

Documentation Page: Visualization Design and Insights

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The design process for the visualization began with a thorough analysis of the dataset, which contained daily passenger volume data across multiple years from Transportation Security Administration (TSA). The goal was to create a tool that would allow users to compare trends across years and identify meaningful patterns. Early brainstorming sessions led to several ideas, including static line charts, interactive charts with toggle features, and overlays of average trends. Initial sketches explored various layouts and interactions, such as a line chart with distinct colors for each year and the ability to add or remove years interactively. These sketches formed the foundation for the final design, which emphasized interactivity, clarity, and accessibility.

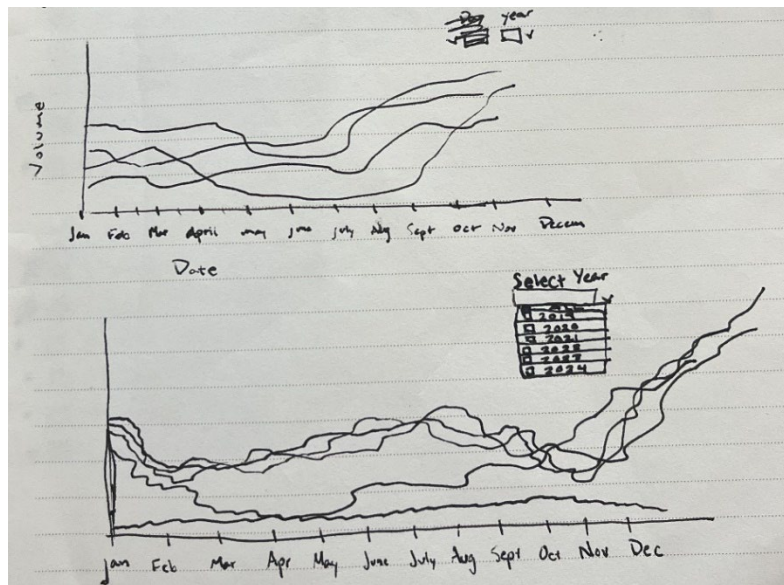


Figure 1: First rough sketch of chart ideas

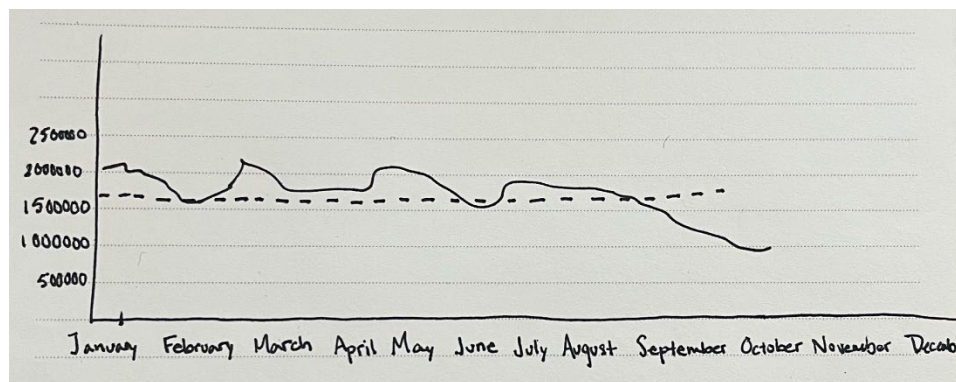


Figure 2: This iteration of chart ideas shows the dashed average line.

The design choices were made with careful consideration of usability and data interpretation. Color was used to encode different years, with each year assigned a unique color to ensure easy differentiation. The dashed line representing the average for each year shared the same color as the solid line for that year, maintaining visual consistency. A diverse color palette was selected to accommodate users with color vision deficiencies. Interactivity was prioritized to reduce clutter and enhance user experience. By allowing users to select specific years for display, the visualization helped focus attention on relevant comparisons while preserving an always-visible legend to maintain context.

The layout was designed for clarity, with the x-axis representing days of the year and the y-axis displaying passenger volume. Care was taken to avoid label overlap, and the y-axis was adjusted to include sufficient padding for peak values.

The interactive visualization uncovered significant insights. It highlighted consistent seasonal patterns, with passenger volume peaking in the summer months each year, reflecting heightened travel activity. Early 2020 showed a sharp decline in passenger volume, likely due to the onset of the COVID-19 pandemic, while recovery trends became evident in late 2023. Average trends confirm fluctuations in overall passenger volume, with gradual normalization in recent years. These observations were supported by visual evidence, with screenshots capturing key patterns and comparisons.

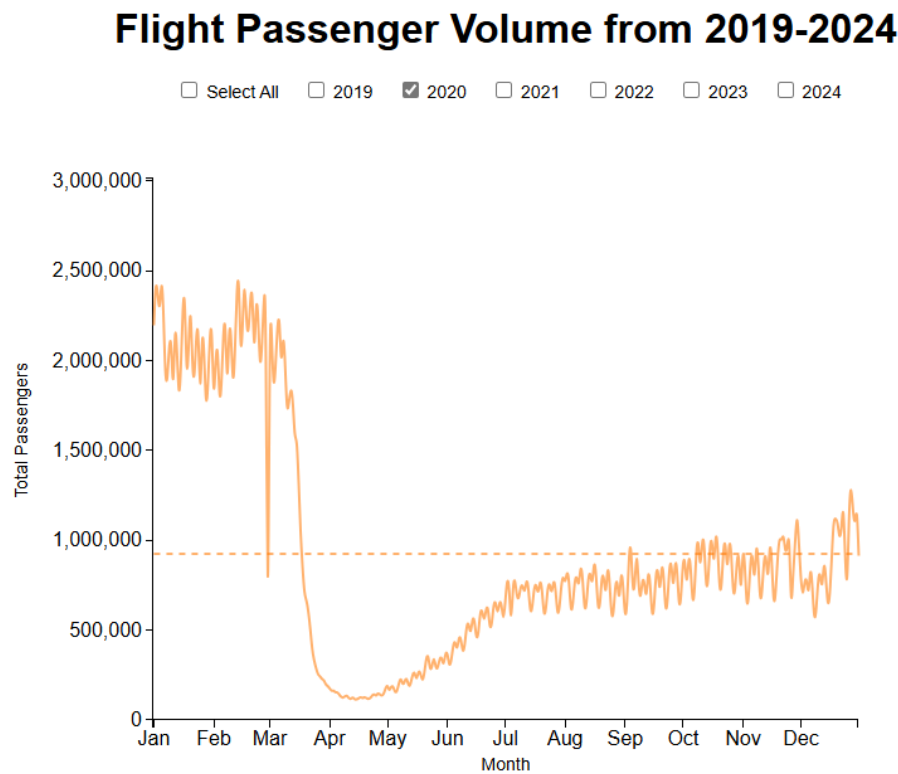


Figure 3: Shows the flight passenger volume from 2020, and the dip that is caused by the COVID-19 pandemic can be seen.

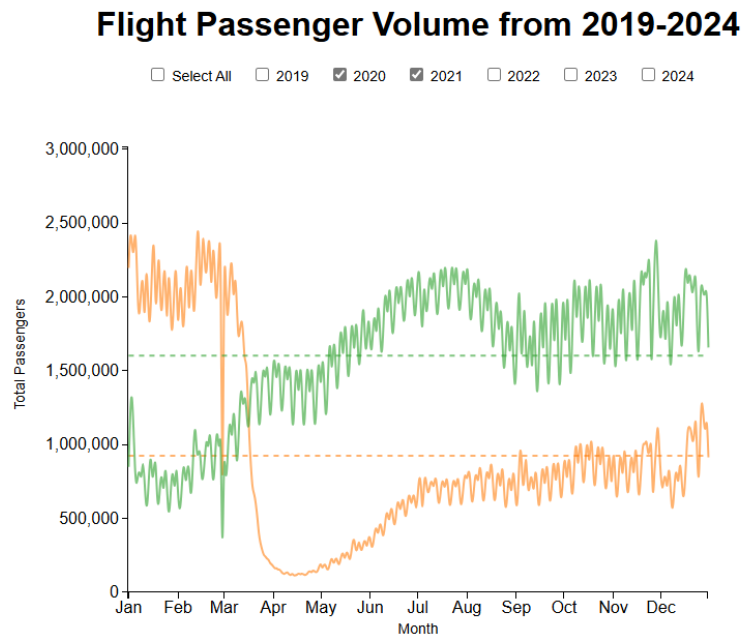


Figure 4: Shows how the volume of passengers began to increase in 2021 (green line) after the pandemic.

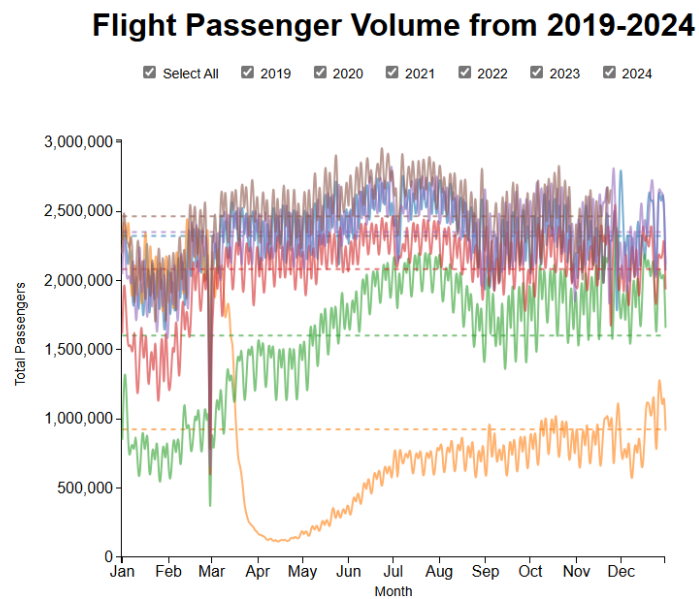


Figure 4: Shows how each year compares to the other and how each year sees a different average volume.

This visualization effectively enabled the discovery of trends and patterns in the data, making it a powerful tool for exploratory analysis and storytelling. By combining interactivity with clear design principles, the final product provided users with an intuitive and engaging way to explore the dataset.