

# PA/MA Bridges falling down



By Richard Enikeieff



## Project Goals:

Attempt to determine what factors lead up to the depreciation of bridges

Examine the more robust PA dataset to narrow down features

Compare two different states to see if we get a similar score and if not hypothesize why and examine the features from the other dataset.



# What we'll be covering:

Background of project

EDA

Model Selection

Conclusions



# Why Bridges?

PA and MA are among the 10 worst states for their bridge upkeep, and I personally lived next to a decaying bridge for a number of years while I lived in Pittsburgh.

# The 10 worst average sufficiency ratings in the US

The rating, which ranges from 0 to 100, measures a bridge's condition, functionality, and importance.

State	Average sufficiency rating
Rhode Island	71.34
Hawaii	73.56
Kentucky	75.13
Arkansas	75.62
Pennsylvania	75.86
Iowa	76.16
Alaska	76.38
<b>Massachusetts</b>	<b>76.44</b>
North Carolina	76.82
Maine	76.90





# EDA:

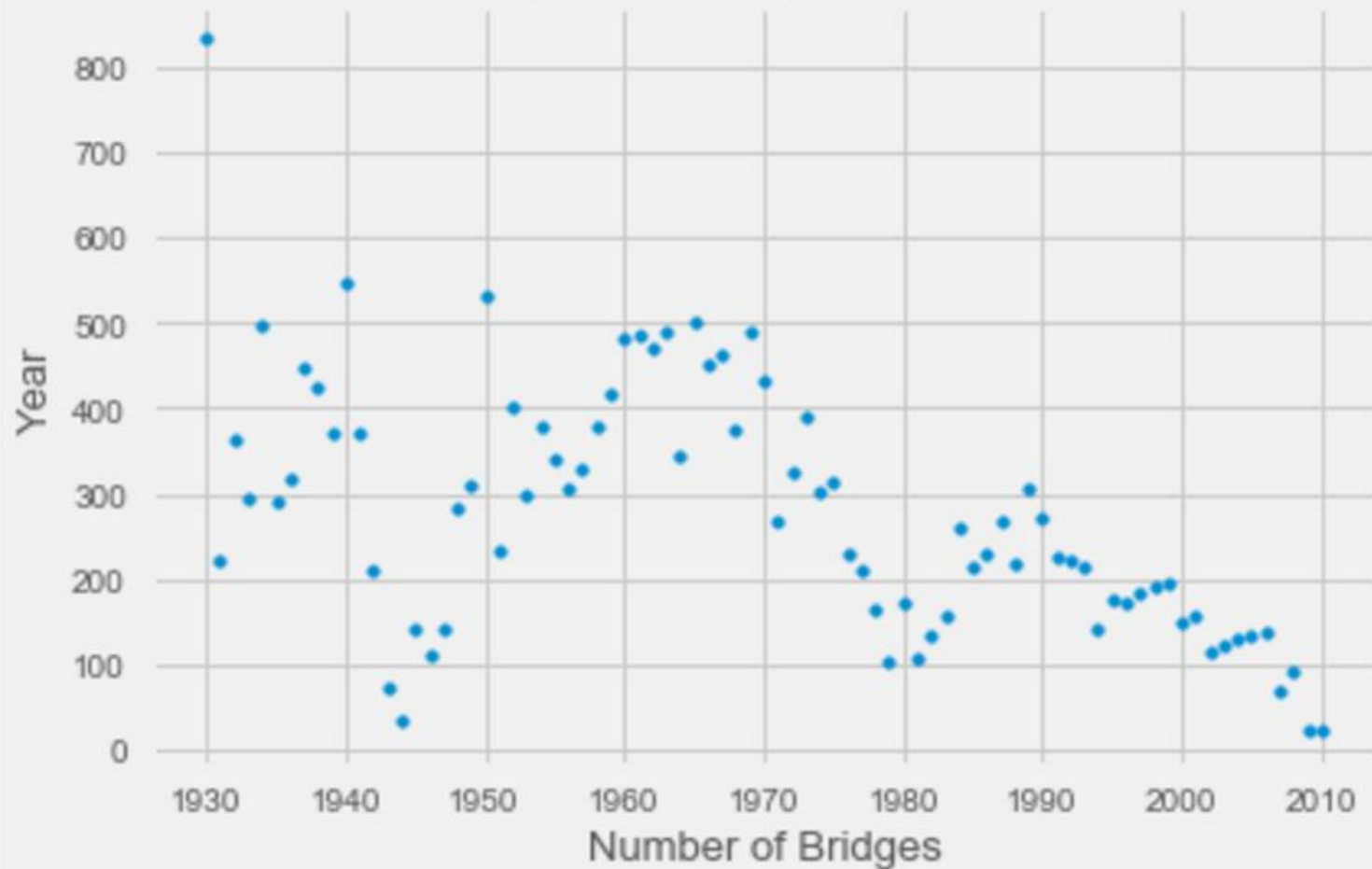
Factor Determination, and choices:

PA Factors:

'X','Y','CTY\_CODE','ADTTOTAL','BRIDGE\_ID','COVERED\_BRIDGE','CUSTODIAN','DECK\_AREA','DECK WIDTH','DEPT\_MAIN\_MATERIAL\_TYPE','DEPT\_MAIN\_PHYSICAL\_TYPE','DESIGNMAIN','HISTSIGN','LENGTH','MATERIALMAIN','NBI\_RATING','STATE\_LOCAL','STRRATING','YEARBUILT','YEARRECON','FLOOD\_INSP','KIND\_HWY'

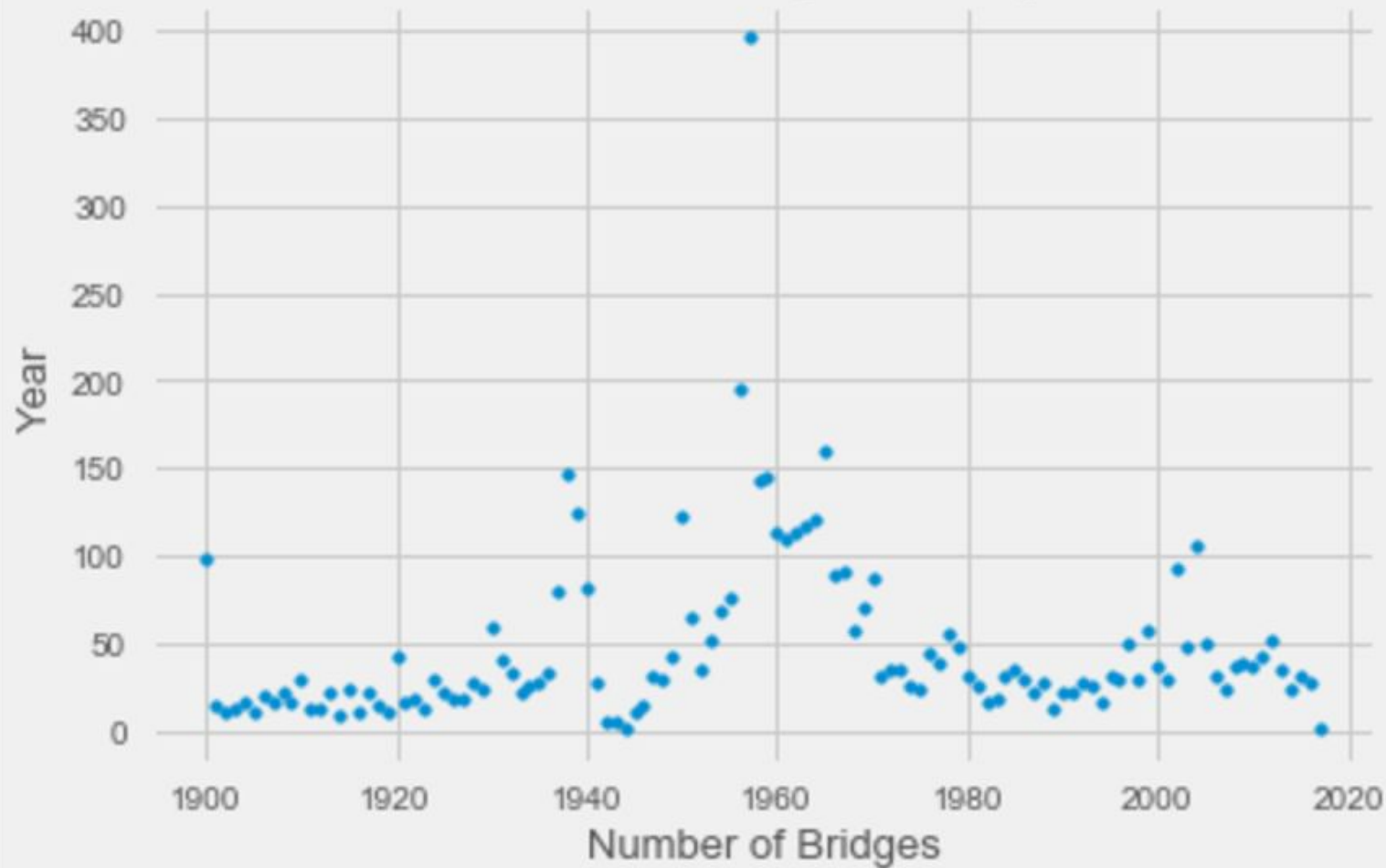
MA Factors: 'Latitude','Longitude','Structure\_Material','Structure\_Type','Town','Bridge\_Owner','Bridge\_Identification\_Number\_\_B','Year\_Built','Year\_Reconstructed','Structure\_Length','Structurally\_Deficient','Structure\_Category'

# Pennsylvania Bridges Built by Year



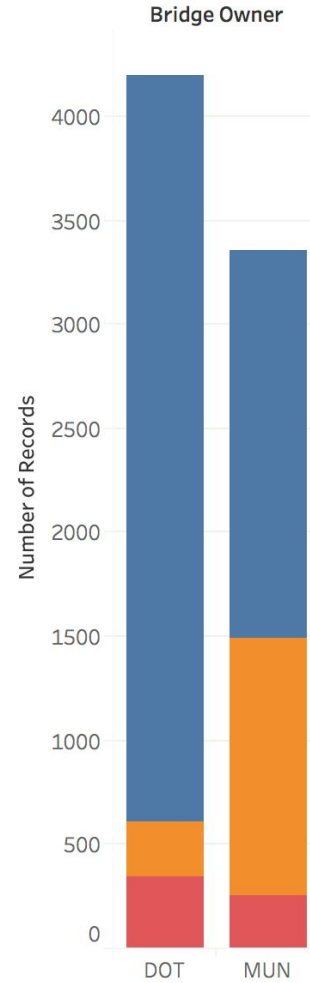


Massachusetts Bridges Built by Year

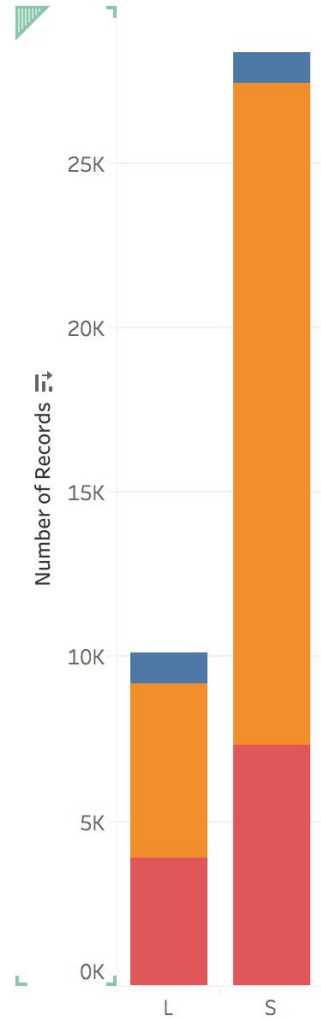


# Bridge Ownership

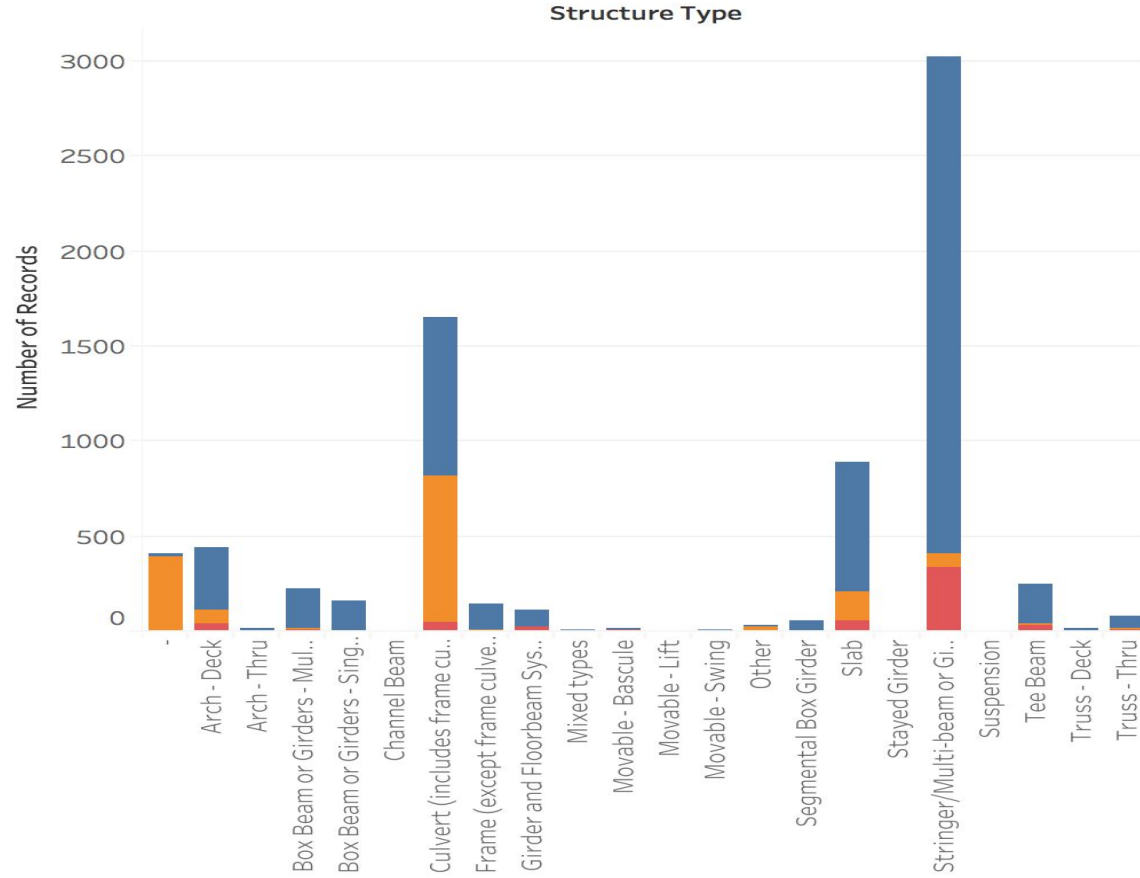
Bridge Owner



State Local



## Types



# PA Feature Importance

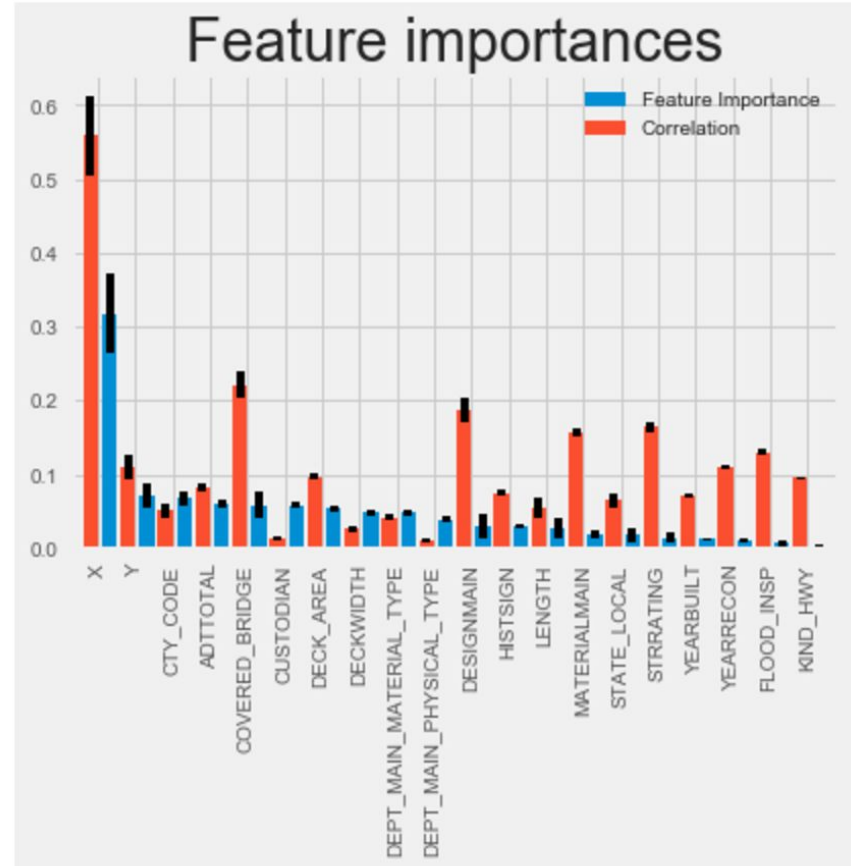
Latitude

Longitude

City Code

Average Daily Traffic

Covered Bridge



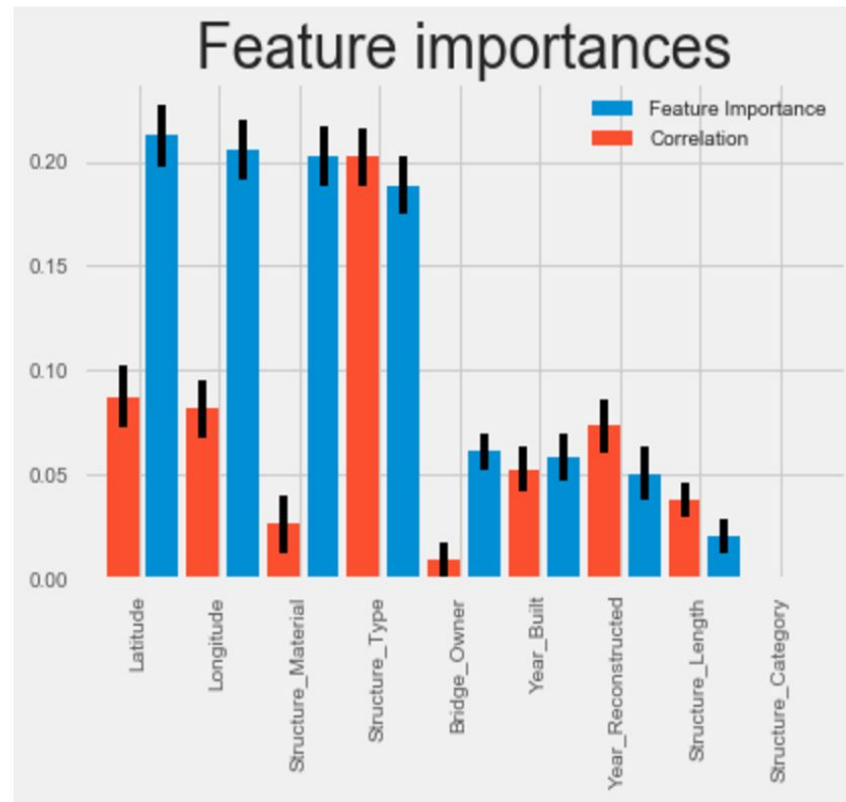


# MA Feature Importance

Geography

Material

Type



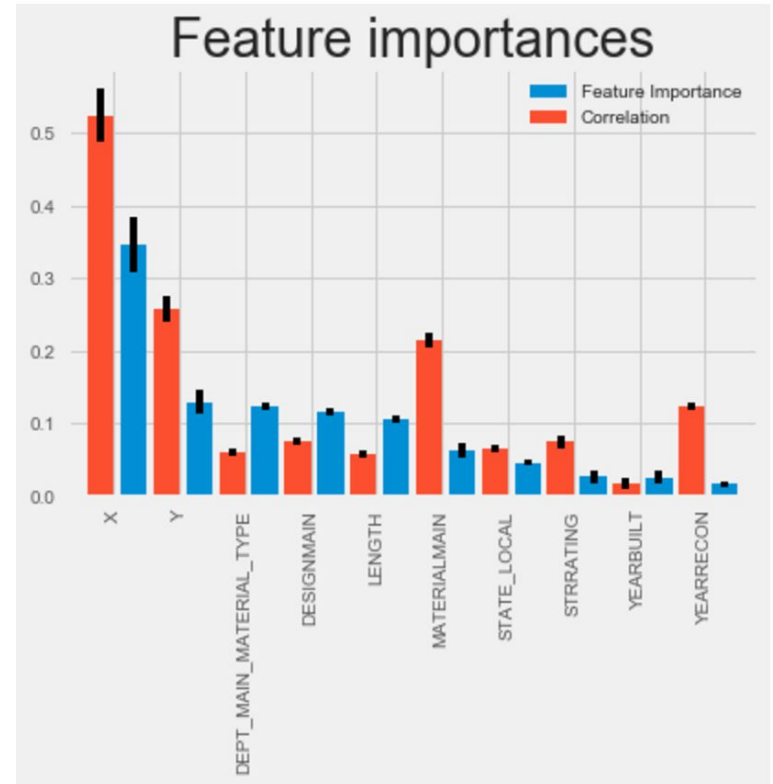
# PA 2 Feature Importance

Location

Material

Design

Length





# Model Selection:

Random Forests

.90 PA1

.80 MA

.85 PA2



## Conclusion:

Depending on the model we are 80-90% confident that these features can lead to the process of depreciation.

Future Goals attempt to determine why similar features were more important depending on the state, look further into the discrepancy between scores.