

# Is Aviation Right for Us?

A Data-Driven Decision Guide

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# Overview – Our Mission: Safer Skies

## Goal

Our goal is to equip leadership with a clear understanding of inherent risks and operational realities to inform a strategic decision regarding potential market entry or investment.

## Why this matters

- Informed Investment:
- Risk Mitigation
- Strategic Positioning
- Reputation & Compliance

## What I explored

Historical air accident data to pinpoint critical risk factors, evaluate operational challenges, and identify areas requiring significant strategic consideration for any new entrant.

# Business Understanding – The Aviation Frontier: Opportunity Meets Complexity

## Strategic Question

The aviation industry presents significant opportunities, but also unique operational challenges and inherent risks. Before committing resources, we need a clear, objective assessment of its safety environment.

## Business Questions

1. **What are the safety implications of different aircraft types, and how might this influence fleet selection?**
2. **How does accident severity (e.g., aircraft damage leading to fatalities) impact the operational and financial landscape for a new player?**
3. **Can historical data guide us towards safer operational models or aircraft acquisitions within the industry?**

## Project Goal

Provide actionable insights derived from accident data, empowering our strategic decision-making on **whether and how to best position our entry** into the aviation industry.

A small white propeller plane with blue and yellow markings is parked on a runway. The plane is viewed from a low angle, emphasizing its tail and wing. The background is a clear blue sky and a flat horizon.

# Analytical Compass

## Data Understanding

**The Data Source:** A comprehensive dataset of historical air accident incidents (1948 -2022) provided by the NTSB. This rich source provides details essential for understanding the operational realities and inherent risks within the aviation sector.

### Key Data Points Utilized:

- **Accident Phase:** (e.g., Landing, Takeoff, Cruise)
  - **Purpose of Flight:** (e.g., Personal, Instructional, Commercial)
  - **Aircraft Category:** (e.g., Airplane, Helicopter)
  - **Aircraft Damage Level:** (e.g., Minor, Substantial, Destroyed)
  - **Fatalities:** Number of lives lost
  - **Aircraft Model & Make:** Identification of specific aircrafts.
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# Analytical Approach

## Exploratory Data Analysis - EDA

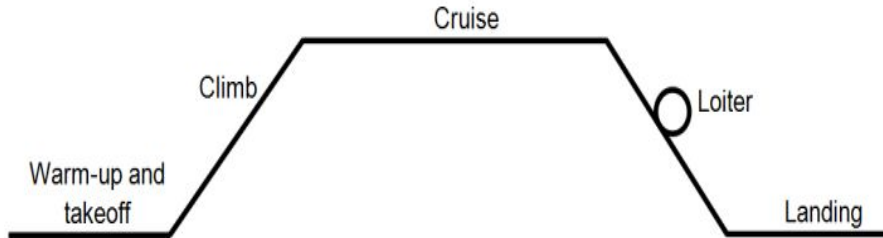
Python, a powerful programming language, was used along with these specialized libraries:

- **Pandas & Numpy:** For efficiently organizing and manipulating large datasets, acting like an advanced spreadsheet.
  - **Matplotlib & Seaborn:** For creating clear and informative visualizations, transforming raw numbers into understandable pictures of risk and trends.
  - **This process, known as Exploratory Data Analysis (EDA), systematically uncovered patterns, identified potential pitfalls, and highlighted areas requiring deep consideration before market entry.**
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# Data Analysis – Identifying Inherent Risks

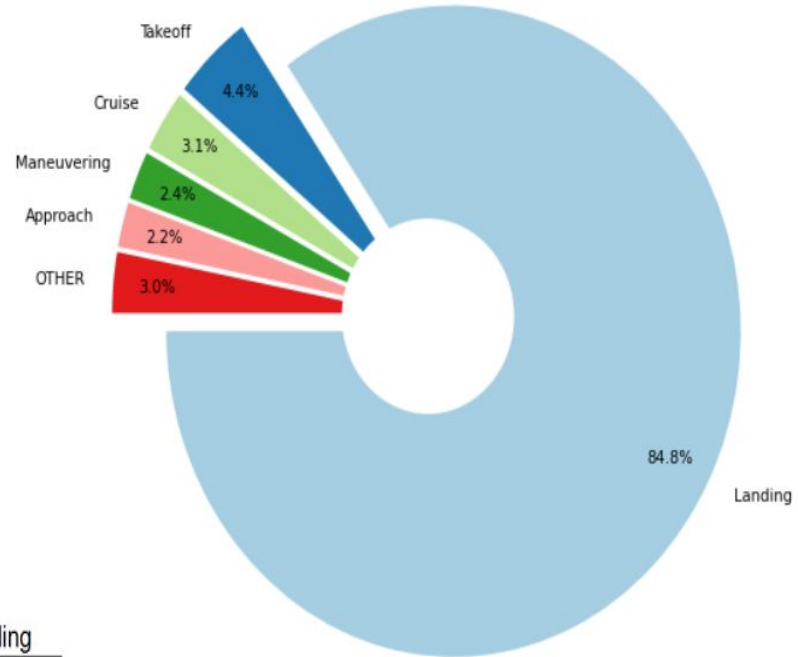
## Landing Phase – The Most Consistent Risk Point for Any Operation

- Insight: landing phase of flight accounts for the highest number of recorded air accidents across the industry.
- For any new entrant, this highlights a fundamental, high-risk operational segment that demands rigorous planning, advanced pilot training, and robust equipment maintenance.



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Distribution of Accidents by Broad Phase Of Flight



# Market Segments and Their Risk Profiles

## Personal & Instructional Flights – A Segment with Elevated Accident Incidence

### Insight:

- Majority of recorded accidents occur within flights conducted for **personal and instructional purposes**.
- Should the company consider entering these segments, we would face a higher inherent accident frequency, potentially linked to diverse pilot experience levels, less standardized operations, or varied flight environments.

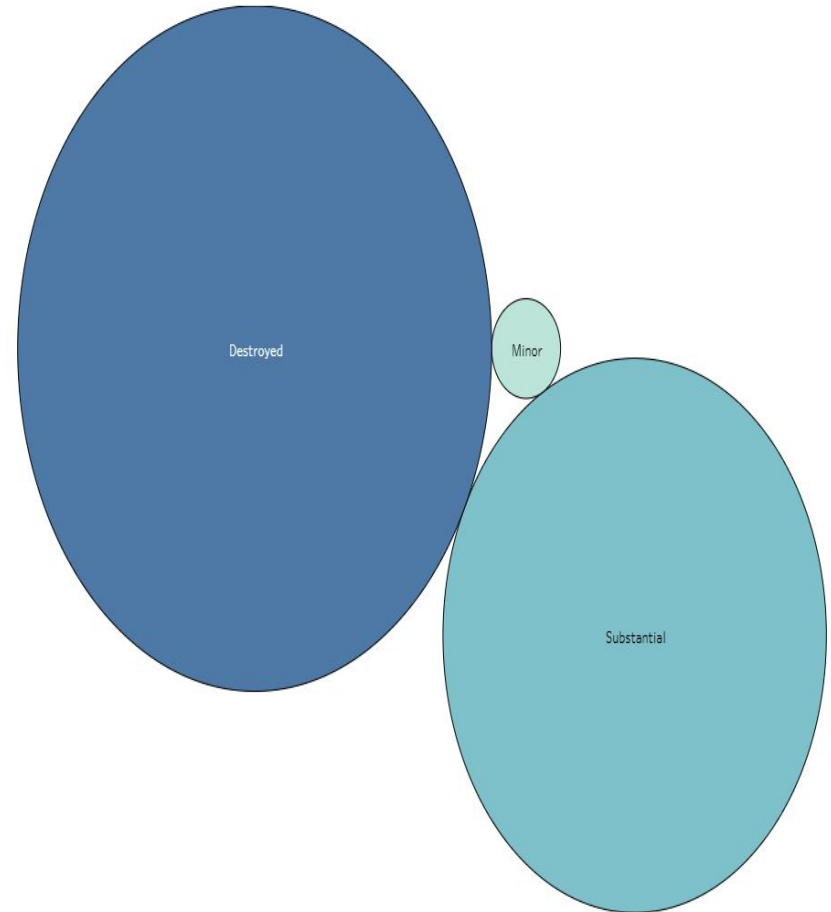
PURPOSE	RECORDS
Personal	21266
Instructional	3740
Ariel Application	1386
Unknown	1119
Business	915
Positioning	515
Other work use	334
Aerial Observation	313
Flight Test	266
Ferry	195

# Asset Loss and Human Impact

## Catastrophic Damage Drives Fatalities; Airplanes Show Higher Fatality Rates

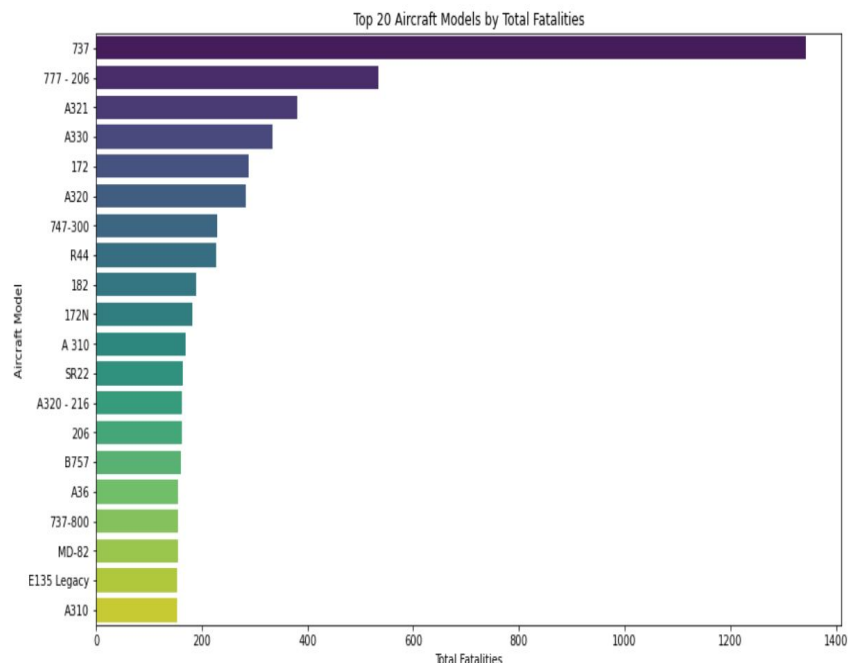
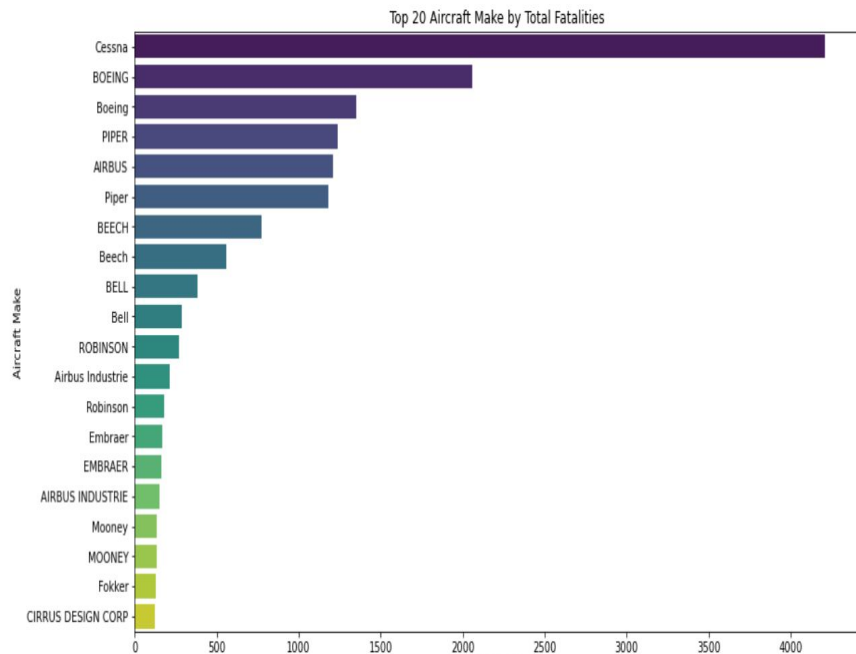
- **Insight:** While "Substantial Damage" is the most common outcome, a **significantly higher number of fatalities occur when aircraft are classified as "Destroyed."**

Furthermore, **airplanes exhibit a 69.5% fatality rate**, slightly higher than **helicopters at 63.0%**, a factor to consider when evaluating fleet acquisition and operational risk.





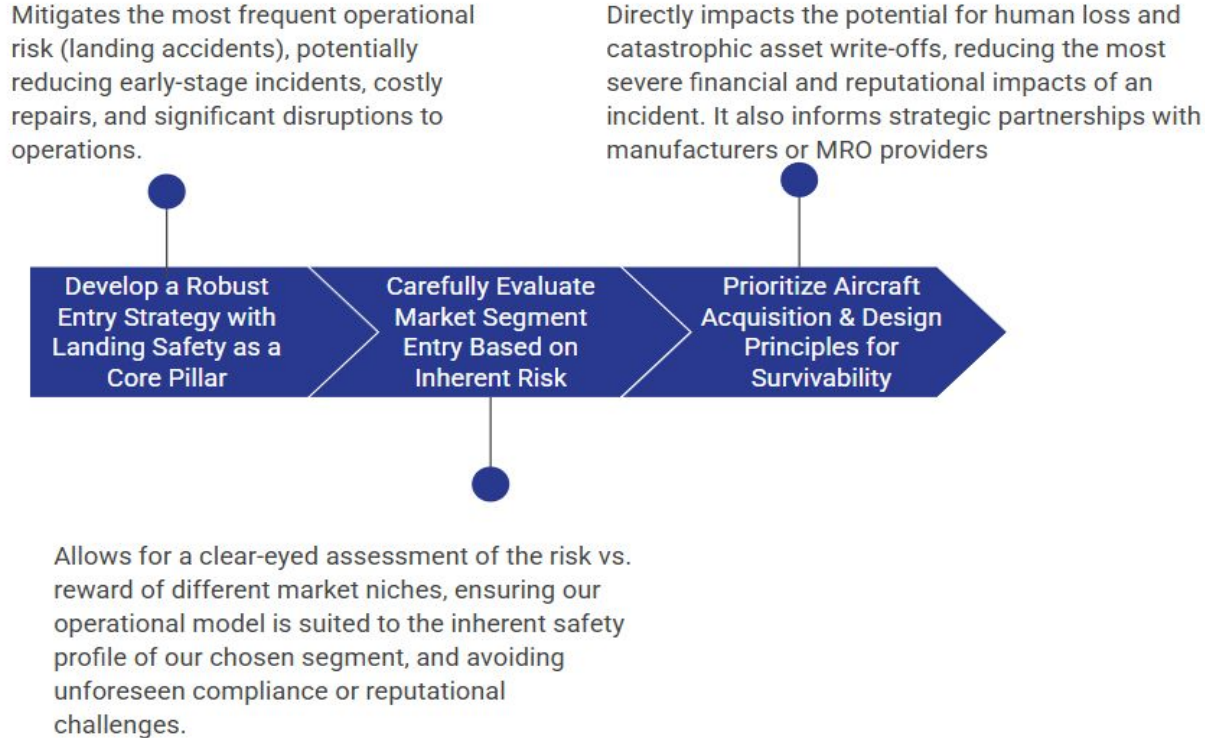
# Identifying Safer Operational Makes/Models



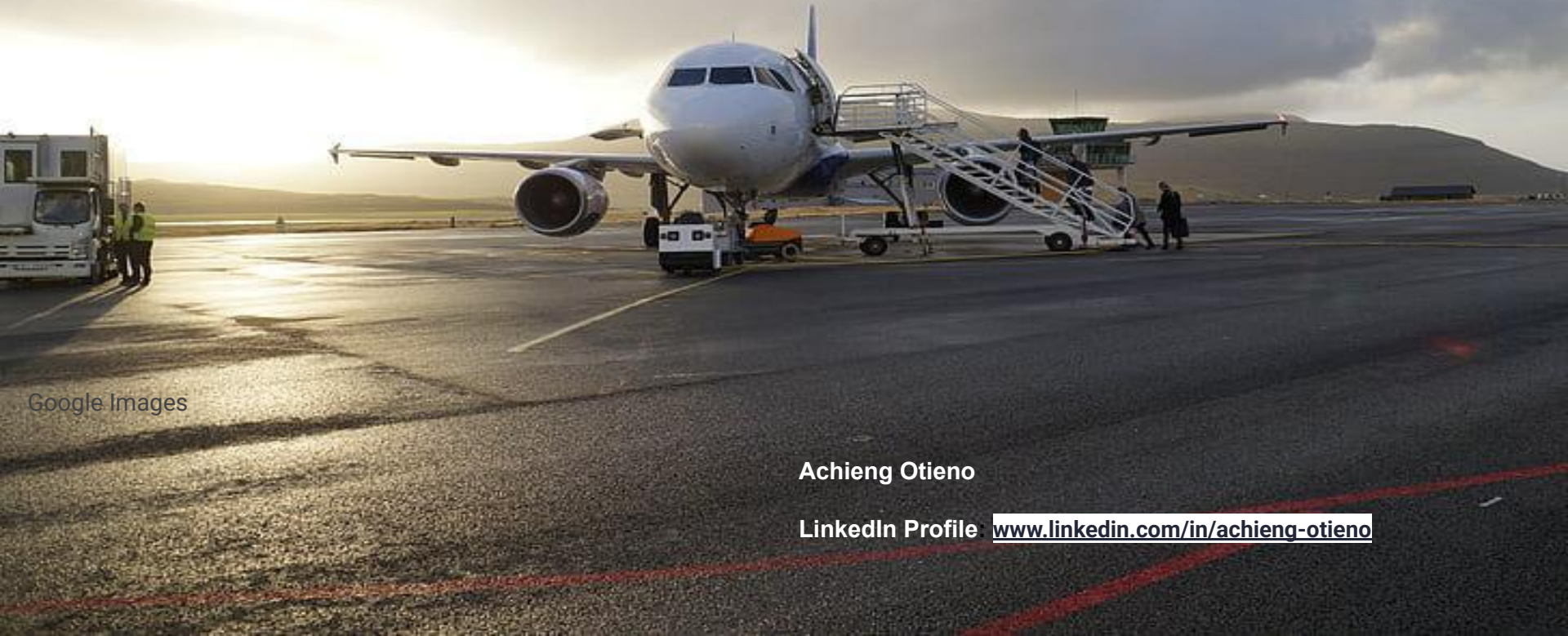
**Airbus A310 Aircraft Model** has demonstrated the **lowest number of recorded fatalities** in our dataset, indicating a potentially robust design or operational safety record.

**Cirrus Design Corp and Fokker Makes** also show the **lowest fatality counts**

# Recommendations – Strategic Pathways for Aviation Entry



# Questions?



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