

Project Task 2: Executive Summary

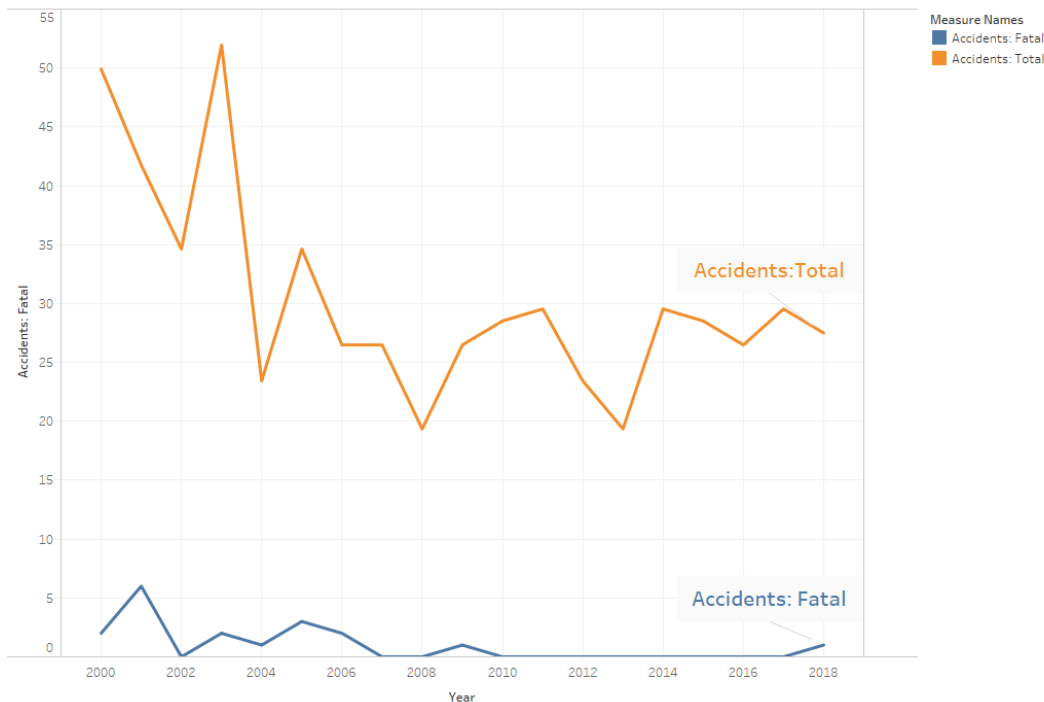
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Due to the unfortunate airline crashes, and biased reports from the media, the aviation industry is facing a crisis. I am preparing an executive summary to senior leaders who care about the portrayal of the industry, specifically, the airlines.

First of all, I describe the current status of airline industry, as I mentioned before, there are people questioning the airline safety. Then I want to analyze the data to provide insights to reassure the airline safety.

1. Airline accidents trend

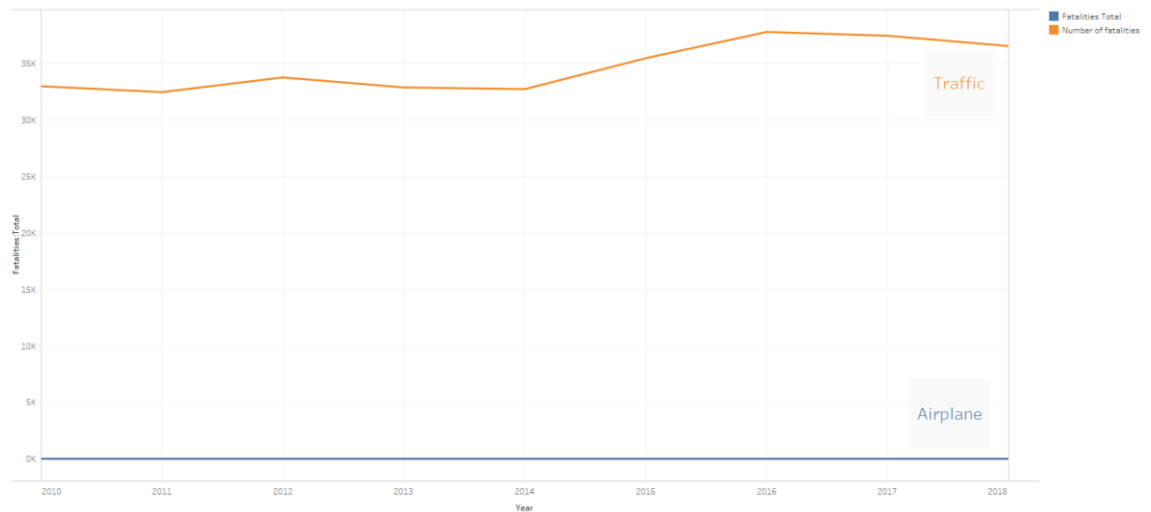
Airline Accidents Decrease



This line graph shows that the total accidents from 2000 to 2018, and fatal accidents at the same period in United States. You can see clearly that both decrease, especially, in recent years, the number of fatal accidents is almost 0.

2. Fatalities

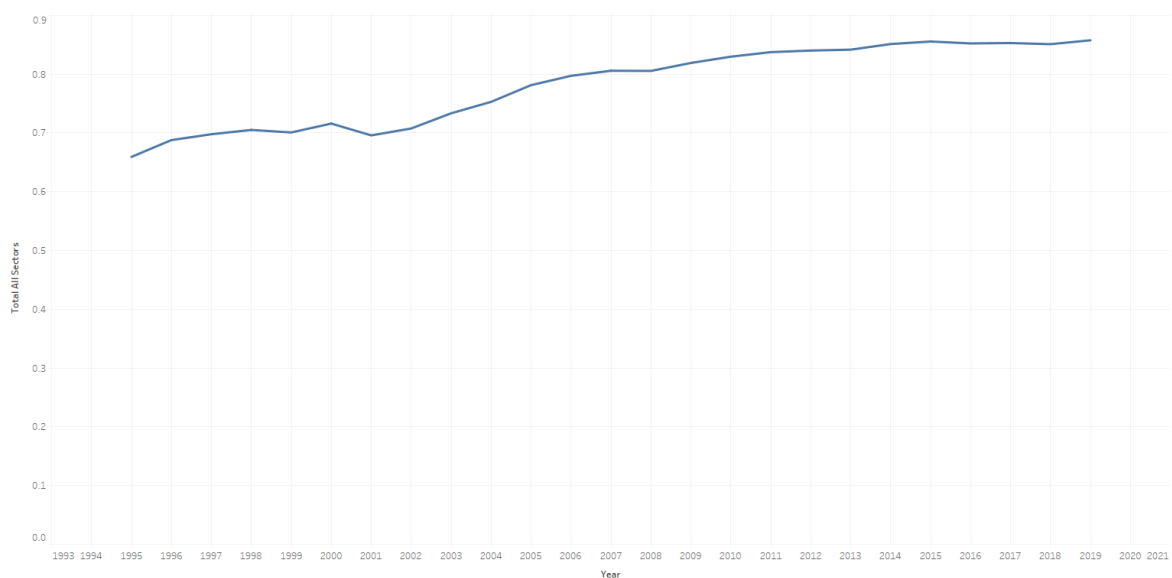
Fatalities (Airplane vs Traffic)



The media reported airplane is no longer a safe way to travel. Here I compared the fatalities between airplane and traffic. Except 2018 having one fatality, there is no fatality from 2010 to 2017 for airline. In sharp contrast, the fatalities of traffic are four orders higher than that of airline. Airline is still the safest way for passengers.

3. Increase in Aircraft Passengers

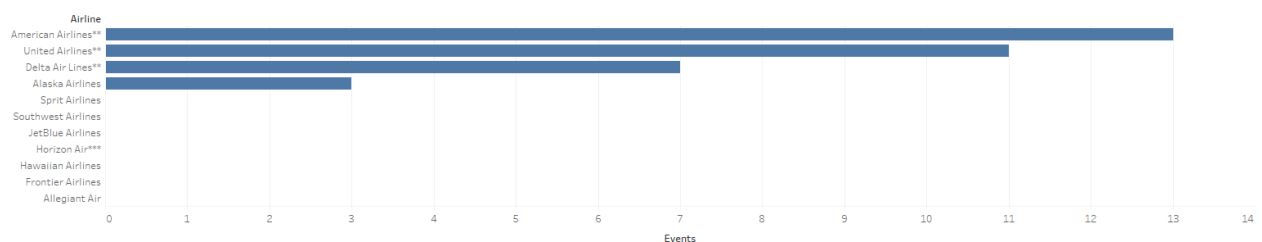
Domestic Load Factor



This line plot displays that passenger load factor is keeping rising. The passenger load factor can be used to evaluate the efficiency of transportation providers to fill seats and generate fare revenue. Although the biased propaganda made by the media, most people still believe in the airline safety.

4. Airplane crashes by airline

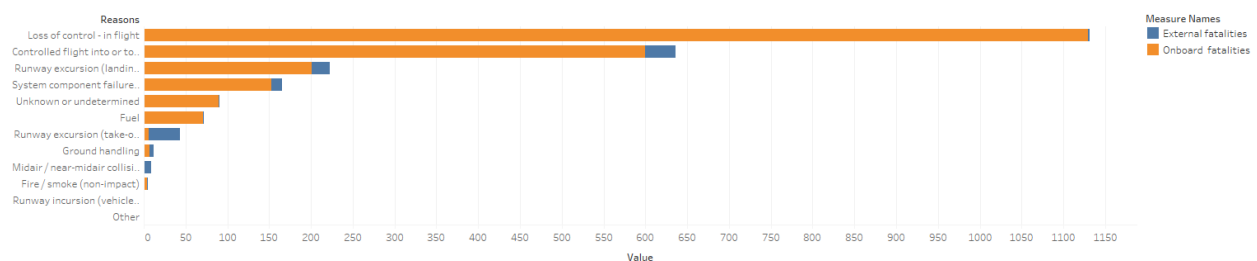
Airplane Crashes by airline



This bar plot shows the number of plane crashes and other events by airline since 1970 that led to at least one passenger death. Because of the unknown and changeable climate and the rocky condition of high altitude, the aircrafts indeed have accidents due to these uncontrollable factors. Once an airplane accident occurs, it may suffer heavy casualties. Therefore, we need do our best to avoid accidents.

5. Most likely reasons for fatal accidents

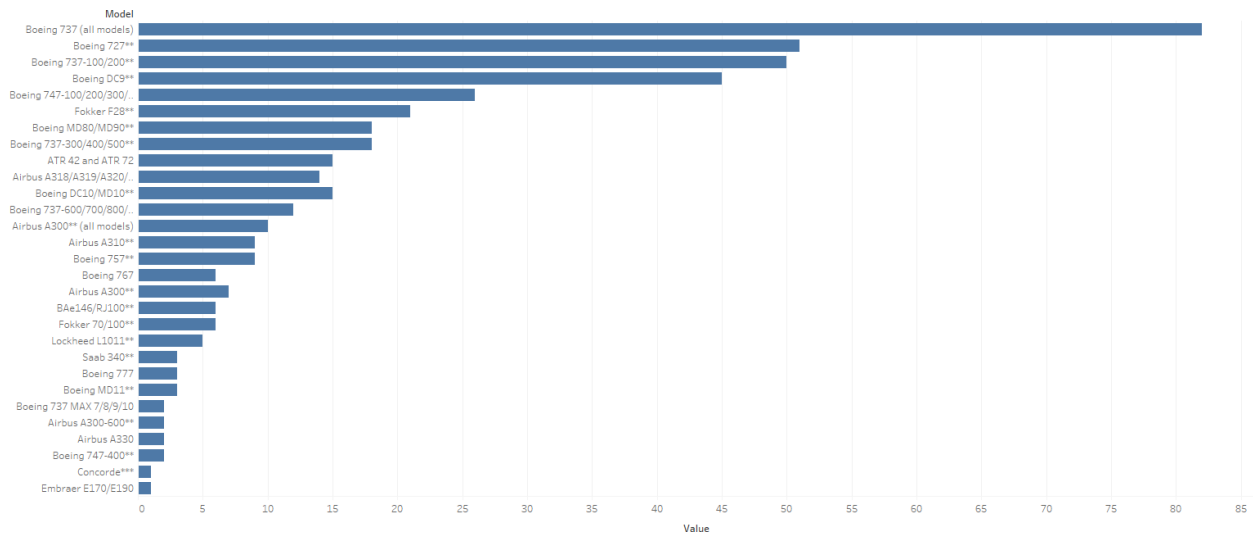
Most likely reasons for fatal accidents in the aviation industry form 2008 to 2017



You can see that the biggest reasons for fatal accidents in the aviation industry from 2008 to 2017 are “the loss of control in flight” and “controlled flight into”. Except for the uncontrolled factors which can cause these problems, the quality and reliability of the airplane itself is also a key factor.

6. Fatal Crash Rates Per Millions of Flights

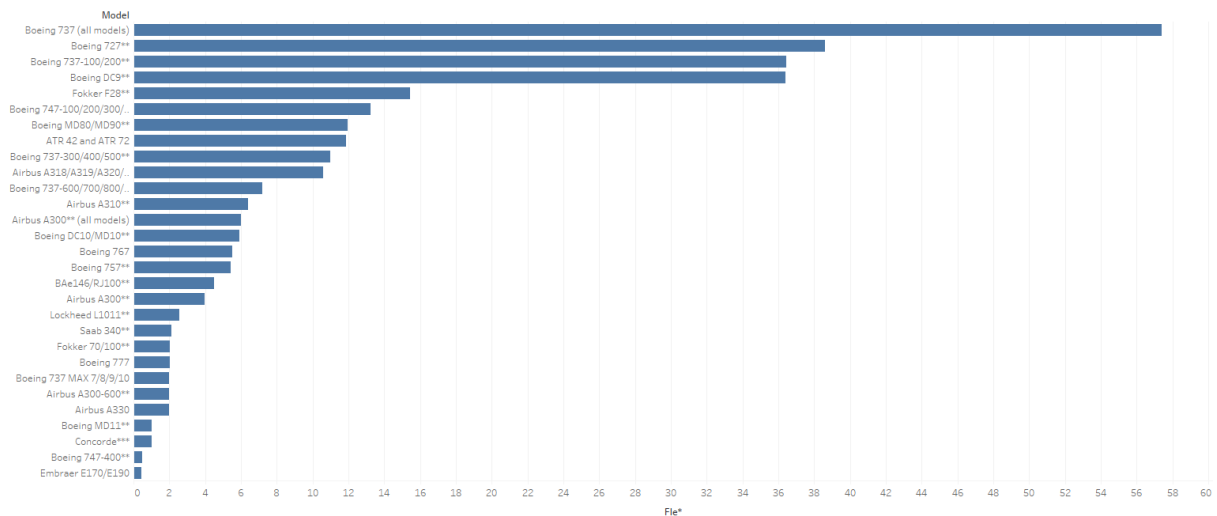
Fatal Crash Rates Per Millions Flights



Apparently, several airplane models have much more fatal crashed than others, such as Boeing 737, Boeing 727, Boeing D29. These are not independent occurrences; the safety of these airplanes should be noticed.

7. Full Loss Equivalent Per Millions of Flights

Full Loss Equivalent Per Millions Flights



Full loss equivalent is the sum of proportions of passengers killed in each fatal incident. For example, 5 out of 100 passengers killed on the flight is a full loss equivalent of 0.05. You can see those aircraft models Boeing 737, Boeing 727, Boeing D29 still have high full loss equivalent, which means if these aircraft models have crashes, there will be more serious casualties than others. Therefore, I think one should carry out regular inspections and even stop flying models with high accident rates.

Data references:

- AirSafe
 - <http://www.airsafe.com/airline.htm>
- Statista
 - <https://www.statista.com/statistics/1093239/most-likely-reasons-fatal-accidents-aviation-industry-fatalities/>
 - <https://www.statista.com/statistics/191521/traffic-related-fatalities-in-the-united-states-since-1975/>
- Airlines for America
 - <https://www.airlines.org/dataset/annual-results-u-s-airlines-2/#>
 - <https://www.airlines.org/dataset/safety-record-of-u-s-air-carriers/#>
- Airline data project
 - <http://web.mit.edu/airlinedata/www/Traffic&Capacity.html>

My GitHub Link: <https://github.com/Cristinazhang09/DSC640>