

- A Data-Driven Approach to Aviation Safety and Operations



# ❏ Project Overview

## **Objective:**

Support strategic entry into aviation through safe and cost-efficient aircraft acquisition.

## **Approach:**

Analyze industry-wide aircraft incident data to identify models with low operational and safety risks.





# ❑ Business Understanding

## ❑ Why This Matters:

- Aircraft investments carry high financial and operational stakes.
- Poor decisions can result in high maintenance, safety violations, and reputational loss.

## Our Solution:

- Data-driven analysis to ensure informed, risk-conscious fleet selection.





# ❏ Dataset overview

- Source: NTSB Aviation Accident Synopses (Kaggle)  
Timeframe: 1962-2023  
Records: 90,348 incidents

Key Fields:

- Event\_ID
- Make and Model
- Fatalities / Minor Injuries
- Flight Phase



# ❑ Data Cleaning & Preparation

## ❑ Steps Taken:

- Removed columns with high missing values
- Dropped rows with missing essential data
- Standardized formats and removed duplicates
- Labeled missing flight phases as 'Unknown'

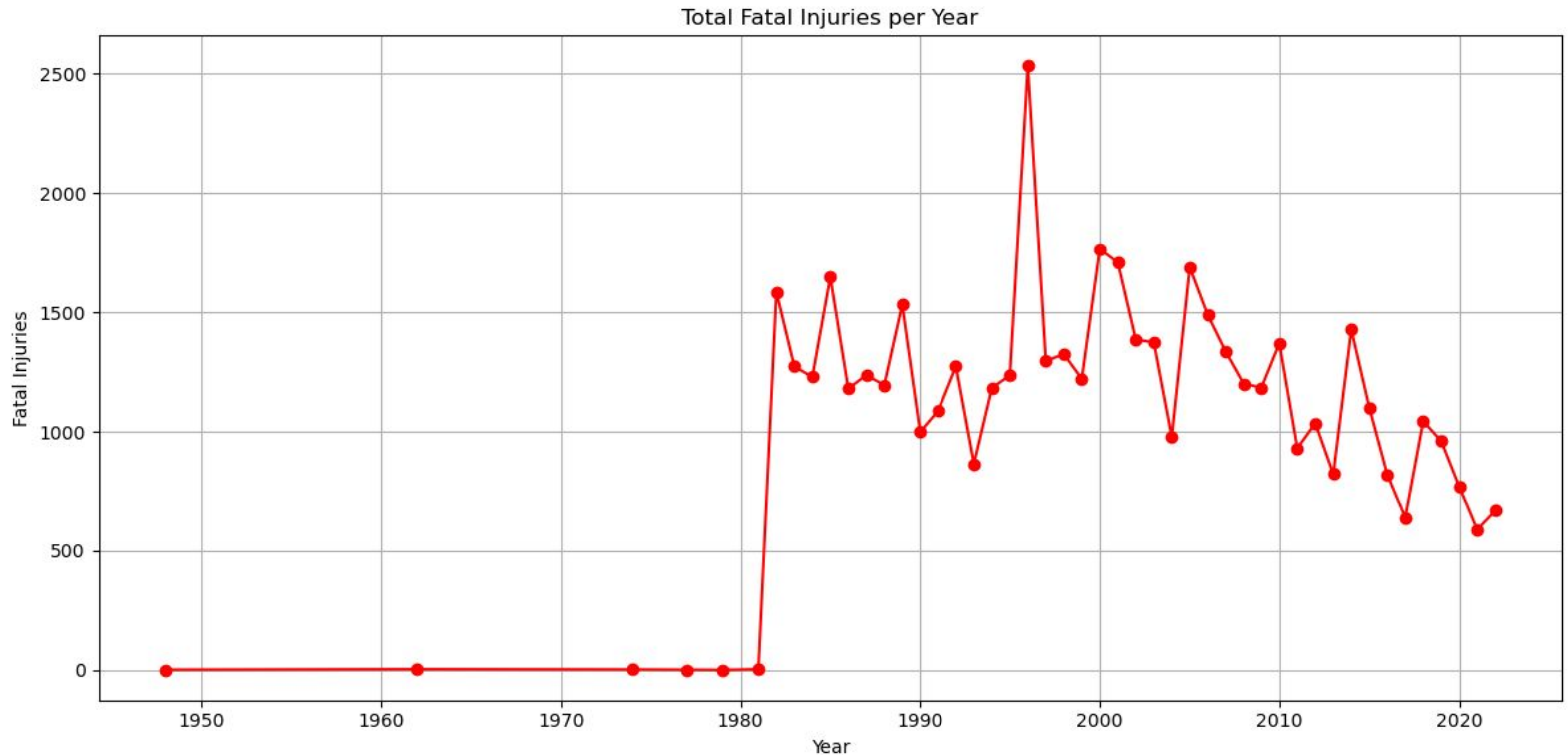




# Visualization

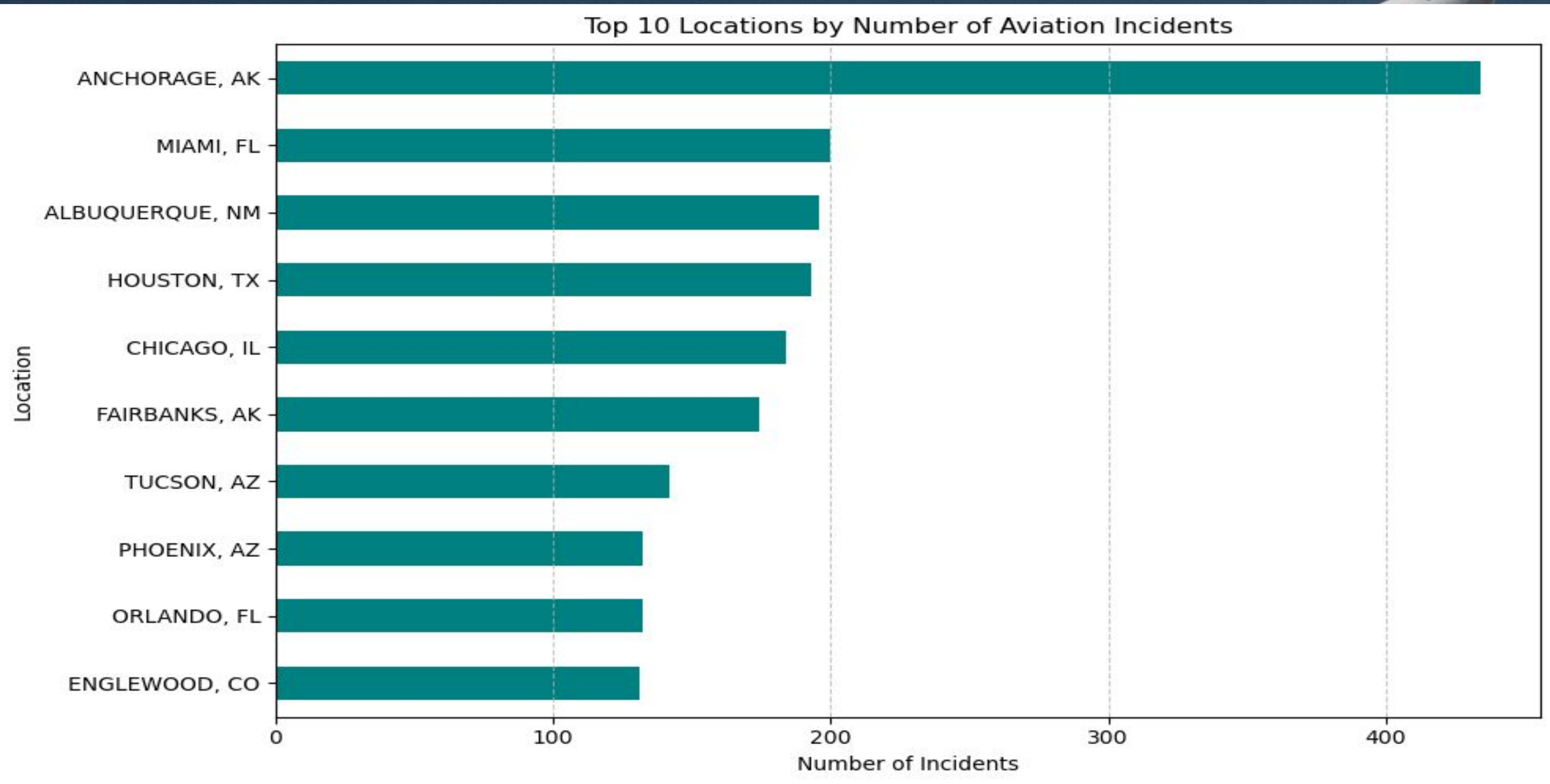
Line chart showing trends in fatal injuries over time

Insight: Decline in fatal injuries over decades indicates improved aviation safety



# Visualization.

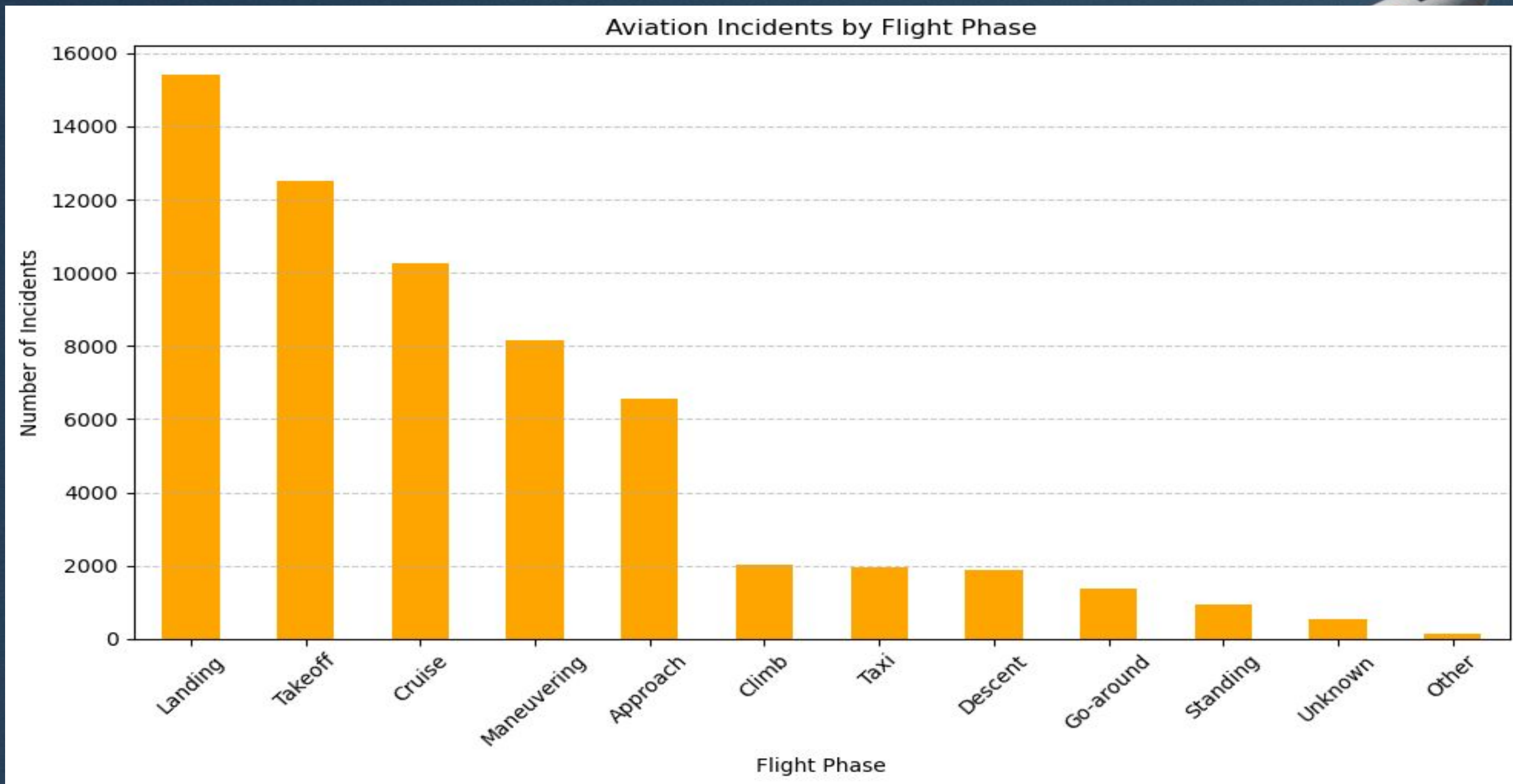
- ★ Bar chart of most incident-prone locations  
Insight: Key hotspots identified, valuable for regional risk assessments





# Visualization.

- ★ Pie chart of accident distribution by flight phase  
Insight: Takeoff and landing are most accident-prone; recommend training focus.





## ❏ Conclusion & Recommendations.

### ★ Key Takeaways:

- Historical data reveals low-risk aircraft models and risky flight phases
- Informed selection reduces safety and operational risks

### Recommendations:

- Prioritize aircraft with strong safety records
- Emphasize pilot training for high-risk flight phases.

