

ANALYSIS OF TRAFFIC ACCIDENTS ON RAYA PELTONG ROAD – ARTODUNG PAMEKASAN DISTRICT

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ABSTRACT

The Peltong-Artodung Highway, Pamekasan Regency has a high accident rate, a length of ± 2 km, and an effective road width of ± 6 m which is an area that has enough potential for the movement of traffic flow because it is a connecting road between Pamekasan City and Sumenep City, along the way there are also offices, schools, markets, shops, and residential areas. This analysis was conducted to determine the causal factors that influence the occurrence of traffic accidents. The data needed in this analysis consists of primary data and secondary data. Primary data consists of street names, number of lanes, lane widths, and LHR obtained from direct survey results in the field. The secondary data needed is a map of the research location, and data on traffic accidents. The data obtained is then analyzed by classifying accidents based on the factors that cause traffic accidents. The main factor in traffic accidents on Jalan Raya Peltong-Artodung (Jl. Lintas Pamekasan-Sumenep) is human beings, the age of the most traffic accident victims is 16-30 years old, the largest number of accidents occur at 06.00 to 20.00 as many as 63.44% which is rush hour and the work of the accident perpetrators is dominated by men. Efforts that can be made to reduce the number of accidents on Jalan Raya Peltong-Artodung (Jl. Lintas Pamekasan-Sumenep), namely: providing traffic education and strict sanctions for road users who violate traffic rules and the installation of signs must be by Decree of the Minister of Transportation No. 61 of 1993 concerning Traffic Signs.

Keywords: *Peltong-Artodung Highway; Accident Characteristics; Victims.*

1. Introduction

In line with technological developments, community mobilization has also increased, people are not only carrying out activities only in their environment but have started to communicate with other people [2]. Community distribution and mobilization began to develop and were supported by increasing vehicle ownership, which in turn had an impact on the number of accidents that occurred which tended to increase [6].

Changes in population growth are getting bigger and advances in science and technology in various fields, one of which is the development of transportation technology, which is an integral factor in people's lives in supporting their survival in today's modern times [4]. Of the various existing transportation facilities and infrastructure, the land transportation sector with road infrastructure is the infrastructure that has received the greatest influence in improving the living standards of people in rural and urban areas [12]. The function of the highway as an infrastructure is to serve the movement of human and goods traffic safely, comfortably, quickly, and economically [11].

Geographically, Jalan Raya Peltong-Artodung, Pamekasan Regency, is a connecting road between Pamekasan City and Sumenep City. As a consequence of this situation, the movement of traffic on the Peltong-Artodung highway, Pamekasan Regency has increased from year to year.

Noting that there is a tendency for an increase in the number of accidents that result in a lot of losses (life and material), it is necessary to conduct a study of these accidents. This final project will discuss the analysis of traffic accidents on the Peltong-Artodung highway, Pamekasan Regency. This traffic accident analysis study will be very useful to find out especially the characteristics of accidents that occur on this road section, which can later be used to reduce the number of accidents and make efforts to improve traffic safety [8]. The study of accident-prone areas is very useful in formulating ways of accident prevention and accident reduction and the Traffic Accident Analysis that have been carried out [10].

2. Material and Methods

To achieve research that is systematic, organized, and can run effectively, efficiently, and on target, a research method is needed which includes the process of planning and conducting research. The implementation of the research is adjusted to the research objectives and procedures for completing the research so that each part has a sequential relationship with one other. Thus it is expected that the result is good to get the maximum value.

2.1 Research Methods

The research methods carried out in this final project include:

1. Data collection

The data collection carried out in this study used primary and secondary data, namely as follows:

- a. Secondary data, traffic accident report data, includes data on the number of accidents for 1 year, starting in 2021-2022, traffic volume data, including average daily traffic data (LHRT), as well as location maps.
- b. Primary data, geometric data includes data on road conditions, including road length, number of lanes, lane width, shoulder width, and road slope.

2. Data processing

- a. Data extraction according to the necessary needs.
- b. Data grouping

3. Analysis and discussion

4. Conclusions and suggestions

2.2 Research Locations

The research location taken in this study is the Peltong-Artodung highway, which is located in the Kab. Pamekasan. The research location can be seen in Figure 1.



Figure 1. Research Location Map

2.3 Research Flow Chart

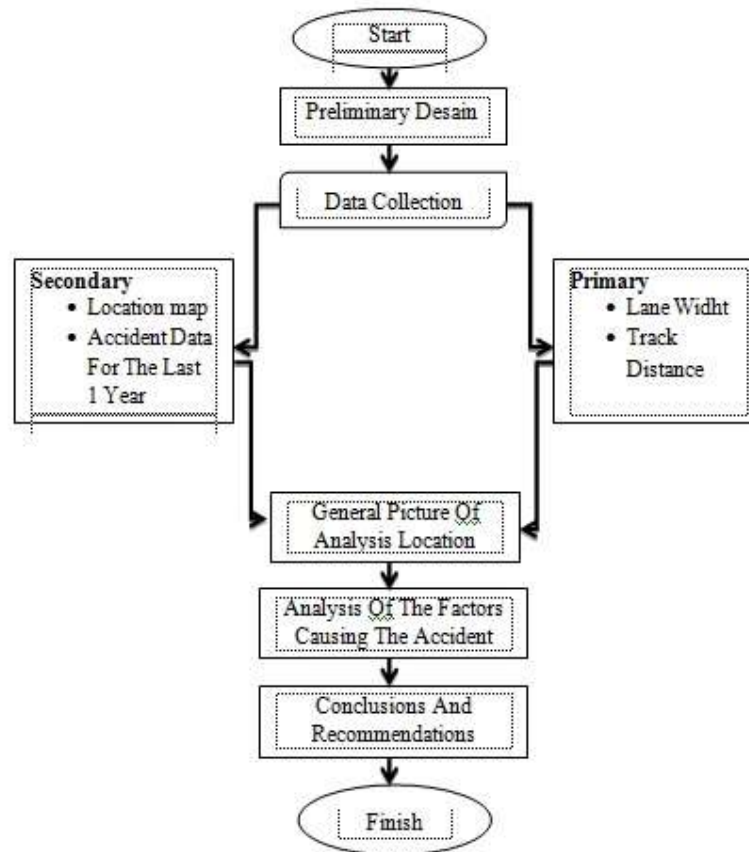


Figure 2. Research Framework

2.4 Data Collection

Data collection is carried out by collecting primary and secondary data obtained from certain institutions according to the required needs. The secondary data to be analyzed is data with a 2-year time series, namely in 2021-2022. This data includes:

1. Secondary Data
 - a. Traffic accident data
Traffic accident data is data that contains records of accident events and monthly accident reports which are collected annually and obtained from the District Police. Pamekasan.
 - b. The road geometry data includes a map of the research location, the Peltong-Artodung main road, Kab. Pamekasan.
 - c. Traffic volumes
Traffic volume is the amount of traffic per day in one year for both road directions, expressed in Passenger Car Units (SMP) where the amount represents the average daily traffic volume (LHR). The traffic volume data used is traffic data from 2021-2022.
2. Primary Data
Geometry data includes data on road conditions, including the number of lanes, lane width, shoulder width, and road grade obtained from field surveys.

2.5 Data Analysis Techniques

The approach used in this study is a percentage descriptive which is the process of describing the research location, namely at the accident location on the Peltong-Artodung highway, Pamekasan Regency. In this research will be obtained an overview of [13]:

- a. Factors causing accidents
- b. Time of the accident
- c. Type of vehicle involved
- d. Type/type of accident

In identifying the locations of accident-prone points, an analysis was carried out on the Peltong-Artodung main road Pamekasan. To carry out the analysis of accident-prone points (black spots), historical accident data for 1 year is required.

In this research, two methods will be used to identify accident-prone areas, namely the Accident Characteristics Method and the Accident Equivalent Number Method [9].

2.6 Accident Characteristics

Accidents can be classified based on several factors. Broadly speaking, accidents are classified based on the type of accident, the number of victims, the condition of the vehicle at the time of the accident, the vehicle involved in the accident, the time of the accident (day and hour), the weather at the time the accident occurred, the location of the accident, the type of collision, the type of vehicle and the cause of the accident [15]. Based on the Guidelines for Handling Traffic accident-prone locations (Pd T-09-2004-B) the analysis of accident data focuses on the study of the types of accidents that are grouped into the dominant accident types.

Data analysis was carried out using the “5W + 1H” approach, namely Why (causes of accidents), What (type of collision), Where (location of accidents), Who (road users involved), When (time of the incident) and How (type of vehicle movement).

2.7 Accident Equivalent Number Method

The accident equivalent number method is a ranking by weighting the accident rate which refers to the cost of the accident. Where accident-prone locations are determined based on the weighting of victims due to the accident [19].

The regression coefficient aims to obtain a line equation formed from the two variables. Correlation and Regression Test Analysis was carried out on several influencing factors, including:

1. Number of accidents with time of occurrence (hours).
2. Number of accidents with the perpetrator (gender).
3. Both variables are dependent, meaning that one variable is the independent variable (predictor variable) while the other variable is the dependent variable (response variable).

2.8 Simple Linear Regression with SPSS

Simple linear regression analysis is a regression method that can be used as a statistical inference tool to determine the effect of an independent (independent) variable on the dependent (dependent) variable. Simple linear regression test or multiple linear regression essentially has several objectives, namely:

1. Calculate the average estimated value and the value of the dependent variable based on the value of the independent variable.
2. Test the dependency characteristic hypothesis.
3. Predict the average value of the independent variable based on the value of the independent variable outside the range of the sample.

3. Result and Discussion

3.1. Accident Characteristics

The research was conducted on roads on Jalan Raya Peltong-Artodung, Pamekasan Regency for 2 years with observations to record violations committed by motorized vehicle users which can trigger traffic accidents.

Characteristics of traffic accidents on Jalan Raya Peltong-Artodung, Pamekasan Regency, which is primary data obtained from the Pamekasan District Police. This data is used to describe the tendency of accidents that occur on roads in Jalan Raya Peltong-Artodung, Pamekasan Regency.

The police are the first agency to report the occurrence of a crime in society. To find out whether the level of crime has increased or decreased can be seen from the statistical figures made by the police.

The number of traffic accidents on Jalan Raya Peltong-Artodung, Pamekasan Regency from 2021 to 2022 has increased. This number is caused by the number of vehicle ownership which continues to increase and is not accompanied by the development of roads and facilities that support road users in driving on the highway. In addition to these factors, the low level of discipline of road users is also one of the reasons for the high number of accidents that occur on Jalan Raya Peltong-Artodung, Pamekasan Regency.

The number of traffic violations that cause accidents on Jalan Raya Peltong-Artodung, Pamekasan Regency. for 2021-2022 can be seen in Table 1.

Table 1. Number of traffic accidents April 2021- July 2022 (Pamekasan District Police)

Year	2021	2022
Number of Accidents	5	7

Table 1 The general number of traffic accidents in Jalan Raya Peltong-Artodung, Pamekasan Regency from 2021-2022, this analysis aims to examine the high number of accidents and analyze the causes of accidents. By looking at the number of accidents in Table 1, the number of accidents in 2021-2022 on Jalan Raya Peltong-Artodung, Pamekasan Regency, was 12 accidents, with details of 5 accidents occurring in 2021, and 7 accidents occurring in 2022.

1. By Type of Victim

Accident characteristics based on the type of victim on Jalan Raya Peltong-Artodung Pamekasan Regency were carried out with the parameters of the type of victim, namely: Death (MD), Serious Injury (LB), Minor Injury (LR). The large number of human victims in traffic accidents for more details can be seen in Table 2.

Table 2. Number of traffic accident victims on Jalan Raya Peltong-Artodung, Pamekasan Regency (Polres, Pamekasan Regency, 2021-2022)

No	Accident Victim	Amount		Percentage (%)	
		2021	2022	2021	2022
1	Death	2	1	10%	4,80%
2	Serious Injury	7	6	35%	28,50%
3	Minor Injury	11	14	55%	66,70%
Total		20	21	100%	100%

2. By Day



Accident characteristics based on days on Jalan Raya Peltong-Artodung, Pamekasan Regency are carried out with the parameters of the number of days in one week, namely: Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, and Sunday. The large number of human victims in traffic accidents for more details can be seen in Table 3.

Table 3. Number of Traffic Accidents on the Peltong-Artodung Highway, Pamekasan Regency (Pamekasan district police, 2021-2022)

No	Day	Amount		Total
		2021	2022	Percentage (%)
1	Monday	1	2	25%
2	Tuesday	1	1	16,70%
3	Wednesday	0	3	25%
4	Thursday	1	0	8,30%
5	Friday	0	0	0%
6	Saturday	1	0	8,30%
7	Sunday	1	1	16,70%
Total		5	7	100%

3. Based on the Time of the Event

Accident characteristics based on the time of the incident in Raya Peltong-Artodung Pamekasan Regency were carried out with the parameters of Light time (24.00-06.00) and Dark time (06.00-24.00). The large number of human victims in traffic accidents for more details can be seen in Table 4.

Table 4. Number of Traffic Accidents on the Peltong-Artodung Highway, Pamekasan Regency, based on the time of the incident (Pamekasan district police, 2021-2022)

No	Time	Amount		Total	Percentage (%)
		2021	2022		
1	24.00-06.00	0	2	2	16,70%
2	06.00-24.00	5	5	10	83,30%
Total		5	7	12	100%

The most accidents occurred in bright weather, at (06.00-24.00) ie 83.3% and in dark weather, at (24.00-06.00) at 16.7%, this shows that during the day the road traffic is always full of vehicles. The drivers use their vehicles at high speeds to avoid congestion on the road, especially the road conditions which are almost entirely on asphalt. However, if road users are careless and are not aware of traffic conditions, this has the potential to result in an accident.

4. Based on Accident Causal Factors

Accidents, in general, can be said to occur due to a cumulative number of factors such as driver accidents, vehicle conditions, weather, road conditions, and so on, but the highest traffic accident rates during 2021-2022 are still dominated by drivers (road crossings), can be seen in Table 5.

Table 5. Traffic accidents based on the factors that cause accidents
(Pamekasan Police, 2021-2022)

No	Causative Factor	Amount		Total	Percentage (%)
		2021	2022		
1.	Driver	3	4	7	58,30%
2.	Vehicle	1	2	3	25%
3.	Road	1	1	2	16,70%
Total		5	7	12	100%

3.2 Factors Causing Accidents and Main Factors

Accidents, in general, can be said to occur due to a cumulative number of factors such as driver accidents, vehicle conditions, weather, road conditions, and so on, but the highest traffic accident rate during 2021-2022 is still dominated by drivers.

Based on the results of the identification of the data it is known that the factors that cause accidents in Jalan Raya Peltong-Artodung Regency can be grouped into four groups, namely human factors, vehicles, roads, and the environment. As for the results of the analysis, the human factor can be described as follows:

1. Human Factors (Human Error)

Humans are the main actors in traffic accidents [17]. From the problems that arise in accidents that occur on the highway, it can be concluded that the human factor is the main cause of a traffic accidents on the highway, both humans as drivers and humans as general road users [14]. This can be due to, among other things, the influence from within the human soul itself which can be described in several parts:

a. Negligence of the victim

The occurrence of traffic accidents on the highway is also caused by the negligence of the victim [16]. For example, a victim who is driving a vehicle that does not pay attention to the speed of the vehicle (going too fast) without paying attention to the vehicles around him which results in the driver having an accident. feet are also often negligent. For example, pedestrians who walk in the middle of the highway or cut the road without paying attention to the vehicles that will pass. If the driver of a vehicle hits a pedestrian in the middle of the road, it means that the pedestrian is temporarily crossing the road and then is run over by the vehicle. This fact shows the negligence of the pedestrian using the road and can cause a traffic accident [1]. If the pedestrian is walking in the middle of the road, then there is a high probability that he will be hit by a vehicle, similarly if he does not pay attention when crossing the road that a vehicle at high speed is passing by, then this can result in the death of someone [3].

b. The perpetrator's carelessness

Careless driving is a major cause of traffic accidents. Someone who is not careful in traffic has a high level of accident risk, this was revealed by Bribda Rudy.s (Member of the Traffic Unit of Pamekasan District Police). According to him, there are still many road users who are still not careful when driving, for example driving at high speed, driving while drowsy, not giving signals when turning, not blaming the lights, and so on.

In addition to internal factors, namely factors originating from within a person, as described above, traffic accidents are also influenced by external factors, namely factors originating from outside a person's self [18]. According to the Member of the Pamekasan District Police, the factors that led to traffic accidents resulting in death at Jalan Raya Peltong-Artodung Regency were:

2. Factors of Road Facilities and Infrastructure

Traffic accidents that occur from traffic activities on the highway are not only caused by human factors themselves but also caused by road facilities and infrastructure that do not support the process of traffic activities [5]. For example, road conditions that are not good/holes, road markings, traffic signs, and street lights that are in bad condition or damaged. This is a factor that triggers road accidents.

3. Environmental factors

Many factors cause traffic accidents, one of which is caused by the natural environment [7]. This can happen if the terrain conditions are not good. In terms of Jalan Raya Peltong-Artodung Regency which is dominated by the number of uneven (damaged) roads.

4. Conclusions

The conclusions obtained from the analysis and discussion are as follows:

1. The main factor in the occurrence of traffic accidents on Jalan Raya Peltong-Artodung Pamekasan. The biggest percentage that results in an accident is due to the driver's human negligence or human error, such as being careless or not following the rules that have been set.
2. Accident characteristics from 2021 to 2022, The research was conducted on roads on Jalan Raya Peltong-Artodung, Pamekasan Regency for 1 year with observations to record violations committed by motorized vehicle users which can trigger traffic accidents. The number of traffic accidents on Jalan Raya Peltong-Artodung, Pamekasan Regency from 2021 to 2022 has increased. This number is caused by the number of vehicle ownership which continues to increase and is not accompanied by the development of roads and facilities that support road users in driving on the highway. In addition to these factors, the low level of discipline of road users is also one of the reasons for the high number of accidents that occur on Jalan Raya Peltong-Artodung, Pamekasan Regency.

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