

# Motor Cycle Driving Behavior and Traffic Safety (Case of Ujung Batu District, Rokan Hulu Regency) Riau Provinsi

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## Abstract

Motorcycles are one of the modes of transportation to be one of the important parts in supporting every activity. Road safety issues are very closely related to traffic because they can cause material losses and fatalities. Factors that influence the rate of dominant accidents are due to human errors and negligence, due to the lack of level of awareness of the behavior of motorists to traffic regulations. The goal is how good motorcycle rider behavior aspects in prioritizing traffic safety in the Ujung Batu Subdistrict area and measuring how much the attitude of the level of awareness of motorcycle drivers in the Ujung Batu Subdistrict area for traffic safety campaigns so that these results can be recommended solutions to minimize the negative impact that exists. The research method used is quantitative descriptive with data collection done by questionnaires and field observations. The questionnaire was given to 100 respondents. The questionnaire consisted of 25 statements divided into two variables: the completeness of the rider and the motorcyclist's behavior. The research used on the spread of this questionnaire used a Likert. From the results of a study conducted on 100 respondents, there are various different behavioral phonations. Based on the results of a statistical analysis of the respondents' responses, the community in Ujung Batu District, Rokan Hulu Regency, where the highest coefficient value is 0.785 with the level of awareness of motorcyclists, namely 'Motor vehicles are equipped with vehicle license plate numbers.

**Keywords:** driving behavior, motorcyclist, safety, traffic.

## 1. Introduction

Cities are directed to develop sustainably, namely development that maximizes potential without compromising future needs. Sustainable urban and rural development is influenced by

several aspects, including population (socio-ecological), spatial planning, and travel behavior (transportation) [1]. The city as a place to live, work, and play requires a good mode of transportation to reduce dependence on private vehicles. People who depend on the use of private

vehicles in carrying out their movements will affect and cause adverse impacts on the environment, security, and traffic jams [2]. In addition, owners of private vehicles who live in the city center will also experience difficulties due to limited parking space, traffic congestion, insurance costs, and expensive parking [3]. The impact that appears should make people's travel behavior in the city center no longer depend on private vehicles.

Owning a private vehicle can be a determining factor in people's travel behavior [2]. Private vehicles provide convenience and flexibility in moving places, which is in line with mobility theory. However, the direction of developing a transportation system is no longer oriented to providing convenience for private vehicle users. Empirical studies reveal that accessibility theory is a more suitable to application in the development of transportation systems in urban centers than mobility theory. This is because the concept of accessibility can become a clear framework for integrating transportation and land use systems [4].

The concept of accessibility emphasizes the integration between modes of transportation and the development of spatial planning that makes it easier for people to travel [5]. Transportation planning that supports accessibility will provide benefits, namely increasing the choice of modes and reducing the use of private vehicles [6]. This supports a transportation system that facilitates people moving from place to place without the need to drive alone. The basic behavior of people who want to travel as short as possible (effective) and cheaply (efficiently) makes the provision of public transportation must accommodate people's routines. So, people's travel behavior and spatial planning are important to consider, because these two things will affect people's travel patterns.

Transportation activities with very far or near distances can deliver users. People in Ujung Batu District, Rokan Hulu Regency, use motorbikes for transportation which support their activities a lot, either for work or just for traveling, because the price of motorbikes is quite affordable and quite effective in operating [7]. Ujung Batu is a sub-district in Rokan Hulu Regency, Riau, Indonesia. Rokan Hulu Regency is one of the regencies in Riau Province with its capital city in Pasir Pengaraian. Ujung Batu has a very strategic location which is on the causeway that connects Medan City and Pekanbaru City. Ujung Batu City is located in the expansion area of Tandon District in Rokan Hulu Regency. Ujung Batu District with an area of 77.85 km<sup>2</sup> and an increasing population

of 73,931 people [8]. With a large number of motorcycle users in Ujung Batu District, accidents cannot be separated from every activity of riding a motorcycle on the streets. Almost every house in Indonesia has a motorized vehicle or even more. The largest number of vehicles is motorcycles with a total of 176,726 units. Followed by passenger cars with a total of 16,441 units, then buses with a total of 97 units, and trucks with 13,095 units [8].

## 2. Literature review

Motorcycles are a development of conventional bicycles that were first discovered. In 1868 [9], Michaux et Cie, the first company in the world to manufacture bicycles on a large scale, began to develop the steam engine as bicycle propulsion. But the effort was still not successful and was then continued by Edward Butler, an English inventor. Butler made a three-wheeled vehicle with an internal combustion engine. Since this discovery, more and more experiments have been carried out to make motorcycles and cars. One of them was done by Gottlieb Daimler and Wilhelm Maybach from Germany.

The two inventors met while working together at Deutz-AG-Gasmotorenfabrik, the largest stationary engine manufacturer in 1872 [10]. The owner of Deutz-AG-Gasmotorenfabrik named Nikolaus Otto succeeded in making a four-stroke engine or also known as a four-stroke engine and the invention was patented in 1877 [11]. Although the four-stroke engine is still too simple and less efficient, the engine is expected to replace the steam engine. In 1880, Daimler and Maybach were fired from the company and the two set up a repair shop in Stuttgart. In 1885, they created a carburetor to mix gasoline and air so that it could be used as fuel for Otto's four-stroke engine. They developed the four-stroke engine into a 100cc cylinder and put the engine on a wooden bicycle.

The wooden engined bicycle was called the Reitwagen ("riding car") and became the world's first motorcycle. The use of motorbikes in Indonesia is very popular because the price is very relatively cheap and affordable for most people and the use of fuel and operating costs are quite efficient [12]. Motorcycles are a development of conventional bicycles that were first discovered. In 1868, Michaux et Cie, the first company in the world to manufacture motorcycles on a large scale, began to develop a steam engine as bicycle

propulsion. But the effort was still not successful and was then continued by Edward Butler, an English inventor. Butler made a three-wheeled vehicle with an internal combustion engine. Since this discovery, more and more experiments have been carried out to make motorcycles and cars. One of them was done by Gottlieb Daimler and Wilhelm Maybach Germany [13].

Safety riding means an effort to minimize the level of danger and maximize safety in driving, in order to create a condition, where we are at a point that does not endanger other motorists and are aware of the possible dangers that can occur. happening around us and the understanding of prevention and mitigation [14]. The implementation of the above understanding is that when we drive a vehicle, we must create a rationale that prioritizes and prioritizes safety, both for ourselves and for others, that the behavior that describes safety riding consists of [15]: a. Motorcycle Maintenance (Checking or heating the engine, tire pressure, brake function, chain condition, brake light function, indicator functions, completeness of the STNK certificate, turning on the turn signal, carrying the STNK, using foot protectors, making sure your passenger is wearing a helmet, cleaning the motorcycle along with completeness and perform regular motorcycle service. b. Preparation (self-protection) (Checking the rearview mirror, horn function, headlight function, high-light function, turn signal function, fuel availability conditions, personal equipment, turning on the headlights, your vehicle is equipped with an STNK, wearing a helmet, mask, gloves, 10 jackets, cleaning protective masks regularly, gloves regularly, helmets regularly). c. Orderliness (Drives the vehicle when the traffic light is yellow, uses a cellphone to make calls, SMS, smokes, violates road markings, violates traffic signs, drives at a speed of more than 60 km/hour, Has rides with more than two people, listens to music via cellphone, ticketed by police officers). The equipment in driving safety is SNI helmet (as head protection), jacket, pants, shoes, gloves, knee protector (protective arm or elbow), chest protective vest, and nose cover (mask).

Driving safety refers to behavior driving which ideally must have a sufficient level of safety both for oneself and for others, in order to avoid traffic accidents. Law of the Republic of Indonesia Number 22 the Year 2009 article 57 paragraph (1) concerning Road Traffic and Transportation, every motorized vehicle operated on the road must be equipped with motorized vehicle equipment. In paragraph (2) the equipment as referred to in paragraph (1) for motorcycles is in the form of Indonesian national standard helmets [16].

### 3. Methodology

Methodology of Data Collection To obtain data, interviews were conducted with 100 respondents consisting of students and those who use motorcycles with the tip of the stone. Interviews were conducted using a questionnaire instrument. There are 2 groups of questions. The first group includes general data, employment data, health data, vehicle data, and respondents' vehicle use data. The second group includes the behavior of respondents in various traffic all-lintas.

#### 3.1 Research Location and Time

This research was conducted in Ujung Batu District, Rokan Hulu Regency, as a case study material in the specification of research data collection by taking the research location in the Ujung Batu District, Rokan Hulu Regency. The time of the study was carried out for 1 month, namely in November 2020.

#### 3.2 Research variable

The variables that will be studied through the respondents of motorcycle riders who pass along the research area in the Ujung Batu District, Rokan Hulu Regency include the completeness of the rider and the behavior of the rider. The following is a table of variables and indicators that will be used in this study.

**Table 1.** Variables and Indicators

Parameter	Variable	Indikator
Equipment Aspect Motorcycle Rider	SIM dan STNK	Frequency of carrying a motorized vehicle license SIM and STNK
	Helm SNI	Indonesian National Standard Helmet (SNI)
	Helmet for small children Helm	A special helmet for small children according to the SNI head
	Complete mirror	Complete left and right mirrors Complete left and right mirrors
	Modified mirror	Unmodified mirrors
	SNI tires	SNI Motorcycle Tires
	Gloves	Gloves
	Shoes	Shoes that protect the feet to the ankles
	SNI Muffler	The muffler according to motorcycle vehicle standards
	Vehicle plate number	Motorized vehicles are equipped with vehicle plate numbers.
Behaviour Aspects of Motorcycle Riders	Use of short-range helmet	Short-distance travel without a helmet
	Putting on the helmet properly	Attach the chin helmet hook until it clicks
	Headlight	Turn on the main light during the day
	Turn signal	turn off the turn signal
	Tire pressure	Check tire pressure
	Machine Condition	Check engine condition before driving
	Transporting goods	Transport as many goods as possible
	Piggybacking a passenger	Piggybacking more than one passenger
	Facilitate the motor	Facilitate those who do not have a SIM
	Riding on the pavement	Riding a motorbike on the sidewalk.
	Switch lanes	Switch lanes to take advantage of narrow gaps
	Driving speed	Driving a motorbike at a high speed
	Minimum speed	Driving a vehicle at a speed of 30 km/hour
Attitude while driving	Drive a motorbike at will	
Communicating while driving	Communicate while driving hands free	

#### 4. Result

To find out the behavior of motorcyclists, it is necessary to distribute a questionnaire that will possibly affect traffic safety aspects in the Ujung Batu District, Rokan Hulu Regency. Questionnaires were given to 100 respondents consisting of 25 questions, namely aspects of rider completeness and aspects of motorcyclist behavior. And for the target respondents, namely students, university

students, private employees, civil servants, entrepreneurs, and other general public aged 17 to > 57 years. The analysis was carried out by validating a questionnaire from data on the completeness of the rider and the behavior of the rider and motorcycle on the aspects of traffic safety. The results of the questionnaire respondents' data (based on gender, age, and level of work), then tested the validity, reliability test, frequency distribution of answers from respondents, mean and rank

#### 4.1 Characteristics of Respondent

The following are the characteristics of respondents based on 100 respondents distributed in the Ujung Batu District, Rokan Hulu Regency, the results of respondent data that 63% are male and 37% female, In terms of age, it was found that 65 respondents aged 17-27 years, 15 respondents aged 28-37 years, respondents aged 38-47 years as many as 6 people, respondents aged 48-57 years as many as 6 people, and 3 respondents aged >57 years, When viewed from respondents based on occupations in the Ujung Batu District, Rokan Hulu Regency, the number of private employees is 15%,

PNS is 3%, Entrepreneur is 6%, Labor/driver is 3%, TNI/POLRI is 2%, Students are 45%, and students by 26%.

#### 4.2 Validity test

A validity test is used to measure the validity or validity of a questionnaire. In the validity test, the sample used was 100 respondents who were motorcycle riders passing through the Ujung Batu District, Rokan Hulu Regency, as presented on Table 2.

**Table 2.** Validity and reliability indicators of the proposed model

Variable	R-Count	R-Table	Results
PT1	0,761	0,1966	Valid
PT2	0,488	0,1966	Valid
PT3	0,658	0,1966	Valid
PT4	0,567	0,1966	Valid
PT5	0,509	0,1966	Valid
PT6	0,612	0,1966	Valid
PT7	0,604	0,1966	Valid
PT8	0,597	0,1966	Valid
PT9	0,633	0,1966	Valid
PT10	0,785	0,1966	Valid
PT11	0,260	0,1966	Valid
PT12	0,321	0,1966	Valid
PT13	0,753	0,1966	Valid
PT14	0,521	0,1966	Valid
PT15	0,604	0,1966	Valid
PT16	0,516	0,1966	Valid
PT17	0,287	0,1966	Valid
PT18	0,529	0,1966	Valid
PT19	0,558	0,1966	Valid
PT20	0,728	0,1966	Valid
PT21	0,782	0,1966	Valid
PT22	0,398	0,1966	Valid
PT23	0,551	0,1966	Valid
PT24	0,493	0,1966	Valid
PT25	0,287	0,1966	Valid

#### 4.3 Uji Reliability

A reliability test is a test on an index that shows how far a measuring instrument can be trusted for its consistency, and whether the

measuring instrument will remain consistent if the measurement is repeated. High and low reliability is expressed by a value called the reliability coefficient, ranging from 0-1 [19].

**Table 3.** Goodness of fit

Reliability	
Number of Questions	Alpha Value
25	0,906

Source: Data Processing Results, 2021

Table 3 shows that the reliability test was carried out on the question items that were declared reliable because they were between the correlation coefficient of 0.8-1.0 which meant that they were included in the Very High-reliability category [20].

#### 4.4 Analysis of Mean and Completeness Rank of Riders

The mean and rank of the completeness of the riders where the mean is sorted from the highest to the lowest and the ranking is sorted from the first to the last rank.

**Table 4.** Table of Mean Rank Completeness of Riders

No	Indicator	Mean	Rank
1	Motorized vehicles are always equipped with a vehicle plate number	4,06	1
2	Using Indonesian National Standard (SNI) motorcycle tires	3,94	2
3	Using the left and right mirrors on motorcycle vehicles	3,87	3
4	Using the left and right mirrors on motorcycle vehicles	3,81	4
5	When riding a motorcycle, carry a driving license (SIM) and a vehicle registration certificate (SNTK).	3,76	5
6	A small child who is riding on a ride wears a special child helmet that is suitable for the size of his head	3,71	6
7	Using an Indonesian National Standard (SNI) helmet which has a hard outer layer, a thick middle layer, and a soft middle lay.	3,43	7
8	Using unmodified mirrors	3,31	8
9	Wear shoes that protect the feet to the ankles	3,08	9
10	Using gloves	2,95	10
Average		$\Sigma=3,59$	

Source: Data Processing Results, 2021

Table 4. The results of the mean and rank of riders' completeness show that the highest mean value is 4.06 with the statement 'Motorized vehicles are always equipped with a vehicle plate number.' And the lowest mean value is 2.95 in the statement 'Using gloves' with total mean value is 3.59 [22].

#### 4.8 Analysis of the Mean and Rank of Rider

The mean and rank of the completeness of the riders where the mean is sorted from the highest to the lowest and the ranking are sorted from the first to the last rank.

**Table 5.** Table of Means and Ranks of Rider Behavior

No	Indikator	Mean	Rank
1	I change lanes to take advantage of the narrow gap in the traffic jam	3,88	1
2	I ride a motorcycle on the sidewalk while avoiding traffic jams	3,86	2
3	I always turn on the headlights when riding a motorcycle during the day	3,84	3
4	I check tire pressure before riding a motorcycle	3,82	4
5	I put the helmet on properly and attached the chin hook until it clicked	3,79	5
6	I'm carrying more than one passenger at the same time	3,73	6
7	drive a motorcycle at high speed	3,63	7
8	I turn off the turn signal before riding the motorcycle	3,57	8
9	I facilitate my relatives who are not yet mature and do not have a driver's license (SIM) to drive a motorcycle	3,26	9
10	Saya mengangkut barang sebanyak mungkin ketika mengendarai sepeda motor	3,22	10
11	I communicate with my cellphone while driving by using handsfree	3,22	10
12	I drive a motorcycle at a speed of 35 km/hour	3,18	11
13	For short-distance trips, helmets are not required	3,14	12
14	I facilitate my relatives who are not yet mature and do not have a driver's license (SIM) to drive a motorcycle	3,07	13
15	I drive my motorcycle as I please when I ride	2,98	14
Average		$\Sigma=3,46$	

## 5. Discussion

Researcher Recommendation to Make a Socialization The recommendation of researchers to make socialization to the people of Ujung Batu District aims to provide direction to the community about the importance of obeying traffic rules because this is safety in traffic. The use of helmets and vehicle accessories can reduce road accidents. Driver safety is prioritized and pay attention to all equipment. In conducting the socialization of traffic discipline, the material presented in the socialization, among others, is about traffic rules and efforts to order good and correct traffic on the highway [23].

Starting with the completeness of the rider, such as bringing a motorcycle to complete all of his motorcycle equipment, such as using an SNI helmet, mirrors, and exhaust as well as a motorcycle plate and obeying traffic signs, not using a cellphone while driving and most importantly of course having a driver's license (Driving Permit) and others related to road safety. Through this socialization, it is hoped that the people of Ujung Batu District can know and comply with traffic regulations properly and correctly. By obeying traffic signs, it will reduce the rate of traffic accidents and not endanger other roads [24].

The behavior of the motorcycle user community in prioritizing traffic safety in the Ujung Batu Rokan Hulu sub-district: For the aspect of rider completeness, it can be seen from the mean and rank results which show that the highest mean value is 4.06 with the statement 'Motorized vehicles are equipped with vehicle plate numbers. And the lowest mean value is 2.95 in the statement 'Using gloves'. For the behavioral aspect of motorcyclists, it can be concluded from the mean and rank results which show that the highest mean value is in the statement 'I change lanes to take advantage of the narrow gap in the traffic jam' with a mean value of 3.88. And the lowest mean value is in the statement 'I drive a motorcycle as I please when I drive' with a mean value of 2.98.

## 6. Conclusion

The results of the traffic awareness level of motorbike users can also be concluded from the results of the analysis of the frequency of answers from each respondent, where the highest coefficient value is 0.785 with the awareness level of

motorbike riders, namely 'Motorized vehicles The author is very aware that in this study many of these obstacles without any assistance, guidance, or support from various parties are very difficult to resolve, therefore the authors would like to thank the Head of the Ujung Batu Police, the Ujung Batu Community of Rokan Hulu Regency, Rektor of the Islamic University of Riau.

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