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# Storyline

## Description

Two questions that dominated our visualizations and exploration were: '***How can Baltimore more efficiently and effectively deal with crime?***' and '***What innovative approaches can be used increase public safety for police and citizens?***'. In order to answer these two questions, we examined the main and external datasets to (listed below under 'Datasets Used') and performed an Exploratory Data Analysis (EDA) to determine the direction of the rest of our analysis. From there, our story revolved around methods of effectively dealing with crime and making Baltimore safer for both its citizens and police officers. Suggested methods/prescriptions were made based off of crime frequency during different times of the day/year (***Figure 1*** and ***Figure 2***); density of crime around police stations, of different weapons used, and of occurrences either indoors or outdoors (***Figure 3-6***); and proportion of crime based on age and race groups (***Figure 7***).

## Challenges

The most challenging part about the storyline was determining the visualizations that would best answer our two main questions around the given main and the external datasets. We had a lot of data from multiple sources to extract and manipulate and we had to play with our data to decide which variables of which datasets were most relevant. A lot of the trends were hard to determine before actually graphing the visualizations, thus it was difficult to discover information that we might have missed initially. After graphing the same data across multiple platforms, we chose the visualization that best represented the information based on clarity and effectiveness. Line graphs were used to visualize variables across time (***Figure 1*** and ***2)*** to better reveal the patterns over time. Heat and contour maps were used to visualize areas with high frequency of crime in terms of certain variables (***Figure 3-6***) to compare locations within Baltimore.  Bar graphs were used to visualize variables across categories (***Figure 7***) to study the differences among race and age groups. As demographics of Baltimore naturally stray from the national standard, proportions for race and age groups were utilized.

## Datasets Used

Dataset Provided

- ***Baltimore for Calls Service***: emergency and non-emergency calls to law enforcement in Baltimore (Eastern Region) from 2015-2017

External Datasets

- ***Baltimore Police Department Victims***: information on victim crimes in Baltimore
- ***Baltimore Police Department Arrests***: top arrest charges of those processed at Baltimore's Central Booking & Intake Facility (NO JUVENILES, 18+)
- ***Baltimore Police Department Gun Offenders Registry***: gun offenders registered with the Baltimore Police Department
- ***Baltimore Police Department Stations:*** location of 9 police district stations and 1 headquarter station

**Storyline**

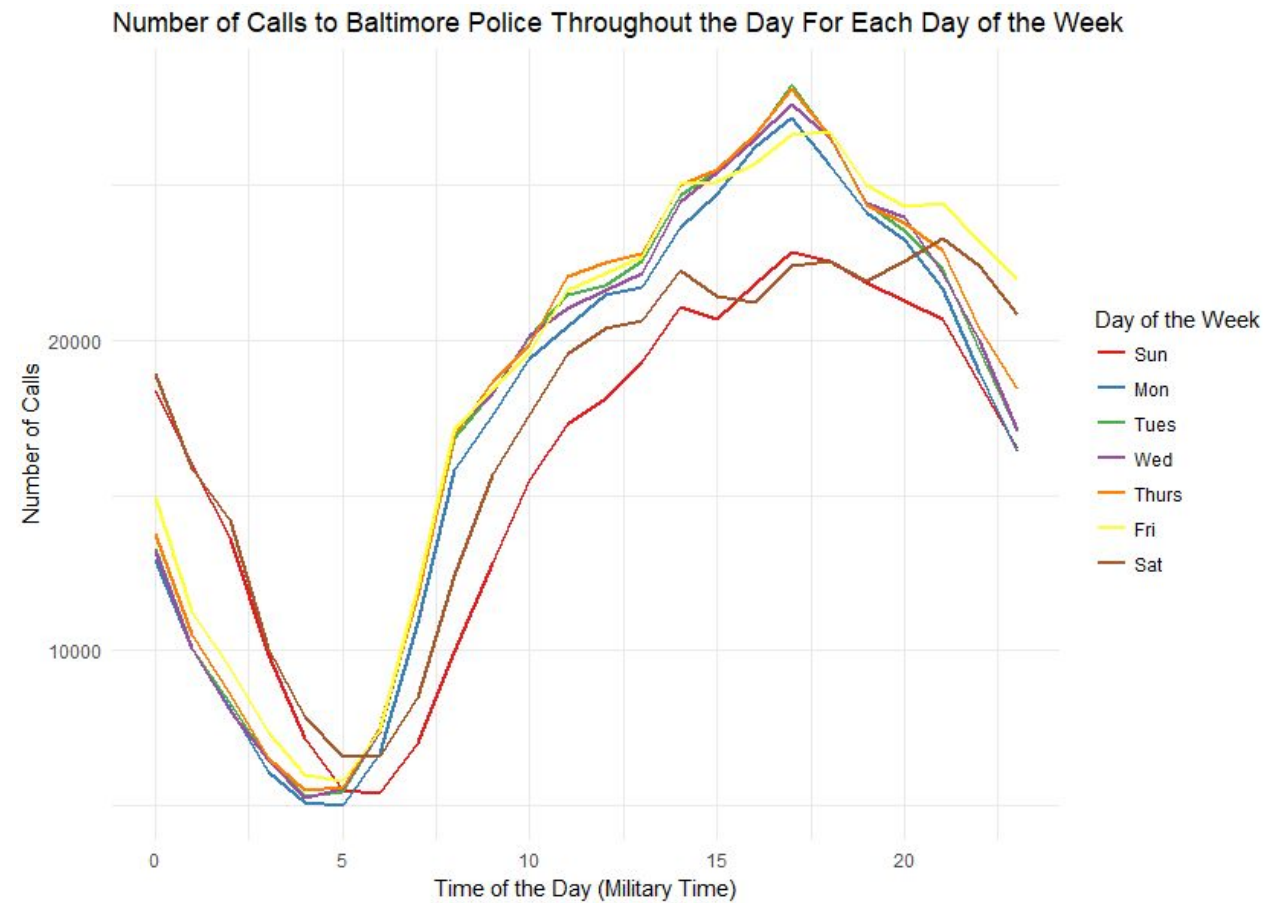Number of Calls to Baltimore Police Throughout the Day For Each Day of the Week



*Figure 1*

- Weekdays = Monday through Friday & Weekends = Saturday through Sunday
- Overall trend is similar between the weekdays & weekend
- Clear shift between weekdays & weekends: compared to weekdays…
    - 0-5: greater # of calls on weekends
    - 5-0: less # of calls on weekends

***Police can better delegate assignments to officers according to day and time of day***
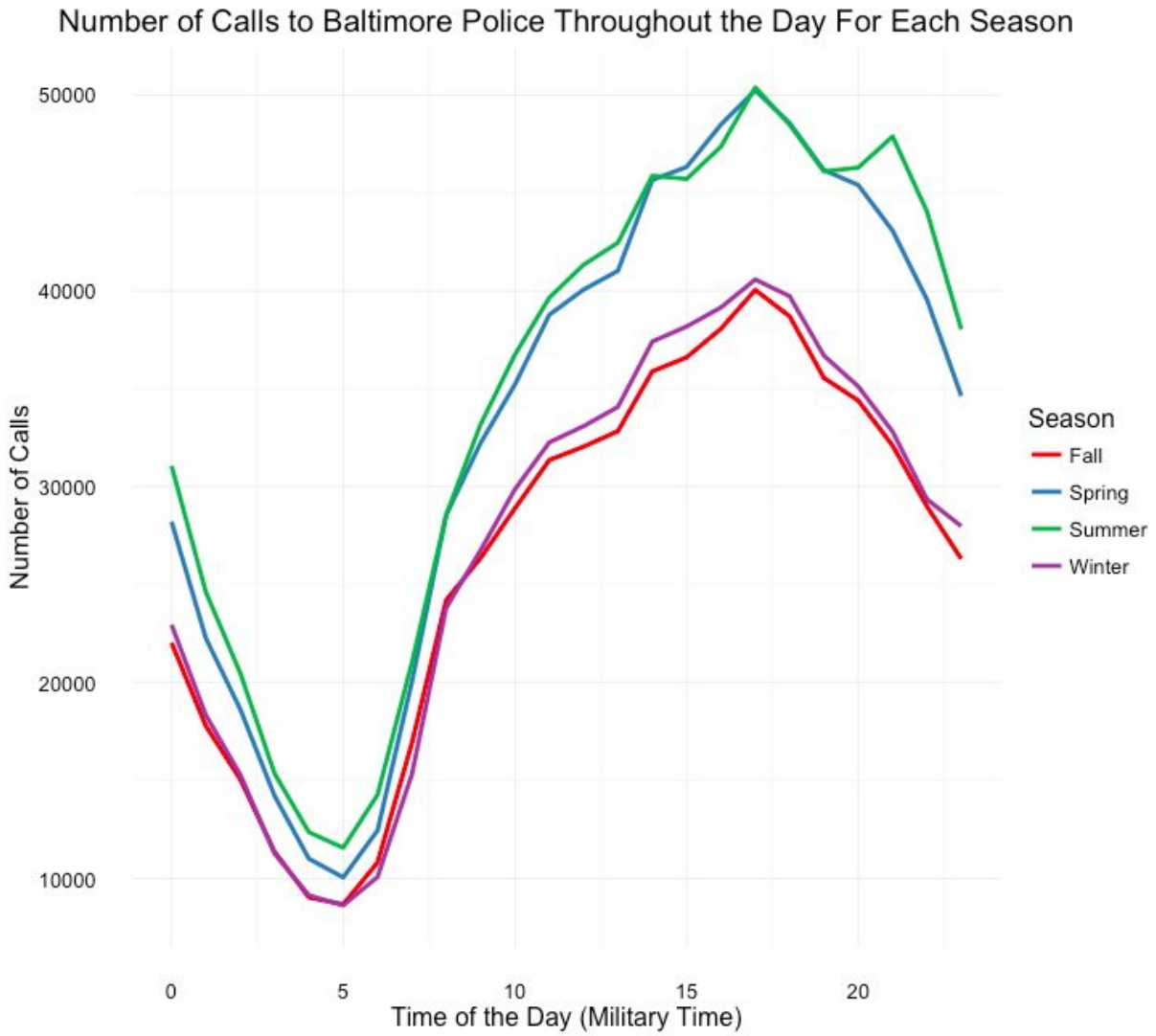
Number of Calls to Baltimore Police Throughout the Day For Each Season

*Figure 2*
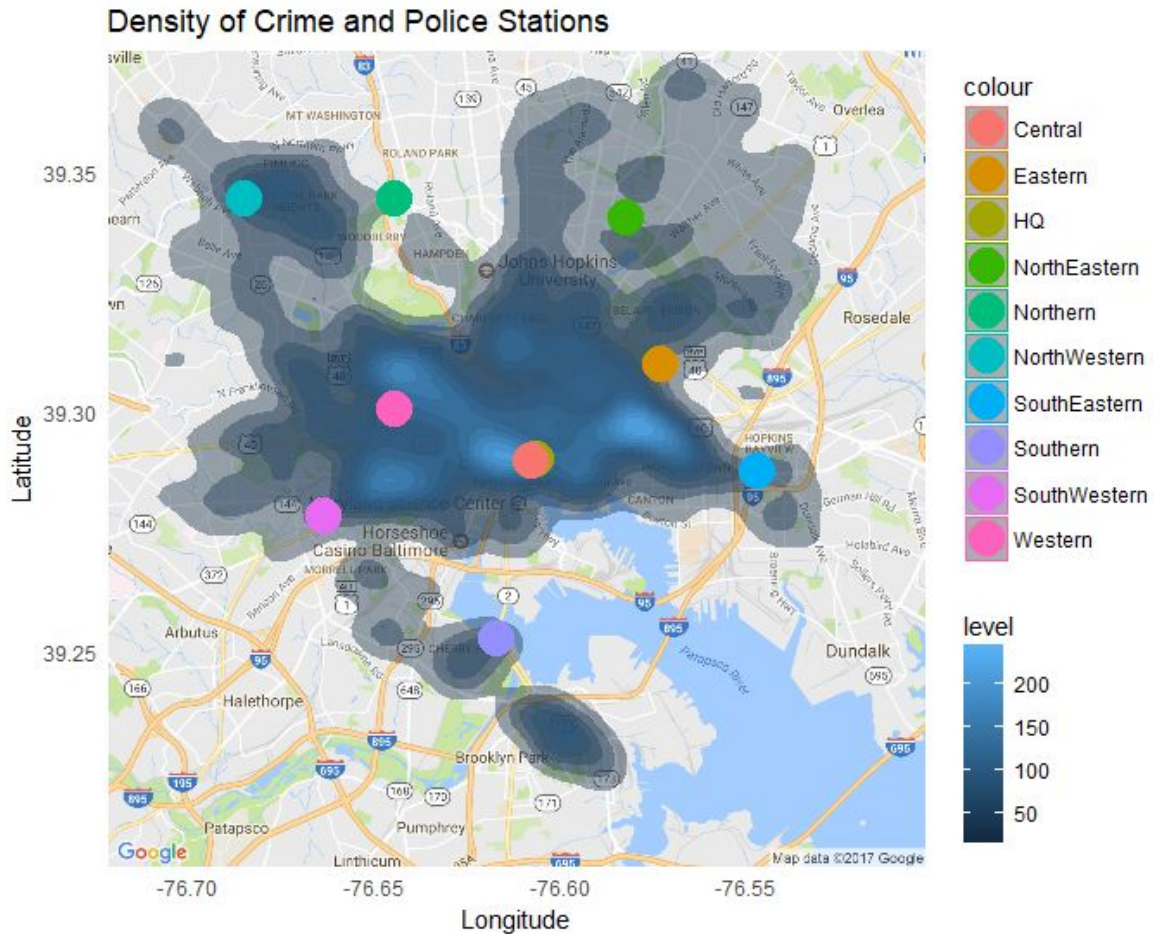*Increase amount of police forces during the spring and summer seasons.*

*Figure 3*

- Stations covering large outskirts (e.g. NorthEastern and Southern locations) requires additional support
    - Additional officers
    - Temporary stations
- Western and Eastern police stations could be relocated to improve response time and crime control

*Stations can be placed in more strategic locations based on the density of crime*
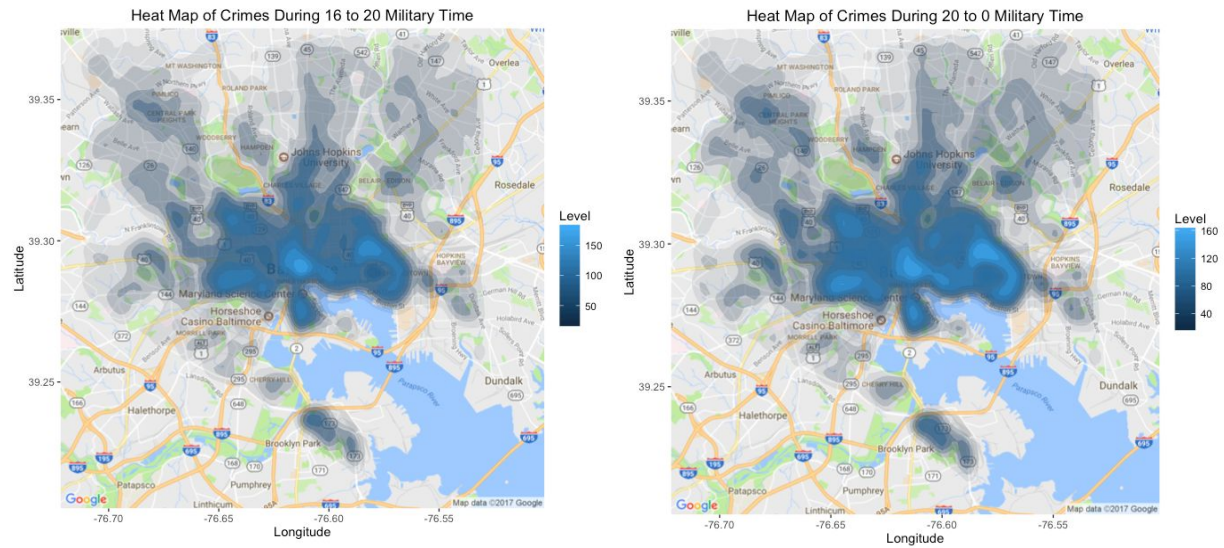
**FIgure 4**

- No obvious distinction in volume of crime between different hours of the day
  - May be due to high frequency of crime in one hour being drowned out by other hours in range
- Outskirts become more dense throughout the day
  - High density areas remain relatively the same

Sending more police officers towards the outskirts of Baltimore as the day progresses will allow for more area coverage
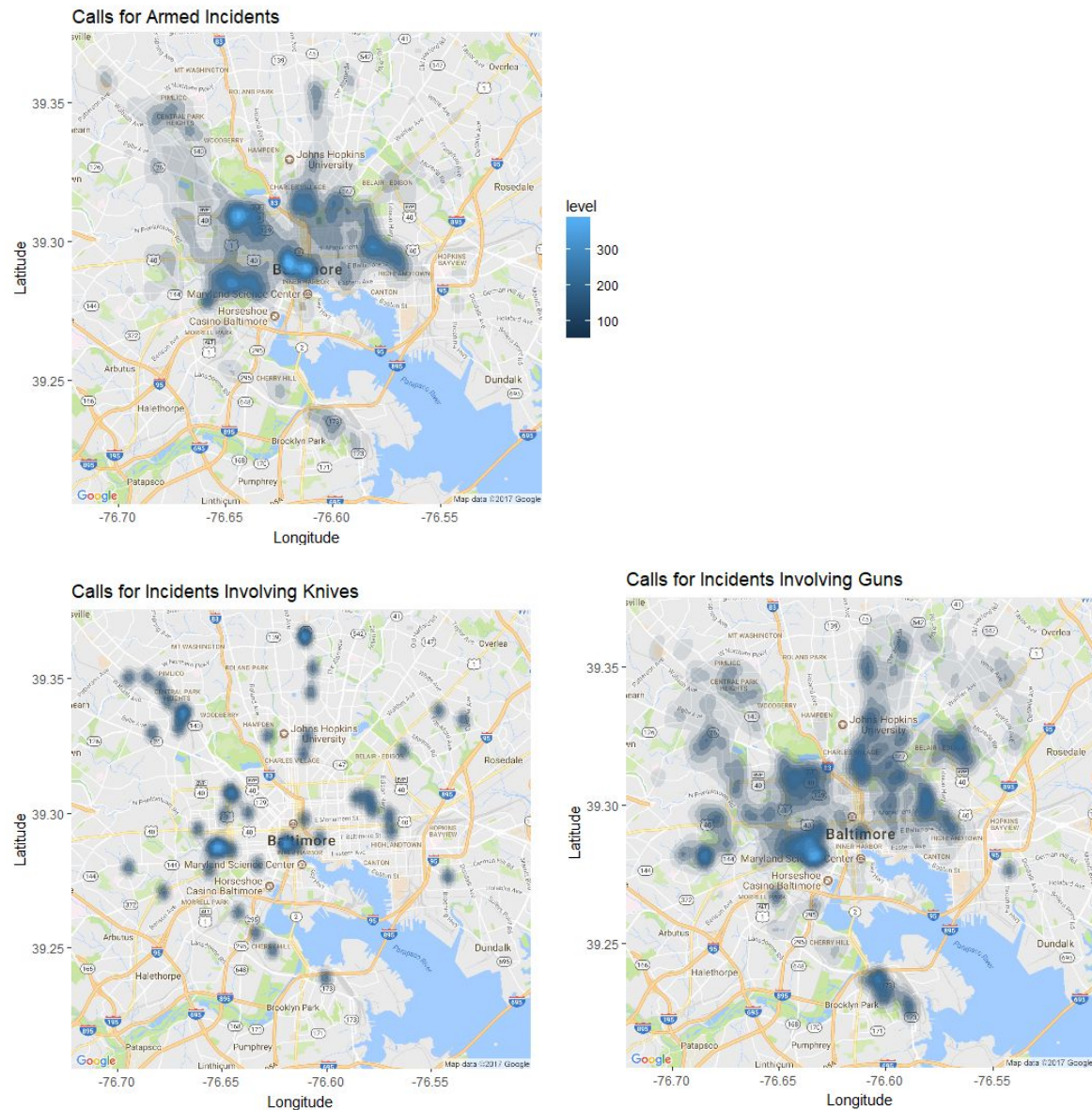
*Figure 5*

- Better prepare police officers for weapons offenders use in certain areas
- In areas with more gun related crimes, police officers should always wear their bulletproof vests if not already and allocate more resources to areas with higher density of certain call types
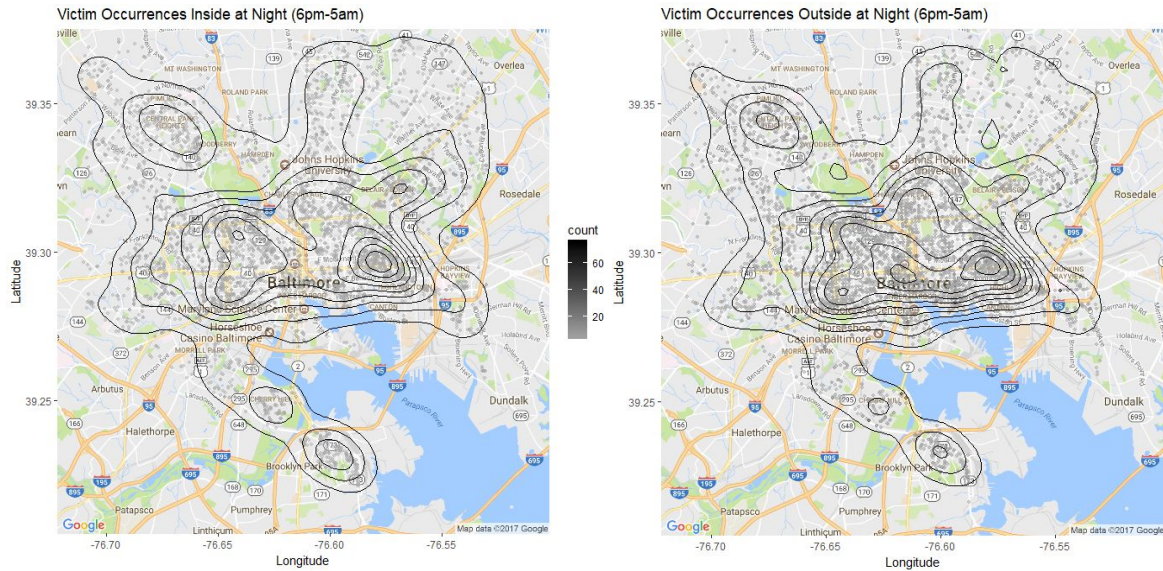
*Figure 6*

**Inside**: A high frequency of the crime happening inside at night is happening east of Inner Harbor. *__More police could be stationed in that area during these times for quicker response rates to the sce__ __and intervention of crimes.__*

**Outside**: Higher frequencies of crime happening outside at night are around Central Baltimore. *__More police can also be stationed here at these times as well as the addition of street lights if these areas are lacking some.__*
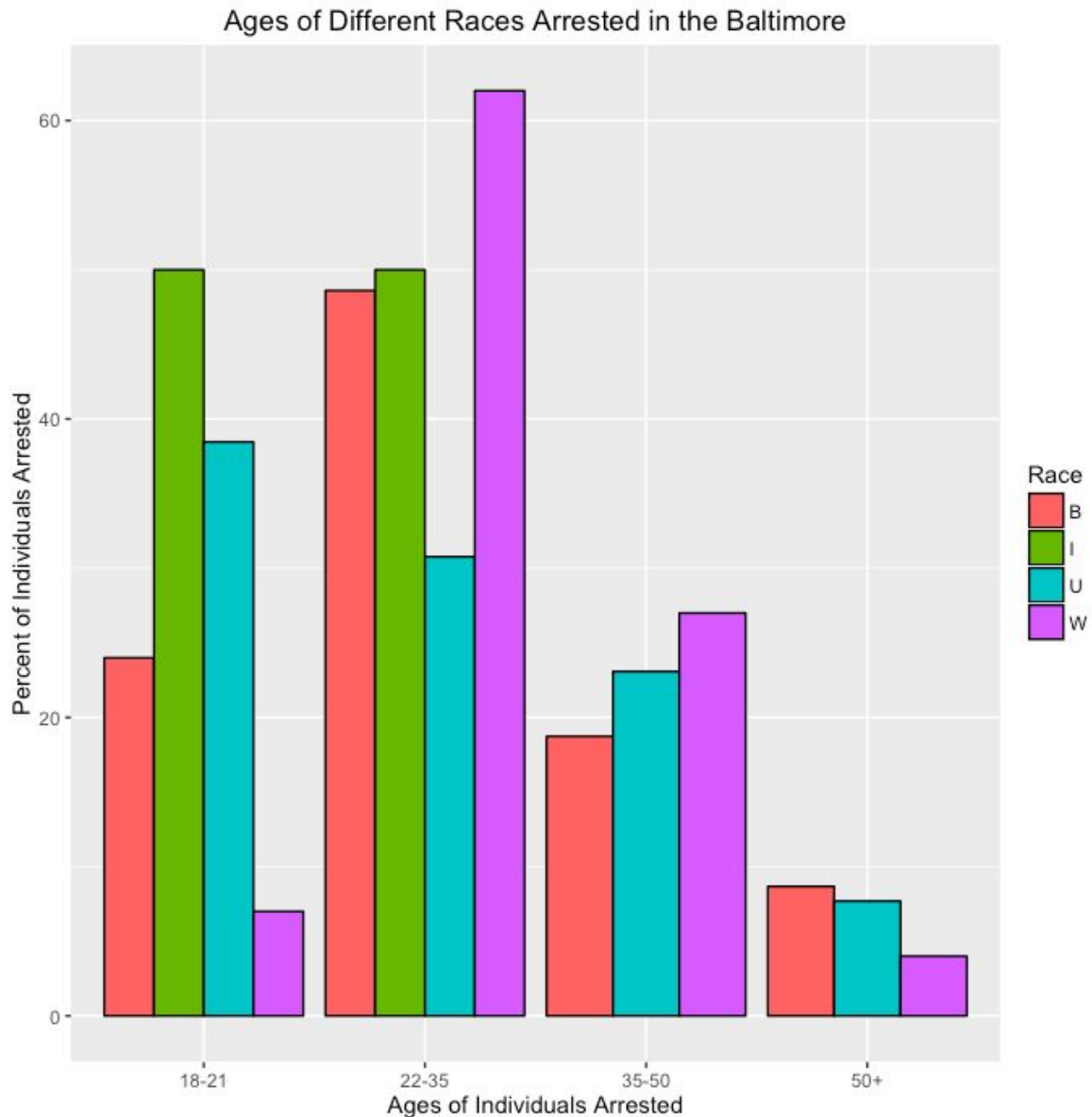
Ages of Different Races Arrested in the Baltimore

*Figure 7*

- Crime committed more by White people than Black people in half of the groups despite "popular belief"
    - 50+: only group that Black people committed the most crime
    - Many of the arrested are younger than 35

*Funding youth programs & schools to promote non-gang related activities*

*Could decrease crime especially for ages 18-21, could impact the succeeding age groups, approach's impact may not be able to be seen until several years pass*

## Summary

- Assign officers more efficiently according to location, day/time of day, season, and location of headquarters
- Prepare officers in accordance to their assignment areas and needs
- Provide better support for citizens and target programs for groups most frequently involved in crimes
- Allocate more resources to locations that have higher densities of certain types of crimes
- Place stations based on crime densities for more effective and faster response rates