Introduction

The growth and development of cities and neighborhoods tend to stretch the resources not only in terms of infrastructure but also in terms of policy services. In an ever-changing world, there is inadequacy of control on the crimes and its different qualities. In the modern era, urbanization and other developments seem to have a consequent impact on the number and emergence of crimes, norms and policy laws.

Population and Crime: Can we relate them?

A lot of theorizing has been done in the past to correlate urban population size with crimes. Characterized by "anonymity", large cities are known to have more reported crimes (more cars to steal, more robberies, etc). The sense of anonymity also stretches to juvenile delinquency. In small town, any crime or wrong-doing by a juvenile would be reported back to his parents. However, in the case of large cities, such cases would rarely get reported; more so the people walking around or bystanders might probably not even recognize a juvenile and thereby nothing much can or will happen in a populated area. Thus, the primary social control in big cities is generally weak. This policy brief seeks to understand the relation between population size and criminal activity. The objectives include:

- Determining the population size for each of the boroughs.
- Map and highlight the prevalence of crimes in New York City. Correlation between the population size and criminal activity based on numerical and graphical analysis.
- Assessing the effectiveness of preventive measures against criminal activities. Recommendations for betterment of life and safety of society.

Crime Highlights of New York City

When speaking of crime in New York, the first thing that comes to mind is the major policy move initiated in the 1990's called the "broken windows" approach which led to a beneficial reduction in crime. The policy was based on disorder (eg. broken windows) which could result in serious crimes. Disorder not only results in serious crimes but can spread fear, disarray and

withdrawal from residents which allows more serious crimes to crawl in due to lack of informal social control. Formulated by James Wilson and George Kelling, the "broken windows" approach was based on the metaphorical expression relating to tracking down crimes such as panhandling, public drinking, and prostitution among many others. It was directed by the then Police Commissioner, William Bratton. However a few years following its initiation, there have been flaws pointed out and certain criticism has prevailed although the effects on lowering crimes were greatly applauded for.

Over the recent years, crime rates have dropped drastically. Recent reports also state this to be "an unbelievable drop" and as of 2017, have called it "the lowest since the 1950s".

Analysis and Datasets

So how does population density and crime relate to each other? As mentioned earlier, a lot of theories and research has been carried out in the past, although there have been debates on such an analysis. It is challenging to find out such a relation because in reality there have been differing views on such a topic.

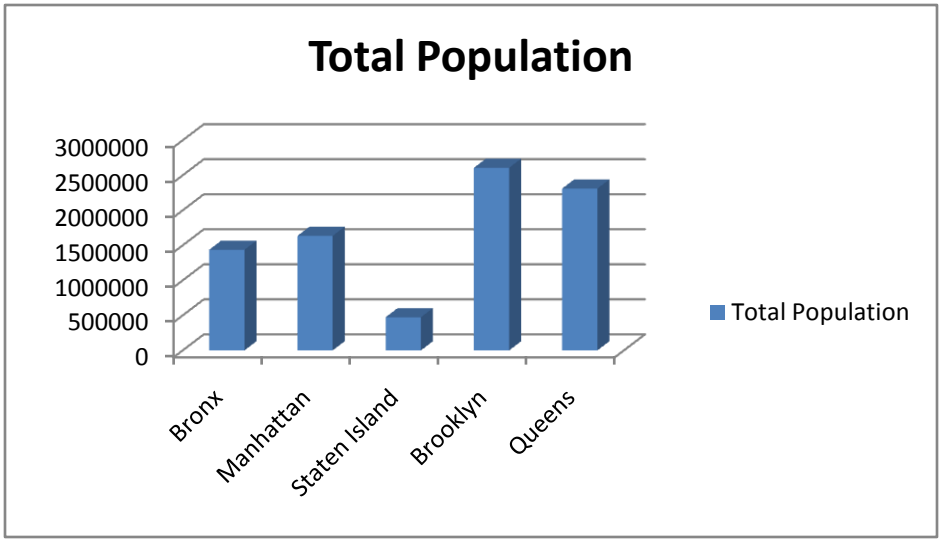
The ACS is a nationwide demographic survey conducted by the census of the United States. The data is open source and easily presentable. The spatial patterns of crimes have been analyzed using the crime values dataset which is open source and easily accessible. ESRI ArcGIS software was used for the trend analysis.

Taking inspiration from the "Hot Spots Policing" initiative proposed by the CEBCP (Center for Evidence-Based Crime Policy), the study involves determining crime hotspots in NYC. Hot Spots Policing involves the procedures whereby the police can focus on localized areas or small geographical units with high criminal activity. The statistical analysis with table and bar graphs are given below

NYC Boroughs	Total Population	Number of crimes reported
Bronx	1436785	8884
Manhattan	1634989	9411
Staten Island	473324	1856
Brooklyn	2606852	11543
Queens	2310039	7902

Figure 1. Table showing the total population and crimes reported for each borough in NYC

Figure 2. Bar graph of Total population



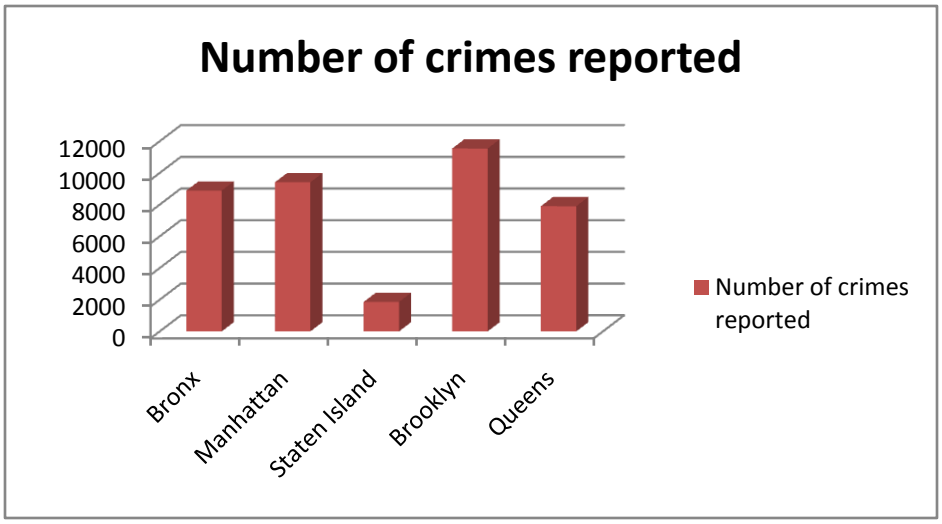


Figure 3. Bar graph of crimes committed

From the statistical analysis we would normally expect more number of crimes in highly populated areas. A few reasons to support this hypothesis are (Braithwaite, 1975):

- Higher crime rates reflect more police activity in larger states.
- In small communities, reports of criminal offenses are minimal. Also big cities might tend to attract criminals from rural areas and smaller cities.
- Poverty can be related to criminal activities. It is known that poor people from rural areas would migrate to larger cities.

If we look at Figures 2, we would expect high crime rates in Brooklyn, Queens and Manhattan in descending order. However, Figure 3 tells a slightly modified story; While Brooklyn has the highest reported crimes, Manhattan ranks second and followed by Bronx. For the purpose of better visualization, there are two maps attached with the report which gives us a better perspective. For simplicity, we have used population density and created a hot spot map.

For the sake of variety, a link between crime rates and land use/land cover pattern has also been visually analyzed in the maps attached with the report. This gives a better view of how crime links with the population and the urban developments in New York City.

Conclusion and Recommendations

From the population density map we find Manhattan, Brooklyn and Queens have larger population densities. The hotspot map highlights that the largest number of criminal activities are known to occur in Manhattan. Brooklyn is also shown to have high criminal rates concentrated as patches within its boundaries. In other words, it is acceptable to say that crime rates are high in regions with larger populations.

A study of crime rates in relation to Land Use/Land Cover has also been produced. With close examination of the maps attached with the report, the following deductions can be made:

- Majority of the area of Manhattan are covered with residential buildings. A small area is concentrated with office and commercial buildings. It is seen that a large number of crimes have been reported in these areas.
- Similarly in Brooklyn, we see a larger number of crimes taking place in residential buildings.

A few measures which can be implemented to curb or reduce crimes based on the results above are:

- In his paper titled, "Population Growth and Crime", Braithwaite suggests family planning incentives to put a check on population growth. This included the use of contraceptives, preventing unwanted births and reducing immigration.
- From the hotspot analysis, we can determine the areas of high criminal activities. Police officers can be given instructions to increase patrol time in these areas. In location-specific targets, cleaning up graffiti or demolishing abandoned buildings are some of the strategies which can be used to reduce crime.
- From the Land Use/Land Cover maps, an inference is made that a high number of criminal activities take place in areas with more residential buildings (one/two family buildings). Increase security and improving infrastructure around the building areas can bring a change.

In conclusion, although the relationship between population and crime is unequivocal at best, it can be significant for crime justice professionals and police to carry out statistical analysis and make comparisons of jurisdictional crime rates.

Bibliography

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Nolan, J. (2004). Establishing the statistical relationship between population size and UCR crime rate: Its impact and implications. *Journal of Criminal Justice, 32,* 547-555. https://doi.org/10.1016/j.jcrimjus.2004.08.002

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New York City Boroughs
N
W
E
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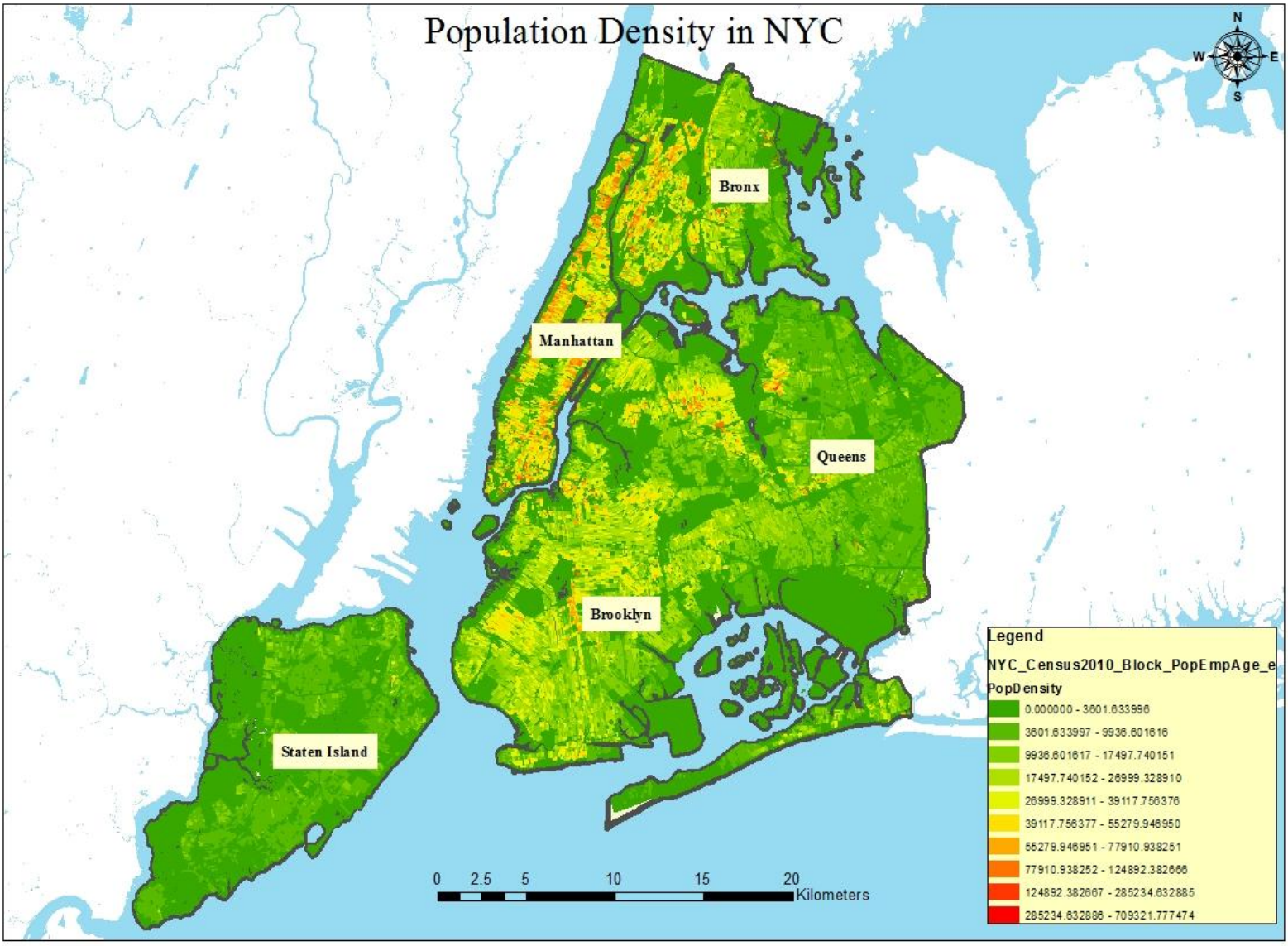
Bronx
Manhattan
Queens
Brooklyn
Staten Island
0 2.5 5 10 15 20
Kilometers


Population Density in NYC
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Bronx
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Queens
Brooklyn
Staten Island
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Kilometers
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3601.633997 - 9936.601616
9936.601617 - 17497.740151
17497.740152 - 26999.328910
26999.328911 - 39117.756376
39117.756377 - 55279.946950
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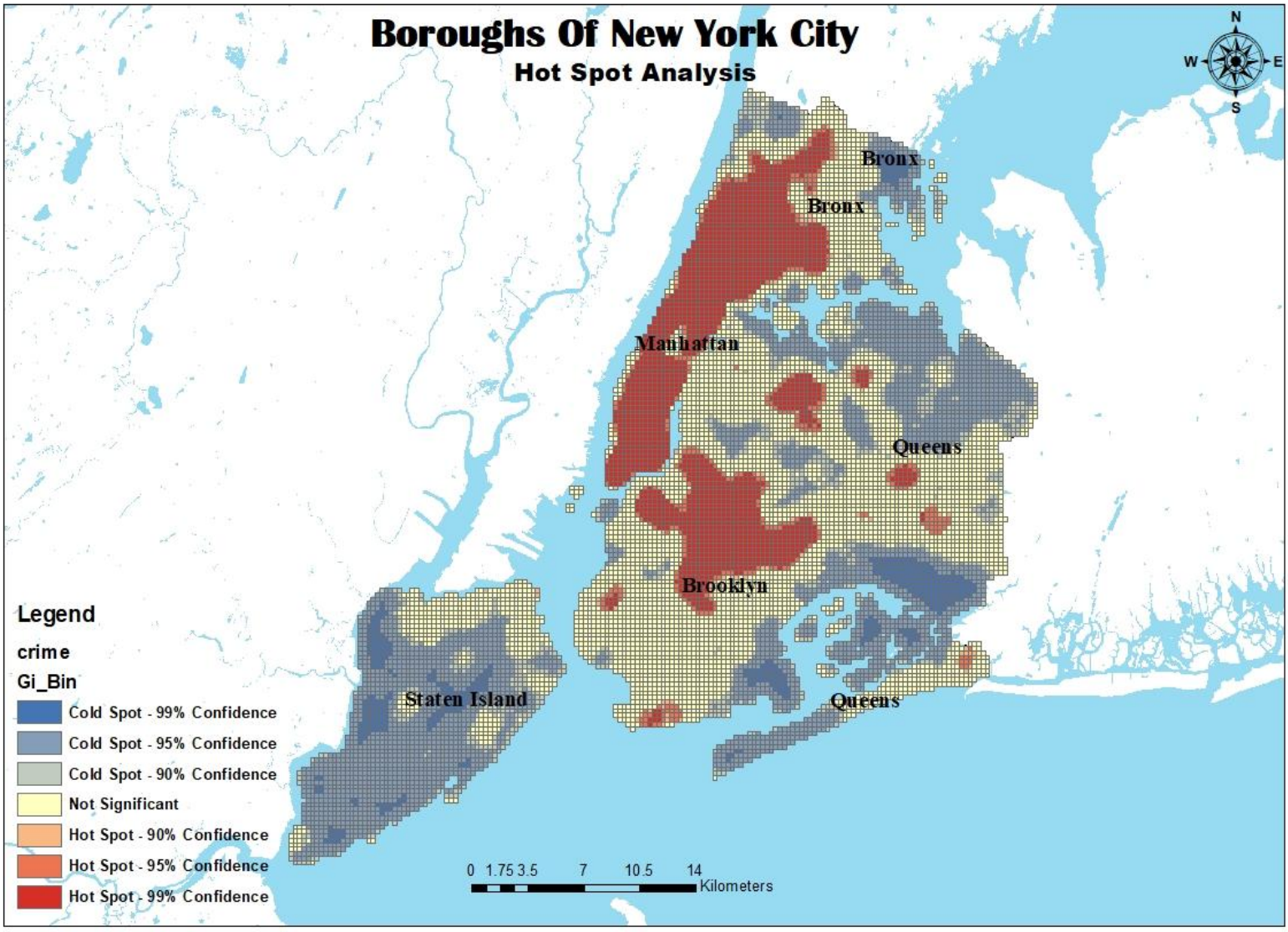
Boroughs Of New York City
Hot Spot Analysis
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W
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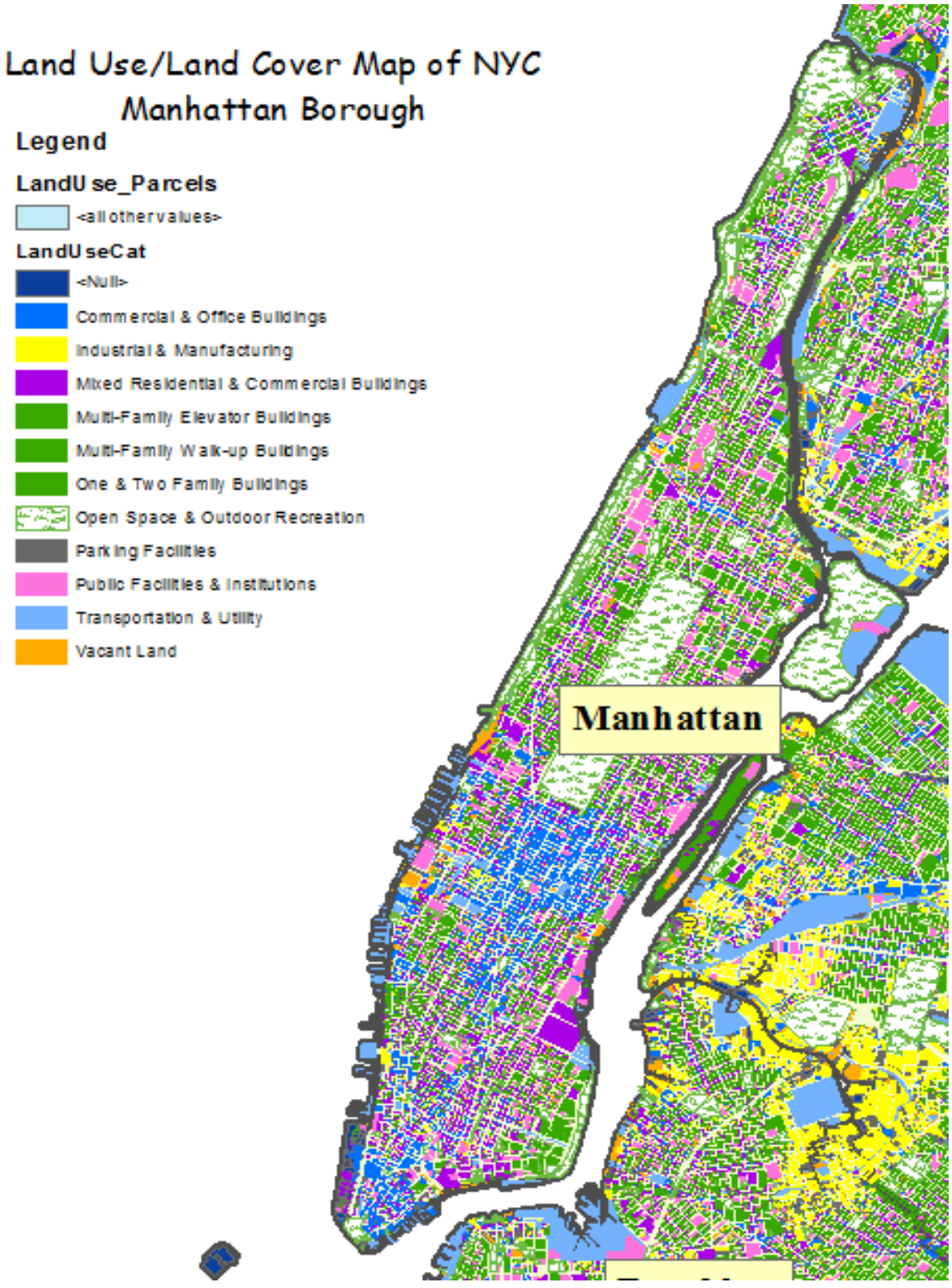
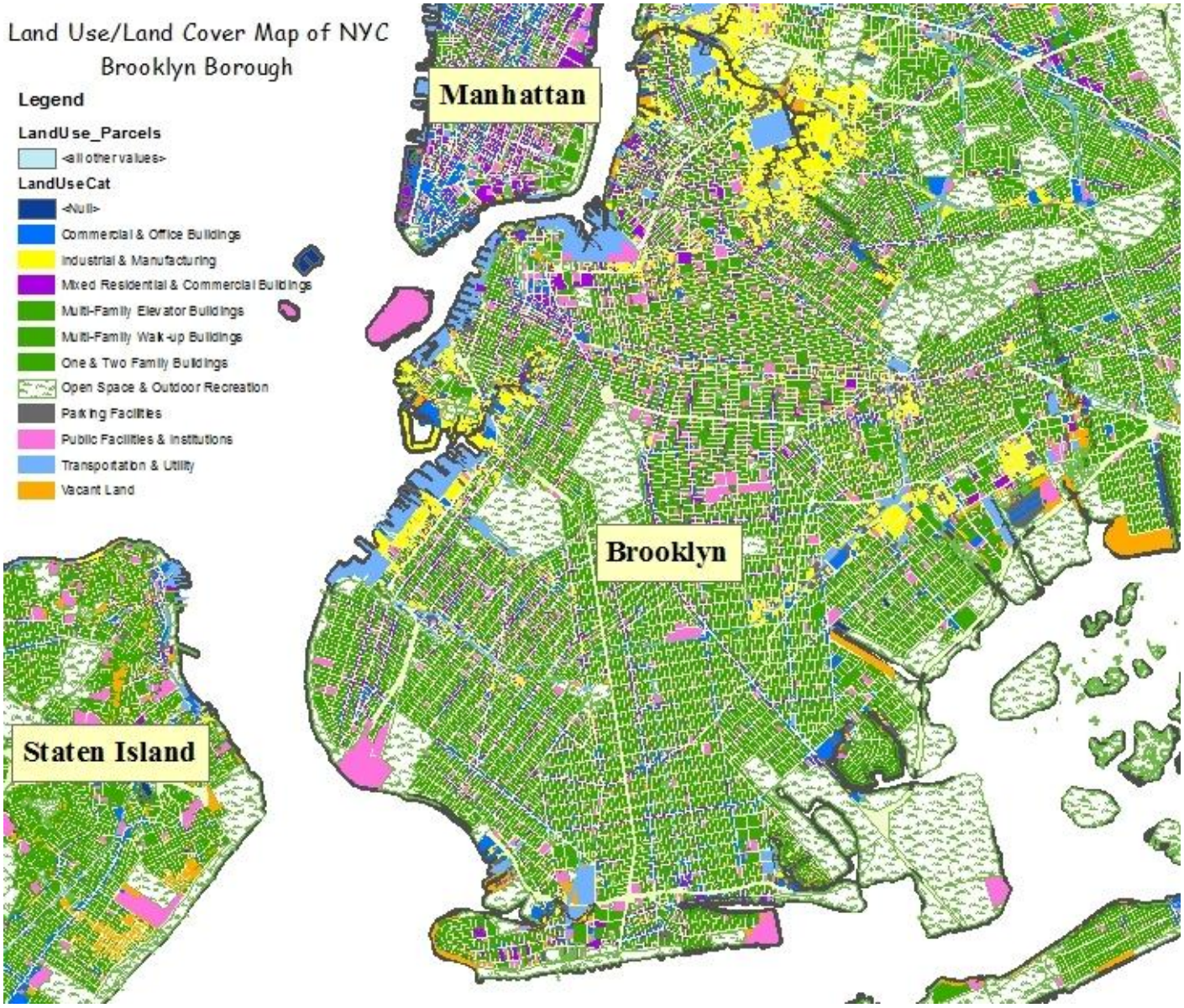
Bronx
Bronx
Manhattan
Queens
Brooklyn
Staten Island
Queens
Legend
crime
Gi_Bin
Cold Spot - 99% Confidence
Cold Spot - 95% Confidence
Cold Spot - 90% Confidence
Not Significant
Hot Spot - 90% Confidence
Hot Spot - 95% Confidence
Hot Spot - 99% Confidence
0 1.75 3.5 7 10.5 14
Kilometers

Land Use/Land Cover Map of NYC
Manhattan Borough




Land Use/Land Cover Map of NYC
Brooklyn Borough
Legend
LandUse_Parcels
<all other values>
LandUseCat
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Commercial & Office Buildings
Industrial & Manufacturing
Mixed Residential & Commercial Buildings
Multi-Family Elevator Buildings
Multi-Family Walk-up Buildings
One & Two Family Buildings
Open Space & Outdoor Recreation
Parking Facilities
Public Facilities & Institutions
Transportation & Utility
Vacant Land
Manhattan
Brooklyn
Staten Island