



# **Data-Driven Decision Support for Aircraft Procurement**

**Author: Daniel Mwaka**



# Summary

- ❑ **Grand Aim:** To support the company in making data-driven decisions in the procurement of safe, logistically appropriate, and reliable airplanes to operate.
- ❑ **Project Objectives:**
  - Identify the riskiest aircraft models.
  - Identify the safest aircraft models.
  - Recommend the safest, operationally feasible aircraft for the company's target market.



# Outline



- Business Problem
- Data
- Methods
- Results
- Conclusions

# Business Problem

- ❖ Operating airplanes for commercial and private enterprises is a potentially profitable portfolio diversification strategy for the company.
- ❖ Venturing into a highly sensitive sector necessitates:
  - 1) Data-driven decisions.
  - 2) Strategic implementation.
  - 3) Formative performance evaluation.
- ❖ Leveraging novel data analytics is a key driver for aircraft safety.

# Data

- This project analyzes the National Transportation Safety Board (NTSB) dataset to support the effectiveness of the company in procuring safe, reliable, and logistically feasible aircraft models to operate.
- The NTSB aviation accident database contains information on crashes and contingency incidents within the U.S., its territories, and across international waters from 1962 to 2023.
- The dataset is adequately detailed and its in-depth coverage on aircraft accidents and incidents across an extensive observation period justifies the replicability of deduced insights.

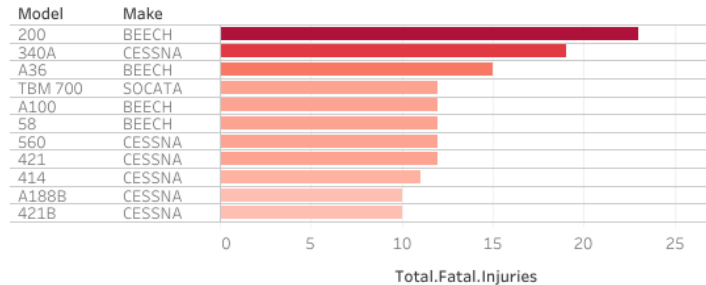
# Methods

- We live in an ever evolving world highlighted by fast-paced technological advancements and the depreciation of old technologies.
- In the aviation sector, manufacturers are progressively advancing the design, control systems, and build-quality for aircraft models.
- The NTSB dataset is filtered to slice data for aircraft incidents from the year 2000 onwards and capture data relevant to the aviation services the company aims to venture:
  - i. Executive/ corporate flights.
  - ii. Business flights.

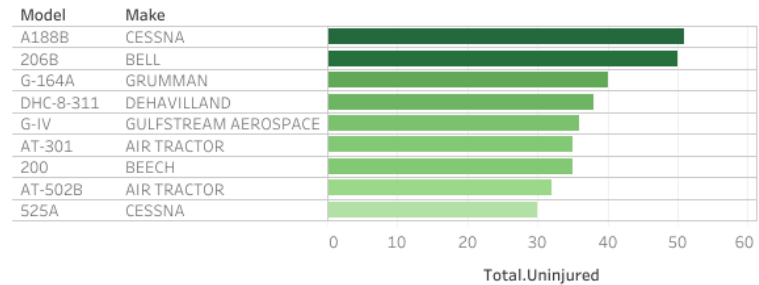
# Results

## Data-Driven Decision Support for Aircraft Procurement

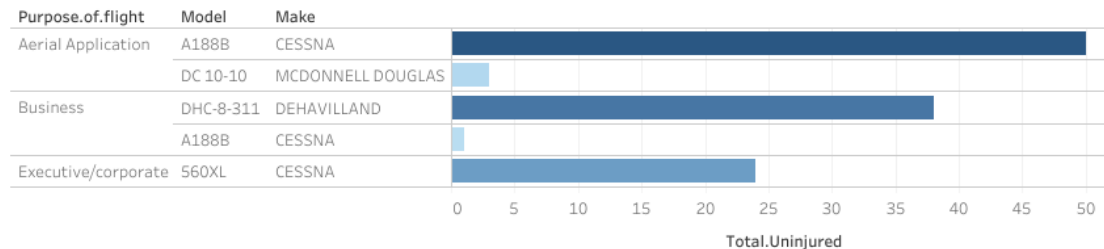
### Least Safe Aircrafts



### Most Safe Aircrafts



### Recommended Aircrafts



Number.of.Engines

- ☒ 1.0
- ☒ 2.0
- ☒ 3.0

Purpose.of.flight

- ☒ Aerial Application
- ☒ Business
- ☒ Executive/corporate

# Conclusions

Aircraft Make - Model	Purpose of Flight	Visual
CESSNA-560XL	Executive/ Corporate Flights	 A white CESSNA-560XL twin-engine turboprop aircraft is parked on a tarmac. The aircraft has a white base paint with gold and blue stripes along the fuselage and tail. The tail number 'N5611V' is visible on the vertical stabilizer.
DEHAVILLAND DHC-8-311	Business Flights	 A white DEHAVILLAND DHC-8-311 twin-engine turboprop aircraft is shown in flight against a blue sky with scattered clouds. The aircraft features a white base paint with red and yellow stripes. The tail number 'DASH 8' is visible on the side of the fuselage.
CESSNA-A188B	Aerial Applications	 A white CESSNA-A188B twin-engine turboprop aircraft is parked on a tarmac. The aircraft has a white base paint with yellow and black stripes. The tail number 'N188B' is visible on the vertical stabilizer.



# Thank You!

**Email:** [ndanielmwaka@gmail.com](mailto:ndanielmwaka@gmail.com)

**GitHub:** [github.com/mwakad/](https://github.com/mwakad/)

**LinkedIn:** [linkedin.com/in/daniel-mwaka-0b85461b0/](https://www.linkedin.com/in/daniel-mwaka-0b85461b0/)