Flying into New Markets… *Safely*

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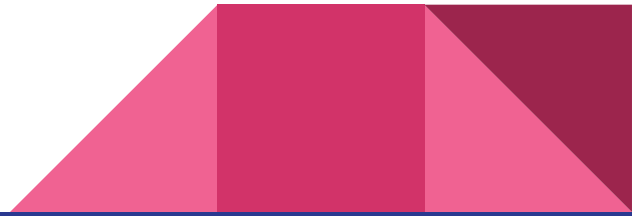


Business Understanding

Background

Looking to invest in airplanes in order to expand into other markets

Goals

Provide three recommendations on which aircraft are the *least risky*

Success Criteria

Define '*least risky*' to refer to types of aircrafts with:

- the least amount of accidents
- the least number of casualties
- the lowest fatality rate

Data Understanding

Dataset on aviation accidents from National Transportation Safety Board (NTSB)

- Includes **31 features** and **88,889 entries**
- Each entry represents aircraft involved in accident

Data Preparation

1. Created functions to assist with assessment of data.
2. Dropped columns with high NaN values or that were unhelpful for analysis: *Longitude*, *Latitude*, *FAR.Description*, and others.
3. Cleaned data for professionally built airplanes, categorized *Injury.severity*, standardized *Make* feature, resulting in a **~65,000**-entry dataframe with **18 columns.**

Data Analysis

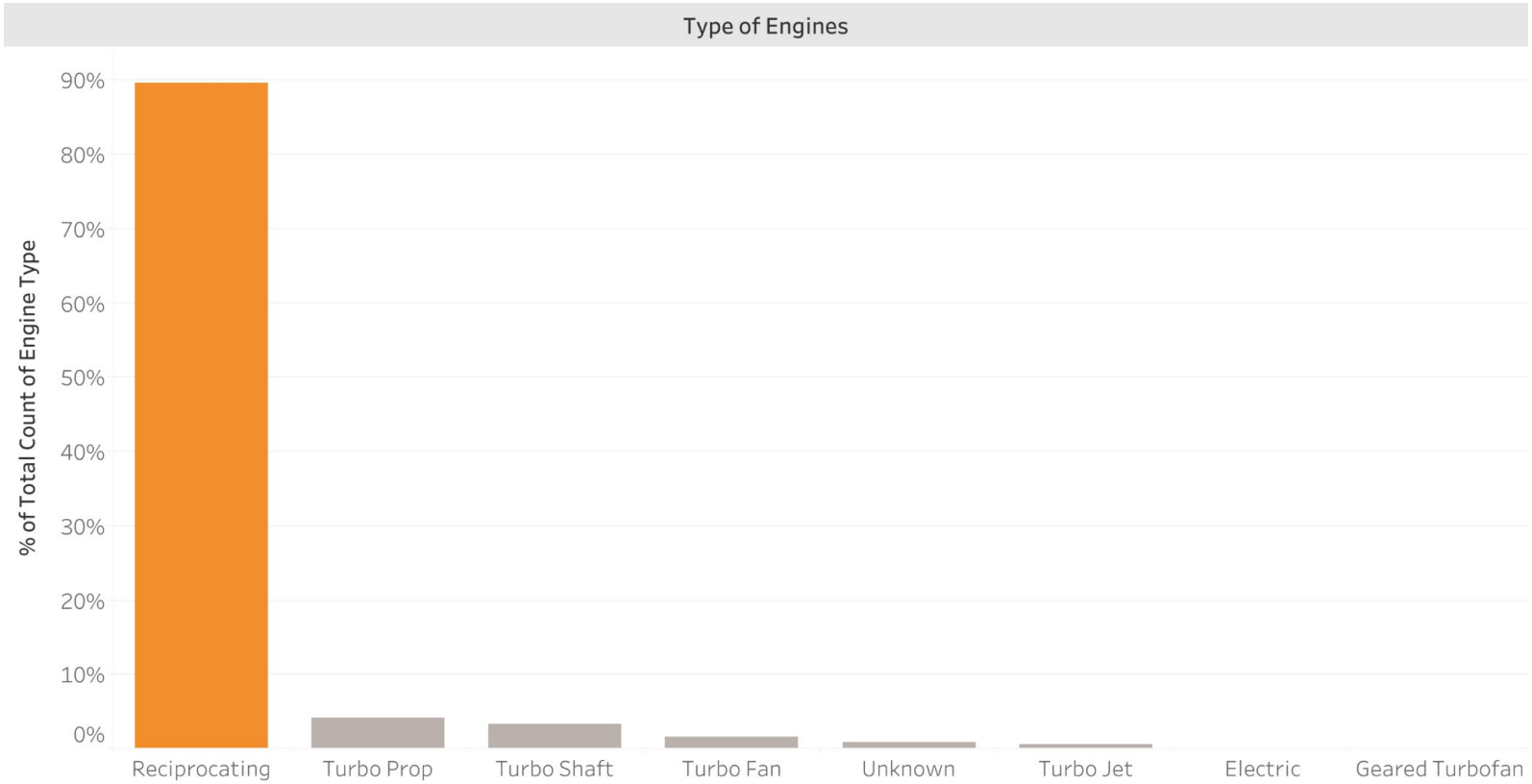
- Total of **64,862** recorded aviation accidents since 1948

- **18.2%** of accidents were classified as **‘fatal’**

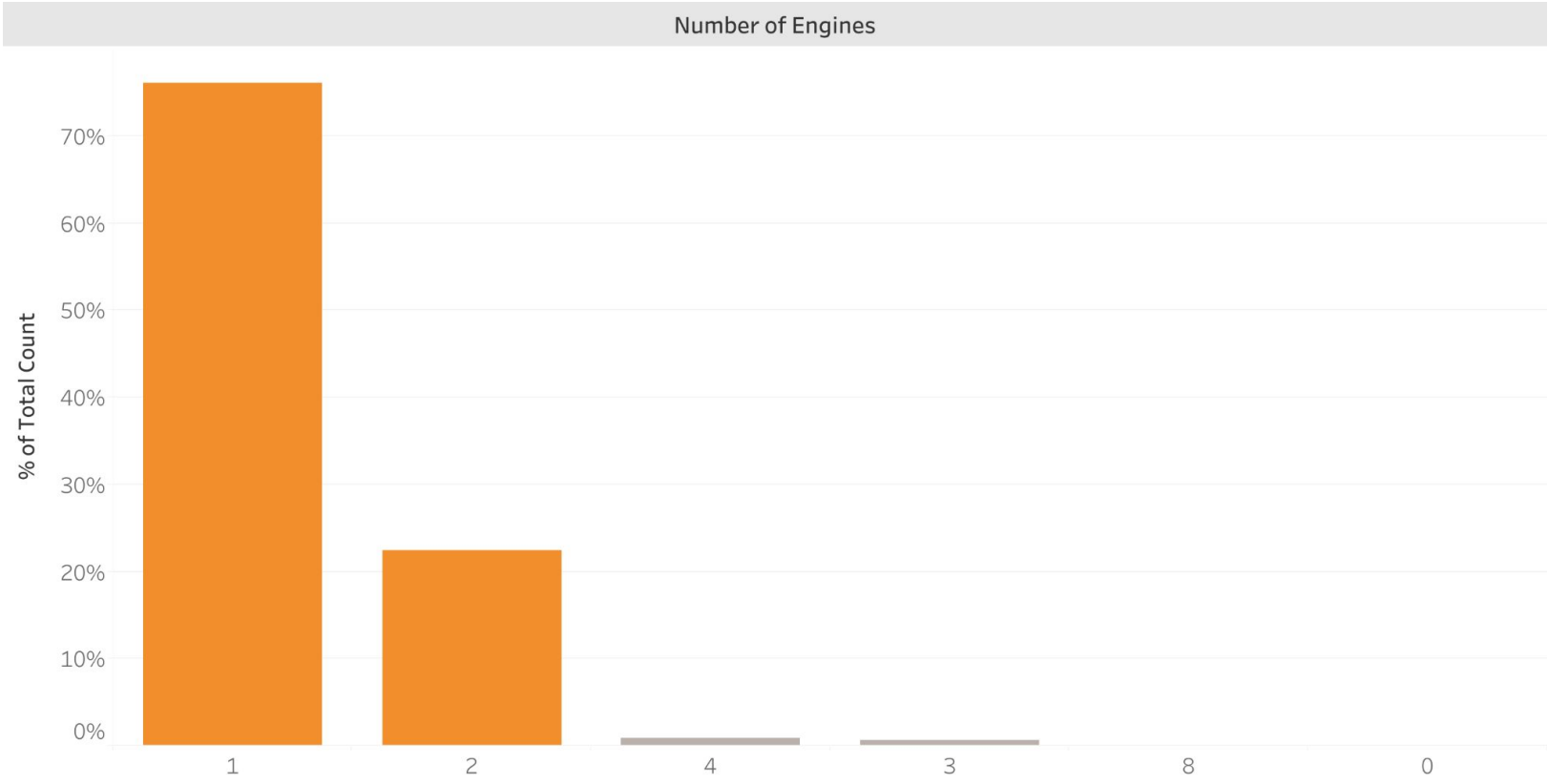
Data Analysis

- One type of engine was involved in **~90%** of recorded aviation accidents
- **~98%** of all accidents occurred in aircraft with **less than 3 engines**
- **Two flight phases** were responsible for **over 30%** of all accidents
- There are **7 aircraft companies** which would be considered the **safest** based on the metrics of Non-Fatal rate, Total Death Toll, and Deaths per flight

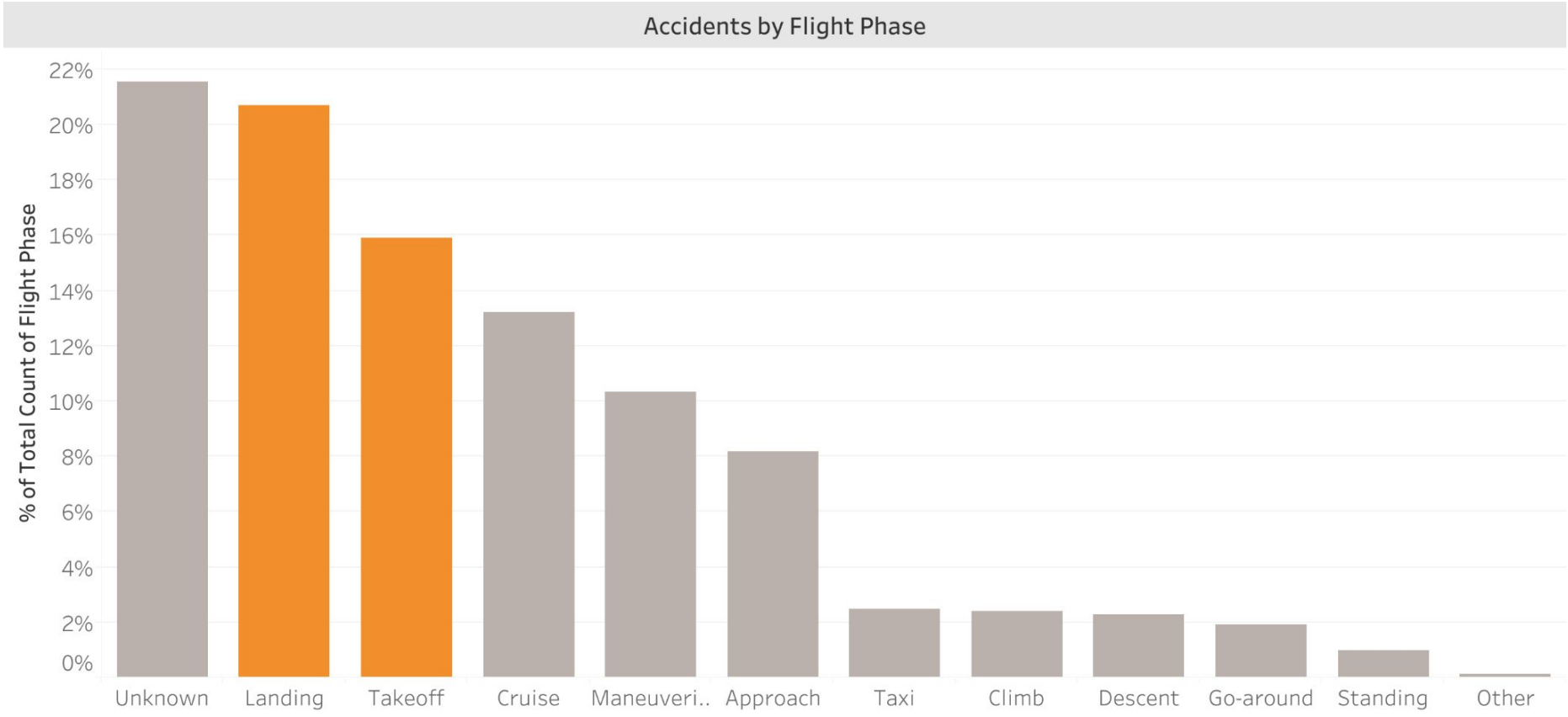
Reciprocating engines make up almost **90%** of all engine types involved in aviation accidents.



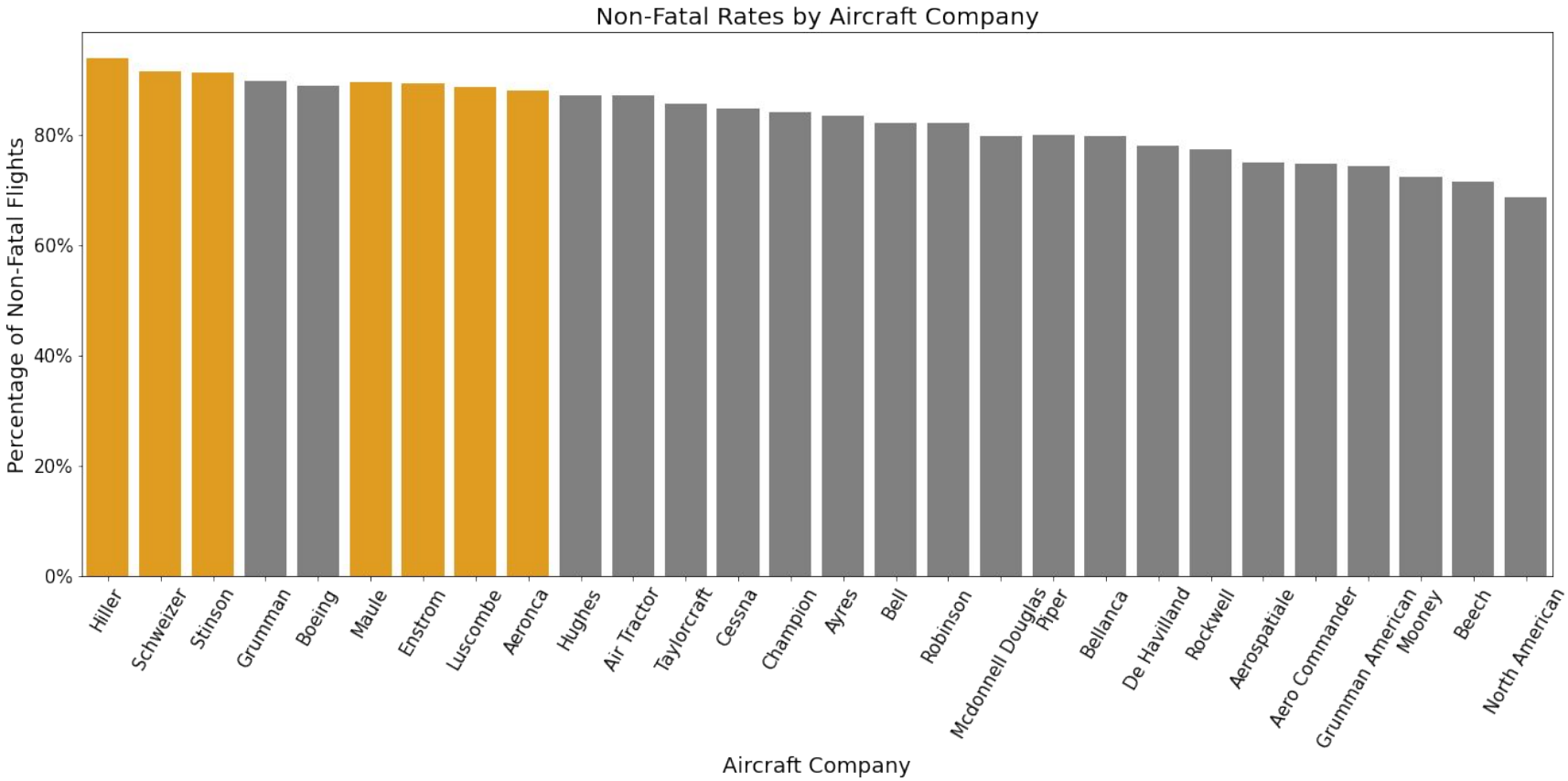
~98% of all accidents occurred in aircraft with **1 or 2 engines**



Over **33% of all accidents** occurred during either the **Landing** or **Takeoff** phases



7 aircraft companies are considered the **least risky** based on the metrics of **Non-Fatal rate**, **Total Death Toll**, and **Deaths per flight**



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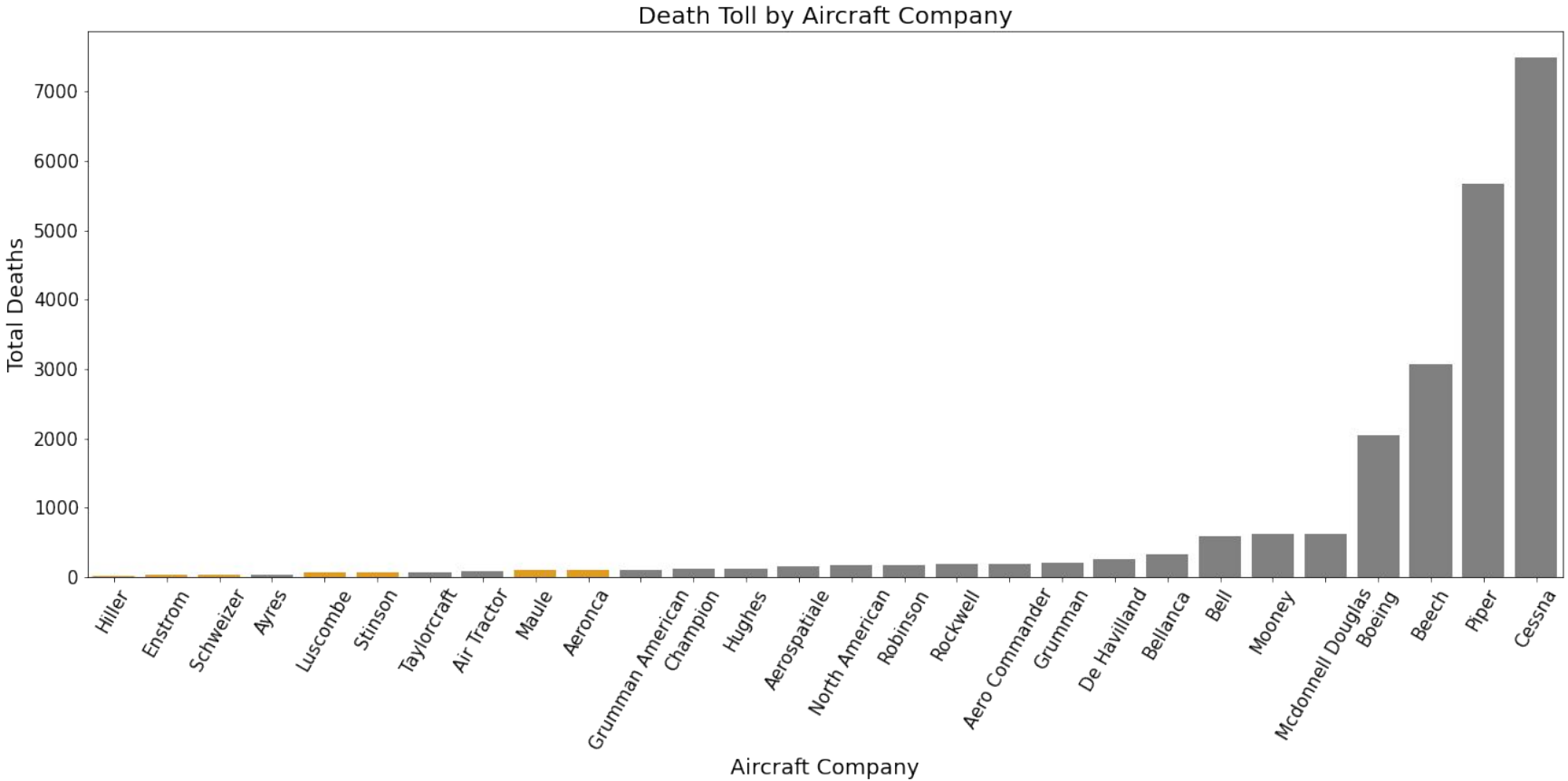

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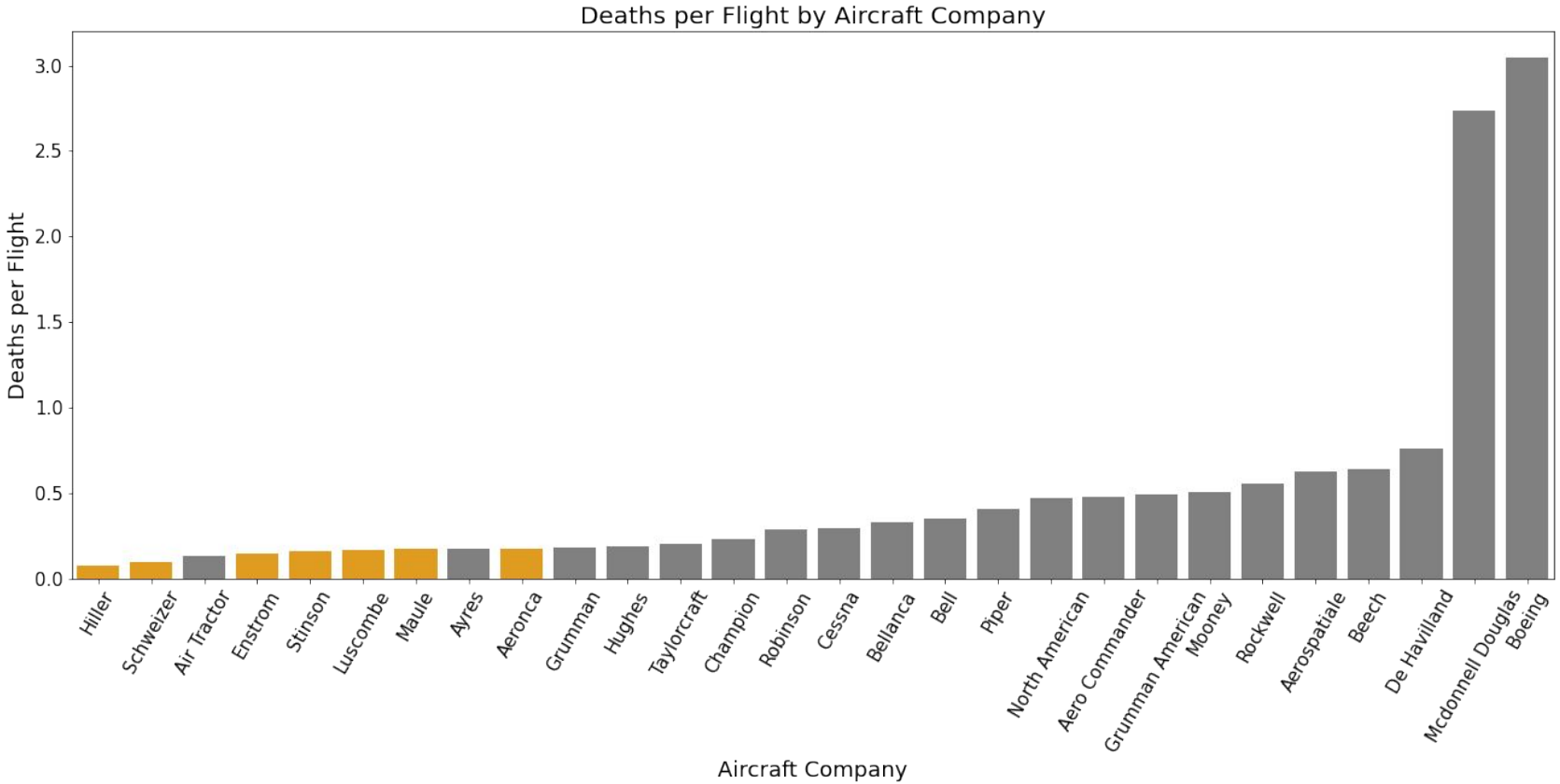


Limitations

- Analysis limited to making recommendations regarding the *least risky* aircrafts
- Least risky aircraft might not be the safest aircraft from the pool of all possible aircrafts
- Within this dataset, least risky = safest aircraft

Recommendations

Recommendation 1: **Engines**

Invest in aircraft:

- That have more than two engines
- Are ***not*** classified as a ‘reciprocating’ engine

Recommendation 2: **Make**

Select aircraft made by one of the following companies:

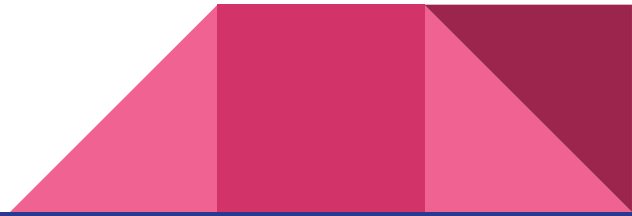
- Hiller
- Schweizer
- Stinson
- Maule
- Enstrom
- Luscombe
- Aeronca

Recommendation 3: **Pilot Training**

Focus training of pilots on the ‘Takeoff’ and ‘Landing’ phases

Next Steps

1. I would be interested in gathering and looking into two sets of data:
    a. price data for aircraft from the recommended companies
    b. pilot training program data



Thank you!

Github Repository:
https://github.com/ckucewicz/aircraft_safety_project

Contact Chris Kucewicz at
cfkucewicz@gmail.com with additional questions