

**PPD 631 Geographic Information System Project**

**LA County Property Crime Analysis**

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## Introduction

Property Crime is a crime to obtain money, property or some other benefits, including burglary, larceny-theft, motor vehicle theft and arson.<sup>1</sup> According to California Department of Justice, the 2017 property crime rate in 2,491 per 100,000 residents, which is twice as much as violent crime.<sup>2</sup> Although the property crime rate has been decreasing since 2011, California's property crime rate is still above the national rate and ranks 25th among all states<sup>3</sup>. Meanwhile, the implement of 2014 Proposition 47 which is reducing the penalties for certain lower-level drug and property offenses rises public concern about property crime. A study conducted by PPIC shows Proposition 47 contributes to a rise in larceny thefts, which increased by roughly 9% after 2014.<sup>4</sup> Therefore, in order to identify the triggers/ factors of property crime, this project using the ArcGIS as a tool to analyze the relevance between property crime and socioeconomics conditions such as poverty in LA County.

## Data Source

Simply Analytics. “# Property Crime, 2016”. Accessed April 21, 2019.

Simply Analytics. “% Education Attainment, < High School, 2016”. Accessed April 21, 2019.

Simply Analytics. “% Employment, Unemployed, 2016”. Accessed April 21, 2019.

Simply Analytics. “% Population in Poverty, 2016”. Accessed April 21, 2019.

## Methodology

After reading some articles, I identify several related factors including poverty rate, employment status, and educational background as the variables to analyze the relationship between these variables and property crime rate. The steps to process data and generate GIS map is followed.

1. Setting Light Gray Canvas as base map.
2. Importing Property Crime Index, % Education, < High School, % Population in Poverty and % Population in Unemployment Status map data obtained from Simply Analytics
3. Using 2016 Property Crime Index in LA County as the main map layer
4. Adding graduated colors to show the distribution of property crime frequency in different cities, I add graduated colors to visualize
5. Adding three layers and using proportional symbol to visualize the geographic distribution of Poverty, Unemployment, Education<High School rate in LA County.
6. Adding legend, miles, direction, titles, and sources

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<sup>1</sup> FBI. “Definition of Property Crime.” <https://ucr.fbi.gov/crime-in-the-u.s/2010/crime-in-the-u.s.-2010/property-crime>

<sup>2</sup> Open Justice. “Crimes Statistics: Crimes & Clearances.” <https://openjustice.doj.ca.gov/crime-statistics/crimes-clearances>. 2017

<sup>3</sup> Public Policy Institute of California (PPIC). “Crime Trends in California.” <https://www.ppic.org/publication/crime-trends-in-california/>. October 2018.

<sup>4</sup> Public Policy Institute of California (PPIC). “The Impact of Proposition 47 on Crime and Recidivism.” [https://www.ppic.org/wp-content/uploads/r\\_0618mbr.pdf](https://www.ppic.org/wp-content/uploads/r_0618mbr.pdf). June 2018.

## Analysis and Findings

Figure 1 Distribution of Property Crime Cases in LA County

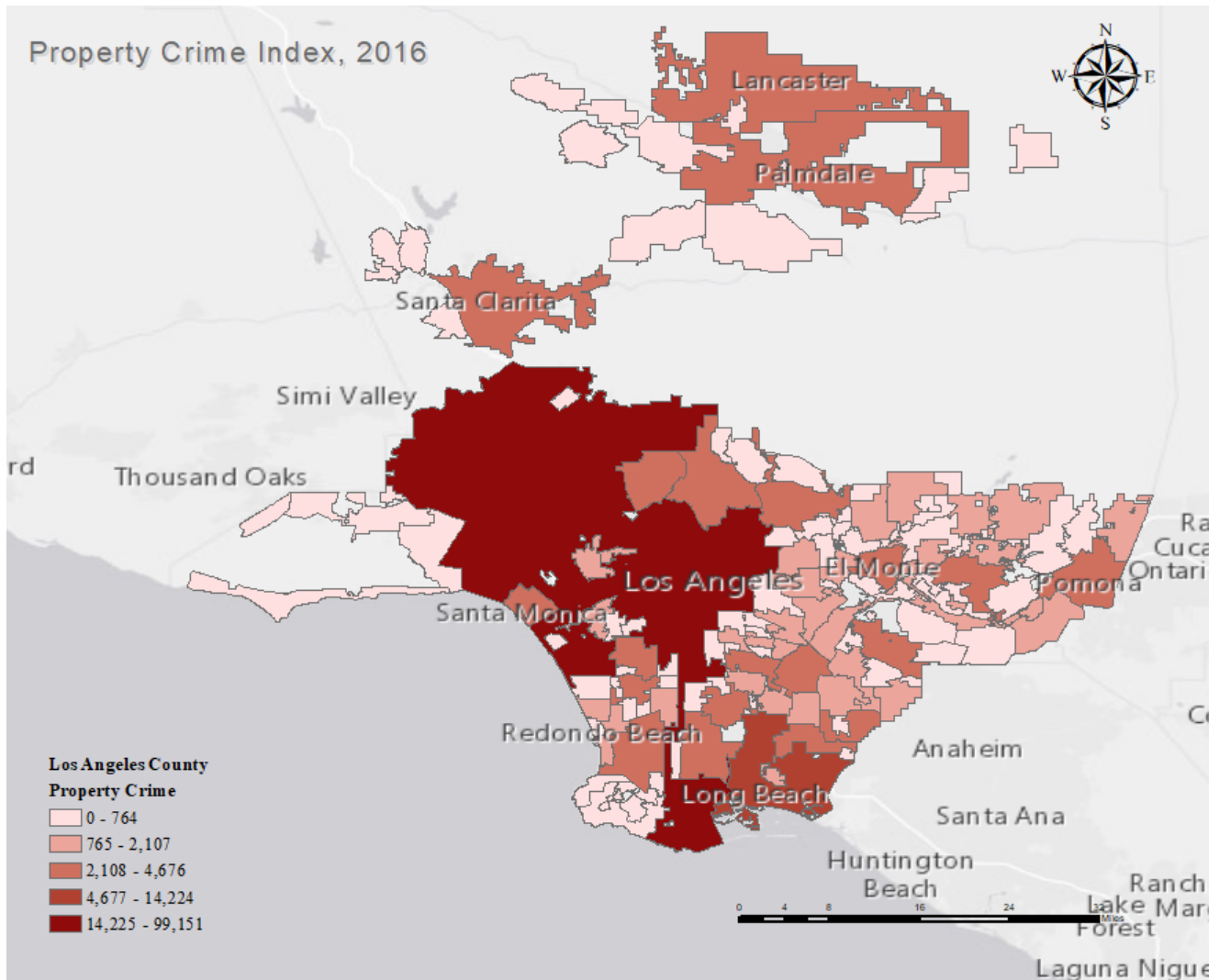
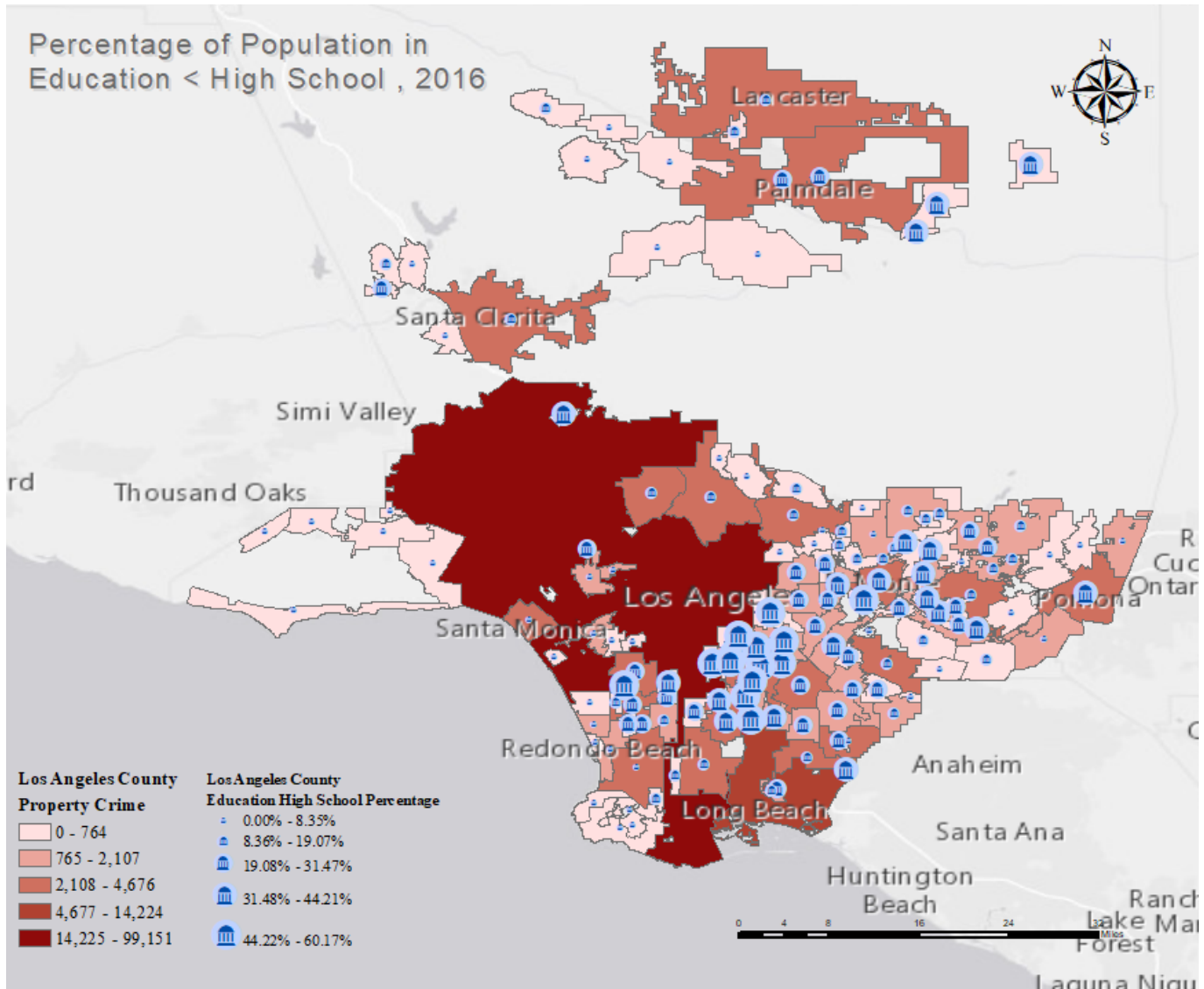


Figure 1 shows the distribution of property crime cases in LA County sorted by different cities. From this, we can see Los Angeles City has the highest number of property crime cases in 2016 and some cities in Northeast such as Burbank, Glendale and Pasadena and some in the south such as Long Beach are reported has high amount of property crime. On the contrary, some cities like Malibu have low property crimes. But Santa Monica which likes Malibu- a coastal city in the west, have comparable higher property crimes. Therefore, the geographic location is not determining the property crimes index and there are other factors affecting the crime in different city.

Figure 2 Distribution of Percentage of Population Without High School or Higher Education Background



In this Figure, the blue dots show the percentage of population with lower than high school education background. It tells that in the lower property crime area, the percentage of people without high school education is lower. For example, Rancho Palos Verdes, Whittier, La Habra Heights, San Dimas and Malibu have lower property crime frequency and lower percentage of education lower than high school. However, higher percentage of population having lower education doesn't mean to result in more property crimes. Santa Monica, Long Beach, Torrance and Beverly Hills have high percentage of population with high school or higher education, as well as high property crime frequency. In addition, the property crime frequency clusters area-the southeast area has average higher percentage of people without high school or higher education background. Offenders are transferable, meaning that they are possible to conduct

illegal behaviors in near cities, especially when other cities have high income community. Thus, the map indicates that education background related to the property crime, but its not the only factors.

Figure 3 Distribution of Percentage of Population in Poverty

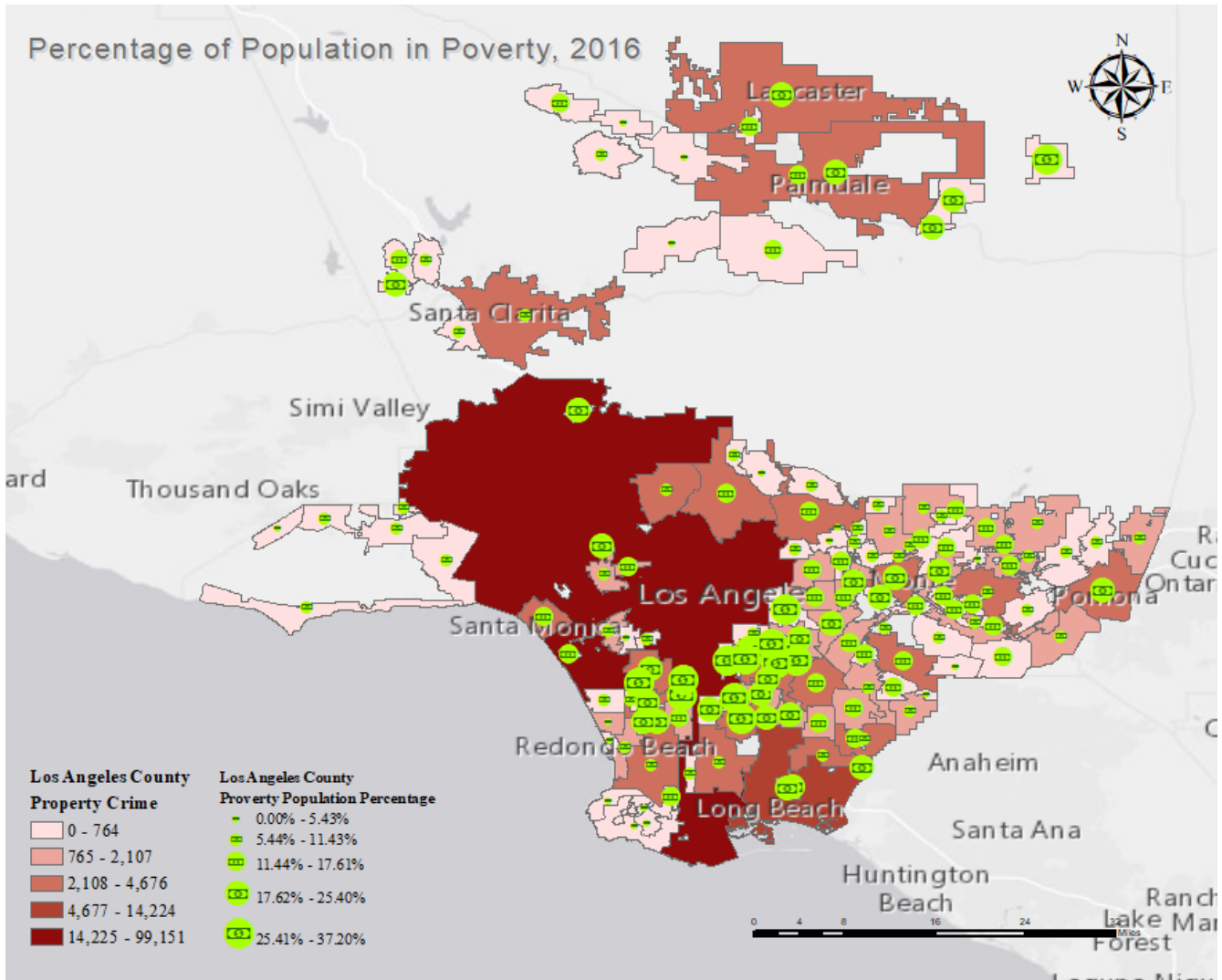


Figure 3 demonstrates the relevance between poverty rate and property crime frequency. The distribution of poverty rate is like lower education rate. The cities clustered in south LA County, especially those near Los Angeles have average higher population in poverty, as well as higher property crime frequency. Although Burbank and Beverly Hills have comparable low poverty rate, but it along with the cities have higher poverty rate, it can easily become the target of offenders. Since money and property are the benefits offenders looking for when they conducted burglary, and motor-vehicle theft, etc. For example, Beverly Hills has 6.32% of unemployed rate, 4.55% education< high school rate, and 9.29 % poverty rate which are close to South Pasadena city, however, the property crime index shows that Beverly Hills has over twice

amount of property crime cases than South Pasadena. One of the possible reasons is the average annual household income in South Pasadena is \$137,389, almost \$ 60,000 lower than Beverly Hills<sup>5</sup>. The offenders would target the nearest cities with higher income and conduct crime.

Figure 4 Cumulative Effect of Education < high school and Poverty Rate

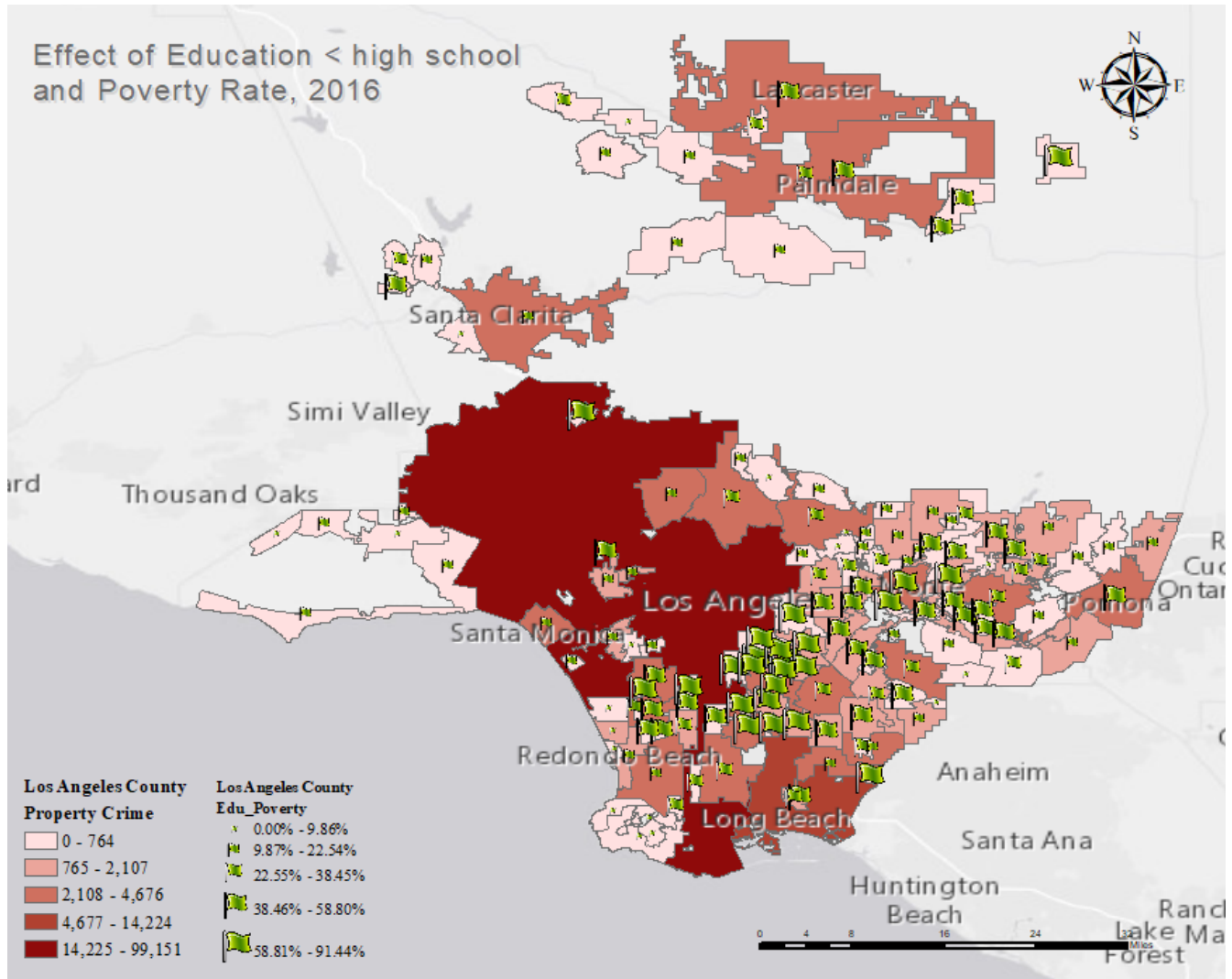
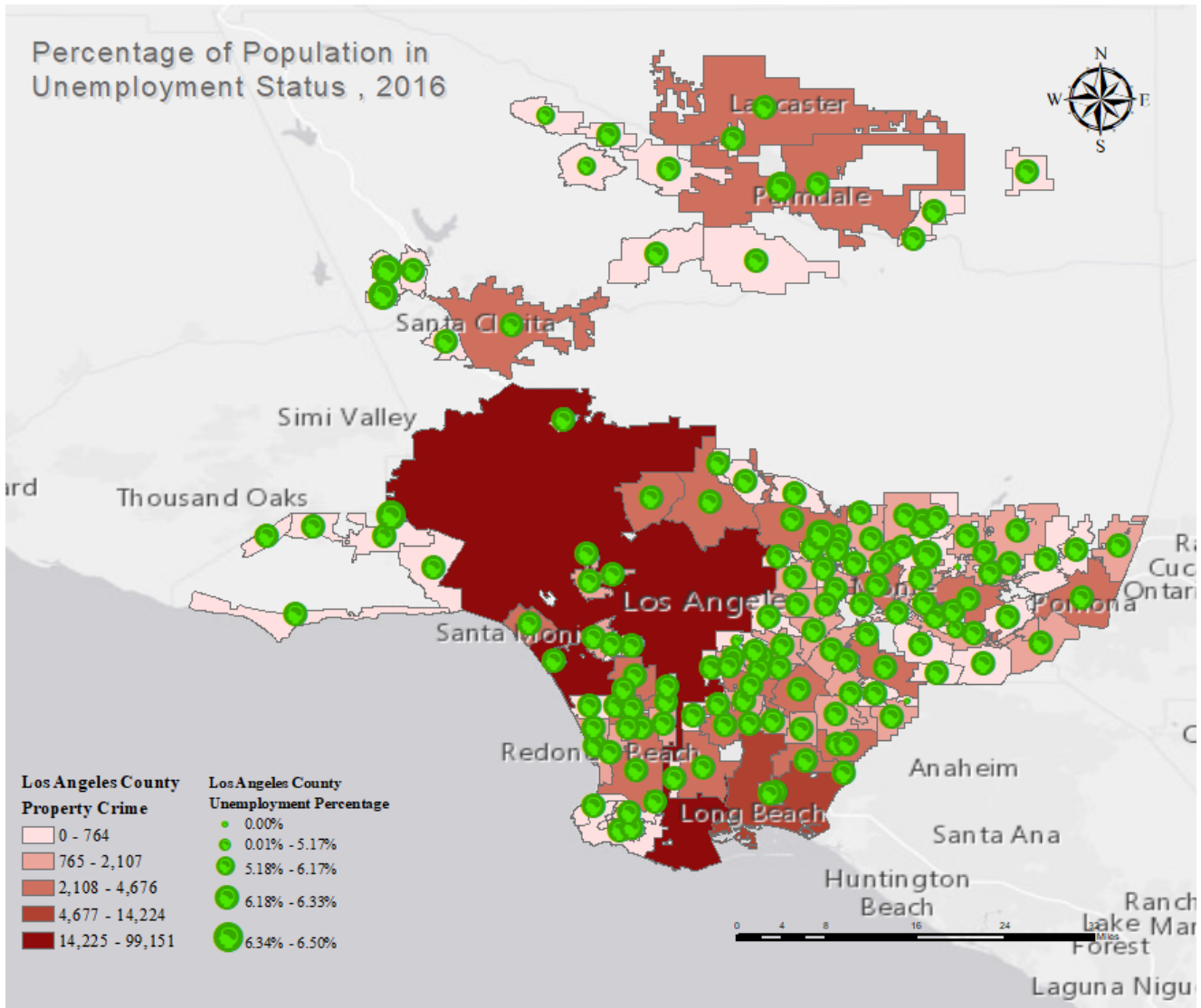


Figure 4 combines the percentage of poverty and low education rate to see the two factors collectively affect property rate. It tells that low education and high property are the two socioeconomic conditions causing cumulative effects on property rate. For example, in the property crime clutters, the south east part near LA city has comparably higher cumulative percentage of population with low education background and in poverty condition, especially comparing to the Rancho Palos Verdes district.

<sup>5</sup> Simply Analytics. "Average Household Income, 2016." Accessed April 21, 2019.

Figure 5 Distribution of Percentage of Population in Unemployment Status



The distribution of Unemployment Status can't tell the story of how unemployment triggers property crime. I think this is because of several reasons. First, the data I collected indicates that the average unemployment rate in LA county is 6.3% percentage, and more than 90% of cities range from 6.2%-6.5% of unemployment rate. There is not significant difference of unemployment rate between cities. What's more, unemployment status resulted from a variety of causes: labor force market and social economic condition. People who are unemployed might actively seeking job. According to a report, people who are unemployed and seeking work are no more likely to commit robbery or burglary than individuals with full-time jobs<sup>6</sup>. And those who are out of labor force for reasons that generally are not socially acceptable and are not looking or work, are most likely to commit burglary. Not all category of joblessness is relevant to crime.

<sup>6</sup> Aaltonen, Mikko, John M. MacDonald, Pekka Martikainen, and Janne Kivivuori. "Examining the generality of the unemployment-crime association." *Criminology* 51, no. 3 (2013): 561-594.

## Conclusion

According to the figures and analysis above, educational background and poverty are defined as strong relevant socioeconomic conditions of property crime. However, the general unemployed rate is not a strong variable to property crime frequency. Firstly, in the property crime clustered area, the lower percentage of people accepting high school or higher education, the higher frequency of property crime. But higher portion of people having higher education background doesn't mean to result in lower property crime rate. Secondly, poverty is also affecting property crimes. However, the distribution of poverty rate shows that the nearby cities' poverty rate could result in the high frequency of crime in a city. Also, we should consider poverty rate and average income together and investigate how the income inequality relates to property crime. If a city has high annual income and poverty rate, it might be the target of offenders in neighbor city. And the income inequality could be a trigger of property crime.<sup>7</sup> The unemployed data in LA County is not proved as strongly relevant to property crime. After a series of analysis, I find that property crime is a problem triggered by many socioeconomic factors working together. Based on my findings, I have some recommendations in reducing property crime. Cities located in south area of Los Angeles city is recommended to have more security sources to prevent property crimes. Governments should take actions in reducing poverty rate and encouraging their citizens to attend high school or high education, including giving financial support and employment guide. To decrease the frequency of property crime, some cities like Santa Monica, Pasadena, and Beverly Hills eliminate income inequality such as increasing minimum wage.

## Limitation

This project had some limitations. First, data access is limited. Other relevant factors such as drug overdose and Gini Index are unable to obtain. Unemployment data is a general data including all category of jobless individuals, if the data is more specific, the relevance between unemployment could be better analyzed. All the data is from 2016, it not the latest data, because property crime index 2018 is not accessible. Second, my GIS skill is limited. The visualization of map is not creative enough. Last but not least, analysis results and recommendations are not strongly supported by data, because the limitation of statistical analysis. The cause behind property crime is complicated and interacted, I'm unable to draw a supportive conclusion based on current findings. More researches are required to make effective recommendations.

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<sup>7</sup> Stack, Steven. "Income inequality and property crime: A cross-national analysis of relative deprivation theory." *Criminology* 22, no. 2 (1984): 229-256.



## Bibliography

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11. Simply Analytics. "% Population in Poverty, 2016". Accessed April 21, 2019.