A decorative graphic consisting of a dashed white line that starts with a small square, rises to a peak, dips, rises to a higher peak, and then ends with an arrowhead pointing towards the right. A solid blue line follows the path of the dashed line.

# Forecasting Bike Accidents in PDX

Author: Ryan Harper



**Why?**

# Portland, OR

## Bike Friendly



### Biking areas

**77 mi** Neighborhood Greenways

**188 mi** Bike lanes

**85 mi** Bike paths

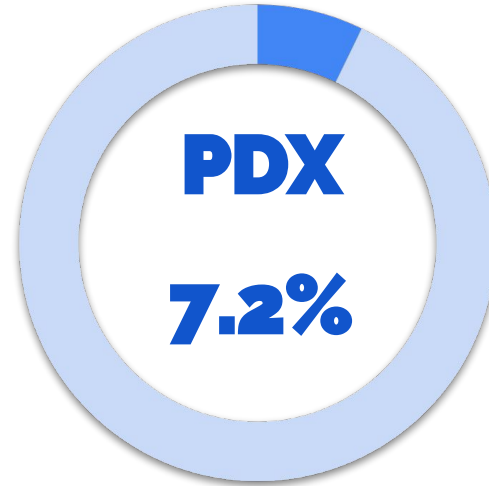
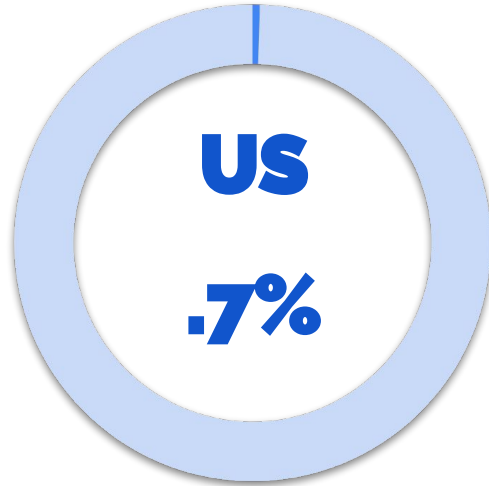
### Bike Parking

**6500** Public Bike Racks

**134** Bike Corrals



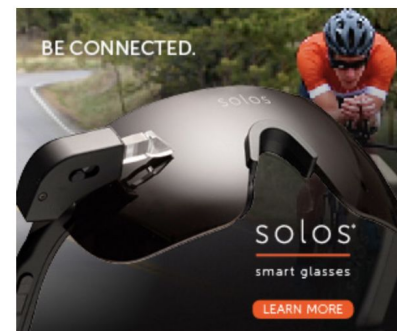
# commuters who bike



# Portland Cyclist Just Wanted to Ride His Bike Naked. Now He's Suing the City for \$566,000.

THE RIDER SUFFERED SERIOUS INJURIES AFTER CRASHING INTO CEMENT BARRIERS IN THE ROAD AS HE RETURNED (FULLY CLOTHED) FROM THE CITY'S WORLD NAKED BIKE RIDE LAST YEAR.

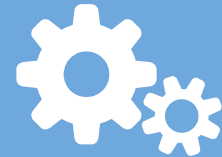
**B** BY MOLLY HURFORD FEB 5, 2018



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## News





# Methodology

1

## Explore

Clean, graph, and visualize the timeline data

2

## Trends and Seasonality

Check for directional trends in the data and look for any seasonal patterns

3

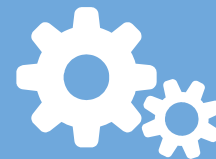
## Modeling

Evaluate different regression models via log likelihood, error metrics, and lag plots.

4

## Forecasting

Find the best model for predicting weekly accident count in 2016



**1**

**Explore**



# ODOT Multnomah Dataset

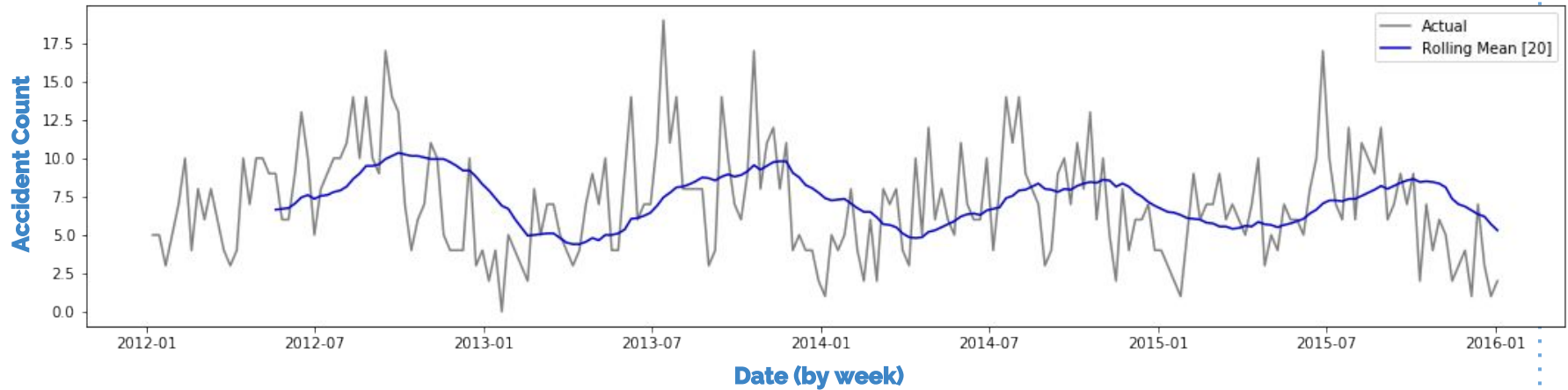




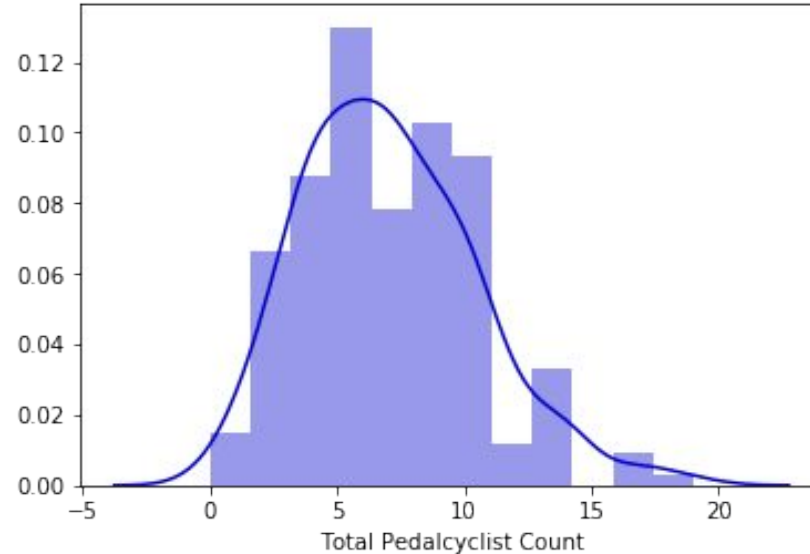


# Bike Accidents

## 2012-2015



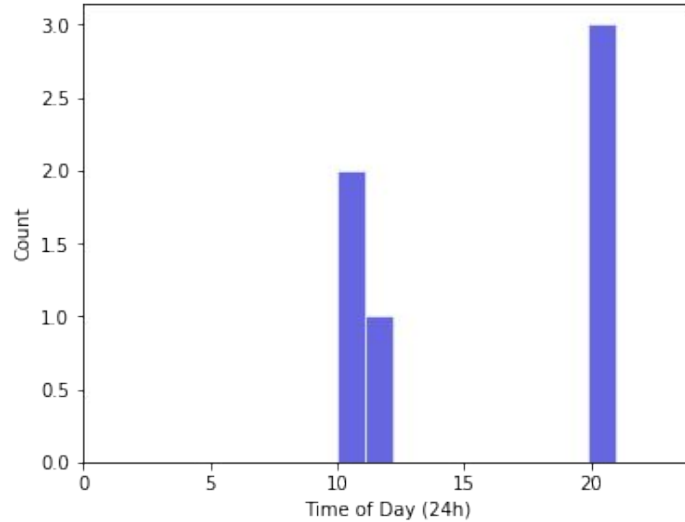
# Distribution: Total Accident Count for 1 Week



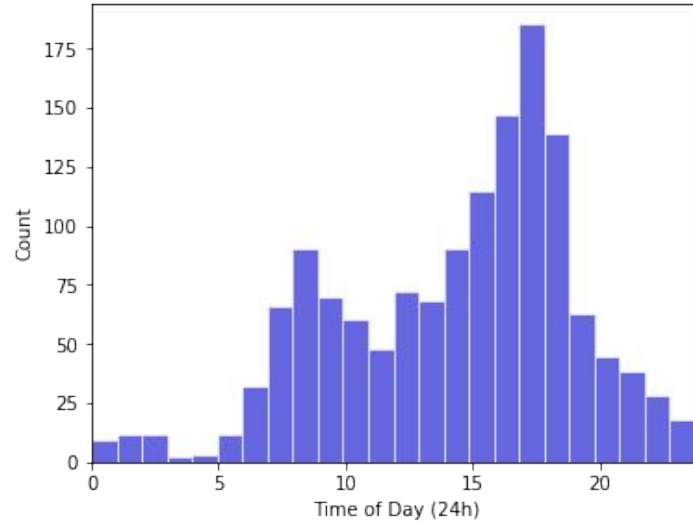


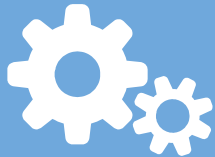
# Distribution: Hourly Accidents

Fatal Injuries 2012-2015 (6)



Non-Fatal Injuries 2012-2015 (1431)



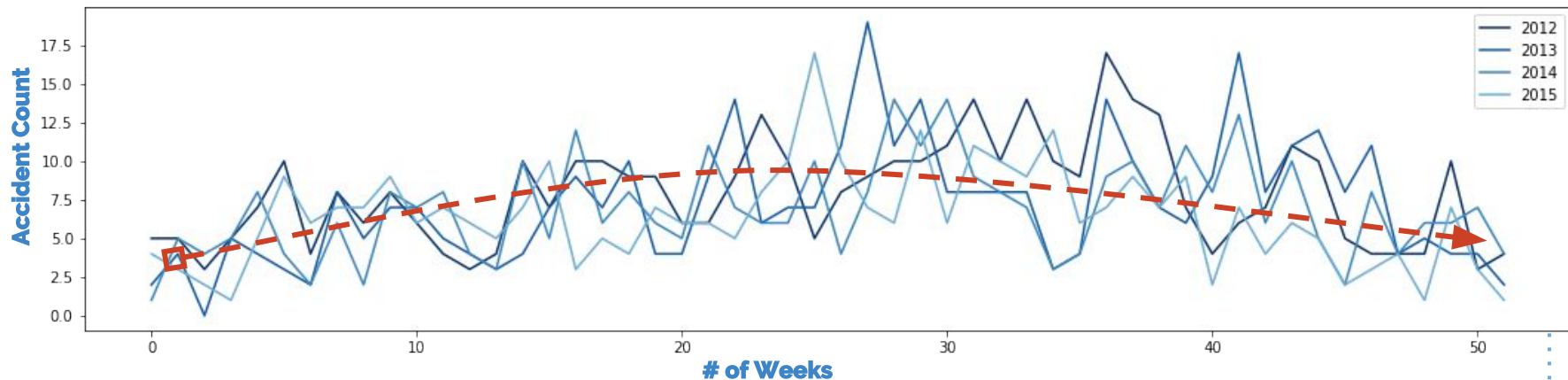


2

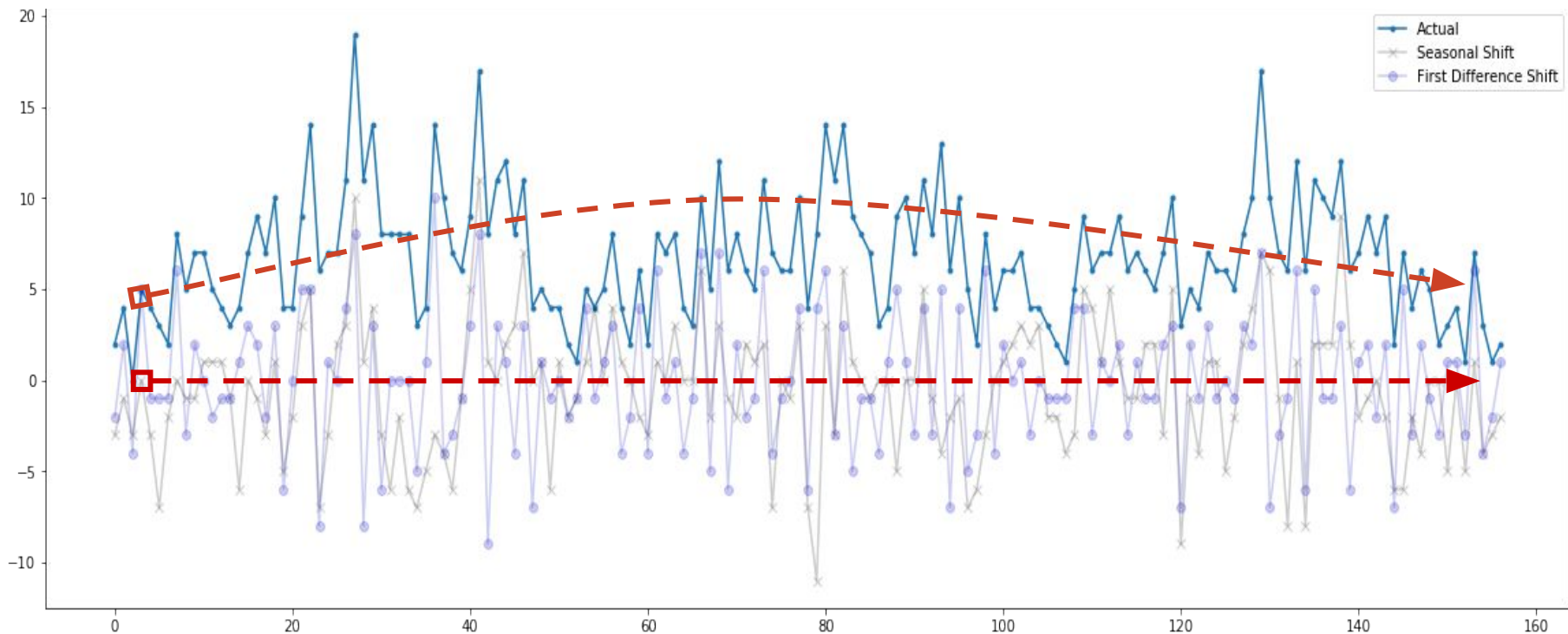
# **Trends and Seasonality**

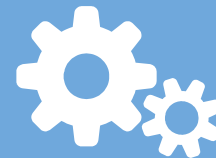


# Accidents by year



# Stationarity





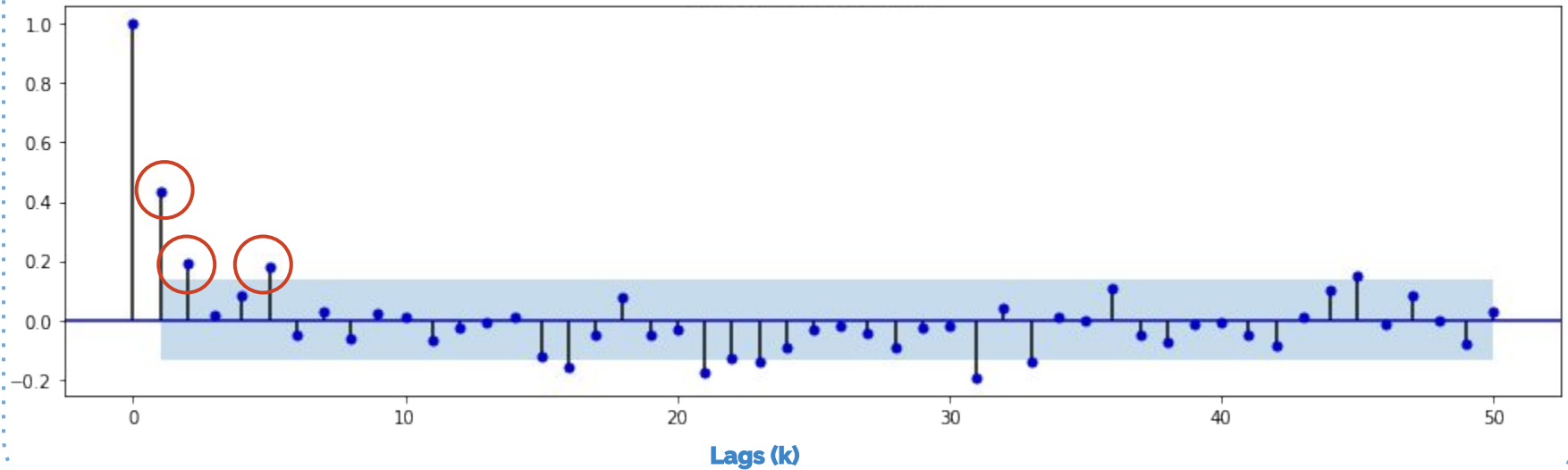
3

**Modeling**



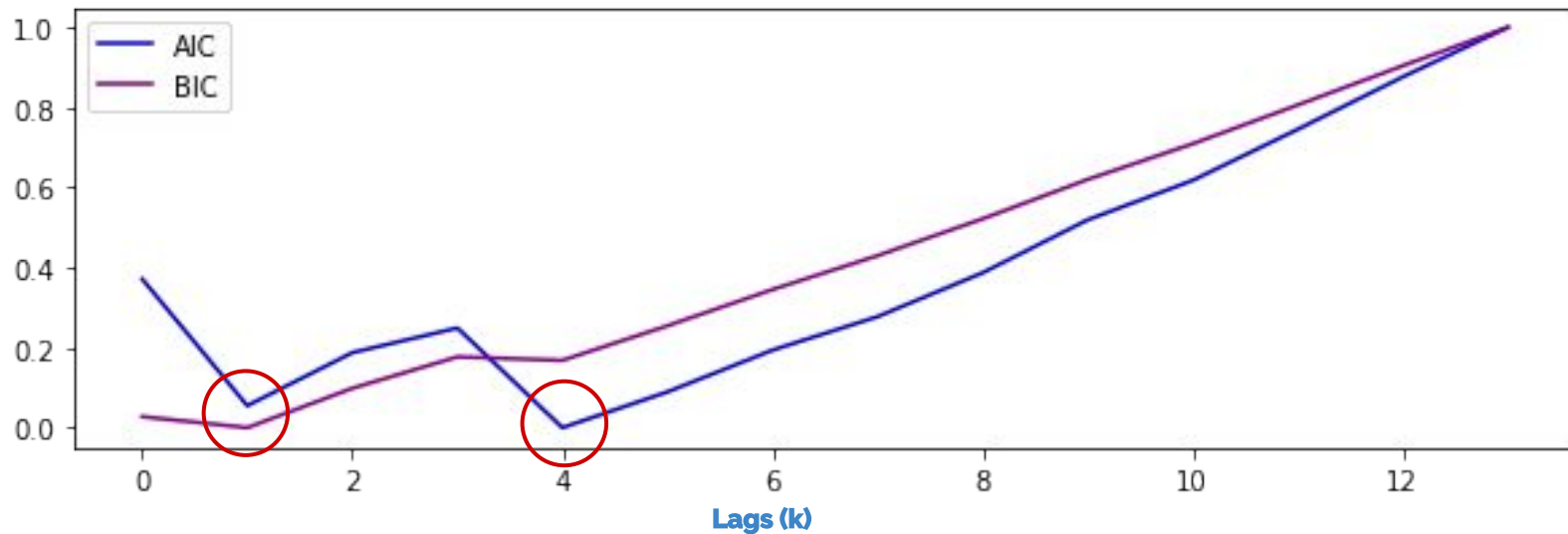
# Partial Autocorrelation: For choosing AR

Partial Autocorrelation



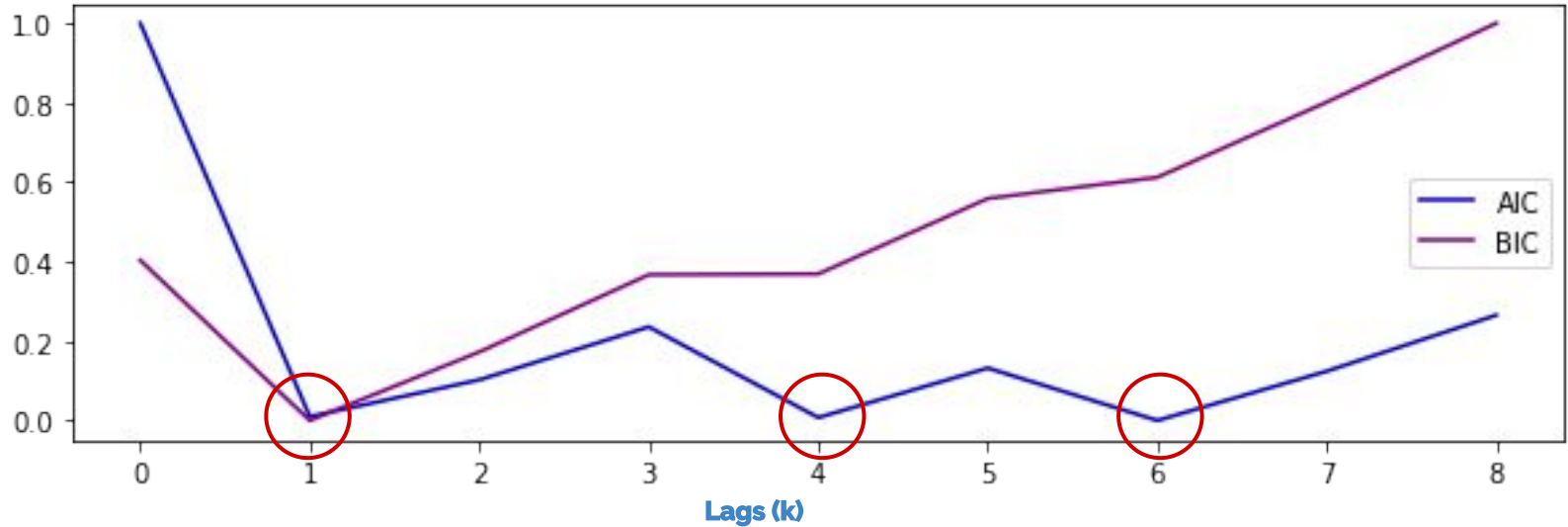


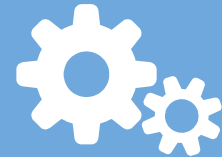
# Likelihood: AR Lags





# Likelihood: MA Lags



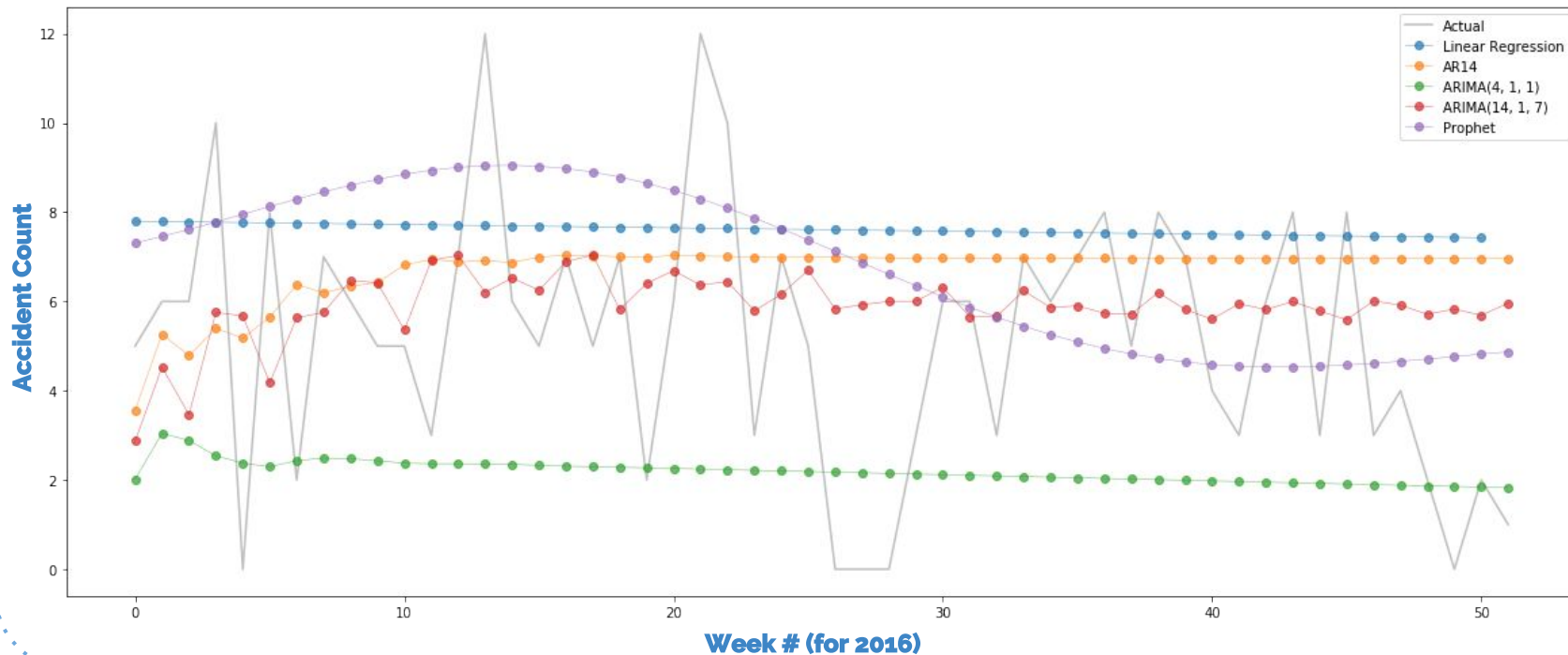


4

# Forecasting

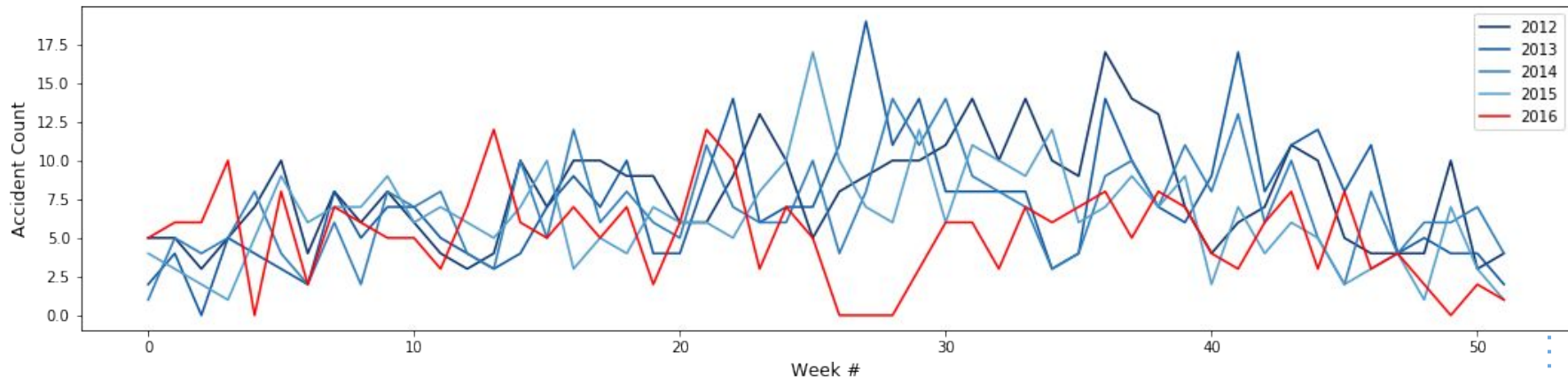


# 2016 Predictions

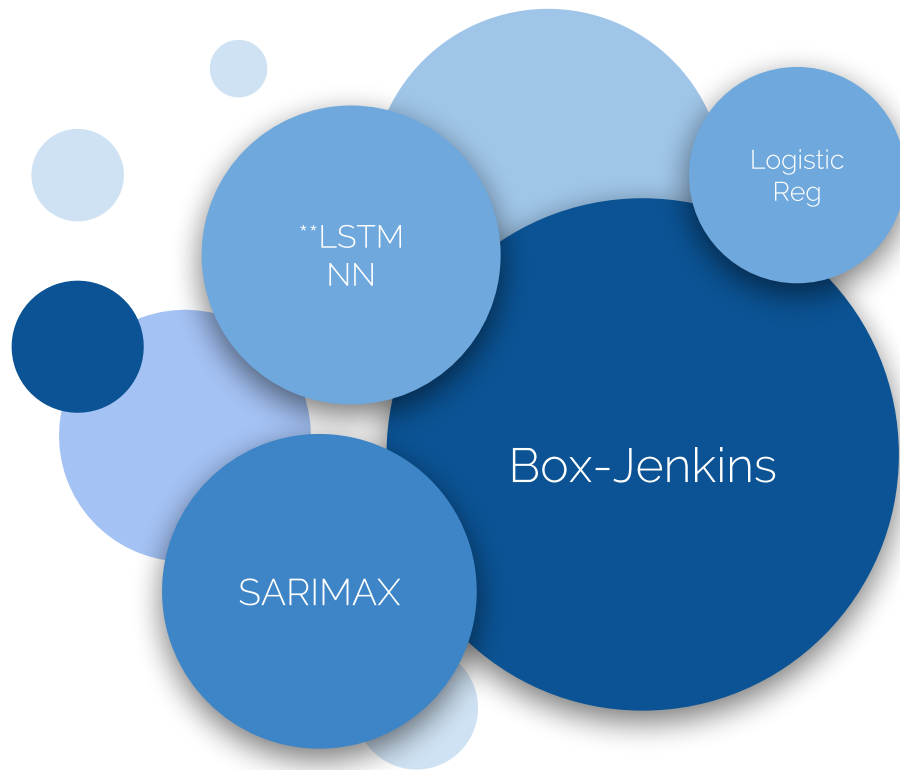


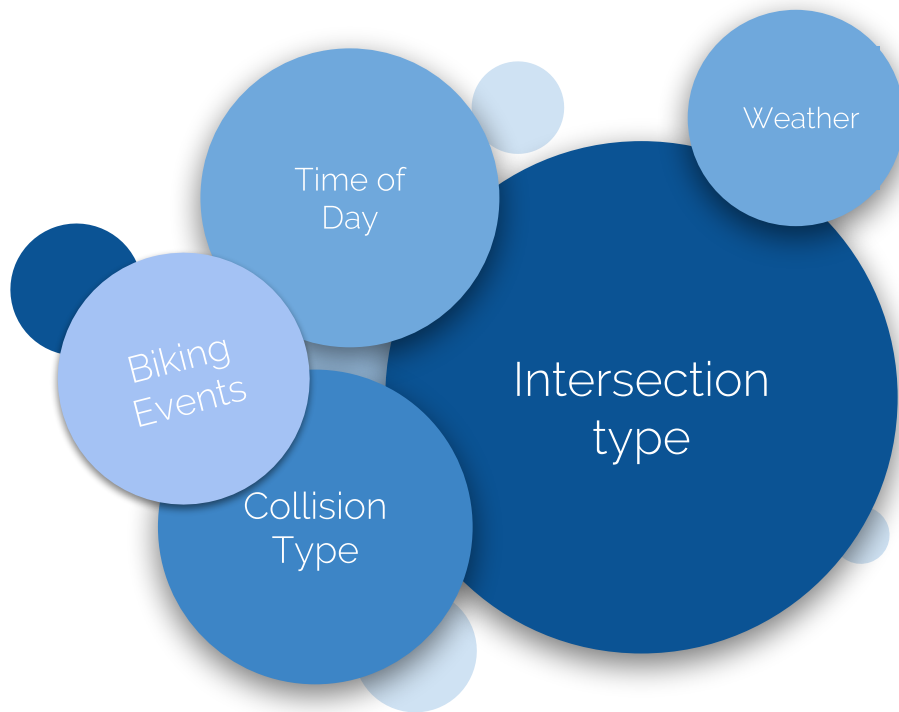


# Accidents by year + 2016



# Other models to explore





**Break up  
the data  
even further**



**Any  
Questions?**





# **Special Thanks!!!**

**Kris Pickrell (Thoughtful mentor)**



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