FINAL PROJECT PRESENTATION

# FLIGHT DELAYS IN RELATION TO AIRPORTS

PAUL DE FUSCO
DSE241C3

# MOTIVATION

- Frequent Airline Delays: 18% ca. in 2015
- Many factors and multiple delay types
- Controversies:
  - Airlines can define longer than needed flight duration
  - Whose fault is it if your plane is late?
  - What can be done to improve flight punctuality?

# DATASET

## FILES AND DATA WRANGLING

- Three files: Airlines, Airports, Flights
- Key Facts:
  - Flights is a network
  - Main attributes: origin airport, destination airport, flight number, location fields, five delay fields, departure and arrival delay,  departure time, arrival time, scheduled time, taxi in/out
  - New fields: airline name, total delay, early flag, total taxi, hub carriers, focus carriers, hub counts, focus counts

# TASKS

- Analyze network topology: route map, destinations map, airport accessibility, destination variety
- Analyze delays and causes: delay correlations, delays map, delays by airline, delays by airport, most delayed airports, delays for hub cities by airline, taxiing vs delays at hub vs non hub

# SOLUTION

- Tableau story made by 23 idioms including interactive maps, scatter plots, charts, heat table, regression, histogram distribution, plots

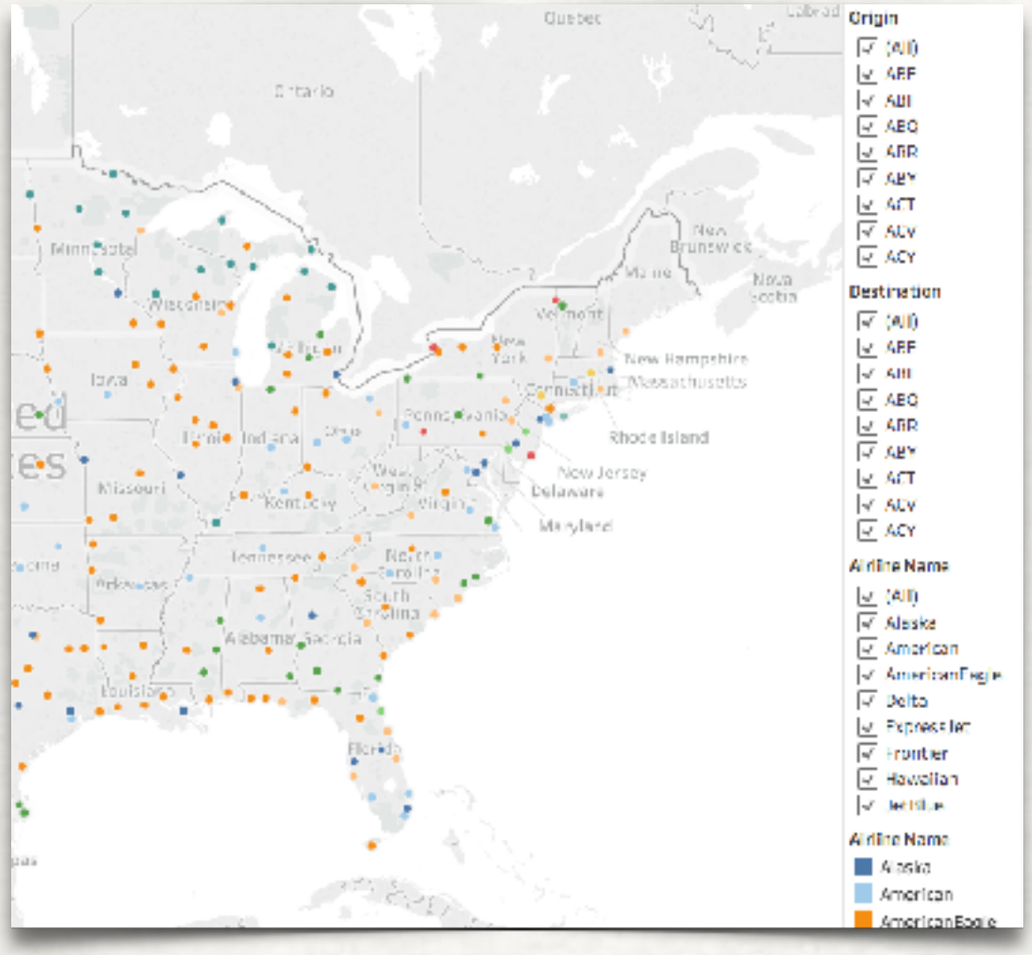
- Three story phases:

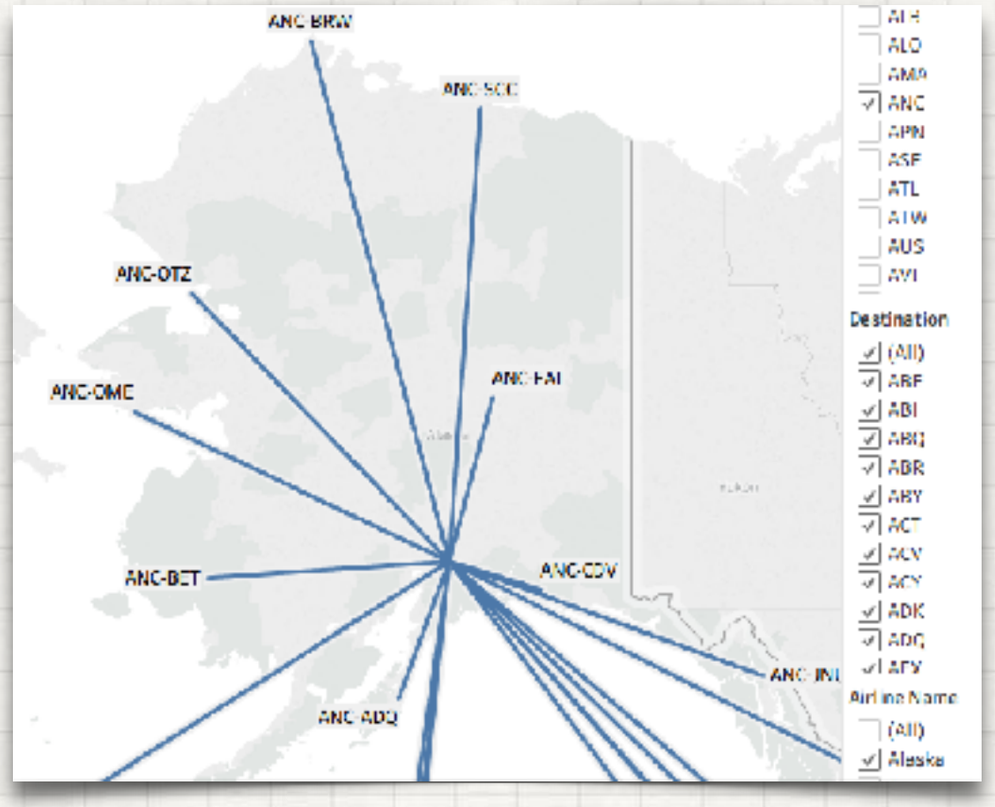
A. Interactive Network Topology Exploration

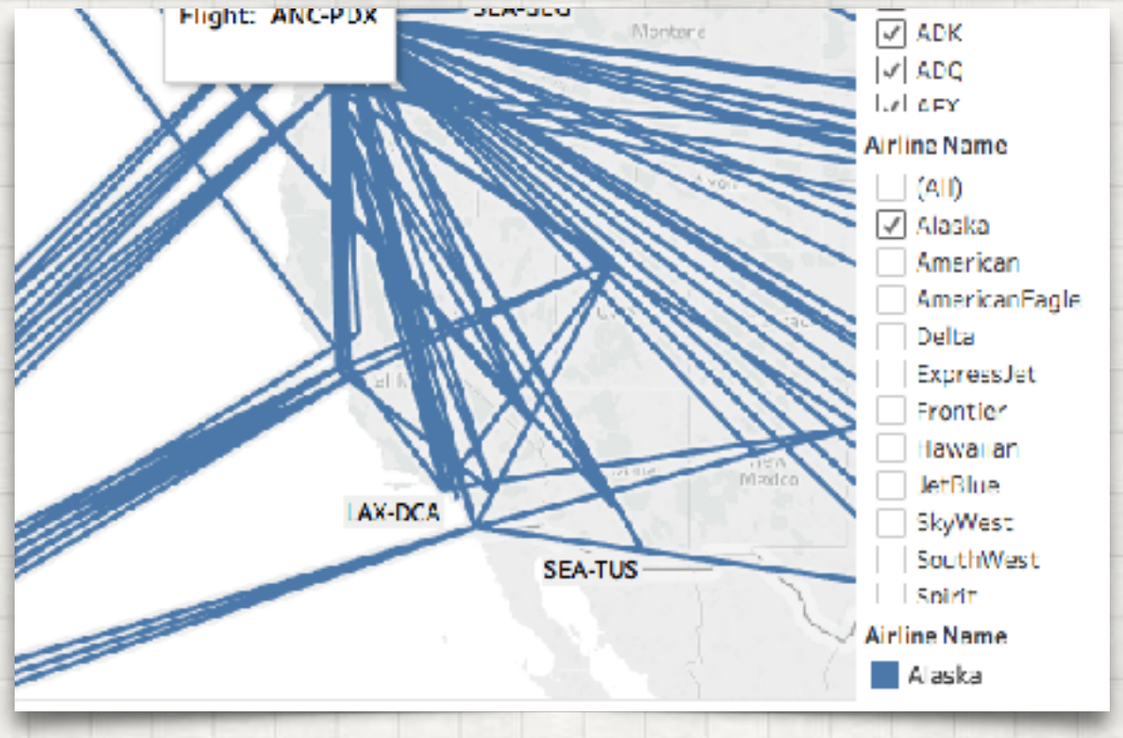
B. Delay Analysis

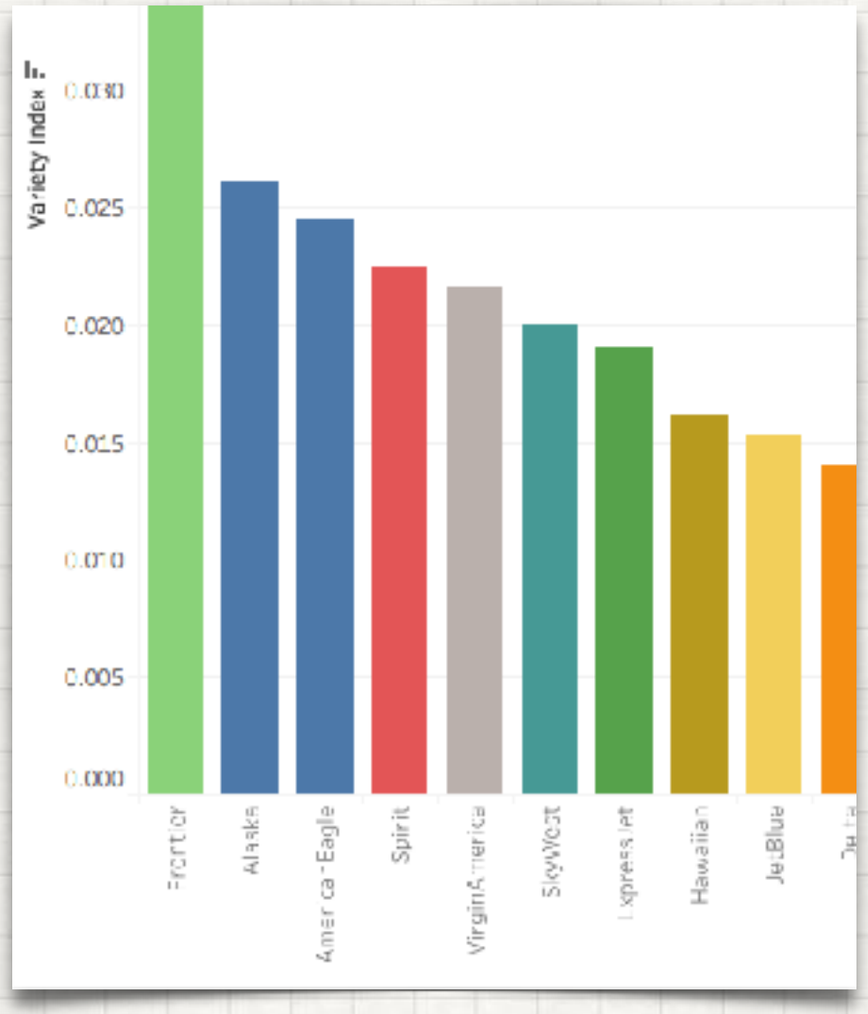
C. Visualization of Results

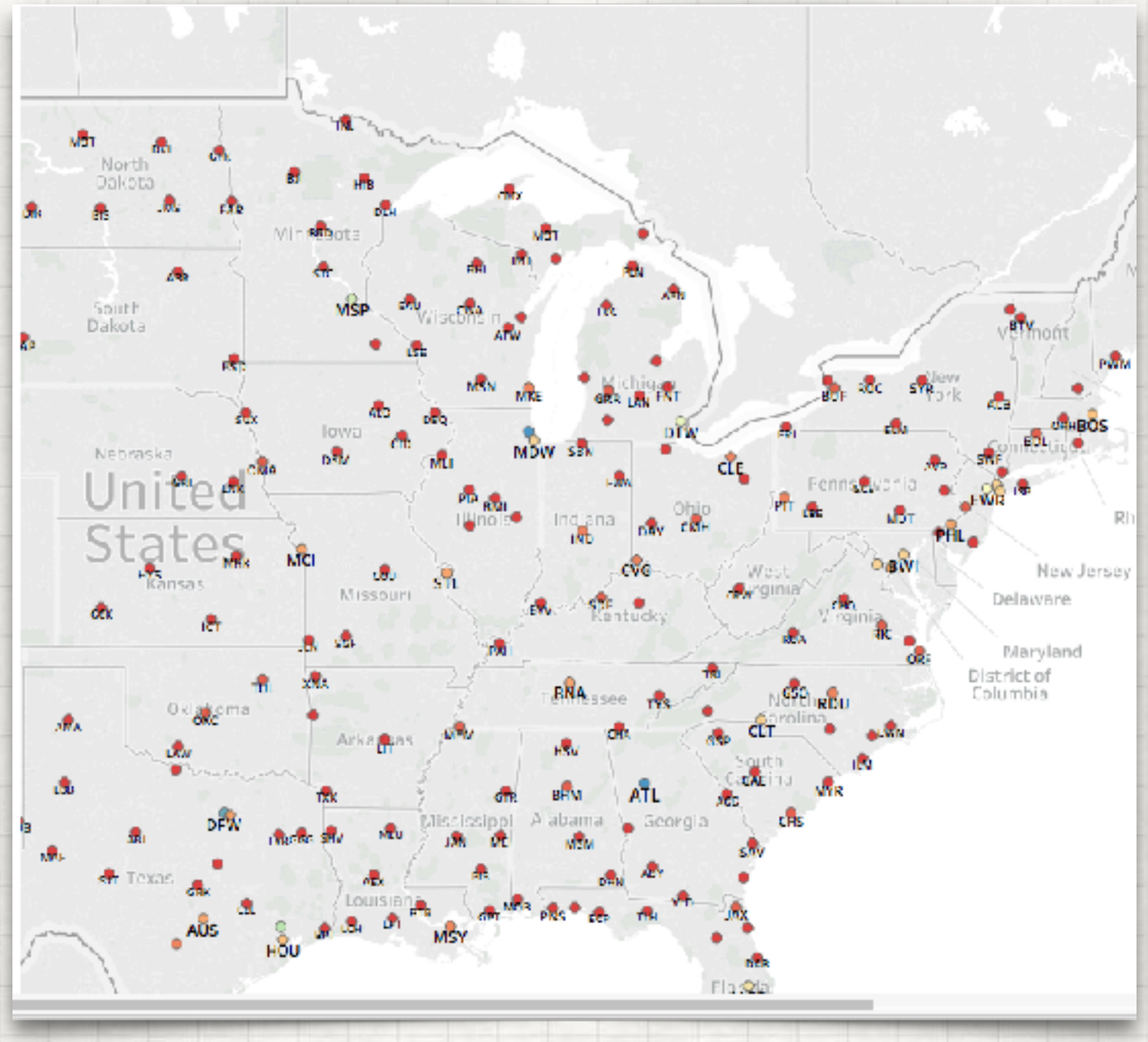
# INTERACTIVE MAPS



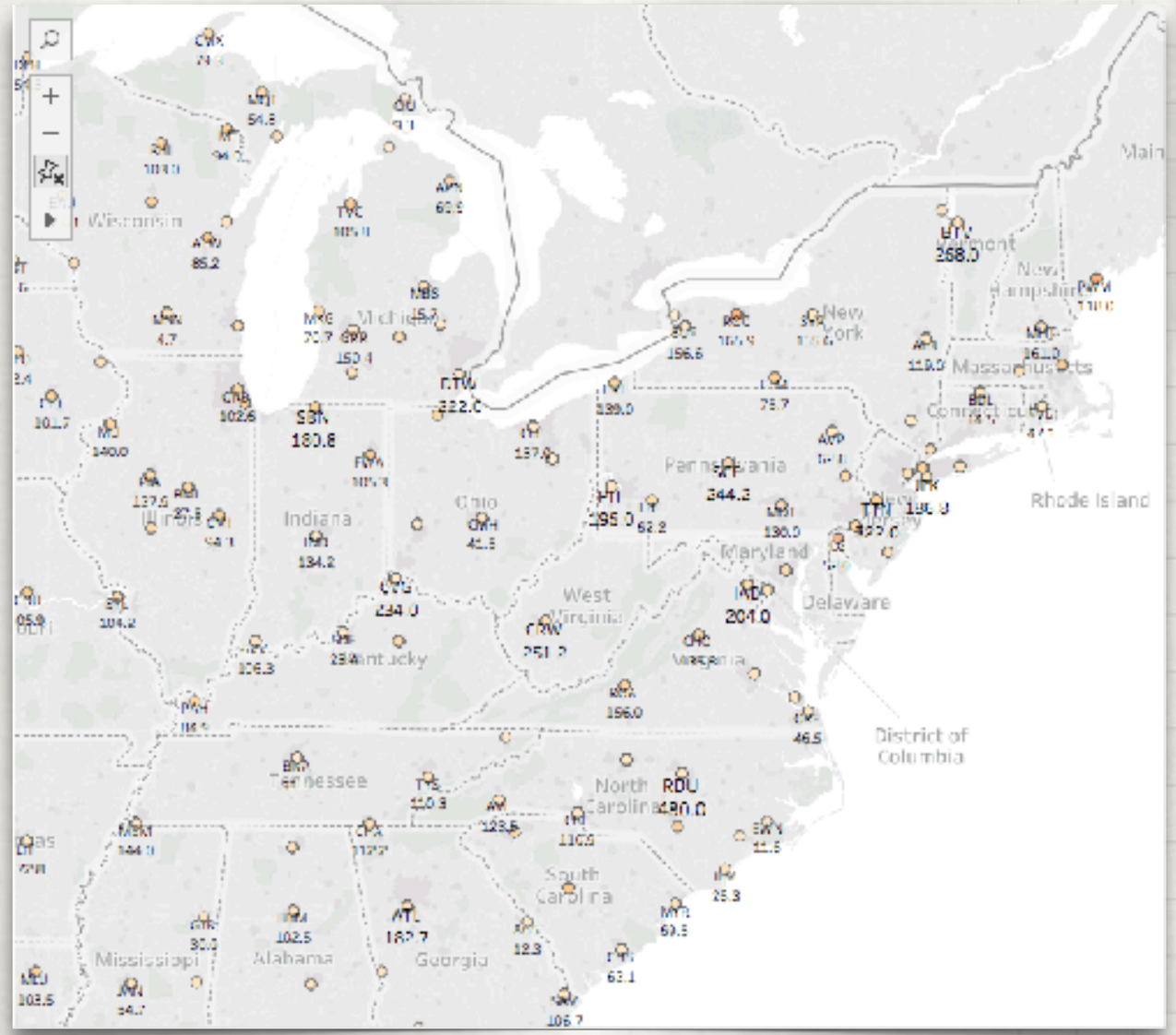



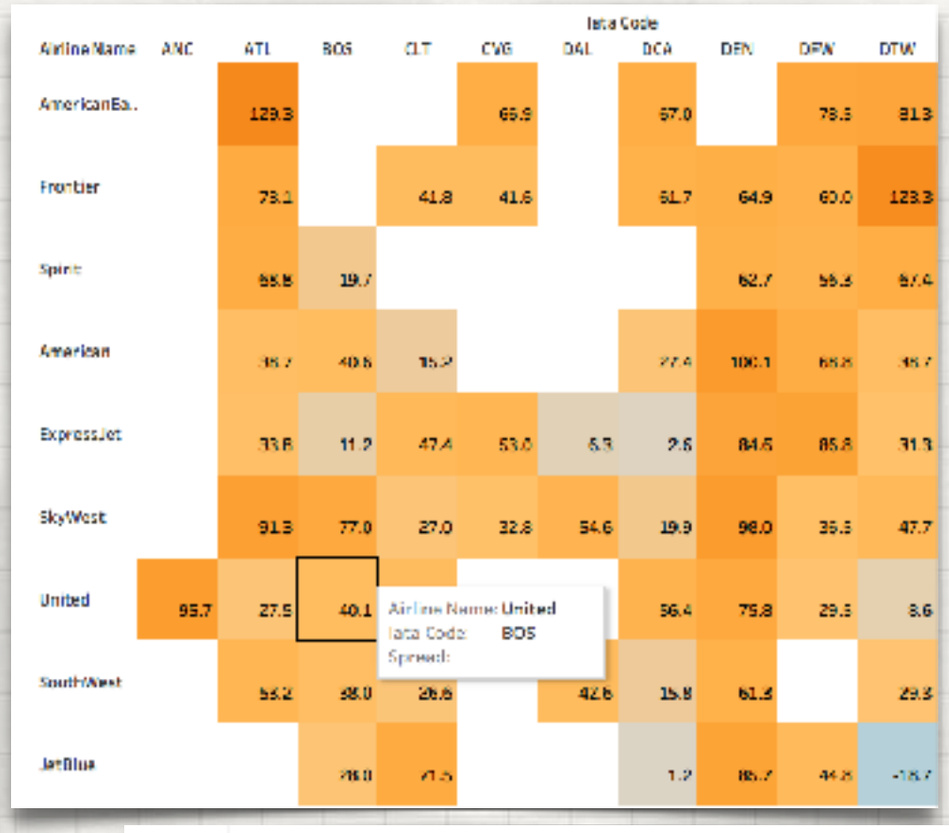



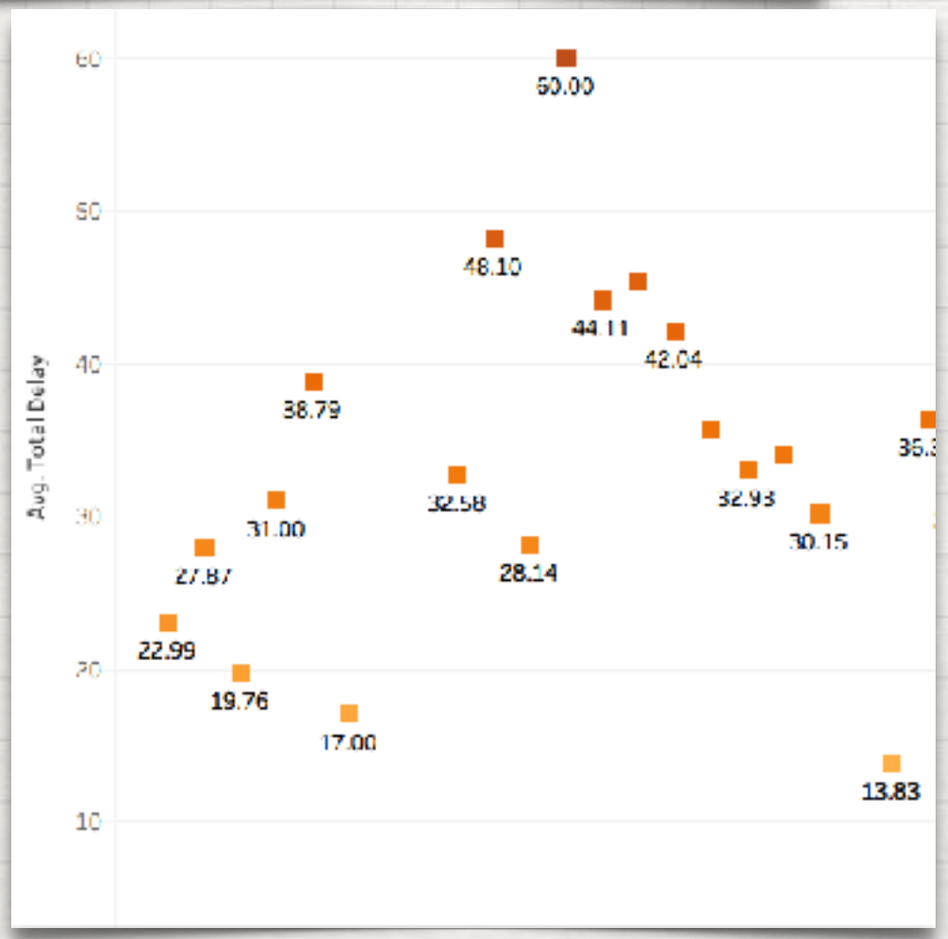

Variety Index
0.030
0.025
0.020
0.015
0.010
0.005
0.000
Frontier
Alaska
American Eagle
Spirit
VirginAmerica
SkyWest
Expressjet
Hawaiian
JetBlue


North Dakota
Minnesota
South Dakota
Wisconsin
Michigan
Vermont
New York
Nebraska
Iowa
Illinois
Indiana
Ohio
Pennsylvania
West Virginia
Kentucky
Kansas
Missouri
Oklahoma
Arkansas
Tennessee
North Carolina
South Carolina
Mississippi
Alabama
Georgia
Louisiana
Texas
Florida
New Jersey
Delaware
Maryland
District of Columbia
MSP
MDW
DTW
CLE
BOS
PHL
MCI
CVG
BNA
CLT
ATL
DFW
HOU
AUS
MSY

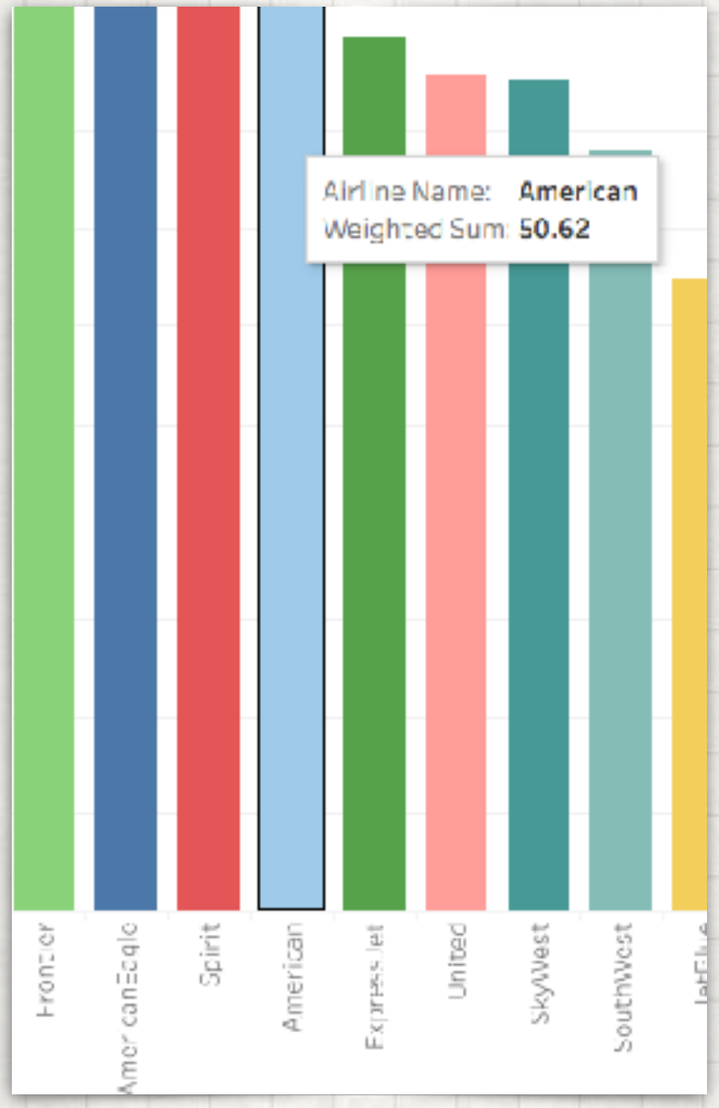
# DELAY ANALYSIS

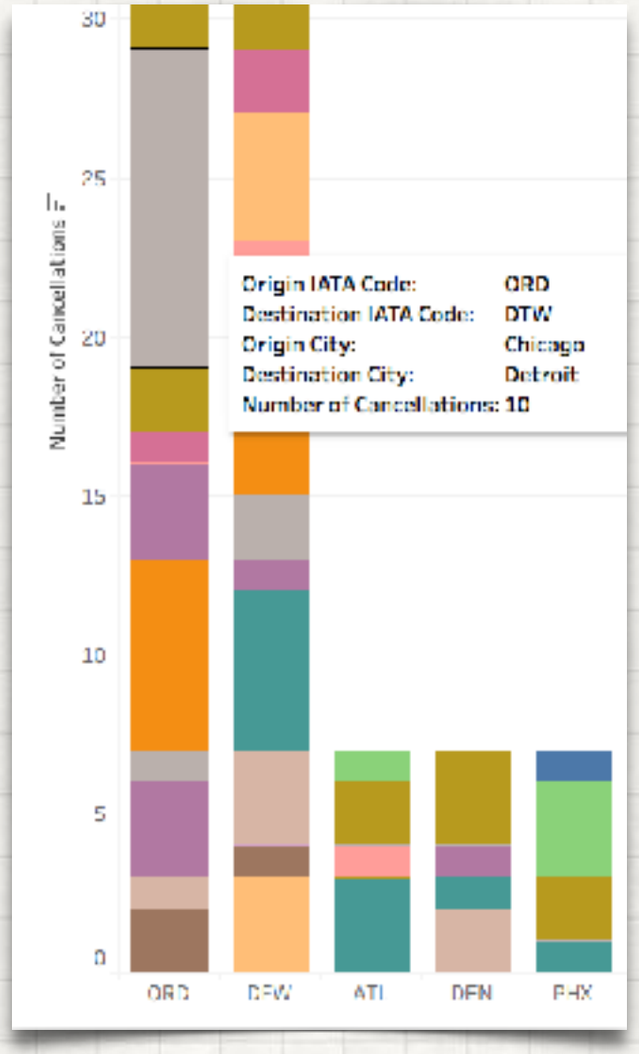


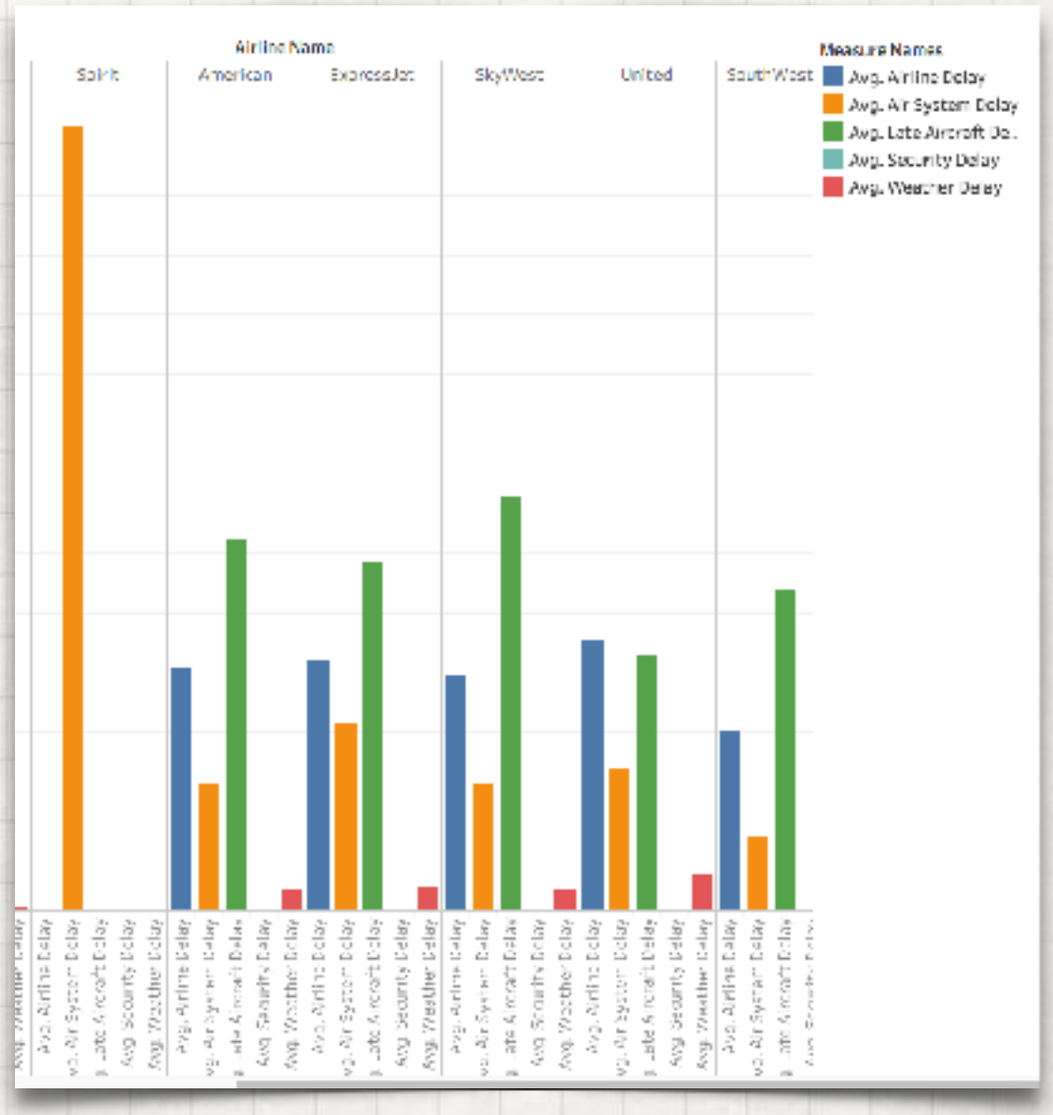
## Frontier Has Highest Delays

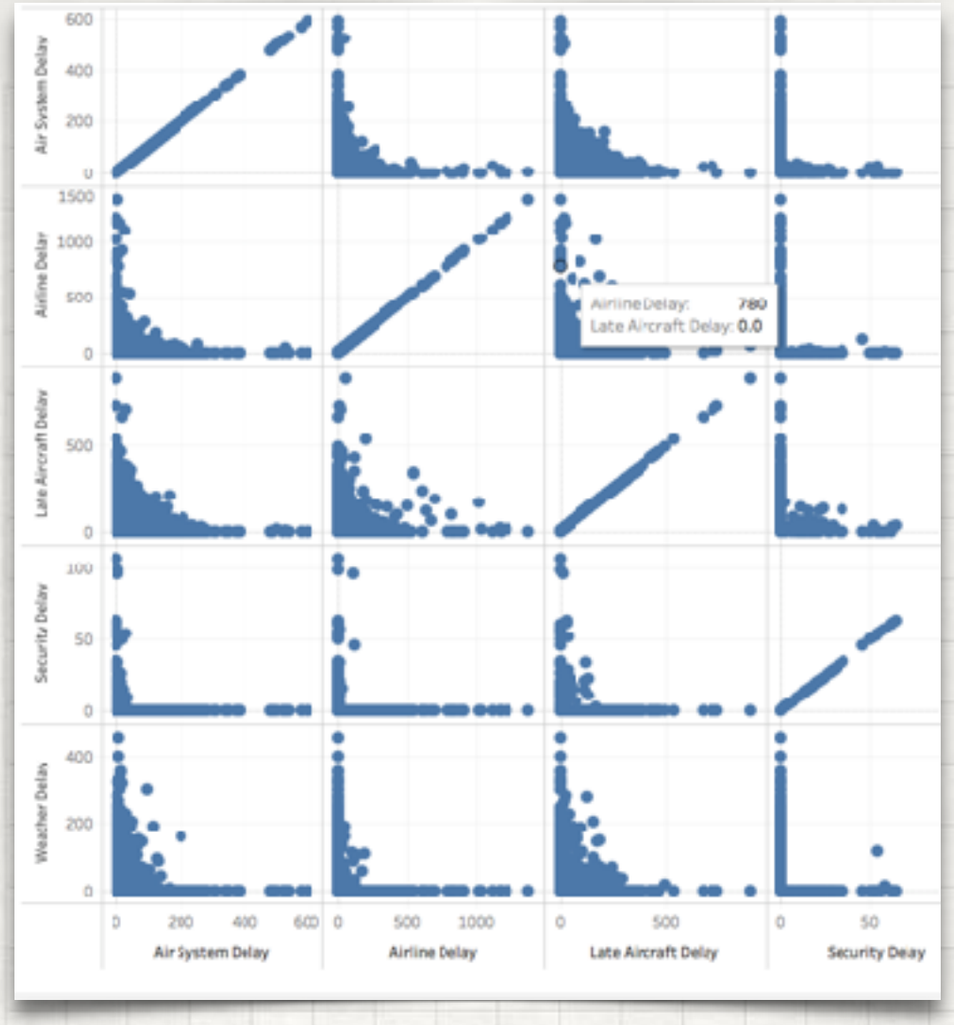


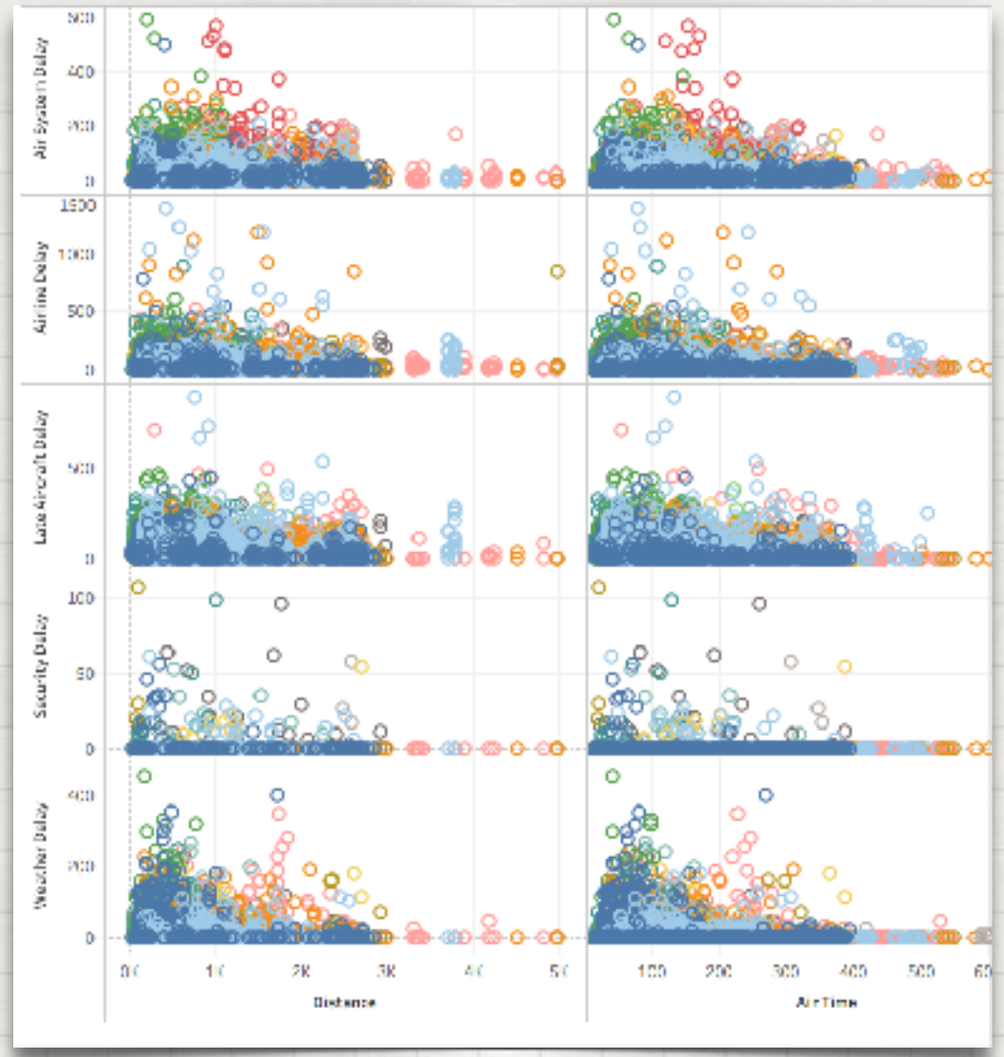



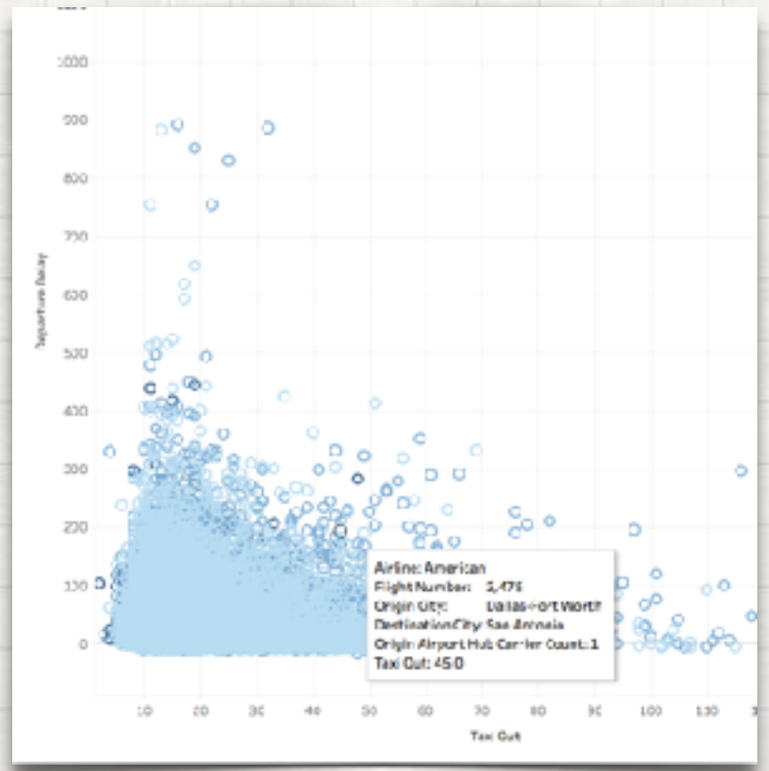

## Top Cancellation Counts Take Place at Hubs

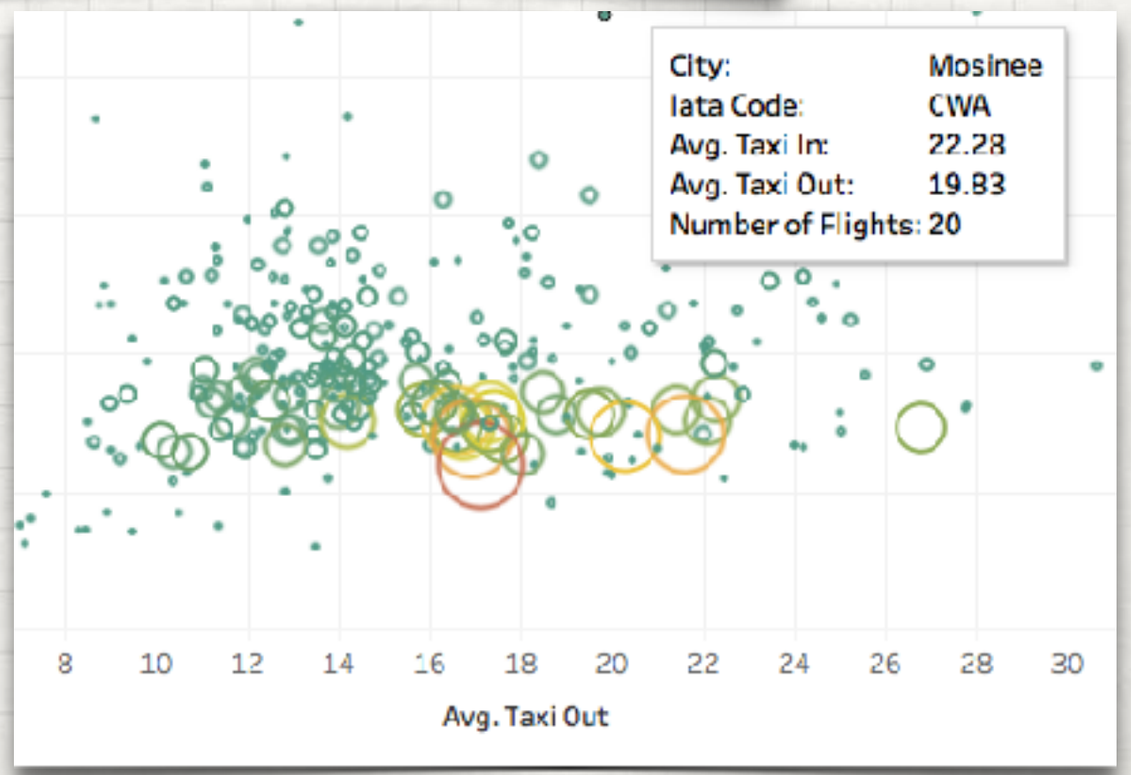
## Late Aircraft is Frequently Top Reason for Delay




Air System Delay
Airline Delay
Late Aircraft Delay
Security Delay
Weather Delay
Airline Delay: 780
Late Aircraft Delay: 0.0
Air System Delay
Airline Delay
Late Aircraft Delay
Security Delay


Air System Delay
Airline Delay
Late Aircraft Delay
Security Delay
Weather Delay
Distance
Air Time

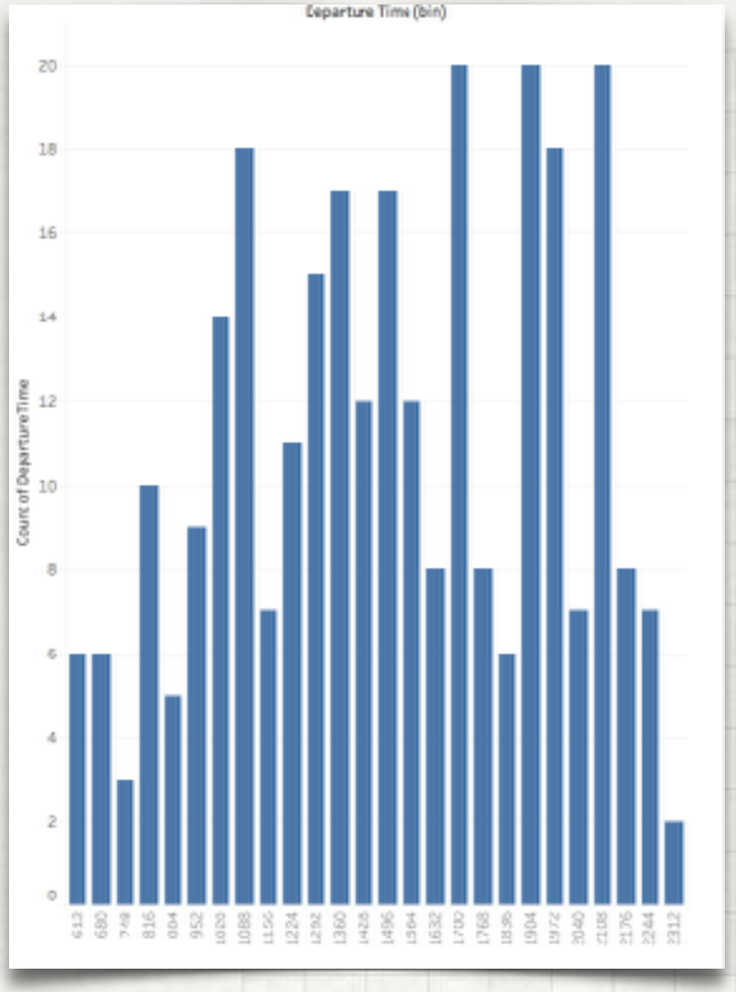

Airline: American
Origin City: Dallas-Fort Worth
Origin Airport Hub Carrier Count: 1
Taxi Out: 45.0
Taxi Out

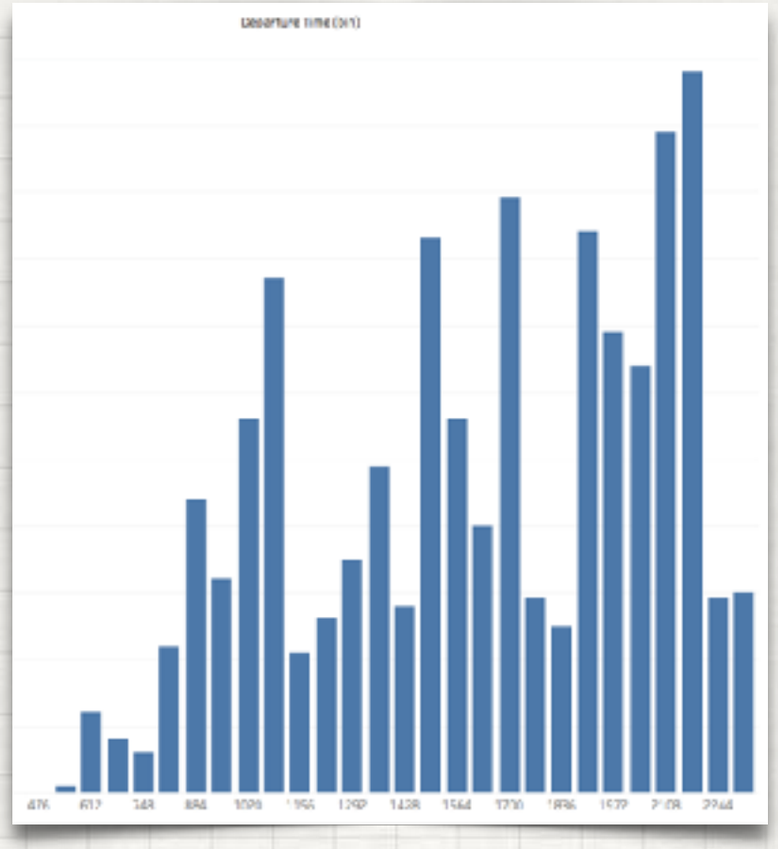

City: Mosinee
Iata Code: CWA
Avg. Taxi In: 22.28
Avg. Taxi Out: 19.83
Number of Flights: 20
Avg. Taxi Out

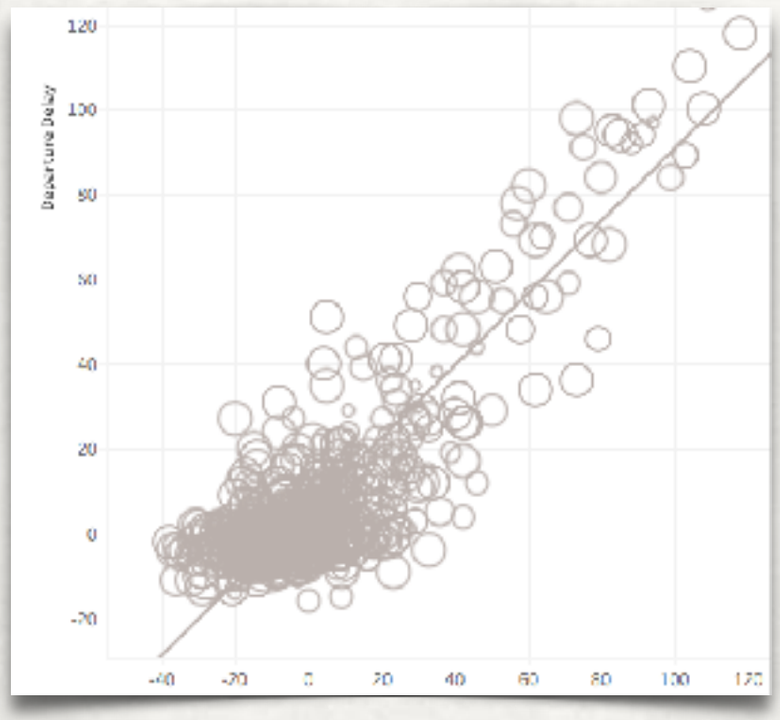
# CONCLUSIONS

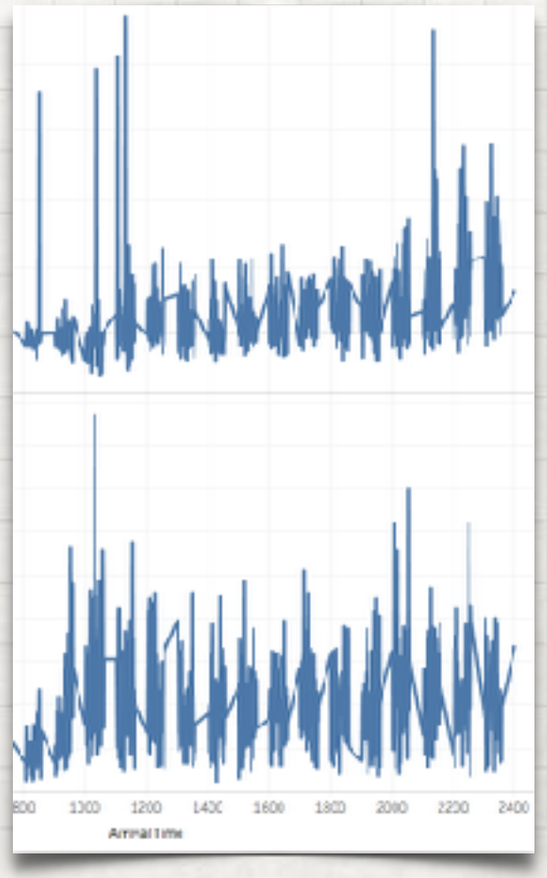
Hub Airport Traffic Radically Different

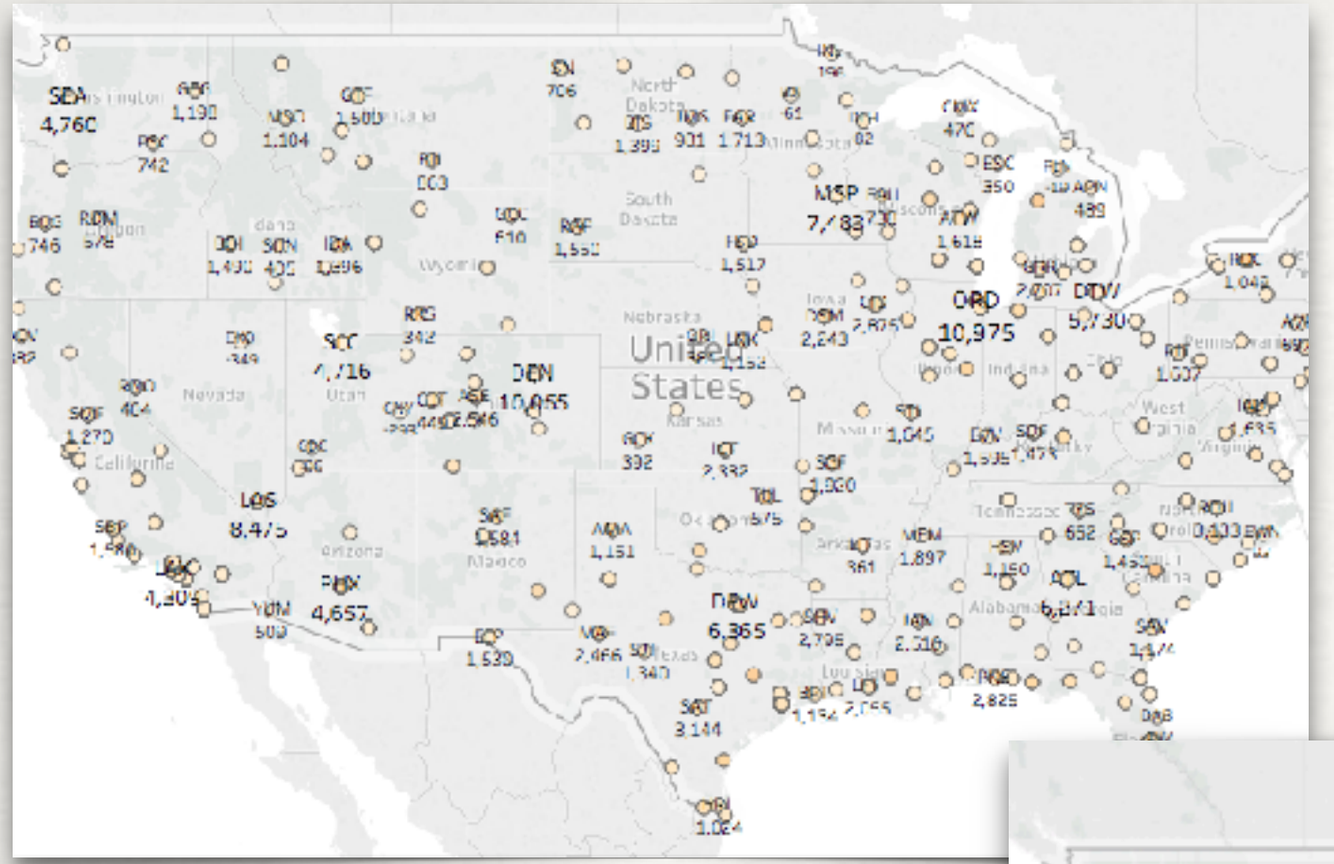
Late Flights Can Catch Up



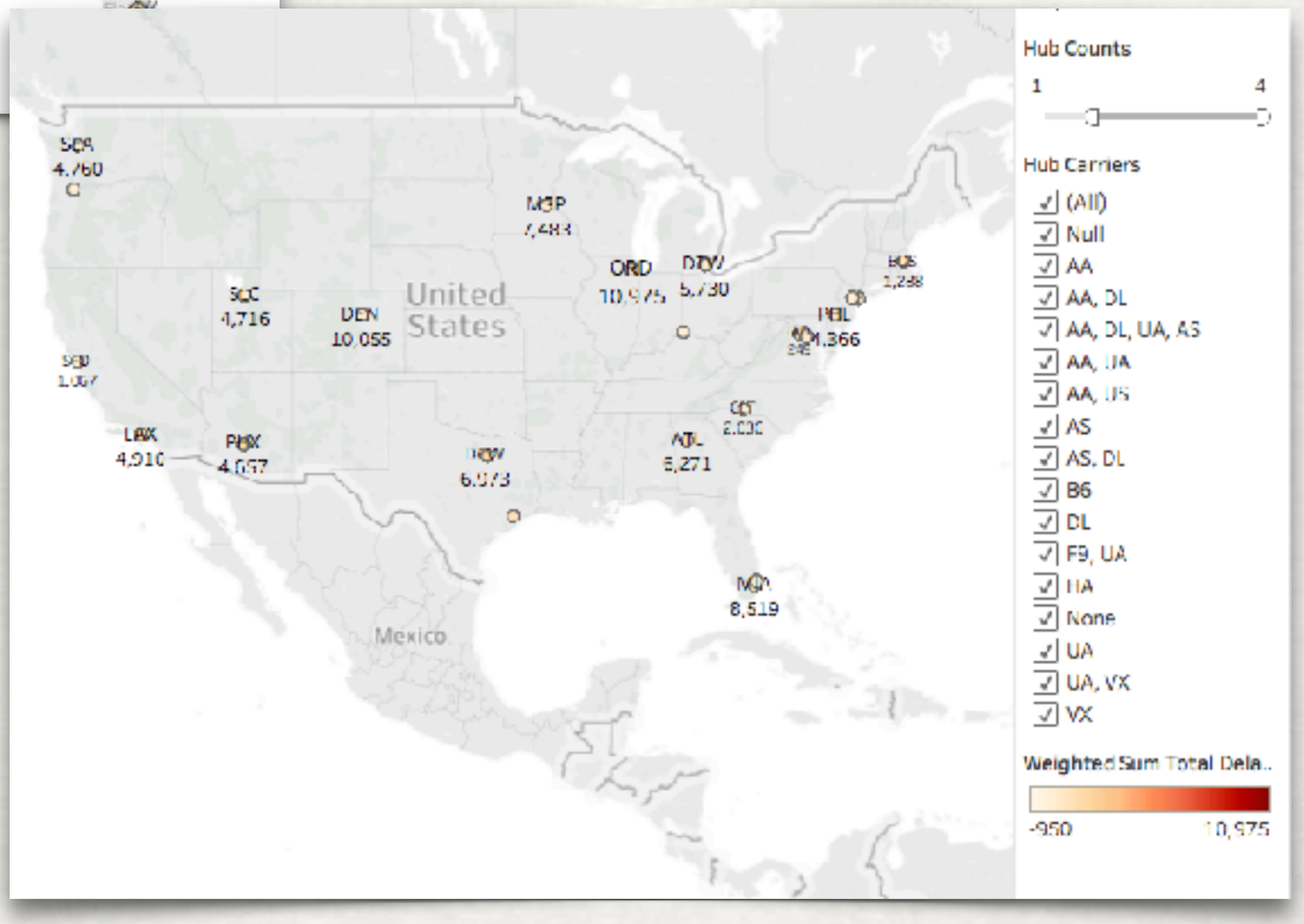








Hub Airports Account for the Majority of Flight Delays in the US




The Cause is Congestion as Shown by Amount of Time Spent Taxiing

# QUESTIONS