Aviation Risk Assessment for New Business Opportunities

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Project Overview

- Objective: Assess aviation risks to recommend low-risk aircraft for purchase.

- Dataset: Aviation accident data (1962–2023) from the National Transportation Safety Board.

- Deliverables: Data analysis, business recommendations, and visual insights

Understanding the Business Problem

- Diversification into aviation.

- Key goals:

1. We should Minimize risks associated with aircraft operations.

2. We should Identify aircraft models with the lowest historical accident rates.

Importance: Data-driven decision-making for risk reduction.

Data Overview

- Source: National Transportation Safety Board.

- Key fields we have analyzed are as follows:

1. Aircraft Make/Model.

2. Injury Severity (Fatal, Serious, Minor).

3. Weather Conditions (IMC/VMC).

4. Total Accidents by Aircraft Type.

- Data challenges: Missing values and data standardization.

Data cleaning and Preparation Steps

- We have Dropped columns with >50% missing values.

- We have Imputed missing injury data with median values.

- We have Filtered data for the last 20 years (2003–2023).

- We have Created new features:

  - Severity Index (weighted score for injuries).

  - Yearly Accident Counts.

Accident Trends Over Time

- This is a bar graph showing yearly accident counts from 2003 to 2023.

- Insights: we have found out that there is a Steady decline in accidents due to improved safety measures.
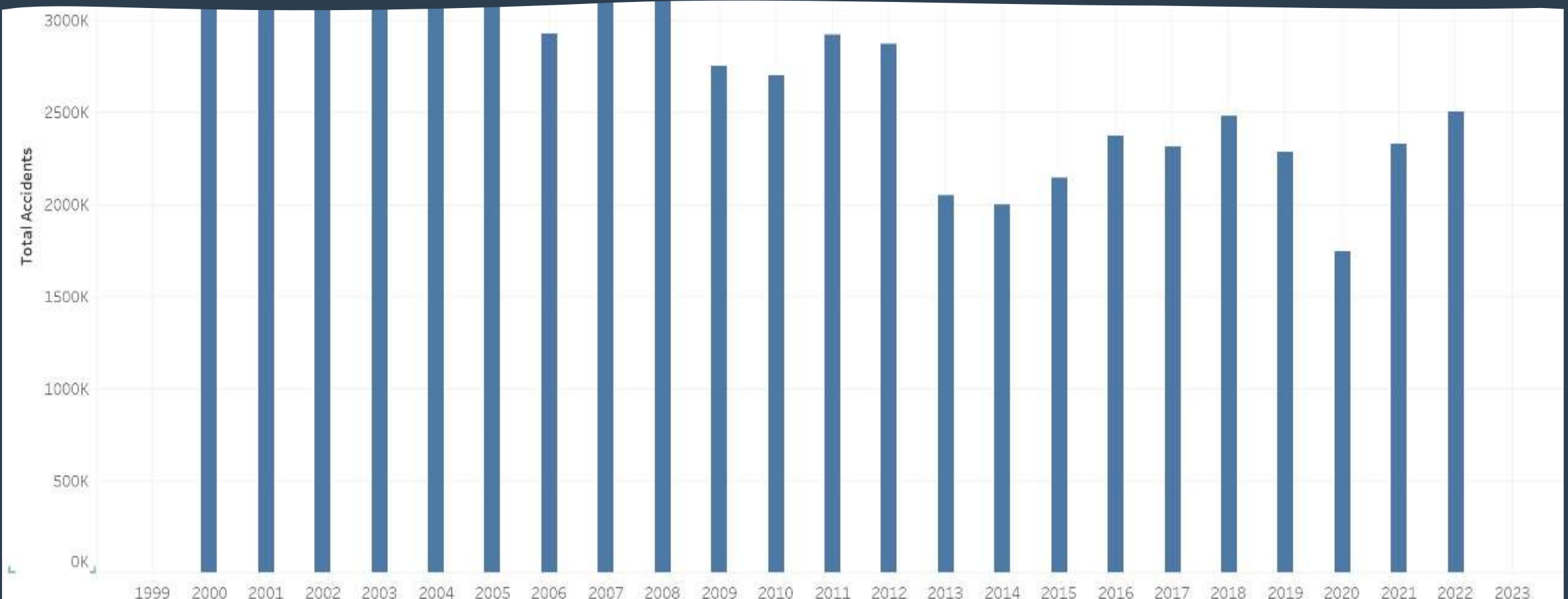
Injury Severity by Aircraft Make/Model

- This is a pie chart comparing total fatal, serious, and minor injuries by aircraft model.

- Insights: we Highlighted the models severity rates and saw the.
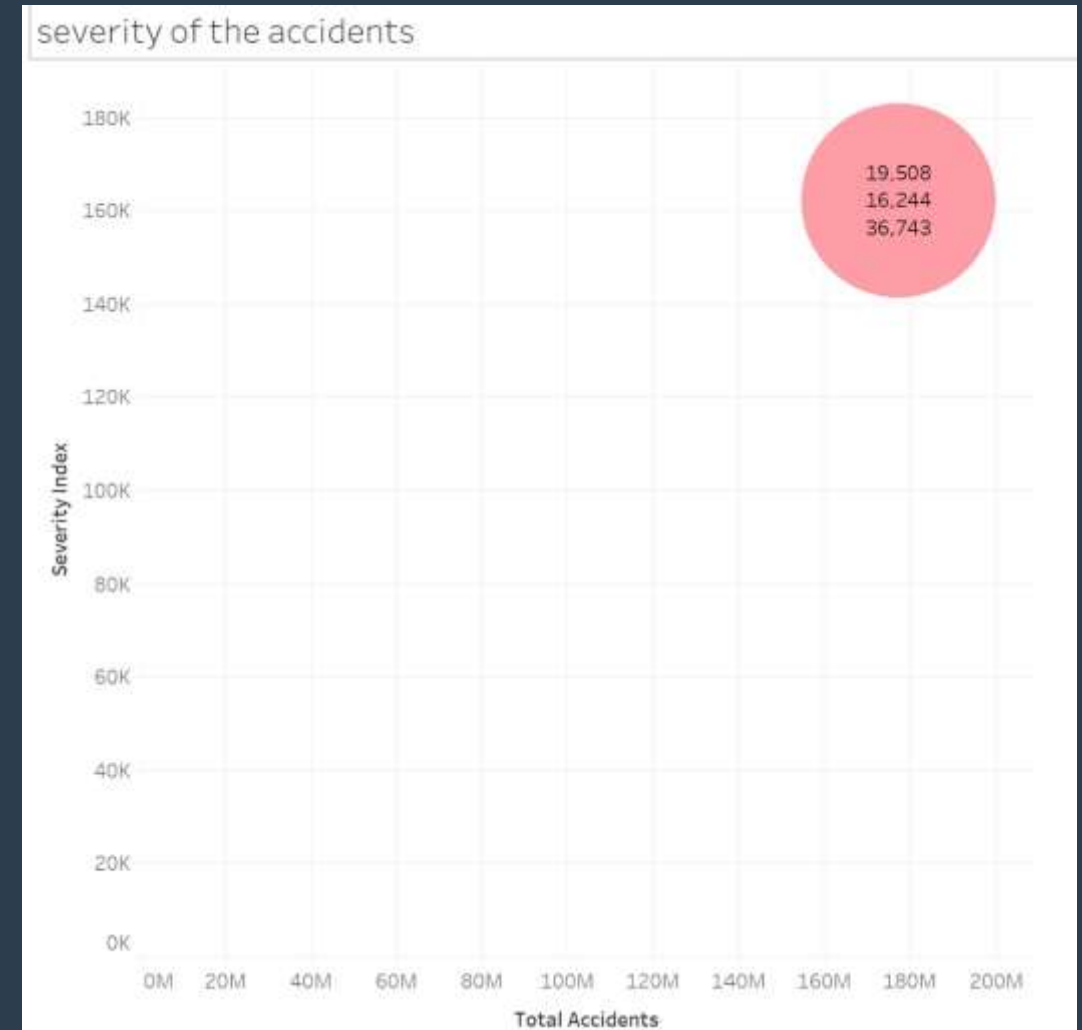
Accident Distribution by Weather Conditions

- This is a Pie chart of accidents in IMC vs. VMC conditions.

- IMC, or Instrument Meteorological Conditions, are weather conditions that require a pilot to rely on flight instruments. On the other hand, VMC, or Visual Meteorological Conditions, are weather conditions that allow a pilot to navigate by visual reference to the ground and other landmarks.

- Insights: IMC conditions contribute disproportionately to severe accidents.
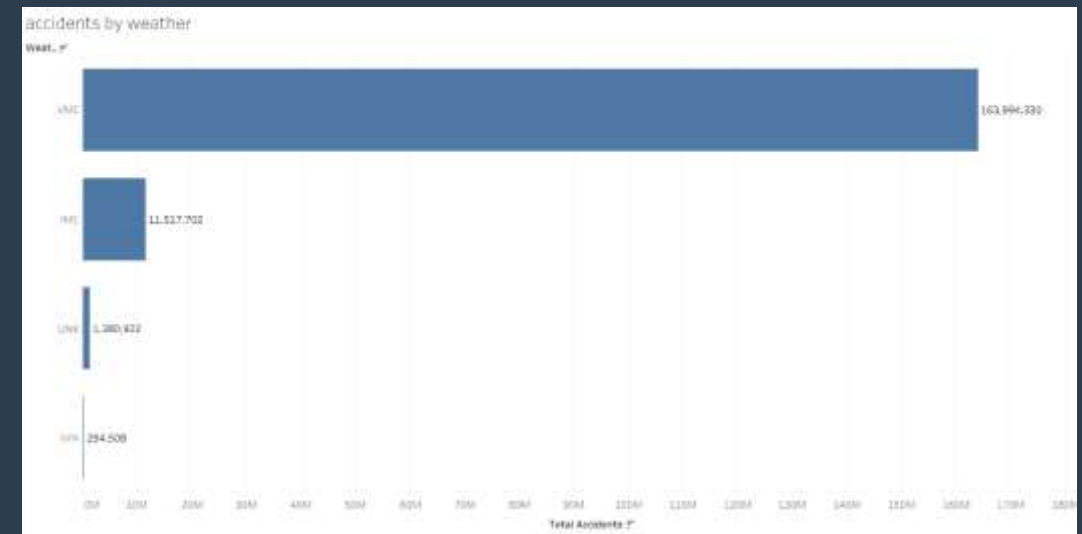
Business Recommendations

- Purchase Low-Risk Models: we should Focus on models with consistently low accident and injury rates.

- Prioritize VMC Operations: we should Develop operational guidelines to avoid IMC conditions.

- Invest in Pilot Training: we should Emphasize IFR training to mitigate risks in adverse weather.

Implementation Plan

- We should Conduct further analysis on maintenance and operational costs for recommended models.

- We should Partner with training institutions for advanced pilot programs.

- We should Establish a risk monitoring system using real-time data.

Thank You

- We invite any questions.