

# AVIATION DATA ANALYSIS

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PROJECT DETAILS: ANIN DEPTH EXPLORATION OF TRENDS,  
SEVERITY AND KEY FACTORS AFFECTING RISK OF AIRCRAFT MAKE  
AND MODEL.

# ANALYSIS OBJECTIVE

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- A G E N D A
- Identify trends in aviation accidents
- Understand factors affecting accident severity.
- Provide actionable recommendations to choose low risk aircrafts.

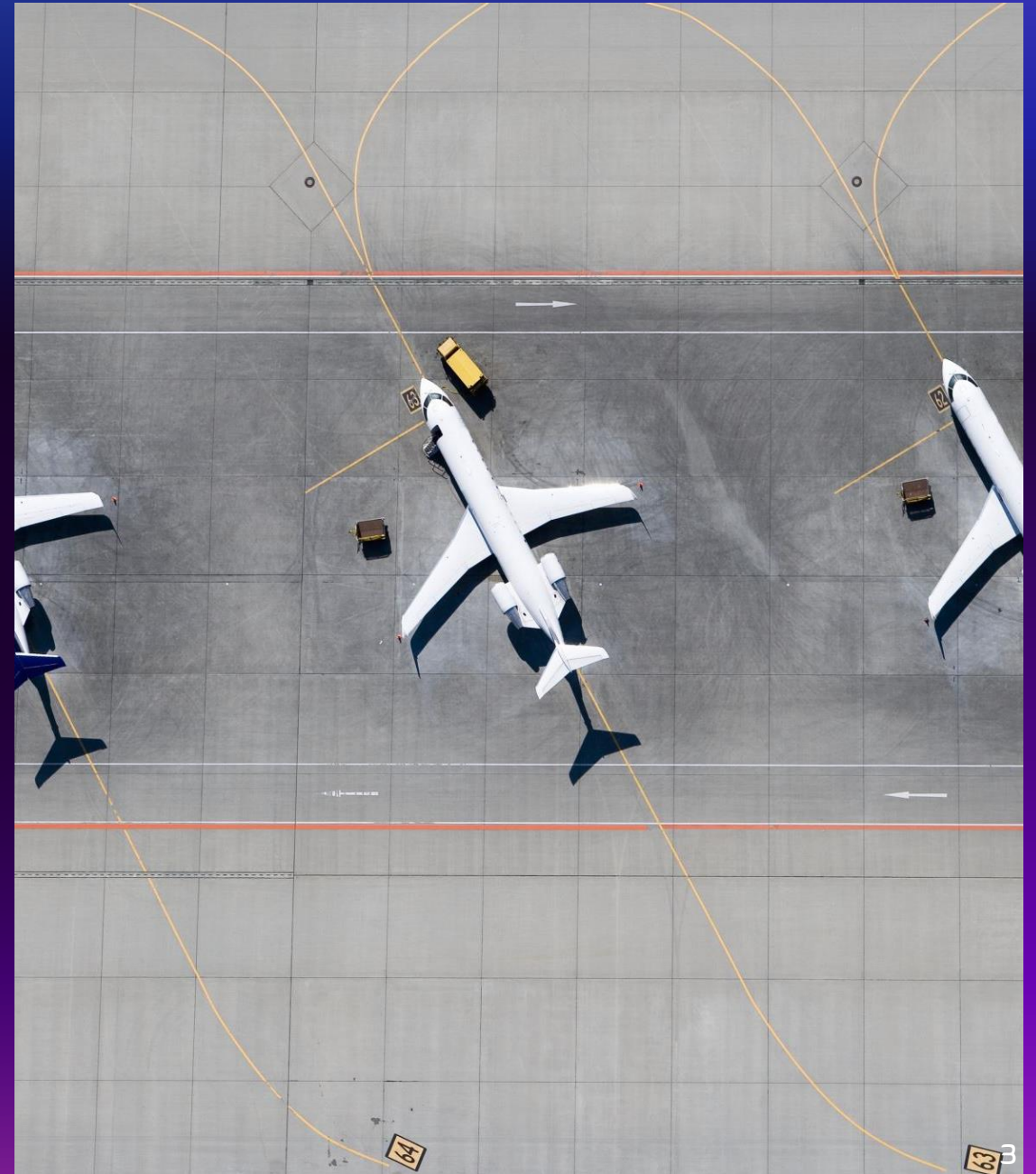
# AVIATION DATASET OVERVIEW

SOURCE: DATA SOURCED FROM AVIATION  
ANALYSIS.

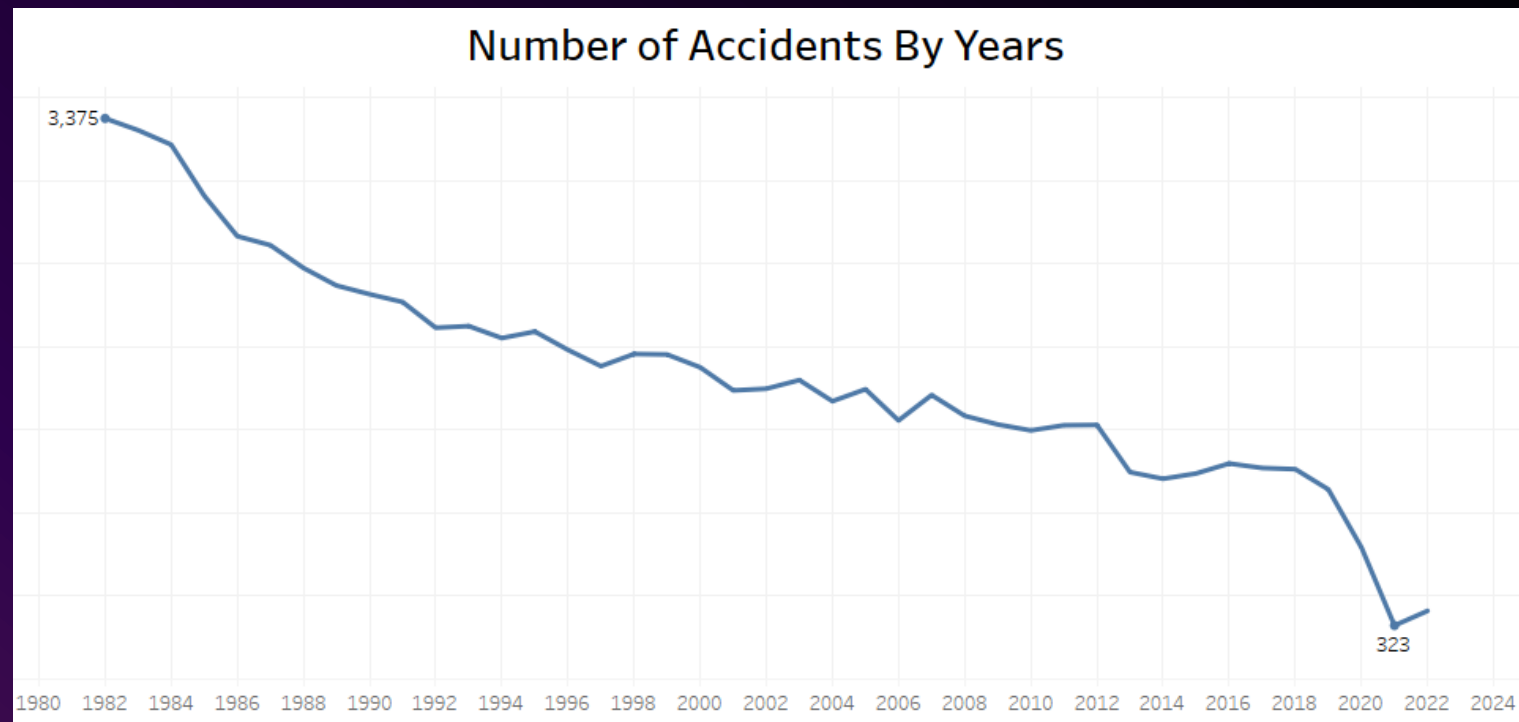
TIMEFRAME: 1962 – 2024

FEATURES :  
AIRCRAFT MAKE, MODEL, SEVERITY  
SCORE, TOTAL FATAL INJURIES,  
WEATHER CONDITIONS, NUMBER OF  
ACCIDENTS.

KEY FOCUS AREAS:  
ACCIDENT COUNT, INJURY SEVERITY AND  
AIRCRAFT MODEL & MAKE.



# YEARLY ACCIDENT TRENDS



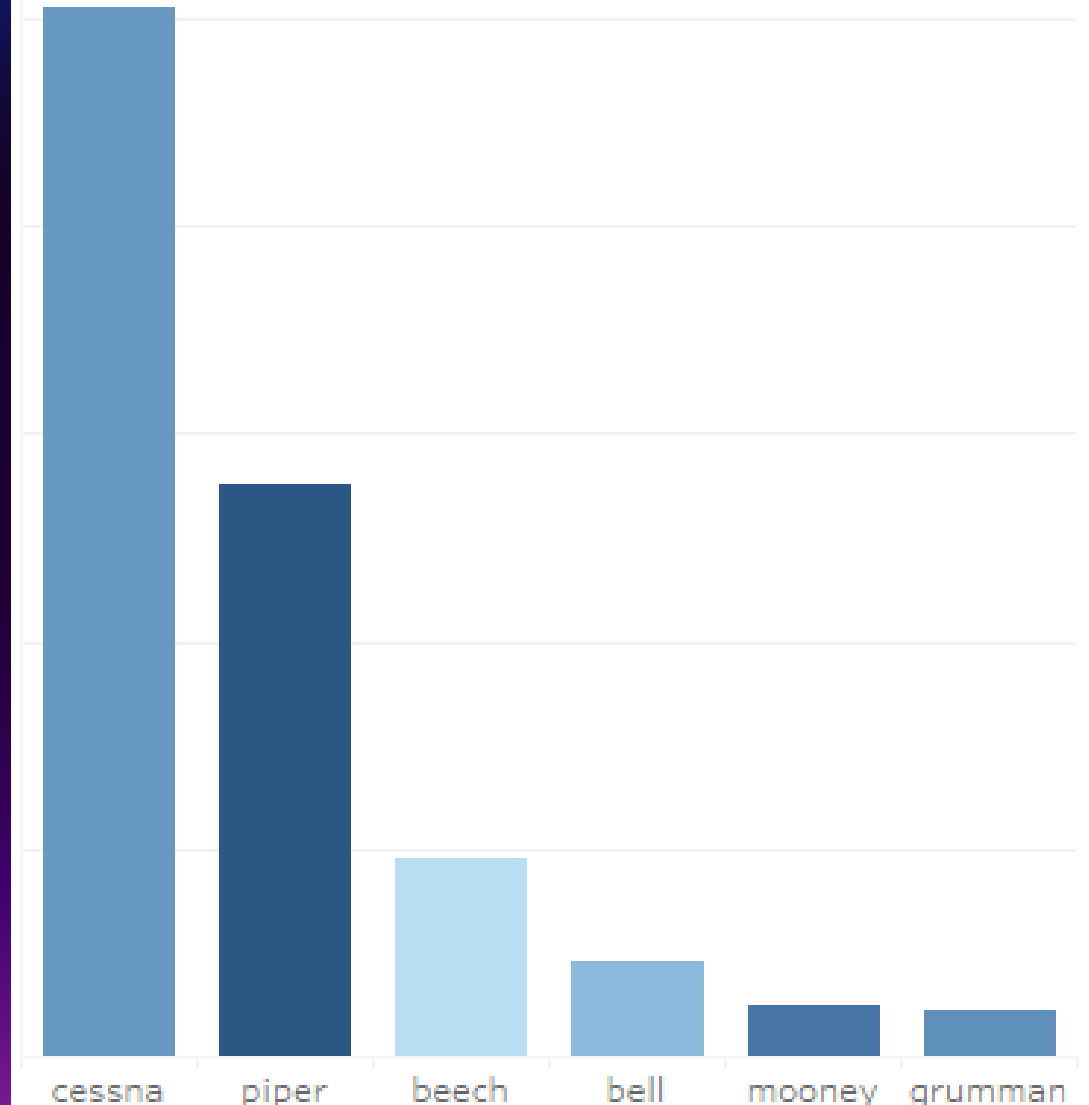
## KEY POINTS

1. Steady increase in accidents from 1962 to 1983.
2. Peak accidents years identified from 1980.
3. Decline in accidents post 2015.

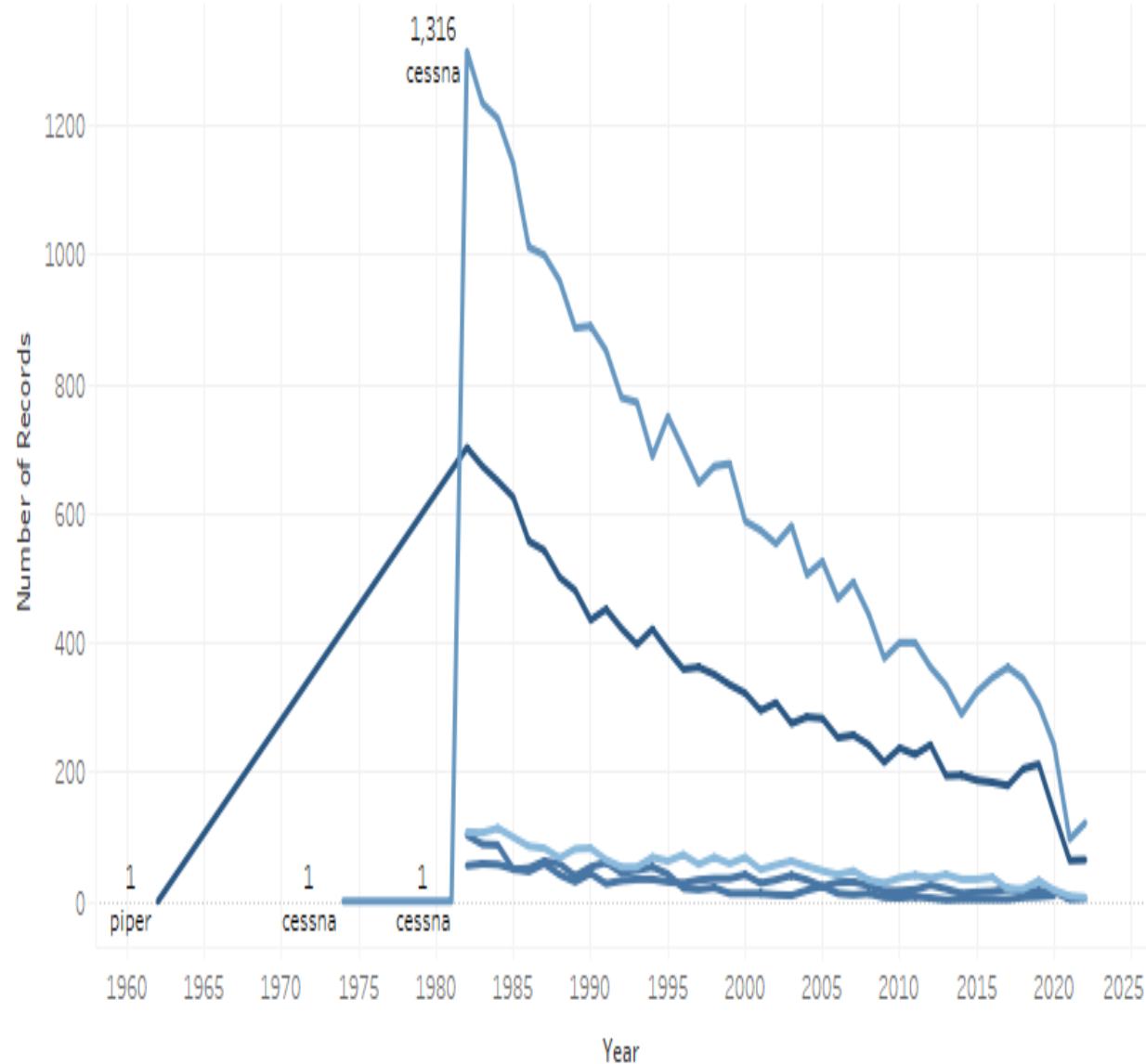
# TOP 6 AIRCRAFT MAKE WITH MOST ACCIDENTS.

- 1.Cessna consistently shows the highest accident rates.
- 2.Mooney witnessed significant improvement after 2005.
- 3.Possible causes: weather, human error.

Accidents Per Aircraft Make



Accident Trends per Year by Aircraft Make



## ACCIDENT TRENDS PER YEAR BY AIRCRAFT MAKE

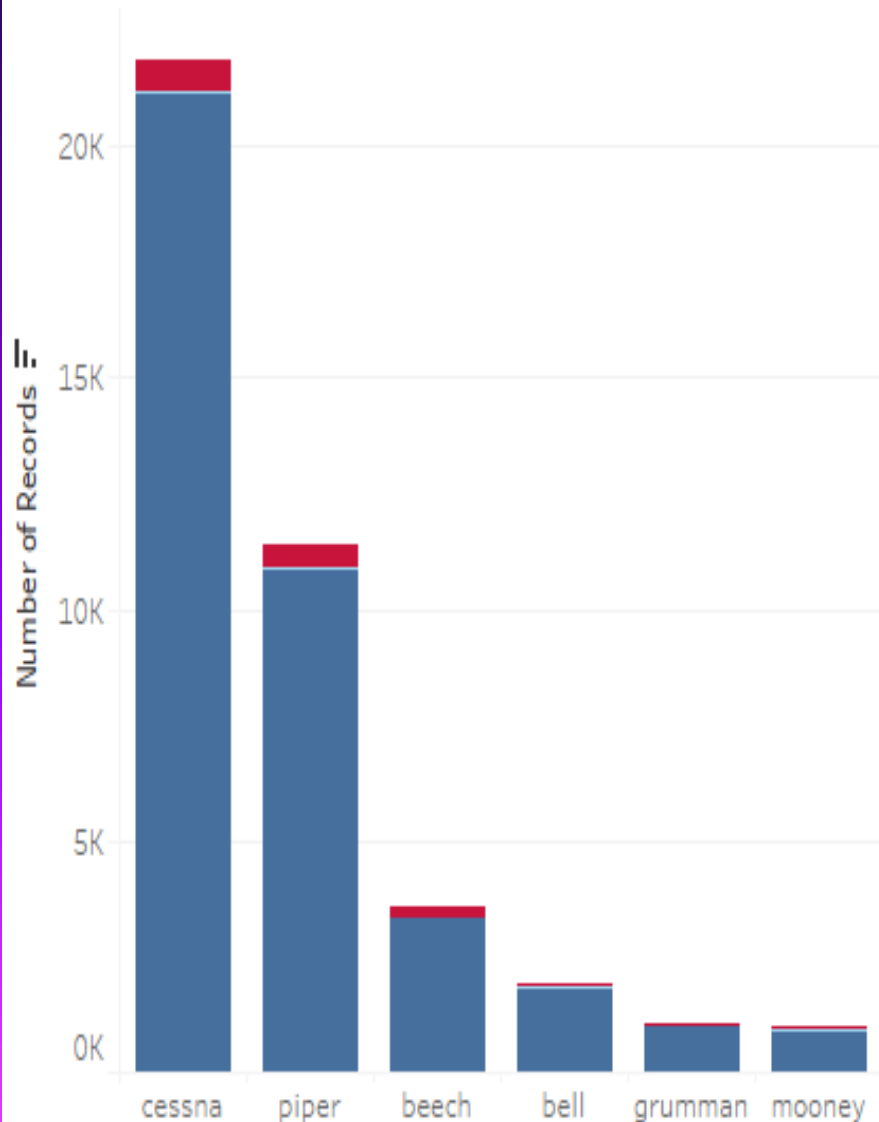
Cessna records the highest record of accidents in 1982 and gradually dropping over the years.

Piper experiences a significant rise in 1982 as well with 703 records.

Bell, Grumman, Mooney, record less than 200 accidents within the same year.

## Injury Severity by Make

Make



## IMPACT OF MAKE ON SEVERITY.

High correlation between total fatal injuries and severity score.

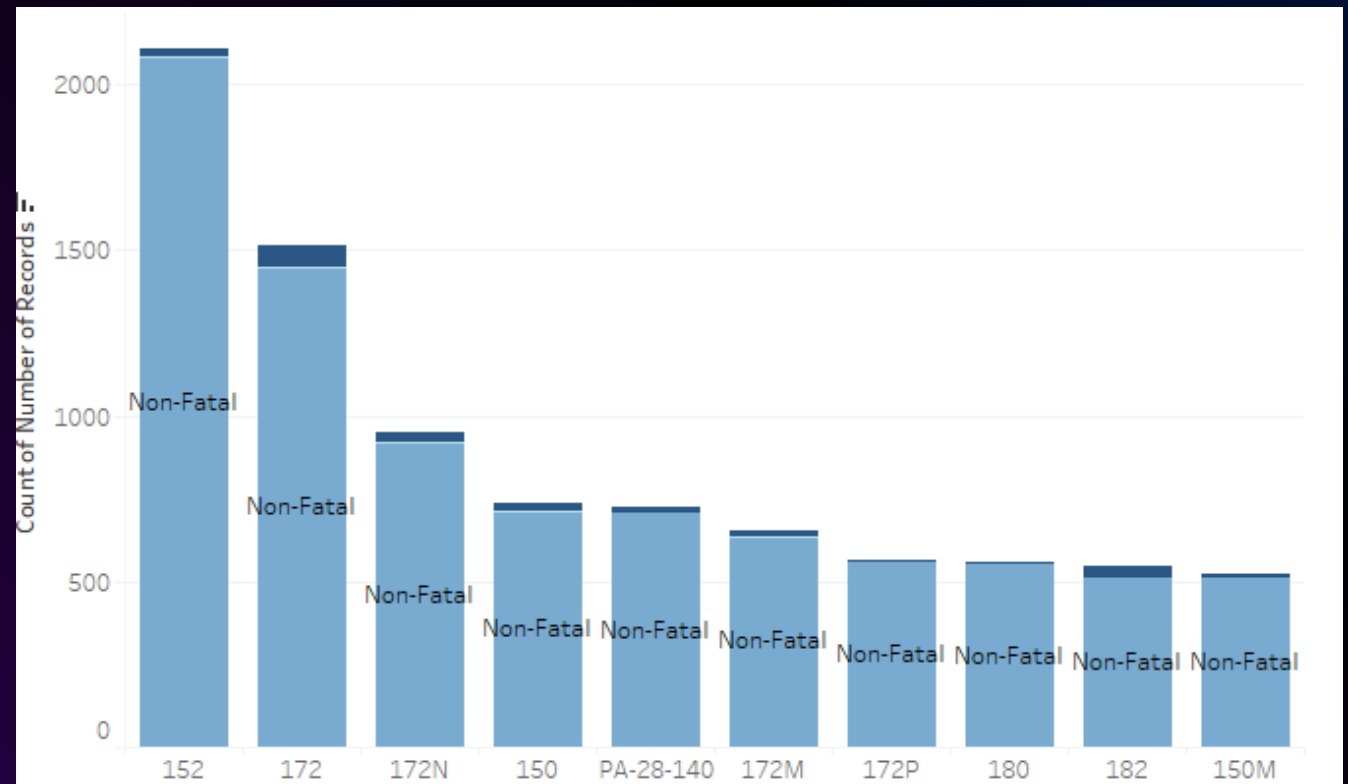
Majority of lower severity accidents involve minor injuries.

Grumman and Mooney experienced low injury severity.



# IMPACT OF MODEL ON SEVERITY.

1. Model 172 experienced the highest number of fatal injuries of 65.
2. Model 172, 172N and 150 recorded the highest number of total fatal injuries overall.
3. Aircraft models , 172P, 180 and 150M have the lowest cases of fatal injuries compared to the rest.





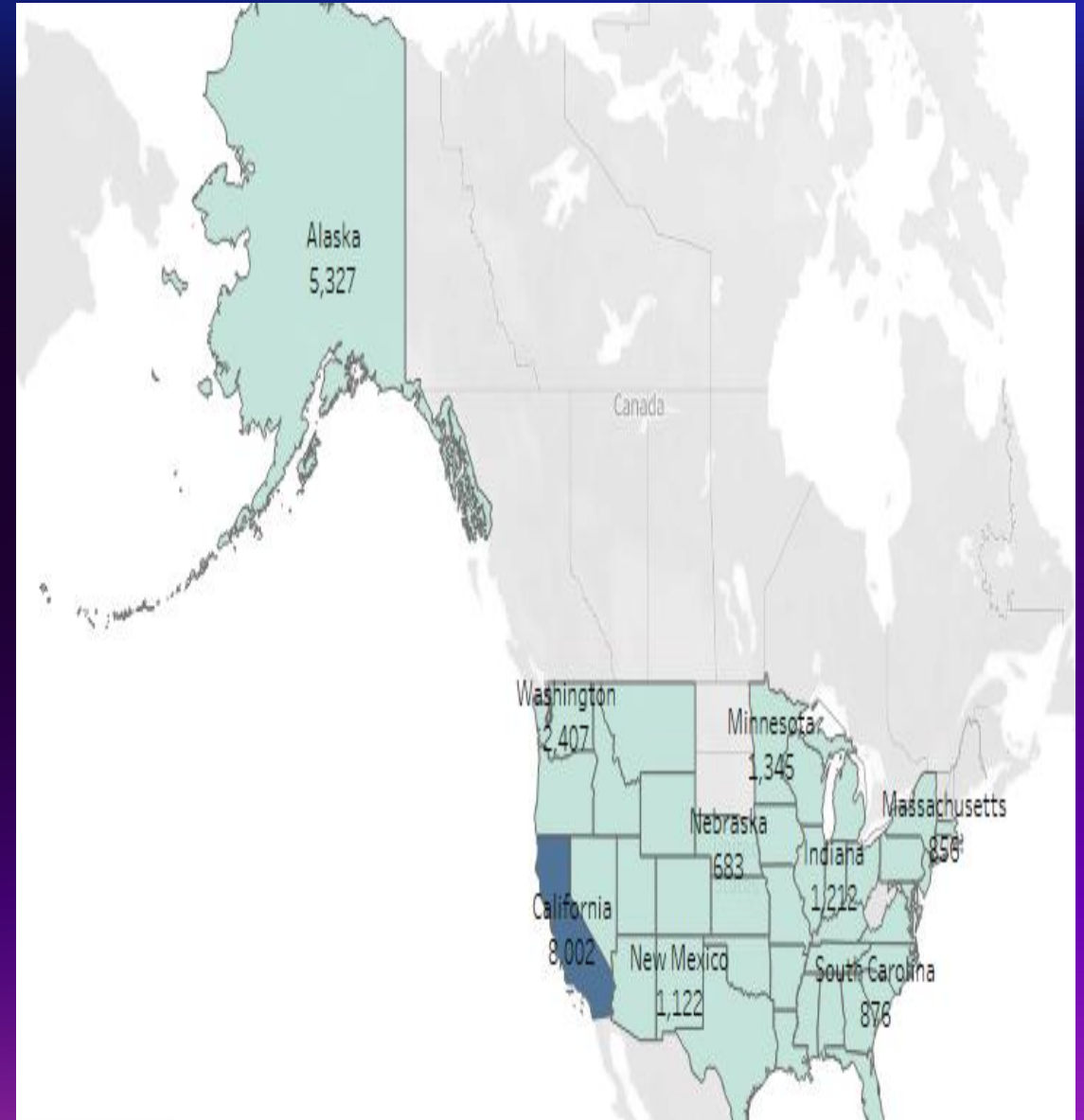
# GEOGRAPHICAL DISTRIBUTION OF ACCIDENTS.

## ACCIDENT DENSITIES BY STATE.

Summary of Top 40 States with highest number of accident records

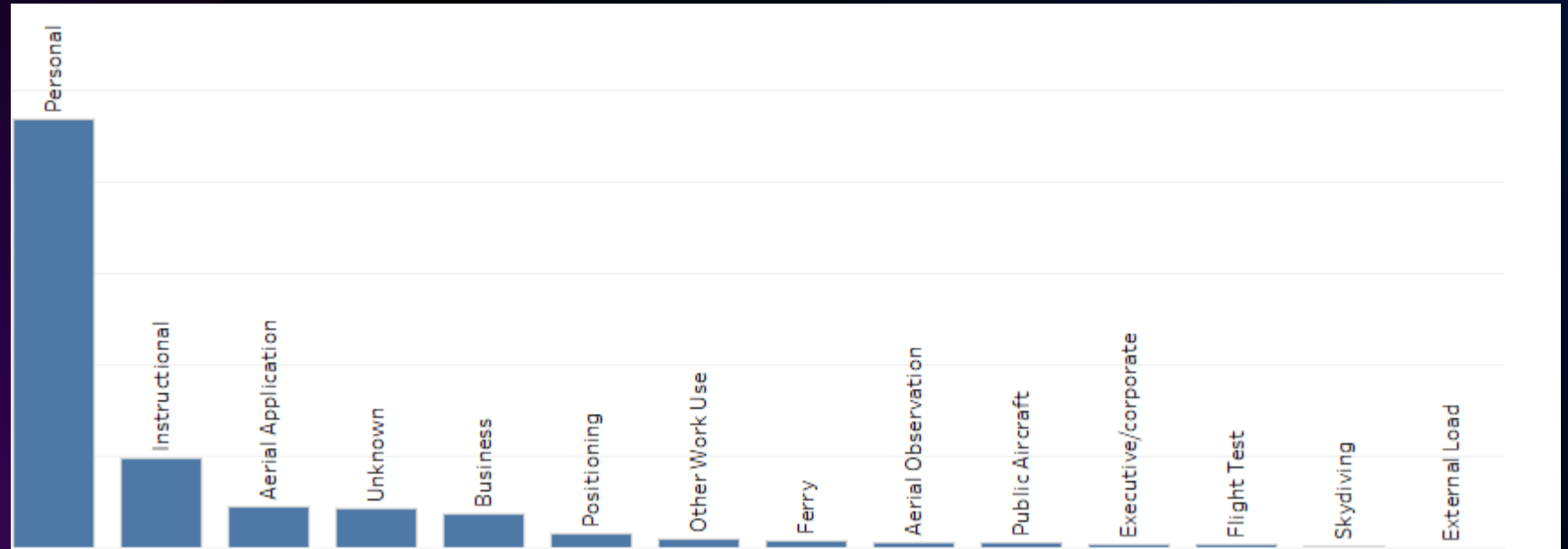
High density accident regions; California, Alaska and Texas.

Urban areas see more accidents involving airplanes compared to other aircraft category.



# ACCIDENTS BY FLIGHT PURPOSE

- Personal flights contribute significantly to accidents.
- Instructional flights experience moderate accidents.
- In low moderation is skydiving with 134 number of accident records.



# LOW RISK AIRCRAFT IDENTIFICATION

## By Make

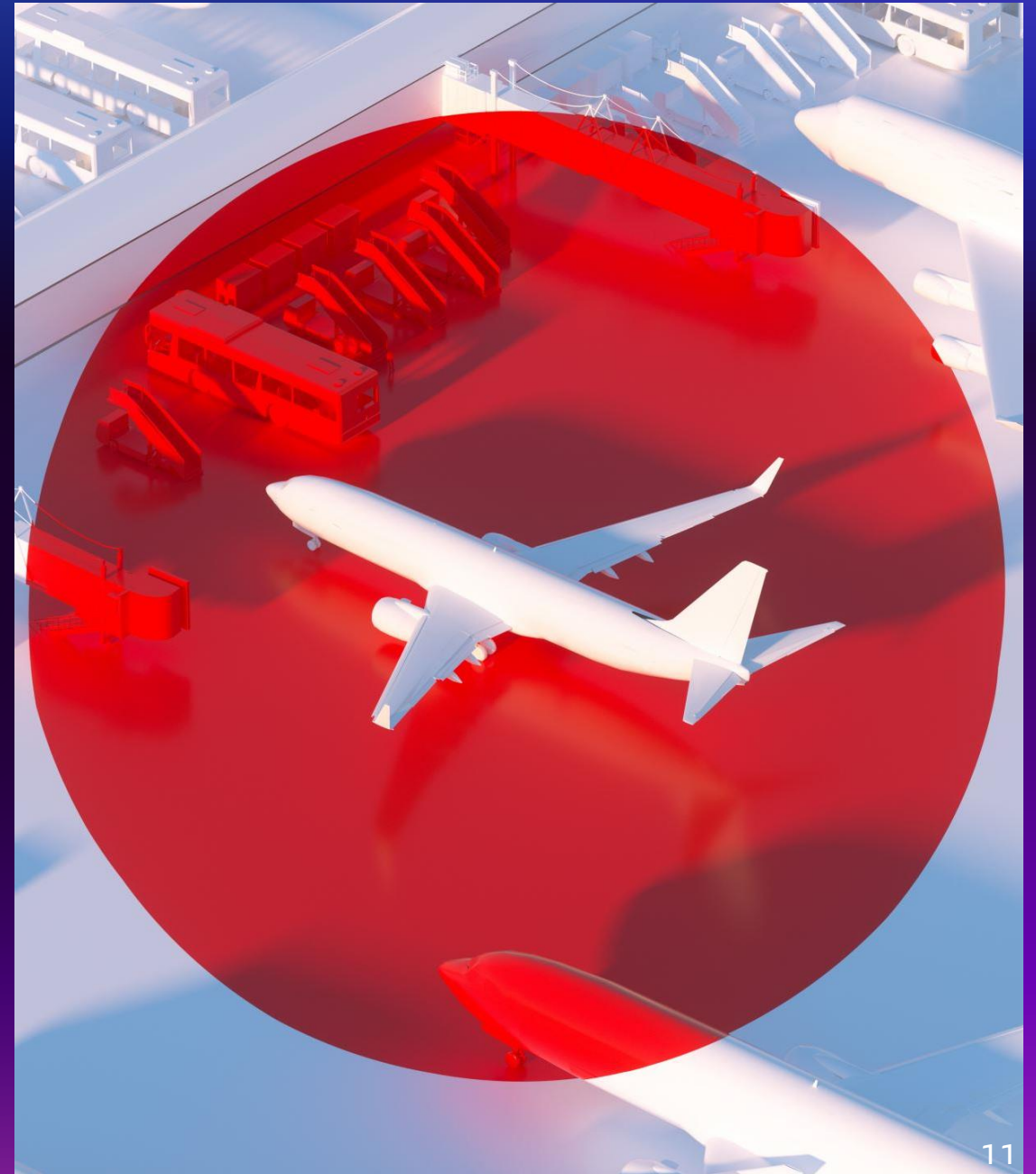
Bell, grumman and mooney makes consistently exhibit lower severity scores, making them ideal for critical and low-risk operations.

## By model

Models a, b, and c demonstrate the lowest accident severity and are well-suited for training and private flights.

## By purpose

Commercial flights have lower accident rates, but private and training flights require significant improvements to reduce moderate and high-risk incidents.





## RECOMMENDATION

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- Aircraft Selection

Use Grumman and Mooney for critical and low risk operations.

Adopt Models for training and private purposes.

- Weather Preparedness

Invest in adverse weather equipment and training.

Develop emergency protocols tailored to identify risks.

# OPERATIONAL RECOMMENDATION

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- Pilot Training.
  - Enhance pilot training with a focus on handling severe weather and emergency situations.

Special attention to training pilots for private and student flights.

- Fleet Modernisation.

Invest in newer aircraft models for private and training purposes.

- Data Driven Decision.

Use accident data to guide maintenance schedules, route planning, and operational strategies.

Establish regular data audits to improve reporting accuracy contributing to mechanical failures.



# FINAL TIPS & TAKEAWAYS

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- Purpose , type, Make, and Model directly influence risk.
- Low risk flights are typically
  - Grumman, Bell and Mooney Makes are more reliable for operations.
- Models are efficient with lower risks.
  - Severity of accidents is highly influenced by total fatalities.
- States with high accident densities often correlate with traffic volume and regional weather.
  - Adverse weather accounts for the most severe accidents.

Seek feedback

Reflect on aircraft  
performance

Explore new techniques

Iterate and adapt

# THANK YOU

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