

Flying Smarter

Data-Driven Decisions for Safer Aviation Ventures

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Analysis Overview

**Weather
Conditions**

**Number and
type of
engines**

**Amateur vs
Professional
manufacturer**

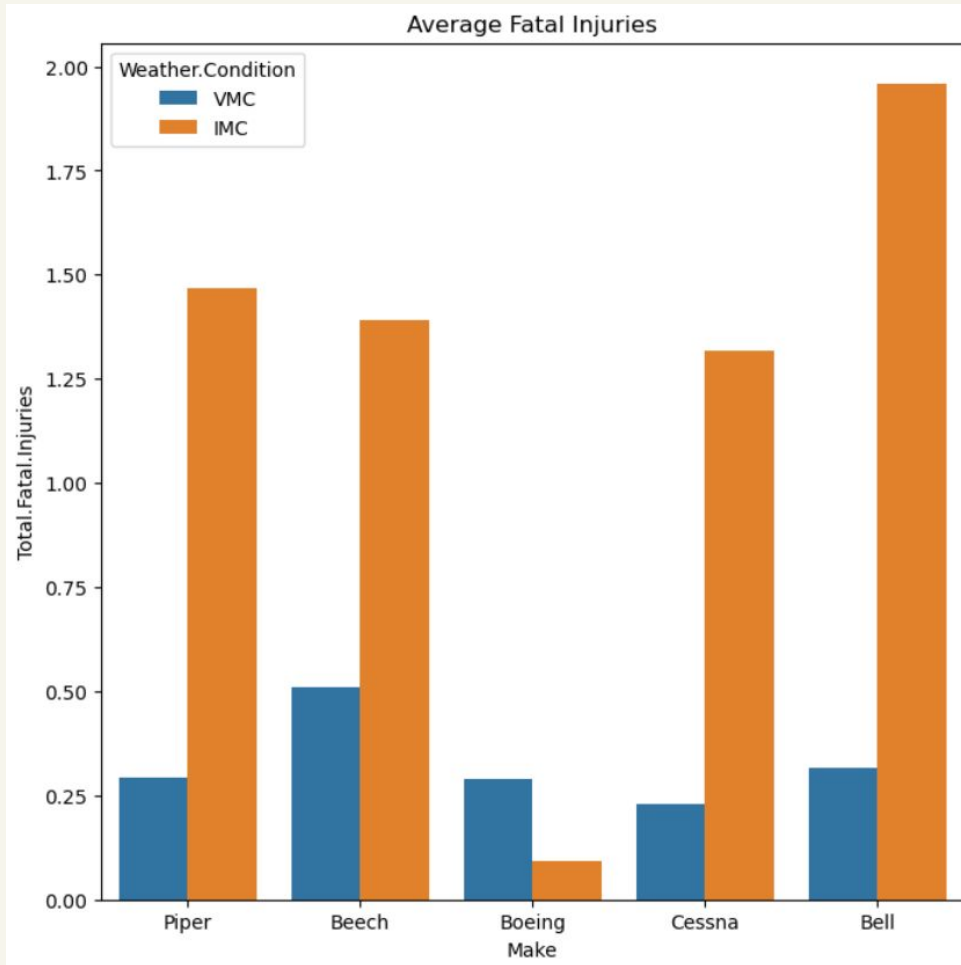
For this project, we will be analyzing aviation accident data from 1962 to 2023 provided by the National Transportation Safety Board to provide business recommendations to help our company make informed aircraft purchases. We will be focusing on three key characteristics for the dataset in our analysis:

Weather-Driven Influences

Comparing the 5 most common aircraft manufacturers to see which one is safer during inclement weather

Different Weather Conditions:

- **VMC** (Visual Meteorological Conditions): weather conditions that allow a pilot to navigate by visual reference to the ground and other landmarks.
- **IMC** (Instrument Meteorological Conditions): weather conditions that require a pilot to rely on flight instruments.

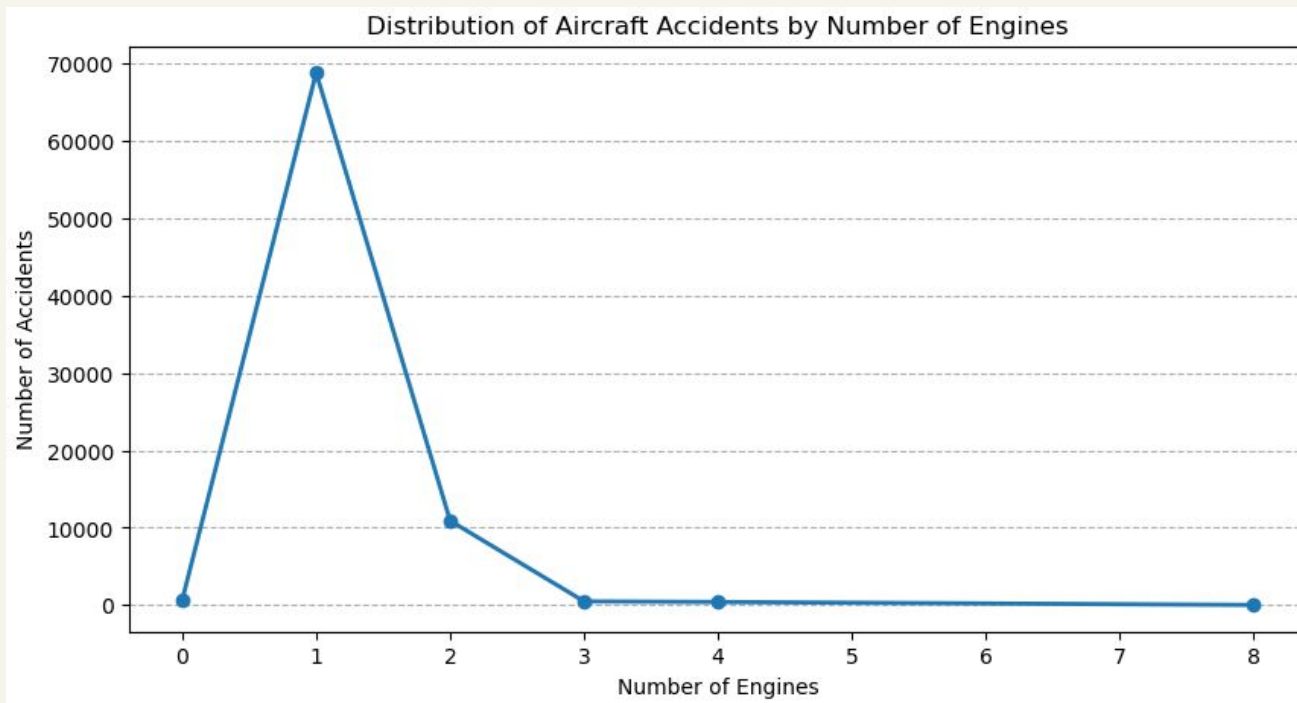


Business Recommendation: *Boeing* is far and away the best manufacturer for flying in inclement weather, most likely due to better navigation equipment.

Engine-Based Accident Analysis

Engine Characteristics and Accident Severity

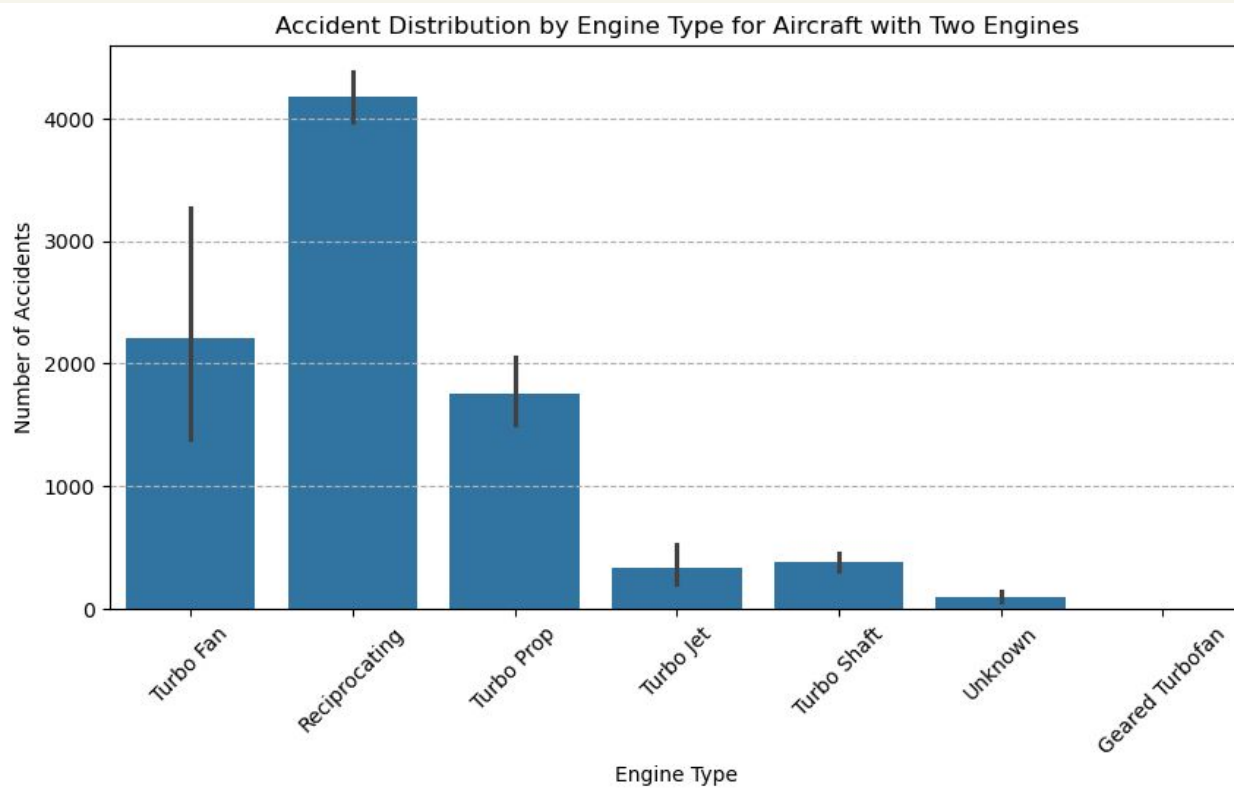
- **Focus:** The impact of engine count and type on accident outcomes.
- **Objective:** Analyze how injury trends evolve over time under varying engine conditions.
- **Hypothesis:** Risk levels are influenced by both the (1) number and (2) type of engines.



Investigating Engine Configuration and Accident Risk

Observation: Single-engine aircraft are associated with a higher likelihood of severe accidents.

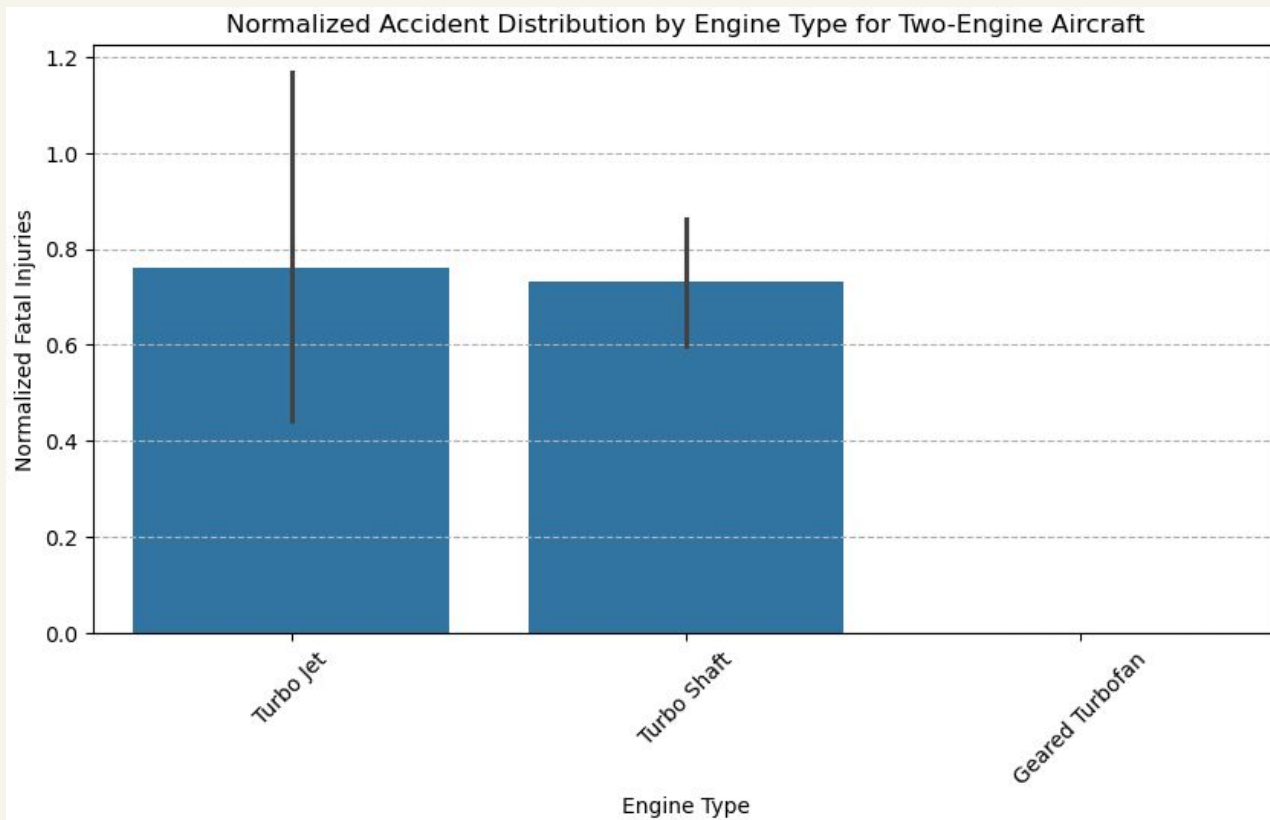
Solution: Assessing the potential safety and performance improvements of transitioning to twin-engine models.



Evaluating Engine Types for Safety Optimization Using Twin-Engine Configurations

Objective: Identify the safest engine types and their associated twin-engine aircraft models.

Observation: Reciprocating and turbofan engines show higher rates of danger compared to other engine types.



Enhancing Safety and Performance Through Engine Selection

Observation: Focusing on turbojet and turboshaft engines offers significant improvements in safety and performance.

Solution: Prioritize these engine types to mitigate risks and optimize aircraft efficiency.

Total Uninjured Count

Airbus Industries 148
Boeing 101
Mcdonnell Douglas 83
Mcdonnell Douglas Aircraft Co 61
British Aircraft Corp 57

Observation: Aircraft from *Airbus and Boeing*, utilizing turbojet and turboshaft engines, indicate lower injury rates.

Key Conclusions

- **Conclusion 1:** Prioritize **Twin-Engine** Configurations
Avoid **single-engine** designs and focus on **double-engine** configurations to enhance safety. Aircraft with at least two engines consistently recorded the lowest accident rates when compared to single-engine designs.
- **Conclusion 2:** Airbus and Boeing Showcase Superior Safety
Aircraft from **Airbus and Boeing**, equipped with **turbojet and turboshaft** engines, demonstrate significantly lower accident and injury rates, highlighting the safety advantages of their engine configurations.

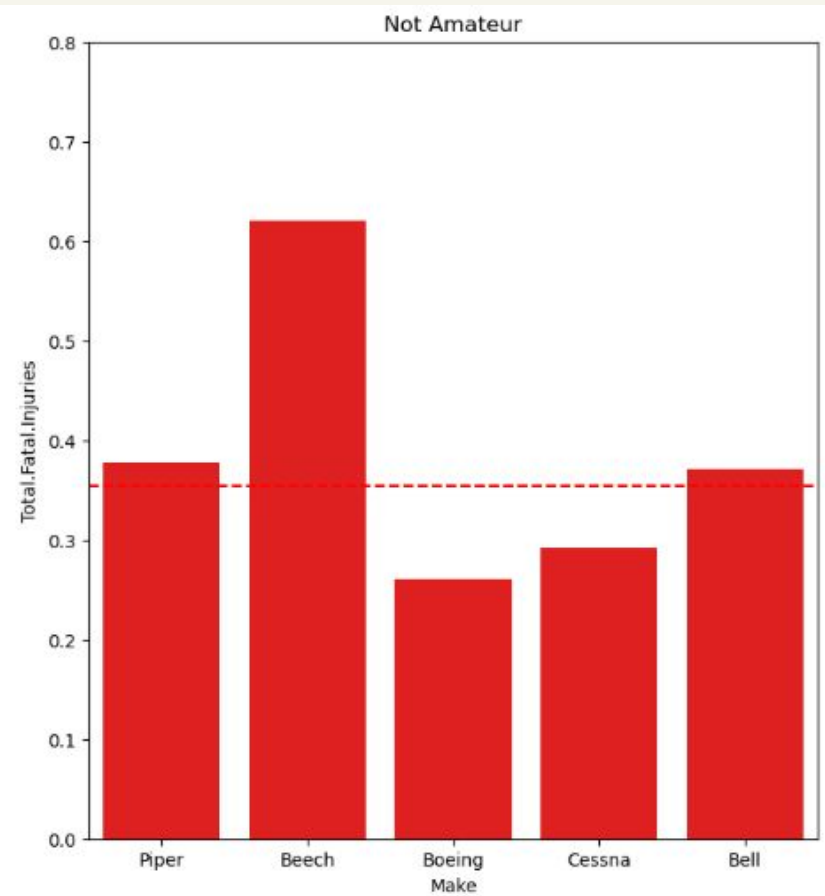
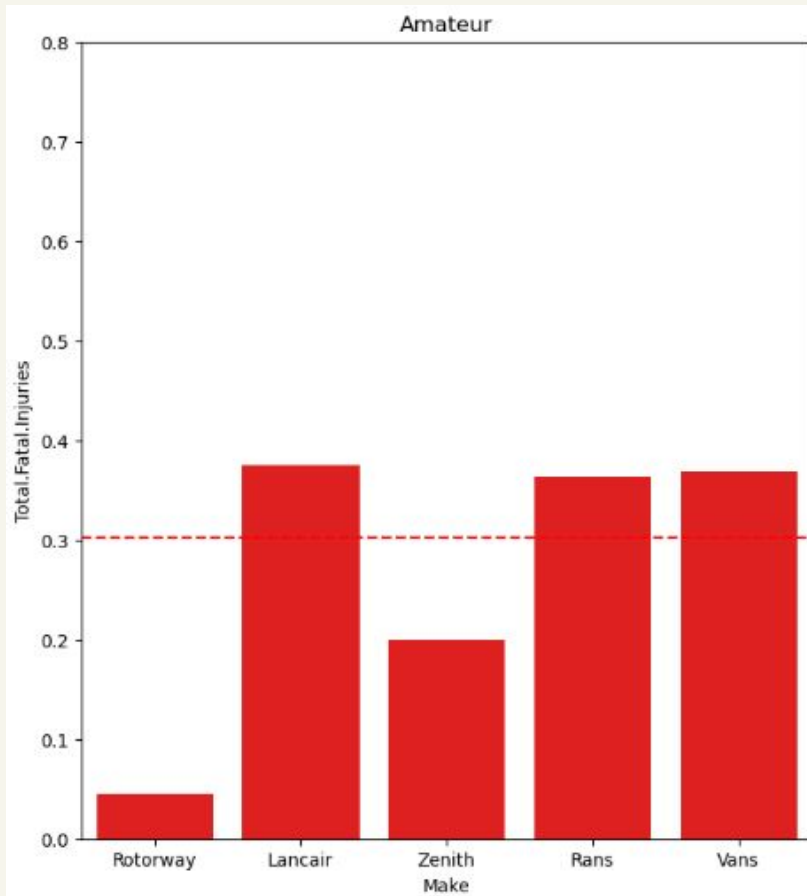
Amateur Made Aircraft

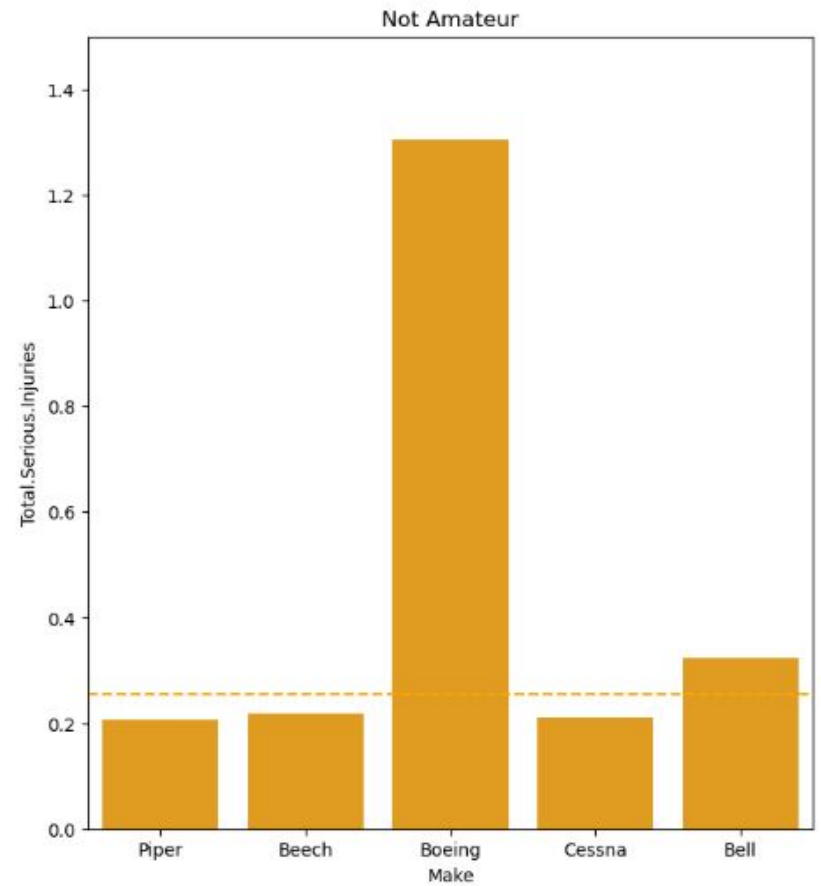
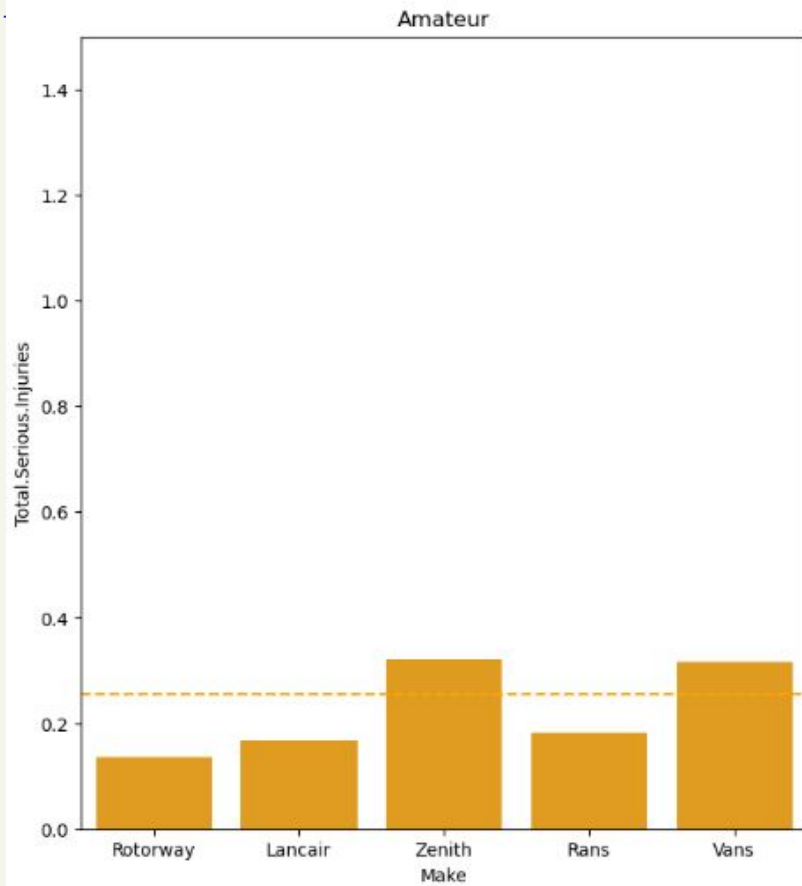
Comparing the most common Amateur and Professional aircraft Manufacturers to determine which is safer

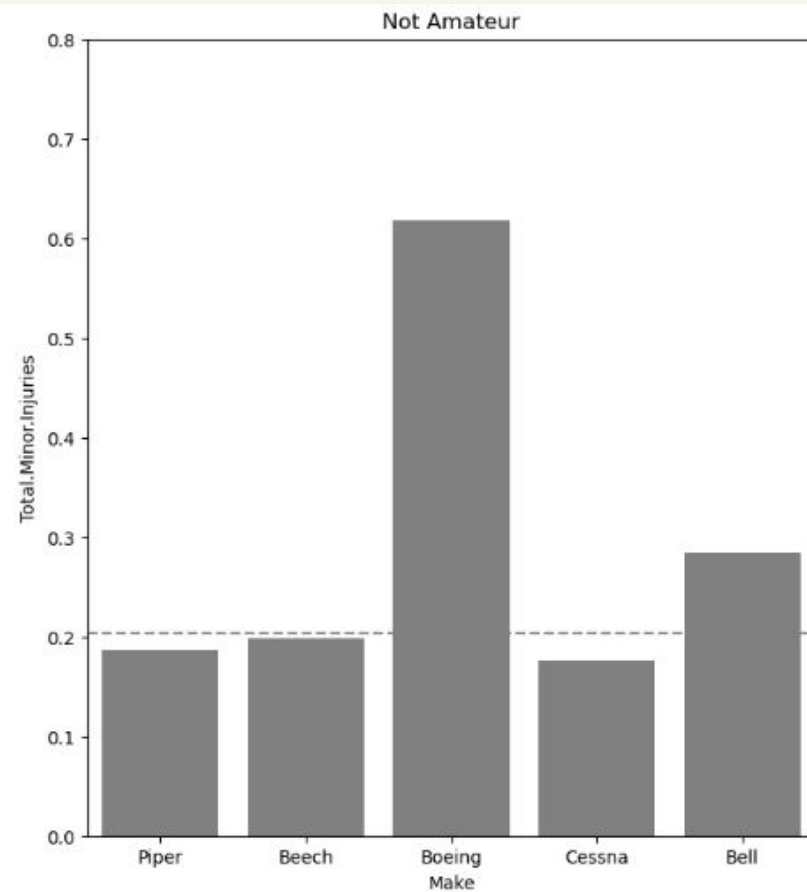
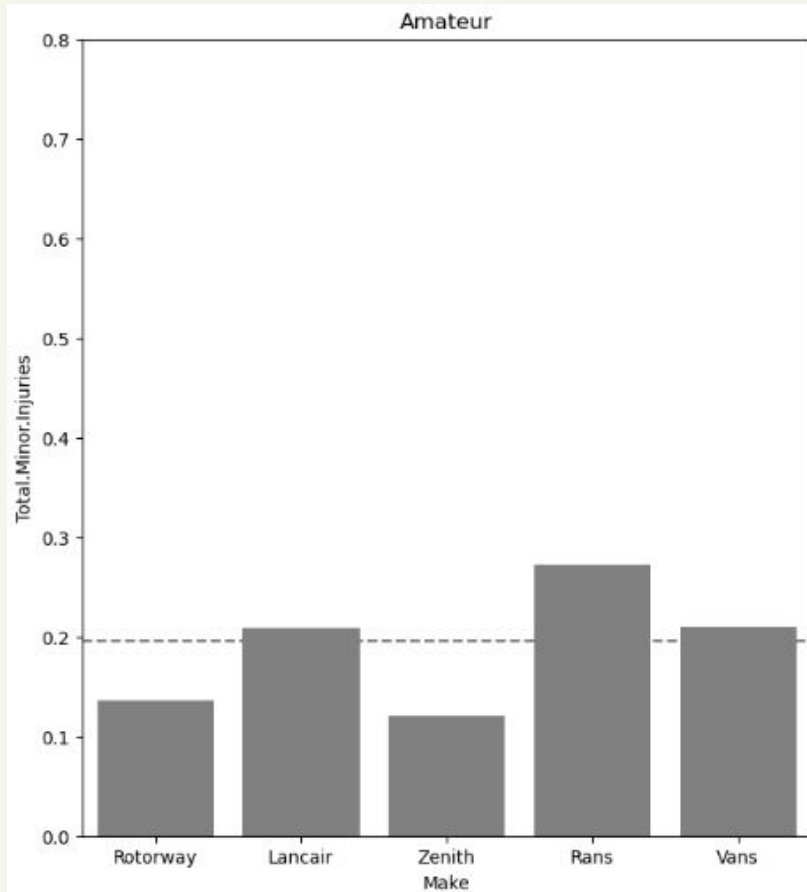
Amateur Built Makes: Vans, Zenith, Lancair, Rans, Rotorway

Professional Built Makes: Cessna, Piper, Beech, Bell, Boeing

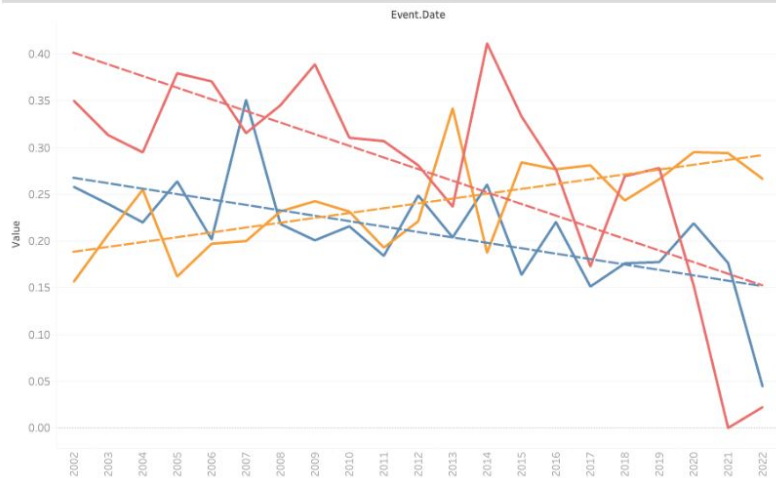
Hypothesis: Aircraft that are Amateur Built have more fatalities on average than non-Amateur Built.



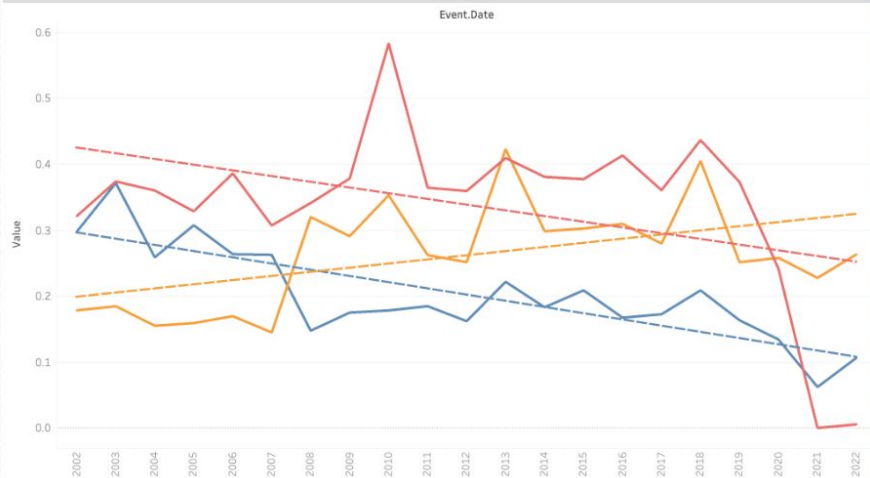




Amateur Built Injuries



Not Amateur Built Injuries



Conclusion: Accidents involving Amateur Built aircraft a lower average fatality count.

Business Recommendation: If you are in the market for an Amateur built aircraft, Rotorway is the best choice. For Professional built, Boeing is the winner.

Next Steps

In the future, we would analyse a dataset that contains cost information for the aircraft and try to determine the most safe aircraft with the lowest cost.

Thank You