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# PREDICTING GUN VIOLENCE IN CENTRAL PHILLY

Using data from North Philadelphia that includes demographics, conditions and point data of reported aggravated assault with a firearm, this analysis will create a model that predicts the likelihood of gun violence in Central Philadelphia. Throughout this analysis, layers such as roads and incidents will remain present and may toggle between the colors of black and white for better visualization.

### North Philly: Percent of Population under age 5
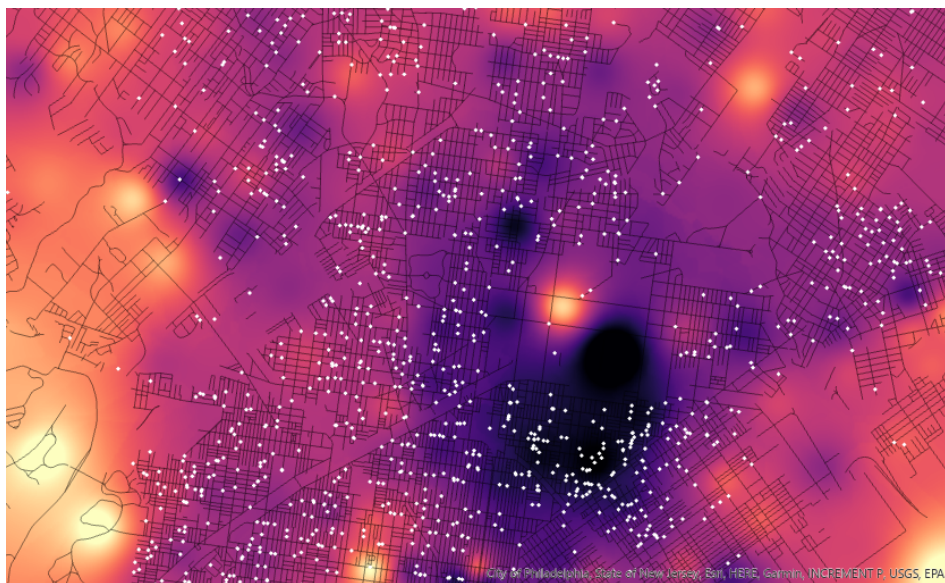
### North Philly: Percent with 2 years of college
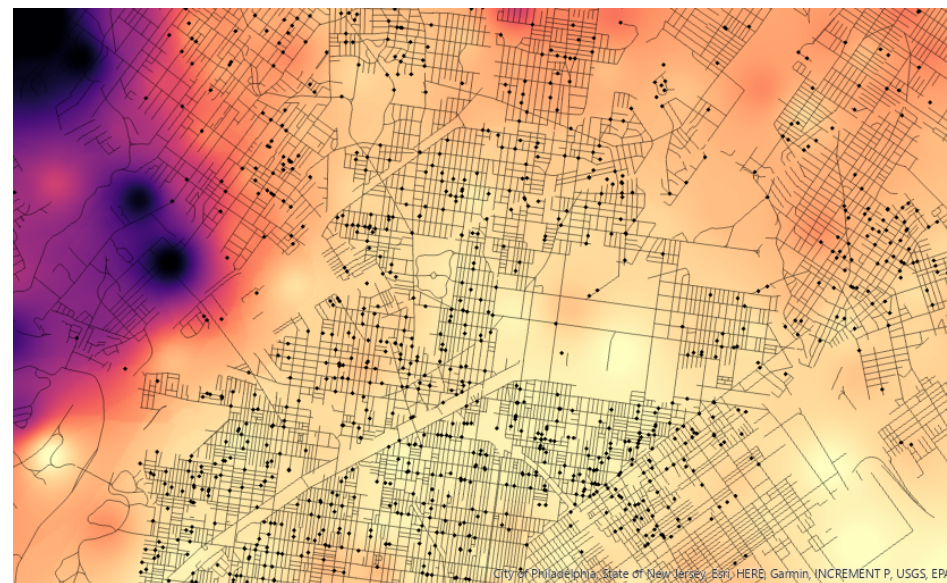


**Inverse Distance Weighted (IDW)** was applied to the following variables: percent of population under the age of 5, and the percent of population in college for at least two years. In the first map, there is a clear overlap between reported assault and areas with a high percentage of population under the age of 5. This is inversely seen in the second map as there is low reported assault in areas with a high percentage of the population in college for at least two years.

**Inverse Distance Weighted (IDW)** was also to the following variables: median rent and the percent of population under the poverty level. In the first map,reported assault is most likely to occur in areas with lower median rent price. This is almost identical to the second map as reported assualt has a higher likelihood in areas where the majority of the population is under the poverty line.

## North Philly: Median Rent
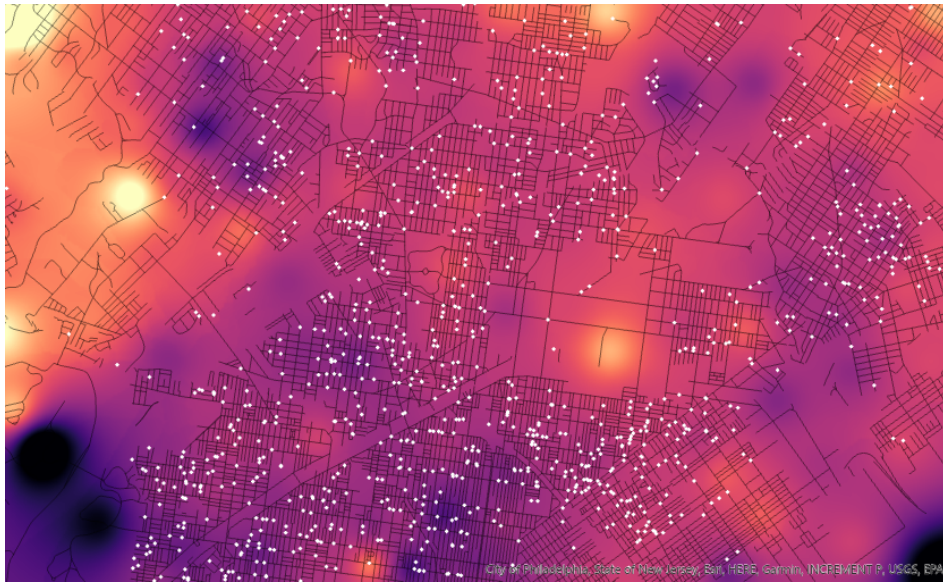
## North Philly: Percent under poverty level



High

Low
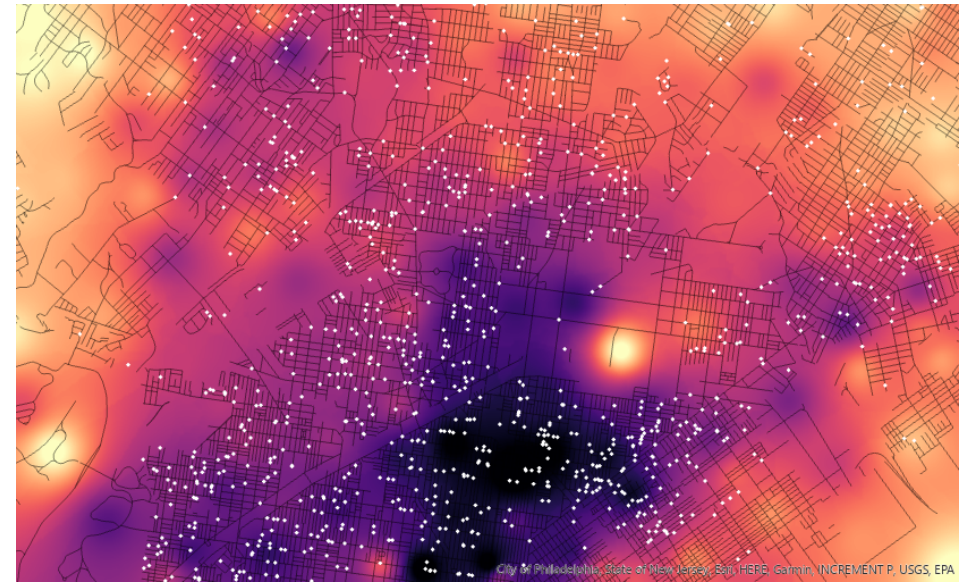
Looking at the IDW analyses the variables that yield the highest correlation with reported assault with a firearm includes: percentage of population under the age of 5, percentage of population with at least two years of college, and the percentage of population under the poverty level.

## North Philly: Percent Asian



**Kernel Density** was applied to factors around race. First examining Asian, there is a slight overlap between the Asian population and reported assaults in pockets of the northernmost point in north Philadelphia.

## North Philly: Percent White
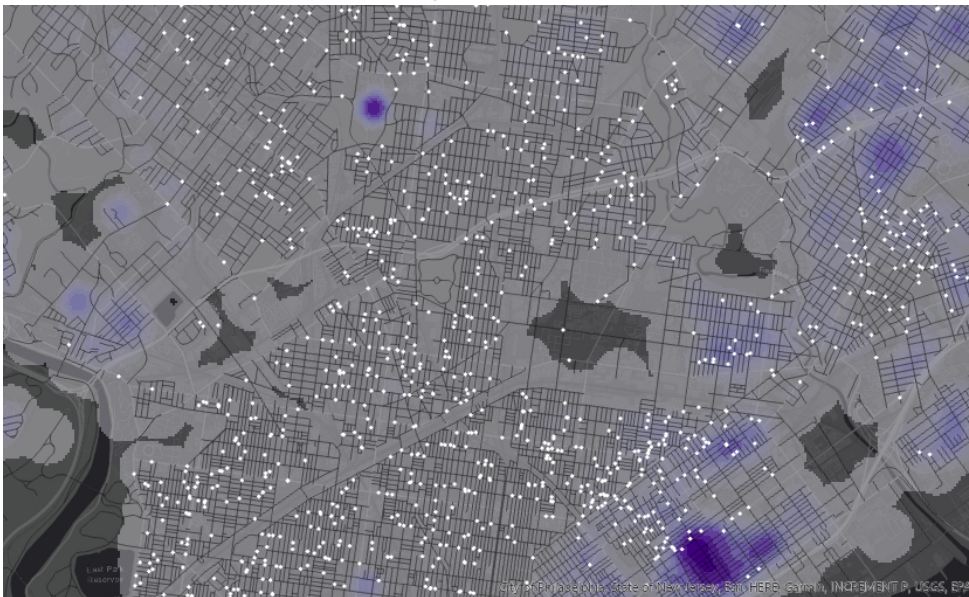


**Kernel Density** used on the percentage of White population shows clear results. In all pockets with a high percentage of the population being white, there are almost no reported assaults with a firearm.

## North Philly: Percent Black



## North Philly: Percent Hispanic



**Kernel Density** then applied to the percentage of the population identifying as Black has a direct correlation with reported assault with a firearm. This is particularly evident in the southwestern corner of north Philadelphia.

**Kernel Density** for the Hispanic community yielded similar results to the percentage of the population identifying as Black, and this is evident in the central part of north Philadelphia.

The use of kernel density on race variables such as the percentage of the population that is Black or Hispanic begins to display a spatial pattern of where the reported assualts with a firearm occur.

Prior analysis showed that poverty, percentage of population under the age of 5, percentage of population with at least two years of college, Black population, and Hispanic population follows the spatial pattern of assault with a firearm.
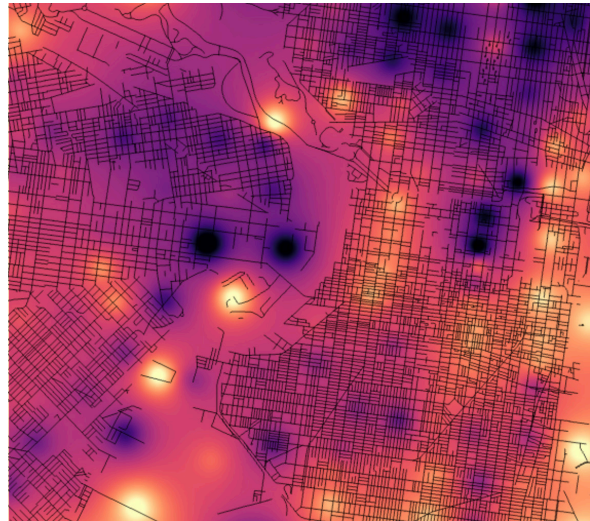
To test this, **Iso Cluster Unsupervised Classification** was used to combine these variables and produce the following analysis. Seeing that these factors follow the spatial pattern, we can use these same variables in a different part of the city to predict future possibilites of assault with a firearm.
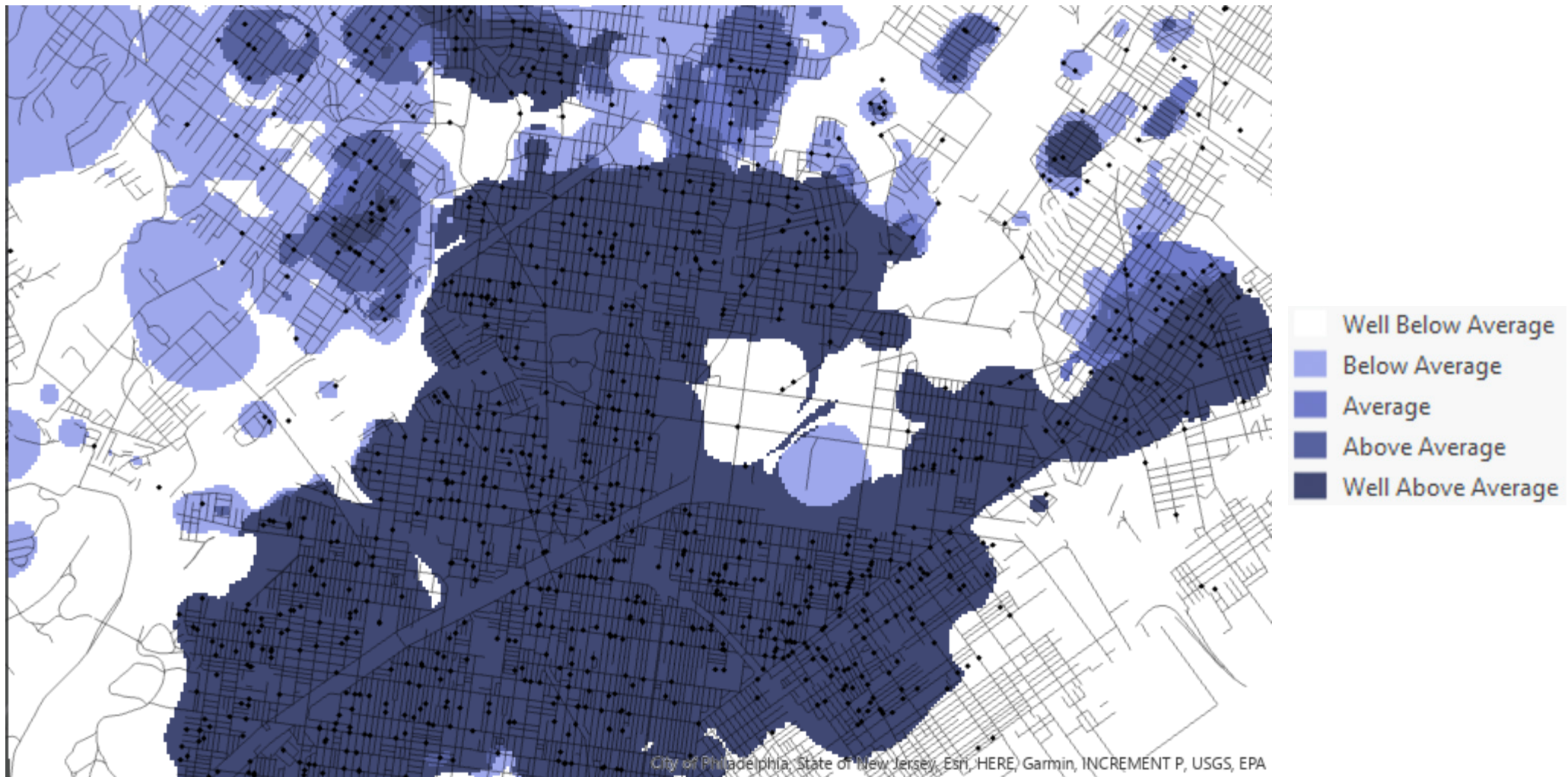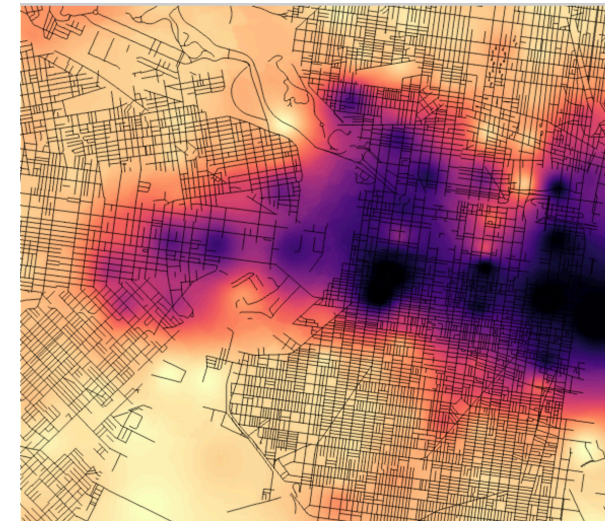
**Central Philly: % under age 5**
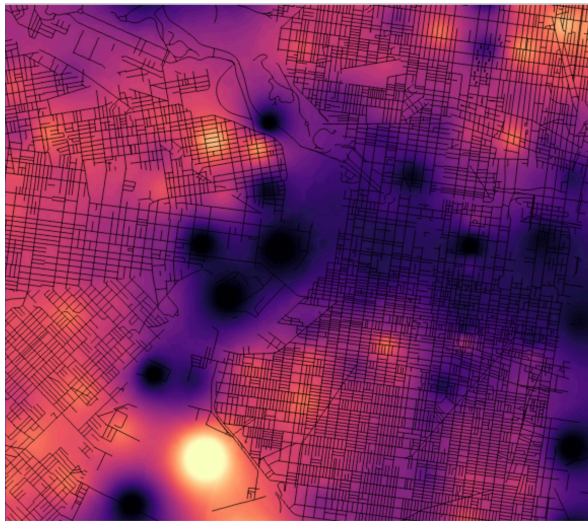
**Central Philly: % Poverty**

**Central Philly: % 2yrs College**

As a result of the analysis in north Philadelphia, **Inverse Distance Weighted (IDW)** was only used on the variables: percentage of population under the age of 5, percentage of population under the poverty level, and the percentage of the population with at least two years of college.

**Central Philly: % Black**

**Central Philly: % Hispanic**

As a result of the analysis in north Philadelphia, **Kernel Distance** was only used on the variables: percentage of Black population and percentage of Hispanic population.

**Iso Cluster Unsupervised Classification** was used to combine these variables and produce the following analysis.



Legend:
- Well Below Average
- Below Average
- Average
- Above Average
- Well Above Average
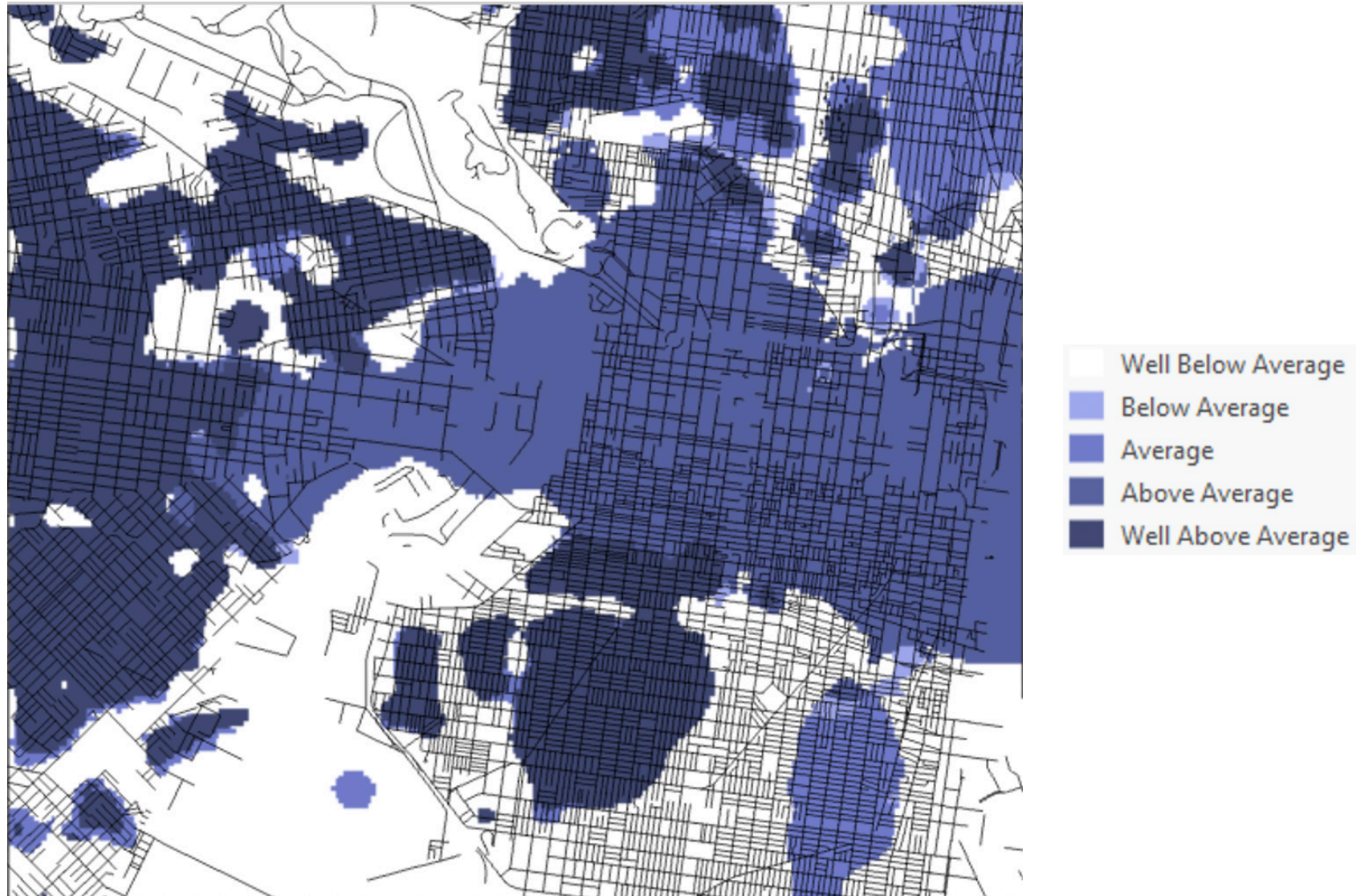
The data in north Philadelphia was able to provide a model for the likelihood of the occurance of assault with a firearm for central Philadelphia. It was found that the spatial pattern for the occurance of a assault with a firearm would happen in areas with a high percentage of the population under the age of 5, a low percentage with two years of a college education, high percentage of poverty, and high perctanges of Black and Hispanic populations.