Data-Driven Decision Support for Aircraft Procurement

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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.

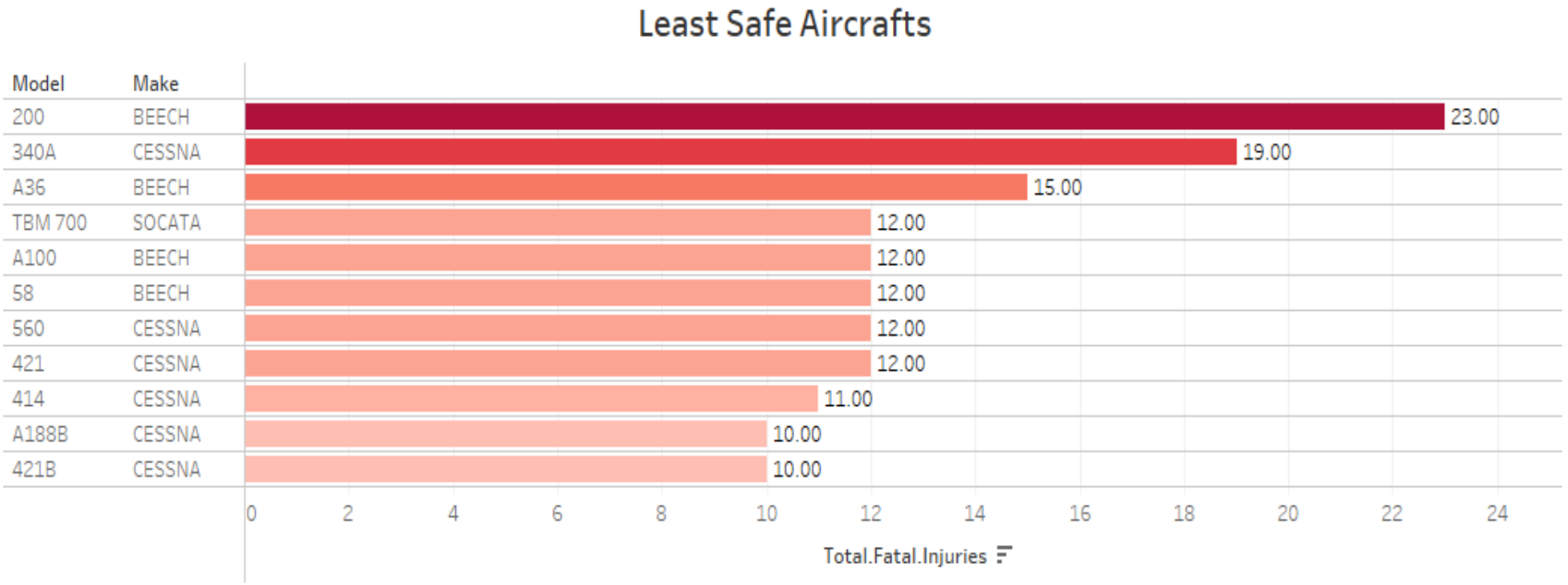
Data

- 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

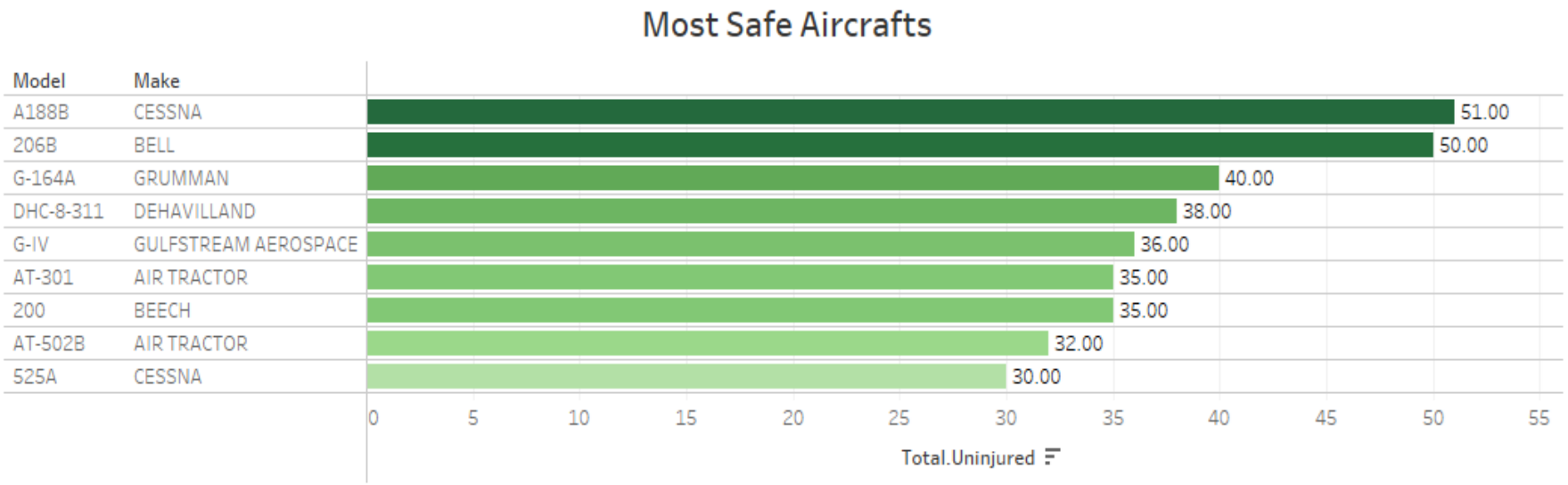
- An adequately sized sample is vital prerequisite for quantitative data analysis.
- However, we live in an ever evolving world highlighted by fast-paced technological advancements and the deprecation of old technologies.
- In the aviation sector, manufacturers are progressively advancing the design, control systems, and build-quality for aircraft models.
- Thus, the NTSB dataset is customized to suit this company's unique dynamics in venturing to a new, highly sensitive industry.
- 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.
    iii. Aerial applications.

Results



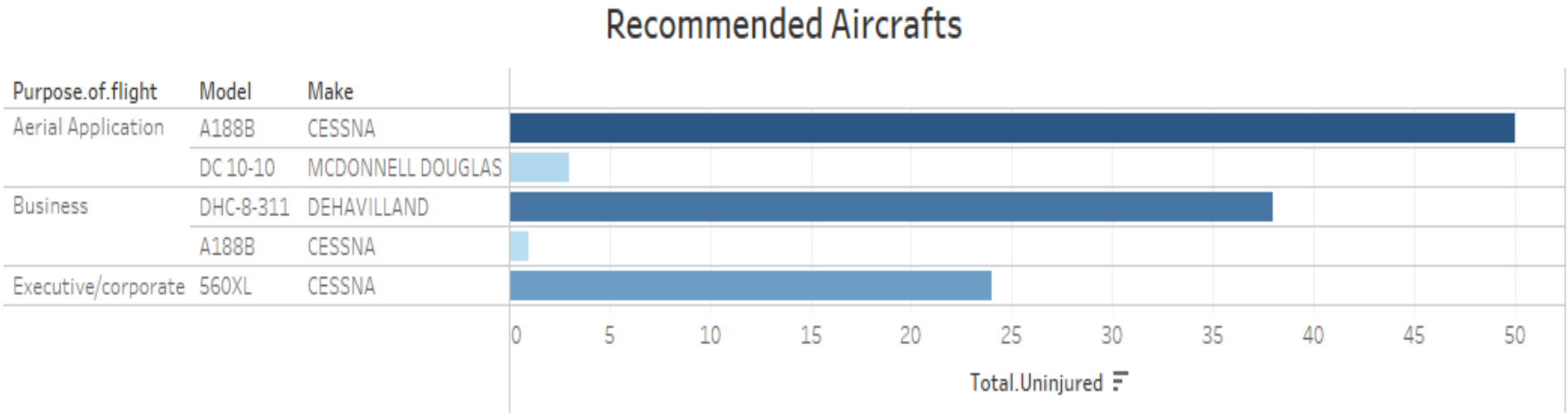
- The visualization highlights the least safe aircraft models the company should refrain from purchasing.

Results



- The visualization captures the safest aircraft models the company can consider procuring.
- However, the decision to purchase an aircraft must be justified by respective logistic operational considerations.

Results



- The safest, most operationally feasible aircraft models the company should purchase to operate Executive/ corporate, Business, and Aerial Application flights.

Conclusions

Aircraft Make - Model	Purpose of Flight	Visual
CESSNA-560XL	Executive/ Corporate Flights	
DEHAVILLAND DHC-8-311	Business Flights	
CESSNA-A188B	Aerial Applications	

Thank You!

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