Up in the Air – A tableau story about US Flights

Introduction

In this project, I have created a data visualization using Tableau that tells a story and highlights patterns of delay in Flights data set. This data set contains information on United State flight delays and performance

Links

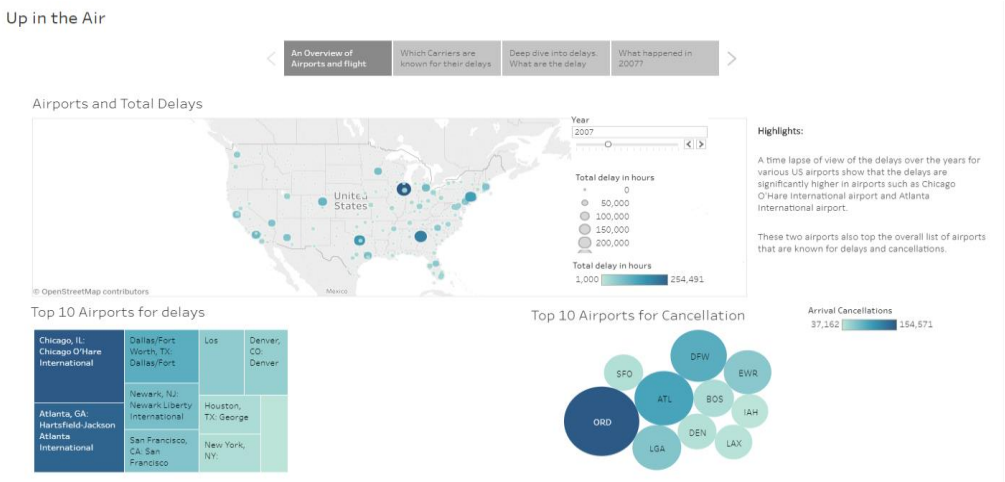
- Draft Version - https://public.tableau.com/profile/anita.vithaldhas#!/vizhome/Flights_draft/Story1
- Version 1.00 - https://public.tableau.com/profile/anita.vithaldhas#!/vizhome/Flights_v1_1/Story1
- Final Version - https://public.tableau.com/profile/anita.vithaldhas#!/vizhome/Flights_Final_revised/Story1

Summary

I have analyzed the flights dataset in tableau with an objective to answer the below questions about flights performance

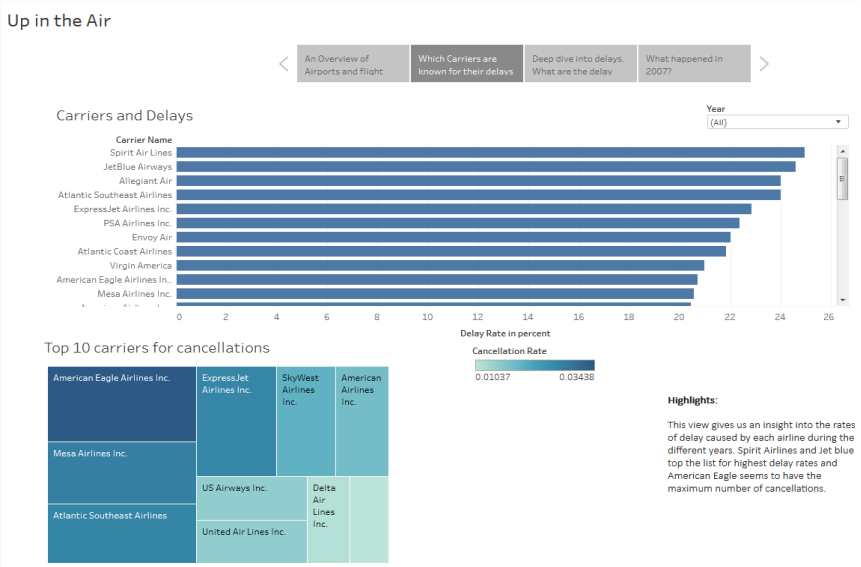
An Overview of Airports and Flight Delays

In this page I have correlated the flight performance with various US airports. I have visualized the overall delay across airports look over the past 15 years. A glimpse into the past 15 years has shown that Chicago O'Hare and Atlanta international airports have the worst delays and cancellations.



Which carriers are known for their delays and cancellations?

In this section, I have plotted the delays of various airlines that can be filtered for a specific year. I have also provided insight into the top airlines known for their cancellations. I have taken into account the delay rate rather than sum total of delay to take into account the number of flights for each carrier. Spirit airlines seem to top the delay list whereas American eagle airlines has the most cancellations.

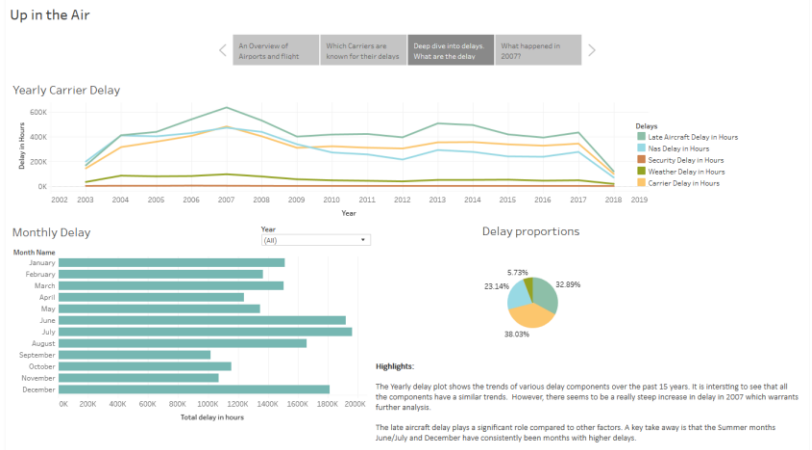


A deep dive insight into Delays

In this page, I have drilled down deep into delay details. I have plotted the various delay component over the years. This plots provides an interesting insight into the trend of various delay components. They have similar patterns across the years. It also shows a sharp peak during the year of 2007.

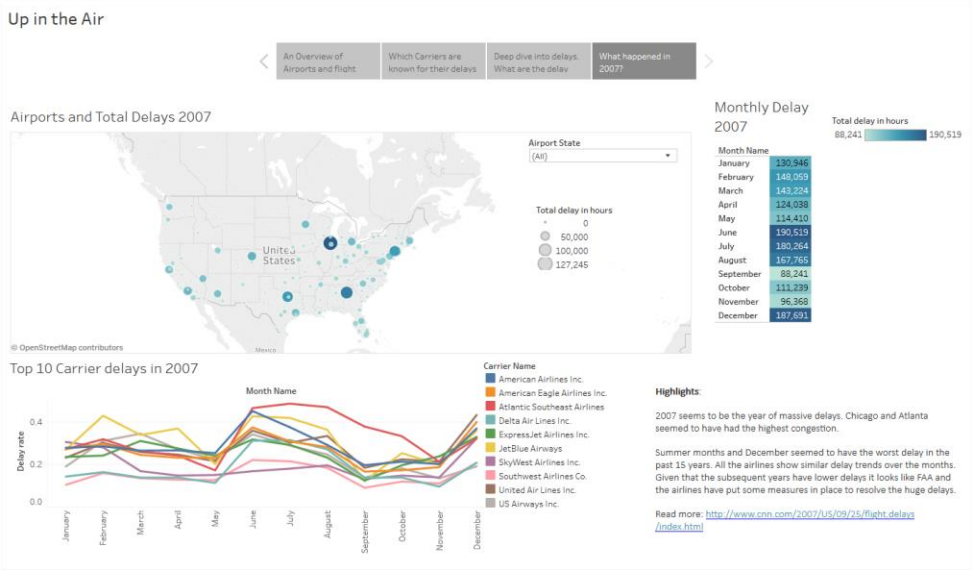
I have also drilled down to the monthly level and was able to infer that summer and December months have the worst delays. This trend is very consisted across the years.

The percentage split shows that about 38% of the delay is accounted by carrier delays. This highlights the significance of carrier aircraft delay factor.



What happened in 2007?

The delay analysis page gave a very interesting insight into the delay peaks at year 2007. In this section, I have analyzed to see in more detail the delay and cancellation statistic in 2007. Chicago and Atlanta seemed to bear the brunt if the delays with American eagle airlines being the worst offender. On further research, it does seem that 2007 has been the worst year for airline delays over the past 20 years and second worst in the history of reported delays.



Design

One of the biggest challenge was to make sure that tableau story is well designed that it provides enough exploration and explanation. I designed this story with the below broad categories as a guideline.

Story Flow

I have designed the story in such a way that the flow from one dashboard to another is seamless. The first couple of dashboard provide high level overview and the subsequent ones delve into the details. The dashboards are organized to compare delay variables with the variable of interest such as either airports or carriers.

Dashboard Design

Each dashboards have about 3 or 4 plots or worksheets. This allows for a clutter free and easy to read design. This is one of the areas where I have received positive feedbacks. Keeping the number of visualizations per page minimal has helped to navigate through the story easier. I have also added a highlight section to provide quick insights or take away from the dashboard. This highlight section has help driven the point to the end user.

Choice of Plots

This has been one of the challenging areas of the design. I have used Geographical heatmaps to display metrics associated with Airport location. I have used horizontal bars and line charts for aggregate data or timeline analysis. I have bubble and square plots to display top 10 results or data share.

Look and Feel

I have chosen the teal-blue color theme for the plot display. This decision was made after the feedback received from a peer that the original red-blue theme was too distracting. I also wanted to keep the dashboards with a high data to ink ratio.

Feedback

Following are some of the feedback I received from my friends who have not used tableau so far. I wanted to get a perspective from someone who is new to the tool and looking at the visualizations for the first time.

1. The dashboard layouts are simple and easy to understand.
2. The highlight ox in each dashboard is a great tool.
3. The year filter button seems inactive.
   Action: I had used tableau desktop for visualizations and used page feature for animating the time lapse of Airports through the years. However, this feature is not available in tableau public which rendered the filter unusable. I changed it to a slider instead
4. The red-blue color themes are too distracting
   Action: I changed the color theme to a single color gradient to avoid confusion. I changed it to teal-blue and changed all the worksheets except multi variable ones with this teal – blue colors.

5. Minor suggestions such as changing the legends, titles etc. For example change Arr cancelled to Arrival cancelled.
   Action: Reviewed all the titles and legends and fixed typos. Updated description as required.

Resources

1. https://www.tableau.com/learn/training
2. https://www.tableau.com/learn/articles/best-beautiful-data-visualization-examples