

# How safe is flying?

An investigation on the history of flight safety and contributing factors.



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Somewhat topically relevant...

*Boeing Board to Call for Safety  
Changes After 737 Max Crashes*

**American Airlines flight attendants say they fear flying on Boeing's 737 Max**

**Boeing pilots discussed 'fundamental issues' with 737 MAX in internal messages**

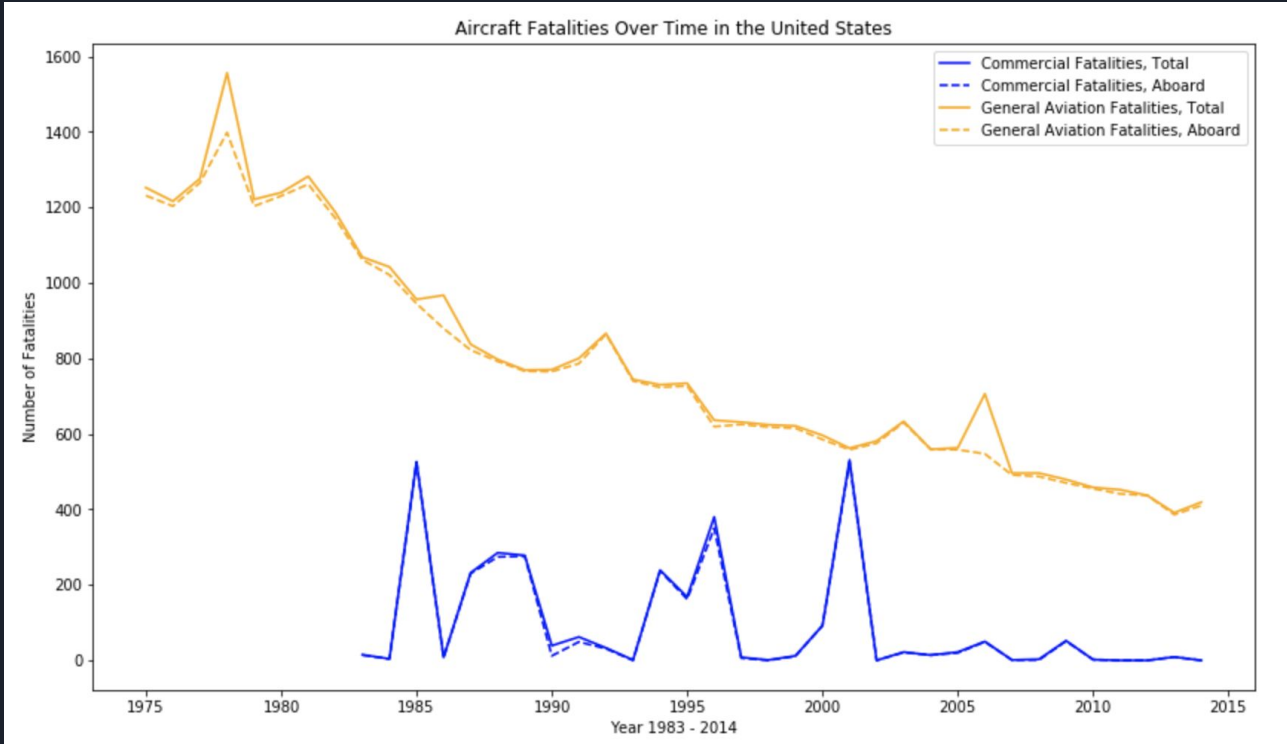
**Is the Boeing 737 Max safe?**



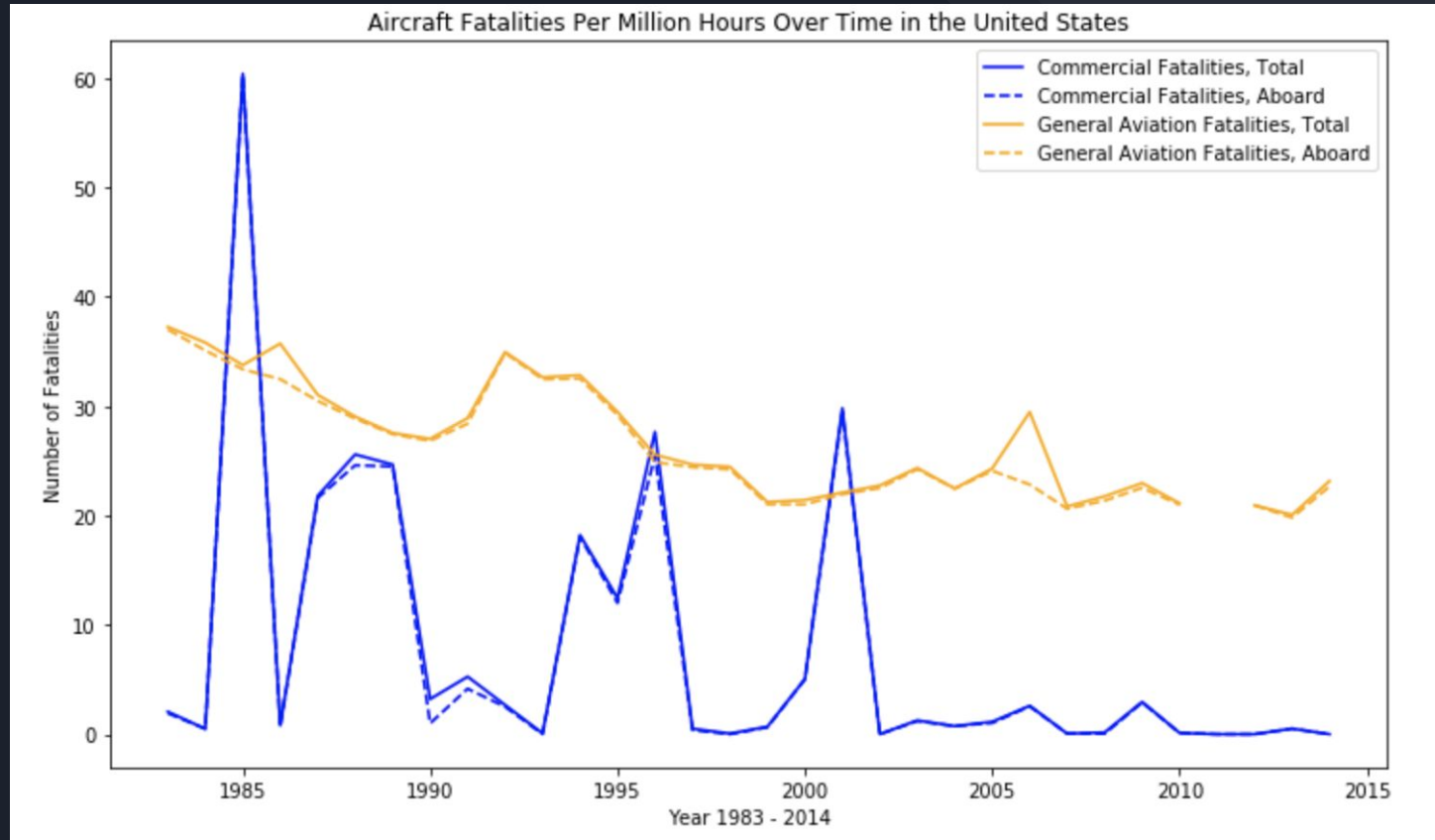
# Data Set & Background

- FAA Accidents and Incidents System Database
  - Domestic Flights
  - Complete data from about 1983-2014
- 'Commercial' vs 'Private'
  - 'Commercial' = 14 CFR-121
    - Domestic, Flag, and Supplemental Operations, more than 10 passengers, scheduled service
  - 'Private' = General Aviation
    - Examples: Personal, Instruction, Business, Travel Club, Executive, Air Taxi

Fatalities have decreased over time, but private flight is more dangerous than commercial flight!



# Fatalities dropping even more with respect to increased air travel.



# 0.508 per million flight hours

This is 1 in 1.97 million hours.

Seattle to New York is 4.5 hours. Let's say you flew this route every single day.

Flying this route every single day for 1,196 years would bring you to the 1.97 million hours.



# What airplanes have the most fatalities?

Airplane Make/Model	Number of Fatal Crashes Reports from 1983-2014
CESSNA CE-182	216
DE HAVILLAND-BOMBARDIER DHC-6 TWIN OTTER	55
CESSNA CE-180	40
CESSNA CE-206	39
DOUG DC-3	38



Cessna CE-182 [8]



De Havilland-Bombardier  
DHC-6 Twin Otter[6]



Cessna CE-180 [9]



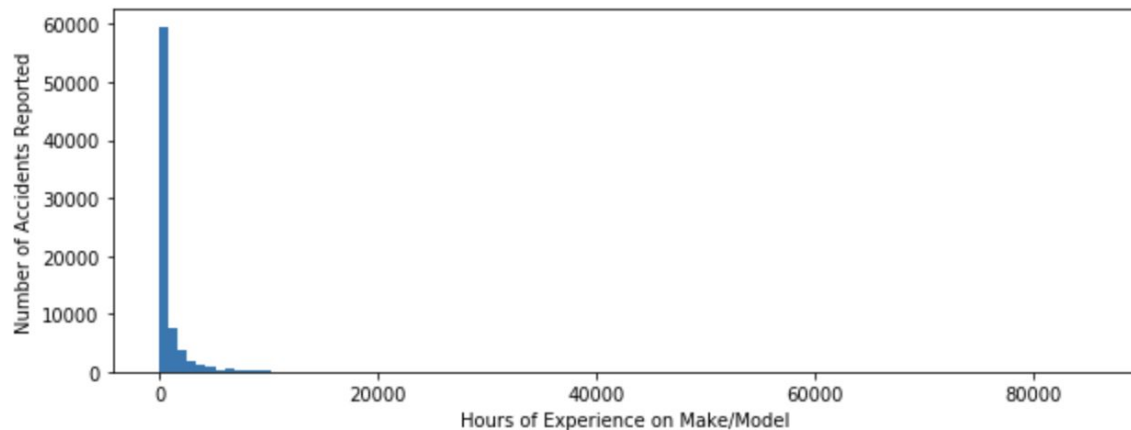
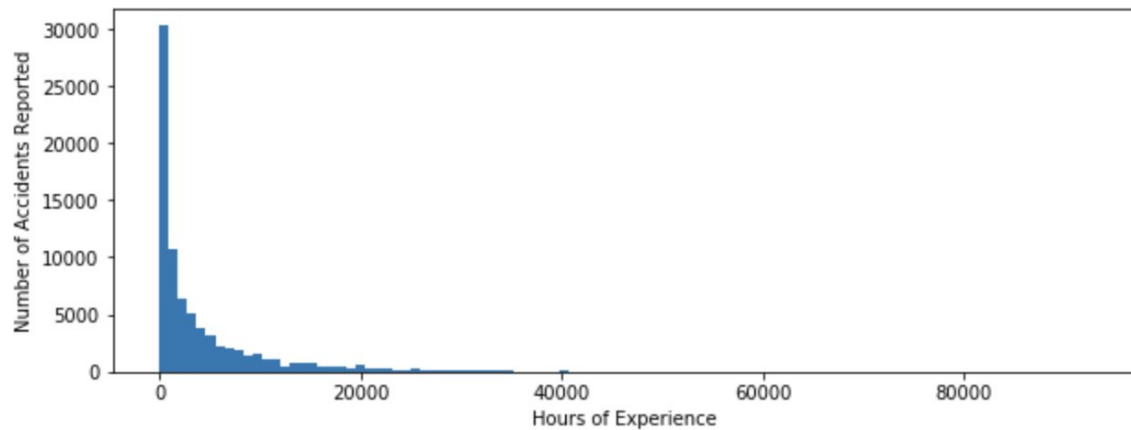
Cessna CE-206 [10]



DOUG DC-3 [7]



## Experience Level of Pilots in Accidents



Pilots  
experience  
matters!



# Conclusion

## Why is private flight more dangerous than commercial flight?

Larger plane → more flight hours  
required for certification to fly

More flight hours → more  
experienced pilots

More experienced pilots → Safer

Larger plane → more expensive

More expensive → fewer exist,  
fewer privately owned

Fewer planes → Less chances for  
them to crash



Thinking bigger: why is flight so much safer than driving?



# Sources

[1] <https://www.asias.faa.gov/apex/f?p=100:11:::NO:::>

[2] <https://catalog.data.gov/dataset/accidents-and-accident-rates-by-ntsb-classification-1995-through-2014-for-u-s-air-carriers>

[3] <https://catalog.data.gov/dataset/accidents-fatalities-and-rates-1995-through-2014-for-u-s-air-carriers-operating-under-14-c-dae36>

[4] <https://catalog.data.gov/dataset/accidents-fatalities-and-rates-1995-through-2014-u-s-general-aviation>

[5] <http://www.oogazone.com/2019/best-free-airplane-vector-library/>

[6] [https://en.wikipedia.org/wiki/De\\_Havilland\\_Canada\\_DHC-6\\_Twin\\_Otter#/media/File:WinAir\\_De\\_Havilland\\_Canada\\_DHC-6-300\\_Twin\\_Otter\\_Breidenstein.jpg](https://en.wikipedia.org/wiki/De_Havilland_Canada_DHC-6_Twin_Otter#/media/File:WinAir_De_Havilland_Canada_DHC-6-300_Twin_Otter_Breidenstein.jpg)



# Sources

[7] [https://en.wikipedia.org/wiki/Douglas\\_DC-3#/media/File:Douglas\\_DC-3,\\_SE-CFP.jpg](https://en.wikipedia.org/wiki/Douglas_DC-3#/media/File:Douglas_DC-3,_SE-CFP.jpg)

[8] [https://en.wikipedia.org/wiki/File:Cessna182t\\_skylane\\_n2231f\\_cotswoldairshow\\_2010\\_arp.jpg](https://en.wikipedia.org/wiki/File:Cessna182t_skylane_n2231f_cotswoldairshow_2010_arp.jpg)

[9] [https://en.wikipedia.org/wiki/Cessna\\_180#/media/File:Cessna.180a.g-btsm.arp.jpg](https://en.wikipedia.org/wiki/Cessna_180#/media/File:Cessna.180a.g-btsm.arp.jpg)

[10] [https://en.wikipedia.org/wiki/Cessna\\_206#/media/File:Cessna.206h.stationair2.arp.jpg](https://en.wikipedia.org/wiki/Cessna_206#/media/File:Cessna.206h.stationair2.arp.jpg)

# Commercial flight has grown more in comparison to private flight

