AIRCRAFT RISK ANALYSIS FOR COMMERCIAL AND PRIVATE ENTERPRISES

Data-Driven Recommendations for Safer Aircraft

DATA OVERVIEW

The dataset is sourced from the National Transportation Safety Board (NTSB) accident records.

It includes:

- NTSB accident data from 1962 to 2023

AIM AND GOALS

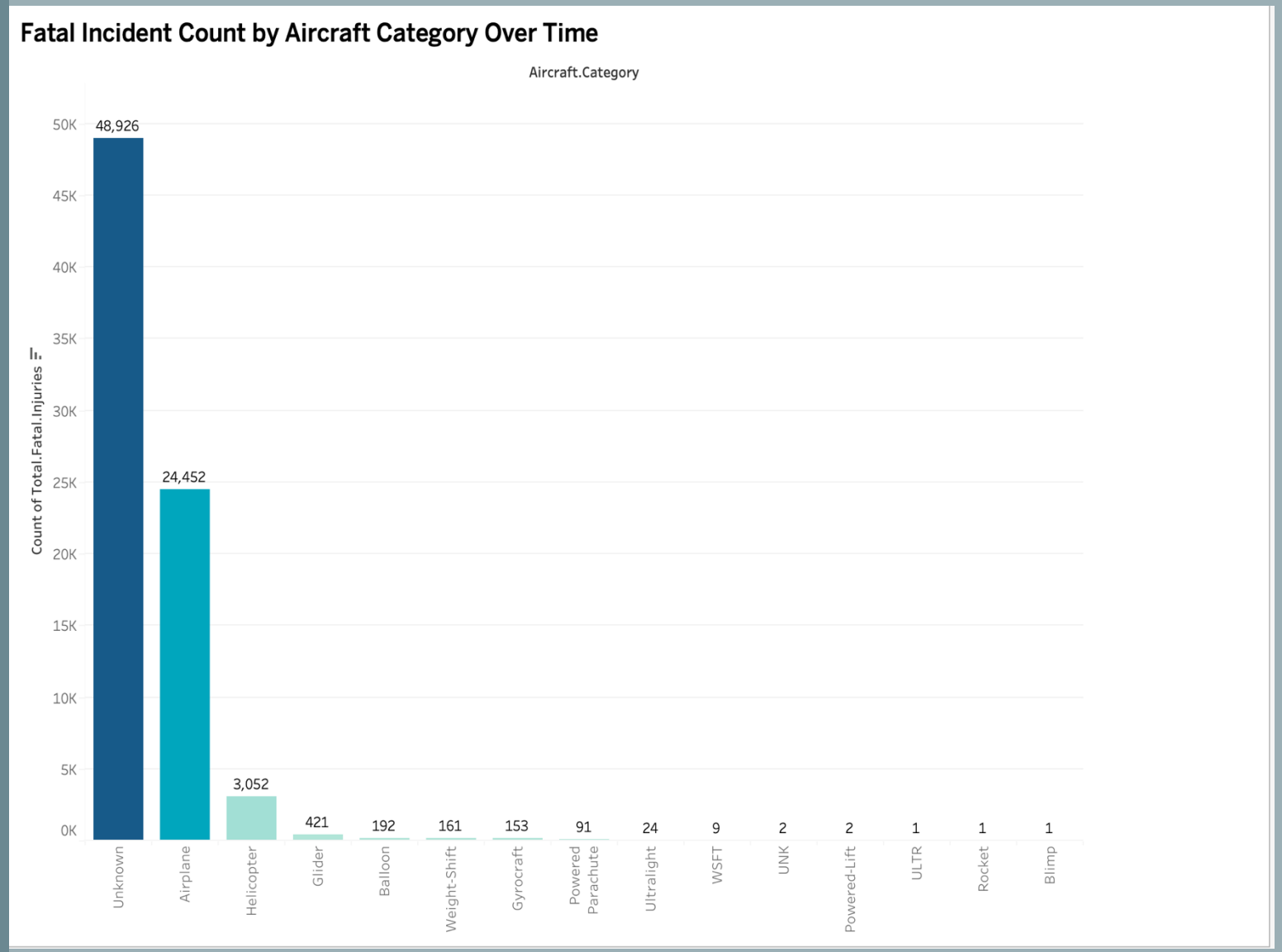
This project analyzes aviation accident data from 1962 to 2023 to identify the safest aircraft models.

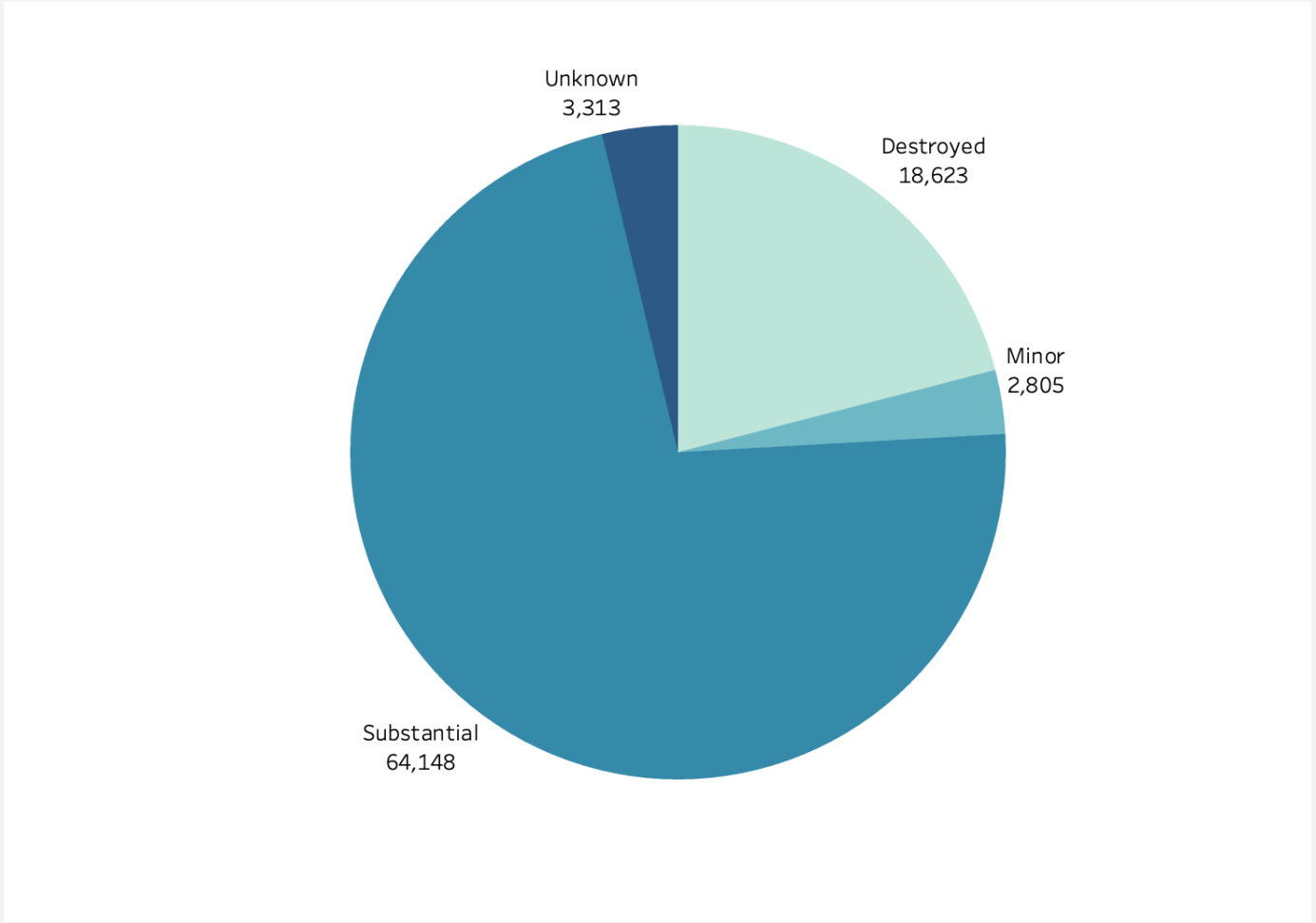
By understanding accident trends, risk factors, and aircraft performance, we aim to provide actionable insights that guide the company in selecting low-risk aircraft for its new aviation division.

Project Goals:

- Identify aircraft models with the lowest accident rates.
- Highlight key risk factors contributing to aviation accidents.
- Provide data-backed recommendations for safe aircraft investment

- The largest bar corresponds to “Unknown,” indicating many records were missing from the data.
- Airplanes show the largest number of fatal incidents.
- Helicopters rank second among known categories, though still significantly lower than airplanes. Their fatal count reflects broad usage in private, emergency, and specialized operations





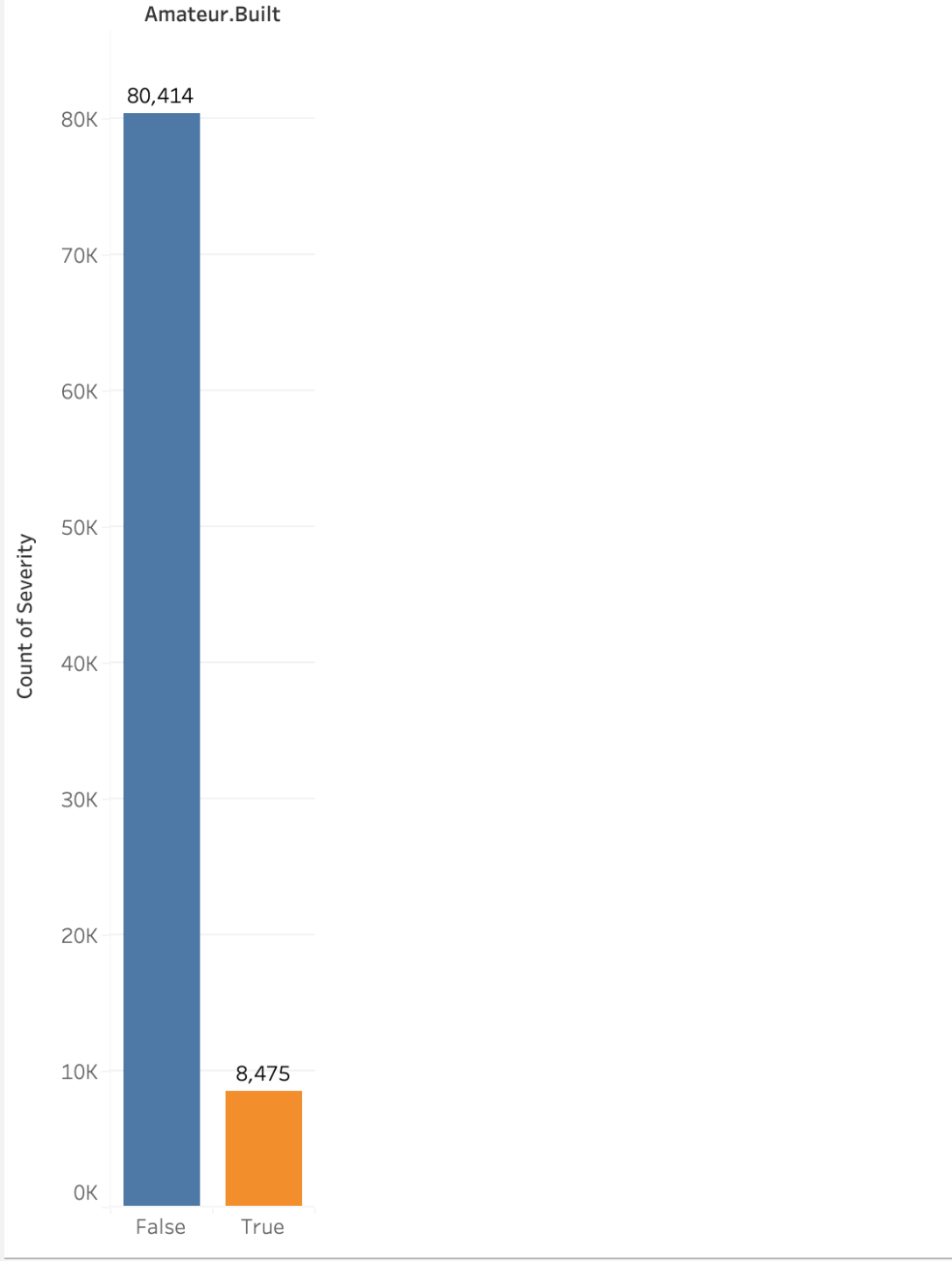
AIRCRAFT DAMAGE DISTRIBUTION

- The biggest slice of the pie chart represents aircraft sustaining “Substantial” damage, indicating that most recorded incidents lead to significant structural harm but not total destruction.
- A noticeable share of incidents results in the aircraft being Destroyed.
- Minor damage forms a smaller slice, suggesting fewer incidents where aircraft only incur minor damage.

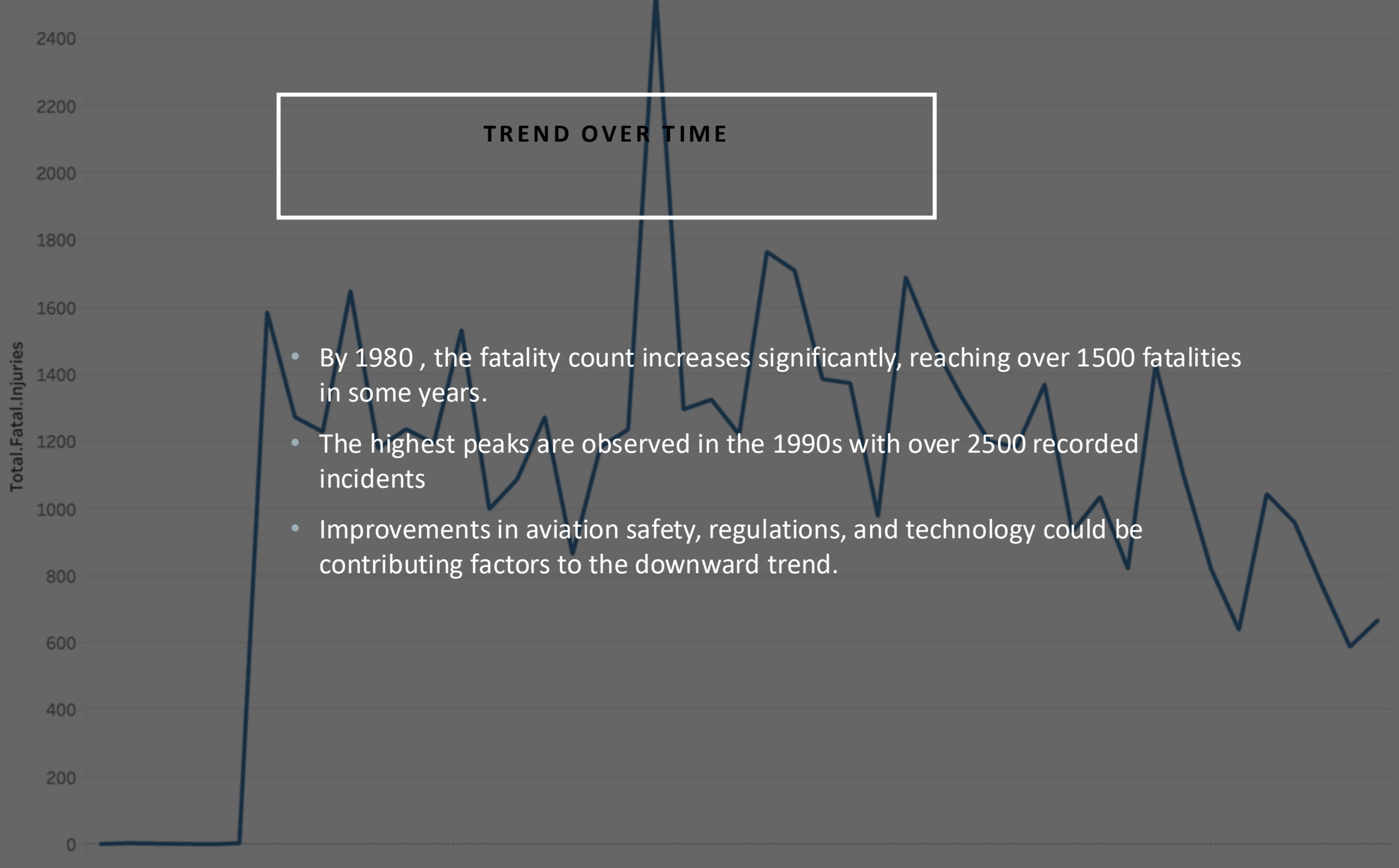
SEVERITY VS AMATEUR BUILT YEARLY

- Professional aircraft have more total incidents recorded.

- Since professional aircraft are more numerous and fly more frequently, it is expected they would have a higher count of incidents across all severity levels



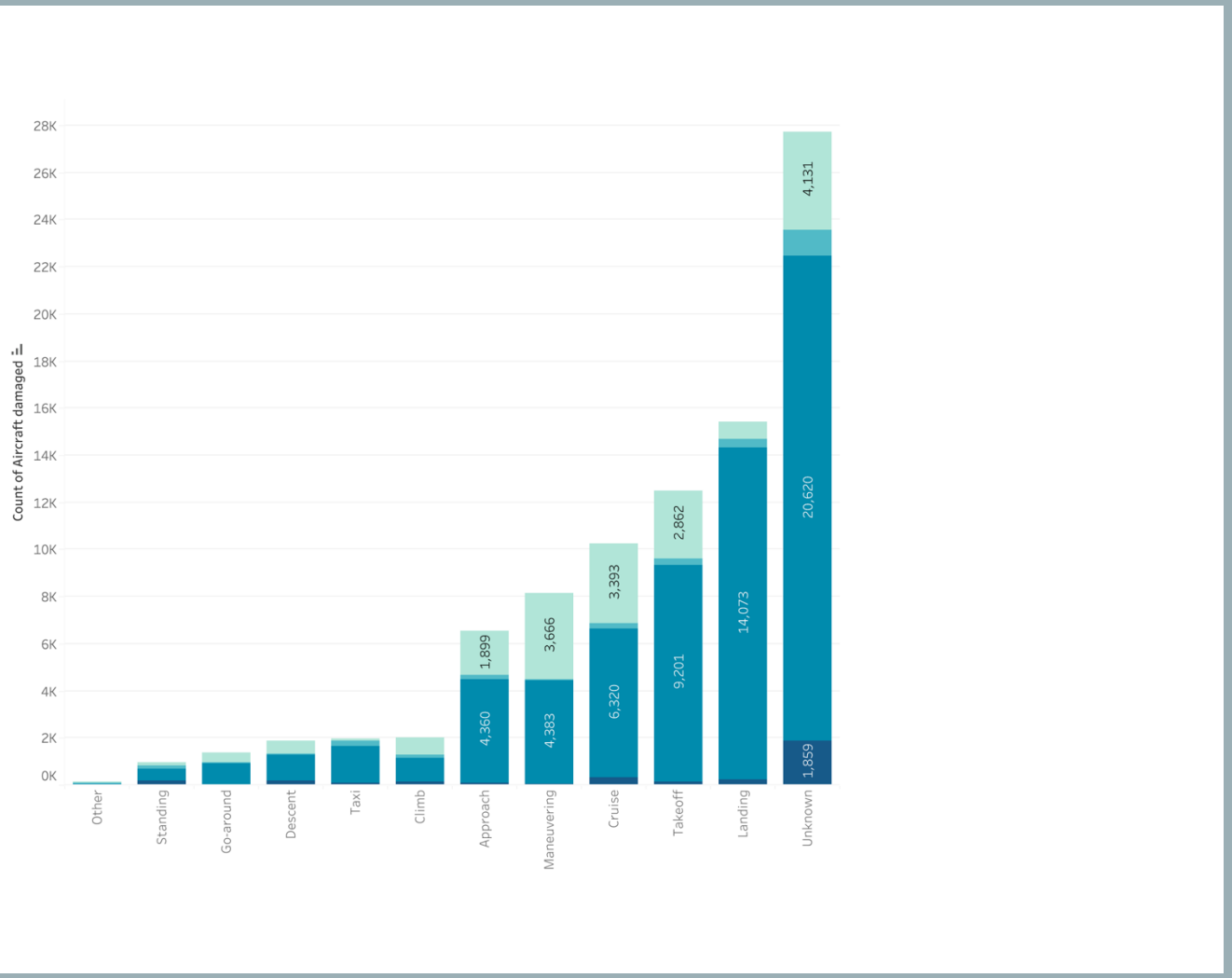
TREND OVER TIME



- By 1980 , the fatality count increases significantly, reaching over 1500 fatalities in some years.
- The highest peaks are observed in the 1990s with over 2500 recorded incidents
- Improvements in aviation safety, regulations, and technology could be contributing factors to the downward trend.

DAMAGE BY PHASE OF FLIGHT

- Landing is widely recognized as a higher-risk phase of flight
- Phases like "Standing" "Go-around," and "Descent" show comparatively fewer incidents.
- Investing in training and safety protocols can reduce accidents in these phases.



RECOMMENDATIONS

- Airplanes are the best option to invest especially in commercial use.
- Helicopters could be considered for private use.
- Avoid smaller aircraft unless equipped with advanced safety features.
- Prioritize aircraft with strong safety measures during landing and takeoff.
- Ensure aircraft have modern weather detection technology.
- Consider acquiring business and executive aircraft.
- Select aircraft with high durability and safety records.
- Consider multi-engine aircraft to enhance safety.
- Choose modern aircraft manufactured after 2010.
- Invest in training the safety protocols.