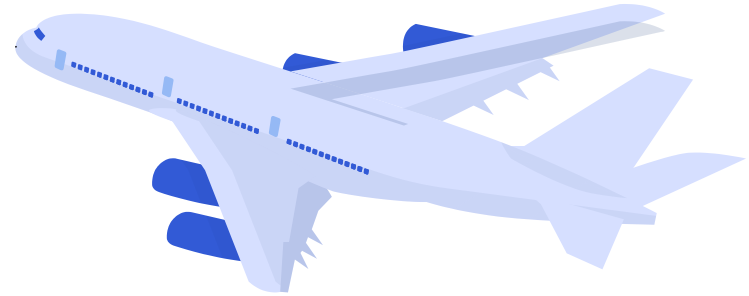


# ***Fly-Hard***



Risk Analysis Project  
June 2, 2023



# ***Our Team***



***Justin Phan***

Technical Lead



***Morgan Goode***

Github Lead



***Simon Hui***

Presentation lead



***1. Business  
Problem***



***2. Data  
Understanding***



***3. Analysis***



***4. Recommendations***



***5. Next Steps***



# ***Business Problem/Overview***

- US private flight market saw up to 30% growth from 2021 - 2022
- Passenger demand is expected to recover fully by 2024
- Maintenance demand is expected to reach \$118 billion by 2030

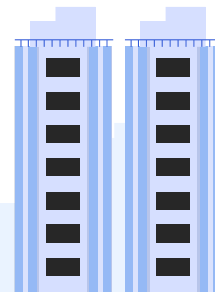
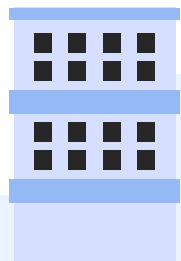


***Sources:***  
***Argus Aviation Analytics***  
***ARSA/Oliver Wyman***



# ***Bottom Line***

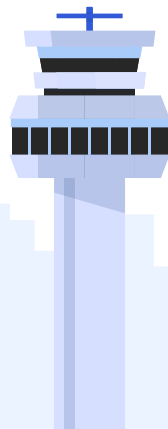
Airplanes with turbofan engines reduce the odds of personal injury and aircraft damage





# ***Data Overview***

- National Transportation Safety Board data
- 1997-2023
- ~ 50k accidents/incidents
- Limitations: no overall flight numbers

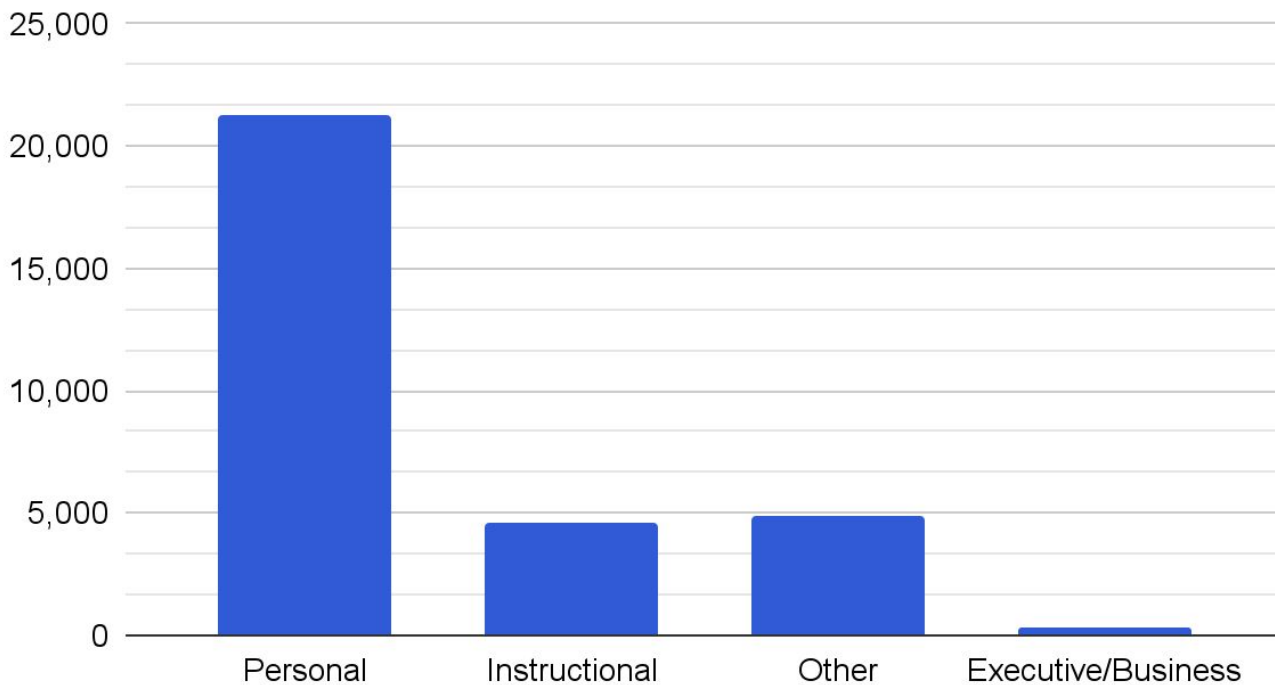




# *Analysis*

# ***Personal and Instructional Flights are the Riskiest***

Purpose of Flights Involved in Accidents/Incidents (1997 - 2023)



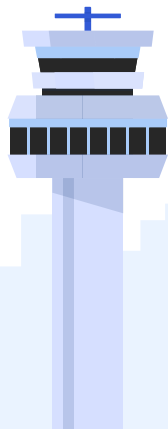




# ***Looking at Relevant Engines***

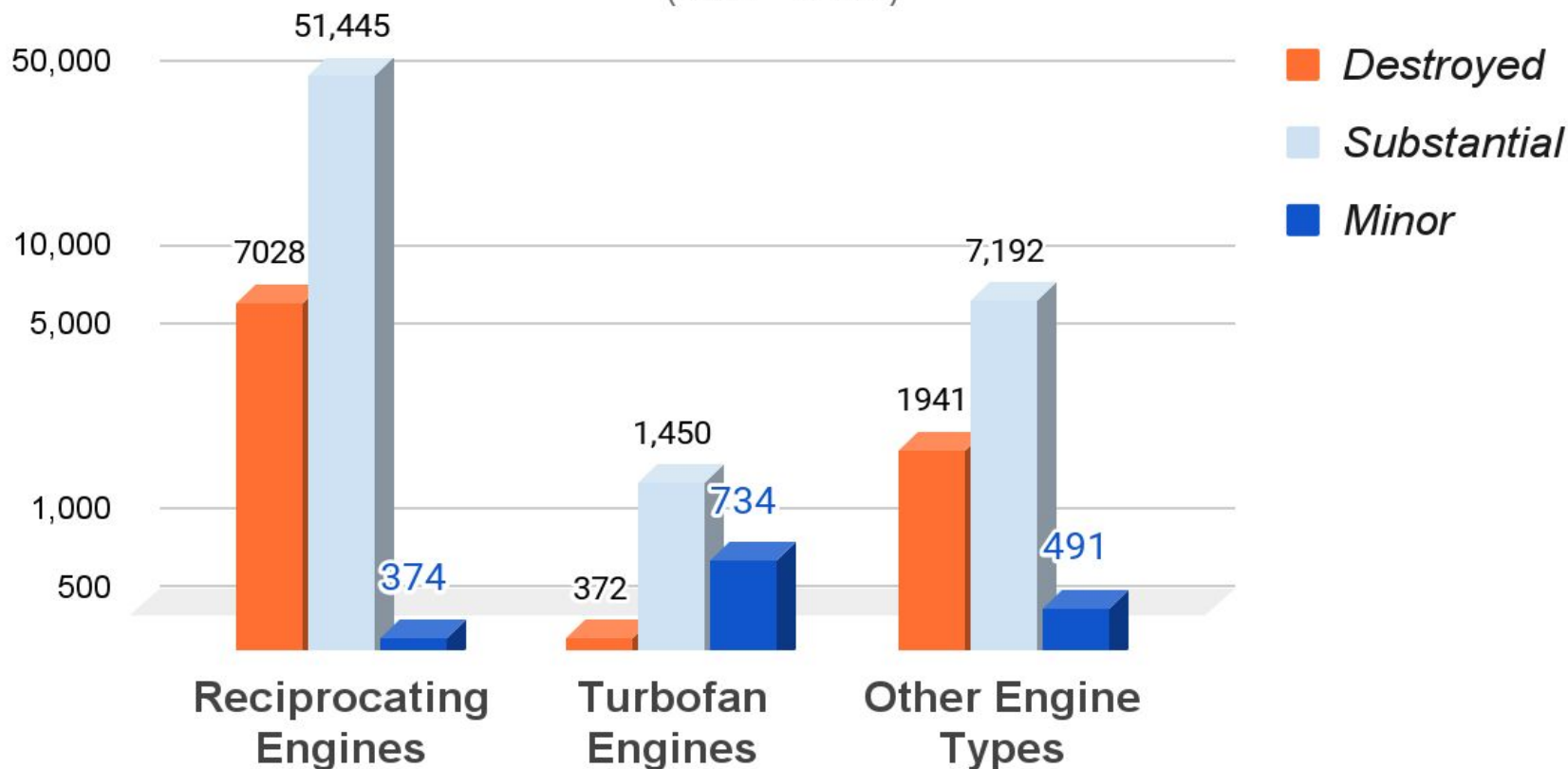
## ***Engine Type Overview:***

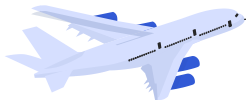
- **RECIPROCATING ENGINES:** commonly used in **smaller propeller-driven planes**
- **TURBOFAN ENGINES:** most commonly used in **commercial airplanes**



# Frequency of Aircraft Damage by Engine Type

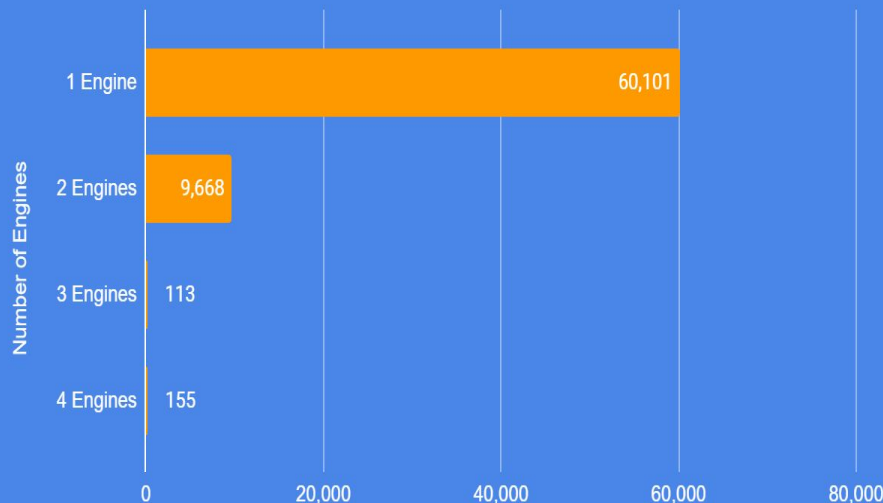
(1997 - 2023)





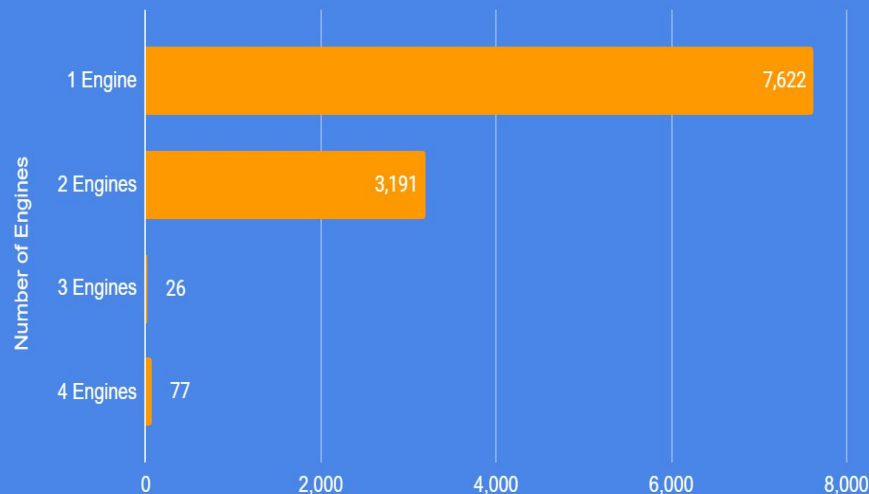
# ***1 Engine Aircraft Suffer More Damage vs. 2/4 Engines 1997-2023***

Substantially Damaged vs. Number of Engines



Substantially Damaged Aircraft from 1997-Present

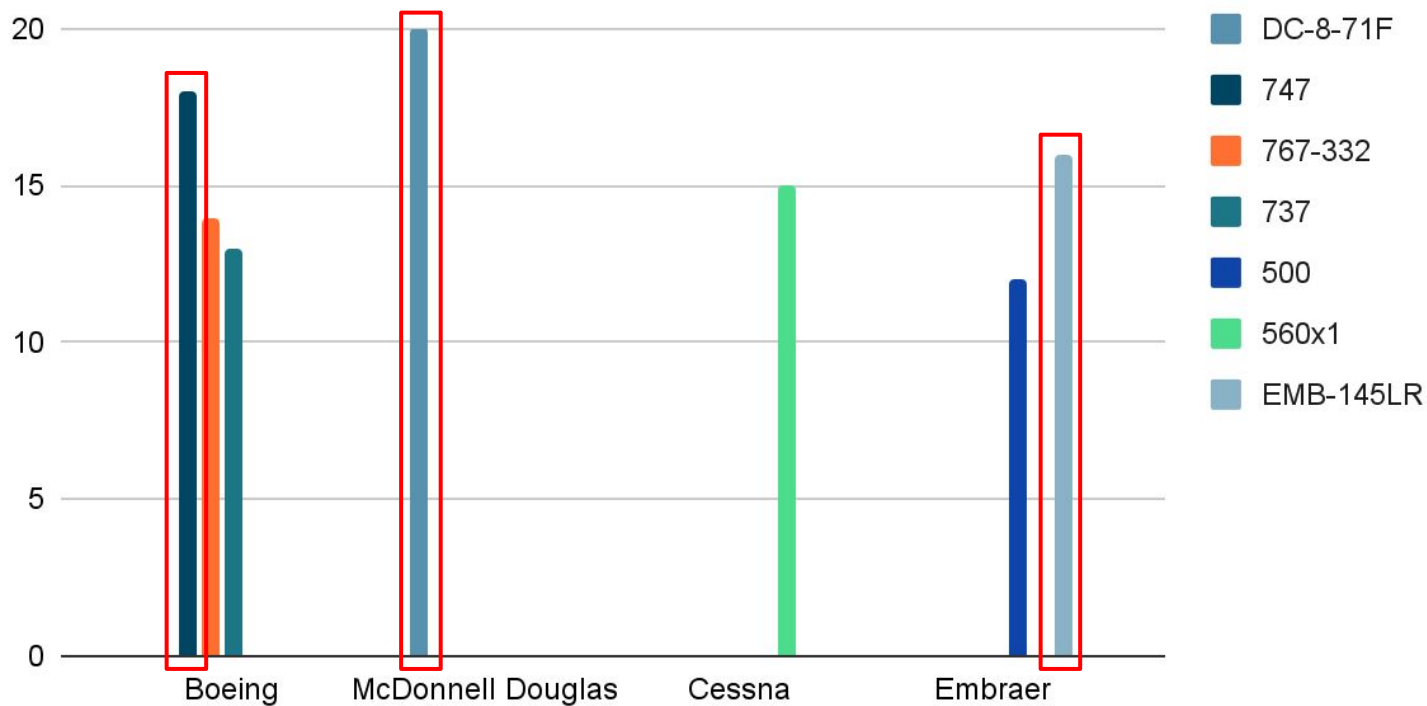
Destroyed vs. Number of Engines



Destroyed Aircraft from 1997-Present

## Airplanes with 2-4 Turbofan Engines and No Injuries

(1997 -2023)



# Plane Recommendations



Boeing **747**



McDonnell Douglas  
**DC-8-71F**



Embraer **EMB-145LR**



# ***Key Takeaways***



**1**

***Private/Business Only***



**2**

***Engine Type***



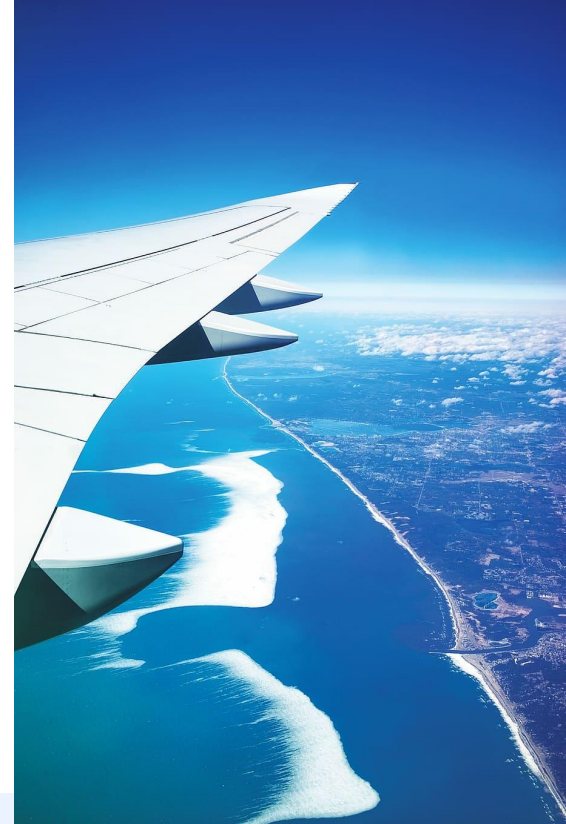
**3**

***2/4 Engines***

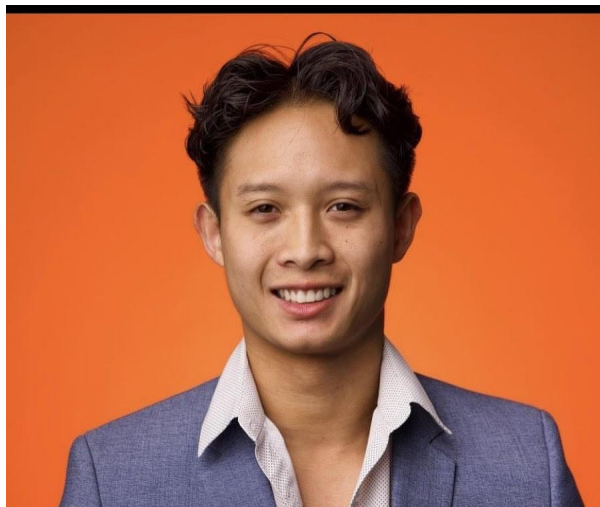


# ***FUTURE STEPS***

- Explore a complete dataset
- EDA on the risks involved in international endeavors



# Questions?



***Justin Phan***

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