Data Visualization and Dashboards with Tableau

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Process

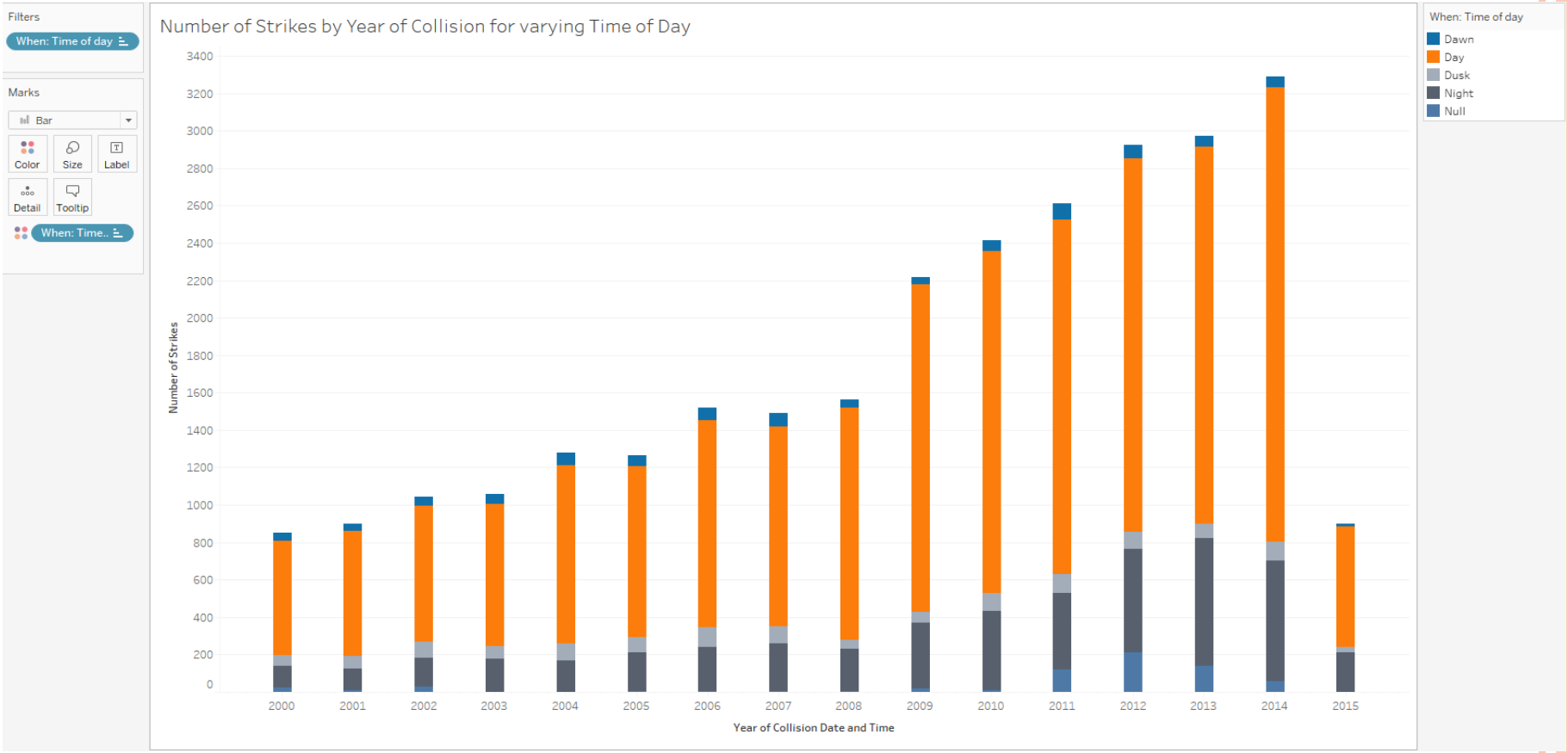
1. Connect to 2015 FAA Wildlife Strikes “cleaned” dataset
2. Examine different datatypes and available fields
3. Build visualizations to learn more about the dataset
    a) Incorporate main categorical features
4. Find any patterns, trends and outliers within the data
5. Create a ‘story’ to annotate any findings or assumptions
6. Create a ‘dashboard’ to answer questions about the data

Visualizations Used

- Map Chart
- Forecast Line Chart
- Treemap Chart
- Stacked Bar Chart
- Highlight Table
- Horizontal Bar Chart

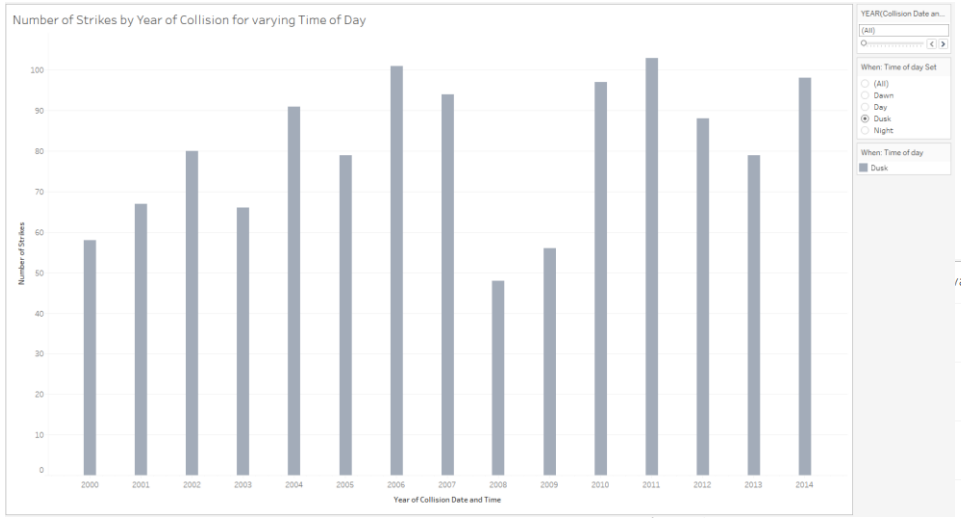
Features of the Dataset

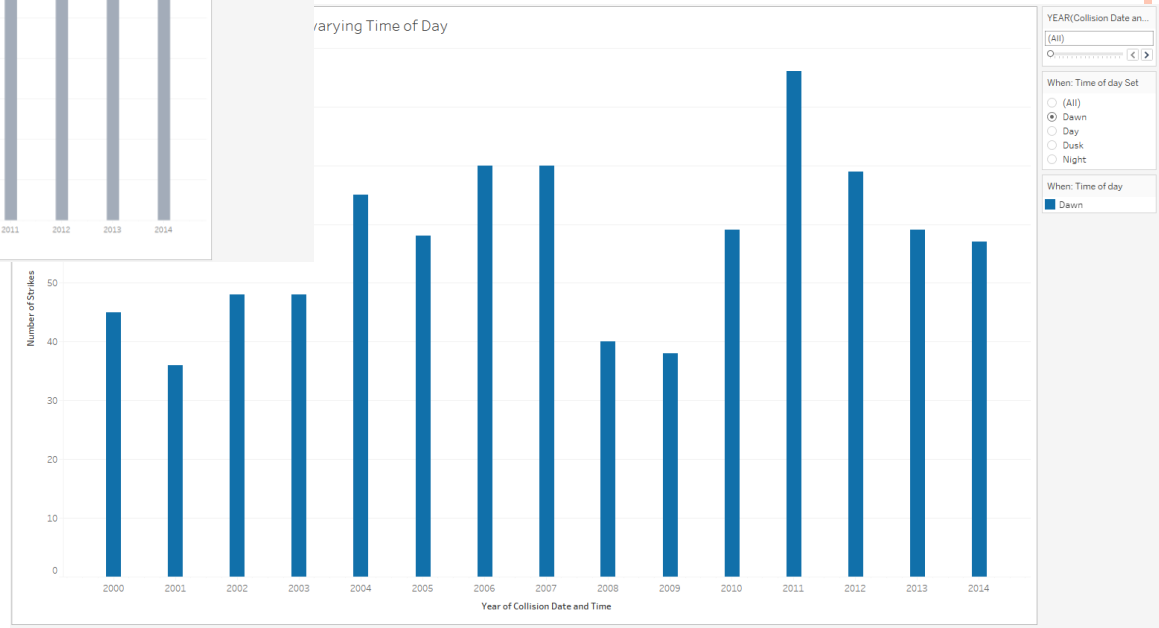
- Dataset contained incomplete data for year 2015
  - Dropped



Features of the Dataset

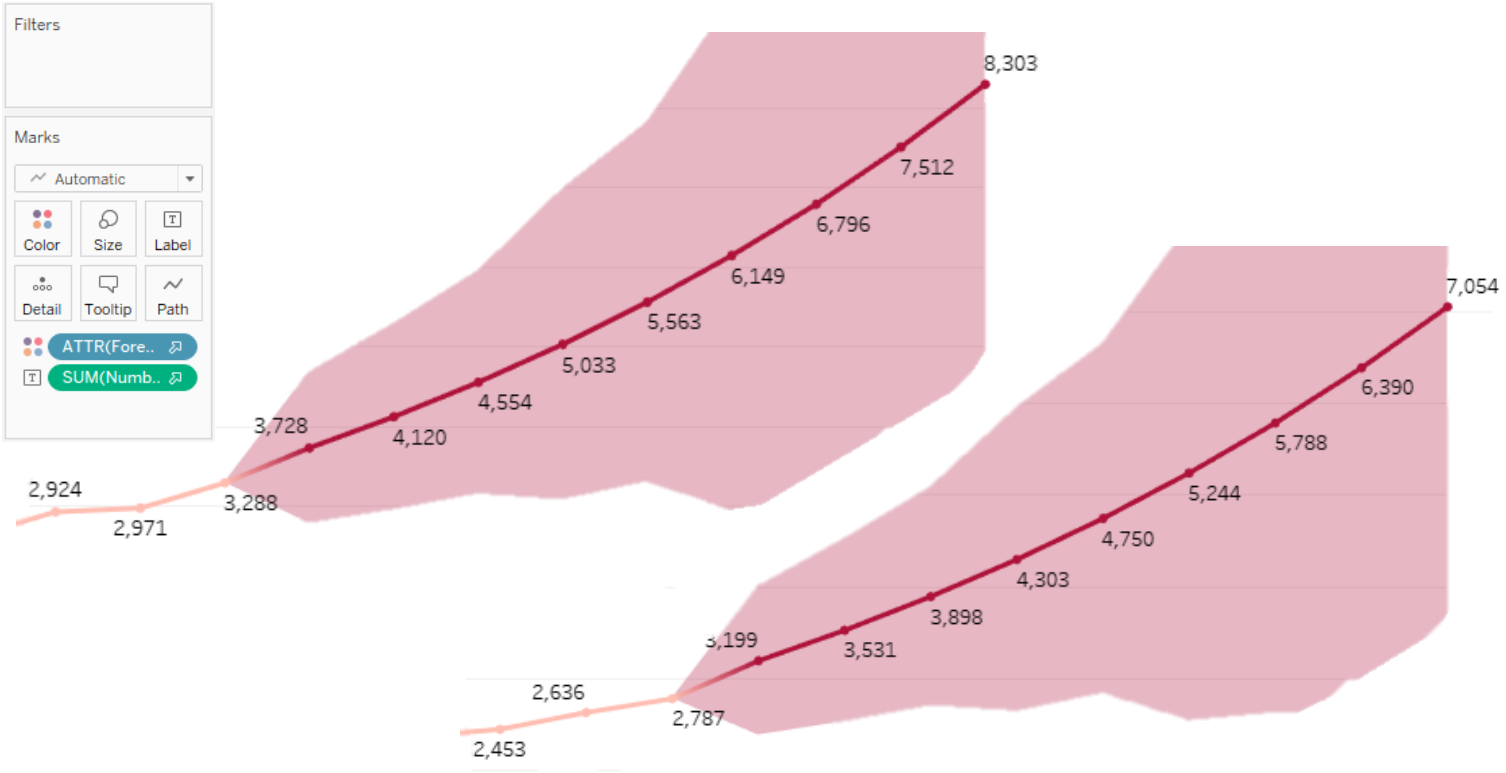
- The visualizations and dataset depict outliers
  - Unmodified

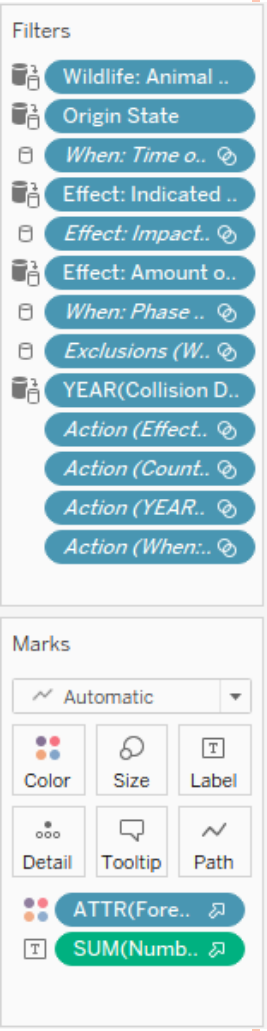




Features of the Dataset

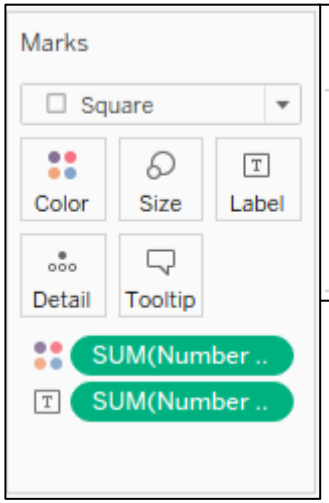
- The visualizations would contain null data
  - Excluded from view
  - Filtered by other sheets



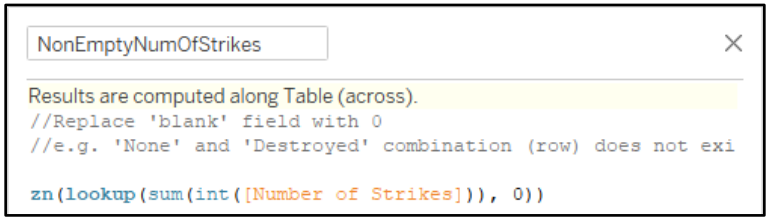


Features of the Dataset

- The visualizations would contain blank field(s)
  - Adjusted using calculated field



	Effect: Amount of damage (detailed)				
Effect: Impact to flight	Destroyed	Medium	Minor	None	Substan..
Aborted Take-off	2	30	77	572	96
Engine Shut Down	1	10	5	18	107
None		321	932	21,721	281
Other	6	51	106	332	106
Precautionary Landing	2	118	234	751	301



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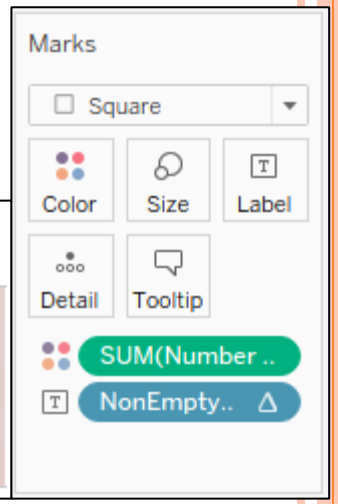
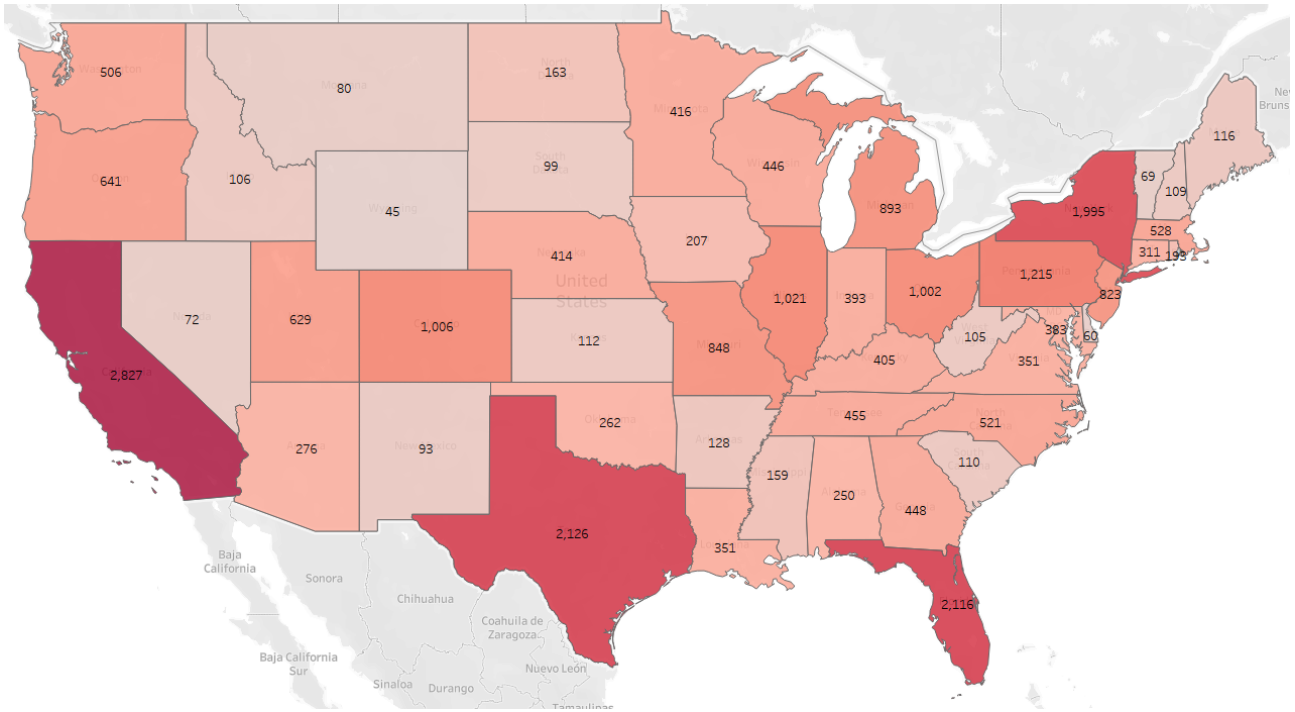


What Questions can be Answered?

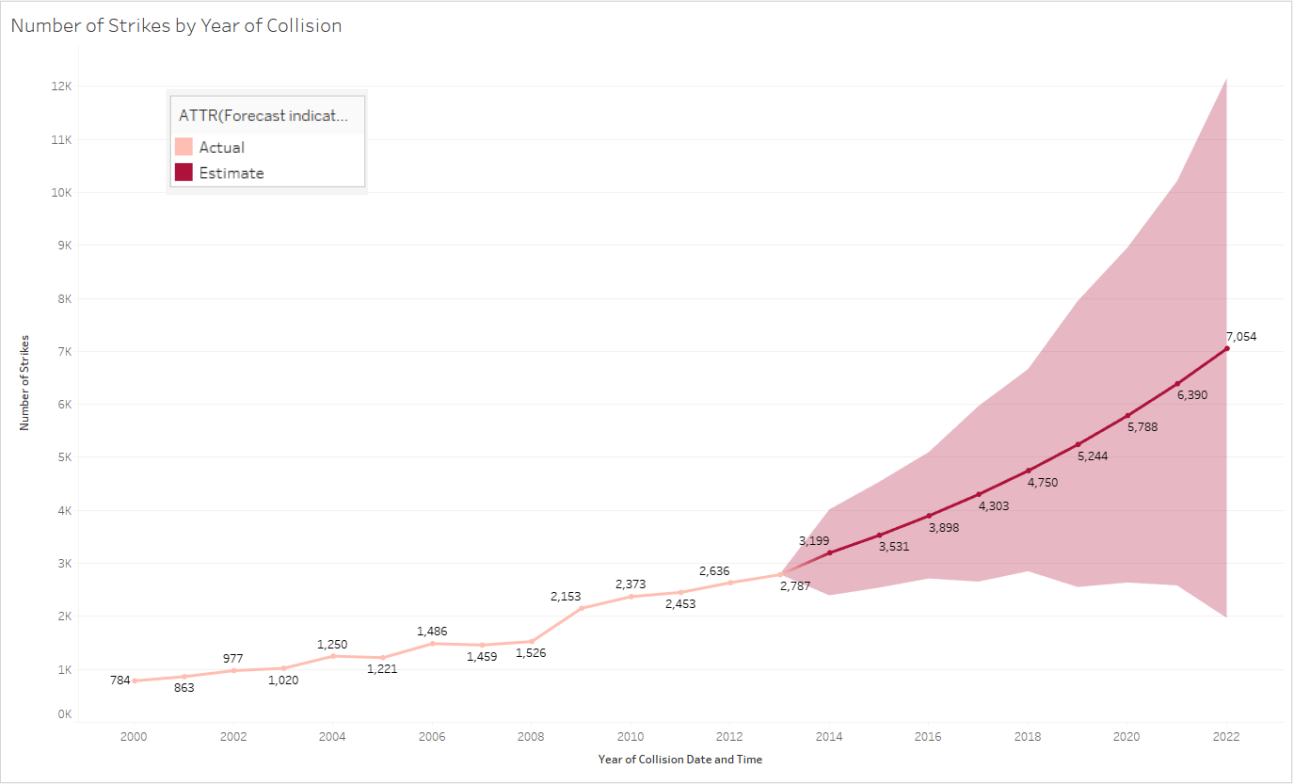
To name a few, we can answer questions related to

- Spatial analysis
- Temporal analysis
- Wildlife species
- Effect of strikes
- Aircraft and flight phase analysis

Where do wildlife strikes most frequently occur?



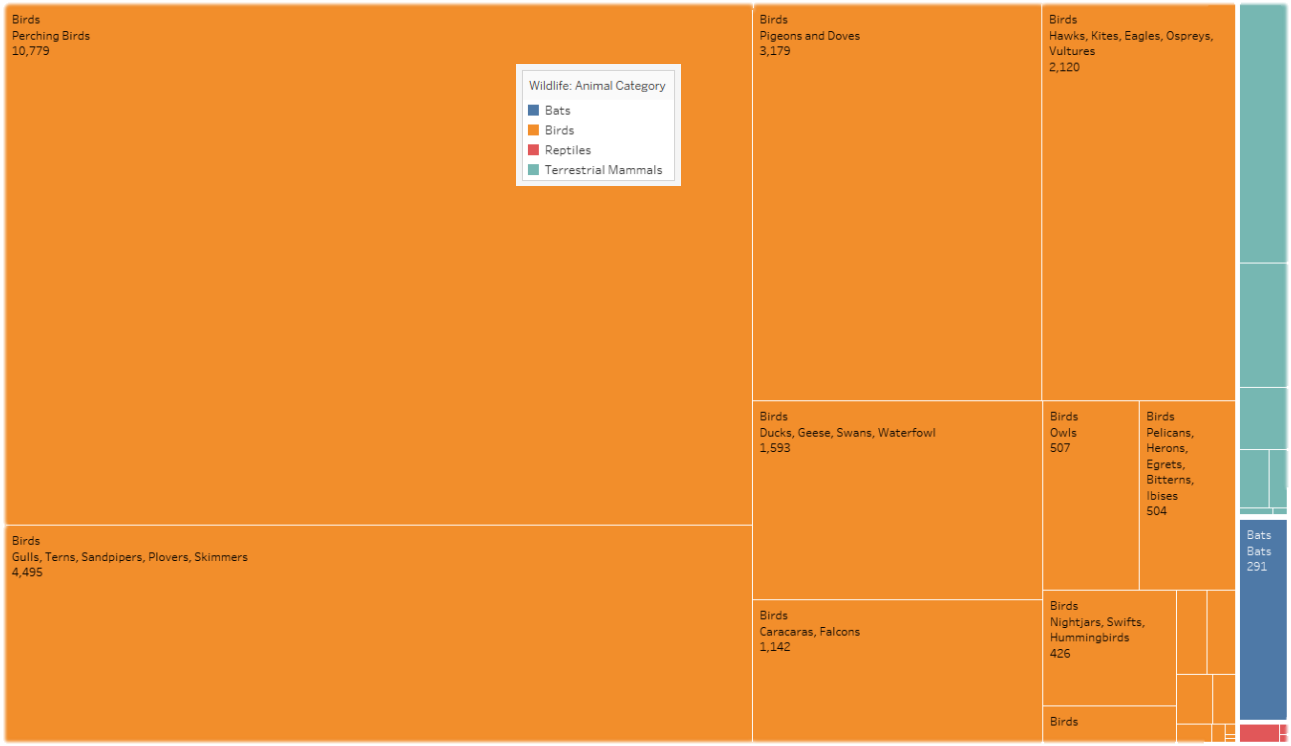
The highest number strikes are 2,827, 2,126 and 2,116 which occur in California, Texas and Florida, respectively.



There appears to be exponential growth in the number of strikes with each year. The model predicts approximately 12,000 wildlife strikes in the year 2022, but according to a [1990-2022 FAA Wildlife Strike Report] 17,190 strikes were reported.

What is the trend of wildlife strikes over the years?

How accurate is the model at predicting future results?



Birds account for majority of the wildlife strikes. More specifically, perching birds (e.g. crows, mockingbirds and sparrows) are the most prone to incidents.

Are there particular wildlife categories more commonly involved?

Of the categories, which wildlife species are most frequently involved?

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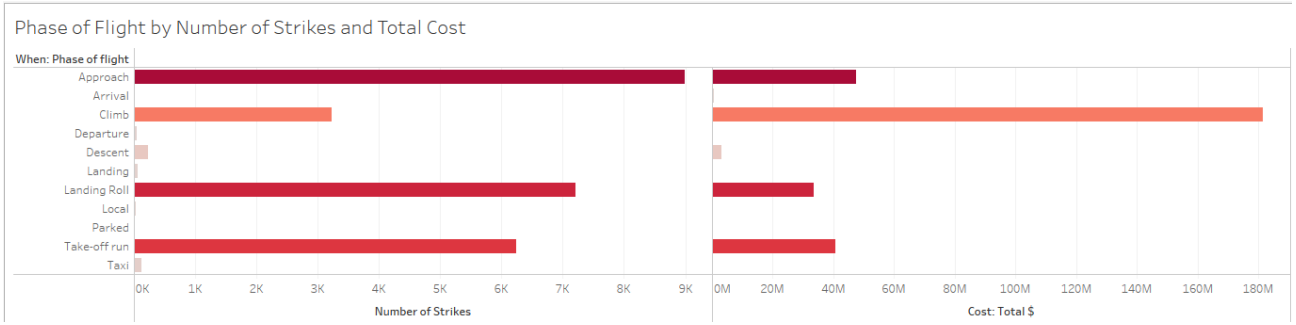

Overall, there is little to no impact of strikes on flight operations. Most of the strikes occur at low altitude and speed where the severity of damage is low.

What is the impact of strikes on flight operations?

How does the effect of strikes vary with the phase of flight?

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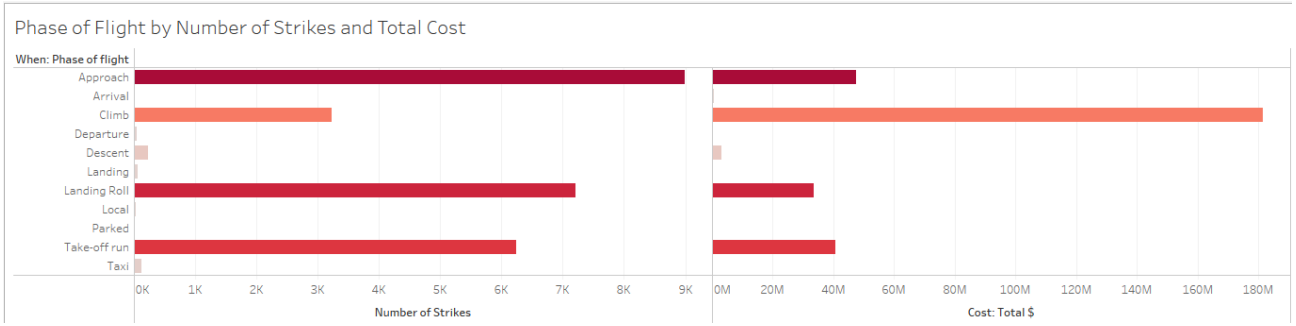

The total cost is higher for the climbing phase than it is for approach, landing roll and take-off run. The latter three phases involve lower altitude and speed where the force of impact would be lesser and smaller birds (and other categories of animals) more common.

How does the cost associated with the different phases of flight vary?

What are possible causes?

Challenges

- The dataset did not include other useful data
- Developing a user-friendly dashboard (balance analysis with clear flow of information)
- Ensuring data quality (deal with null, outliers and inconsistencies)