# DATA 608 Final Project

# WildLife Strikes At US Airports

**Data Source :**

Primarily datasets of WildLife Strikes are derived from FAA (Federal Aviation Administration) primarily in csv /xls formats\*\*

* https://wildlife.faa.gov/
* https://public.tableau.com/s/sites/default/files/media/faa\_data\_subset.xlsx

The FAA Wildlife Strike Database under study contains records of reported wildlife strikes since 2000. Strike reporting is voluntary. Therefore, this database only represents the information that has been received from airlines, airports, pilots, and other sources.

**Parameters For Data Set :**

* Geography : This contains the strikes reported for US Airports
* Timeline : The data is recorded for year 2000 - 2015.
* Data points recorded :

The data contains the date and time of strike, the airport name, US state, aircraft tpe, phase of flight when strike happened, amount of damage, impact to flight, cost in terms of time out of service, cost i terms of dollars, broad level species, species group, order, species which actually striked, and number of strikes.

* Why this data set :

During the past century, wildlife-aircraft strikes have resulted in the loss of hundreds of lives worldwide, as well as billions of dollars in aircraft damage. We are aware of the 'Miracle On Hudson' when US Airways flight landed in emergency on Hudson river. Although this was lucky escape for all passengers, it has not been so in many cases. The FAA (Federal Aviation Administration) maintains a comprehensive program to address wildlife hazards. Through policy and guidance, research and outreach, it strives to stay ahead of the issue. I found it interesting to dive deeper into the data that could reveal a lot of information with regards to the time and season of strikes and wanted to see if the birds migration across the US can cause or impact such strikes. A good way was to visualize this data from FAA and hence this attempt.

**Visualizations :**

**The following visualizations were chosen** rather than going for the traditional graphs as I strongly feel these choice of visualizations give more information to further deep dive into mitigating the wildlife strike risks.

**The visualization concepts of small multiples, high data-ink, zooming panning,tooltips through map chorophleths, aethetics & techniques through sunbursts, a certain drill down /crossfiltering have been highlighted through these.**

* **Sun Burst Charts :**

I chose these as I found them to be great for providing an at-a-glance overview and breakdown of the number of strikes. The following two breakdowns I thought were more useful in understand the patterns.

### Phase Of Flight-Time Of Day-Animal Category

This denotes No of Strikes for the different phase of flight and further categorizes into time of day and a sub level of animal category for each time of day

Derived : The primary strikers are the birds for the main phases Approach , Landing roll Take Off , Climb.

And in each phase of flight, day time is prime time

### Animal Category-Phase Of Flight-Flight Impact-Damage Level

This denotes the cost in terms of dollars for each broad level wildlife category (Birds , Bats, Terrestrial , Reptiles) and dive deeper into phase of flight , impact on flight (Aborted Take Off / Engine Shut down / None / Other/ Precautionary Landing/ Unknown) and damage level (Destroyed / Menium / Minor / None / Substantial)

Derived : At Climb level, which is level where birds could be found flying, we do not see much in air strike and Aborted Take Off Of Precautionary Landing and the impacts and most of the times it leads to Substantial costs

* **Chorophleth Maps :**

These were chosen to study the Strikes Vs Species for each state with data over the years could be studied

On choosing the state and the particular species , one can know that most strikes state for that species

with color coded maps.

* **Strikes By State Charts :**

These were chosen to study the Strikes Vs Cost plots for States and respective airports over the years timeline.

* **Bar Graphs**

These were chosen to study the seasonality patterns for strikes and to see if the migration of birds over fall and spring seasons could raise the strike numbers .

Small multiples of monthwise strikes have been displayed for the state selected.

And top two months when strikes have been most ( across all years data) are displayed.

The month selection for the state selected further gives insight into the species that have been regularly causing strikes in that state for that month. A donut chart reflects the time of daywise strikes for the month.

Derived : The state of Florida for eg, does show high strikes by Tree Swallow a species of birds which are migratory and fly south for the winter months. This could possibly be denoting seasonality pattern impacting the number of strikes.

I believe that a proper study of these maps as a whole could help understand strike patterns that may exist due to these various factors of species of birds, time of day and their existence or migrations in particular, northern /southern states. Understanding these is vital to curb their arrival / restrict habitat.

**Link to presentation : https://dodata.shinyapps.io/Data608\_FinalProjectPresentation/**

**Link to Final Project App : https://dodata.shinyapps.io/Final\_WildLifeStrike/**