

Analysis of Road Safety in terms of Management and Traffic Safety in Palembang (Case Study of Colonel H. Burlian Road, Palembang)

Andriyan Agiyah Bylardo¹, Desheila Andarini*¹, Novrikasari¹, Mona Lestari¹, Anita Camelia¹, Feranita Utama¹, Siti Noverizky Andarwiza²

¹Fakultas Kesehatan Masyarakat, Universitas Sriwijaya
Jl. Raya Palembang Prabumulih KM.32, Sumatera Selatan, Palembang, 30862, Indonesia

²Fakultas Ekonomi, Universitas Gadjah Mada
Jl. Sosio Humaniora No. 1 Bulaksumur, Sleman, Yogyakarta, 55281

E-mail: *desheila_andarini@fkm.unsri.ac.id

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Abstrak

Analisis Keselamatan Jalan Dalam Aspek Manajemen dan Keselamatan Lalu Lintas di Palembang (Studi kasus Jalan Kolonel H. Burlian, Palembang): Kecelakaan lalu lintas merupakan penyebab kematian terbesar kesembilan dan bertanggung jawab atas 2,2% dari seluruh kematian secara global. Audit keselamatan jalan raya merupakan salah satu cara untuk mengantisipasi kecelakaan lalu lintas. Kecelakaan yang umumnya terjadi karena berbagai sebab secara kolektif yaitu: manusia, kondisi jalan dan kelengkapan jalan. Tujuan dari penelitian ini adalah untuk melakukan Analisis Keselamatan Jalan Pada Aspek Manajemen dan Keselamatan Lalu Lintas Jalan Kolonel H. Burlian di Palembang. Penelitian ini menggunakan metode deskriptif dengan pendekatan kualitatif serta metode wawancara dan analisis HIRARC. Informan berjumlah enam orang dengan dua orang informan utama dan empat orang informan tetap. Hasil penelitian menunjukkan bahwa sepanjang jalan Kolonel H. Burlian geometri jalan masih belum layak untuk dilalui kendaraan dikarenakan kondisi jalan yang banyak berlubang hingga gundukan, kelengkapan rambu lalu lintas cukup terpenuhi karena kondisi buruk seperti jalan tanda dalam kondisi pudar atau tertutup tambalan.

Kata kunci: Jalan, Keselamatan, Kecelakaan, Palembang

Abstract

Road traffic accidents are the ninth leading cause of death and are responsible for 2.2% of all deaths globally. Road safety audits are one way to anticipate traffic accidents. These accidents generally occur due to various causes collectively, including: humans, road conditions, and road completeness. The objective of this study is to conduct a Road Safety Analysis in the Management and Traffic Safety Aspects of Colonel H. Burlian Street in Palembang. The research used a descriptive method with a qualitative approach as well as interview methods and HIRARC analysis. There are six informants with two main informants and four regular informants. The results showed that along the Colonel H. Burlian Street, the road geometry was still not suitable for vehicles due to the road conditions that had many holes to the bumps, the completeness of traffic signs was sufficiently fulfilled because they had poor conditions such as road markings in faded conditions or covered with patches.

Keywords: Accident, Palembang, Road, Safety

1. Introduction

Traffic accidents are a potential health problem in Indonesia as development has become more active lately. Road transport safety is significantly less developed than that of rail, water and air transport. The average individual risk of being a fatality in relation to the distance covered is thirty times higher in road transport than in the other modes. This is mainly because the different modes have a different approach to safety management and to the use of risk management methods and tools [1]. Accident rates are increasing despite of many preventive measures applied to improve road conditions and traffic laws. Ignoring the traffic rules is one of the major cause of accidents. 90% of road accidents are caused due to driver's errors [2]. According to the World Health Organization (WHO) in the last two years, traffic accidents in Indonesia are considered to be the third biggest killer, after coronary heart disease and tuberculosis / TB. Each year nearly 1.3 million people die as a result of a road traffic collision in the world, more than 3500 deaths each day [3]. The 2013 Global Status Report on Road Safety places Indonesia as the fifth highest number of traffic accidents in the world [4].

A road traffic accident is an event that is not expected by every road user. Usually accidents are caused by many factors and an analysis of the characteristics of an accident in a certain time period will be able to identify road safety elements that have contributed to the cause of the accident, such as road

users, vehicle conditions, and road and environmental conditions [5] [6]. According to the Association for Safe International Road Travel many researchers have conducted a study on the factors that cause accidents, and many of the results of these studies explain that humans are the dominant factor causing traffic accidents. But, a previous study by George et al, good weather conditions and crashes during the night were found to be associated with increased accident severity [7].

Safety audits have great potential in improving road safety and are the most cost effective measure if they can be applied from the planning and design stages [8]. Purpose of the audit is to look at the accident potential and safety performance of the proposal [9]. Traffic safety is an important part of traffic engineering to achieve the objectives of a traffic engineering that is safe, comfortable and economical. Traffic accidents are one of the biggest causes of death in Indonesia. The large number of victims will have significant economic (material loss) and social impacts [10]. Traffic congestion that occurs on roads in urban areas is also a problem of road traffic congestion, which has recently become quite prominent and tends to show an increase [11]

A Road Safety Audit (RSA) is a way to prevent traffic accidents which generally occur due to several factors, namely humans, road conditions, vehicle conditions, and the environment [12]. The outcome of a road safety audit is the identification of any road safety deficiencies and formulation of recommendations aimed at removing or reducing those deficiencies [13]. Humans are the dominant cause of traffic accidents, although in fact road conditions can also be one of the causes of traffic accidents [14].

So to prevent this, roads need to be equipped with various road fittings to help regulate traffic flow, namely: road markings, traffic islands, separation lanes (medians), traffic lights, safety fences, and other traffic engineering [15]. In addition, road alignment both horizontally and vertically also greatly affects the smooth flow of traffic, or may even endanger traffic safety.

In Indonesia, the main cause of the large number of accidents is the human factor, either due to negligence or carelessness of vehicle drivers and other road users in traffic by intentionally or unintentionally ignoring courtesy and traffic rules on public roads. The high number of traffic accidents and the large cost of losses caused by the many problems faced in improving traffic safety and road transportation really need serious security [16][17].

Accidents are caused by many factors, not only bad drivers or careless pedestrians. Among the main factors causing accidents are vehicle damage, vehicle design, driver errors, road surface, and road design.

Table 1. Collision Type/Position

Collision Position	Total Accident	Percentage
Front	60	9.05%
Front Side	103	15.46%
Front Rear	192	28.82%
Side	195	29.27%
Hit Human	48	7.20%
Single Accident	12	1.80%
Streak Accident	47	7.05%
Collision At Object	9	1.35%

Source: Results of documentation, 2023

Accidents due to road design are the cause of accidents, both partly or wholly. Bends, alignments, intersections and signs, and traffic engineering are parts of them. Various important traffic symptoms in urban areas in underdeveloped countries can be noted, including the following: 1) The condition of road infrastructure is generally unsatisfactory, that is, it is narrow and the quality is below standard; 2) The number of motorized vehicles is increasing every year with a very rapid growth rate, not comparable to the available roads; 3) The large number of slow-speed vehicles, such as buggy and pedicab often causes congestion and traffic accidents; 4) Discipline, politeness, and traffic awareness of road users are still lacking, which often results in traffic chaos.

Some of the traffic regulation is still considered unable to guarantee the smooth flow of traffic. The implementation of the road transportation safety program is carried out by the Government, Local Government, Legal Entities and the Community. In relation to the Palembang Indralaya Line, the implementation of the road transportation safety program is carried out by the central government as the

executor and the local government as an assistant in the implementation of the road transportation safety program. Overall, the road transportation safety program includes the road sector and the traffic and road transportation facilities and infrastructure sector.

Areas in the road transportation safety program include matters that are closely related to road transportation safety, such as in the road sector which includes the following programs: (1) inventory of road service levels and their problems; (2) preparation of plans and implementation programs and determination of road service levels; (3) planning, building, and optimizing the use of road segments; (4) improving the geometric area of roads and road intersections; (5) determining road sections for each road section; and (6) testing road function feasibility according to safety and traffic comfort standards information and communication in the field of road infrastructure. Other fields containing road traffic and transportation facilities and infrastructure include the following programs: (1) road traffic and road transportation facilities and infrastructure; (2) traffic management and engineering; (3) motor vehicle roadworthiness; (4) public transport licensing; (5) development of information and communication systems in the field of road traffic and transportation infrastructure; and (6) guidance.

A Road Safety Audit is an official road / traffic project inspection in which an independent team of experts reports potential collisions and safety aspects of the project. According to the Department of Public Works (2005), road safety audits are efforts to find the causes of accidents or problems that occur on accident-prone roads in order to provide safety for road users. There are many reasons that a road or intersection can be audited and they could include: roadway sections where there are general safety concerns, sections with high crash levels, high traffic volumes, geometric roadway and associated design issues, sections scheduled for overlay projects and school zones that have dangerous aspects associated with them [18]. Road safety audits are part of a traffic accident prevention strategy with an improved approach to geometric design conditions, road complementary buildings, road support facilities that have the potential to cause traffic conflicts with a comprehensive, systematic, and independent road inspection concept .

2. Methodology

2.1. Data Collection

This research is descriptive qualitative research with four research informants and two key informants consisting of the Palembang City Transportation Agency and the Palembang Police. The respondents are eight informant that consist of two key informant which are police officer, transportation officer, and six road users of Kolonel H. Burlian road. The method of data collection is by means of document review, in-depth interviews, and observation.

2.2. Data Processing

The hazard identification process was carried out based on the guidance from the worksheet and hazard checklist, then a risk analysis was carried out and a risk ranking was carried out based on the guidance from the qualitative table, which was then narrated in the form of a sentence.

2.3. Data Analysis









The data obtained from in-depth interviews and observations were analyzed using qualitative analysis techniques. Data from in-depth interviews were recorded and the notes were summarized and presented in narrative form then transferred in the form of a summary matrix and the interpretations were grouped according to the questions and research objectives.

3. Result and Discussion

To find out whether Colonel H. Barlian's road condition is suitable for vehicles to pass, it is necessary to check directly to the road to see the condition of the road. In the observations made on Colonel H. Burlian road, there were still findings that the road was bumpy to the point where there were at least two holes along the Colonel H. Burlian road and there was one bend and a steep road. Jalan Kolonel H. Barlian itself is a national / primary arterial road which is an arterial or collector road in the primary road system

that connects between provincial capitals and national strategic roads, Colonel H. Burlian road itself has a road area of 5.077m with a marking length of 5.077






Table 2. Perforated and Wavy Locations

Location	Wavy	Perforated	Information
Hajj Dormitory Fly Over			Bumpy roads are found at flyovers while potholes are found under flyovers
Punti Kayu			There are potholes on the left side of the road / motorbike lane which is often flooded
LRT Siti Fatimah Hospital			The road is bumpy and has potholes on the right side of the road / car lane
Myria Hospital			There are potholes and bumps after the detour

Source: Results of documentation, 2023

The table above explains that there are roads that are potholes and bumpy. For the correct road standard of road planning where the actual shape and size of a planned road and its parts are adjusted to the needs and characteristics of existing traffic.

Table 3. Locations Not Installed Traffic Signs

Nama Lokasi	Types of Signs that are not Installed	Information
JM Sukarame		The yellow light is gone
JM Sukarame		There are no uphill road signs installed
JM Sukarame		There are no warning signs for the entry and exit of the project vehicle
Ar-Rasyid Hospital		There are no bend signs attached
Punti Kayu		Almost all Colonel H. Burlian streets have not yet had signs to enter the alley

Source: Results of documentation, 2023

The table above shows that there are several points where the traffic signs are not installed. This is especially dangerous for drivers on opposite currents. If the driver is driving a vehicle at high speed, a collision can occur due to the lack of traffic signs which should be needed but not available. In addition, some roads that have bends have traffic signs that are not in good condition, such as turn signs that are damaged and bend mirrors that are faded and must be updated immediately. This is supported by direct interviews with motorists and residents around the place of residence.

"... I often pass on this road and there are no turning signs or corner mirrors, this could cause an accident because the turns are sharp, especially at night because of the dark conditions..." (if3)

"... During the time I lived here, accidents happened a lot at turns because there were no signs..."(if4)

From the interview above, it is true that the condition of the Palindra crossing road is that there are still many roads that are not equipped with traffic signs, especially turning signs and corner mirrors which

are needed at sharp bends. This is not only felt by residents who live in the area of the road but also motorists passing by. on that road.

Traffic signs play an important role in road safety aspects for motorists crossing the road, apart from that, traffic signs are one of the roadworthiness factors. From direct observation on the road, the completeness of the traffic signs can be said to be complete, almost along the road there are signs that are useful for motorists. It's just that in some places there are no signs or the condition of the signs is not in good condition, as can be seen in the picture, specifically in the area of the LRT station at Siti Fatimah Hospital on sharp bends that should be given signs.

Tabel 4. Locations that do not have road markings / are already damaged

Location Name	Locations that do not have road markings / are already damaged
Talang Jambe	
Bank BRI	
Mitra Bangunan	
JM Sukarame	
Gamedia World	

Source: Results of documentation, 2023



Based on the picture above, it can be seen that the road markings must be repaired immediately because the conditions are faded, when descending the field, almost along Colonel H. Burlian's road, the road markings are in a faded state, this can be dangerous because with the fading of the road markings, motorists do not know where the boundaries are. lanes that should be traversed and could result in a collision because there will be many vehicles cutting off the lanes of the road, even though on the road it is not allowed to cut the road, especially at curves because it is not marked by road markings.

This is supported by direct interviews with drivers and people who live on the road as follows:

"... What I saw was that almost all the roads didn't have markings, even though they were very useful, because if they didn't have markings, many drivers would drive straight down the road without seeing other drivers in front of them..." (if7)

"...Along this road, many of the markings are faded and when there is a traffic jam, many vehicles do not line up in their lane..."(if6)

Table 5. The location of the lamp

Location Name	The location of the lamp that is already off
Hajj Dormitory Fly Over	
JM Sukarame	
Punti Kayu	
Mitra Bangunan	

Source: Results of documentation, 2023

The need for street lights is very useful, especially on this causeway, it is useful to help illuminate at night for motorists crossing the road due to the minimal lighting conditions at night. After the observation, several areas on Colonel H. Burlian Street had street lights that were no longer on.

This results in limited visibility for drivers. This is also supported by interviews with local residents and several motorists who often cross the road at night.

"... As for the signs, they are quite complete, but as for the street lights, some are no longer on..." (if2)

"...The street lights here often go out..."(if1)

From the results of the interview above, almost all of Colonel H. Burlian's road is still not equipped with street lighting. Along the road, lighting should be equipped which is useful for motorists crossing the route, especially at night Based on direct observation, this analysis is carried out to identify the risks in each area of each type of road infrastructure, the completeness of Traffic Signs, and the number of accidents. This risk is assessed by considering the possible hazards in each type of component involved. Once the risks are identified, a risk assessment is carried out to give priority to taking action and controlling the appropriate actions to deal with the hazards that exist in the whole area along Colonel H. Burlian road. The table that will be presented below shows the classification of risk priority levels based on location.

Table 6. Risk Assessment

Location Name	Risk Classification		
	Low	Medium	High
Hajj Dormitory Fly Over			High
Station LRT Siti Fatimah Hospital		Medium	
Punti Kayu		Medium	
JM Sukarami	Low		

Source: Results of documentation, 2023

The results obtained in the risk assessment table based on location, after looking at several hazard identification factors, informant interviews, and accident data, it can be concluded that the areas that are the most vulnerable are in the Hajj Dormitory Fly Over area. This is because this point is still a high number of accidents and this is caused by roads that are still potholes and bumpy and the street lights are no longer on. And for points that are in the area of the LRT Station at RSUD Siti Fatimah and Punti Kayu, because some points have been equipped with road facilities, even though some of them are faded and must be updated immediately. Meanwhile, the lowest point is at JM Sukarami point because of the complete road support facilities and the minimal number of accidents in the area, but many of the street lights are not on. So it can be concluded that the Colonel H. Burlian road is still very vulnerable to traffic accidents.

According to the theory of Bird (1980) traffic accidents are an unwanted source of events that can result in loss of life as well as property loss. It usually occurs as a result of contact with an energy source that exceeds the limits of the body or structure's capabilities. A traffic accident is an incident in road traffic that involves at least one vehicle which causes injury or damage to the owner. In this case the traffic accident on Jalan Colonel H. Burlian in Palembang City is an accidental and accidental traffic accident, involving road users or not involving other road users resulting in human casualties and property loss.

According to the theory of Bird dan Germain, an accident is caused by the behavior of workers, unsafe conditions and controls from management. In this study, the causes of traffic accidents experienced by drivers crossing Colonel H Burlian's road will be seen not only based on the driver's unsafe behavior, but based on unsafe conditions which include the condition of the road itself. The condition of Colonel H. Burlian's road, based on interviews and observations, it is known that there are several roads that are damaged or have potholes that cause the number of vehicles not to drive freely, along Colonel H. Burlian's road does not have a speed limit in driving, the results of interviews from informants note that, the majority riders who exceed the normal speed limit, which is 40 km / h, usually start above 07.00 AM

Based on the results of interviews and document tracing of traffic accidents, namely in the condition of a potholed lane, a road that turns at a crossroads or turns to enter an alley, this is in accordance with a statement that says that the sharper a bend, the higher the number of traffic accidents, let alone the bend is in a two-way lane.

4. Conclusion

Based on the results of the research that has been conducted regarding the road safety audit of Kolonel H. Burlian Street, it can be concluded that the majority of traffic accidents on Kolonel H. Burlian Street are caused by damaged roads and the victims who frequently experience accidents are motorbike users. Road geometry such as potholes and bumpy roads, traffic signs such as not installing convex mirrors and vehicle speed limit signs, road markings such as road dividing lines that have started to become blurry and street lights appear to be not turning on the street lights in some of these areas. The priority of handling the road geometry is because it is a factor in the occurrence of traffic accidents with the majority of motorbike users in the area. The suggestion for this are to perform regular maintenance of road infrastructure so that every vehicle crossing the road is always in a good and ready condition, so that

congestion and accidents are avoided due to inadequate road conditions and improving road infrastructure, such as repairing signs that are already in poor condition.

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