THE TRAGEDY OF FLIGHT: A COMPREHENSIVE CRASH ANALYSIS

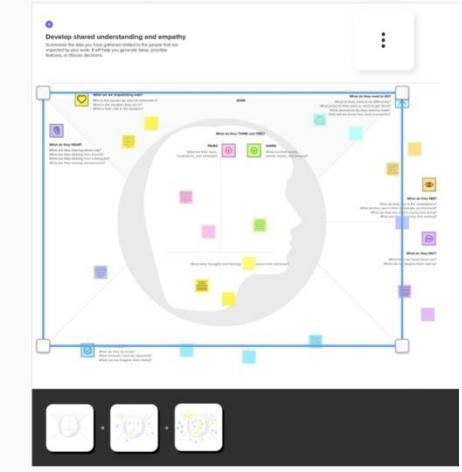
INTRODUCTION:

An airplane crash analysis is a detailed investigation into the causes of an aviation accident. The goal of an airplane crash analysis is to identify any factors that contributed to the accident, with the ultimate goal of improving safety and preventing future accidents. The process of conducting an airplane crash analysis typically involves the collection and analysis of a wide range of data, including information about the aircraft and its systems, the operators, and any other relevant factors. This data is typically collected from Kaggle. Once the data has been collected, it is analysed through tableau, to identify any potential causes of the accident. The results of an airplane crash analysis are typically published in a report, which may include recommendations for improving safety and preventing similar accidents in the future. These recommendations may be implemented by the relevant authorities or industry organizations is as safe as possible. This field of study is considered accident survivability or crashworthiness. Current crashworthiness standards focus on various systems that aim to increase the safety of the aircraft crash. Accident survivability is synonymous with the word crashworthiness, and is analysed by the acronym CREEP which stands for Container, Restraint, Environment, Energy Absorption, and Post-Crash Factors (Davis, 2008). When evaluating a crash, investigators analyse each component of CREEP to rate the accident as survivable, non-survivable, or partially survivable. A survivable crash is one in which each facet of CREEP is within human tolerances. A non-survivable accident is where one or more components of CREEP cause a life threatening injury for all occupants of the aircraft. A partially survivable

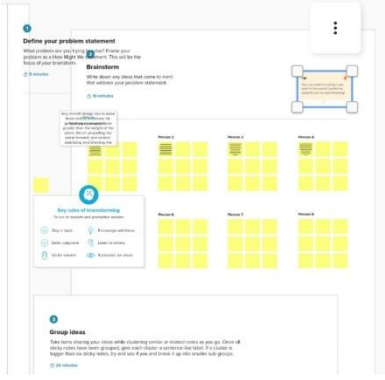
accident is one in which some components of CREEP exceed human tolerance in part or some of the aircraft, but are within human tolerances for the remaining parts. When evaluating all potential aviation accidents, the current survivability standard has significant short falls and does not address many survivability considerations that could be experienced during an accident. United States Code of Federal Regulations (U.S. CFR) define an aircraft accident as “an occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or which the aircraft receives substantial damage” (Definitions, 2010). Lap-held infants and unrestrained cargo are not directly addressed by CREEP, although they may contribute to accident survivability. While CREEP focuses on crashworthiness, there is much more to aviation survivability than what happens during a crash. By only focusing on a vehicle’s impact with terrain, many types of aviation accidents and survivability concepts are not captured. Uncontained engine failures and fires have the potential to cause serious injury or death to the occupants of an aircraft, while not necessarily causing the aircraft to crash. Crashworthiness does not address the survivability of occupants that egress the aircraft prior to impact with terrain such as aircraft equipped with ejection seats, escape capsules, or occupants that can bail out using parachutes.

Problem definition & design thinking

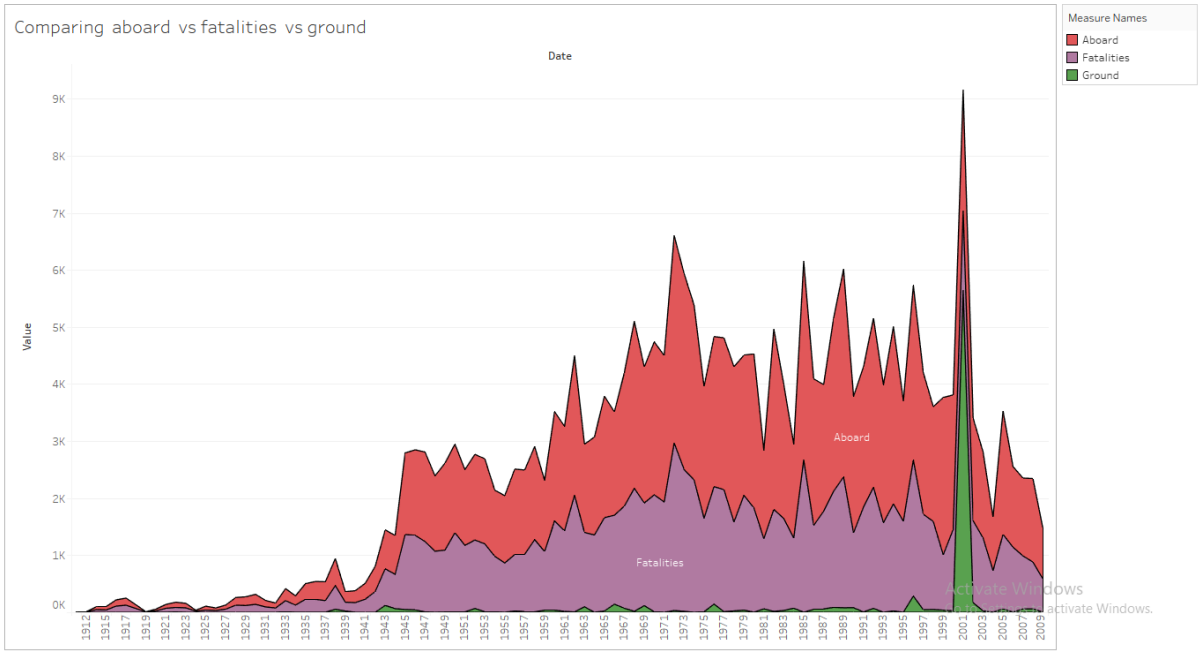
2.1 empathy map

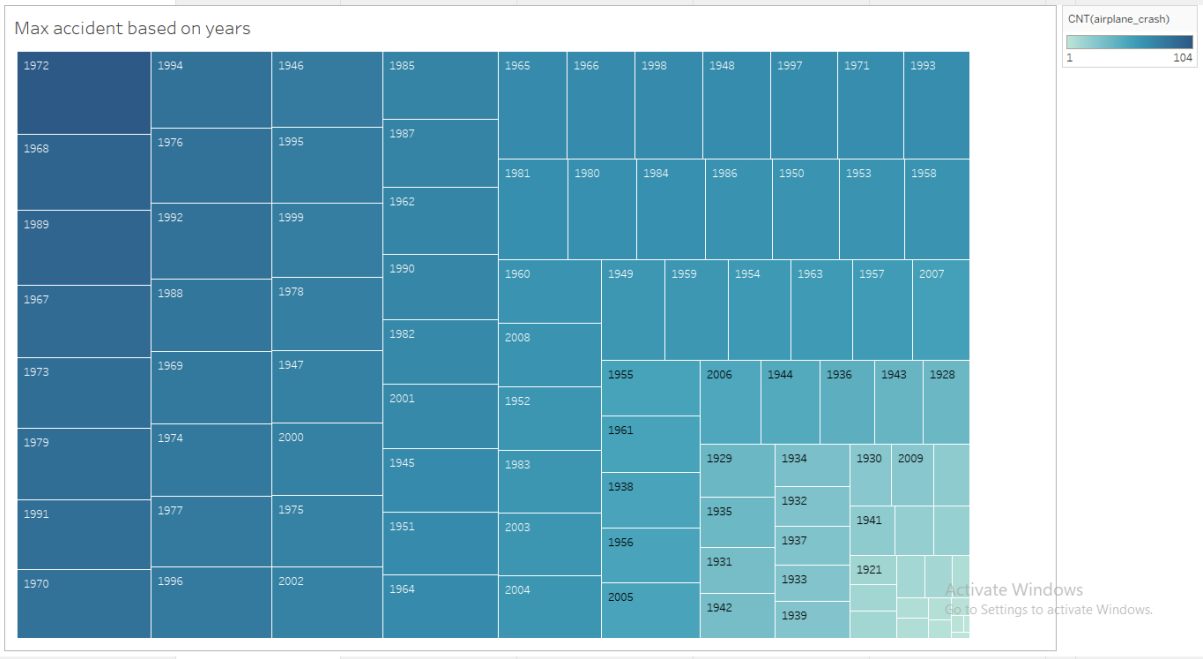


2.2 Ideation & Brainstorming Map



RESULT


Comparing aboard vs fatalities vs ground
Date
Value
Measure Names
Aboard
Fatalities
Ground
Aboard
Fatalities
Comparing aboard vs fatalitie...
Max accidents based on years
Accidents happened in 1972 (M...
Highest No. of accident happene...
Top 10 location which had more ...
Top 5 flights which have max ac...


Max accident based on years
CNT(airplane_crash)
1
104
Comparing aboard vs fatalities ...
Max accidents based on years
Accidents happened in 1972 (M...
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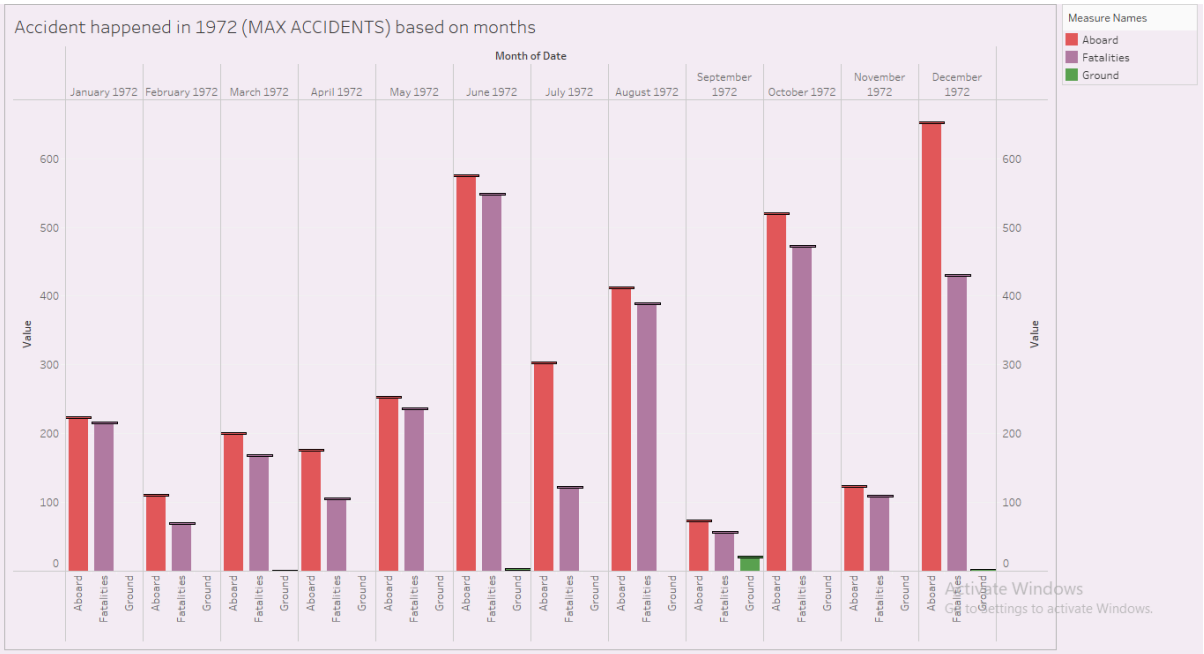
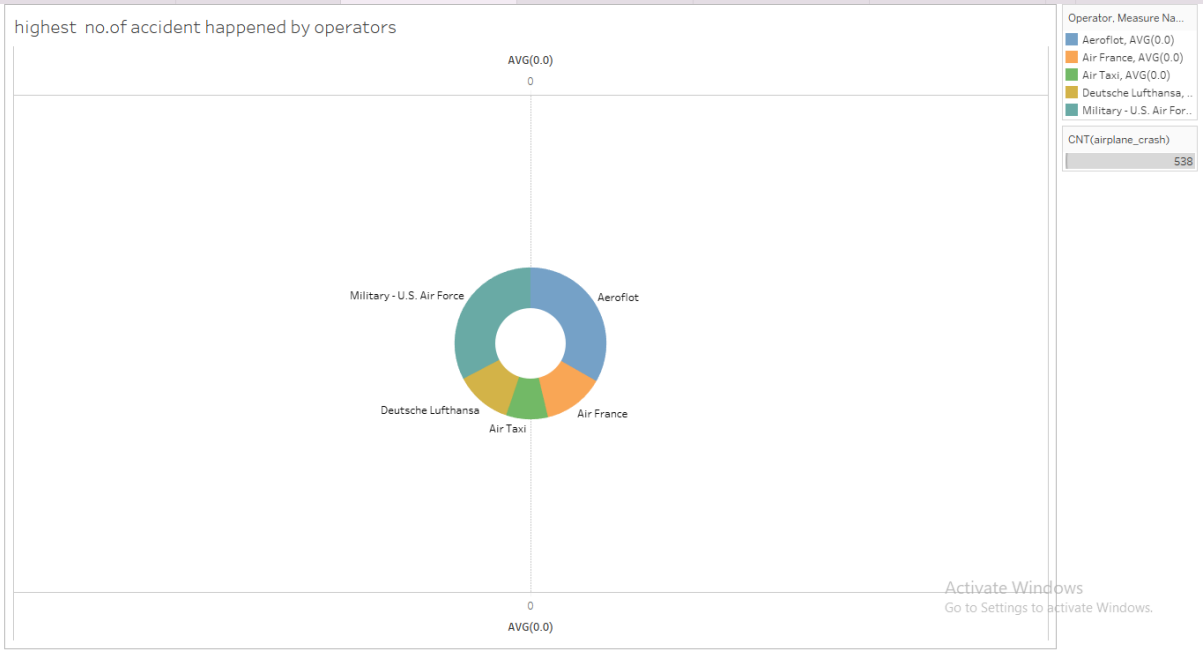
Top 10 location which had more ...
Top 5 flights which have max ac...

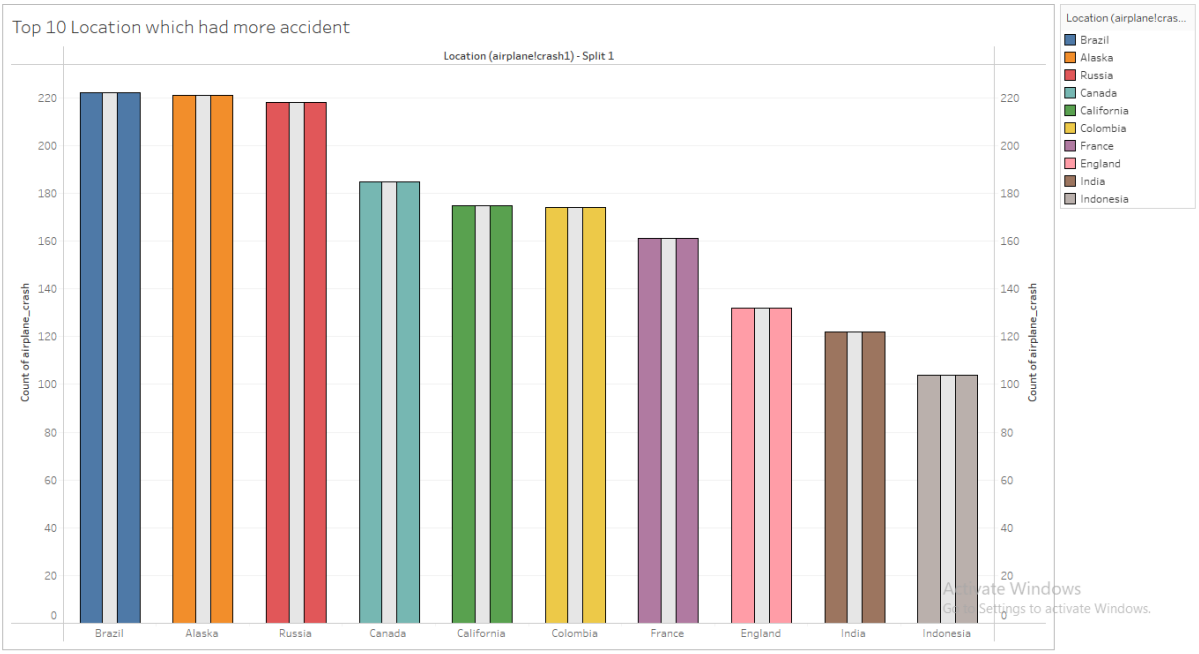


Comparing aboard vs fatalities ... | Max accidents based on years | **Accidents happened in 1972 (...** | Highest No. of accident happene... | Top 10 location which had more ... | Top 5 flights which have max ac... | Acci

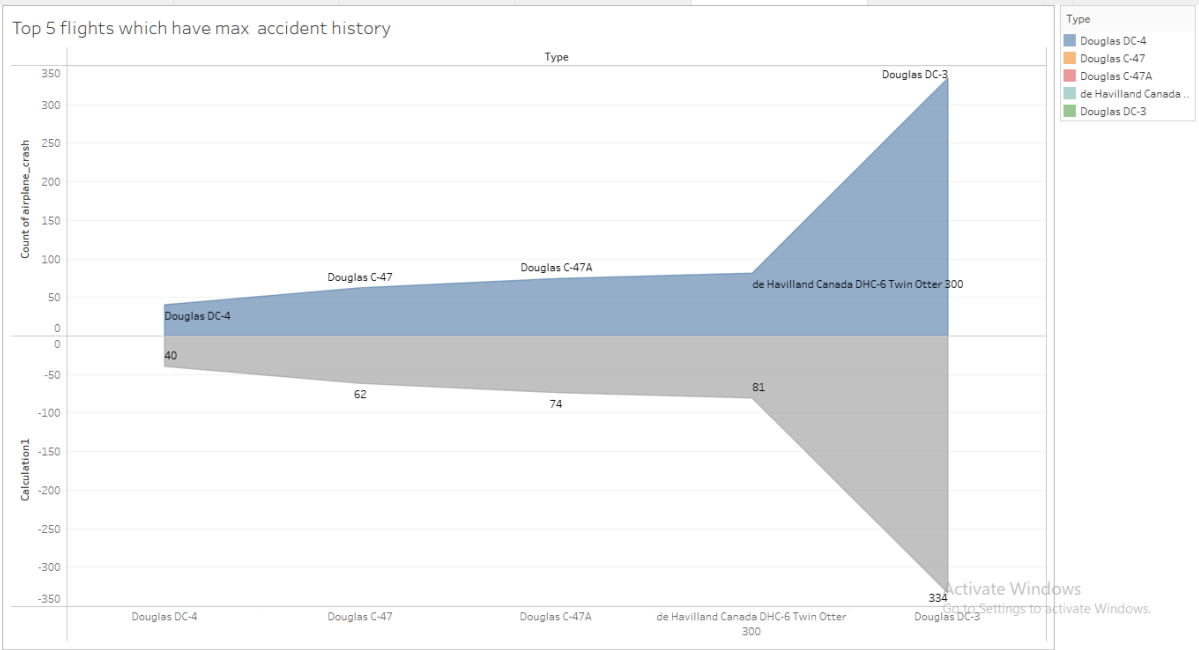


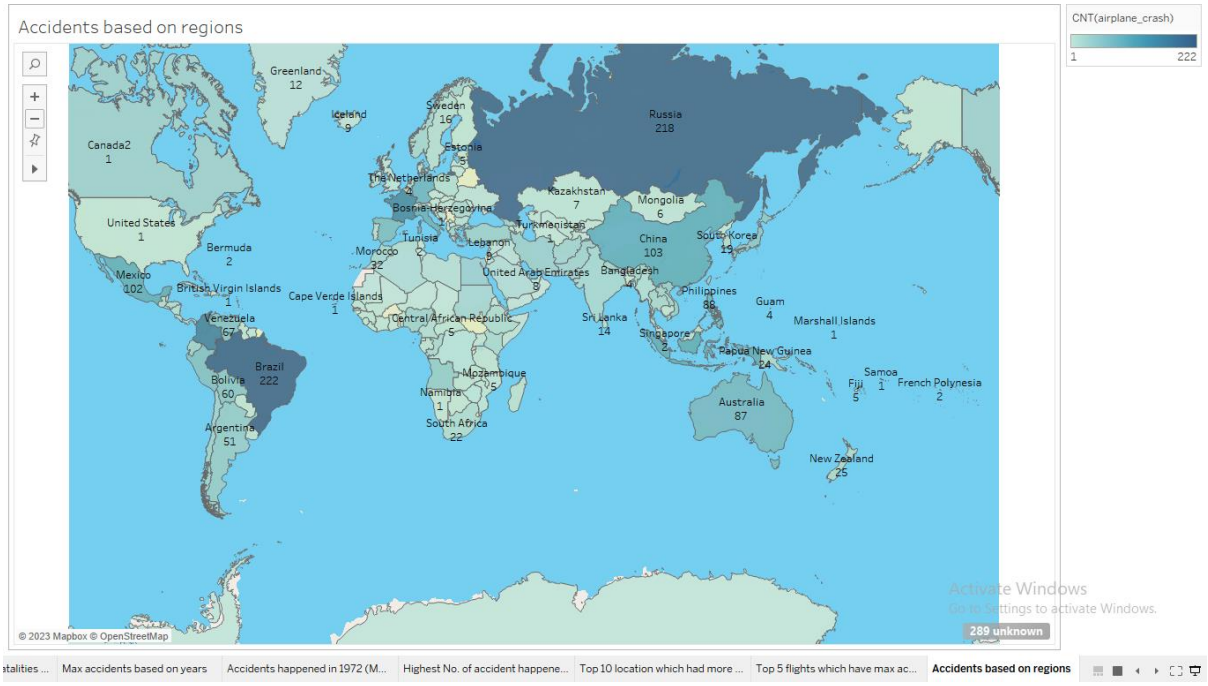
Comparing aboard vs fatalities ... | Max accidents based on years | Accidents happened in 1972 (M... | **Highest No. of accident happe...** | Top 10 location which had more ... | Top 5 flights which have max ac... | Acci

Top 10 Location which had more accident



Top 5 flights which have max accident history





Advantages & disadvantages

He fastest and easiest way to move people or goods by aircrafts such as aeroplanes, the helicopter is Air transportation. Though it has some limitations like it cannot be used for rural areas especially in India, where still some regions are undeveloped to use airways service means it’s not helpful for door to door service. Apart from this air transport is helpful in the movement of cargo and humans in the fastest way which makes it easy to connect globally to every part of the world which promotes economic growth around the world.

Some aircrafts widely used in defence mostly in every country across the world. Every nation has developed armed services which primarily look at aerial warfare. Some aircrafts used for defence are jet planes, helicopters, etc. These are helpful during natural calamities like floods, earthquakes etc. Primarily the main objective of air transport is to not only move people easily to distant places faster but to also develop trade faster which boosts employment and help nations to grow. As air transport is rapid and sustainable which is its main

advantage but it comes with a few disadvantages also. Let’s discuss some of its advantages and disadvantages.

Air transport is fast. Airplanes currently reach high speeds in flight and this reduces shipping times. This is beneficial for any product, especially for food and pharmaceutical or medical material that requires specific storage and temperature condition .**It is reliable**. There are relative legislations in the air transport that guarantee that it is a safe transport and that our shipment will not suffer any type of deterioration.

It arrives everywhere. Through air transport you can reach any destination, within normal conditions and as long as it is not a danger. There are several models of air transport such as airplanes, helicopters and drones. Pilot error is the number one cause of aviation accidents. Piloting an aircraft requires lengthy training, a knowledge of the mechanical components of an aircraft, and hand-eye coordination skills to effectively and safely manoeuvre an aircraft the main benefits are focused on the speed of the service, as well as reliability for delivery, while the main drawback is its high cost. Major airlines (scheduled service) experienced no on board fatalities and had a fatal accident rate of 0.0 per 100,000 flight hours in 2021. This contrasts sharply with general aviation, which experienced 341 on board fatalities and had a fatal accident rate of 0.951 per 100,000 flight hours.

Applications

- **Equipment Failure/Malfunction**

  Defects in aircraft can be caused by design flaw, manufacturer flaw, or wear and tear from use. Although inspections are performed on the

airplane before and after flights, accidents still result from faulty equipment and malfunctioning components.

- **Human Error**
  From mechanics and ground crew to flight attendants and air traffic controllers, these professionals all play an important role in the maintenance and safe operation of the aircraft. The Federal Aviation Administration (FAA) looks at the training each person has received, the attention to detail that was provided before the flight took off, the communication that exists before air traffic control, the ground crew, and the pilot to determine if human error contributed to the cause of the accident.

- **Mid-air Collisions**
  Mid-air collisions are less common than other types of aviation accidents, because the FAA uses the most up-to-date technology for its air traffic control system, which monitors airliners in the United States. In addition, airliners are required to have TCAS II collision-avoidance systems, which detect potential collisions with other transponder-equipped aircraft and advise pilots to climb or dive in response. When these devices malfunction or are ignored, accidents can occur.

- **Pilot Error**
  Pilots are responsible for the safe transportation of their passengers. At times, rarely, pilots fail to comply with proper procedures in the operation of an aircraft.

- **Weather**

  Unpredictable weather, such as shear gusts of winds, freezing ice storms, thunderstorms and lightning, and more, can affect both small

and large airplanes. Before airplanes can fly in freezing weather, they are de-iced, and all airplanes are required to have forward-looking radar wind-shear detectors on board.

Conclusion

The primary reason flight attendants are on an aircraft is for safety, so if one of them asks you to do something like fasten your seat belts, do it first and ask questions later

Before getting too invested in the causes of aircraft injuries, let's take a moment to clarify the terminology. "Aviation accidents" are not solely confined to planes crashing. This category includes other aircraft such as helicopters, ultra-lights, gliders, etc. Aviation accidents may not necessarily involve aircraft crashes. Occasionally passengers fall while boarding airlines, have health issues while onboard, or sustain injuries from turbulence.

If you are injured in any type of aviation accident, you may be eligible for civil damages from the responsible party. The airplane attorneys at Wilson Kehoe Winingham have experience flying and understand aviation accidents. This knowledge helps us to determine fault in your case and ultimately helps you through any legal action that needs to be taken.

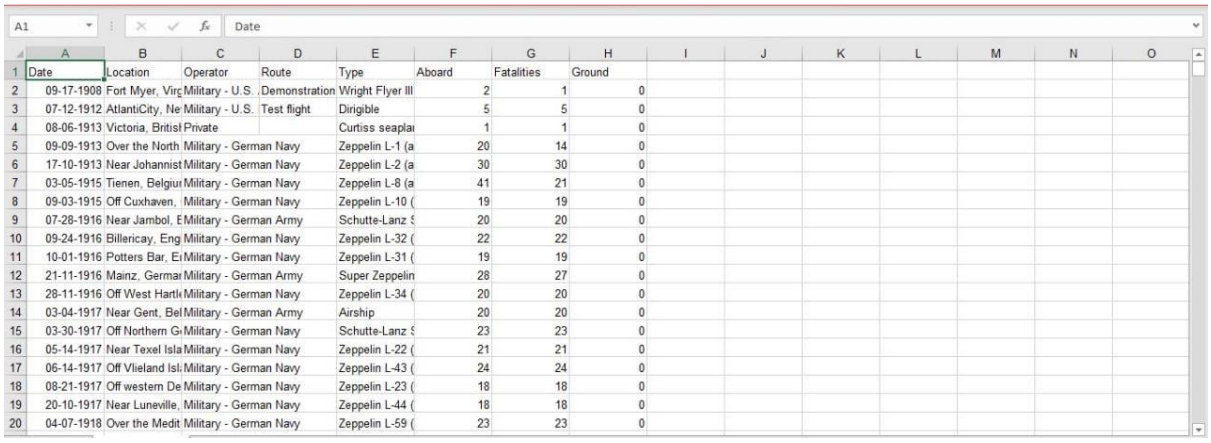
FUTURE SCOPE

Mobility and its pillars of transport (air, inland and maritime) are at the very center of our socio-economic fabric. They underpin social connections and facilitate access to goods and services, including trade, jobs, health care and education. In today's world, mobility by air, road and water is all about efficiencies, speed, interconnectivity and accessibility by all. However, this raises the issue about sustainability. The UN predicts that by 2050 two thirds of

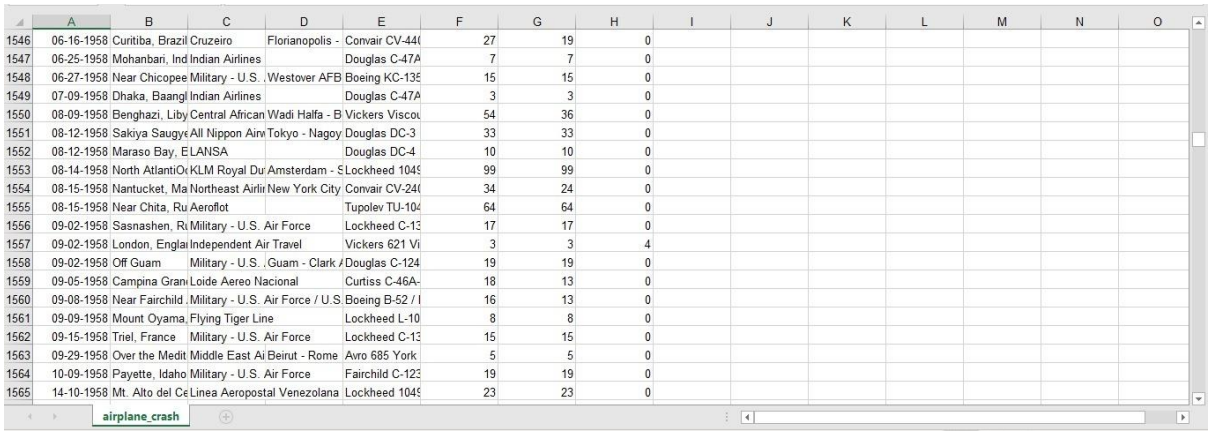
the world population will live in cities1. How can we adapt and enhance today's already-stretched mobility system for it to respond to our expectations and increased demands? How can mobility be reinvigorated for it to be sustainable and support the 2030 Agenda of Sustainable Development and its 17 Sustainable Development Goals (SDGs)

For a start, mobility actors should come together in a shared vision. This is where the World Bank-led Sustainable Mobility for All (SuM4All) steps in. For the first time ever, the SuM4All provides the transport sector and its modes of transport with the opportunity to speak with one voice and jointly unpack a Roadmap of Actions that is tailored to countries and cities to implement on a voluntary basis. The SuM4All includes all modes of transport, including aviation. Aviation facilitates access to countries and cities, increases multi layered efficiencies in travel and makes safety and security in travel top priorities. The aviation sector is rapidly taking gender equality at heart.

APPENDIX

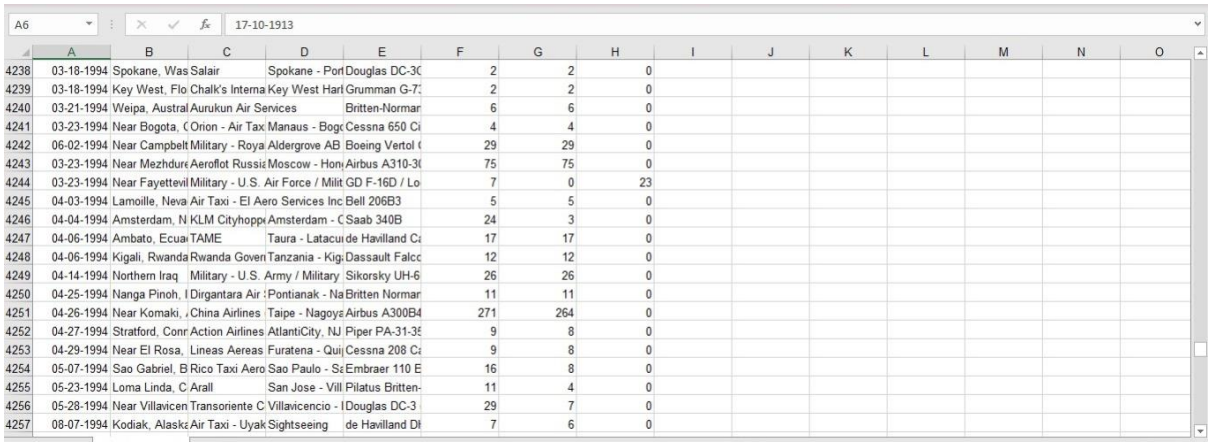


Date	Location	Operator	Route	Type	Aboard	Fatalities	Ground
09-17-1908	Fort Myer, Virg	Military - U.S.	Demonstration	Wright Flyer III	2	1	0
07-12-1912	AtlantiCity, Ne	Military - U.S.	Test flight	Dirigible	5	5	0
08-06-1913	Victoria, Britisl	Private		Curtiss seaplar	1	1	0
09-09-1913	Over the North	Military - German	Navy	Zeppelin L-1 (a	20	14	0
17-10-1913	Near Johannist	Military - German	Navy	Zeppelin L-2 (a	30	30	0
03-05-1915	Tienen, Belgiur	Military - German	Navy	Zeppelin L-8 (a	41	21	0
09-03-1915	Off Cuxhaven,	Military - German	Navy	Zeppelin L-10 (	19	19	0
07-28-1916	Near Jambol, E	Military - German	Army	Schutte-Lanz S	20	20	0
09-24-1916	Billericay, Eng	Military - German	Navy	Zeppelin L-32 (	22	22	0
10-01-1916	Potters Bar, Er	Military - German	Navy	Zeppelin L-31 (	19	19	0
21-11-1916	Mainz, Germar	Military - German	Army	Super Zeppelin	28	27	0
28-11-1916	Off West Hartl	Military - German	Navy	Zeppelin L-34 (	20	20	0
03-04-1917	Near Gent, Bel	Military - German	Army	Airship	20	20	0
03-30-1917	Off Northern G	Military - German	Navy	Schutte-Lanz S	23	23	0
05-14-1917	Near Texel Isla	Military - German	Navy	Zeppelin L-22 (	21	21	0
06-14-1917	Off Vlieland Isl	Military - German	Navy	Zeppelin L-43 (	24	24	0
08-21-1917	Off western De	Military - German	Navy	Zeppelin L-23 (	18	18	0
20-10-1917	Near Luneville,	Military - German	Navy	Zeppelin L-44 (	18	18	0
04-07-1918	Over the Medit	Military - German	Navy	Zeppelin L-59 (	23	23	0



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1546	06-16-1958	Curitiba, Brazil	Cruzeiro	Florianopolis -	Convair CV-44(	27	19	0							
1547	06-25-1958	Mohanbari, Ind	Indian Airlines		Douglas C-47A	7	7	0							
1548	06-27-1958	Near Chicopee	Military - U.S. .	Westover AFB	Boeing KC-135	15	15	0							
1549	07-09-1958	Dhaka, Baangl	Indian Airlines		Douglas C-47A	3	3	0							
1550	08-09-1958	Benghazi, Liby	Central African	Wadi Halfa - B	Vickers Viscou	54	36	0							
1551	08-12-1958	Sakiya Saugye	All Nippon Airv	Tokyo - Nagoy	Douglas DC-3	33	33	0							
1552	08-12-1958	Maraso Bay, E	LANSA		Douglas DC-4	10	10	0							
1553	08-14-1958	North AtlantiO(	KLM Royal Du	Amsterdam - S	Lockheed 1049	99	99	0							
1554	08-15-1958	Nantucket, Ma	Northeast Airlir	New York City	Convair CV-240	34	24	0							
1555	08-15-1958	Near Chita, Ru	Aeroflot		Tupolev TU-104	64	64	0							
1556	09-02-1958	Sasnashen, Ru	Military - U.S.	Air Force	Lockheed C-13	17	17	0							
1557	09-02-1958	London, Englai	Independent	Air Travel	Vickers 621 Vi	3	3	4							
1558	09-02-1958	Off Guam	Military - U.S. .	Guam - Clark A	Douglas C-124	19	19	0							
1559	09-05-1958	Campina Gran	Loide Aereo	Nacional	Curtiss C-46A-	18	13	0							
1560	09-08-1958	Near Fairchild .	Military - U.S.	Air Force / U.S.	Boeing B-52 / I	16	13	0							
1561	09-09-1958	Mount Oyama,	Flying Tiger Line		Lockheed L-10	8	8	0							
1562	09-15-1958	Triel, France	Military - U.S.	Air Force	Lockheed C-13	15	15	0							
1563	09-29-1958	Over the Medit	Middle East Ai	Beirut - Rome	Avro 685 York	5	5	0							
1564	10-09-1958	Payette, Idaho	Military - U.S.	Air Force	Fairchild C-123	19	19	0							
1565	14-10-1958	Mt. Alto del Ce	Linea Aeropostal	Venezolana	Lockheed 1049	23	23	0							

airplane_crash



A6 17-10-1913

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
4238	03-18-1994	Spokane, Was	Salair	Spokane - Port	Douglas DC-30	2	2	0							
4239	03-18-1994	Key West, Flo	Chalk's Interna	Key West Harl	Grumman G-72	2	2	0							
4240	03-21-1994	Weipa, Austral	Aurukun Air	Services	Britten-Norman	6	6	0							
4241	03-23-1994	Near Bogota, C	Orion - Air Taxi	Manaus - Bogo	Cessna 650 Ci	4	4	0							
4242	06-02-1994	Near Campbelt	Military - Roya	Aldergrove AB	Boeing Vertol (	29	29	0							
4243	03-23-1994	Near Mezhdure	Aeroflot Russia	Moscow - Hon	Airbus A310-30	75	75	0							
4244	03-23-1994	Near Fayettevil	Military - U.S.	Air Force / Milit	GD F-16D / Lo	7	0	23							
4245	04-03-1994	Lamoille, Neva	Air Taxi - El	Aero Services Inc	Bell 206B3	5	5	0							
4246	04-04-1994	Amsterdam, N	KLM Cityhoppe	Amsterdam - C	Saab 340B	24	3	0							
4247	04-06-1994	Ambato, Ecua	TAME	Taura - Latacu	de Havilland Ca	17	17	0							
4248	04-06-1994	Kigali, Rwanda	Rwanda Gover	Tanzania - Kig	Dassault Falco	12	12	0							
4249	04-14-1994	Northern Iraq	Military - U.S.	Army / Military	Sikorsky UH-6	26	26	0							
4250	04-25-1994	Nanga Pinoh, I	Dirgantara Air	Pontianak - Na	Britten Norman	11	11	0							
4251	04-26-1994	Near Komaki,	China Airlines	Taipe - Nagoya	Airbus A300B4	271	264	0							
4252	04-27-1994	Stratford, Conr	Action Airlines	AtlantiCity, NJ	Piper PA-31-35	9	8	0							
4253	04-29-1994	Near El Rosa,	Lineas Aereas	Furatena - Quij	Cessna 208 Ca	9	8	0							
4254	05-07-1994	Sao Gabriel, B	Rico Taxi Aero	Sao Paulo - Sa	Embraer 110 E	16	8	0							
4255	05-23-1994	Loma Linda, C	Arall	San Jose - Vill	Pilatus Britten-	11	4	0							
4256	05-28-1994	Near Villavicen	Transoriente C	Villavicencio - I	Douglas DC-3	29	7	0							
4257	08-07-1994	Kodiak, Alaska	Air Taxi - Uyak	Sightseeing	de Havilland Dl	7	6	0							