

# Final Project Report

## Problem Selection

Flight delays are worsening the situation. There are factors that are under the direct control of the carrier, such as aircraft turnarounds between flights, passenger punctuality, technical and crew performance etc. On the other hand, there are perhaps even more factors that are outside of the airlines control, security, airport conditions etc.

## Data Collection

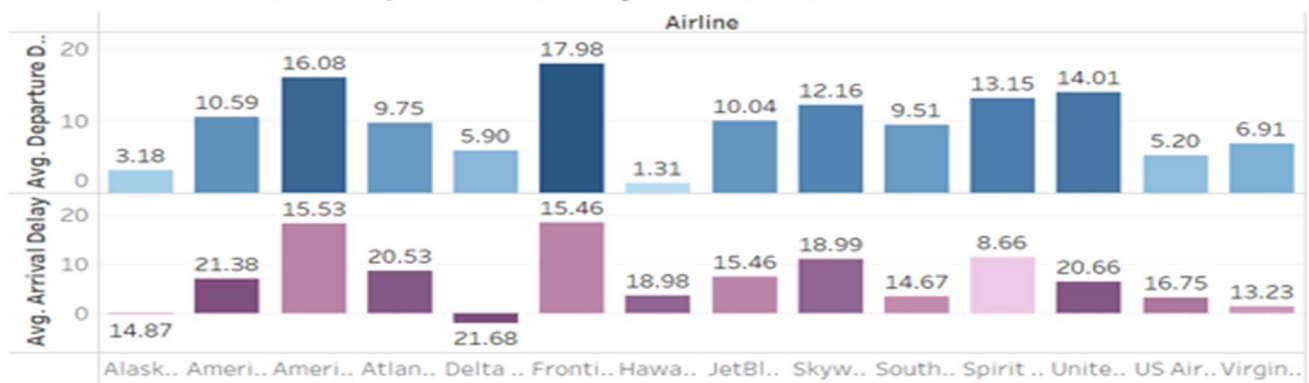
The main datasets used were the csv files taken from kaggle.com. Our datasets included the delay data of USA flight of one month with a fairly large amount of variables describing the reasons for the flight delay as well as the time period of the delay and information such as the delay occurred at which airport and through which airline.

## Presentation of Results

Using the Tableau, we are able to draw some conclusion and interpretation on the effect of flight delay occurred by different airlines at different airport and found the various reasons for delay as well as suggest solutions to reduce those delays.

**We created a visualization for the arrival and departure delay of different airlines**

Total Arrival and Departure Delay for Airlines

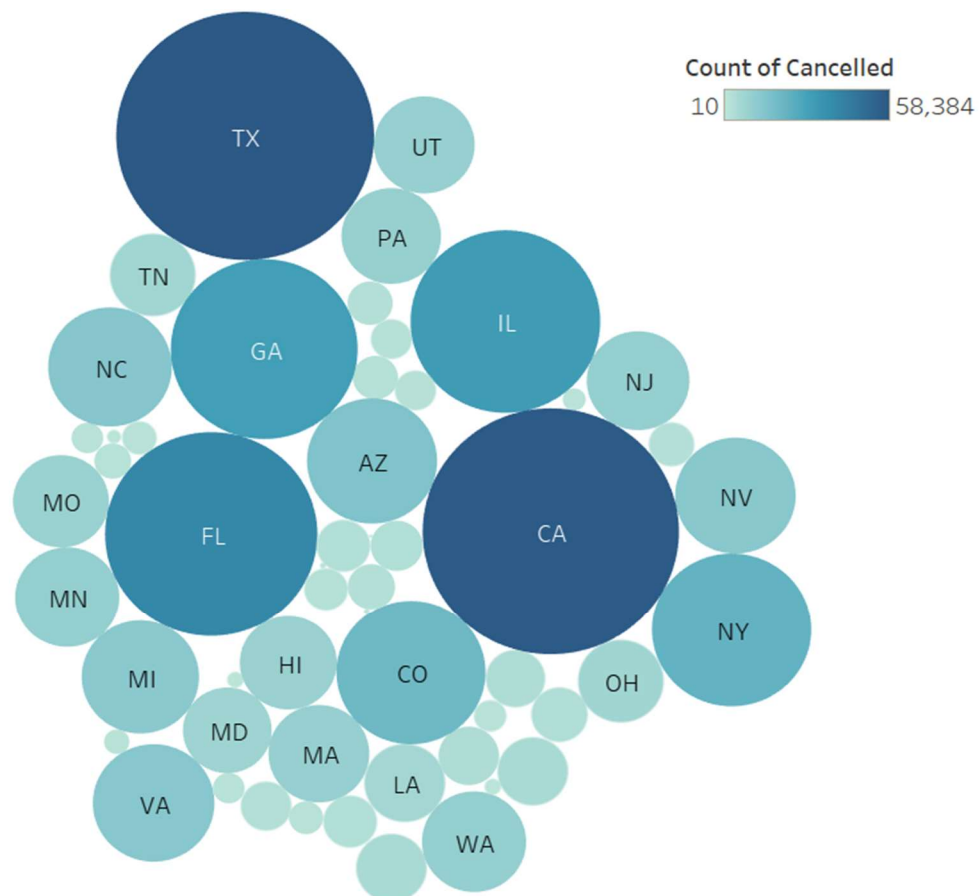


## Traffic Is Increasing, worsening delays

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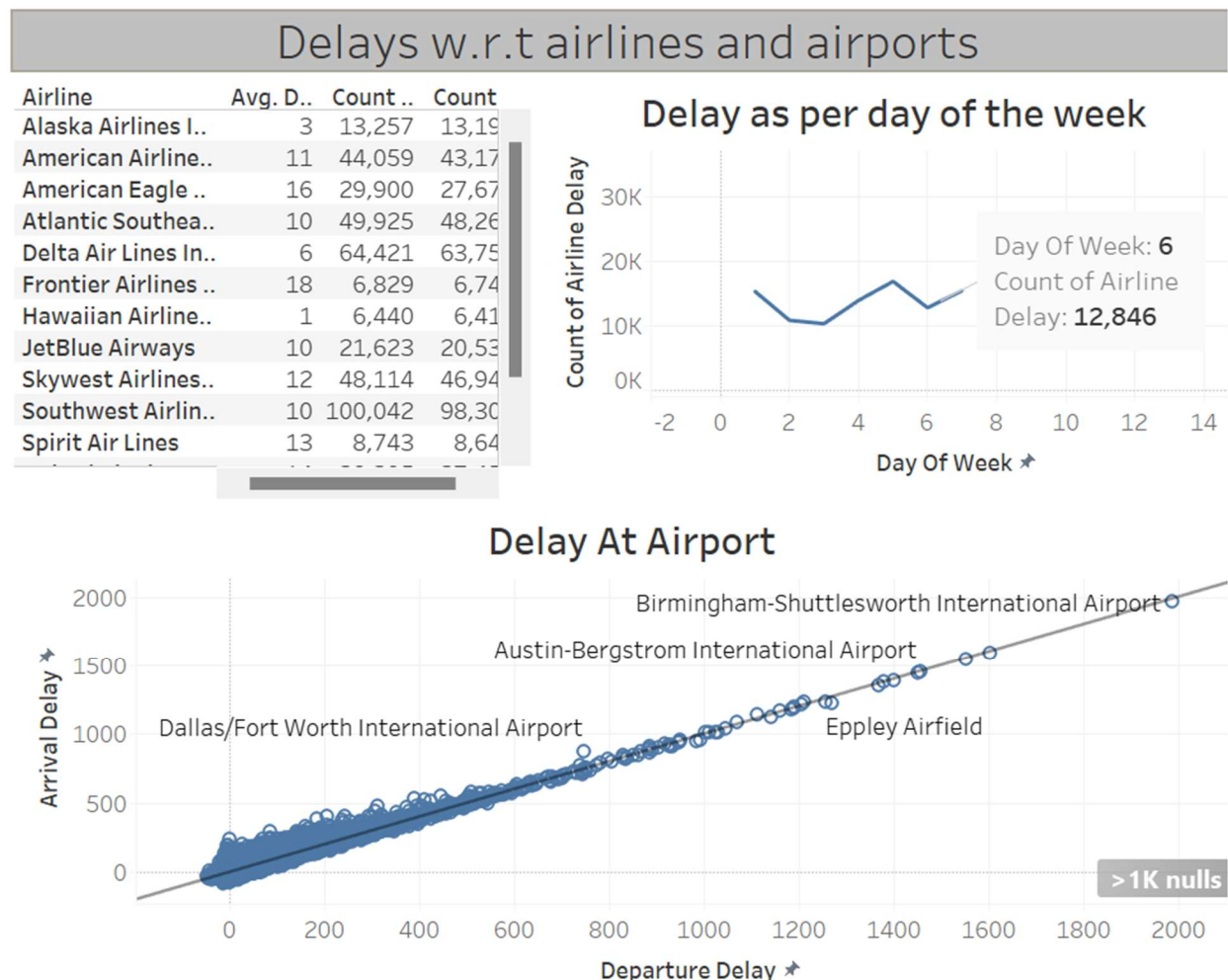
The reality is such that so long as airplanes continue flying, flight delays will be a part of the experience. According to the Bureau of Statistics, about 20% of all flights are delayed bt 15 minutes or more and increasing traffic will worsen the situation in future.

## Delay of Airlines in different states



## Delay with respect to airlines and airports

Here, we have made a dashboard combining the three worksheets containing the data of delay as per the day of week, the airlines delay data and the data of delay happened at the different airports.

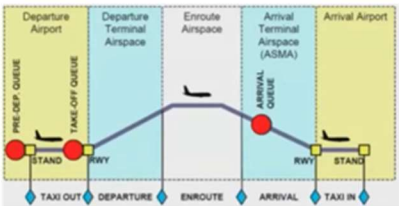


Arrival and delay departures are the major culprits. Now, let us see the reasons behind them.

### Domestic Flight Delays in USA

Delay of airline in d..	Delay w.r.t airlines and ai..	Airline Delay of Top 5 Airlines ..	Major culprits for delays in t..	Cancellation Rates	Cancellation in different cities	Solution to reduce delays
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#### Arrival and Departure Delays are massive

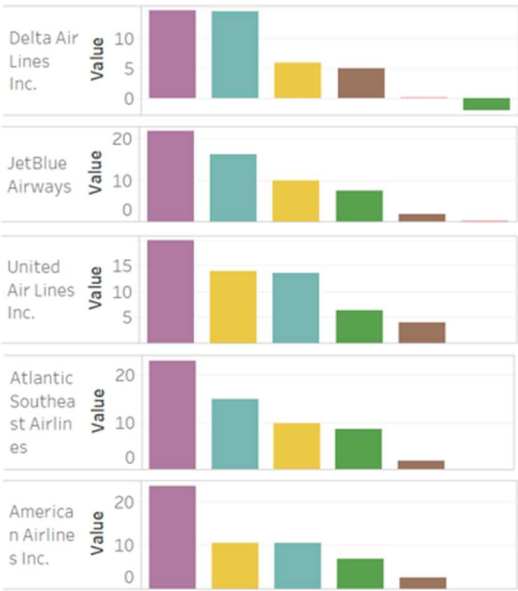


Delays and disruptions in airline operations annually result in billions of dollars of additional costs to airlines, passengers and the economy.

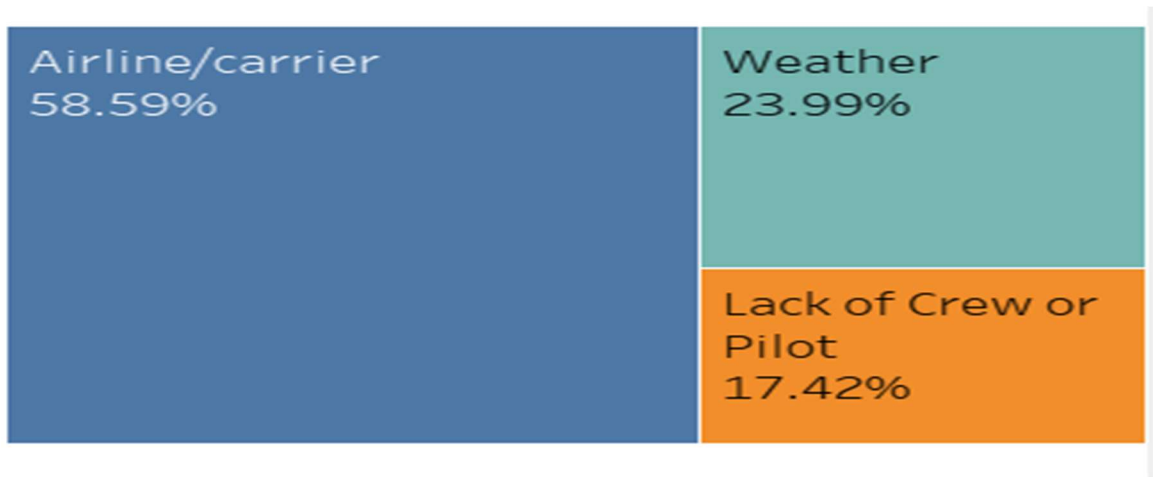
Here in the graph, we can clearly see that the biggest causes of delays are Arrival delays and Departure delays that are caused while taxi in and taxi out of the aircraft.

Delays and cancellations affect both passengers and air carriers. by resulting in increased travel time and increased expense on food and lodging, they cause stress among passengers. further, they disrupt th..

Measure Names  
■ Avg. Late Aircraft Delay  
■ Avg. Air System Delay  
■ Avg. Departure Delay  
■ Avg. Weather Delay



### The Cancellation reasons



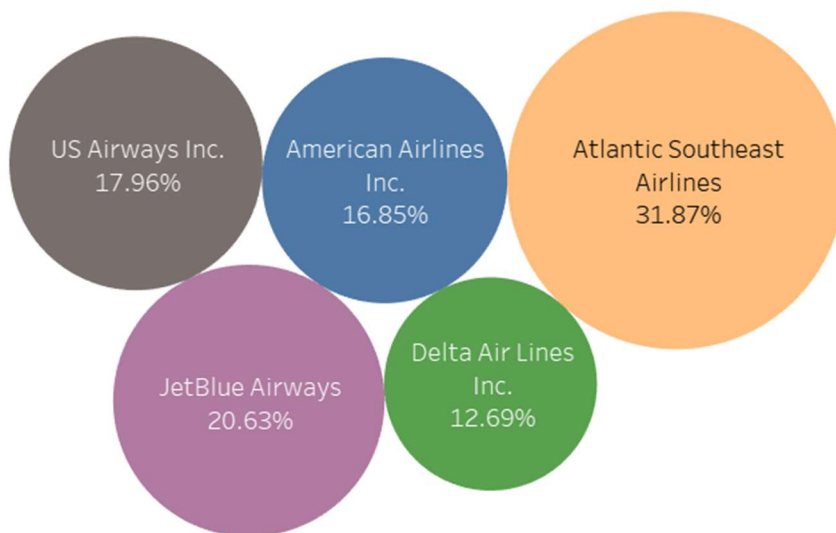
## Weather

Bad weather is one of the most common reason for flight cancellations. It's no wonder that the share of cancelled flights increases in winter. Adverse weather conditions are hurricanes, blizzards, tornadoes, etc. They are phenomena that seriously impair or endanger the operation of flight, justifying its cancellation.

## Air Traffic restrictions

Air traffic controllers sometimes request an airline to cancel their flight. This usually happens after the flight was delayed take offs keeps being postponed by lack of available time slot in the airports departing schedule, until the flight is cancelled altogether.

**We have chosen top 5 airlines among all the airlines and did the analysis on them. The cancellation rate with respect to airlines**



### 1) Mechanical Issues

A lot of preparation goes into getting the aircraft ready for the flight. In addition to that, frequent maintenance checks are done on the aircraft to ensure that it's operational.

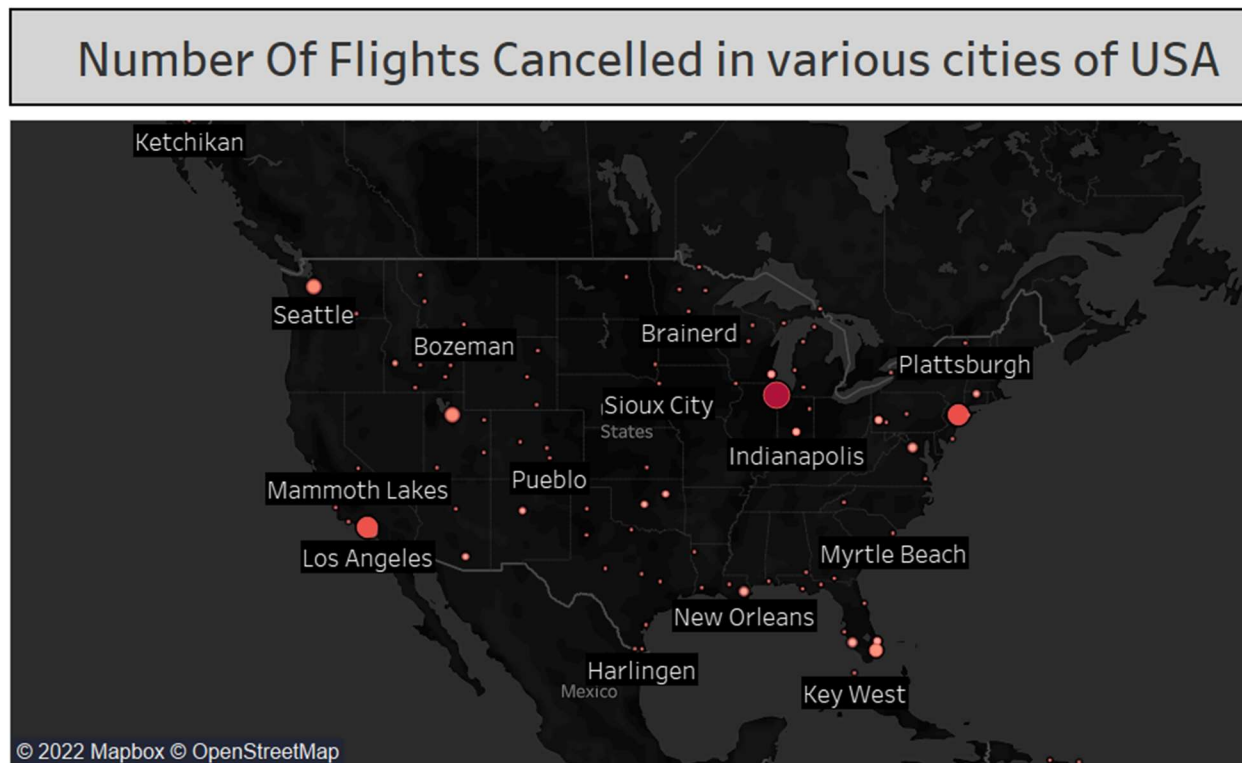
### 2) Missing Aircraft

Airlines also cancel flights when they do not have an aircraft available for the flight. This can occur when the aircraft scheduled for the flight must actually undergo maintenance or fixed after an issue was identified.

### 3) Missing Crew

Cancellation can also occur when you're not missing the aircraft, but the people supposed to fly it. They usually don't. However, flying takes a toll on the body. The staff that was supposed to fly on your aircraft may have mixed out their hours.

**The below visualization shows the number of flights cancelled in various cities of USA**



The Big cities of USA such as Chicago, Seattle, Los Angeles, New York, Salt Lake City, and Indianapolis have the airports, which are busiest in the country. Therefore, number of flights cancelled at these airports are the highest in the country. The number of flight cancelled were the highest in Chicago city followed by Los Angeles, New York city, Seattle, Salt Lake City and New Orleans. The number of flights cancelled were in the range of 9 to 33000 in a single month.

The solutions for the delay can be focusing on reducing the diversion rate, which will result in reducing the traffic in airport and also the mismanagement happened due to diversion of route for the flight although the climate is an important for diversion which can't be controlled but the factors can be controlled and the diversion of flights can be reduced.

### Focusing on reducing diversion rate



### Dealing with Air Traffic

One of the reasons for flight delays is considered to be air traffic and the delays can be minimized by efficient traffic management.

### Reducing the Diversions.

The Diversions are directly proportional to the delays occurred while airborne times. There could be several reasons for the diversions that we can find in our data like system issues, weather problems or security purposes.

Also, we can see that diversion rate is significant for majorly 2 airlines, Southeast airlines and delta airlines. Thus causing halts and delays in the overall journey.