Crime Analysis - Washington, DC

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For: City of Washington, DC
By: JE Consulting

The Objectives

Part One:

- Total Crime by Offense
- Crime by Hour, Weekday, Month
- Crime Rate by Ward
- Geographical Crime Distribution

Part Two:

- Successful Modelling with Current DC Police Department Data
    - Success = Model Accuracy > 95%
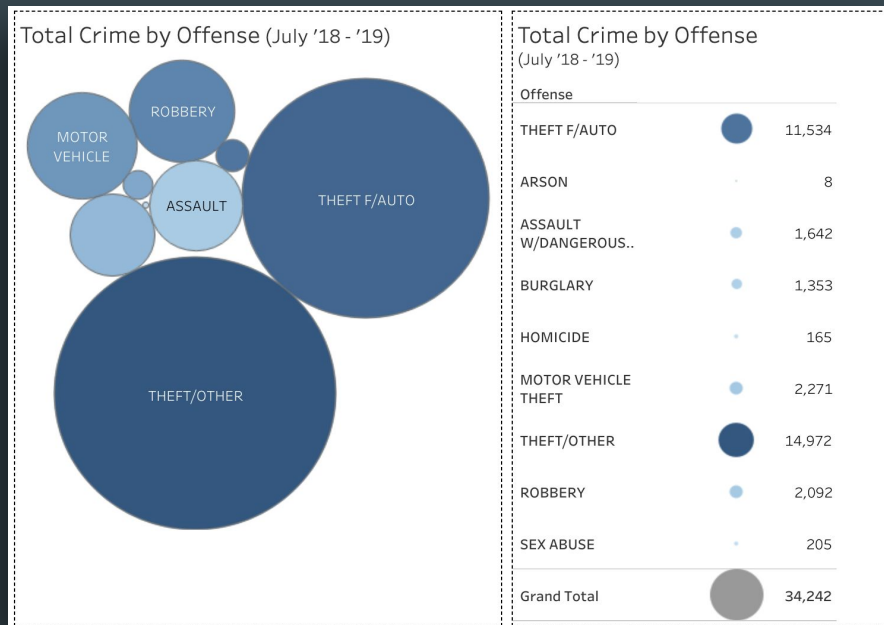
The Data

Crime Data - 2018, 2019 YTD

~ 54k Crime Instances

Key Features:

- Latitude, Longitude
- Crime Type
- Ward
- Incident Time
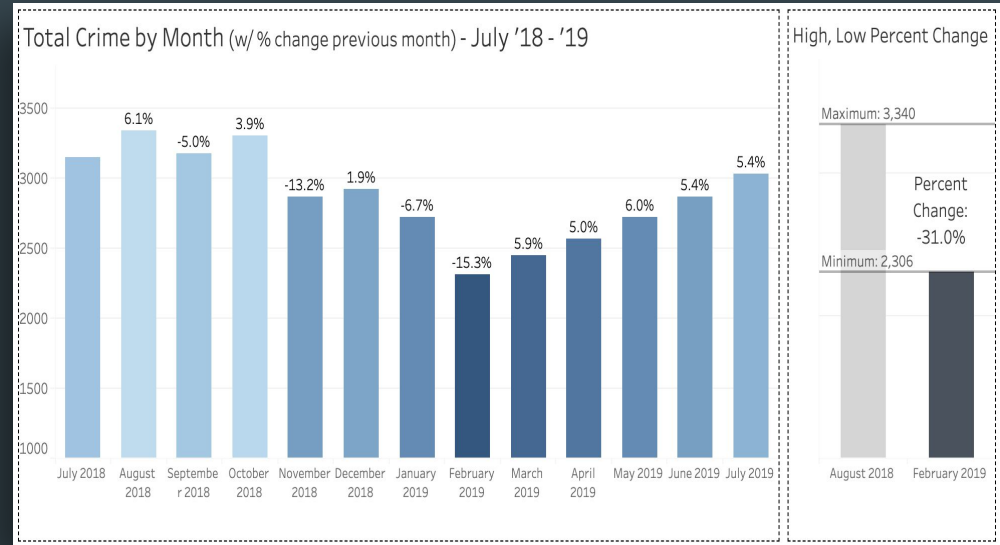- Method

Part One Highlights

Total Crime by Offense (July '18 - '19)

Total Crime by Offense (July '18 - '19)		
Offense		
THEFT F/AUTO	●	11,534
ARSON	·	8
ASSAULT W/DANGEROUS..	●	1,642
BURGLARY	●	1,353
HOMICIDE	·	165
MOTOR VEHICLE THEFT	●	2,271
THEFT/OTHER	●	14,972
ROBBERY	●	2,092
SEX ABUSE	·	205
Grand Total	●	34,242

Total Crime

34,242 Total Crime Incidents

- Theft = ~77%

- Homicide = ~.5%

- Assault w/ Dangerous Weapon = ~5%
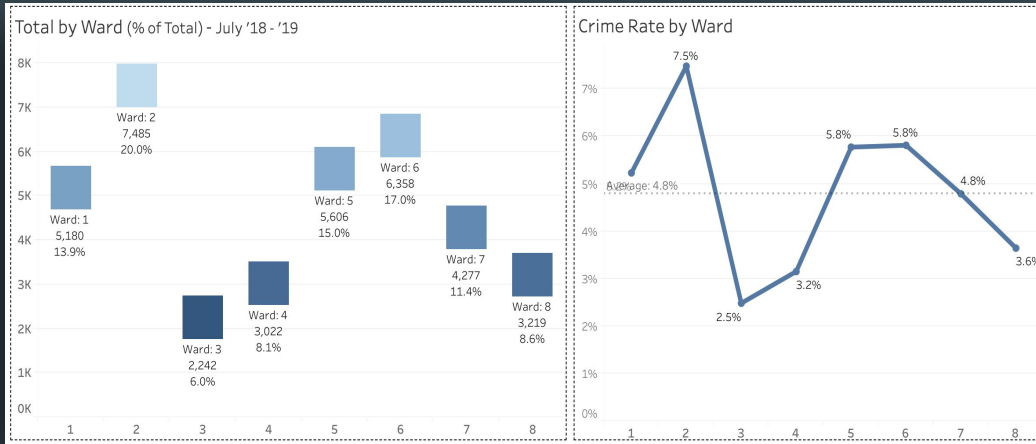
- Vehicle Theft = ~7 %

The Highlights - Part One

Time/Day, Month Analysis

- Seasonality exists:
  - February = bottom
  - August = peak
- Daily cycles exist:
  - Peaks early afternoon/late evening
    - 9 pm = (2,375 incidents)
  - Bottoms early morning
    - 6 am = bottom (532 incidents)
- No meaningful weekday variation

Total Crime by Month (w/ % change previous month) - July '18 - '19

High, Low Percent Change

The Highlights - Part One

Total by Ward (% of Total) - July '18 - '19
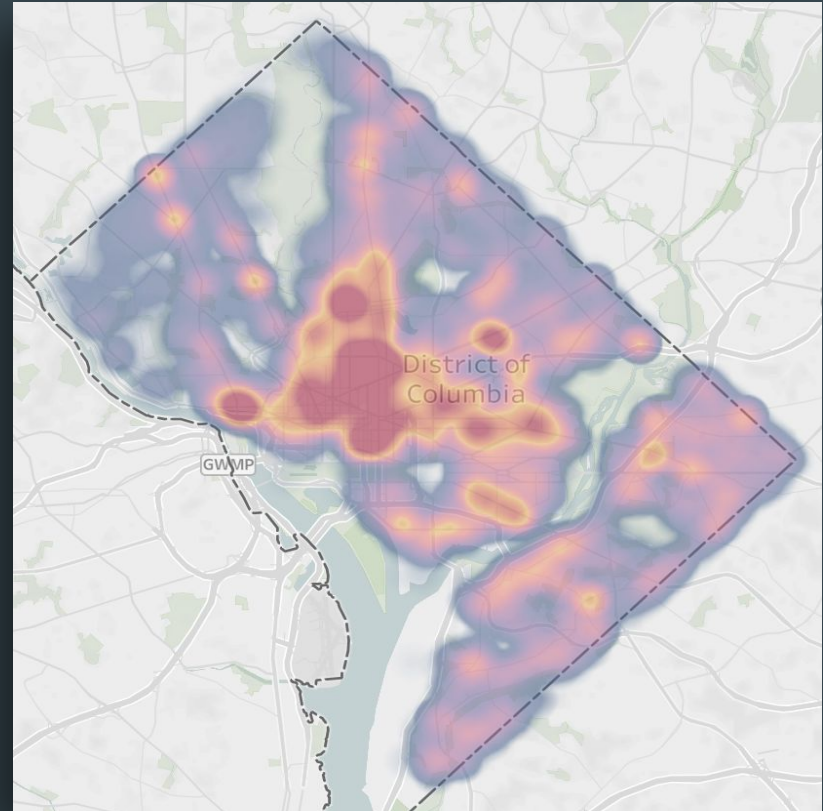
Crime Rate by Ward

Crime Rates by Ward

- Ward two = Highest Rate (20% of total crime)
- Ward three = Lowest Rate (6% of total crime)
- Average rate = 4.8%

The Highlights - Part One
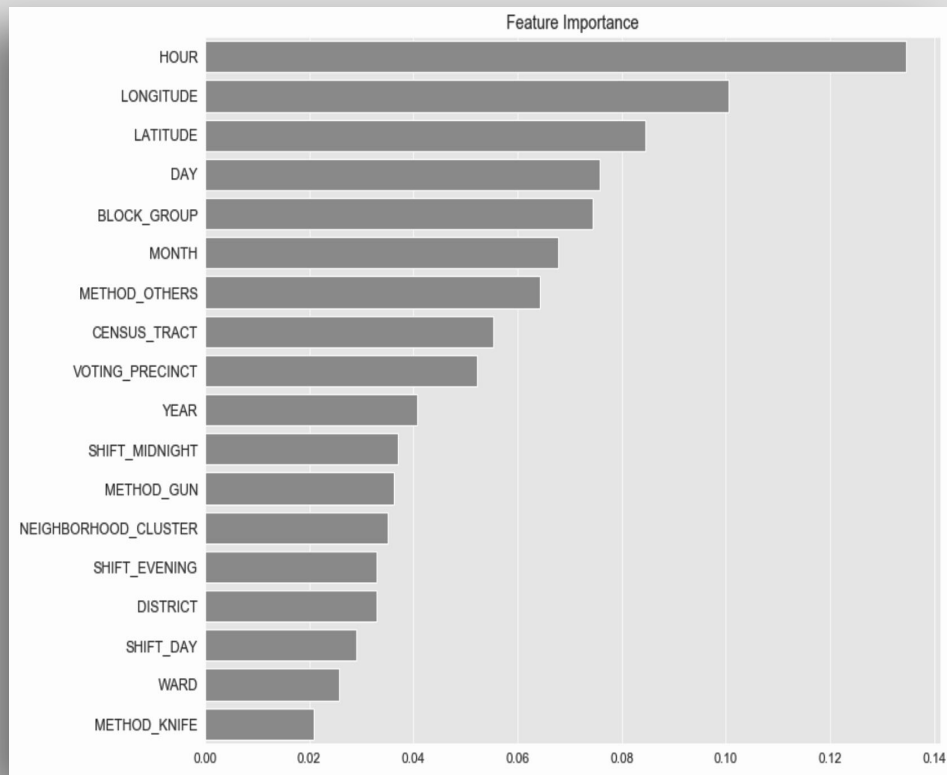
Geographic Distribution

- CBD concentrations

- Violent crimes East & Southeast of 16th St. corridor

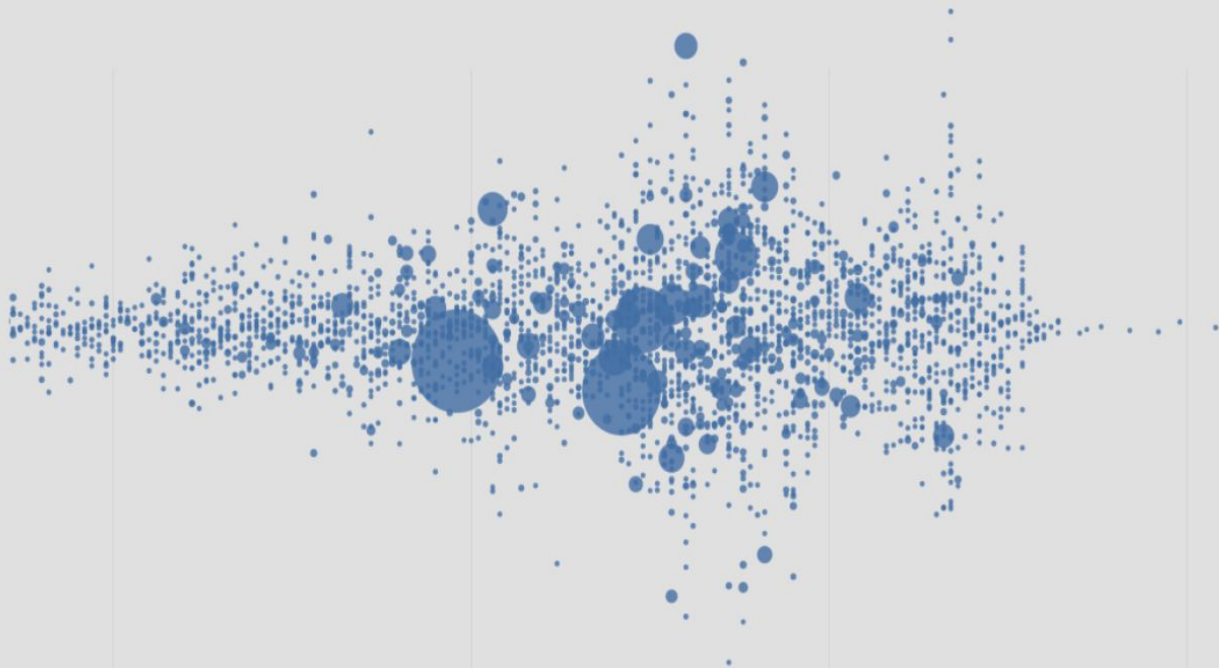- Transit station correlations

The Conclusion - Part Two

Final Model:

- 19 Features

- Most Predictive Features:
  - Day of Month
  - Geographic Location
  - Hour

- ~85% Accuracy

Feature Importance

The Recommendations

➔ More Features

➔ More Training Data

➔ More Classifiers

➔ More Testing

The End

Questions?