Sam Wood

Jennifer Clarke

Stephen Mendoza

Nolan Hatch

**Analysis of Traffic Violations**

Introduction

Just about all of us have encountered a traffic violation. This makes traffic violations a social topic that many people discuss. With the discussion of traffic violations, people make predictions or try to see trends in why they may have received one. Our intentions on this project were to pick a series of questions to see if there are any trends in the amount of traffic violations issued.

Data Used

The best data we were able to find with traffic data was from Montgomery County MD. This listed every electronic traffic violation in the system since 2012. However, due to human error and other aspects of the data it did need to be cleaned. The data was cleaned using tableau and python techniques. The final data set used was still large with over 894,000 rows and 27 columns.

Analysis

1. Which Make of vehicle gets pulled over most often?

The traffic violation data was filtered by speeding violation type and then broken down into total vehicles pulled over for speeding and total vehicles that received a citation for speeding. A double bar graph was created to compare total stops to how many stops resulted in citations, and highlight any trends in increased citations for specific vehicle makes. The graph was limited to the top 24 vehicle makes with the greatest amount of speeding offences. The finding of this analysis shows that there seems to be no outlier vehicle make that is receiving more citations proportionate to the amount of times that make was pulled over for a speeding offence. Each vehicle make was let go with a warning almost as many times as they were written a citation. The even distribution of data makes for an interesting data point showing the consistency of police officers in Montgomery County MD when it comes to speeding stops and how many citations are given.

1. Which vehicle color gets pulled over most often for speeding?

There is a common perception that red Vehicles are more likely to be pulled over for speeding then others. In order to test this theory, we organized the Traffic violation data by color and filtered it down to speeding violations only. The percentage of each car color category was calculated and compared to a car color popularity study done by paint manufacturer Dupont in 2012. The findings of this analysis were surprisingly different from what the general perceived outcome would be. Instead of showing the red vehicles as being pulled over more frequently compared to the percentage of red cars on the road, it showed that the red vehicles were pulled over in proportion to the number of red cars on the road. In contrast, the blue and green vehicles were pulled over at a higher percent then the number of vehicles in those colors in the general population. Another notable finding from this data shows that White colored vehicles are far less likely to be pulled over when compared to the number of white vehicles in the general population.

1. Do men or women commit more traffic violations?

The findings on this analysis shows that men had more violations in every case measured. Each violation was taken and tallied up for each gender. Driving without valid license and registration and driving vehicle with unauthorized equipment seemed to have the highest differences between men and women.

1. Do men or women get pulled over more often for using their phone while driving?

Men had a higher incidence of getting pulled over for using a mobile device while driving than women. Men had around 6,000 more occurrences than women. Mobile use is defined as either texting or talking on the phone while operating a vehicle.

1. Are there certain periods of the year that consistently experience higher volumes of traffic violations?

May, April and March were the months with the highest amounts of violations. October, November and December were the lowest amount of violations. Further investigation could be done on these to find out what the root cause is. This may be due to weather or maybe that people are more likely to travel in certain months than others.

The weeks with the highest violations coincided with the months listed. Among the top five listed showed April and May weeks. An interesting point is that the highest week is the week of Memorial Day weekend. This could just be a coincidence since May is the highest month though.

1. What time of day are you most likely to get a speeding ticket?

Our analysis shows that the highest rate of drivers receiving a speeding ticket occurs a little before and a little after 10:30AM. The next cluster is around 12pm to 2pm. This is not what we expected for the time of highest rate of speeding violations.

1. Do police officers really issue more citations at the end of the month to meet quotas?

Looking at the graph for citations written throughout the month, there are really no trends suggesting that there is a time of the month where officers increase ticket issuing. There are a lot of factors that are involved trying to find this trend. More analysis may be needed to see if there is an increase or not.

1. Do certain races receive traffic violations disproportionately to their percentage of the overall population?

To determine this, we needed to take the total amount of warnings and citations for each race. Also, we needed to get extra data to determine the demographics of the area. The data shows that among all of the races listed, black drivers are more likely to be given a ticket than a warning. Black drivers have a 50/50 chance when getting pulled over whether they will be given a ticket or warning. On the other hand, Asian drivers are most likely to get a warning. With an analysis as delicate as this there is more work that can be done to truly determine if the department is being unfair. For example, one race may be committing more crimes that are less likely to get a warning.

Conclusion

We have shown that many of our hypotheses about traffic violations have accepted the null. Overall, it appears that the examined police force does not show any major inconsistencies in the way they conduct their work. There may be some other issues that can be investigated further such as the race ticket to warning ratio. Examining traffic violations for inconsistencies could easily be a full-time job with all of the different variables to measure and the amount of data. All of these analyses could be looked into further and ran differently, but this is a great look into public opinion of the police force and what actually is happening.