# Dashboard Summary

The focus for this milestone was to create a dashboard showing the facts about airline safety. Negative publicity within the media has recently portrayed airline travel as an unsafe method of transportation. As a Data Analyst for the airline organization, this dashboard will help summarize some of the main findings after review of four primary datasets. The audience for this dashboard is my internal peers within the airline organization (mainly the Data Science Management team). This dashboard will also help decision makers identify potential action to take for future improvements.

PowerBI was the tool chosen to generate the dashboard. The four datasets utilized for the initial analysis were from Github (Airline Safety), Aviation Safety Network, Bureau of Aircraft Accidents Archives, and Kaggle (The Statistics of Airplane Accidents). Importing the data from these sources was the first step. A link to the website for Bureau of Aircraft Accidents was used, otherwise a CSV file was generated (and cleaned) for the other three sources. Additional details about these sources can be found through the respective links within the Reference section. The visualizations and style of the dashboard were strategically created. There were eight visualizations chosen for the dashboard. These visualizations included a Slicer (by year), Card (showing airline accident count), Line and Stacked Column Chart, Map, 100% Stacked Column Chart, Pie Chart, Clustered Column Chart, and finally a normal Column Chart. The Slicer was implemented into the dashboard to allow users to review the data over specific years. The Card shows the number of airline accidents over the selected year range. This could be revised in future versions of the dashboard to show a ratio of the total outgoing flights compared to the number of accidents. The Line and Stacked Column Chart shows the trend of airline accidents over the years. This visualization shows how the number of accidents has drastically declined from 1946 until 2021. This chart also includes a five-year moving average to reiterate the trends over time. The Map shows the location of fatalities (and quantity based on bubble size) for the years with the highest number of fatalities. The 100% Stacked Column Chart compares the number of airline accidents to the number of fatalities over a particular period (2011-2021). The thought behind this visualization was that not all accidents may have resulted in fatalities. However, it does appear to show that an increase in accidents tends to result in additional fatalities. The Pie Chart shows a part-to-whole relationship of types aircrafts involved with the fatal accidents. The categories available from the data where Helicopters, Gliders, Gyroplanes, and Ultralight Aircrafts. The Clustered Column Chart shows the top ten airlines sorted by the number of incidents (between 2000-2014). This visualization also shows the number of fatal accidents associated with each airline. Lastly, the normal Column Chart represents the top ten airlines sorted by number of fatalities (between 2000-2014). The color scheme chosen for this dashboard was colorblind safe.

There are many summary points to conclude from this dashboard. In addition, there are future improvements and actions that can be taken within the organization. Improvement recommendations for the dashboard are: collect data for the most recent years to show the latest trends, work to manage the relationships between the different datasets used in the dashboard, and improve the visualization card showing a ratio of accident “opportunities” compared to actual “accidents”. Improvement recommendations within the organization are: continue driving the reduction of airline accidents over time (maybe set a goal to reduce by certain % each year), focus on helping airlines with the highest number of incidents reduce this number, focus on understanding airlines with the highest fatalities over time (understand why and then implement corrective actions), and lastly look into aircraft safety improvements to show how the type of aircraft is now safer over time. From an ethical standpoint, the facts need to be shown that airline accidents still occur periodically, however there needs to be communication showing improvements over the years. In addition, all of the data used for the dashboard can be found in the original PowerBI file for transparency.

# References

Bureau of Aircraft Accidents Archives. (2023). *Accidents Rate Per Year*. Statistics. [Accidents Rate per Year | Bureau of Aircraft Accidents Archives (baaa-acro.com)](http://www.baaa-acro.com/statistics/crashs-rate-per-year?page=0)

Escobar, Francisco. (2019). *The Statistics of Airplane Accidents* [Data]. Kaggle. [The Statistics of Airplane Accidents | Kaggle](https://www.kaggle.com/code/franciscoescobar/the-statistics-of-airplane-accidents/data)

Fivethirtyeight. (2023). *Airline Safety* [Data]. Github. [data/airline-safety at master · fivethirtyeight/data · GitHub](https://github.com/fivethirtyeight/data/tree/master/airline-safety)

Nussbaumer, Cole (2015). Storytelling with Data. John Wiley & Sons, Inc.

Ranter, Harro. (2021). *Aviation Safety Network* [Data]. Aviation Safety Network Database. [Accidents and fatalities per year - Google Sheets](https://docs.google.com/spreadsheets/d/1SDp7p1y6m7N5xD5_fpOkYOrJvd68V7iy6etXy2cetb8/edit#gid=661081734)

Yau, Nathan. (2011). Visualize This. (1st ed). John Wiley & Sons, Inc.

# Milestone 1 Requirements:

**The Scenario/Business Problem:**

Due to recent unfortunate airline crashes, the media has been promoting statistics stating air is no longer a safe way to travel. The news and media outlets have been bombarding the public with reports and figures about the trends of airline safety and that things are not looking good. What was previously thought as the safest way to travel, especially when compared to automobiles, is now being presented as one of the most dangerous to the public. But are any of these claims based on facts?

You work for an airline on the data science team as a data analyst and are a resident data visualization expert. You have been tasked with helping multiple groups in the organization combat this negative publicity and help tell the airline's side of the story. There is a fear internally about what this type of media coverage will do to airline sales and how it could impact the future of the company. Not only do they need you to help create some internal communications, but you will also be tasked with what is published to the public and the media.

Note - if you select your own topic, you must stick with the same business problem.

Examples:

* Media: Letting babies cry it out...  Business Problem: You work for a company that sells baby soothing products and want to combat the media
* Media: COVID Vaccine isn't safe for...  Business Problem: You work for a hospital or pharmaceutical rep and want to combat the media

The business problem above demonstrates the importance of storytelling, presenting information, and arguably most importantly - the ethics around how we present and share information. You are welcome to make up data for this project to meet the story you are trying to tell. You should never do that in a real project, but this is for academic purposes only.

**Project Task 1: Dashboard**

Your first task is to create an internal dashboard for your peers and data science management team that outlines the facts – what are the stats and what are the trends? Is there any supplemental data that you can use to support that air travel is still in fact the safest? Is there anything politically going on that would cause this type of media attention to be at a peak – remember, this is for an internal review by your peers and management – and will likely spark a lot of discussion for how you approach the next level of discussion with your executive leadership team. Is there anything to show sales are down or are headed that way? Do the safety incidents appear to be in a specific geographic area or by a specific airline every time? Do some analysis of the data you have and look for other sources to see what you can find to help inform your internal team. This project is the first of many building on top of the information you find and will present internally and then externally.

Initial Airline Dataset:

* [Airline Safety](https://github.com/fivethirtyeight/data/tree/master/airline-safety), GitHub
* [Aviation Safety Network](https://aviation-safety.net/), Flight Safety Foundation
* [Accidents and Fatalities Pery Year](https://docs.google.com/spreadsheets/d/1SDp7p1y6m7N5xD5_fpOkYOrJvd68V7iy6etXy2cetb8/edit#gid=1448957446)

Supplemental Data:

* [Crash Stats & Reports](https://one.nhtsa.gov/Data), NHTSA
* [Fatality Analysis Reporting System (FARS)](https://www.nhtsa.gov/research-data/fatality-analysis-reporting-system-fars), NHTSA
* [Data Catalog](https://catalog.data.gov/dataset?tags=traffic), Data.Gov
* [Crash Datasets](https://data.world/datasets/crash), Data.World
* [Economic Impact of Commercial Aviation By State](http://airlines.org/data/), Airlines for America
* [Traffic and Capacity by Operating Region](http://web.mit.edu/airlinedata/www/Traffic&Capacity.html), Airline Data Project
* [Statistics](http://www.baaa-acro.com/statistics), Bureau of Aircraft Accident Archives
* [ASN Aviation Safety Database](https://aviation-safety.net/database/), Aviation Safety Network

The following must be subitted to the assignment link:

* Your dashboard (created either in PowerBI, Tableau, or another tool that puts multiple metrics on 1 page). Make sure to export to PDF prior to submission.
  + Your dashboard should have at least 6 visualizations on it.
  + Make sure you follow a design methodology that you can defend (colors, labels, chart types, etc.).
  + Must use at least 1 supplemental dataset of your choice.
* A 250-word paper summarizing what you did and why you made the decisions you did – why did you choose the visualizations you did? How do you plan to present to your internal team? What were your findings? Ethically what do you need to consider? This paper is for the instructor to understand your thought process and justification of design.

Remember: your GitHub repository can act as a portfolio for potential employers! I would highly suggest using this to submit your work, so you can fill it with good content that demonstrates the projects you are working on! Make sure to submit as PDFs to GitHub vs other file formats that will require download.