

DATA698- Senior Research Project

A DATA MINING CASE STUDY ON THE TOWN OF CARY'S CRASH INCIDENTS DATASET

Project Proposal

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Introduction

Death caused by crash incidents on the road way is a global epidemic. According to the Association for Safe International Road Travel(ASIRT), road traffic crashes rank as the 9th leading cause of death and account for 2.2% of all deaths globally ("Road Safety Facts — Association for Safe International Road Travel," 2018). It is also predicted by ASIRT, that traffic crashes will become the fifth leading cause of death by 2030, if there is no continued serious intervention. Noteworthy, according to the World Health Organisation (WHO), road traffic injuries are now the leading killer of people aged 5-29 years(Global Status Report on Road Safety, 2018). Hence, traffic injuries are proving to be even more dangerous in claiming the lives of the world's youth than prevailing pestilences such as HIV/AIDS.

Not only does crash incidents take numerous lives, but they also incur tremendous financial costs. For example, road crashes cost the United States \$230.6 billion per year, or an average of \$820 per person("Road Safety Facts — Association for Safe International Road Travel," 2018). Given the seriousness of this cause of death, it is important to analyze all contributing factors.

There are a number of factors that influence or lead to crash incidents in general. Among the dominant factors and usually the number one reasons are those that directly relate to human behaviors such as drunk driving and speeding followed by vehicle characteristics. However, it important to understand and explore how factors outside of human behaviors directly affect crash incidents. Such explorations will no doubt inform and strengthen preventative measures.

Among recommendations made by The World Report on Road Traffic Injury and Prevention (WHO), are these listed below:

- **Assess problems**, policies, institutional settings and capacity relating to road traffic injury.
- Implement specific actions to prevent road traffic crashes, minimize injuries and their consequences, and evaluate the impact of these actions.
- Prepare a national road safety strategy and plan of action globally ("Road Safety Facts — Association for Safe International Road Travel," 2018).

In reference to the first recommendation stated above, the need for continuous assessment of problems that contribute to escalating crash incidents is of critical importance. Hence, the researcher proposes to explore and analyze a dataset, the case of a US Town's (CARY), crash incidents, so as to discern the relationship that may exist between crash incident factors such as weather, road characteristics and features, time of day, traffic control with fatality and/or injuries. The main expected output is a dashboard that can be used for quick storytelling of these relationships so as to inform downstream analysis for business intelligence and policy making. Additionally, with the use of these variables, the researcher proposes to implement and evaluate a logistic regression model to determine the extent to which it can accurately predict fatality and/or injury from crash incidents in the Town of Cary.

Research Questions

With the aid of the Town of Cary crash incidents dataset, researcher seeks to answer the following questions:

1. Were factors such as weather, road characteristics, time of day, traffic control strongly correlated with fatality and/or injuries ?
2. Which factors were most/least significant?
3. Is there a need for stronger intervention by government to improve traffic control and road features so as to reduce fatalities in crash incidents?
4. How well can a logistic regression model predict whether or not a crash incident in the Town of Cary will result in fatality and/or injury?

Significance

Drastic action is needed to put measures in place to meet any future global target that might be set and save lives during crash incidents ("Global status report on road safety 2018," n.d.) .

Outcomes from this study can be used to inform preventative measures for the reduction of fatalities from crash incidents.

Reference

Global status report on road safety 2018. (n.d.). Retrieved from
https://www.who.int/violence_injury_prevention/road_safety_status/2018/en/

Road Safety Facts — Association for Safe International Road Travel. (2020). Retrieved 22 February 2020, from <https://www.asirt.org/safe-travel/road-safety-facts/>