Bike and Car Accident Prediction

Milestone Report

Helping Drivers and Bicyclists Share the Road

Many drivers hate sharing the road with bicyclists, but perhaps they could become allies, if road improvements for bikes made the road safer for cars as well and vice versa.

This exploration looks for commonalities between what causes bike and car accidents in the Boston Area

Data Sources

- A database of Boston bike accidents from 2009 to 2012, constructed from police reports during this time
- A database of car accident/crashes for the entire US in 2017
- The Massachusetts Department of Transportation (Mass DOT) road inventory
- The Mass DOT road inventory has a [data dictionary](#)

Data Wrangling

- Create clusters of accidents within 50m of one another using shapely and geopandas packages
- Associate road data with those clusters
- Create areas without accidents and associate road data with those

Initial Findings

Many road attributes are not strongly correlated with higher rates of accidents, including:

- Traffic
- Road width
- Number of lanes

Quantitative Road Data Correlation Matrix
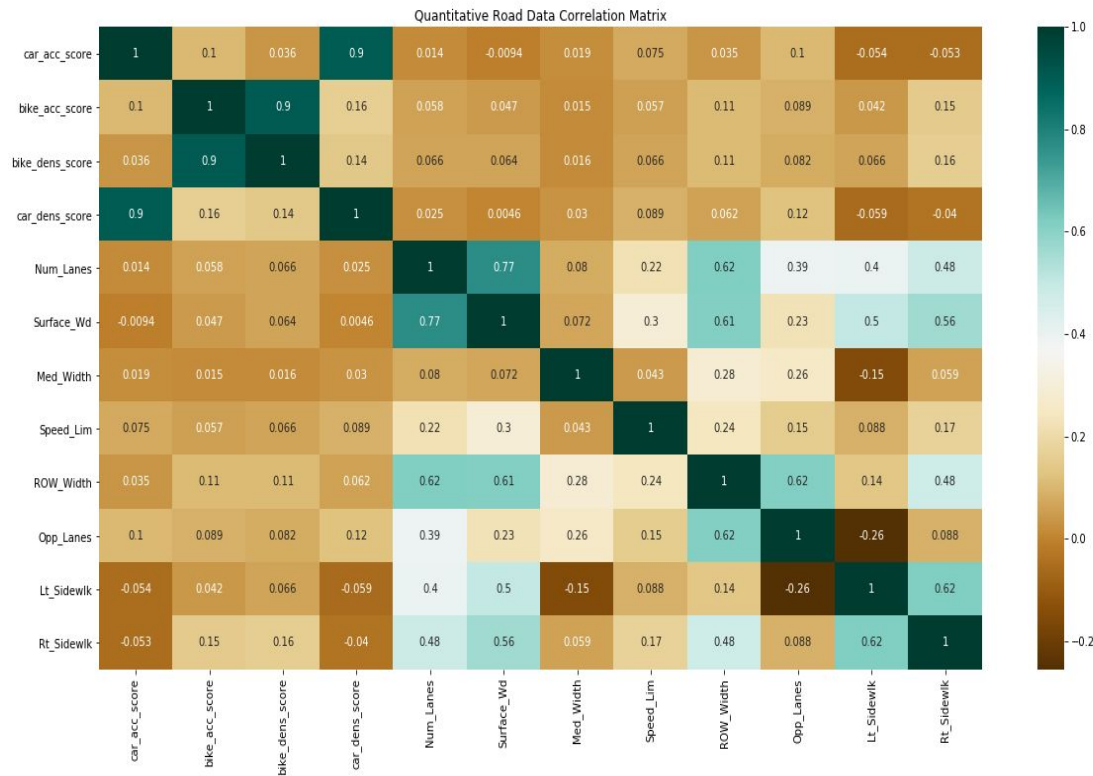
Findings With Statistical Significance

- **Facility type:** Facility Types like tunnel, ramp, double deck, rotary and bike lanes all have higher accident density than regular roads
- **Number of Lanes:** roads with 1, 3, 4 and 5 lanes have a higher mean *car* accident density
- **Truck Access:** roads that exclude trucks have fewer accidents than roads that allow them
- **Surface Type:** gravel or stone, block road, surface-treated roads and Portland cement roads all have more accidents than regular bituminous road
- **Speed Limit:** raising the speed limit from 20 to 30 increases *bike* accident density

Next Steps

Apply machine learning to find more complex predictors of accident density.

Car Accident Density Heatmap