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Collision Incidents in Butuan City, Region 13

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Abstract — The analysis of accidents is necessary and valuable in several ways. It discusses real-world examples of accidents and, therefore, arouses people more quickly than statistical data and theoretical models. The main objective of this study was to explore and investigate the extent of collision incident cases and the major causes behind it in Butuan City, Region 13. A qualitative method of research was used with the aid of an interview-guide questionnaire as the primary source of data gathering. The research was conducted in Butuan City with 10 respondents who were LTTMO Personnel selected through purposive sampling. Data were gathered through an interview guide questionnaire and analyzed through thematic analysis. When it comes to the leading cause of accidents, driver's recklessness posted the highest case listed. The commonplace where accidents happened from 2016 to 2019 is in Libertad, where the most casualties occurred.

Moreover, solutions or recommendations that can be done to minimize if not eliminate the occurrence of vehicular accidents are categorized. They can be controlled by the Traffic Management Division and individual accountability. The existing Traffic Plans and Programs initiated in the Traffic Office like conducting a seminar to the Driver's Association of every barangay and the conduct of Traffic Rules and Regulation Symposium, regular mobile patrol roaming around on designated terminals, with police presence and visibility on highways and streets.

Keywords — *Collision Incidents, Traffic Rules and Regulations, Traffic Accident, Traffic Management, Accident, Vehicular Accident*

Introduction

An accident is an unintended and unforeseen event, usually resulting in personal injury or property damage and even death-bringing agony and discomfort to many families worldwide. However, an accident can happen in various ways, but vehicular accidents are now becoming a common incident on the roads. Vehicular accidents and the associated unpleasant consequences are on the rise and at such an alarming rate.

Around 85 percent of road traffic-related deaths and 90 percent of disabilities due to road crashes mostly happen in low-to-middle income countries makes the road safety issue a recognized crucial global health priority (Nantulya et al., 2013). World Health Organization (WHO, 2009)

predicts that in 2030, the number of road traffic injuries will be increasing, and it will become the fifth leading cause of death.

Further, according to the World Health Organization (2018), 1.35 million people are killed on roadways around the world each year. Also, almost 3,700 people are killed globally in road traffic crashes involving cars, buses, motorcycles, bicycles, trucks, or pedestrians every day. More than half of those killed are pedestrians, motorcyclists, and cyclists. In addition, road traffic injuries are estimated to be the eighth leading cause of death globally for all age groups and the leading cause of death for children and young people 5–29 years of age. More people now die in road traffic crashes than from HIV/AIDS.

In the Philippines, the Department of Health, as cited by Kim (2019) tags road accidents as one of the leading causes of death among children, overpowering other deadly diseases, including dengue. In fact, in Metro Manila alone, about two children die daily due to road accidents. According to the road accidents in the Philippines 2018 report from the Metro Manila Accident Reporting and Analysis System, there are 394 fatalities, both adults and children, due to road-related accidents in the Metro. In totality, there are 14,553 road accident deaths and injuries involving passengers, drivers, and pedestrians, which gives an average of 40 individuals per day.

The analysis of accidents is necessary and valuable in several ways. In many countries, highway and road departments are required to keep track of traffic accidents, identify possible causes, and improve the road and traffic situation and conditions in case of a significant accident frequency at a particular road section, improve the road and traffic situation, and shapes. Such accident analyses can be educational for ordinary drivers since they discuss real-world examples of accidents and, therefore, arouse people more quickly than statistical data and theoretical models (Du Val, 2013).

Moreover, the safety of drivers/motorists on the country's roads has become an increasing concern among traffic safety professionals. With the rising number of road accident fatalities each year, it was essential to conduct an in-depth study on vehicular traffic accidents to develop more appropriate countermeasures. In addition, countermeasures from different disciplines could be integrated and implemented to solve or minimize this problem. In this context, the researcher proposed to conduct a study on the collision incidents and its contributory factors in Butuan City, Region 13.

The theory of Molt and Beryle (1982) can be connected to the present study since the most common cause of collision incidents is the lack of obedience of drivers or motorists in following traffic rules and regulations. The said theory of adaptation assumes that the human being tries to adapt its behavior to its environment; thus, for drivers to avoid a collision, they should behave and follow existing traffic rules and regulations. On the other hand, the Domino Theory of Heinrich pointed to the undesirable behavior of people, which may result in injuries and accidents, such as in the case of drivers. It also pointed out that not just the driver would become a victim, but other innocent people such as passengers and damage to properties.

The study explored and assessed the collision incident in Butuan City and the Comprehensive Traffic Ordinance in Butuan City. The study was held in Butuan City. Data extracted were limited to collision incidents in Butuan City based on police reports of different police stations. Moreover, additional information was gathered through the self-administered interview from the Land Transportation and Traffic Management Office (LTTMO) and selected Police Station in Butuan City. Moreover, the researcher acknowledged the limitations of this research work and only assessed the collision incidents in Butuan City.

Literature Review

Every six seconds someone is killed or seriously injured on the world's roads. It is estimated that more than a million people die on the roads each year one in five of whom is a child. More than 50 million people are hurt or seriously injured. The World Health Organization (2015), on its United Nations Decade of Action for Road Safety 2011-2020, revealed that if nothing is done to curb road accidents worldwide, 1.9 million lives will be lost annually by 2020. Because of this, the international community has to develop a common strategy and joint action to enhance road safety.

In recent years, in the United States has produced various estimates of the level of sleep-related road accidents. The National Highway Traffic Safety Administration (NHTSA), as cited by Reissman (2016), estimated 56,000 sleep-related road crashes annually in the USA, resulting in 40,000 injuries and 1,550 fatalities. It calculated that 17% (about 1 million) of road accidents are sleep-related. It also suggested that 2.6% of accidents caused by driver inattention were due to fatigue.

In Australia, an Australian road safety organization estimates that 25% - 35% and possibly up to 50% of road crashes are sleep-related (VicRoads, 2015).

It also estimated that driver sleepiness accounts for 6% of road accidents, 15% of fatal accidents, and 30% of fatal crashes on rural roads. In Germany, a study of motorway accidents in Bavaria estimated that 35% of fatal motorway crashes were due to reduce vigilance due to driver inattention and fatigue (Sagberg, 2018).

Pickrell (2016) stressed that most drivers know that texting and using other gadgets while driving is dangerous. However, many still use their cell phones and other mobile devices behind the wheel, putting themselves and others at risk. Many drivers see distracted driving as risky when other drivers do it but do not recognize how their driving deteriorates.

Person (2018) revealed that road traffic accidents were related to the poor road network, absence of knowledge on road traffic safety, mixed traffic flow system, poor legislation and failure of enforcement, poor conditions of the vehicle, poor emergency medical services, and absence of

traffic accident compulsory insurance law have been identified as critical determinants of the problem.

In addition, road crashes are not evenly distributed throughout the network. They may occur in clusters at single sites, along particular road sections, or scattered across whole residential neighborhoods, especially in areas of social deprivation. While road engineering can significantly help in reducing the frequency and severity of road traffic crashes, it can also contribute to crashes. The road network affects crash risk because it determines how road users perceive their environment, and it provides instructions for road users, through signs and traffic controls, on what they should be doing (Trinca et al., 2018).

Methodology

This study utilized the qualitative research design. Accordingly, a qualitative approach allows for rich possibilities of inquiry that provide a distinct and more complex comprehension of people's reported experiences and observations that could contribute to the topic of the study (Suter, 2016). Moreover, Polit and Hungler (2017) also emphasized that qualitative research is an inductive, holistic, subjective and process-oriented method used to understand, interpret, describe and develop a theory on phenomena or to set which is mostly presented and associated with words, language, and experiences rather than measurements, statistics and numerical figures which generate an in-depth account that will present a lively picture of the research participants' reality. In this context, the researcher has decided to utilize qualitative designs to explore and assess the collision incident in Butuan City, Region 13.

Results and Discussion

This study was conducted in Butuan City, a first-class, highly urbanized city and regional center of the Caraga Region. Respondents were the personnel of the Land Transportation and Traffic Management Office (LTTMO) of Butuan City and Butuan City Police Office of the selected police station. Purposive sampling was used in choosing the interview respondents to generate first-hand data as validation on the secondary data used for the analysis of the investigated study.

Table 1. Collision Incidents Data in terms of Type of Vehicular accidents and the vehicles involved

Collision Incidents	Year				
Type of vehicular accidents	2016	2017	2018	2019	Total
DAMAGE TO PROPERTY	430	359	485	319	**1,593**
HOMICIDE	35	39	38	17	**129**
PHYSICAL INJURY	466	331	333	162	**1,292**
BCPO	931	729	856	498	**3,014**
Vehicles Involved					
4-WHEEL VEHICLES & ABOVE	688	630	873	511	**2,702**
MOTORCYCLE	876	619	679	347	**2,521**
MC TRICYCLE	86	20	48	42	**196**
BICYCLE	20	4	7	5	**36**

In terms of Incidents according to the type of vehicular accidents, data revealed that the vehicular incident statistics significantly increased from 2016 to the early part of 2019. The highest number of casualties was on collision incidents recorded at Butuan City Police Office -13, and the lowest in statistics would be on the collision incident resulting in homicide. The total increase in the collision incidents would strongly imply that drivers do not have sufficient education about social obligation and safe driving. On the other hand, this result also means that the local government needs to revisit its road infrastructure and monitor road safety warning signs. As an observation, many of our drivers are not defensive drivers, especially the PUJ drivers. Plus, the pedestrians do not have full awareness and education about road safety. With this, now and then, road accidents happen, leading to fatal deaths of many.

Specifically, BCPO had the most number of occurrences from the year 2016 to half of 2019, which the number of events had reached 3,014 cases. This was followed by damage to property with several occurrences of 1,593 cases. The PI case got second to the last rank with 1,292 reported cases. The least among the identified cases was a homicide, with 129 reported cases. Statistically, there was a significant increase in the total number of accident cases for four years. However, seeing it from 2018 to the early part of 2019, collision incidents resulting in homicide cases significantly decreased by (55%)—collision incidents resulting in damage to property were reduced by closely (34%). Collision incidents resulting in physical injury were reduced by (51%), and recorded cases at BCPO were reduced by (42%). This result would imply that the efforts are made by the government basically work out. Perhaps, the comprehensive traffic plan/program implemented by the Land Transportation and Traffic Management Office of Butuan City positively reduced collision cases in the locality. Possibly due to massive road safety education and improved road engineering.

Accordingly, road engineering factors include those where a road defect directly triggers a crash, where some element of the road environment misleads a road user and thereby creates error, or where some feasible physical alteration to the road would have made the crash less likely. In the planning, design, and maintenance of the road network, the following four particular elements affecting road safety have been identified: safety-awareness in the planning of new road networks;

the incorporation of safety features in the design of new roads; safety improvements to existing roads; remedial action at high-risk crash sites (Muhlrad & Lassarre, 2015).

As to the type of vehicles involved, 4-wheeled vehicles and above had the most recorded incidents, which reached 2,702. This is followed by motorcycles with 2,521 cases. Tricycle and bicycle had the least recorded incidents, with 196 and 36 cases, respectively. Findings imply that 4-wheeled vehicles and above are the most accident-prone vehicles. Thus, this could be directly attributed to several factors such as driving attitudes, knowledge and awareness on road safety, and other factors.

Based on the statistics from 2018 to the early part of 2019, there was a significant decrease in the collision cases according to type of vehicles. The 4-wheel vehicle accident was reduced by (41%). Motorcycle cases were reduced by (48%).

Problem 2: What are the common causes and places recorded about the collision cases in Butuan City?

Table 2. Data on the Common Causes of Collision Incidents

Collision Incidents	Year				
Type of vehicular accidents	**2016**	**2017**	**2018**	**2019**	**Total**
Road/ Weather Condition	99	33	24	10	166
Mechanical Malfunction (brakes, steering wheel, etc.)	21	17	17	12	67
Tire Explosion	0	0	3	5	8
hit Stray animals	18	14	7	5	44
Driver fell asleep	0	11	0	5	16
Speeding	120	151	123	77	471
Hit low lying cables	7	0	4	8	19
Sudden overtaking	85	67	34	57	243
Driver's Recklessness	475	362	528	273	1,638
Sudden crossing of a pedestrian	5	1	2	0	8
Total	**936**	**730**	**858**	**498**	

Reflected the leading cause of accidents, as recorded, it revealed that driver's recklessness posted the highest case listed. This is followed by overspeeding with 342 cases. Being drunk is the

third leading cause of collision incidents. This has posted 342 cases from 2016 to 2019. Sudden overtaking ranked fourth in the list with 243 cases. Road or weather condition is also one of the causes of these incidents with 166 cases reported. Other recorded cases with less than 100 occurrences are caused by mechanical Malfunction, stray animals, low-lying cables, driver falling asleep, and sudden crossing of pedestrian and tire explosion, with 67, 44. 19, 16, 8 incidents, respectively.

It can be noted that among the most common causes of collision accidents is driver's recklessness, speeding, and a drunk driver. This implies that the driver's reckless behavior directly related and significantly caused the collision incidents in Butuan City. This was affirmed by Vera (2016) that road user behavior is the single most important contributory factor of road accidents today.

This was stressed by the Global Road Safety Partnership (2017) that the road accidents are happening most often due to the reckless and speedy driving of the vehicles, not obeying or following traffic rules, the attitudes of the "right of the mighty" bigger vehicles toward the smaller vehicles, overburdened or overcapacity hauling of public and transport vehicles, poor maintenance of the vehicles, drunk and driving, driver fatigue, and above all the appalling condition of the already chocked roads with every inch encroached by unauthorized persons and properties. In addition, drunken driving is one of the significant causes of road accidents. Globally, some 480,000 deaths and 20 million people get injured by drunk driving every year. In most high-income countries, about 20% of fatally injured drivers have excess alcohol in their blood, i.e., blood alcohol concentration (BAC) over the legal limit.

Moreover, another common cause of a collision is the road/weather condition. Although weather conditions cannot be remedied because it is an act of nature, road conditions can be improved or upgraded to minimize or, if not eliminate, the incidents of a road collision. Road collision due to poor road conditions sometimes cannot be attributed to the fault of the drivers, as this was in parallel to the statement of Gildian and Bedigian (2018) that some accidents are caused through no fault of the driver and that poor road conditions can lead to accidents injuring drivers, passengers, and pedestrians. Roads can deteriorate to the level where they become dangerous, including potholes, uneven road surfaces, broken concrete, exposed rebar, sinkholes, and road cracks. If a driver hits a large pothole, it could burst the tire, causing the vehicle to veer into another lane, colliding with another vehicle. Uneven road surfaces can cause drivers to lose control of their vehicle, leading to a crash or rollover accident injuring the driver, passengers, and pedestrians.

Problem 3: What are the respondents' solutions/recommendations to minimize or eliminate vehicular incidents?

Table 3. Respondents Solutions, Recommendations to Minimize if not Eliminate the Occurrence of Vehicular Accidents

Question	Responses
What are your solutions/recommendations to minimize if not eliminate the occurrence of vehicular accidents in your area (Station)?	- 50% of the respondents said that... "In Baan Km. 3 Highway is the top barangay in an accident-prone area. Thus I would like to suggest that along with City Hardware, I think we *should put a wake-up call lane."* - 100% of the respondents strongly recommend that. "There should be a proper seminar before obtaining a driver's license, and also, there should be a strict implementation of rules and regulations. Aside from this, installation of more road signages should be given priority". - 100% of the respondents said that "There should be additional driver's education on road safety. Also, additional traffic signs that are informative and precautionary in nature should be installed." - 85% of the respondents said, "There should be an implementation of *rerouting motorcycles with sidecars and multicabs.* Also, *strict implementation of NO Motorcyclpreventivercab should pass in the National Highway* except when parked and the like. In addition, regular lectures and examinations should be conducted. - 75% of the respondents said, "*Increased the amount of citation ticket should also be implemented.* Implementation of *fast lane at the national highway with six (6) lanes with 60Kph, while the slow-moving vehicle will occupy the outer lane* for the convenience of road users." - 100% of the respondents said that "*There should be an instal of CCTV camera, additional lights in accident-prone area regulate additional franchising of PUJ and MC with sideca*

Divulges the respondents' responses about their personal intuitions on the solutions/recommendations to minimize if not eliminate the occurrence of vehicular accidents in your area (Station). All or 100% of the respondents strongly believed to have the following actions: (a). There should be a proper before obtaining solutions/recommendations, and there should be a strict implementation of rules and regulations. Aside from this, installation of more road signages should be given priority." (b). "There should be additional drivers' education on road safety. Also, other traffic signs that are informative and preventive should be installed. Another thing is the

regular maintenance of road signage along the National Highway (c). There should be CCTV cameras, additional lights in accident-prone areas, and further franchising of PUJ and MC with sidecar.

Thus, under President Rodrigo Roa Duterte, and through the guidance of Department of Transportation Secretary Arthur P. Tugade, the LTO came up with its framework to reduce, if not eliminate, road crashes. The LTO Road Safety Action Plan (RSAP) intends to mainstream road safety in the LTO. This document provides a comprehensive and integrated policy and plan that will address the five (5) LTO Mandate-related Pillars of Road Safety: Qualified Drivers; Road Worthy Vehicles, Traffic Discipline; Community Relations; " and Legislative initiatives.

The findings were in parallel to the study for the Department for Transport in 2013 as cited by Willis (2013), who found that road safety was perceived as a critical benefit for street lighting improvement. In the study, 73% of respondents agreed that 'better street lighting would improve the safety of children, and 63.8% agreed that improved street lighting would lead to fewer accidents on the roads.

Problem 4: What can the respondents say about the existing Comprehensive Traffic Plan/Program implemented by the Land Transportation and Traffic Management Office regarding collision incidents in Butuan City?

Table 3. Impact On the Existing Comprehensive Traffic Plan/Program Implemented by the LTTMO

Question	Responses
Respondents opinions, thoughts about the LTTMO Traffic plan	- 95% of the respondents believed that the LTTMO current Traffic Plan and Program of the city help significantly in the management of collision incidents in the city. - 5% of the respondents said that there must be a revision on the LTTMO plan/program to ensure high success in managing collision incidents in the locality. However, fines and penalties should be revised to cope up with the present situation.

It shows the respondents' responses about what they thought about the existing LTTMO Traffic plans and program of the City of Butuan. Data revealed that most of the respondents affirmed that the current Comprehensive Traffic Plan/Program implemented by the Land Transportation and Traffic Management Office directed much in managing collision and other traffic-related cases in Butuan City. However, it is presently subjected to amendments and revisions to cope with the current situations in the locality.

As highlighted in the LTTMO plans and program, implementation of RA 4136 was strongly mandated and to do the following: Conduct seminars to the Driver's Association of every barangay and the conduct of Traffic Rules and Regulation Symposium; Conduct of regular checkpoints and profiling each driver who has violations committed; Visit each barangay and conducting a seminar on traffic violations and new laws implemented is done; There is regular mobile patrol roaming around on designated terminals; Police presence and visibility on highways and streets that are congested is observed and assist students and Senior Citizens in crossing Pedestrian lane.

Conclusion

It can be concluded that the local government makes the efforts of Butuan City workout. It can be concluded further that the comprehensive traffic plan/program implemented by the Land Transportation and Traffic Management Office of Butuan City positively contributed and powerfully impacted the reduction of collision cases in the locality. It also proved that most of the drivers do not have enough knowledge of road safety. Because of lack of discipline, driver's recklessness, overspeeding, and driving while drunk manifested as the top 3 significant causes of collision incidents in Butuan City.

The commonly recommended solution cited by the respondents is the intensification of driver's education to increase their level of knowledge and awareness on road safety. This implies that driver's education is directly correlated to road safety. Thus, this should be given focus by concerned government agencies. The importance of drivers' education and awareness was supported by the study of Mayhew (2017) that with better evaluation methods and research on drivers' education on road safety, it showed a statistically significant reduction in road accidents. It indicated that drivers who underwent the education program were less likely to be involved in accidents during their first two years of driving than drivers who did not go through the education.

This was also emphasized by Estoquia (2014) that the public does not seem as alarmed about road safety and the dangers leading to injuries and casualties as they are about other public health concerns. Road crashes, it seems, are an ever-present danger that people do not give much attention to until an incident happens to them or to someone they know.

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