

How Streetlights Deter Crime

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Introduction

We have attempted to figure out which factors influence crime, and what direct measures can be taken to limit the problem.

Through our use of datasets provided by The City of Boston, we have been able to map crimes to a number of other relevant traits, and from that deduct if there is a correlation.

Datasets

We used the *Crime Incident Reports* provided by the Boston Police Department, which contain all official crime reports, as the foundation for our research.

In addition, we also looked at the *Streetlight Locations*, *Boston District Stations*, *Food Pantries*, and *Property Assessment* datasets.

Transformations

Using the *Pearson Product-Moment Correlation Coefficient* we have been able to calculate the correlation between our datasets.

$$\rho(x, y) = \text{cov}(x, y) / (\sigma(x) \cdot \sigma(y))$$

Results

Due to the poor quality of certain datasets, we were only able to confidently confirm a relationship between crime and streetlights.

Mapping crime to streetlights gave us a linear correlation of **-0.85**, which proves a relationship between the two. In other words, *the more streetlights the less crime*.

Proving that streetlights indeed defer crime, we are now able to create visualizations that can be used to make real-world suggestions on how to limit the problem.

The heat map visualizes areas with more streetlights as warmer, while plotting individual crime incidents as points. Areas with more crime are generally under-lit compared to other parts of the city.

Though there are more factors at play, this allows us to make suggestions as to which areas could benefit from more thorough research, and potentially more streetlights.

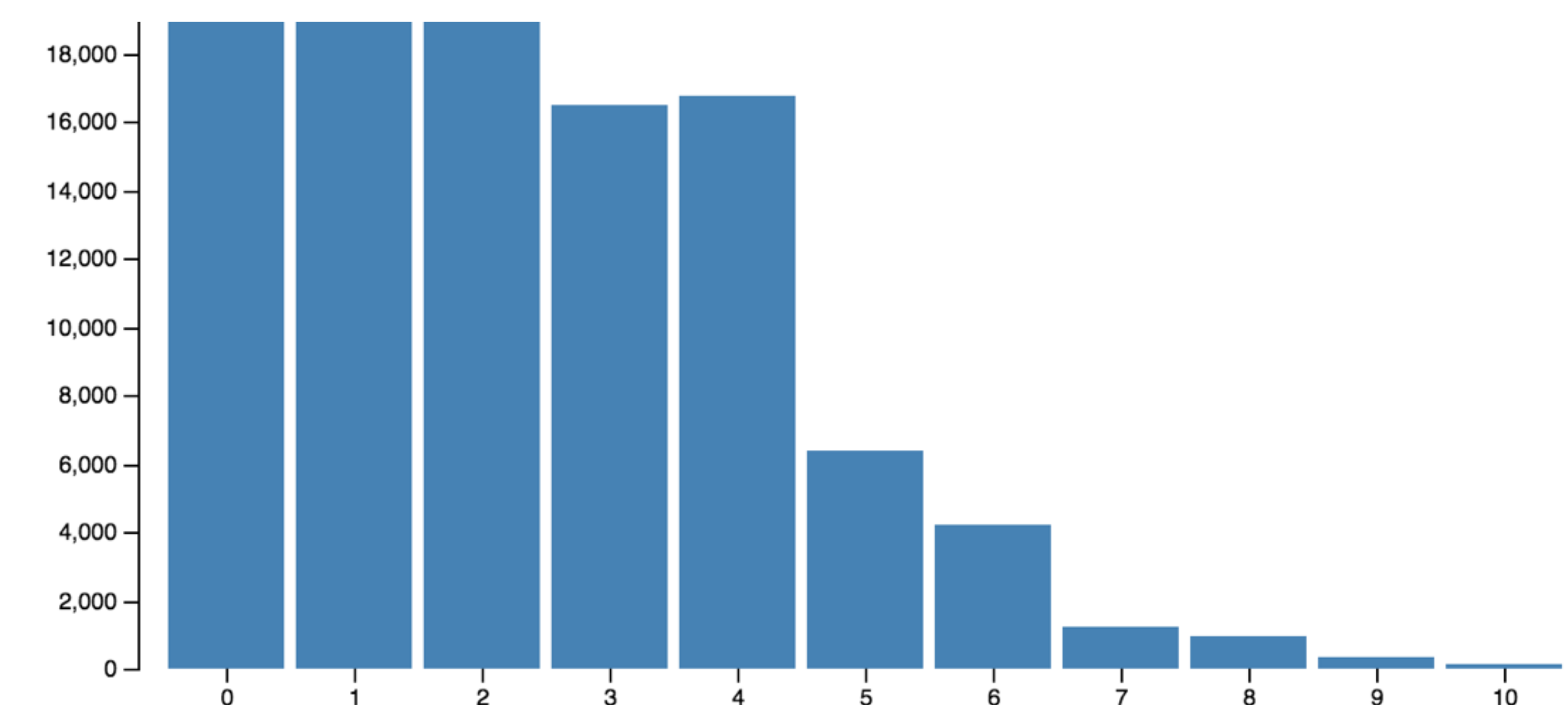


Figure 1: bar chart plotting y number of crimes in close proximity to x number of streetlights.

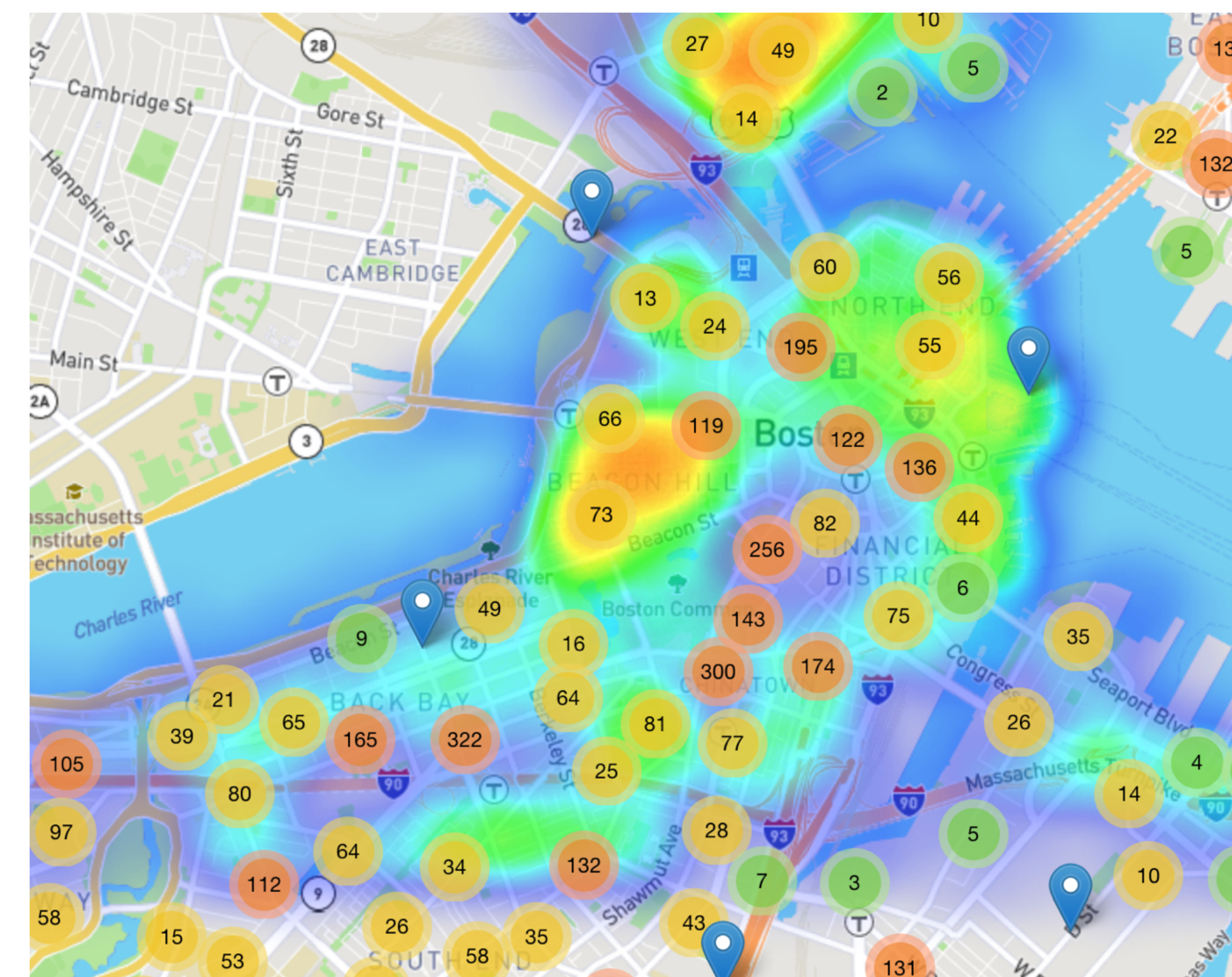


Figure 2: heat map visualizing higher concentration of streetlights as warmer and crimes as individual pins.