

# Air Travel Delay Study

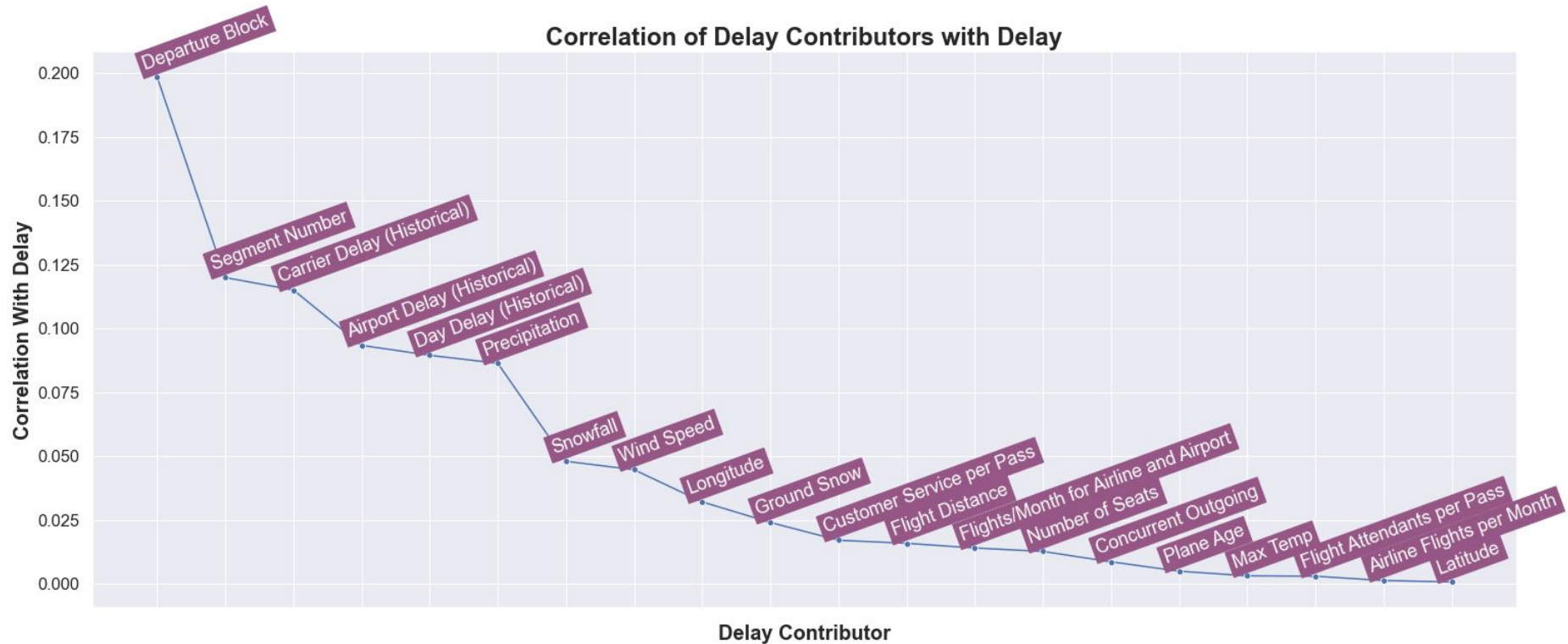
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Prepared For the Bureau of Transportation Statistics



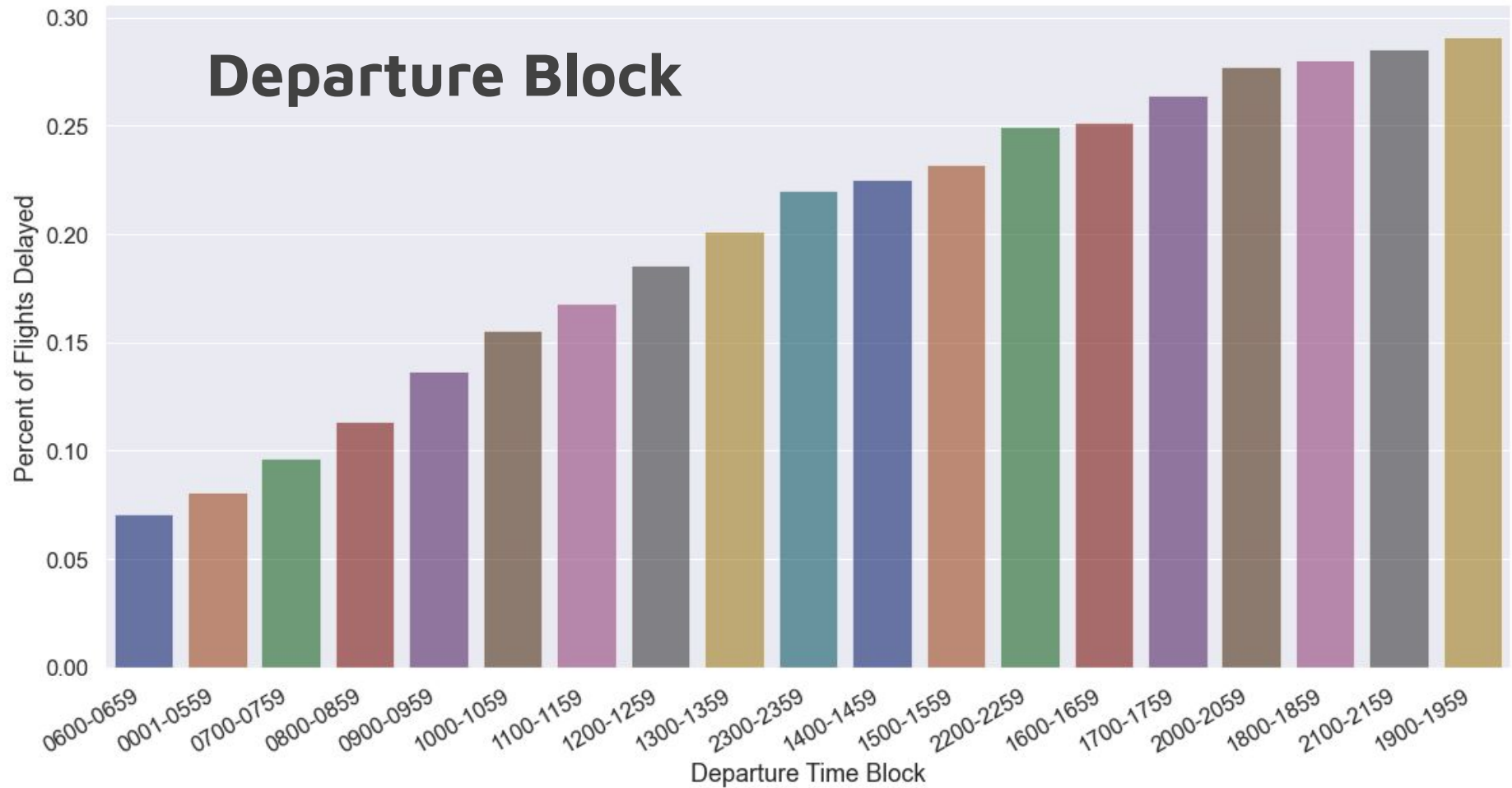
## Why Study Flight Delay?

- Can we anticipate a delay with the Bureau's current collection metrics?
- Given a delay, can we predict why the delay occurred?
- With this information in hand - can the BTS provide resources to help reduce delay?

# Delay Contributors



Percent of Flights Delayed by Departure Block



**Can we  
predict  
delay?**

# 58.6%

Out of all actual delays, how many did we predict?

*We predicted just over half of the actual delays.*

# 20.3 %

Out of the delays we predicted, how many were correct?

*We predicted far more delays than were true.*

# 60.7%

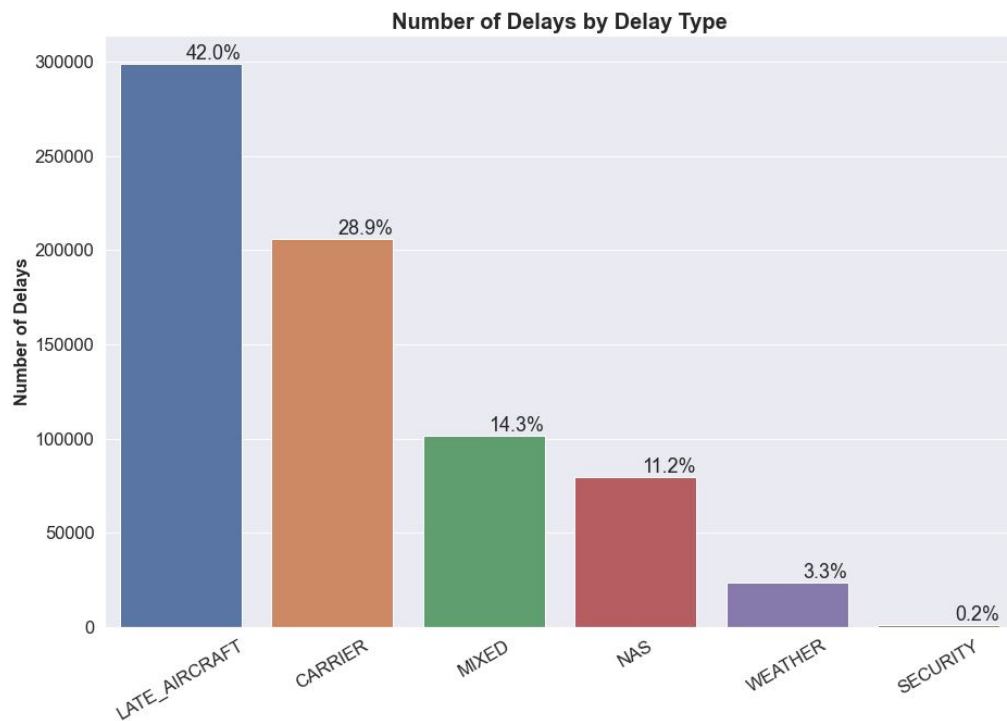
How good is the model at distinguishing between choices?

*A model with a 50% AUC has no skill. This is barely better.*





# What are possible delay reasons?



**Late Aircraft** - The incoming aircraft arrived late

**Carrier Delay** - Circumstances within airline control

**National Aviation Systems** - Minor weather delays, airport operations, air traffic control

**Weather Delay** - Extreme, unflyable weather

**Security Delay** - Large-scale security issues or TSA screening delays

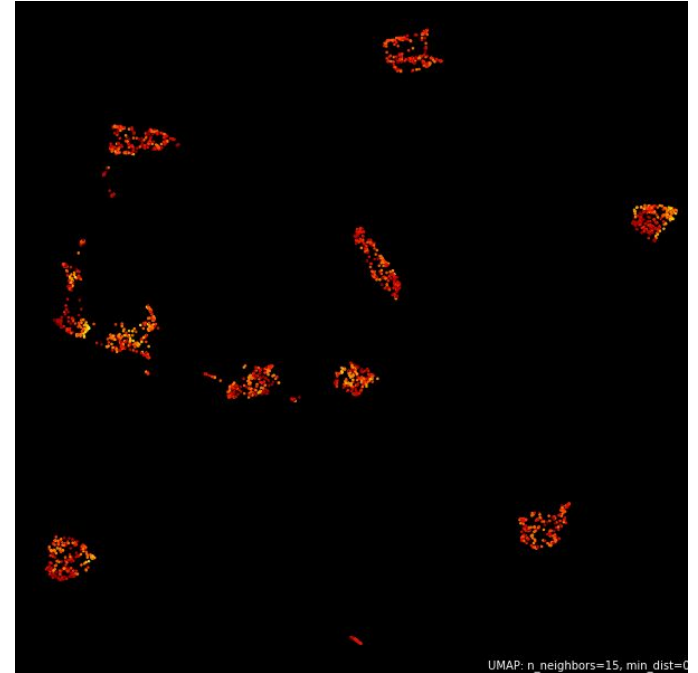
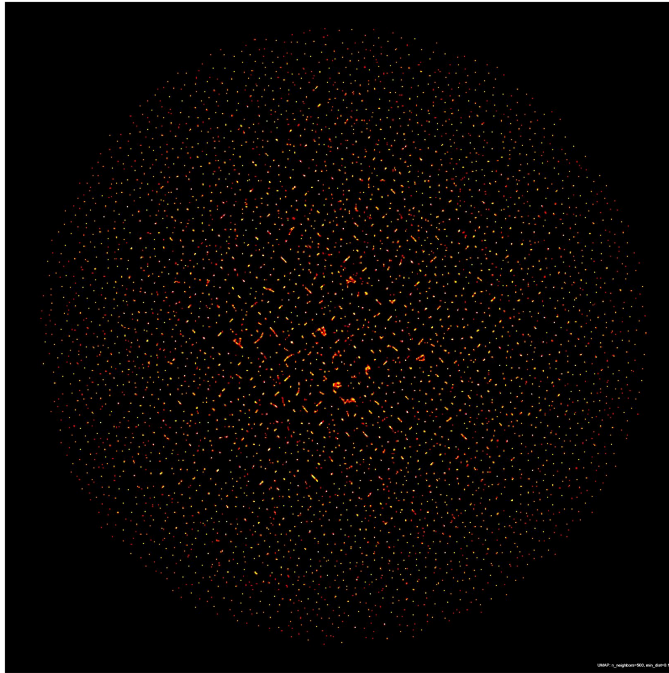


## Predicting Delay TYPE

Out of all delay types, how many did we predict correctly? 24.5%

Out of the delay types we predicted, how many were correct? 25.2%

# Visualizing relationships between features shows the predictive weakness



Our map vs a strong example map



## What DID we learn?

- Not very many delays can actually be blamed on the weather, airport etc
- Nebulous area of “carrier delay” encapsulates unknown inefficiencies for which the bureau has no predictors.
- The largest visible contributors revolved around departure block and segment number.



## Recommendations

- Airlines engage in an internal study of service methods and metrics in order to increase their operating efficiencies
- A feasibility study to an airline's flight map to see if overall segments/blocks can be shifted

**Thank you!**

