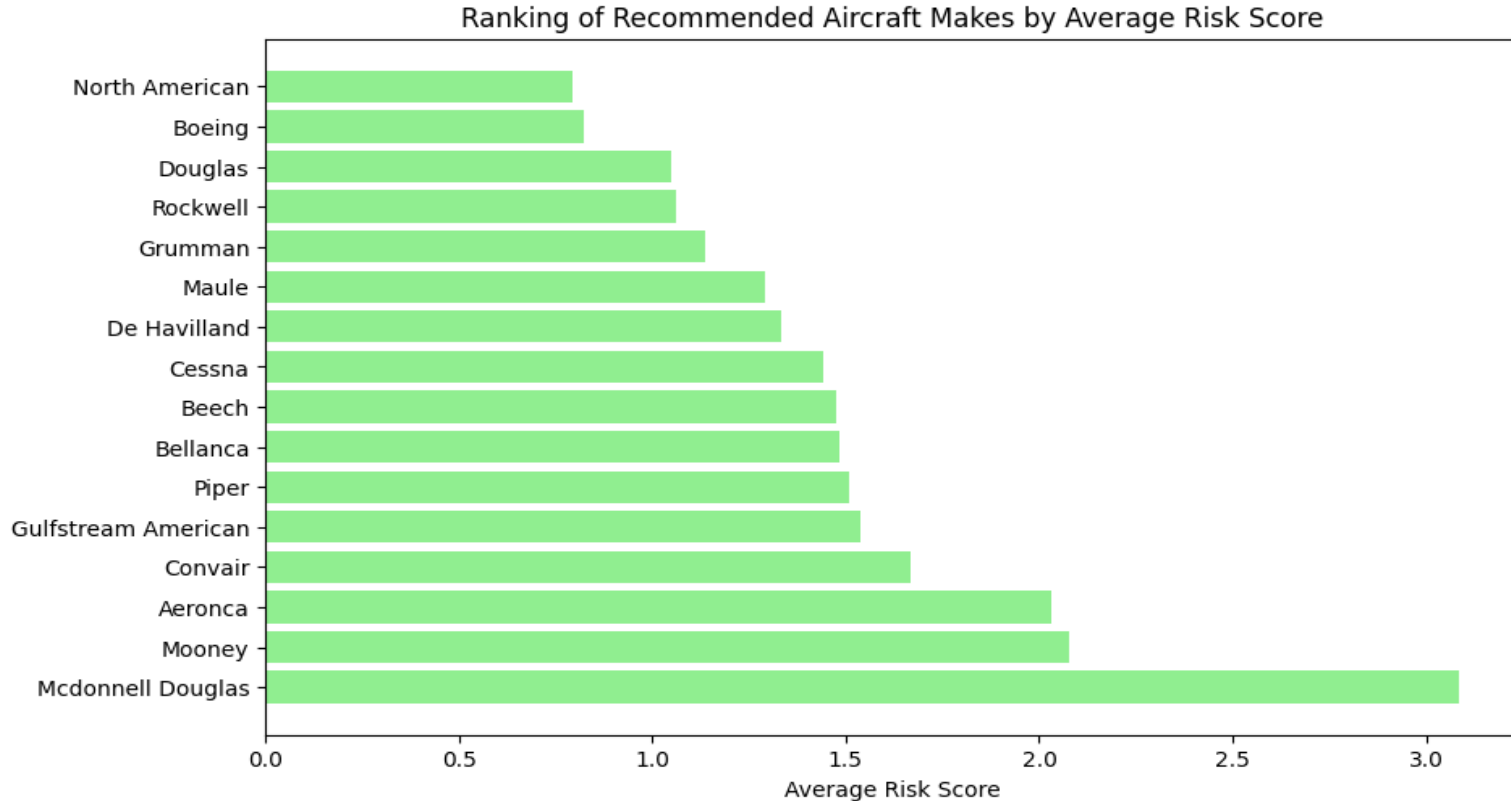
- **Safe_Engine_Makes** - Contains airplane makes using Reciprocating or turbofan engines, which present the least injuries after an incident.
- **Zero_Risk_Makes** - Has airplane makes whose risk score is zero. Risk score is calculated out of 10 by factoring Total Fatal Injuries, Total Serious Injuries and Total Minor Injuries while giving the highest weight to Total Fatal Injuries. 0 represents makes with no injury risk, while 10 represents makes with very high injury risk.
- **Minor_Damage_Makes** - List shows the makes that have had Minor injuries after an accident.
- **Non_Fatal_Makes** - Has airplane makes in which there were no fatal injuries after an accident.

A recommended make appeared in all four lists. There were 16 different makes that qualified, which were ranked according to their average risk and ten of them carrying the least risk were picked as recommended.

The ranking of the 16 makes is shown in the next slide.

4.4.2: Data Analysis and Visualisation

Ranking of recommended airplane makes



05: Recommendations



- **Prioritize airplane makes that are top-ranked for purchase.**- Stakeholder should consider the top 10 lowest-risk airplane makes during decision making as they demonstrate consistently safer outcomes across multiple variables.
- **Consider Turbo Fan or Reciprocating Engines.** - If a purchase has to be made outside the top 10 recommended makes, stakeholder should mandate a technical requirement for Turbo Fan and Reciprocating Engines. These engines are correlated with low injury risk after incident.
- **Keep a check on near-qualifying makes.** - Airplane makes that narrowly missed qualification should be monitored for improvement trends and re-evaluated.



Thank You