

Identification of Road Safety Hazards in the Roadway of Palembang-Indralaya

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Abstract - One of common problem in the road user accident is the condition of road infrastructure. Road accidents was categorized as the ninth rank of death most common cause in 1990 and are estimated to be the third by 2020. Road Safety Audit is needed to identify and eliminate potential hazards from roads and their equipment, which can cause accidents. This safety issue identification is carried out at the earliest possible stage to reduce the cost of design or rebuilding and ensure that the road can be used safely from the start. The roadway along Palembang-Indralaya connecting Sriwijaya University in two different location, Indralaya and Palembang. Most of the accident were civitas academica in Sriwijaya University due to high mobility. The aim of this research was to identify safety hazards in the roadway of Palembang-Indralaya route. Research method used were qualitative study design by examine the road infrastructure along the roadway and indepth interview . The informant were local community that live near Palembang-Indralaya Roadway. The results were identified hazard consists of moving hazards (vehicles, animals and crossing pedestrians) and immovable hazards (electric poles, road signs, traffic signs, curving road, lighting and deep hole). The government should conducted annually maintenance program in or der to prevent fatality accident.

Keywords: Hazard, Roadway, Accident, University, Palindra

I. INTRODUCTION

Rapid increasing in motorcycle ownership in the Asia during the last three decades have placed pressure on the road, control and traffic devices, and on the driver of road facilities. Therefore, many people killed and injured in traffic crashes (1).

It is a fact that the world road crashes are a serious problem both in social and economic perspective. Road design guidelines are applied in line with the consideration road safety issues implementation. A number of techniques and processes have been developed for improving road safety infrastructure. One of them is Road Safety Audit which is known as one of the most efficient tools (2).

It is known that road traffic crashes as much as 334 815 deaths in the South-East Asia during 2010. The highest rate was Thailand, 38.1 per 100 000 population followed by Timor-Leste (19.5), India (18.9), Indonesia (17.7) and Nepal (16.0). Maldives had the lowest rate with only 1.9 per 100 000 population. The number of people with minor injuries seeking emergency care is not known precisely and could be in the range of 9–10 million. India alone contributes 73% of the total deaths in South-East Asia in absolute numbers followed by other countries (3).

Wang (4) stated that several roadway and environmental factors caused traffic crash severity. The factors are consisted of road function class, road location, road alignment, condition of the light, road surface condition, and speed limit. Road function class has significant

impact on traffic crash severity. The odds and probability of fatality or serious-injury is significantly different in every road function classes. The probability increases according to urban expressway, interstate, minor arterial, major arterial, rural interstate, rural minor arterial, and rural major arterial.

Based on Rolison et al (5) the most frequently reported factors in the road accident are failure to look properly, loss of control, and failure to judge another person's path or speed. Therefore, the most strongly associated factor are driver age and gender in the accident records.

The varied activity between two different campus both Indralaya and Palembang required adequate condition of the roadway that connecting them. Many accident have been happened in the roadway. One of them was a student killed in an accident in the Palembang-Indralaya crossing, Sungai Rambutan Village, Indralaya District, Ogan Ilir Regency (OI), Monday (4/29/2019). The deadly accident began when the motorcycle driven by the student drove at high speed from Indralaya towards Palembang. Arriving at the scene, the crossing point Km 16 Desa Sungai Rambutan, the motorbike hit the back of a truck parked left of the road.

The purpose of this study is aimed to identify safety hazards in the roadway of Palembang-Indralaya Route. It is hoped that the result of this study can provide information to the public about several hazard identified in order to prevent accidents.

II. METHODS

Qualitative study design was used in this study and the qualitative methods consists of observations, interviews, or document review. Qualitative methods are used to understand phenomena by research subjects, and by the form of descriptions in word and language (6). Informant in this study were eight residents who lived along

Palembang-Indralaya Roadway for minimum two years.

This research used interview by using in-depth interview guidelines and observation. Data collection instruments were in-depth interview guidelines which contained questions in order to get information, checklist, camera, book and a pen.

The location of the research is in the roadway along Palembang and Indralaya that connecting Sriwijaya University in Palembang to Indralaya Campus. The study was conducted in August 2019. Data analysis was performed by listing every identified hazard according to Road Safety Audit Guideline.

III. RESULT

The length of new roads that have been built by the Government of Ogan Ilir Regency until now are 66 new roads with a total length of 330.95 km, consisting of:

- (1) in 2006 as many as 23 sections along 157.53 km were built.
- (2) in 2007 18 sections of 100.12 km had been built.
- (3) in 2008 19 sections of 53.00 km had been built.
- (4) in 2009 5 segments along 10.30 km were built.
- (5) In 2011 a 10.0 km Belanti-Tanjung Laut road was built.

The number of bridges in Ogan Ilir Regency in 2005 the number of bridges reached 82 units with a length of 1,383 meters, in 2013 the number of bridges was 176 units with a total length of 3,678 meters, and in 2014 the number of bridges was 176 units with a total length of 3,678 meters.

Roadway hazard along Palembang-Indralaya could be identified into two categories, moving hazards and immovable hazards.

a. Moving Hazard

The vehicles that are potential hazards of moving consisted of cars, other motorcycles, trucks, trailers, buses, trains,

pedals, carts, etc. According to Data from Department of Transportation in Ogan Ilir 2019, it is known that the speed level for the roadway of Palembang-Indralaya is 60 km/hours with vehicle volume as many as 1837 vehicle/hours.

Animals are potential hazard for motorcyclists to finally fall and get serious injuries from crashing cats, dogs, chickens and other domestic animals. In swamp areas crossed by highways, wild animals such as crocodile, snakes and others also often appear near the road.

Crossing pedestrians are potential hazard for the roadway user. A person that would like to cross and make estimation of safe moment for crossing and one case in a million makes a disastrous mistake especially for motorcyclist. According to the Transportation Department in Ogan Ilir, it is known that motorcyclist user were high, a total of 19.842 in 2017 and increase as many as 32.890 in 2018.

b. Immovable Hazards

Electric poles, road signs and traffic signs are the hazards on the highway. In Palembang-Indralaya roadway there are unusual location of electric poles located in the middle of the sidewalk that disturbs pedestrians, thus making pedestrians go down to the road when crossing it. Since the road has been widened, the position of the poles stands upright on the road and the government do not act quickly to prevent fatality.

The trees along the roadway are identified as hazard because many traffic sign such as sharp turn, bumpy road are not visible because covered with lush tree leaves will potentially cause accidents.

The geometrics condition of curving road also identified as hazard because vehicles coming from the front are invisible because of obstruction of buildings or objects on the edge of the road so that the distance and field of view becomes limited. When a vehicle crosses a bend, there is a force that makes the vehicle push out of the bend. It is this

driving force that often makes each vehicle sway or widen out of the proper lane and take the road from the front or out of the body of the road. The more the speed of the vehicle moving in the bend the greater the thrust that arises and the smaller the bend angle, the greater the thrust that the vehicle receives. A curved road in Palembang Indralaya route is not designed with adequate public street lighting could be worse at night.

Deep hole also identified as potential hazards. There are still many hole in the roadway of Palembang Indralaya that danger for heavy vehicle such as bus and truck especially for those with over capacity loading.

IV. DISCUSSION

The identified hazards in the roadway is similar with the research conducted by Samsuddin, et al stated hazard in the roadway is correlated with infrastructure. Road safety infrastructure should be implemented in every single step of the development so that it could handle safety problem among the road user. Good design principle should be well implemented in order to avoid the safety problem that occurred. The policy makers could make a decision in safety evaluation at early phase. Installation of sufficient and well prepared infrastructure components along the road would reduce the rate of accidents and it can make the driver feel safe when using the roads(7) .

In addition, the factors associated with accident are divided into six factors across seven categories, road environment, vehicle defects, injudicious actions, error or reaction, impairment or distraction, behavior or inexperience, and vision affected (8).

Single-vehicle (SV) accident are one of the cause in high fatality rates. The proneness of high injury severity for vehicle operators brought about by SV accidents without the confounding influence of other road users. The research

results show that for riders and drivers, variables include age for 65 and above, drink while driving, human error, driving manoeuvres, are associated with severe injuries. While less severe injuries are related to other factors such as wet, oily or sandy surfaces. Based on the research, it is known that targeted countermeasures that introduced from multiple perspectives include education of the driver and policy development to improve non-traffic inter active safety (9).

According to George, et al (10) factor associated with increased accident severity are good weather conditions during the night. Based on crash types, they were found significant in specific models. The influence is different depends on the vehicle type involved. In conclusion, crash type have an important role in examining accident severity.

Heavy vehicles such as truck is in the high risk of accident victim along Palembang-Indralaya roadway. Based on Ghaleh, et al, the causes of increased risk in truck accidents are associated to vehicle malfunction, brake system, and unsuitable inspections. The cause are different start from lack of adequate strength and resistance during accidents, and brake system due to technical defects, lack of proper inspection with poor technical parameters that still used as active vehicle, law absence and legal emphasis. Several standards and international certificates should be followed for trucks with technical and equipment defects related to the safe performance of road fleet for hazardous materials transportation, and accordingly to be solved with a greater emphasis.(11).

For drivers in the road, tunnels reduce the speed and increase the lateral position from the right tunnel wall while driving. In shorter tunnels, with reduced driving speed, driver vigilance will be more robust without being hindered by dull driving in a longer tunnel. In spite of driver alertness, crash rates in tunnels occur due to the tunnel's unusual driving

environment. Crash rates are lower in the tunnel inner zone due to driver alertness, especially after passing the transition zone and acclimating to the tunnel environment (12).

V. CONCLUSION

The identified hazards on the Roadway in Palembang-Indralaya Route that connecting Sriwijaya University in two different campus are categorized into moving hazards (vehicles, animals and crossing pedestrians) and immovable hazards (electric poles, road signs, traffic signs, curving road, lighting and deep hole).

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