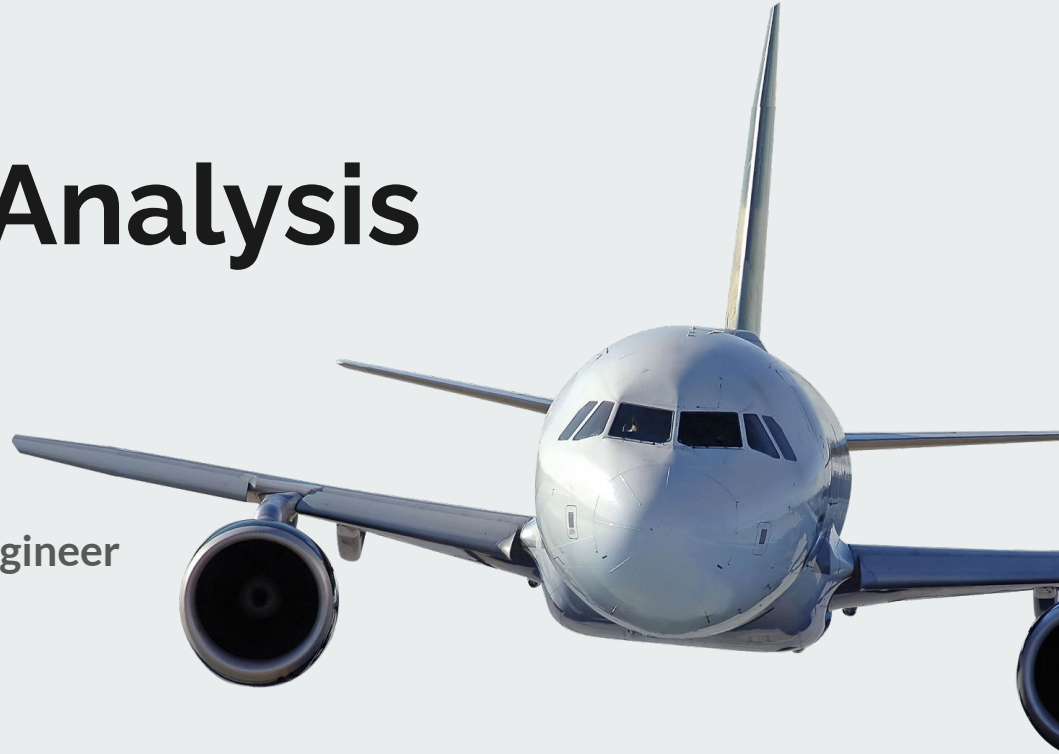




Aircraft Risk Analysis

Author : **Ralph Djino DUMERA**, IT Engineer





Overview

Project Goal:

"Identify lowest-risk aircraft models to safely launch our aviation division"

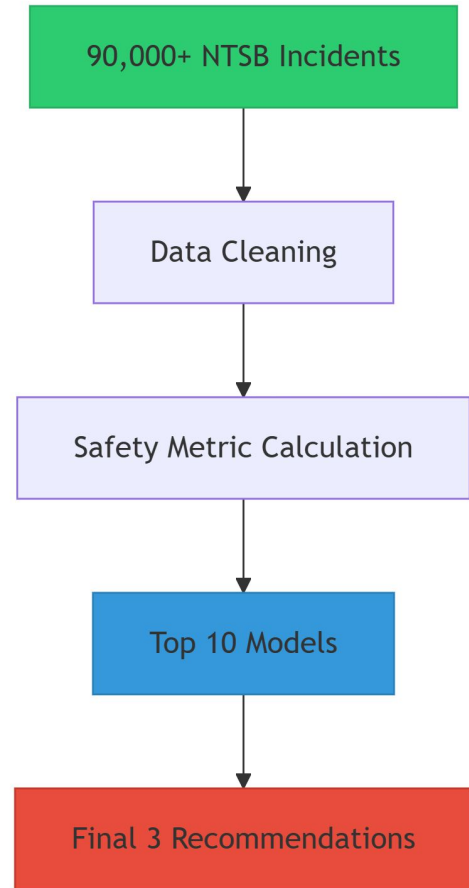
Approach:

1. Analyzed 90,000+ NTSB incident records
2. Ranked models by safety metrics
3. Filtered for commercial viability



From data to decision

Methodological flow from raw data to actionable recommendations





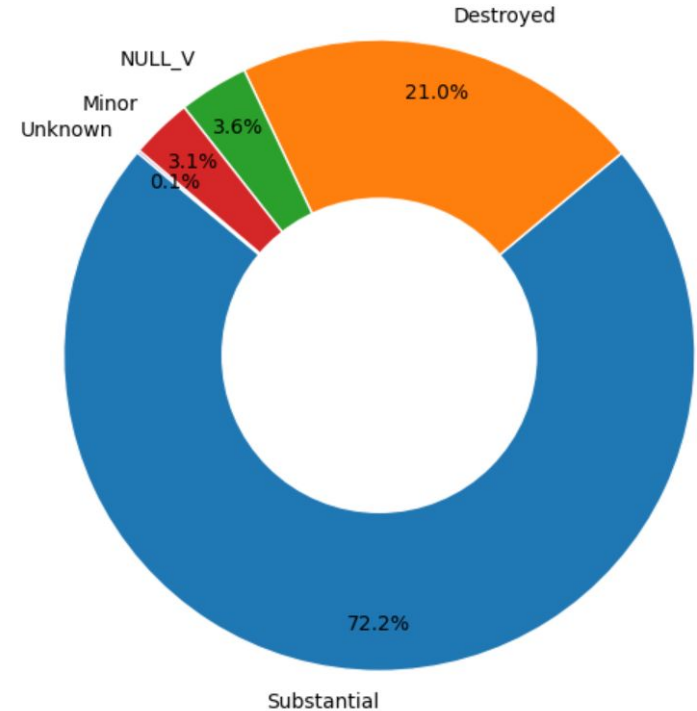
Business Understanding

Why This Matters:

- Aircraft choice impacts:
 - **Safety:** 72% of incidents cause substantial damage
 - **Reputation:** High-profile accidents harm brand

Distribution of Aircraft Damage

- 72% of incidents cause Substantial Damage
- 21% Destroyed Aircraft
- Only 3.1% Minor Damage





Data Understanding

Dataset :

- **Source** : NTSB/FAA (1962-2023)
- **Shape** : 90 348 entries, 31 columns
- **Key Field** : `Aircraft.Type (Make + Model)`, `Total.Fatal.Injuries`, `Total.Uninjured`

Limitations :

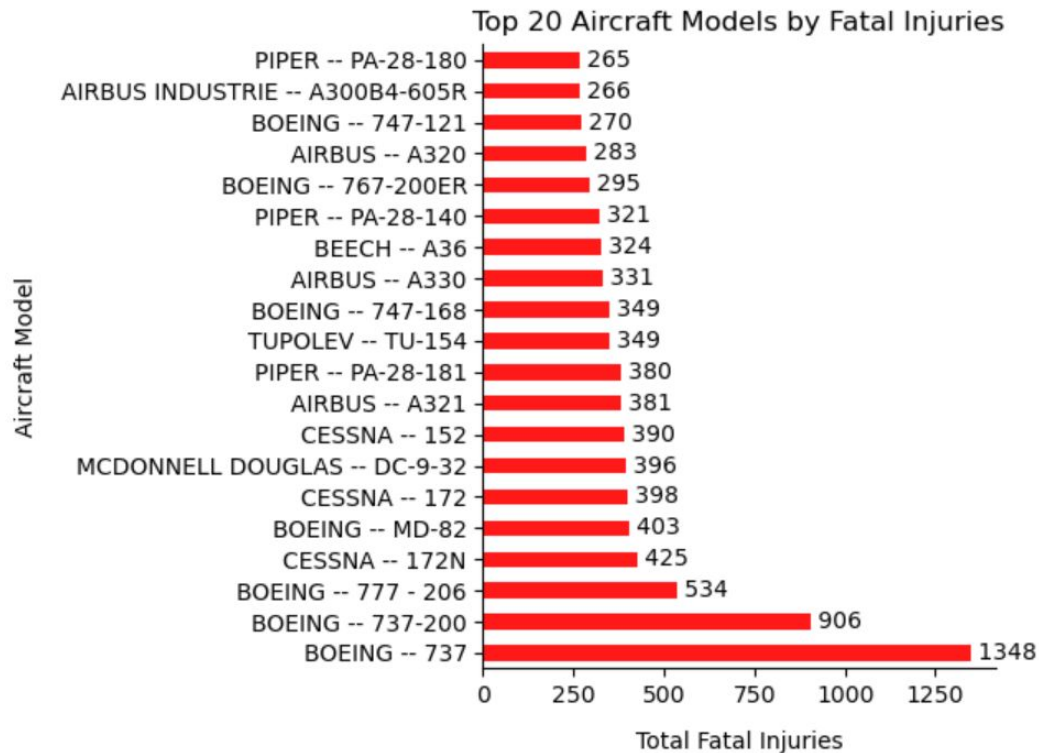
- No flight hours → Used per-incident rates
- Older models overrepresented in incident data

Fatal by model

Our analysis reveals three high-risk models dominate

fatal incidents:

- Boeing 737 (all variants): 1348 fatalities
- Boeing 737-200: 906 fatalities (despite <5% of fleet)
- Boeing 777-200ER: 534 fatalities (notably rare but severe events)



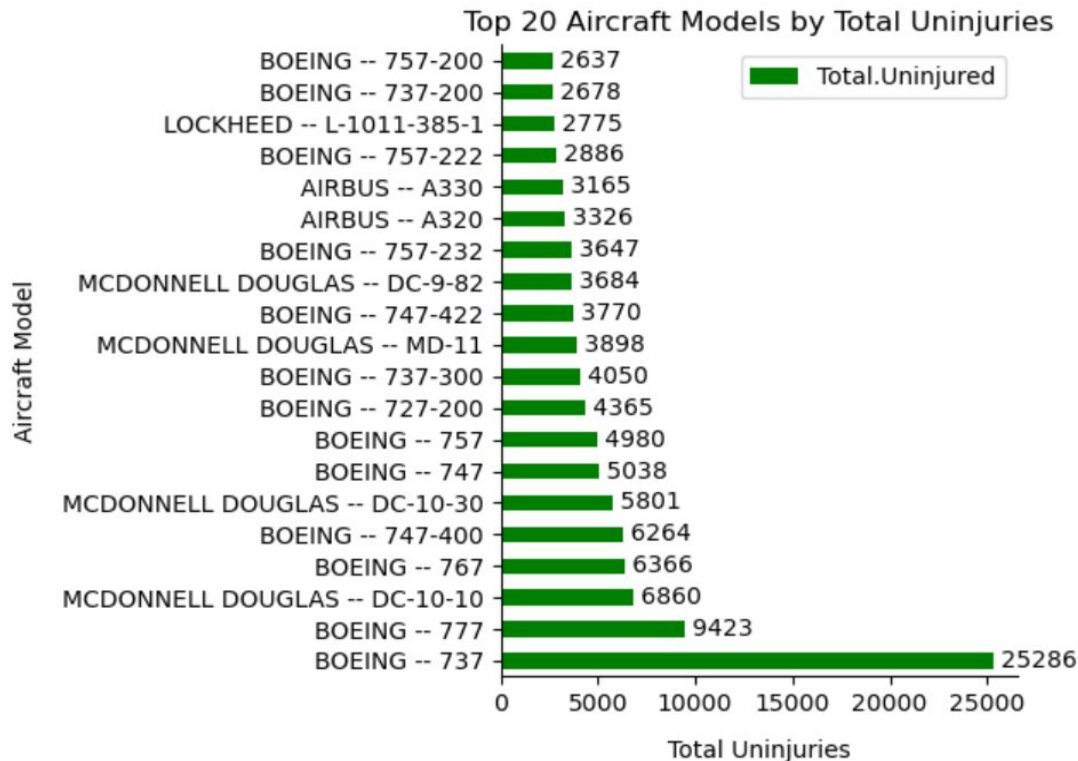
Safe by model

High uninjured counts don't always

equal **safety**—context matters.

The DC-10 appears here due to:

- *Underreported minor incidents*
- *Survivor bias*"



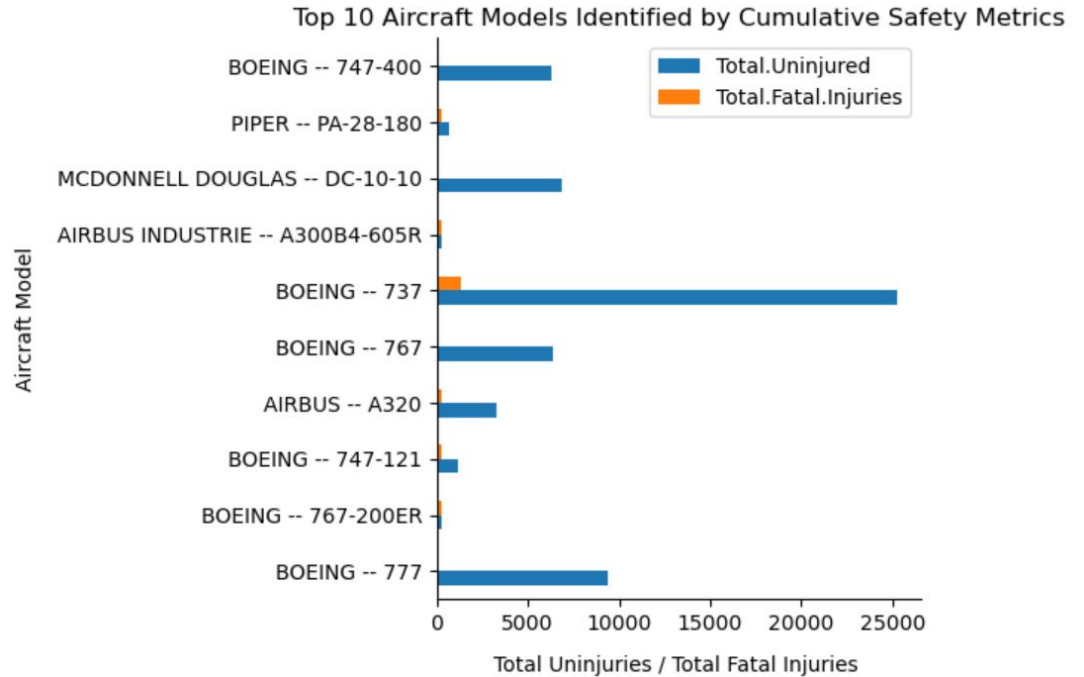


Data Analysis

Key Findings:

1. **Modern jets dominate safety:** A320/777 fewer fatalities than 1980s models.
2. **Wide-body paradox:** 747-400 outperforms older 747s.
3. **Training advantage:** Newer systems reduce pilot error.

Top 10 recommended models



Recommendations

Acquisition Priority :

1. Airbus A320

- Lowest fatality rate in narrow-bodies
- Ideal for regional and short-to-medium haul

commercial use.



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Recommendations

2. Boeing 777

- Zero fatal incidents.
- Excellent for long-haul and international routes.



Recommendations

3. Boeing 767

- Best cost/safety balance among wide-bodies
- Versatile mid-size wide-body for both cargo

and passenger services.





Next Steps

1. **Phase 1** : Lease 2 A320 (\$5M/year) for route validation
2. **Phase 2** : Negotiate 777 purchase options
3. **Phase 3**: Audit 767 maintenance records for cargo ops

A large passenger airplane, likely a Boeing 747, is shown on a runway. The aircraft is white with blue and gold accents, including the "JT" logo on the tail and "ЮТэйр" (Ural Airlines) on the fuselage. The background is a hazy, overcast sky. Overlaid on the image are several text boxes and a small logo in the top left corner.

Thank you !

“Let’s build a safer aviation division together!”

Question ?

 ralphdumera00@gmail.com

 www.linkedin.com/in/ralph-djino-dumera-76b162138