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MS Business Analytics and Project Management

OPIM 5501 Visual Analytics,

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Project#2

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Predictive Policing in Hartford

Project Report

# **Executive Summary:**

The city of Hartford is the capital of Connecticut and has a population of 125,071. It spans 17.95 sq. mi, an area which has been divided into 6 police districts and 15 neighborhoods. In spite of having 445 police personnel, the highest in Connecticut, the crime rate is 147% more than the state average. An average of 369 crimes per sq mile results in Hartford ranking 139 among 169 places in Connecticut in terms of safety. There is an undeniable crime problem in the City of Hartford. The Hartford Police Department needs to be armed with the right information about the prevalence and trends in crime so that they can efficiently deploy their resources to curb its growth. We, as Visual Analysts have used advanced visualizations to bring their attention to problem areas and recommend predictive policing techniques to reduce crime. Our major insights were derived from weekday and hourly level crime trends in different neighborhoods and areas policed by the 6 stations. We found that the South Area 6 station, which polices the most neighborhoods in Hartford, displays the fastest rising crime trends. We also found how crime trends influence population and hence in the long run the real estate industry. Using the findings of our project, the Hartford Police Department can ask the right questions and thus address the problem areas more effectively.

# **Data Description**

We aggregated data from multiple sources. Our main dataset came from the Hartford Public Data Website which had the details of reported Police incidents. We aggregated some publicly available demographic data along with the Police stations data to complete our analysis.

## **Dataset details**

1. Reported incidents of crime (with the exception of sexual assaults, which are excluded by statute) that occurred in the City of Hartford from 2005 to the present. Data is taken from data.hartford.gov and contains more than 400,000 records. Major Fields includes Data & time of crime, location of crime, neighborhood of crime, geocode of crime location, and type of crime.
2. Neighborhood level Census of 2010, 2015 that includes population, area of different neighborhoods

# **Process**

Our goal was to provide actionable insights to the Hartford Police Department on the trends in crime based on time of day, day of the week, month; neighborhood or location drilling down to the street level. For this reason, we had to ensure Police Incidents data is in the right shape to enable the drill down. Once we had cleaned the Police Incidents data was in the right format and shape, we integrated the neighborhoods’ demographic data with the Police Incidents data. We then extracted information on Police Stations in Hartford, coded them manually into our Police Incidents dataset for the purpose of analysis. Once the data was brought in from all sources and aggregated, we decided to follow the drill down approach of analyzing trends in crime. We started with representing crime trends in the areas controlled by the Police Stations with the ability to drill down to the time of day. Same approach was adopted for Neighborhoods drilling down all the way to the Streets. Finally, in order to analyze the interplay between crime growth and population growth, we plotted the points on a scatter plot to give us a better picture of the relationship.

# **Major Findings**

1. As weekends approach, crime rises steadily especially during the latter part of the day with Downtown Hartford being especially vulnerable.
2. Violent crime has gone up significantly over the last 5 years.
3. Weather seems to have an effect on trends in crime.
4. There is a strong inverse relationship between population growth and crime growth.

# **Challenges Faced**

1. Bringing data together from different sources
2. Inability to find 911 calls data
3. Inability to find detailed demographic data at the neighborhood level
4. Inability to demarcate neighborhoods on the Tableau maps

# **References**

<https://data.hartford.gov/Public-Safety/Police-Incidents-01012005-to-Current/889t-nwfu>

<http://www.neighborhoodscout.com/ct/hartford/crime/>

<https://www.cga.ct.gov/2011/rpt/2011-R-0194.htm>

<http://www.hartford.gov/images/police/crimeanalysis/2015/Compstat-website%2012-13-15%20to%2012-19-15.pdf>

<http://www.city-data.com/>

<https://github.com/jayachandrabalusu/WebsiteIndicators/tree/master/NeighborhoodProfiles>