Analysis of the Causes of Vehicular Accidents in the City of Santiago, Isabela

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ABSTRACT

Vehicular accidents remain one of the leading causes of injury, death, and property damage in the Philippines, posing serious challenges to public safety and law enforcement agencies. Road crashes not only result in loss of lives but also create social and economic burdens for families, communities, and the government. This study aimed to analyze vehicular accidents in the City of Santiago, Isabela, based on the records of the Philippine National Police for the year 2024. The study employed a quantitative descriptive-analytical research design using documentary analysis to examine existing vehicular accident records from the Philippine National Police. The findings show that vehicular accidents in the City of Santiago are mostly attributed to motorcycles, due to their increasing number of users, affordability, and fuel efficiency. Most accidents in the city occurred in January, coinciding with higher travel volumes after the holiday season. Furthermore, the majority of vehicular accidents happened during late-night hours, likely due to driver fatigue after long working hours, which may also increase the likelihood of speeding in an attempt to reach home sooner, further elevating the risk of accidents. Moreover, the main cause of these accidents was driver recklessness, indicating that most accidents in the city are preventable if drivers exercise caution.

Keywords: Causes of Accidents, Vehicular Accidents, Accidents, Traffic Accidents.

INTRODUCTION

Vehicular accident is the largest cause of death by injury and the tenth-leading cause of all fatalities worldwide, now account for a surprisingly large share of the global burden of disease. Every year, an estimated 1.2 million people are killed in traffic accidents, and up to 50 million are injured, occupying 30 percent to 70 percent of orthopedic beds in developing-country hospitals. If current trends continue, road traffic injuries are expected to be the third-leading contributor to the global burden of disease and injury by 2020 (Population Reference Bureau, 2020).

According to Centers for Disease Control and Prevention, (2023). Roads are shared by cars, buses, trucks, motorcycles, mopeds, pedestrians, animals, taxis, and other travelers worldwide. Road traffic accidents are the leading cause of death in the United States for individuals aged 1 to 54, and the leading cause of nonnatural death for U.S. citizens residing or traveling overseas. Motor vehicles enable travel, which contributes to the social and economic development of many nations. Despite this, automobiles are involved in collisions that cause millions of injuries and fatalities annually. Whether you're traveling domestically or overseas, be aware of the dangers and take preventative measures to protect your health and safety.

Isabela PPO ICT Team, (2023), reported that from January to December 2021, they documented a total of 691 occurrences of motorcycle-related traffic accidents, resulting in 130 deaths and 358 injured victims. It is considered that one of the factors contributing to the surge in motorcycle-related incidents in the province is the hardheadedness and lack of education and training of motorists/riders in terms of traffic norms and regulations. Notable is the use of the outer lane designated for them rather than the inside lanes designated for four-wheeled vehicles, as well as driving under the influence of alcohol and other drugs.

In the City of Santiago, there are 63 recorded cases of vehicular incidents, some of which resulted in deaths and major property damage. These issues became the motivating factors for the researchers to analyze the accident records of the PNP in Santiago to determine whether the city faces similar issues when it comes to vehicular accidents.

Objectives Of the Study

This study aimed to analyze vehicular accidents in the City of Santiago, Isabela based on the records of the Philippine National Police Santiago City for the year 2024. Specifically, it sought to achieve the following objectives:

1. To analyzed the vehicular accidents in the City of Santiago, Isabela based on official PNP records for the year 2024 in terms of;

1.1. type of vehicles;

1.2. months; and

1.3. time of accidents.

2. To determine the causes of vehicular accidents in the City of Santiago, Isabela for the year 2024.

METHODOLOGY

The study employed a quantitative descriptive-analytical research design with the use of documentary analysis to examine existing vehicular accident records from the Philippine National Police. This design was deemed appropriate as the study focused on describing accident patterns using official police data. To gather data, an extraction checklist was used to systematically collect relevant information from the PNP Traffic Enforcement Unit. The checklist covered variables such as type of vehicle, months and time the accidents occurred including the reported cause of accidents. To ensure the confidentiality of information, only numerical data were reflected in the study. No vehicle plate numbers or names of owners, drivers, or any individuals involved in the accidents were reflected. For the analysis, simple descriptive statistics such as frequency counts and percentages were used to describe the profile and causes vehicular accidents.

RESULTS AND DISCUSSION

Vehicular Accidents in the City of Santiago, Isabela Based on Official PNP Records for the Year 2024 Table 1. Frequency and Percentage Distribution of Accidents in terms of Types of Vehicles.

Types of Vehicles	Frequency	Percent
1. Motorcycle	72	62.61%
2. Motorized Vehicle	41	35.65%
3. Agricultural or Farm Machinery	2	1.74%
TOTAL	115	100%

As reflected in Table 1, there were a total of 115 recorded vehicles involved in traffic accidents in the City of Santiago, Isabela, for the year 2024, wherein motorcycles accounted for the highest number of accidents, with 72 cases or 62.61%, followed by motorized vehicles such as cars, vans, and trucks with 41 incidents or 35.65%. Meanwhile, agricultural or farm machinery was minimally involved, with only 2 incidents or 1.74%. This indicates that motorcycles were the most frequently involved vehicles in traffic accidents in the city for the year 2024.

The increasing number of motorcycle-related accidents may be attributed to several factors. Motorcycles are widely used due to their affordability, fuel efficiency, and maneuverability, particularly in both urban and rural areas. However, their lack of physical protection, combined with high exposure to traffic hazards, increases the vulnerability of riders to accidents. Lu J. L., Herbosa T., Lu S. (2022) reported that motorcycle accidents in the Philippines suffered severe injuries due to its small size and lighter weight.

On the other hand, there was minimal involvement of agricultural or farm machinery in the city, as these types of vehicles are less frequently present on public roads or are operated at lower speeds.

The findings highlight important implications for traffic safety policy, such as stricter enforcement of laws and the conduct of public safety seminars for all motorists to ensure that they are always reminded of the risks associated with using their vehicles on public highways.

Table 2. Frequency and Percentage Distribution of Accidents in terms of Months.

Months of Accidents	Percent	Percent
1. January	17	26.99
2. February	6	9.53
3. March	7	11.11
4. April	10	15.88
5. May	2	3.17
6. June	8	12.70
7. July	2	3.17
8. August	2	3.17
9. September	1	1.59
10. October	3	4.76
11. November	3	4.76
12. December	2	3.17
TOTAL	63	100

Table 2 shows the monthly distribution of accidents in the City of Santiago, Isabela for the year 2024 with a total of 63 recorded cases. January recorded the highest frequency of accidents or 26.99%, followed by April with 10 or 15.88%. In contrast, the lowest percentages were recorded in September with a frequency of 1 or 1.59%. This indicates that accident occurrences are not evenly distributed throughout the year, with certain months exhibiting notably higher rates.

The increased of accident in January may be associated with the post-holiday travel which increases more road usage, which may also lead to driver fatigue, and possible alcohol-related driving following the year-end celebrations. Additionally, the return to work and school activities may contribute to higher traffic volume, and increasing accident risk. While the elevated accident rate in April could be linked to summer vacation where there is an increasing number of travelers. Nwongbe law (2025) mentioned that holidays are a time of celebration but it also brings spike in road hazards across the U.S traffic collisions and fatalities.

On the other hand, the lower accident rates in September may reflect reduced mobility, and less stress or fatigue due to normal schedules of driving along the highway.

These results suggest that the occurrence in vehicular accident may be affected by weather conditions and volume of traffic which calls a more intensified preventive measure during high-risk months especially before and after the holiday season where most of the people are celebrating or on a vacation.

Table 3. Frequency and Percentage Distribution of Accident in terms of Time.

Time	Frequency	Percent
1. 1:00 AM to 6:00 AM	9	14.29
2. 6:01 AM to 12:00 PM	13	23.81
3. 12:01 PM to 6:00 PM	12	19.05
4. 6:01 PM to 12:00 AM	20	42.85
TOTAL	63	100

Table 3 presents the distribution of accidents according to the time of day, with a total of 63 recorded incidents. The highest number of accidents occurred during the 6:01 PM to 12:00 AM period, accounting for 20 cases or 42.85%, while the lowest number of accidents occurred between 1:00 AM and 6:00 AM, with 9 cases or 14.29%.

This distribution indicates that accidents are more frequent during evening to late-night hours compared to early morning periods. This may be attributed to several factors, including darkness and driver fatigue due to long working hours, which may also increase the likelihood of speeding in an attempt to reach home sooner, further elevating the risk of accidents. ZipDo Education (2025) reported that drivers are more likely to crash at night dan daytime due to reduced visibility and fatigue drivers.

The lower frequency of accidents during early morning hours can be explained by reduced traffic volume, despite the potential risks associated with darkness and driver drowsiness.

This suggests that traffic density plays a significant role in accident occurrence, which calls for enhanced traffic enforcement and improved visibility measures, especially during evening and late-night hours.

Causes of Vehicular Accidents in the City of Santiago, Isabela for the Year 2024.

Table 4. Frequency and Percentage Distribution on the Cause of Accidents in the City of Santiago, Isabela.

Cause of Accidents	Frequency	Percent
1. Intoxicated	8	12.70%
2. Miscalculations	9	14.29%
3. Recklessness	37	58.73%
4. Over speeding	9	12.70%
TOTAL	63	100%

Table 4 presents the causes of accidents based on 63 recorded cases. The highest identified cause of accidents is recklessness, accounting for 37 incidents or 58.73%, while intoxication is the least reported cause, with 8 incidents or 12.70%. This distribution indicates that human behavior is a significant factor contributing to traffic accidents in the city.

The predominance of recklessness suggests that unsafe driving behaviors such as aggressive driving, failure to observe traffic rules, and improper overtaking play a significant role in vehicular accidents. This highlights that many accidents are preventable and are rooted in behavioral or driving habits rather than mechanical failure or environmental factors.

These findings have important implications for policy formulation and driver education and reorientation programs that emphasize risk awareness and responsible driving.

CONCLUSION

Based on the findings of the study, vehicular accidents in the City of Santiago, Isabela for the year 2024 show a clear pattern, wherein motorcycles are the most frequently involved in traffic accidents, highlighting the vulnerability of motorcycle riders due to greater exposure to road hazards. In terms of temporal distribution,

accidents were more prevalent during the late-night hours from 6:01 PM to 12:00 AM, which indicate reduced visibility, driver fatigue, and increased traffic density. Meanwhile, monthly data revealed that accidents were higher in January, which may be due to increased travel after the holiday season. Furthermore, the most commonly identified cause of accidents recorded by the PNP was recklessness, underscoring the role of human behavior in traffic accidents and indicating that most accidents are preventable if proper education and selfdiscipline are taken seriously.

RECOMMENDATION

Based on the findings and conclusions of the study, the following recommendation are hereby offered:

Targeted Enforcement and Surveillance Late-Night Patrols: Increase PNP and traffic enforcer visibility during late-night hours (10:00 PM – 4:00 AM) to deter speeding and manage driver fatigue.

Automated Enforcement: Implement "No-Contact Apprehension" using AI-powered CCTV cameras at high-risk intersections to detect reckless driving, lane splitting, and signal violations without the need for physical stops. January Safety Blitz: Launch a specialized "Post-Holiday Road Safety Month" every January, featuring intensified checkpoints for DUI (Driving Under the Influence) and vehicle roadworthiness.

Motorcycle-Specific Interventions Affordable Safety Gear: Partner with local businesses or the LGU to provide subsidies for certified helmets and high-visibility vests, addressing the high involvement of motorcycles in local crashes. Exclusive Motorcycle Lanes: Designate specific lanes on major Santiago thoroughfares to minimize conflict between small bikes and larger commercial vehicles. Rider Education: Collaborate with the TESDA and LTO to offer mandatory safety seminars that focus on defensive driving and "blind spot" awareness for motorcycle riders. Infrastructure and Technology Upgrades Smart Lighting: Install motion-sensor or solar-powered LED street lighting in accident hotspots to improve visibility during the high-risk late-night hours. Hotspot Geometry: Use GIS-based heat mapping to identify specific curves or junctions with high accident rates and install rumble strips or improved directional signage. Real-time Alerts: Leverage mobile applications to provide drivers with real-time traffic updates and "fatigue alerts," encouraging them to take breaks during long late-night trips.

Policy and Community Engagement Fleet Management Standards: Encourage local delivery and transport companies to use telematics to monitor driver behavior, such as harsh braking and over-speeding. Road Safety Council: Establish a multi-agency Santiago City Road Safety Council to coordinate data sharing between hospitals, the PNP, and the LGU for more accurate incident tracking.

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