The NTSB Aviation Accident Dataset

An overview, analysis, and recommendations

Overview

The company is interested in becoming involved in the aviation industry. Specifically with owning and operating aircraft in a commercial endeavor, which would indicate an interest in airplanes or helicopters.

The NTSB Aviation Accident dataset

Years overview: 1948 - 2022

Number of records: 89,000

Data fields: 31 fields including location, injury severity, aircraft damage and category, weather, make and model, cause of incident, etc.

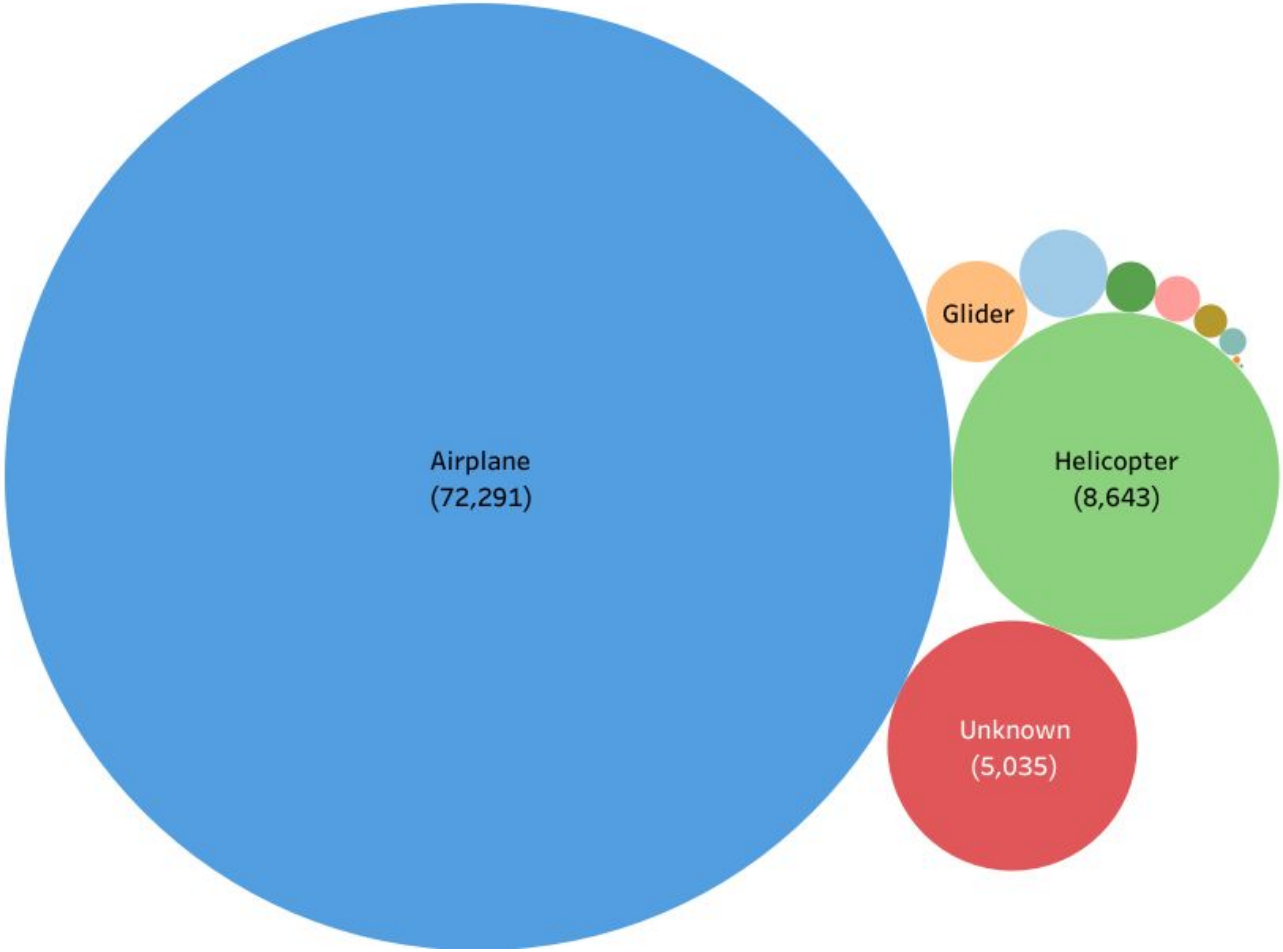
Aircraft Categories

Categories in the dataset include: airplanes, helicopters, gliders, balloons, gyrocrafts, powered parachutes, blimps and more.

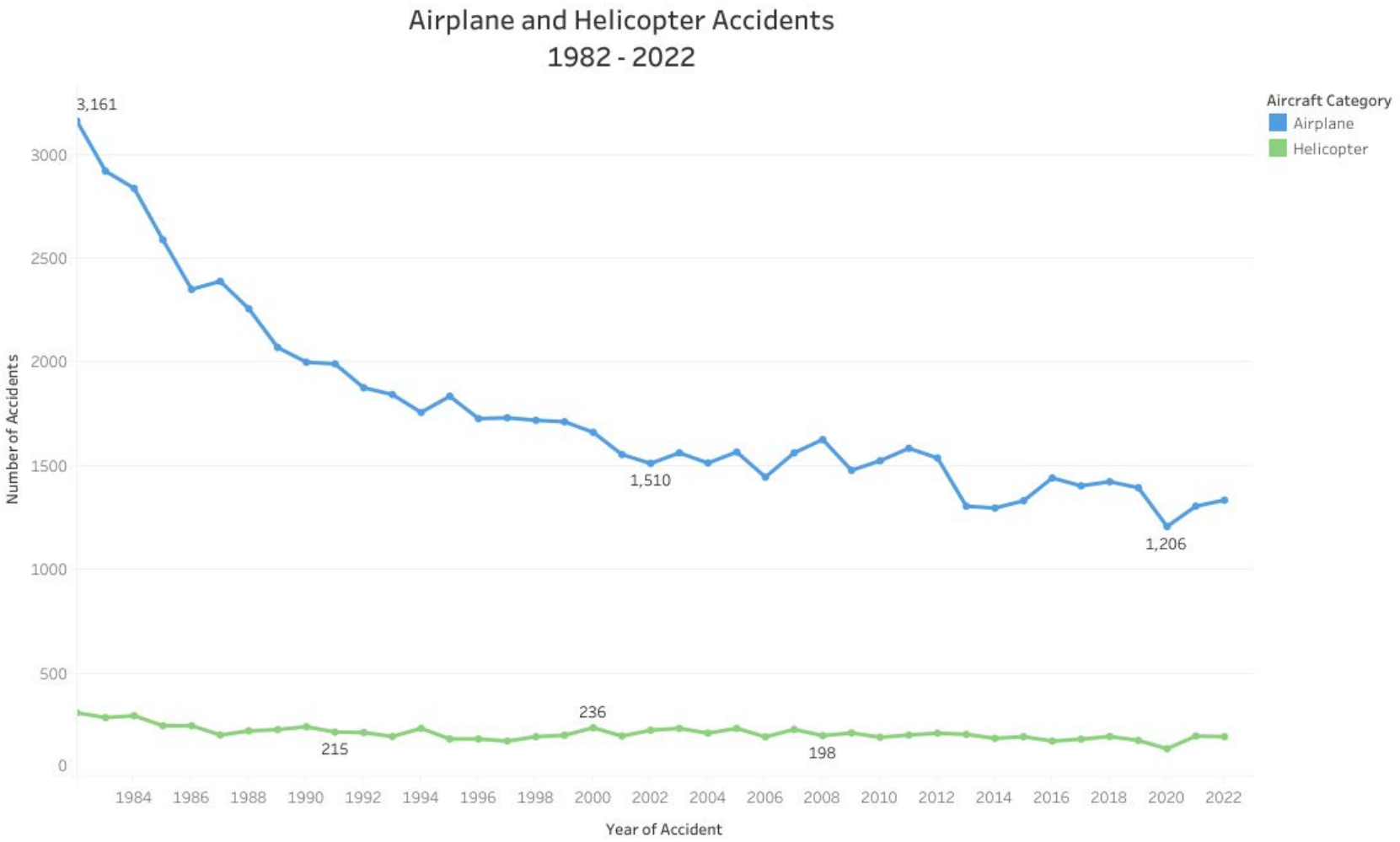
The records were mostly incomplete as far as category.

The Make field in the dataset proved useful to completing the category field.

Aircraft Accidents by Category

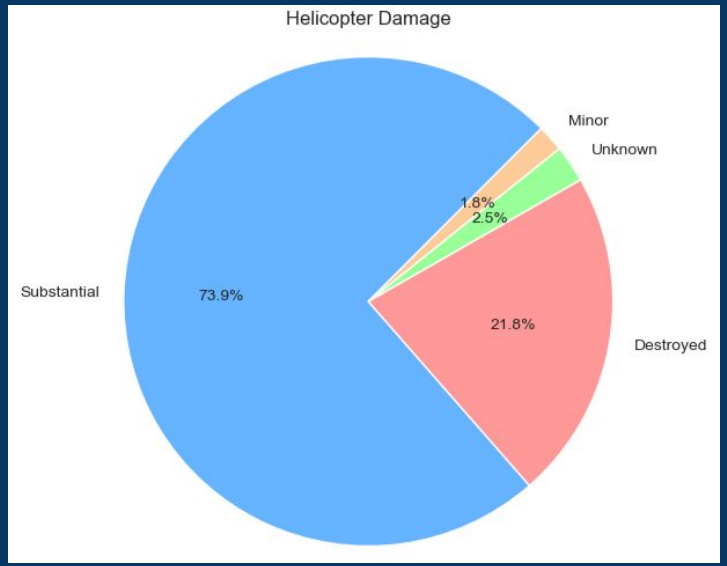


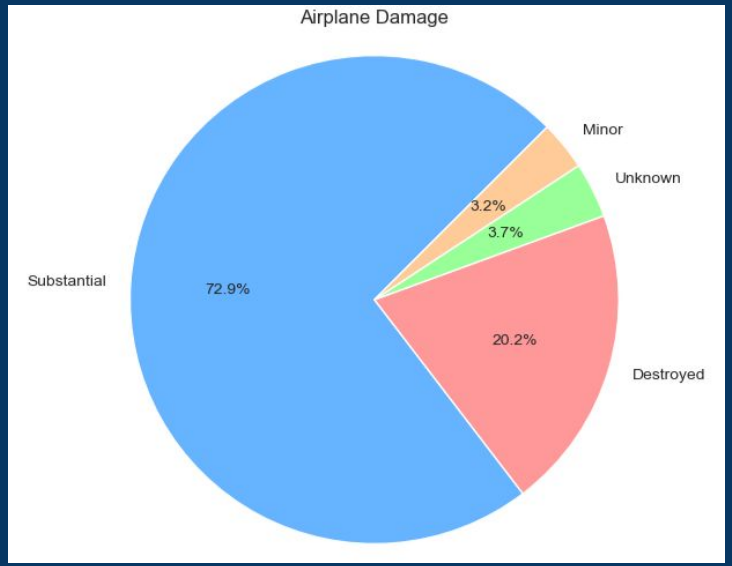
Aircraft Category
- Airplane
- Helicopter
- Unknown
- Glider
- Balloon
- Gyrocraft
- Weight-Shift
- Powered Parachute
- Ultralight
- Blimp
- Powered-Lift
- Rocket


Airplane and Helicopter Accidents
1982 - 2022
Aircraft Category
Airplane
Helicopter
Number of Accidents
3,161
1,510
1,206
236
215
198
3000
2500
2000
1500
1000
500
0
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022
Year of Accident

Aircraft Damage:

Minor, Substantial or Destroyed

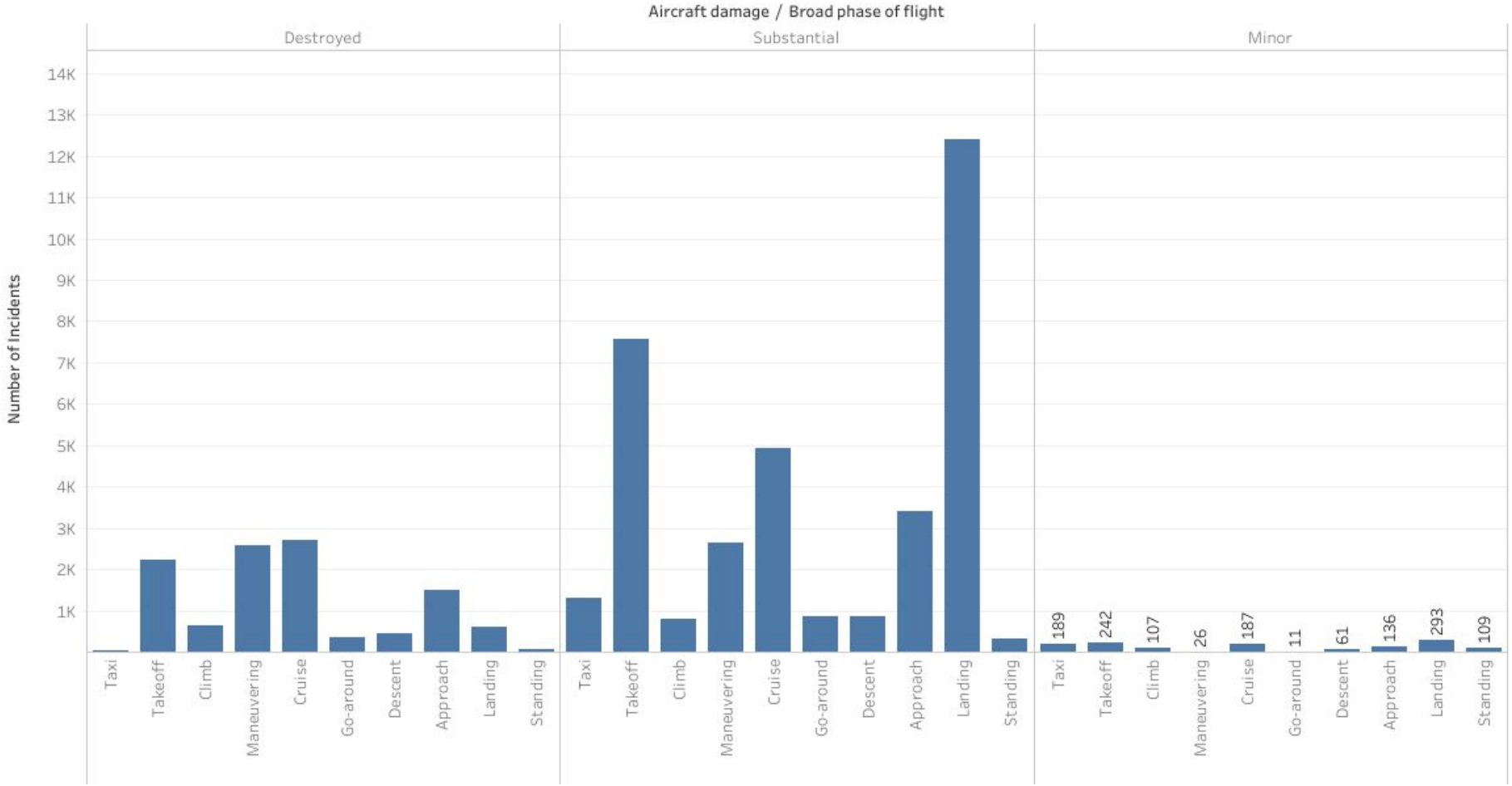




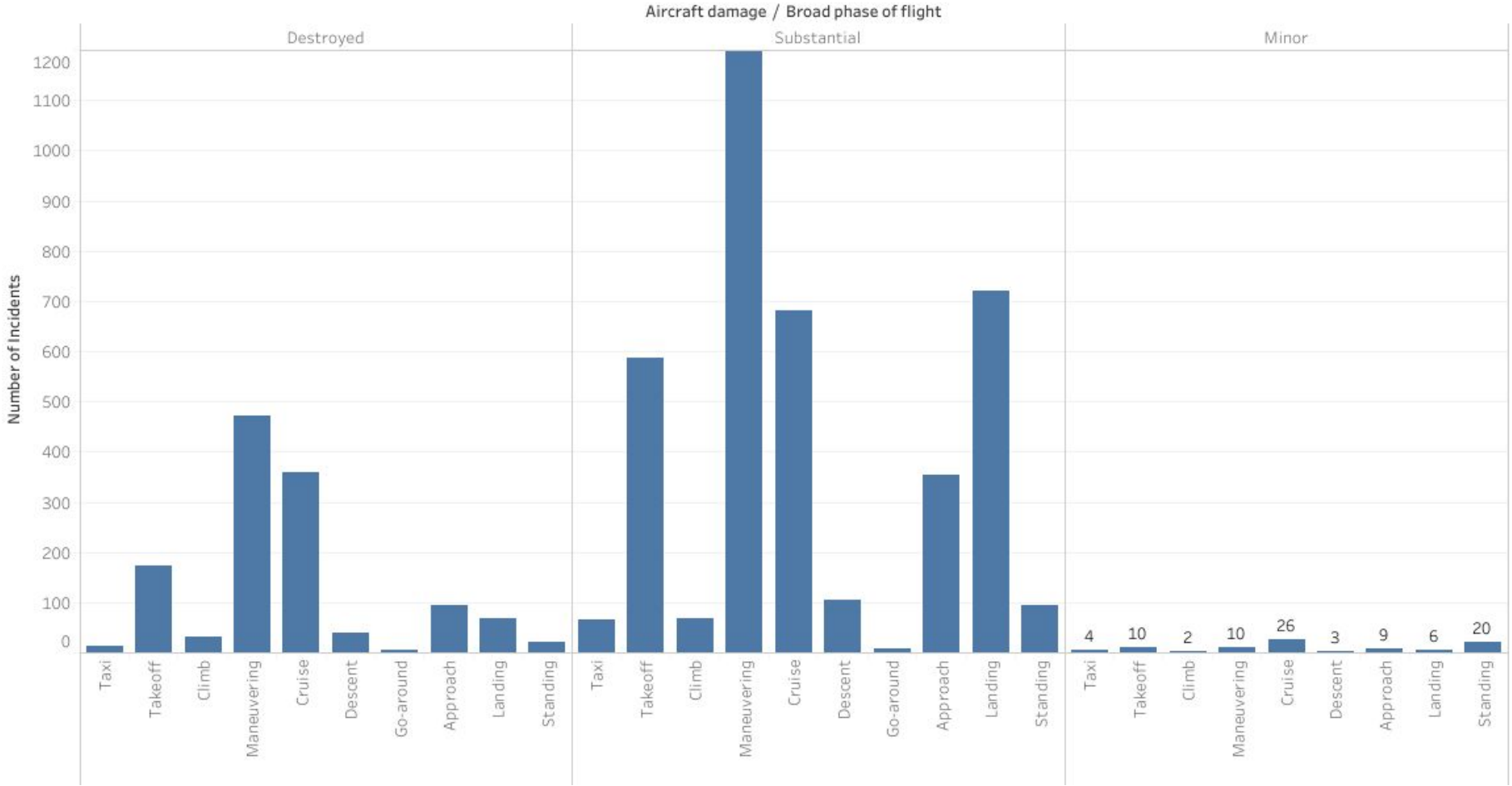
Aircraft Damage & Phase of Flight

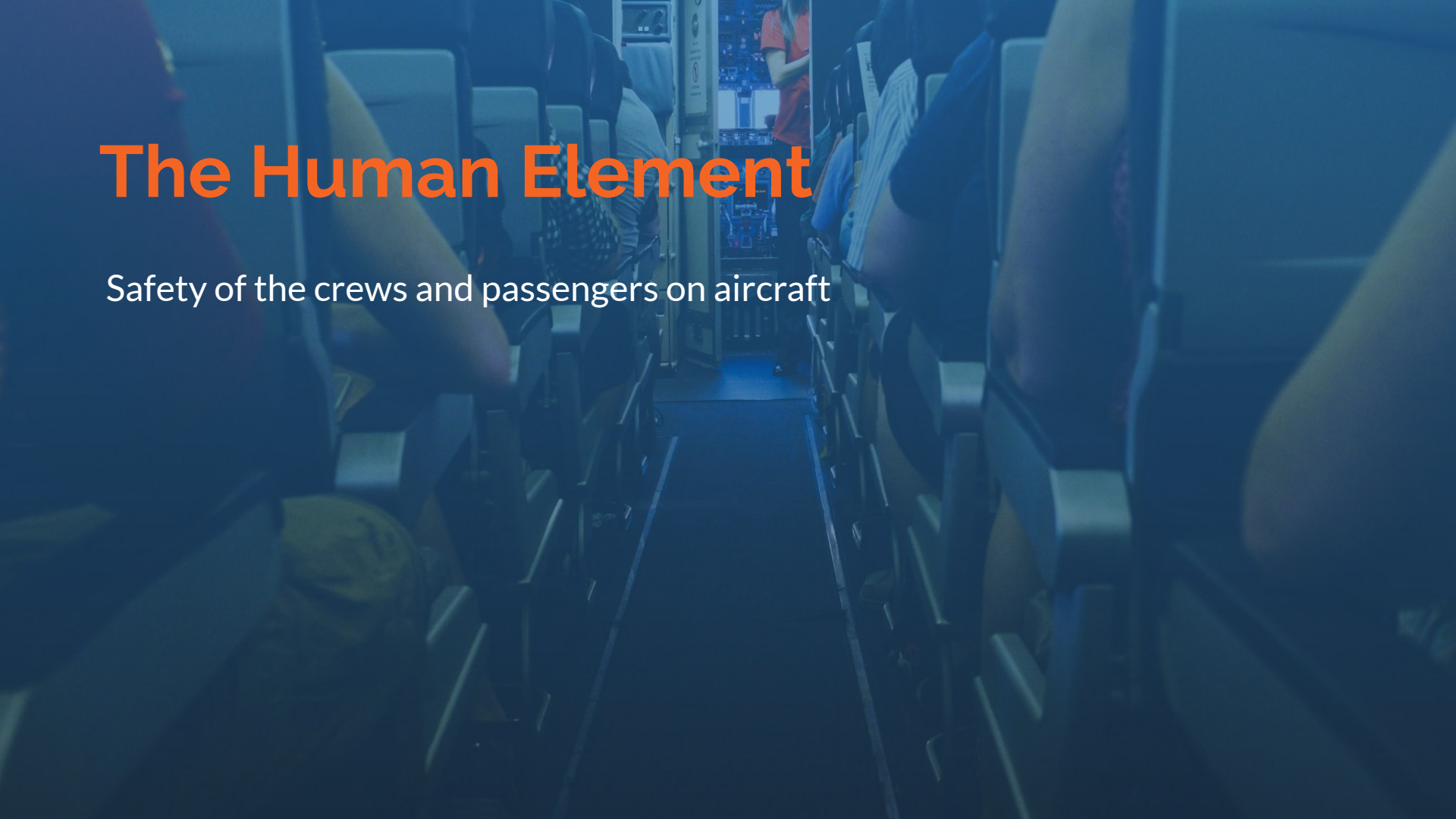
When during the aircraft's operation do accidents most often occur?

Phase of Flight and Airplane Damage



Phase of Flight and Helicopter Damage

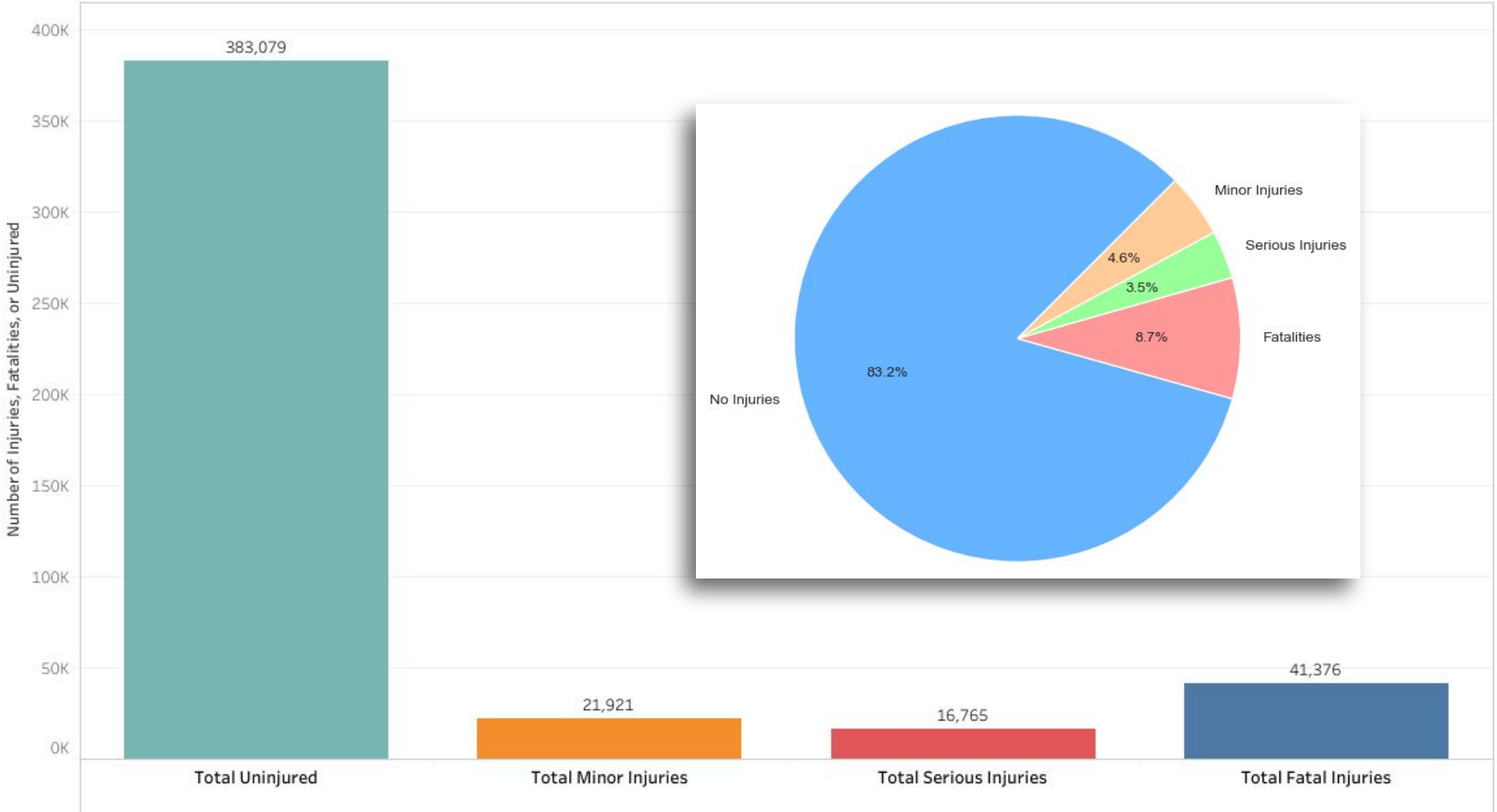




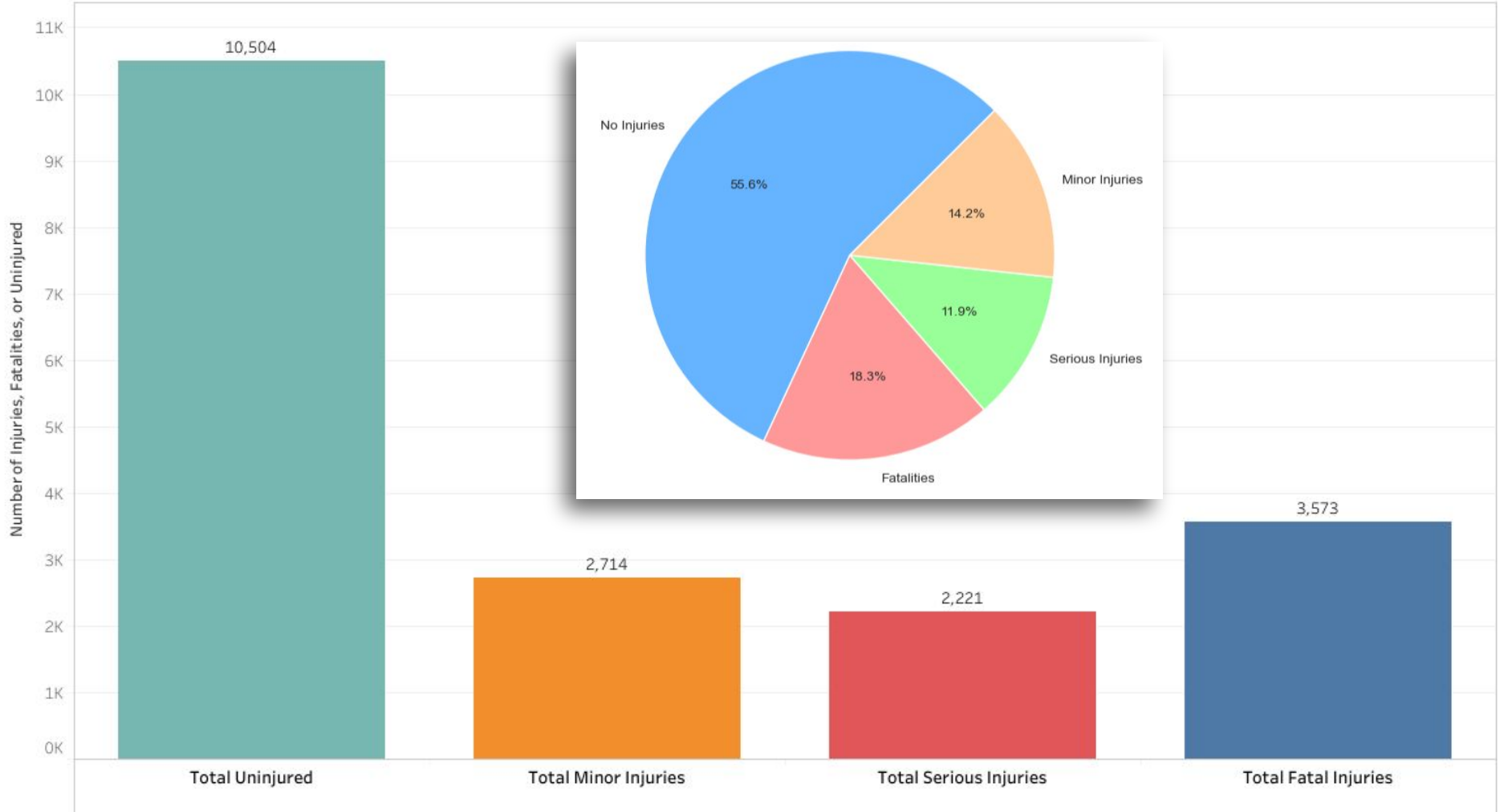
The Human Element

Safety of the crews and passengers on aircraft

Total Airplane Injuries, Fatalities, and Uninjured



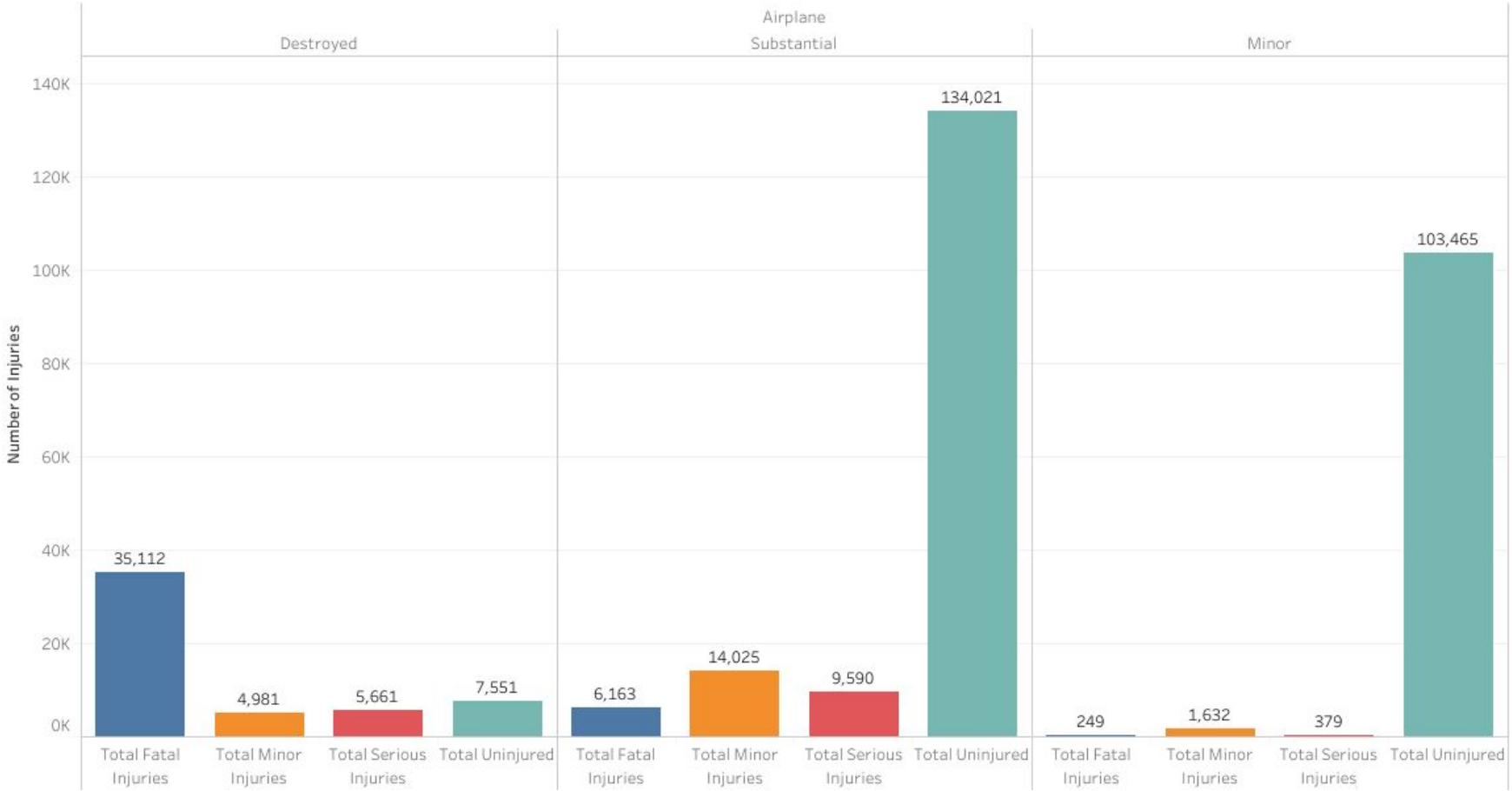
Total Helicopter Injuries, Fatalities, and Uninjured



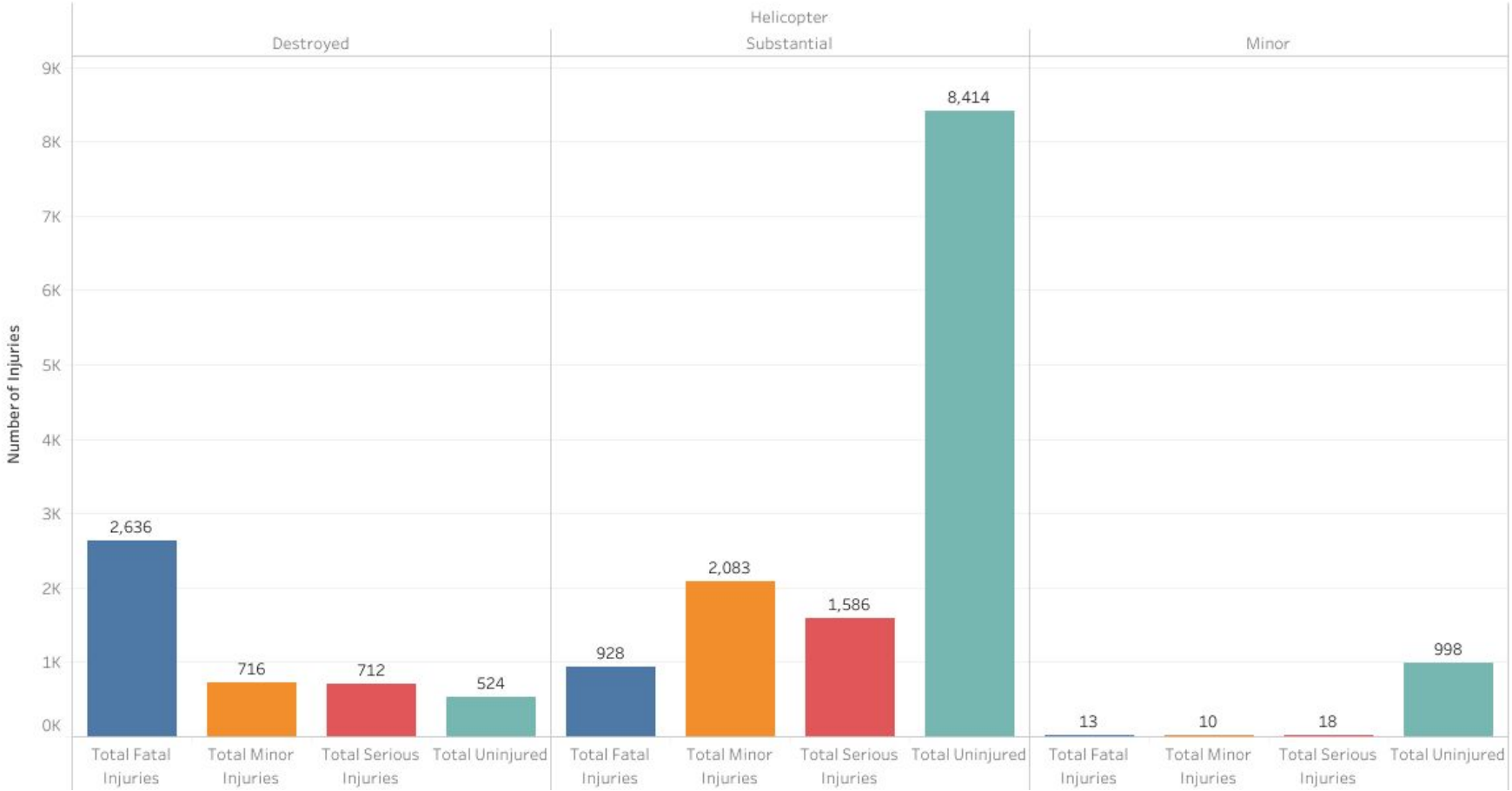
The Human Element & Damage Levels

A look at how injuries relate to the aircraft damage

Fatalities and Injuries based on Damage Level
Airplane



Fatalities and Injuries based on Damage Level
Helicopter



Causes of Incidents

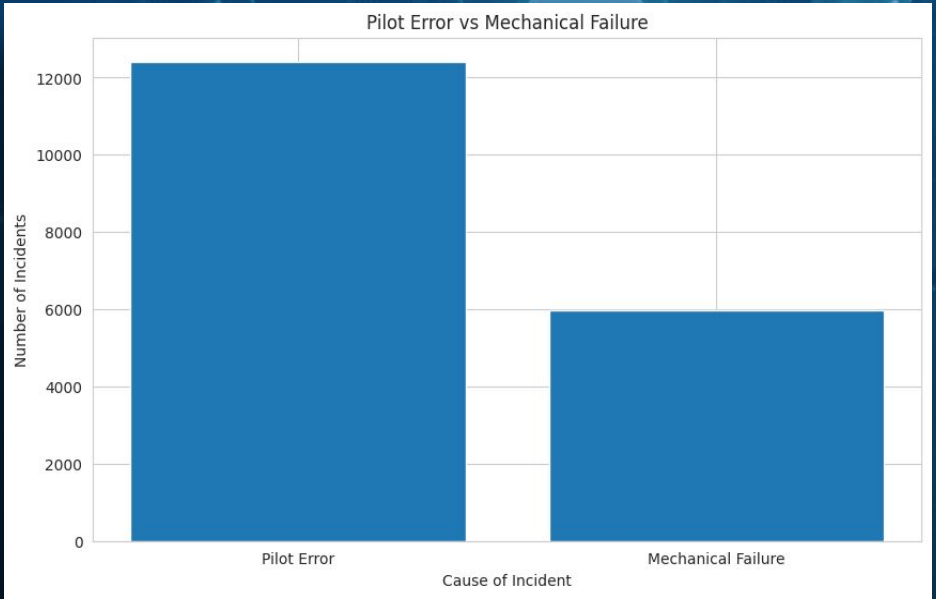
The dataset provides a field called Report Status that details the reason for the aircraft accident.

This field in the dataset is mostly non-informative, containing values such as Probable Cause, Unknown, Foreign, or Factual.

A number of values contained the words “pilot’s failure”, and these values constitute a human-error factor.

About 14% of the records (12,414) indicate pilot error as the main cause of the incident. Another 6.8% (5,966) contain a variety of causes for the incident, most of which point to mechanical or equipment issues.

Causes of Incidents



18,380 informative values for Report Status

almost 68% are pilot error

32.5% are equipment failure

Summary

Airplane accidents from 1982 through 2022 dramatically decreased.

Frequency of helicopter incidents remained quite steady.

Likelihood of injury or death in an airplane accident is much lower than in a helicopter accident.

For destructive accidents in both airplanes and helicopters, the injury level is likely to be fatal.

The importance of training, proper maintenance, and strict adherence to safety protocols cannot be stressed enough.

Suggestions for Further Study

Aircraft in use in the various aviation industries over the same period as the accident dataset would be useful. Numbers, makes, models , etc. would give us the opportunity to evaluate the safety record of different makes and models of aircraft as we would have figures related to their overall representation in the industry.

Recommendations could then be made regarding what makes and models would be the best investment for the company from a reliability and safety standpoint.

Completing the Report Status column of the dataset would be extremely helpful in providing more insights as to the safety protocols, training, and maintenance of the aircraft industries