

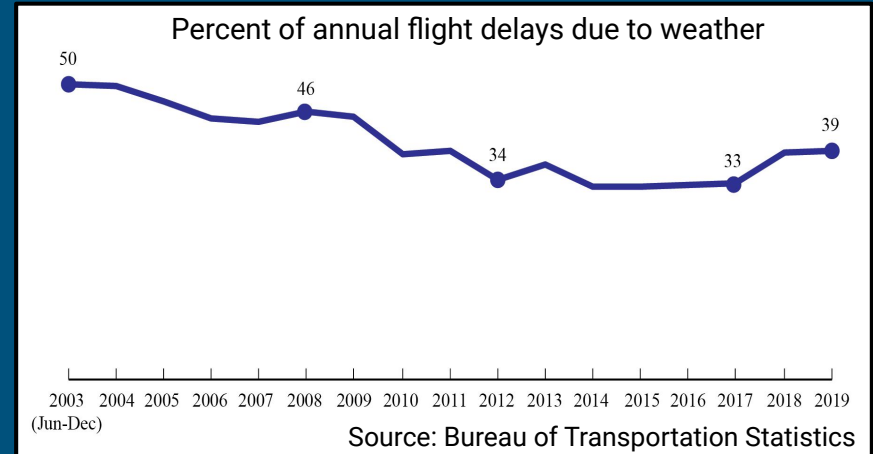
# Crunched Connection

Will weather leave you stranded at the airport?

Maria Zatko  
Insight Data Science Fellow

# Feeling anxious about a tight flight connection?

Over 800 million passengers annually, and over 20% of flights are delayed or cancelled. Some, but not all, delays are impossible to anticipate.



# Use **Crunched Connection** several days before trip to determine how likely weather is to impact your travel

App relies on flight data, weather forecasts, and machine learning



### Flight Itinerary Details

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#### Select Main Carrier

Carrier

Alaska Airlines ▼

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#### Select Departure Information

Departure Airport

SEA ▼

Connecting Airport


TUS ▼

Date

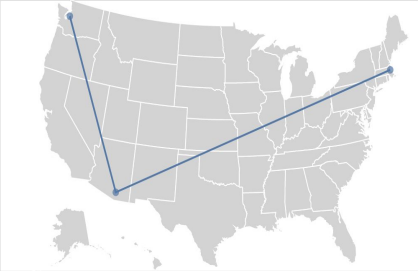
2019/12/31

Scheduled Departure Time

## Crunched Connection



Use this tool several days before your flights to determine if severe weather will impact your connection.



You have 0 hours and 49 minutes to make your connection in TUS.

User input now being ingested into machine learning algorithm...

Your departure flight is 70% likely to be at least 15 minutes late, leaving you with no less than 34 minutes to spare. You are at risk of missing your flight connection!

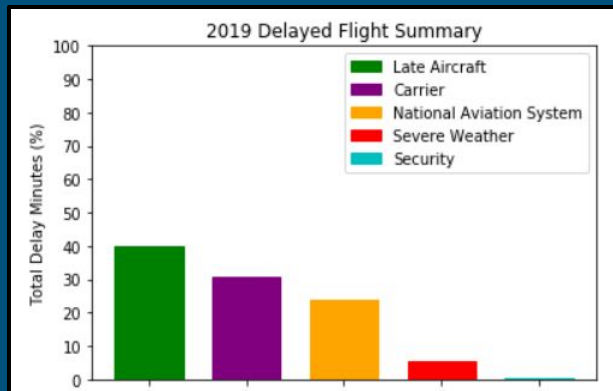
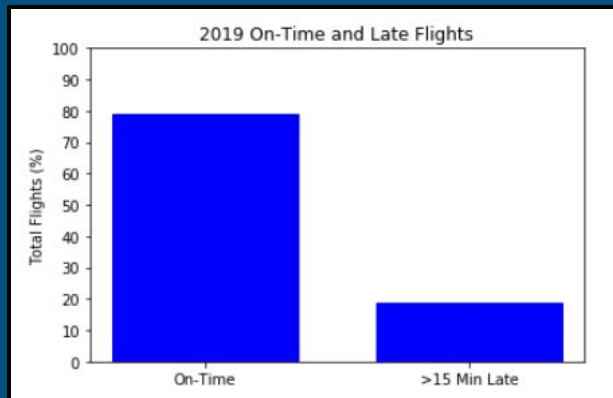
Link to web app: <http://54.191.68.138:8501>

# U.S. Bureau of Transportation Statistics Airline Data

2019 Flight Routes

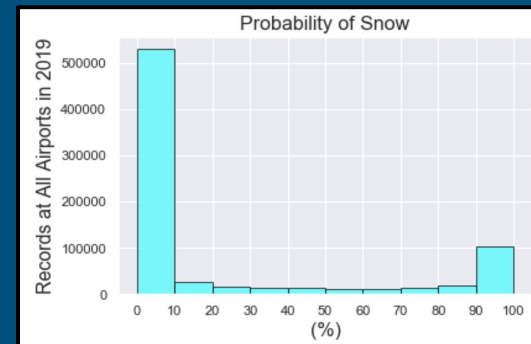
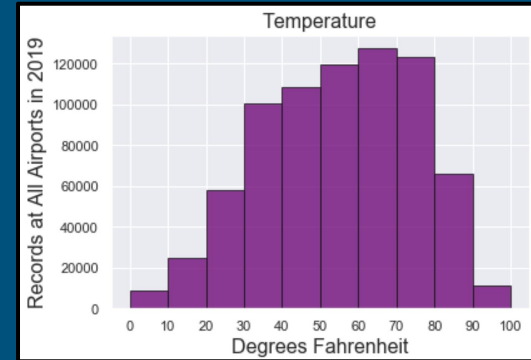
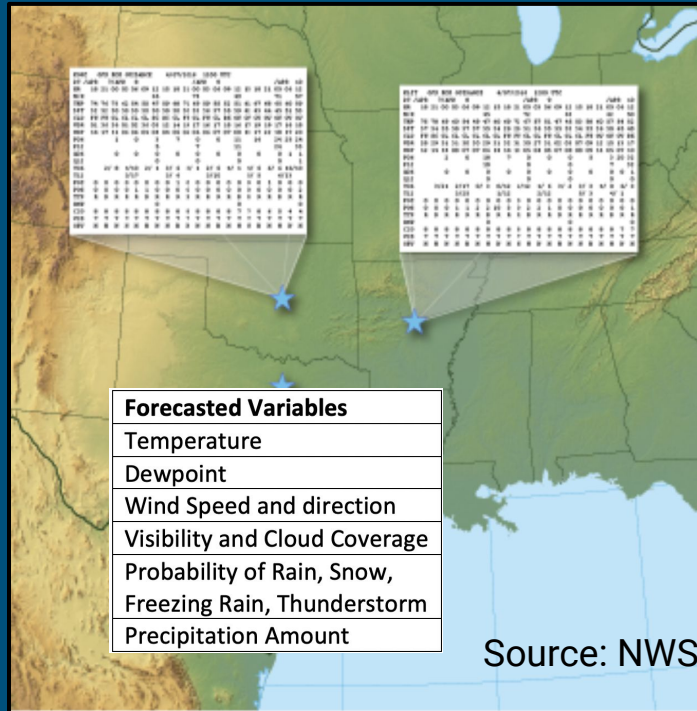


6,000 city pairs, 12,000 daily and 7M annual flights



Severe weather impacts  
100,000 flights annually

# National Weather Service Archived Forecast Data



Weather forecasts at departure and arrival airports paired with 2017-2019 flight data

# Machine Learning Algorithm and Metrics

20 flight and weather features



Probability of precipitation  
and thunderstorms important

imblearn resampling



random forest

Binary classification  
(on-time, over 15 minutes late)

Metrics	Result	Range
Macro-averaged precision	0.86	0 to 1
Macro-averaged F1	0.77	0 to 1





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Senior Air Quality Consultant

