

Capstone Project- Predicting Car Accident Severity; A Case Study of Seattle, Washington D.C.

Makinde Muiyiwa Debowale Fatolu.

10th, September 2020.

1. Introduction.

1.1 Description and Background

Road accidents have been both social and economic issues for time immemorial and have always been a headache for policymakers, governments, and individuals alike. Although it is not desirable, it happens often.

Road Accident refers to any accident involving at least one road vehicle, occurring on a road open to public circulation, and in which at least one person is injured or killed. Intentional acts (Murder, suicide) and natural disasters are excluded. Killed persons" are accident victims who die immediately or within thirty days following the accident. Before Jan 2005, the time period considered was only six days.

Generally speaking, almost every city in our world today, is faced with this problem. But for the purpose of this project, we are going to narrow the searchlight on Seattle as a city.

Car accident collisions in Seattle have been attributed to factors which include; Alcohol/Drugs, Stress, Unsafe lane change, Speeding, Failure to Obey Traffic Safety Devices, Distracted driving/Teenage drivers, Weather condition, etc.

Seattle is the largest seaport city on the West Coast of the United States. According to the data released in 2019, the metropolitan population stands at 3.98million. In July 2016, it was the fastest major growing city in the USA, with an annual growth rate of 3.1%.

The strategic and economic location of Seattle, as a port city, the northernmost border city south of the Canadian border, a major gateway for trade with Asia has endeared the city to a different kind of people over time, which includes Natives, Scandinavians, Black Americans, Asian Americans, and a thriving LGBT community.

The emergence of the local Boeing Company after World War II established the city as a center for aircraft manufacturing. Also from 1980 onwards, the Seattle area was developed into a technology center with the advent of Microsoft; Microsoft founder Bill Gates is a Seattleite by

birth. Amazon (The Internet retailer) was founded in Seattle in 1994, Alaska airline is based in Sea-Tac, Washington, Seattle-Tacoma International Airports. The stream of new software, biotechnology, and internet companies have also increased the city's population. The city and the state of Washington are known to have some of the highest minimum wages in the US.

However, there is no gainsaying that, this strategically located city will have its fair share of transportation and other problems. The resultant effect of car accident collision include; Property loss, Traffic Congestion/Delay in the area, Death/Injuries/fatalities toll, Time Wastage, Loss of Productivity, Cost of Legal System, Loss of Quality of life for victims and their families.

The US Department of Transportation recently reports that \$871 Billion is the economic loss of motor vehicle crashes every year in the US. This figure includes \$271 Billion in economic loss and \$594 Billion in harms from loss of lives and the pain.

The aim of this project is to predict the accident severity in Seattle, reasons for the accident, and where it could happen, in order to mitigate and limit future occurrences and ensure the safety of lives and properties.

Our targeted audiences are Seattle City Council, Government, and decision-makers, the general public, and Seattle Traffic Management Division-SDOT.

.2 Data Description

The source of the data is Seattle Traffic Management Division-SDOT- (A US state Government Agency), as provided through a link on Coursera in CSV format. This particular dataset starts from 2004 and is updated weekly till this present time.

<https://s3.us.cloud-object-storage.appdomain.cloud/cf-courses-data/CognitiveClass/DP0701EN/version-2/Data-Collisions.csv> - This is the link to the source of our data.

The information contained in the data includes; Speed, Collision Type, Weather situation, Severity Code, Location, Address Type, Road Condition, Status, Vehicle, etc.

3. Methodology

This is the main component of the report. Where Data exploratory analysis is discussed and why. Jupyter notebook is used for data analysis, where various Python libraries will be used. Likewise, Github is the main external repository to illustrate the analyzed data. Since the dataset is labeled data, the use of Machine learning is employed.

At the initial stage, I uploaded the .csv to the Jupyter notebook. I spent time cleaning the dataset in the spreadsheet since there were duplicates and missing values. I used types to identify the type of data, in order to know the number of accidents and the probability of accidents that will take place with rainy weather.

I chose to focus on; SEVERITYDESC, WEATHER, and ROADCOND (assuming rain = wet conditions).

4. Results.

From my analysis, I can deduce that there was no strong connection between and the severity description i.e there is a low correlation between rain and injury collision damage. Since my analyzed assumption, is whether rainy weather might correlate with higher instances of an injury collision.

I chose these conditions, at the same time testing for road conditions and locations.

5. Discussions

At this juncture, my observation, and my recommendations are showcased.

I discovered that rainy weather does have an impact on accident severity, with a high probability of getting a serious injury.

My recommendation to the audience is that drivers and road users should be extra vigilant and careful in rainy weather, because of the high probability of fatal car accidents in such a condition.

6. Conclusion

In conclusion, although road users and drivers can get into serious/fatal accidents in rainy weather conditions, there are also other factors that can influence this. These factors include; lightening condition, location, blind spot etc.

Also, as discussed earlier Seattle's increasing population, wet climate, topography, etc could be more recipe for a serious car road accident.

All hands should be on the deck and more public awareness should be encouraged on these aforementioned factors. Laws guiding driving culture should be strictly adhered to, if possible, more traffic laws should be made to safeguard and encourage more driving ethics, in order to protect lives and properties.

References:

www.justiceforyou.com/the-economic-costs-of-motor-vehicle-crashes

www.insee.fr/en/metadonnees/definition/c1116