DATA VISUALIZATION OF BIRD STRIKES BETWEEN 2000 – 2011

BY:

SUSHMITHA. A

Project Details

Title: - Data Visualization of Bird Strikes Between 2000 – 2011

Domain: - Transportation and Communication

Problem Statement:

Transport and communication are one of the crucial domains in field of analytics. Environmental impacts and safety are, nowadays, two major concerns of the scientific community with respect to transport scenarios and to the ever-growing urban areas. These issues gain more importance due to the increasing number of vehicles and people. Seeking for new solutions is reaching a point where available technologies and artificial intelligence, especially MAS, are being recognized as ways to cope and tackle these kinds of problems in a distributed and more appropriate way. A bird strike is strictly defined as a collision between a bird and an aircraft which is in flight or on a take-off or landing roll. The term is often expanded to cover other wildlife strikes - with bats or ground animals. Bird Strike is common and can be a significant threat to aircraft safety. For smaller aircraft, significant damage may be caused to the aircraft structure and all aircraft, especially jet-engine ones, are vulnerable to the loss of thrust which can follow the ingestion of birds into engine air intakes. This has resulted in several fatal accidents. Bird strikes may occur during any phase of flight, but are most likely during the take-off, initial climb, approach and landing phases due to the greater numbers of birds in flight at lower levels. To have a closer look the following document visually depicts the data collected on Bird Strikes by FAA between 2000- 2011.

Introduction

Purpose

The purpose of this report is to analyse bird strikes from 2000 to 2011 using data provided by Unified Mentor. This analysis aims to identify trends, impacts on flights and airports, associated costs, and geographical distribution. The insights gained will help in understanding the scope of bird strikes and informing strategies for aviation safety and wildlife management.

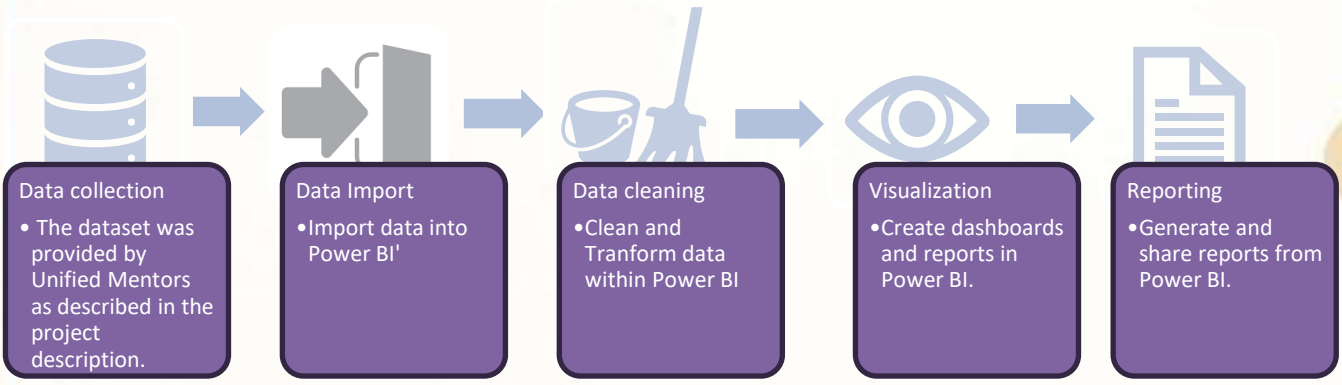
Dataset Information:

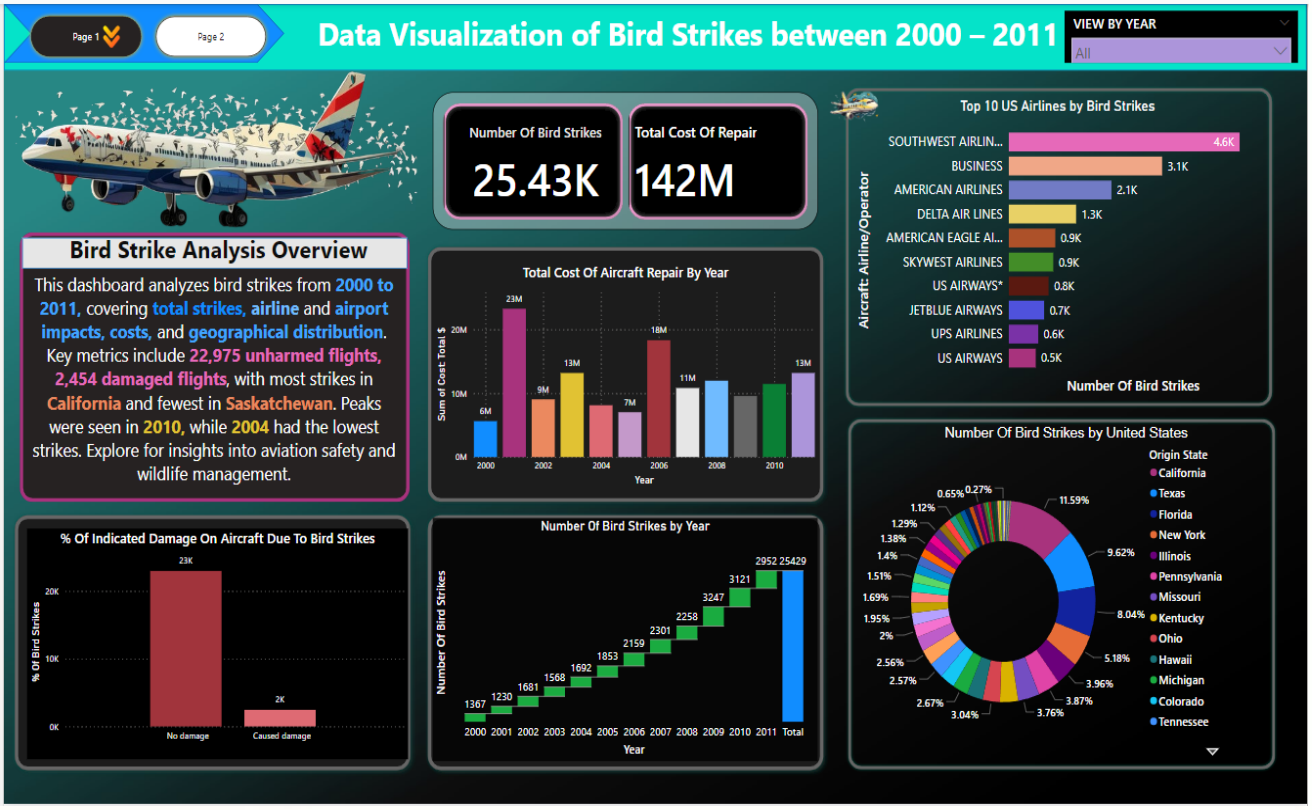
- Record ID
- Aircraft: Type
- Airport: Name
- Altitude bin
- Aircraft: Make/Model
- Wildlife: Number struck
- Wildlife: Number Struck Actual
- Effect: Impact to flight
- Flight Date
- Effect: Indicated Damage
- Aircraft: Airline/Operator
- Origin State
- When: Phase of flight
- Conditions: Precipitation
- Cost: Total $
- Number of people injured
- Pilot warned of birds or wildlife?

MAIN KPIs:

- **Bird Strike Rate:** Frequency of bird strikes per flight.
- **Severity of Bird Strikes**: Damage or impact caused by bird strikes.
- **Economic Impact:** Financial cost incurred due to bird strikes.
- **Altitude of Bird Strikes:** Height at which bird strikes occur.
- **Phase of Flight:** Stage of flight during which bird strikes occur.
- **Incidents with Prior Warning:** Analysis of incidents where pilots were informed of bird activity beforehand.
- **Weather Conditions:** Most strikes occurred in clear weather, showing little correlation with adverse conditions.
- **Response Time:** Average time taken to respond to bird strike incidents.
- **Operational Impact:** Number of flights delayed or cancelled due to bird strikes

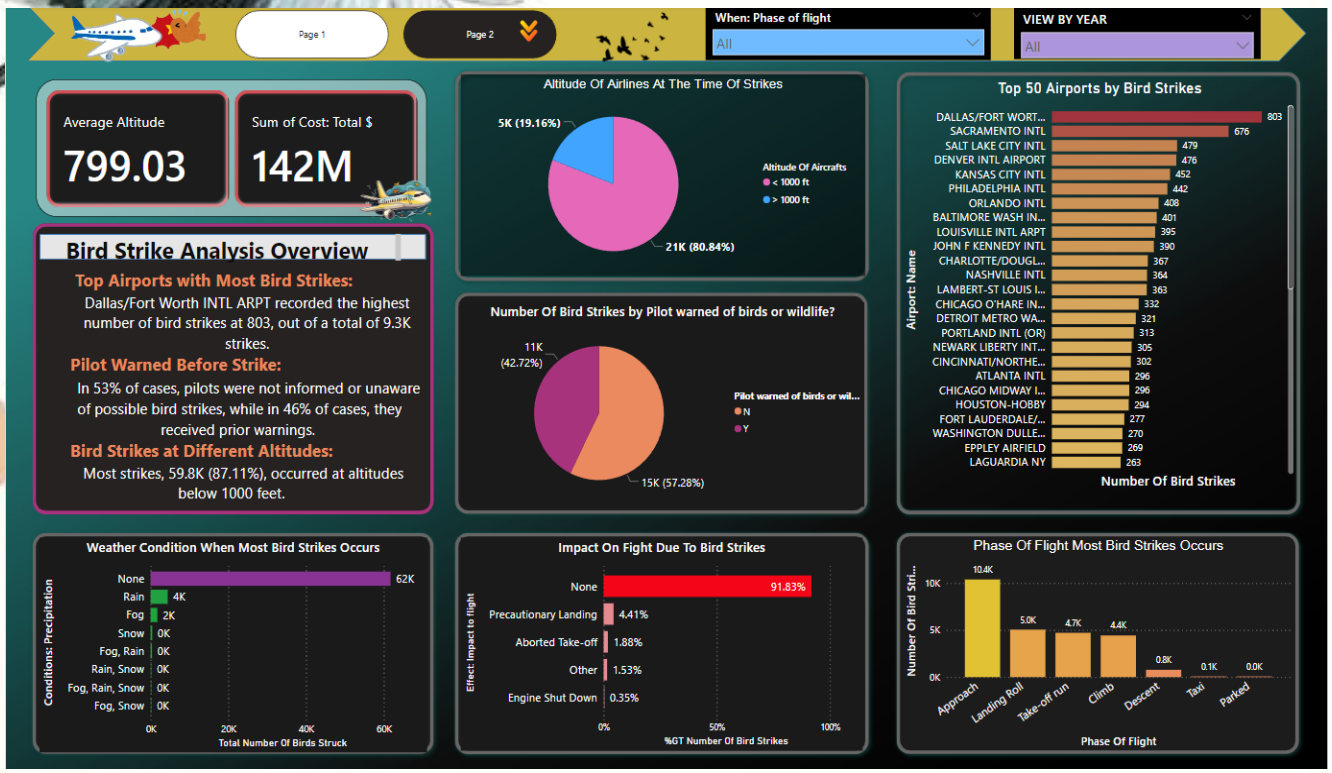
Design Details:





Insights:

- Total number of bird strikes happens is around 25.43 thousand in the span
- In this span of 11 years more than 2000 Aircrafts got Damaged due to Bird Strikes and this resulted in the repair cost of 143 million dollar of aircrafts.
- Out of 25,429 flights that have been involved in a bird strike incident, 22,975 received no damage while 2454 received small to large scale damages.
- Number of bird strikes continue to increase yearly from 2000 to 2011. where in 2009 the number of strikes is highest where as in year 2001 the lowest number of Bird strikes happens.
- Airlines namely, Southwest Airlines, Business, American Airlines, Delta Air Airlines, US Airlines are more involved in bird strikes than other airlines.
- The state of California is involved with the greatest number of birds strikes in all of the USA, followed by Taxes. States like Montana received a comparatively low number of strikes



Insights:

- 80.84 % of the planes were flying at an altitude Greater than 1000ft when the strikes occurred and 19.16 % of the planes were flying at an altitude lesser than 1000ft when the Bird strikes occurred
- Rain, Fog or Snow has little to no relation with respect to bird strikes and it’s seen in most of the cases when strike occurred, the weather was fine.
- A highest number of strikes occurred when the plane was approaching the runway. No strikes were reported when planes were either parked or being taxied.
- Average altitude at which most of the strikes occurred is 799 ft from ground
- In 57.268 % cases pilots were not informed or they are unaware of the possible bird strikes where as in 42.72% cases they were informed prior to the strikes.
- 91.83 % bird strikes result in no damage to the plane or the flight 4.41% bird strikes resulted in precautionary landing of the flight. 1.88 % bird strikes resulted in Take-off being aborted. 0.357% bird strikes caused engine shut down

Conclusion

The analysis of bird strikes from 2000 to 2011 reveals important trends and impacts. Most strikes occurred at low altitudes and during clear weather. While many incidents caused no damage, those that did resulted in significant costs. Prior warnings to pilots significantly reduced the risk of damage. Addressing these findings can help improve aviation safety and reduce the impact of bird strikes.

THANK YOU