Reducing Risk in Aviation Investment
A Data-Driven Aircraft Safety Analysis

Using historical aviation accident data to guide aircraft acquisition decisions

By: SHARAHBILL ABDI
DATE: 18-12-2025

Overview

Purpose of This Analysis

- The company plans to expand into aviation operations
- Aviation involves high safety, financial, and liability risk
- This analysis identifies **lower-risk aircraft options** using historical accident data

Outcome

- Clear, actionable recommendations for aircraft acquisition

Business Understanding

Key Business Question

Which aircraft types present the lowest operational risk for commercial and private use?

Why This Matters

- Safety incidents increase:
  - Insurance premiums
  - Legal liability
  - Reputational damage
- Early aircraft choices determine long-term risk exposure

Data understanding

Data Source

- National Transportation Safety Board (NTSB)
- Aviation accident data (1962–2023)

What the Data Includes

- Aircraft category and manufacturer
- Injury outcomes
- Purpose of flight
- Date of accident

What We Focused On

- Accident frequency
- Injury severity as a proxy for operational risk

How risk was measured

Severity Scoring Approach

- Fatal injuries → High risk
- Serious injuries → Moderate risk
- Minor or no injuries → Lower risk

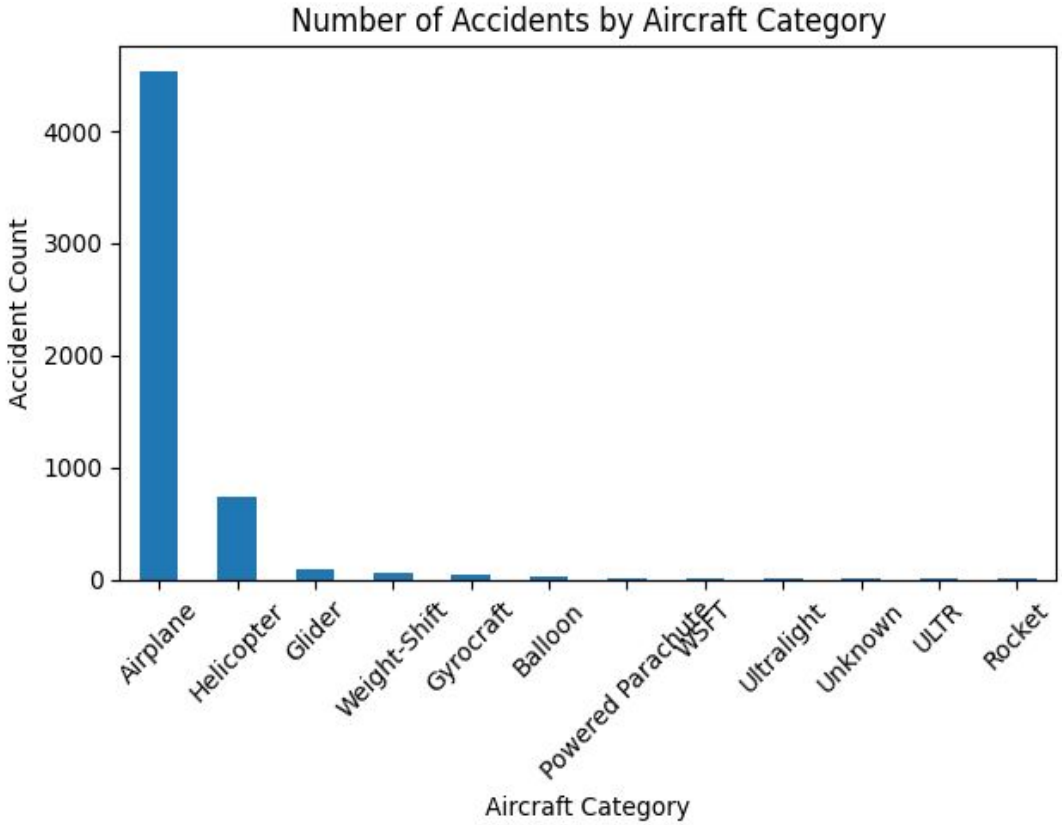
This allows us to:

- Compare aircraft categories objectively
- Move beyond anecdotal opinions

Accident Frequency by Aircraft Category

Key Insight

- Fixed-wing aircraft dominate accident counts due to volume of use
- This makes **severity** analysis critical for true risk comparison

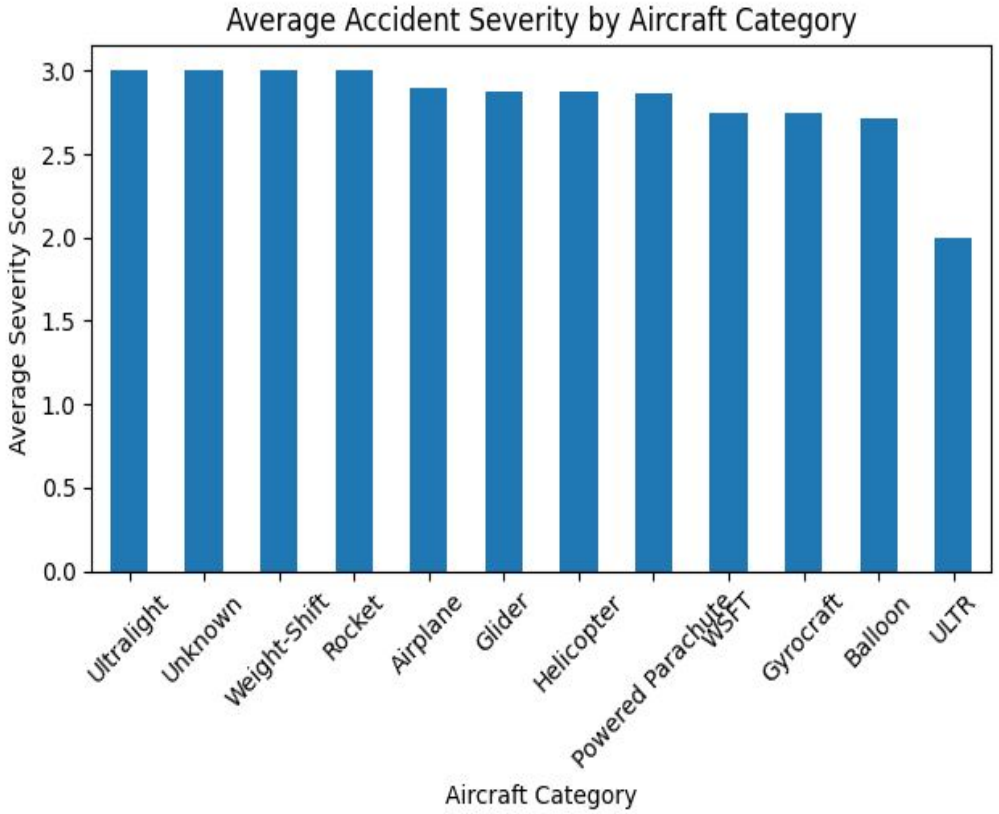


Average Accident Severity by Aircraft Category

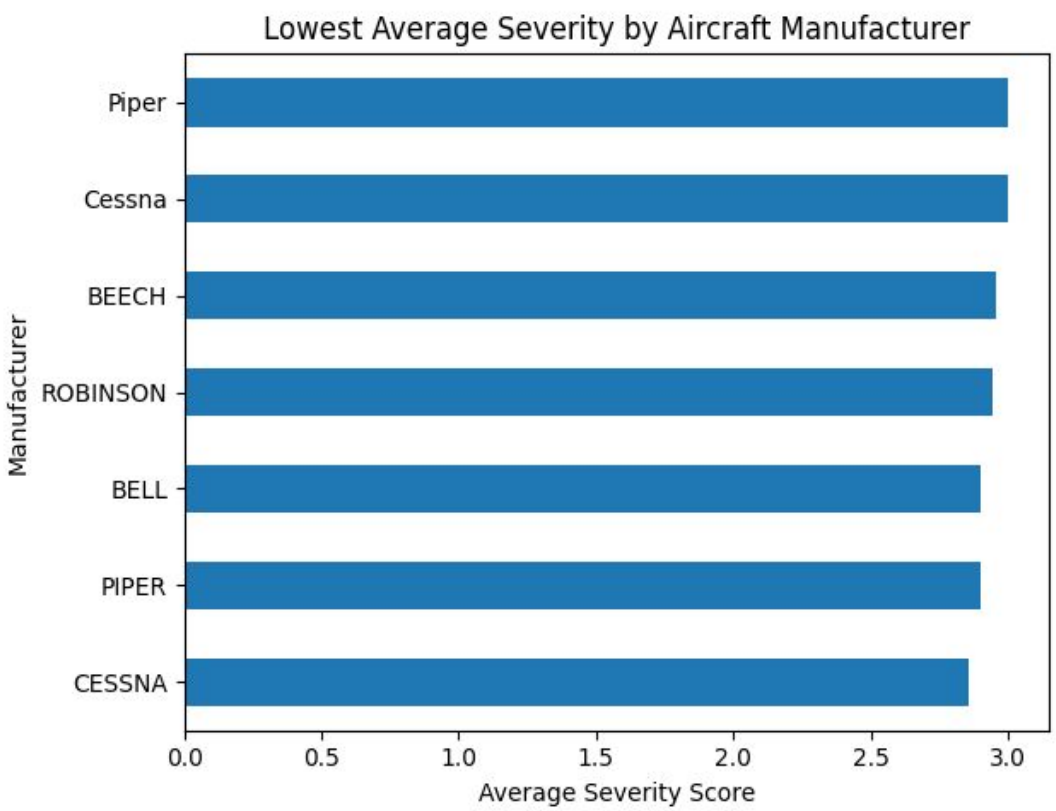
Key Insight

- Helicopters and experimental aircraft show **higher average severity**
- Fixed-wing commercial aircraft show **lower severity outcomes**

This indicates **lower human and financial impact per incident**



Lowest-Risk Aircraft Manufacturers



Key Insight

- Established commercial manufacturers consistently show lower severity
- Indicates strong design, maintenance, and safety standards

Business Recommendation

Recommendation 1

Prioritize fixed-wing commercial aircraft

They demonstrate the lowest combined frequency and severity risk.

Recommendation 2

Avoid experimental aircraft and rotorcraft in early expansion

They show higher severity outcomes and operational volatility.

Recommendation 3

Focus on proven manufacturers

Established manufacturers reduce safety, insurance, and liability exposure.

Thank you slide

THANK YOU

BY : *SHARAHBILL ABDI*

LinkedIn : www.linkedin.com/in/sharahbill-abdi-6b3463362