Airline Safety

A summary of current airline safety and travel analytics

DSC 640 Project 2: Executive Summary Doug Marcum

Overview

Due to a recent unfortunate airline incident, there has been an increase in media coverage pertaining to the safety of air travel. Several statistics have been shared stating air is no longer a safe way to travel.

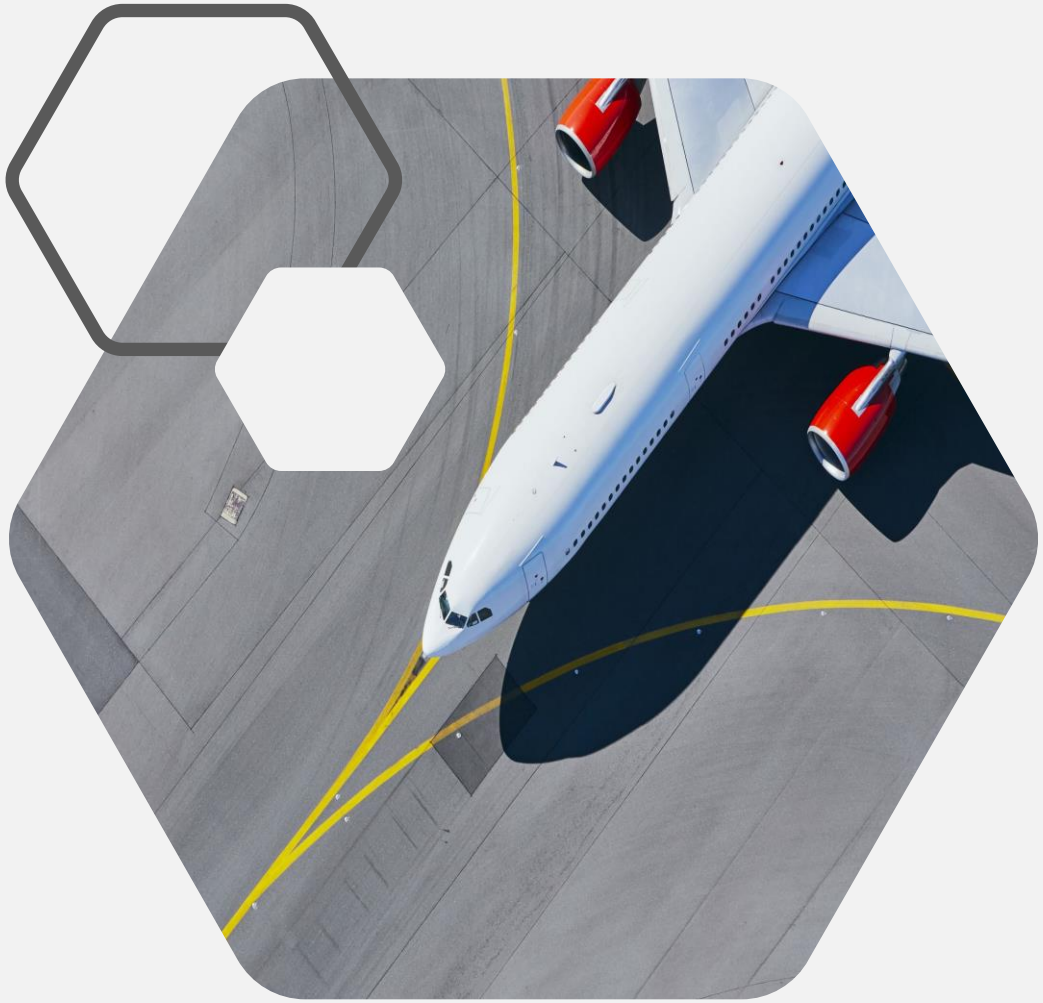
Our team has tackled the topic and reviewed multiple data sources to assess the current situation. A focus was placed on the time period of 2000 to present, to determine if air travel is still the safest way to travel.

The proceeding analysis and findings support the fact that U.S. based airline travel is safe and financially prosperous.

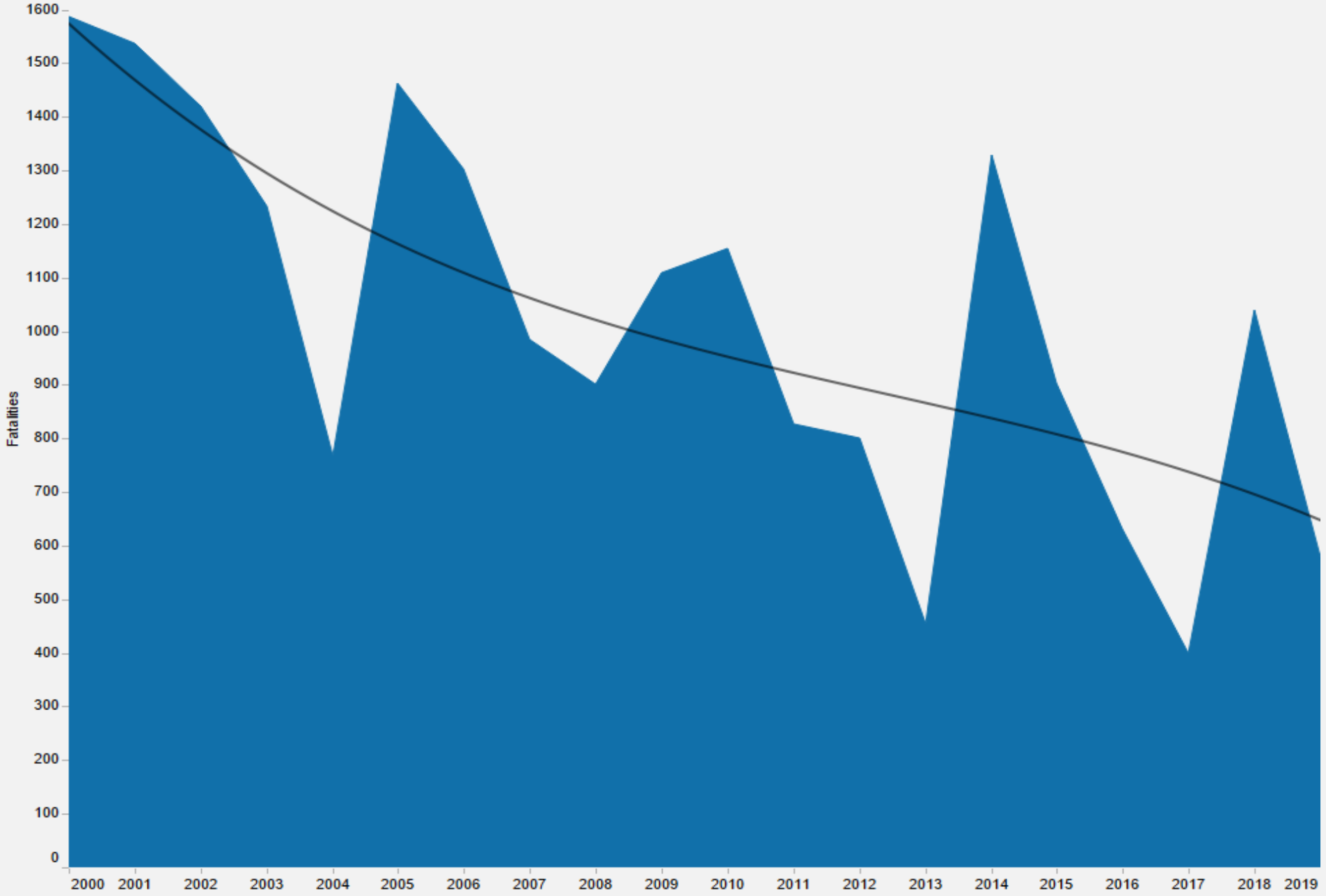
Air travel continues to be one of the safest modes of transportation both domestically and internationally.

Safety Findings

- Since 2000, U.S. and International Carriers have had an annual downward trend in fatalities related to air travel
- From 2000 – 2014, no airline suffered more than three fatal accidents, with over 30 airlines having zero fatal accidents
- U.S. Carriers have an outstanding safety record over the past decade with only two fatal accidents occurring since 2009
- U.S. automobile accidents continue to far outpace air related fatal accidents by averaging in excess of 30,000 fatal accidents annually



Air Travel Fatalities - U.S. & International Carriers (2000 - 2019)

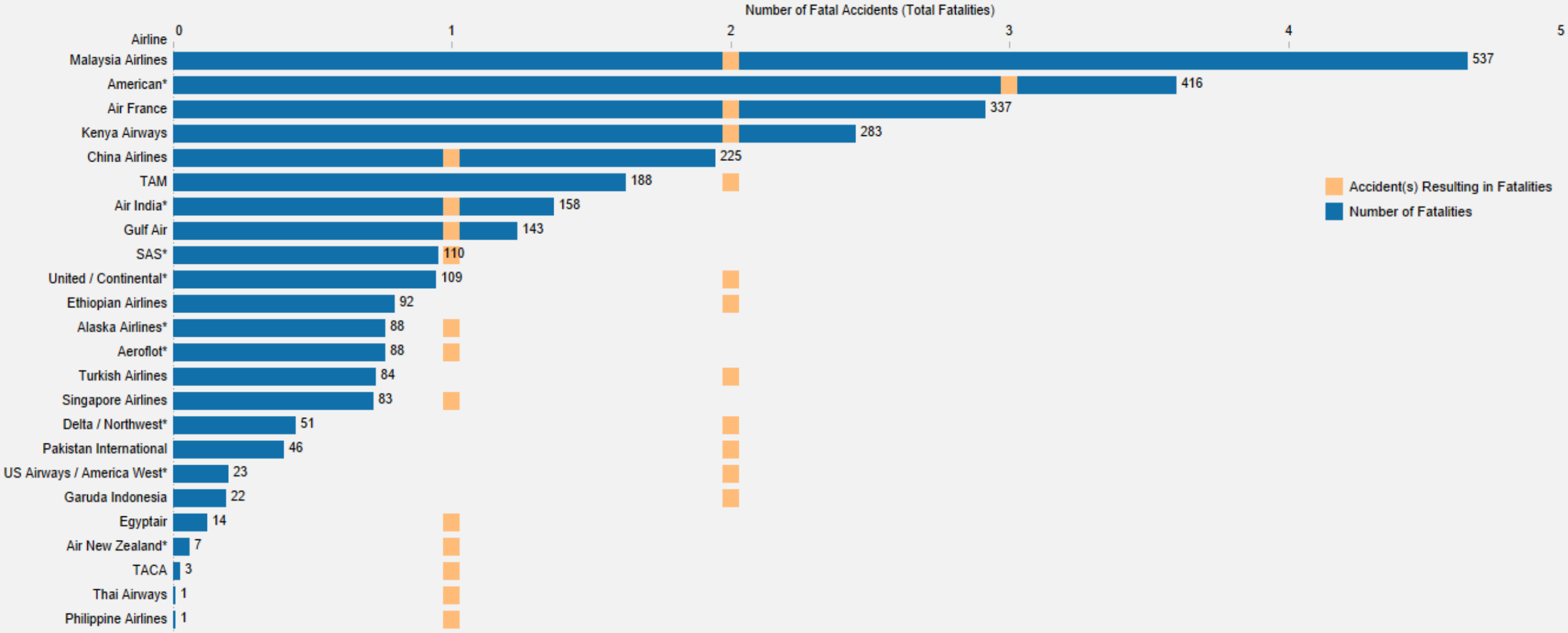


Since 2000, global air travel fatalities have experienced a downward trend.

While accidents have occurred resulting in fatalities, the overall trend is that of a steady year over year decline.

Source: Bureau of Aircraft Accident Archives

U.S. and International Carriers Fatal Accidents (2000 – 2014)

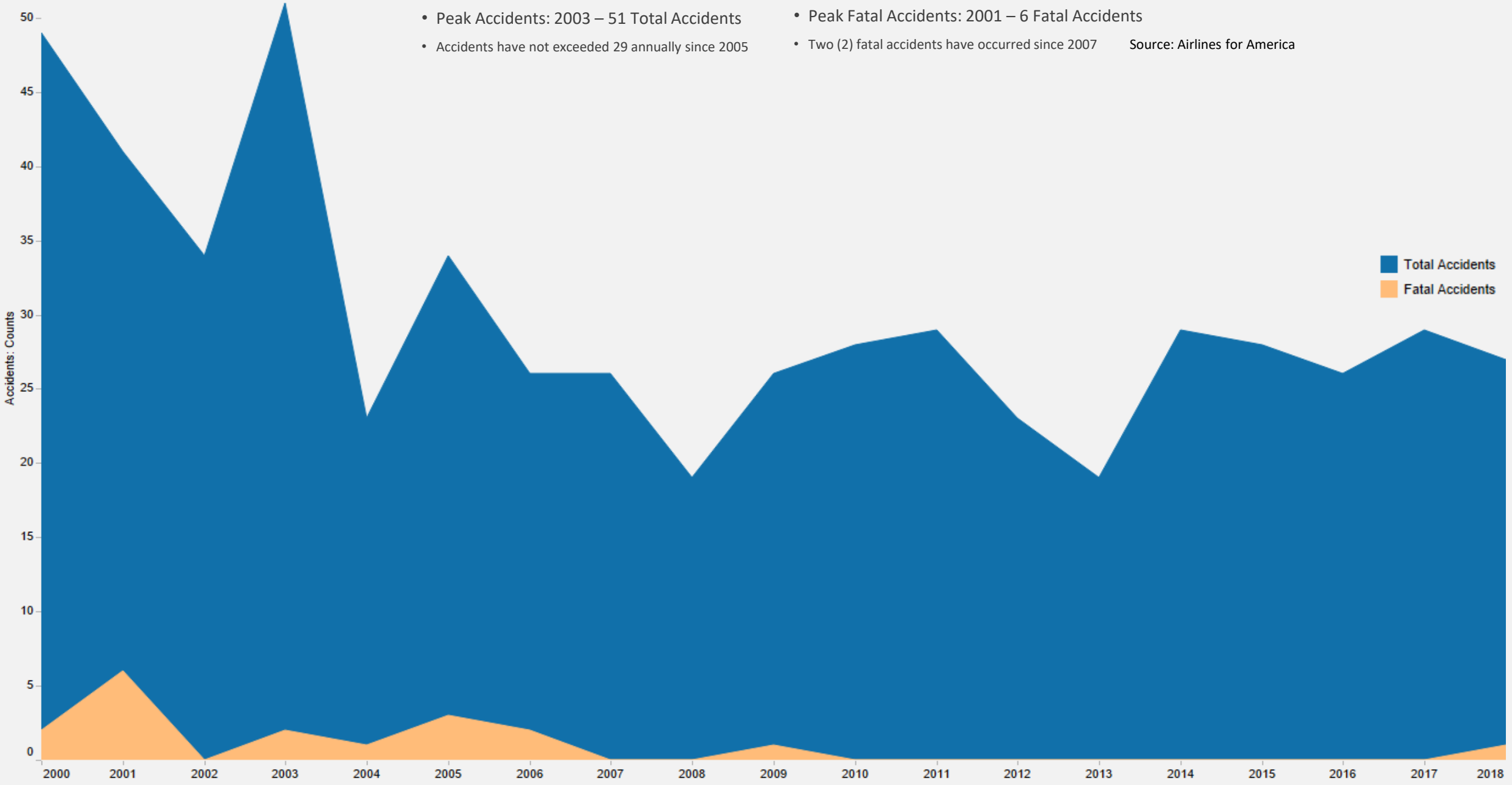


Source: Aviation Safety Network

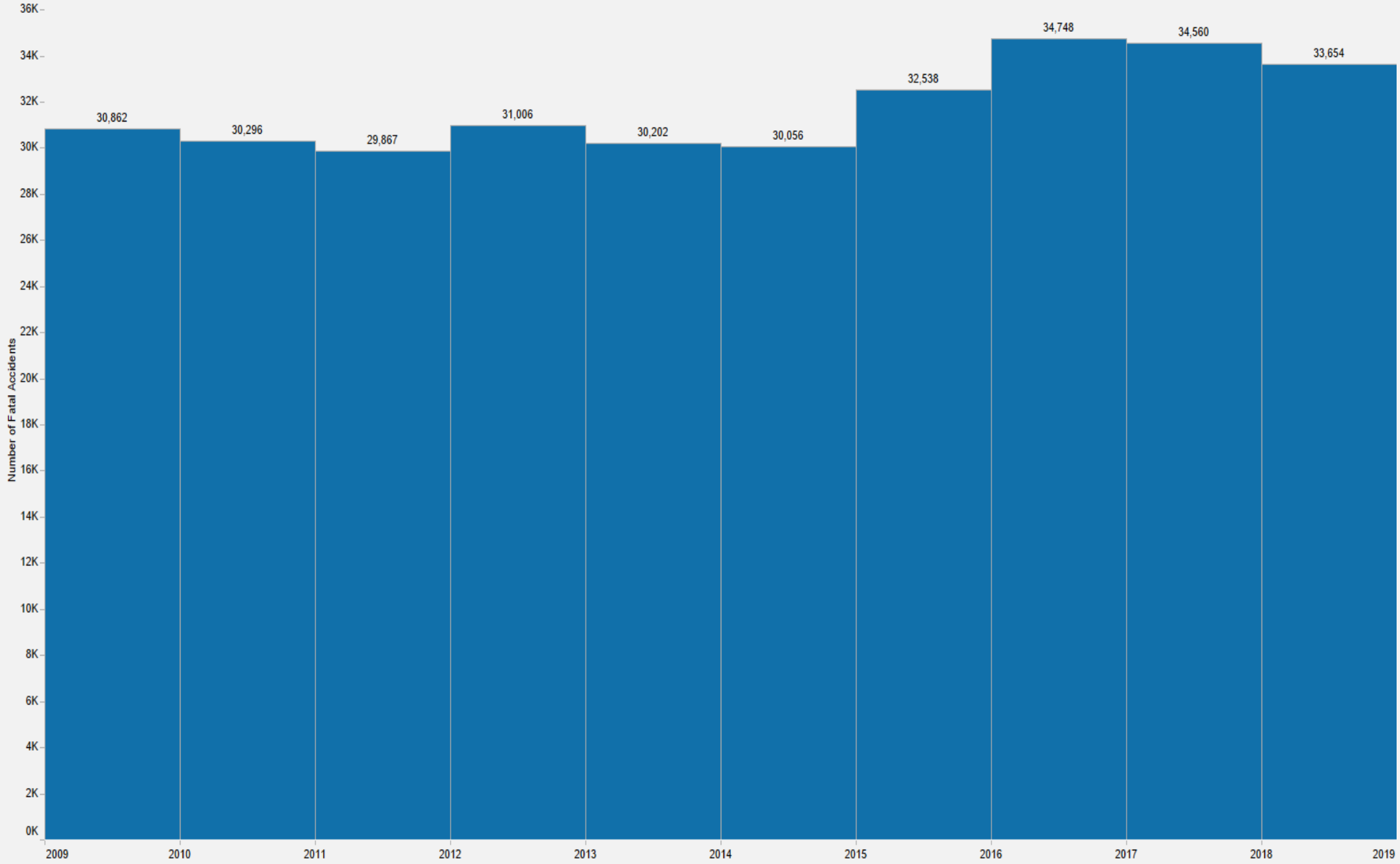
U.S. Air Carrier Total and Fatal Accidents

- Peak Accidents: 2003 – 51 Total Accidents
- Accidents have not exceeded 29 annually since 2005
- Peak Fatal Accidents: 2001 – 6 Fatal Accidents
- Two (2) fatal accidents have occurred since 2007

Source: Airlines for America



Fatal Automobile Accidents (U.S.)



The United States has averaged **31,779** fatal automobile related accidents annually since 2009.

U.S. airlines have been involved in **2** fatal accidents over the same time period.

Source: National Highway Traffic Safety Administration (NHTSA)

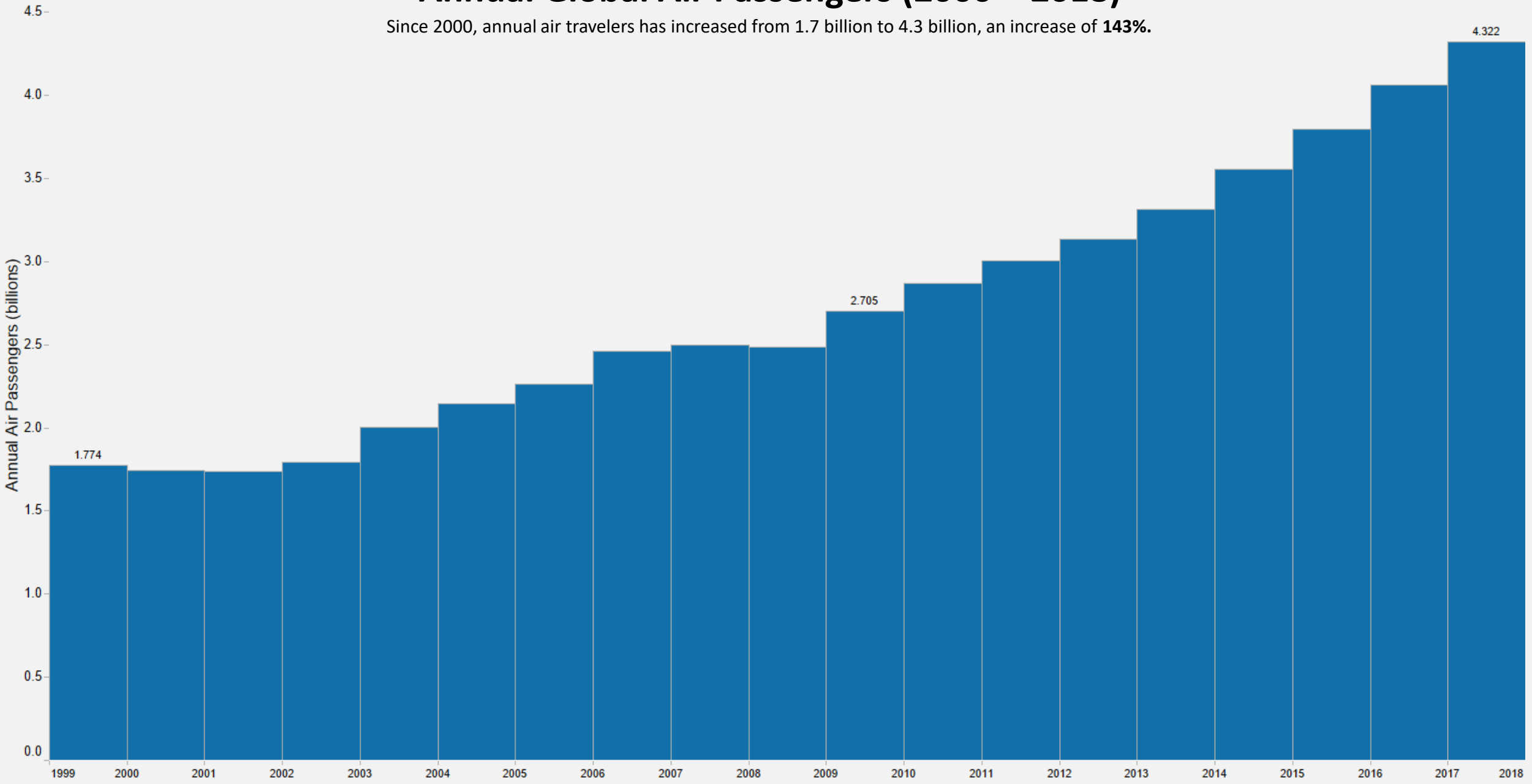
Air travel continues to be robust, with a growing number of passengers traveling for business, as well as pleasure.

Passenger and Financials Analysis

- Annual global air passengers has increased 143% since 2000 and over 59% since 2010
- Over 4.3 billion global passengers traveled by air in 2018
- U.S. Carrier revenues have exceeded $150 billion annually since 2011
- U.S. Carrier pre-tax profits have exceeded $7 billion annually since 2013, with profits of $14.87 billion in 2019

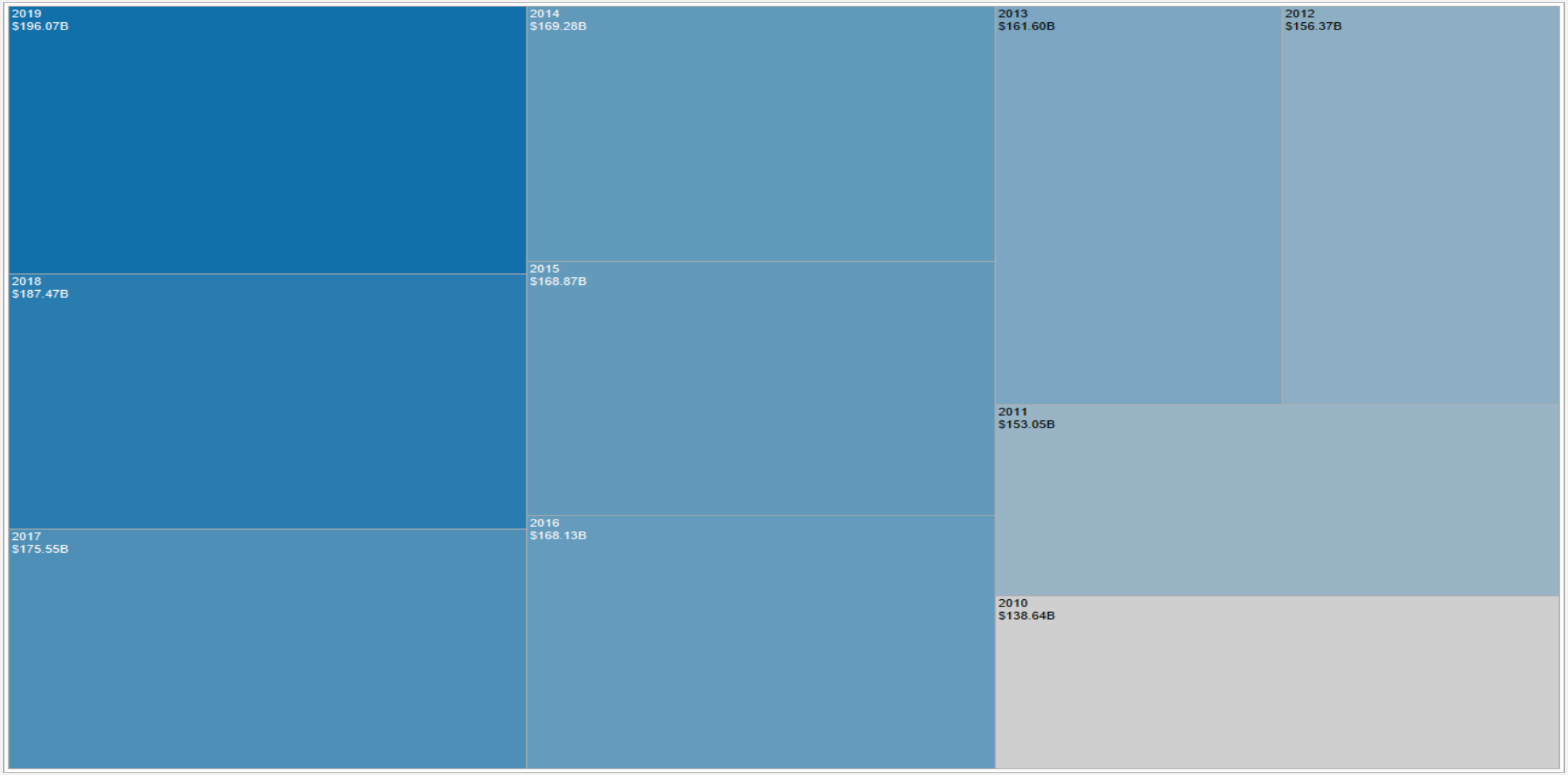
Annual Global Air Passengers (2000 – 2018)

Since 2000, annual air travelers has increased from 1.7 billion to 4.3 billion, an increase of **143%.**



Source: Airlines for America

U.S. Passenger Carriers Annual Revenue (2010 – 2019)



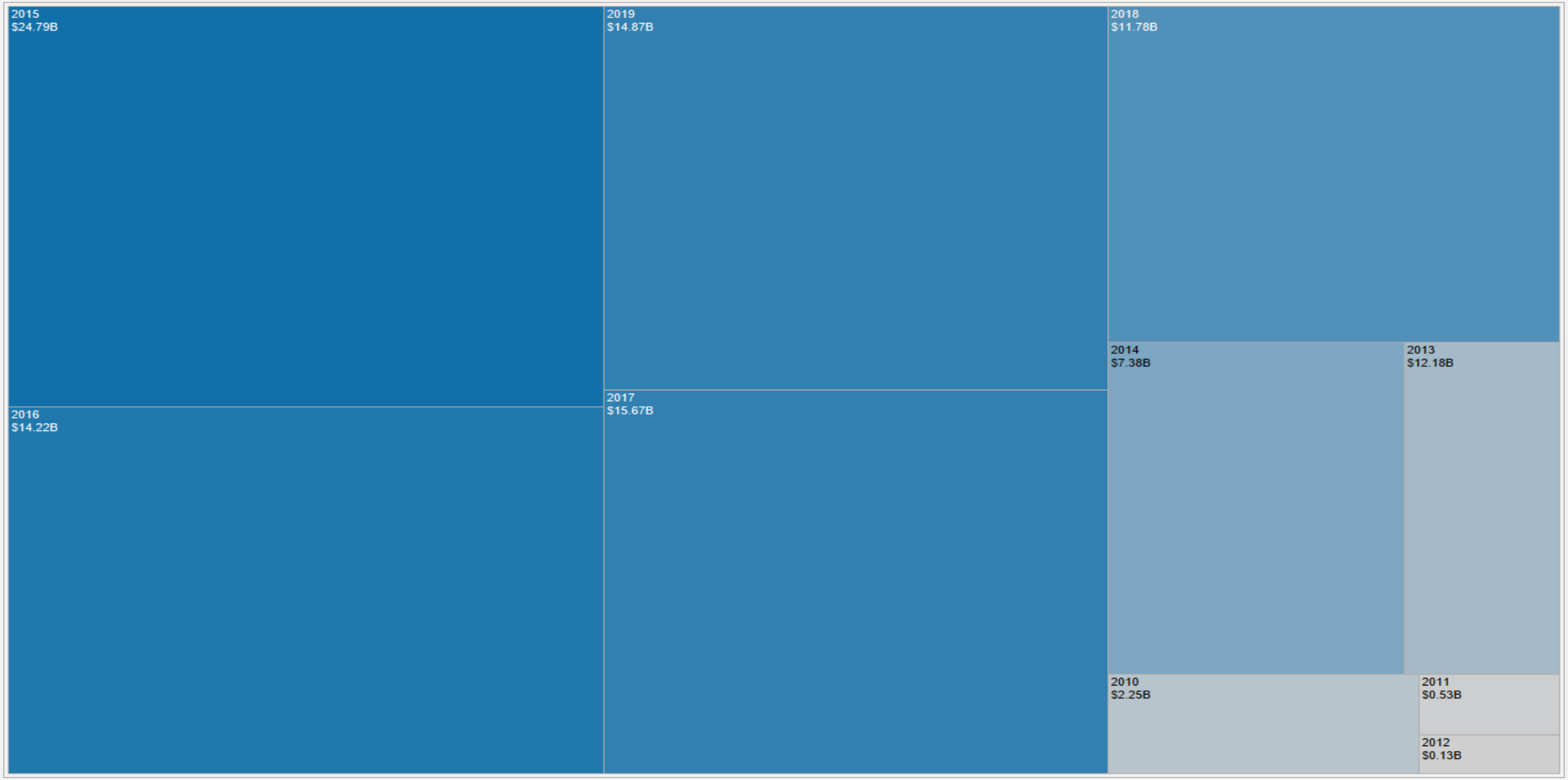
Revenue increased from 2010 – 2019

Source: Airlines for America

Average Annual Revenue 2010 – 2014: $155.79 Billion

Average Annual Revenue 2015 – 2019: $179.22 Billion

U.S. Passenger Carriers Annual Pre-Tax Profits (2010 – 2019)



Profits remain robust from 2010 – 2019.

Source: Airlines for America

Average Annual Pre-Tax Profits 2010 – 2014: $4.49 Billion

Average Annual Pre-Tax Profits 2015 – 2019: $16.26 Billion

Sources

Airline Safety, Aviation Safety Network

Death Rate Per Year, Bureau of Aircraft Accident Archives

Safety Record of U.S. Air Carriers, Airlines for America

Annual Financial Results: U.S. Passenger Airlines, Airlines for America

World Airlines Traffic and Capacity, Airlines for America

Fatality and Injury Reporting System Tool (FIRST), National Highway Traffic Safety Administration (NHTSA)

Summary

The design selected for the executive summary is consistent with the design of the initial dashboard. A simple, colorblind color palette was selected to make certain information was not lost to color confusion. The colors were selected to not outshine the data and information being shared. Any imagery selected is directly tied to the airline industry or travel, and this allows for a continuous string throughout the summary. A focus on fatal accidents was maintained throughout, as when travelers think of safety, they often think of life or death scenarios. General accidents and incidents are difficult to quantify in terms of safety, and when comparing to automobile travel, fatalities, unfortunately, are to scale across all factors.

Each chart was kept to a minimum, or simplified from the dashboard visual, to avoid confusion in the data being shared. Chart embellishments were minimized and the brief additional text on selected charts is there to reinforce the findings. Additionally, traditional charts (bar, area, tree map) were used, as varied audiences can quickly understand and feel comfortable with the information being shared. The following is a breakdown of each chart displayed in the summary:

Chart 1 – Air Travel Fatalities – U.S. & International Carriers (2000 - 2019) – This chart highlights the downward trend in air travel fatalities over the past 19 years. Even with a few accidents causing upticks, the overall trend is downward and partially why it is the first chart displayed.

Chart 2 – U.S. and International Carriers Fatal Accidents (2000 – 2014) – This chart does an excellent job of showing that over the 15-year period, even the largest incidents resulted in a low number of fatalities, as well as showing that many of the incidents occurred with International Carriers. I hesitated in highlighting American and United's incidents related to the September 11th terrorist attacks.

Chart 3 – U.S. Air Carrier Total and Fatal Accidents (2000 – 2018) – This chart highlights how safe air travel is with U.S. Carriers. The data from 2000 – 2018 illustrates this by showing accident occurrences and those resulting in fatalities. Particularly, these accidents, since 2009, have nearly resulted in zero fatalities.

Chart 4 - Fatal Automobile Accidents (U.S.) – By listing the number of annual fatal accidents that occur in the U.S. annually via automobile, in contrasts greatly with the information highlighted in the previous chart. I did not combine the two, as the discrepancy is too great, even when utilizing a dual axis chart. This could lead to potential confusion or misinterpretation.

Chart 5 – Annual Global Air Passengers (2000 – 2018) – This shows a consistent increase in the number of global air travelers, showing public trust towards air travel safety.

Charts 6 and 7 - U.S. Passenger Carriers Annual Revenue and Profits (2010 - 2019) – This illustrates the robustness of the industry, how vital it is to the economy, and informs investors of the potential future returns. Tree maps were utilized here to break from continued use of bar charts and allow for easy interpretation of the financial data.

Overall, the findings solidify the fact that air travel is extremely safe and has been consistently safe. These findings and visuals can be utilized in amplifying the voice for safety in the industry, when communicating with media and other mediums. Presenting this information can be done in a variety of manners, as the visuals are approachable and require little additional explanation.

Data Sources

Airline Safety, Aviation Safety Network
Safety Record of U.S. Air Carriers, Airlines for America
World Airlines Traffic and Capacity, Airlines for America
Death Rate Per Year, Bureau of Aircraft Accident Archives
Annual Financial Results: U.S. Passenger Airlines, Airlines for America
Fatality and Injury Reporting System Tool (FIRST), National Highway Traffic Safety Administration (NHTSA)