

An aerial, top-down view of an airport tarmac. Three white commercial airplanes with dark blue accents are parked in a diagonal line. Each airplane is surrounded by ground support equipment, including yellow and black service vehicles and smaller ground crew vehicles. Orange lines on the tarmac indicate taxi paths or parking positions. The background shows a grid-like pattern of the tarmac surface.

KPI Dashboard

Using Airplane Crash Data

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1	Date	Time	Location	Operator	Flight #	Route	Type	Registration	cn/ln	Aboard	Fatalities	Ground	Summary						
2	09/17/190	17:18	Fort Myer, Virginia	Military - U.S. Army		Demonstration	Wright Flyer III		1	2	1	0	During a demonstration flight, a U.S. Army flyer flown by Orville Wright crashed.						
3	07/12/191	6:30	Atlantic City, New Jersey	Military - U.S. Navy		Test flight	Dirigible			5	5	0	First U.S. dirigible Akron exploded just offshore at an altitude of 1,000 ft.						
4	08/06/1913		Victoria, British Columbia, Canada	Private	-		Curtiss seaplane			1	1	0	The first fatal airplane accident in Canada occurred when American barnstormer crashed.						
5	09/09/191	18:30	Over the North Sea	Military - German Navy			Zeppelin L-1 (airship)			20	14	0	The airship flew into a thunderstorm and encountered a severe downdraft.						
6	10/17/191	10:30	Near Johannisthal, Germany	Military - German Navy			Zeppelin L-2 (airship)			30	30	0	Hydrogen gas which was being vented was sucked into the forward engine.						
7	03/05/191	1:00	Tienen, Belgium	Military - German Navy			Zeppelin L-8 (airship)			41	21	0	Crashed into trees while attempting to land after being shot down by British aircraft.						
8	09/03/191	15:20	Off Cuxhaven, Germany	Military - German Navy			Zeppelin L-10 (airship)			19	19	0	Exploded and burned near Neuwerk Island, when hydrogen gas, being vented, caught fire.						
9	07/28/1916		Near Jambol, Bulgaria	Military - German Army			Schutte-Lanz S-L-10 (airship)			20	20	0	Crashed near the Black Sea, cause unknown.						
10	09/24/191	1:00	Billericay, England	Military - German Navy			Zeppelin L-32 (airship)			22	22	0	Shot down by British aircraft crashing in flames.						
11	10/01/191	23:45	Potters Bar, England	Military - German Navy			Zeppelin L-31 (airship)			19	19	0	Shot down in flames by the British 39th Home Defence Squadron.						
12	11/21/1916		Mainz, Germany	Military - German Army			Super Zeppelin (airship)			28	27	0	Crashed in a storm.						
13	11/28/191	23:45	Off West Hartlepool, England	Military - German Navy			Zeppelin L-34 (airship)			20	20	0	Shot down by British anti-aircraft fire and aircraft and crashed into the North Sea.						
14	03/04/1917		Near Gent, Belgium	Military - German Army			Airship			20	20	0	Caught fire and crashed.						
15	03/30/1917		Off Northern Germany	Military - German Navy			Schutte-Lanz S-L-9 (airship)			23	23	0	Struck by lightning and crashed into the Baltic Sea.						
16	05/14/191	5:15	Near Texel Island, North Sea	Military - German Navy			Zeppelin L-22 (airship)			21	21	0	Crashed into the sea from an altitude of 3,000 ft. after being hit by British anti-aircraft fire.						
17	06/14/191	8:45	Off Vlieland Island, North Sea	Military - German Navy			Zeppelin L-43 (airship)			24	24	0	Shot down by British aircraft.						
18	08/21/191	7:00	Off western Denmark	Military - German Navy			Zeppelin L-23 (airship)			18	18	0	Shot down by British aircraft.						
19	10/20/191	7:45	Near Luneville, France	Military - German Navy			Zeppelin L-44 (airship)			18	18	0	Shot down by French anti-aircraft fire.						
20	04/07/191	21:30	Over the Mediterranean	Military - German Navy			Zeppelin L-59 (airship)			23	23	0	Exploded and crashed into the sea off the southern coast of Italy.						
21	05/10/1918		Off Helgoland Island, Germany	Military - German Navy			Zeppelin L-70 (airship)			22	22	0	Shot down by British aircraft crashing from a height of 17,000 ft.						
22	08/11/191	10:00	Ameland Island, North Sea	Military - German Navy			Zeppelin L-53 (airship)			19	19	0	Shot down by British aircraft.						
23	12/16/1918		Elizabeth, New Jersey	US Aerial Mail Service			De Havilland DH-4	97		1	1	0							
24	05/25/1919		Cleveland, Ohio	US Aerial Mail Service			De Havilland DH-4	61		1	1	0	Caught fire in midair. The pilot leaped from the plane to his death as the plane crashed.						
25	07/19/1919		Dix Run, Pennsylvania	US Aerial Mail Service			De Havilland DH-4	82		1	1	0							
26	10/02/1919		Newcastle, England	Aircraft Transport and Travel			De Havilland DH-4			1	1	0							
27	10/14/1919		Cantonsville, Maryland	US Aerial Mail Service			Curtiss R-4LM	32		1	1	0							
28	10/20/1919		English Channel	Aircraft Transport and Travel			De Havilland DH-4	G-EAHG											
29	10/30/1919		Long Valley, New Jersey	US Aerial Mail Service			De Havilland DH-4	77		1	1	0							
30	03/10/1920		New Paris, Indiana	US Aerial Mail Service			De Havilland DH-4	65		1	1	0							
31	03/30/1920		Newark, New Jersey	US Aerial Mail Service			De Havilland DH-4	72		1	1	0							
32	04/10/1920		Newark, New Jersey	US Aerial Mail Service			Curtiss R-4LM	49		2	1	0							
33	04/11/1920		Heller Field, New Jersey	US Aerial Mail Service			Curtiss JN-4H	44		2	1	0							
34	05/12/1920		Oskaloosa, Iowa	US Aerial Mail Service			De Havilland DH-4	79		2	1	0							
35	06/06/1920		Cleveland, Ohio	US Aerial Mail Service			De Havilland DH-4	204		1	1	0							
36	08/16/1920		Bedford, England	By Air			Armstrong-Whitworth F-K-8	G-EALW		1	1	0							
37	08/16/1920		College Park, Maryland	US Aerial Mail Service			De Havilland DH-4	317		1	1	0							

The Dataset

Descriptive Statistics

	count	mean	std	min	25%	50%	75%	max
Aboard	5246.0	27.554518	43.076711	0.0	5.0	13.0	30.0	644.0
Fatalities	5256.0	20.068303	33.199952	0.0	3.0	9.0	23.0	583.0
Ground	5246.0	1.608845	53.987827	0.0	0.0	0.0	0.0	2750.0

```
data['Type'].value_counts()
Douglas DC-3          334
de Havilland Canada DHC-6 Twin Otter 300
Douglas C-47A         74
Douglas C-47          62
Douglas DC-4          40
...
Douglas DC-3 (C-50A-DO) 1
Convair CV-240-53      1
Consolidated C-87      1
Swearingen SA227-AC    1
Fairchild-Hiller FH227C 1
Name: Type, Length: 2446, dtype: int64
```

```
data['Registration'].value_counts()
49          3
CCCP-09303  2
N864JA      2
412         2
N91303      2
...
JY-ACB      1
44-70286    1
N401RA      1
VH-SWP      1
N215AA      1
Name: Registration, Length: 4905, dtype: int64
```

```
data['cn/In'].value_counts()
178         6
229         5
213         5
125         5
19          5
...
22554       1
CC-827B /   1
790323      1
26683       1
203         1
Name: cn/In, Length: 3707, dtype: int64
```

```
data['Date'].value_counts()
08/27/1992    4
08/28/1976    4
09/11/2001    4
02/28/1973    4
06/18/1972    4
...
12/18/2003    1
01/10/1991    1
09/14/2002    1
01/08/1959    1
03/09/2000    1
Name: Date, Length: 4753, dtype: int64
```

```
data['Time'].value_counts()
15:00    32
12:00    31
11:00    29
16:00    26
19:30    26
...
00:35     1
06:22     1
05:50     1
21:46     1
21:48     1
Name: Time, Length: 1005, dtype: int64
```

```
data['Location'].value_counts()
Moscow, Russia          15
Sao Paulo, Brazil       15
Rio de Janeiro, Brazil  14
Anchorage, Alaska       13
Manila, Philippines     13
...
Islip, New York         1
Mt. Elk, Wyoming       1
Near Puerto Inca, Huanuco, Peru 1
Near Newhall, California 1
Off Namibia, Africa     1
Name: Location, Length: 4303, dtype: int64
```

```
In [9]: data['Operator'].value_counts()
Out[9]: Aeroflot          179
Military - U.S. Air Force 176
Air France              70
Deutsche Lufthansa      65
Air Taxi                44
...
Northwest Airlines      1
Air Jordan               1
Avia-Taxi               1
Air Taxi - Flying School of the Cascades Inc. 1
Mustique Airways       1
Name: Operator, Length: 2476, dtype: int64
```

```
In [10]: data['Flight #'].value_counts()
Out[10]: -          67
         1         10
         4          7
         6          6
        21          6
...
        292         1
        1996         1
        5966         1
        810          1
        785          1
Name: Flight #, Length: 724, dtype: int64
```

```
In [11]: data['Route'].value_counts()
Out[11]: Training          81
Sightseeing              29
Test flight              17
Test                     6
Sao Paulo - Rio de Janeiro 5
...
Prague - Brun - Pressburg 1
Rio de Janeiro - Buenos Aires 1
Tegucigalpa - Duzuna      1
Los Angeles, CA - Burbank, CA 1
Libya - England           1
Name: Route, Length: 3244, dtype: int64
```

Value counts

Missing Percentages

	percent_missing
Flight #	79.707669
Time	42.122248
Route	32.384207
cn/ln	23.310554
Summary	7.403189
Registration	6.359150
Type	0.512528
Aboard	0.417616
Ground	0.417616
Location	0.379651
Operator	0.341686
Fatalities	0.227790
Date	0.000000

Data After Processing

	Date	Location	Operator	Type	Aboard	Fatalities	Ground
0	1908-09-17	United States	Military - U.S. Army	Wright Flyer III	2.0	1.0	0.0
1	1912-07-12	United States	Military - U.S. Navy	Dirigible	5.0	5.0	0.0
2	1913-08-06	Canada	Private	Curtiss seaplane	1.0	1.0	0.0
3	1913-09-09	Over The North Sea	Military - German Navy	Zeppelin L-1 (airship)	20.0	14.0	0.0
4	1913-10-17	Germany	Military - German Navy	Zeppelin L-2 (airship)	30.0	30.0	0.0
...
5263	2009-05-20	Indonesia	Military - Indonesian Air Force	Lockheed C-130 Hercules	112.0	98.0	2.0
5264	2009-05-26	Congo	Service Air	Antonov An-26	4.0	4.0	NaN
5265	2009-06-01	Brazil	Air France	Airbus A330-203	228.0	228.0	0.0
5266	2009-06-07	Canada	Strait Air	Britten-Norman BN-2A-27 Islander	1.0	1.0	0.0
5267	2009-06-08	India	Military - Indian Air Force	Antonov An-32	13.0	13.0	0.0

Overview of Analysis

The business questions:

Has flying gotten safer?

When was it most dangerous to fly?

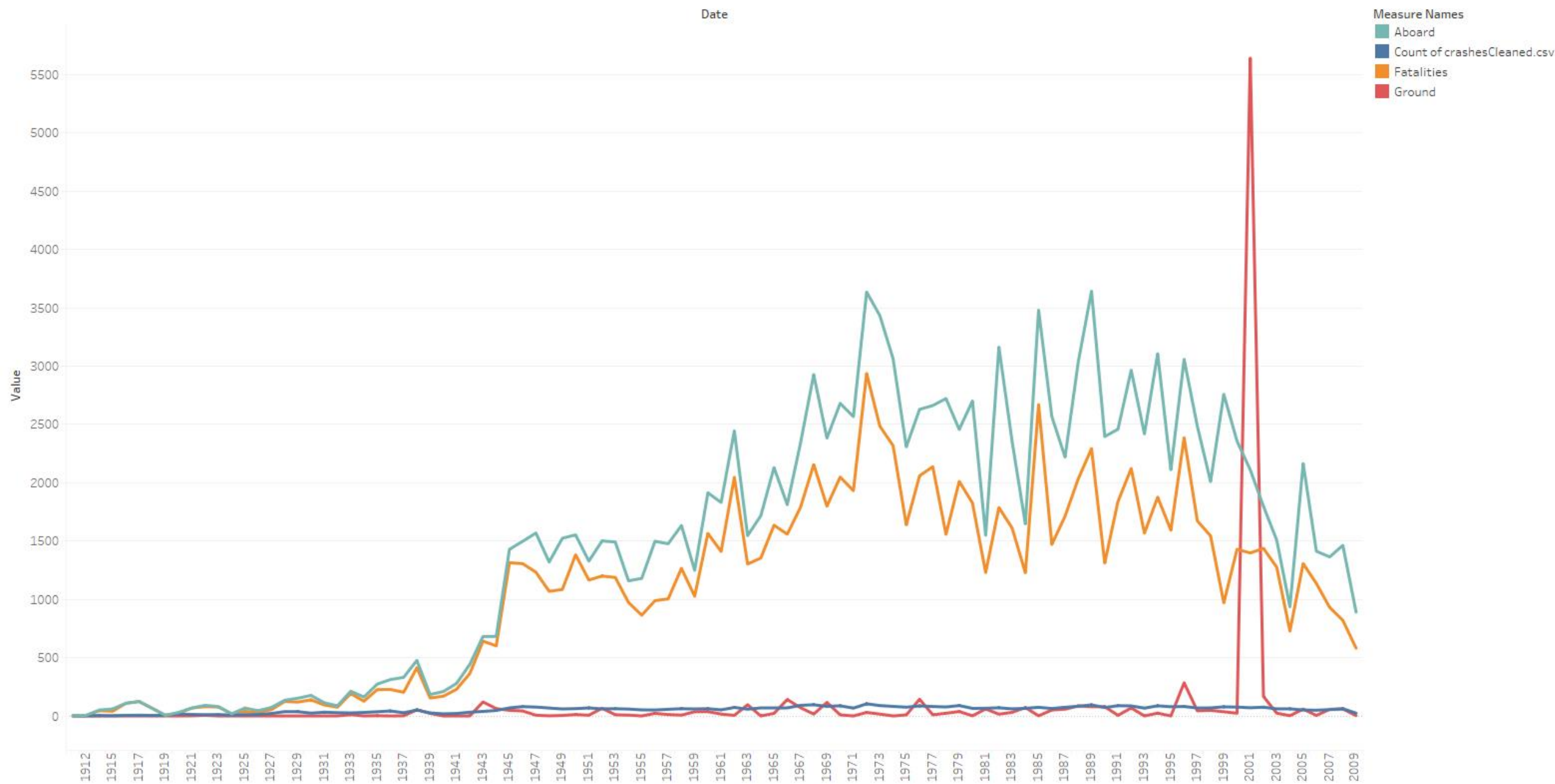
What is the most dangerous plane to be in?

What is the most dangerous country/airline to fly with?

Crashes over time

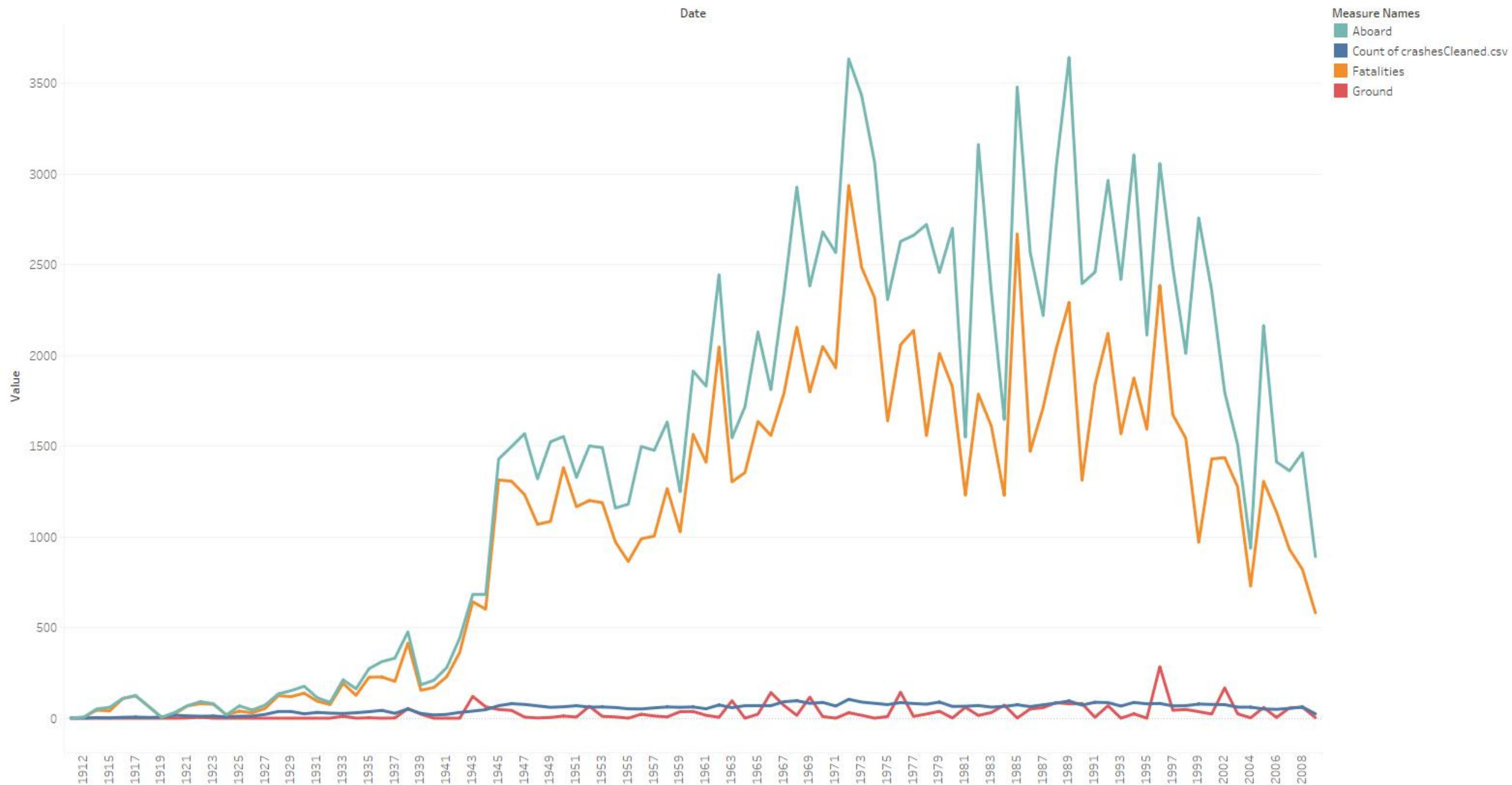
A thick, hand-drawn style orange line that underlines the text "Crashes over time". It starts under the first letter and ends under the last letter, with a slightly wavy, irregular edge.

Crashes, fatalities, and ground fatalities over time



The trends of Aboard, Fatalities, Ground and count of crashesCleaned.csv for Date Year. Color shows details about Aboard, Fatalities, Ground and count of crashesCleaned.csv. The view is filtered on Date Year, which keeps 98 of 98 members.

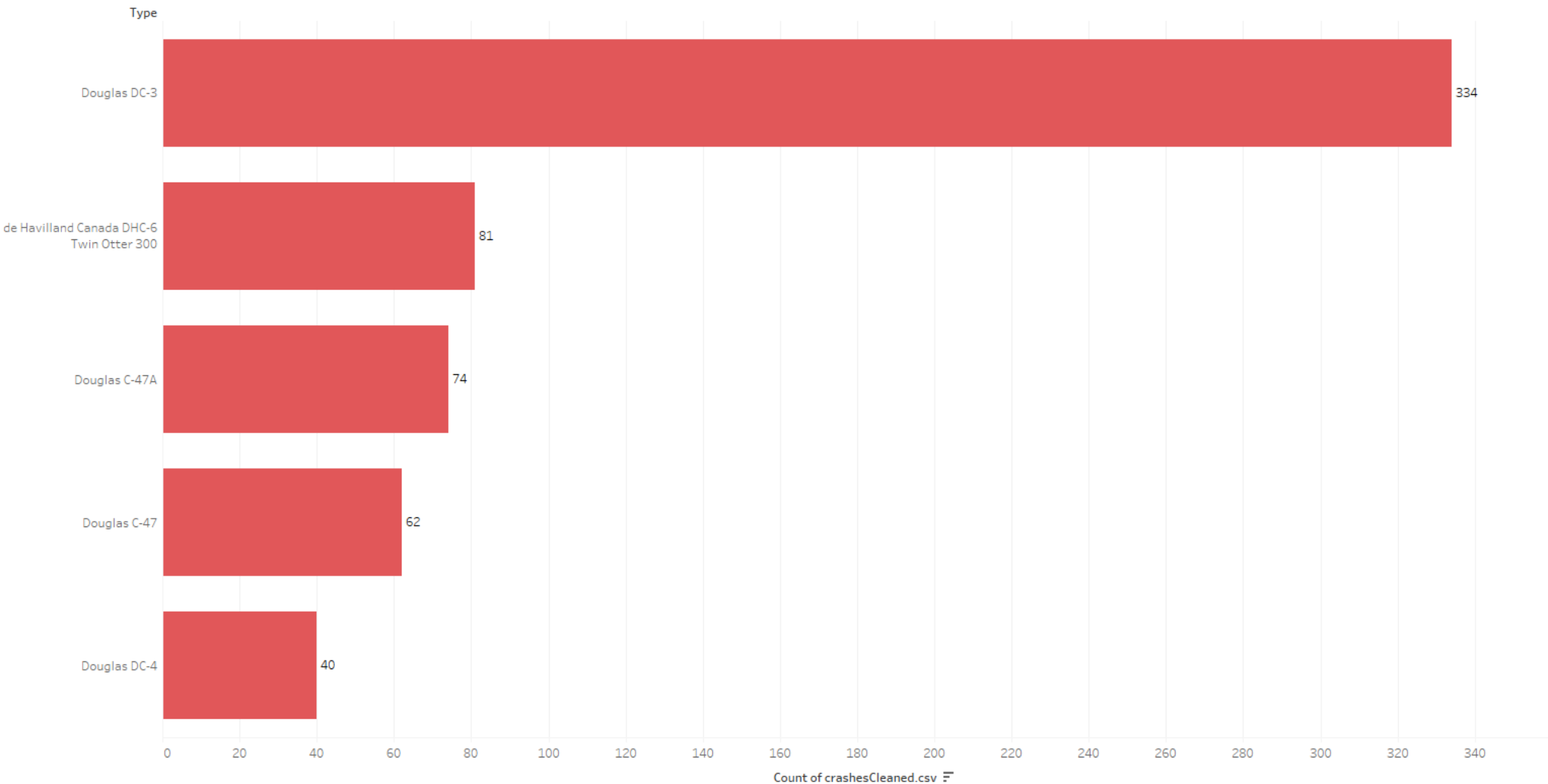
Crashes, fatalities, and ground fatalities over time



The trends of Aboard, Fatalities, Ground and count of crashesCleaned.csv for Date Year. Color shows details about Aboard, Fatalities, Ground and count of crashesCleaned.csv. The view is filtered on Date Year, which excludes 2001.

Crashes by plane model

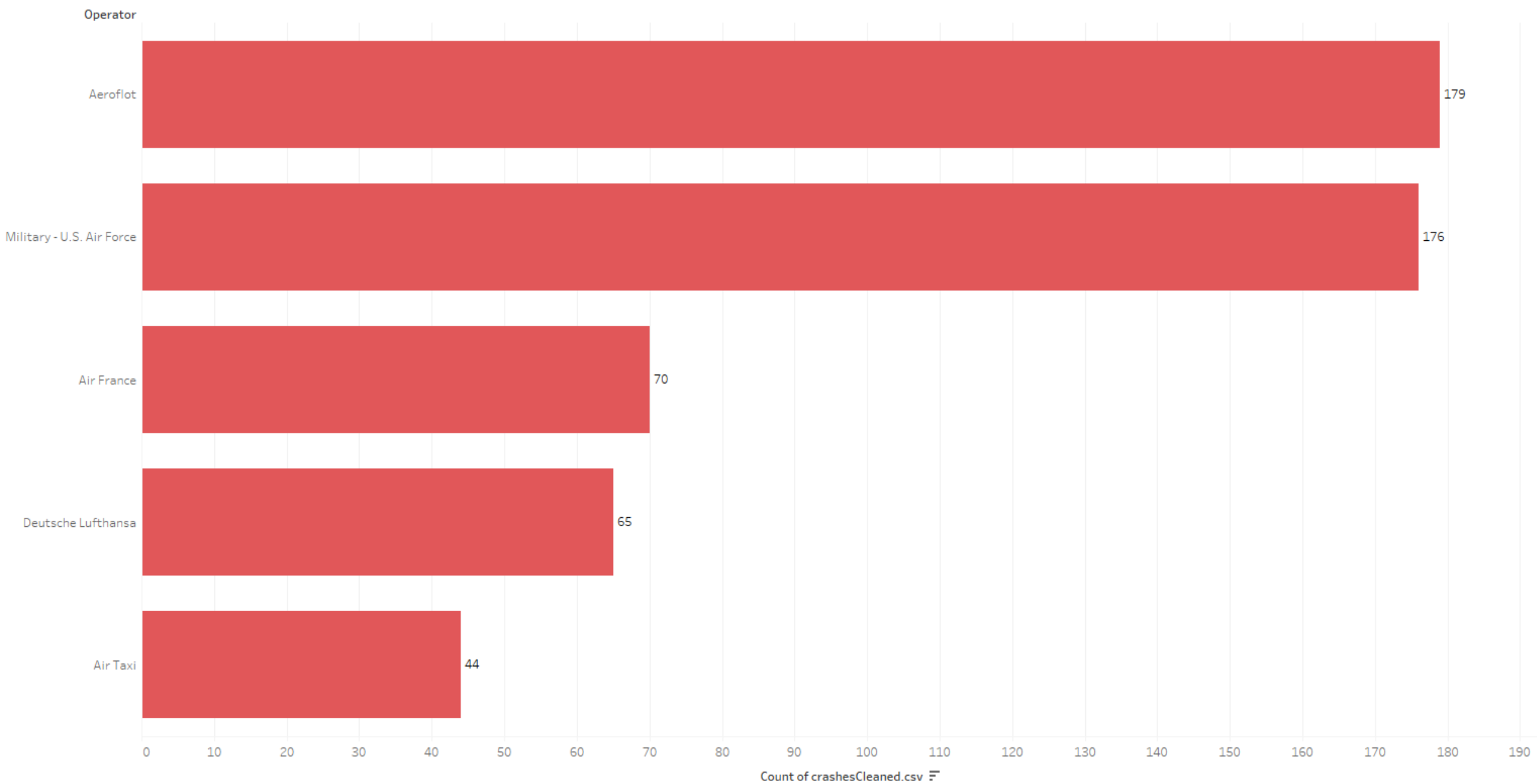
Top 5 Crashes by Model



Count of crashesCleaned.csv for each Type. The data is filtered on Date Year, which keeps 98 of 98 members. The view is filtered on Type, which keeps de Havilland Canada DHC-6 Twin Otter 300, Douglas C-47, Douglas C-47A, Douglas DC-3 and Douglas DC-4.

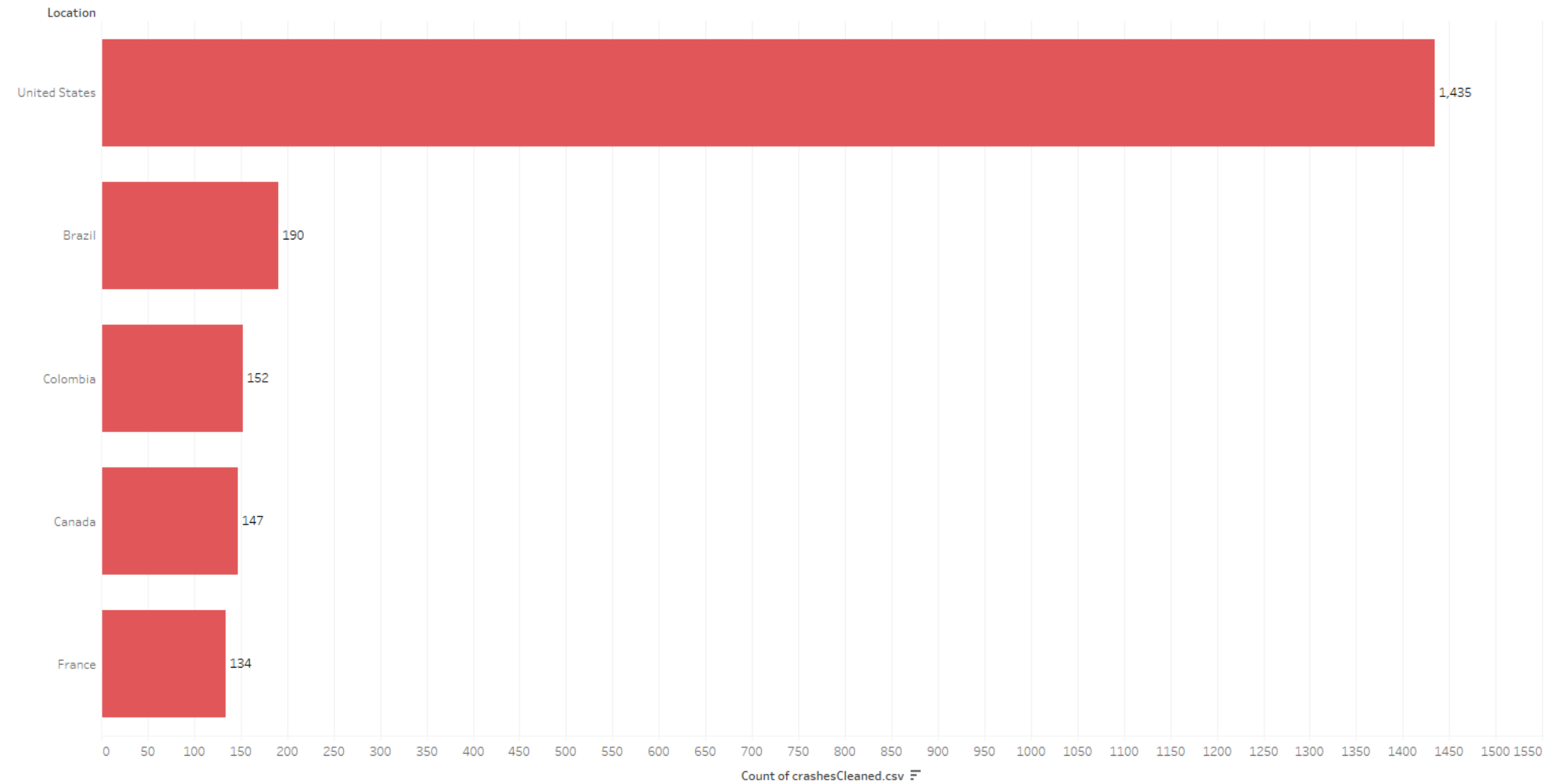
Crashes by country/airline

Top 5 Crashes by Operator



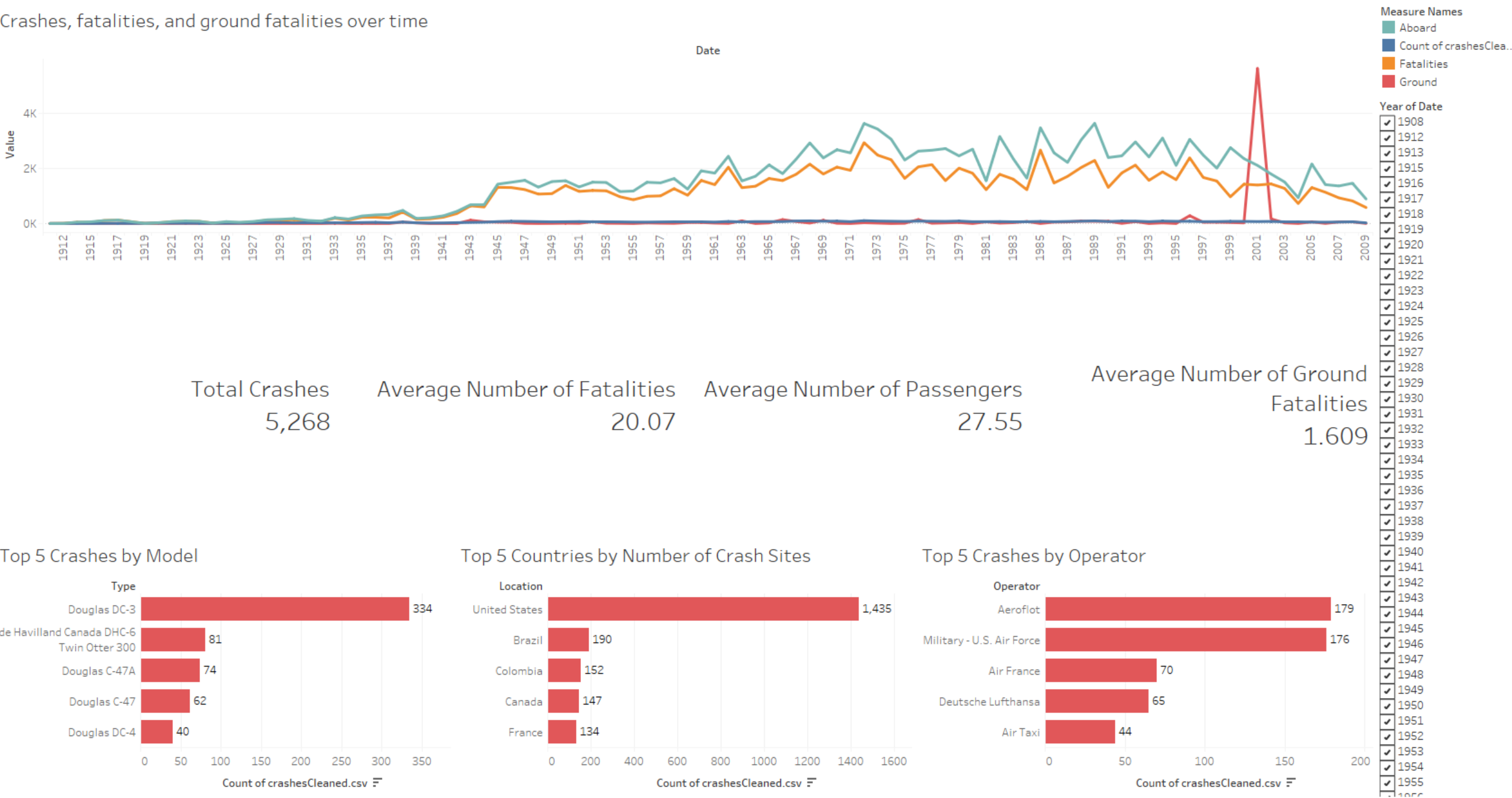
Count of crashesCleaned.csv for each Operator. The data is filtered on Date Year, which keeps 98 of 98 members. The view is filtered on Operator, which keeps Aeroflot, Air France, Air Taxi, Deutsche Lufthansa and Military - U.S. Air Force.

Top 5 Countries by Number of Crash Sites



Count of crashesCleaned.csv for each Location. The view is filtered on Location, which keeps Brazil, Canada, Colombia, France and United States.

Crashes, fatalities, and ground fatalities over time



Conclusion

- Flying has gotten safer every year and is safer now than it has ever been.
- The most dangerous year to fly in was 1972, but 1985 and 1996 were close.
- The most dangerous plane to fly in is the Douglas DC-3, however it ceased civilian production in the 1940s.
- The most dangerous airline to fly with is Aeroflot, with the U.S air force being nearly tied.

References

- <https://data.world/data-society/airplane-crashes/>