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# STUDY ON SPEEDING BEHAVIOUR OF DRIVER'S MOTOR VEHICLES TO TRAFFIC ACCIDENT RISK IN NATIONAL ROAD IN MAKASSAR CITY

## *Studi Perilaku Pengendara Kendaraan Bermotor Dalam Melampaui Batas Kecepatan Terhadap Potensi Resiko Terjadinya Kecelakaan Lalu Lintas Pada Ruas Jalan Nasional di Kota Makassar*

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**Abstract**

The traffic accidents often occur due to the lack of awareness while driving. The variance reason such us undisciplined and unwise to be polite when driving is the main cause of crashes. Road safety is one of the important roles to support and to develop to the commonwealth. This research aims to investigate the potential risk of speeding on a national road in Makassar. The driver performance the speeding is more occurs in the midnight till dawn. The situation of drivers while speeding is conducted to make them arrived early to the destination. The respondents' preferences also show the speed of the vehicle through the national road is around 40 – 60 km/hour. It is still in normal speed requirement at least 60 km/hour.

**Keywords:** behavior, traffic, accident, vehicles, national road

**Abstrak**

Potensi kecelakaan akibat ketidaktertiban dalam berlalu lintas dapat terjadi. Penyebab kecelakaan lalu lintas dapat beragam seperti kurangnya kesadaran untuk berkendara secara bijak dan tertib serta penuh tanggung jawab. Pentingnya menjaga ketertiban ketertiban berkendara merupakan salah satu upaya dalam mendukung pembangunan dan integrasi nasional untuk memajukan kesejahteraan umum. Dalam melihat potensi risiko kecelakaan maka dilakukan suatu studi terkait perilaku pengendara kendaraan bermotor yang melampaui batas kecepatan pada ruas jalan di nasional di kota Makassar. Kecenderungan pengendara kendaraan bermotor yang melampaui batas kecepatan maksimum banyak terjadi pada malam hingga dini hari dengan tujuan agar pengendara sampai lebih cepat atau tepat waktu. Hasil wawancara juga menunjukkan bahwa responden mayoritas menggunakan kecepatan pada kisaran 40 – 60 km/jam dan masih masuk dalam kategori kecepatan normal dan tidak melampaui batas maksimum .

**Kata kunci:** perilaku, lalu lintas, kecelakaan, kendaraan bermotor, jalan nasional

## PREFACE

Road safety and public transport are playing an important role in encouraging infrastructure and national integration as a part of developing wealth. The road safety

traffic and public transport have a strategical part supporting the commonwealth. The performance of traffic and technology simultaneously is one of the achievement indicators as a developing country in national and international. A great effort to perform the safety, secure, and comfortably as a developing country is expected to fulfil the international standard. Throughout the world, cars, buses, trucks, motorcycles, pedestrians, animals, taxis, and other categories of travellers, share the roadways, contributing to economic and social development in many countries.

Yet each year, many vehicles are involved in crashes that are responsible for millions of deaths and injuries. Globally, every year, about 1.25 million people are killed in motor vehicle crashes, and approximately 50 million more are injured. Following current trends, about two million people could be expected to be killed in motor vehicle crashes each year by 2030. Currently, road crashes are ranked as the ninth most serious cause of death in the world, and without new initiatives to improve road safety, fatal crashes will likely rise to third place by the year 2020 (WHO, 2015). In developed countries, road traffic death rates have decreased since the 1960s because of successful interventions such as seat belt safety laws, enforcement of speed limits, warnings about the dangers of mixing alcohol consumption with driving, and safer design and use of roads and vehicles. For example, the Police Department of Indonesia (Korlantas POLRI) shows the high level of traffic accidents with the number of road traffic fatalities has declined by for 100.000 national population of 2016 around 10,46. The main reason for traffic accidents are the majority by enforcement rules, and lack of responsibility to safe driving on the road — Makassar records as a city with a high risk of traffic accidents. The Police department notices the crash with 4.295 cases of traffic accidents (Laka Lantas) along 2018 started in January till July 2018 (Ditlantas Polda, Sulsel 2018). The speeding behaviour is also measured by considering the average speed of the vehicle. Speed characteristics regard to motorcycle (Hustim 2013). They are determined the speed through by the vehicles of each lane (Isran, 2013). The behaviour of the vehicle of each segment of traffic (Abulebu, Ramli 2012). The speed of vehicles affects the heterogeneous mix traffic flow (Hustim, Ramli 2018).

This research objective is to gain the basic value of risk potential from indicators related to driver behaviour due to the cross the road is beyond speed in normal conditions and situation. Finally, the result of research may contribute and give accident information to the stakeholder to increasing road safety.

## RESEARCH METHOD

### Data Collection

The observation is conducted with traffic surveys, traffic counting of vehicles, geometric survey to determine the size of road, lane, median, shoulder, and utilities, the direct speed test, and questionnaire. The location of research is the performance at Perintis Kemerdekaan of Makassar with specification type 6/2 D. The condition of cross-section road is figured out at table 1 and figure 1 below.

**Table 1**. Geometric condition

| | Segment | Type | Width | Total Lane | Width Lane (m) | Width Shoulder (m) | Median (m) |
|---|---|---|---|---|---|---|---|
| 1 | Direction BTP-Telkomas | 6/2 D | 9 | 2 | 3 | 2 | 3,5 |
| | Direction Telkomas-BTP | | 9 | 2 | 3 | 2 | |

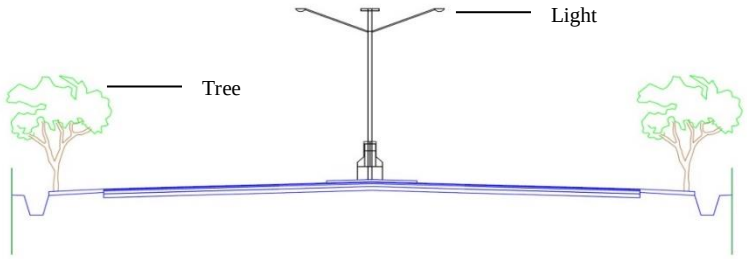



**Figure 1**. The general cross-section of Perintis Kemerdekaan Road

## Traffic Counting of Vehicles

The traffic counting is conducted in one day (24 hours) on Thursday and started at 06.00 am with 15 minutes of sequence period. The counting has recorded the vehicles according to the Indonesian Highway Capacity Manual (IHCM) 1997 in which classified the vehicles into Light Vehicle (LV), Heavy Vehicle (HV), and Motorcycle (MC). Then, the more briefly and location of Jalan Perintis Kemerdekaan with total direction is shown in the following figure 2.

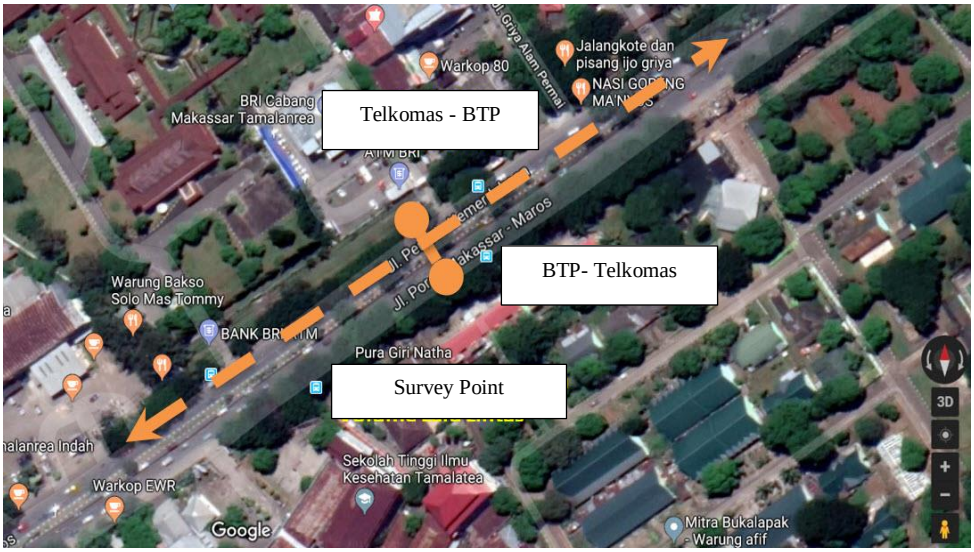



**Figure 2**. Traffic counting location

## Speed Test Survey

The speed test also observed using the speed gun test to measure the speed of vehicles for as much as a sample for LV, HV, and MC. The total sample of variance vehicles is a minimum of 30 for one hour and done as long as 24 hours.

### An Interview using Questionnaire

The driver behaviour is conducted by interviewing the respondent with a related question of speeding behaviour and other questions about traffic accident potential due to speeding. The experience of speeding in urban roads, national roads, and others. The characteristics of respondents are obtained and the opinion about speeding behaviour.

### Data Analysis

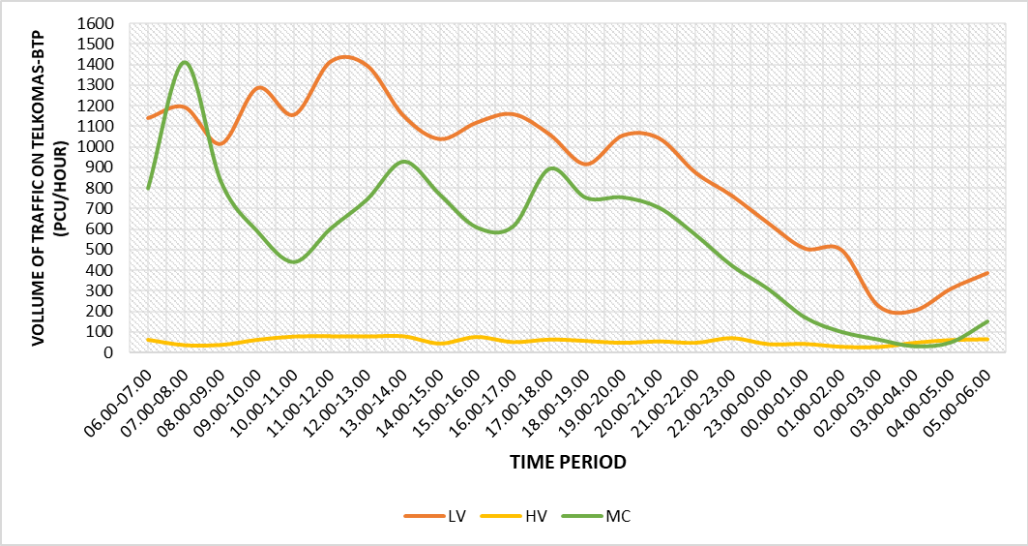
This study is using two concepts of psychology, the risk-taking culture with belief and intention, subjective norm (Eiksund, 2009); risk perception that perception to the probability of traffic accidents risk (Machin, Sankey 2007). The study also established the value of culture that has an important role and colour the behaviour of the drivers as local content.

The research using descriptive analysis of qualitative and quantitative for total respond of the respondent and the analysis of average speed, mean, and level of service from the total condition of road, the composition of vehicles, and validation of speeding behaviour of vehicle-based direct sample measurement and perception of vehicle to speeding using T-test and F-Test. The result of speed data is tested first using a normal distribution test as the requirement to do the statistical test. The total sample of direct observation of speed is analyzed and classified into the sample that over the minimum restriction speed 60 km/hour.

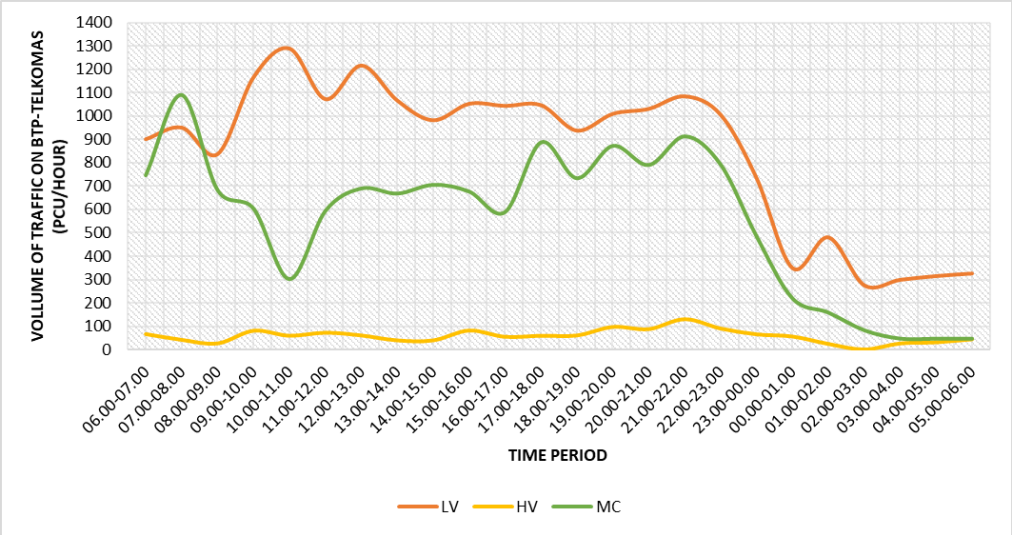
## RESULT AND DISCUSSIONS

### Vehicles Volume

The traffic counting of the vehicle in the road segment is conducted to gain the volume of vehicles with the three categories; LV, HV, and MC. The volume of vehicles is observed for a two-way direction. The total vehicles in 24 hours are shown in the following figure 3. The volume of vehicles is counted and shows the total number of vehicles through the observation area.




(a) Telkomas-BTP

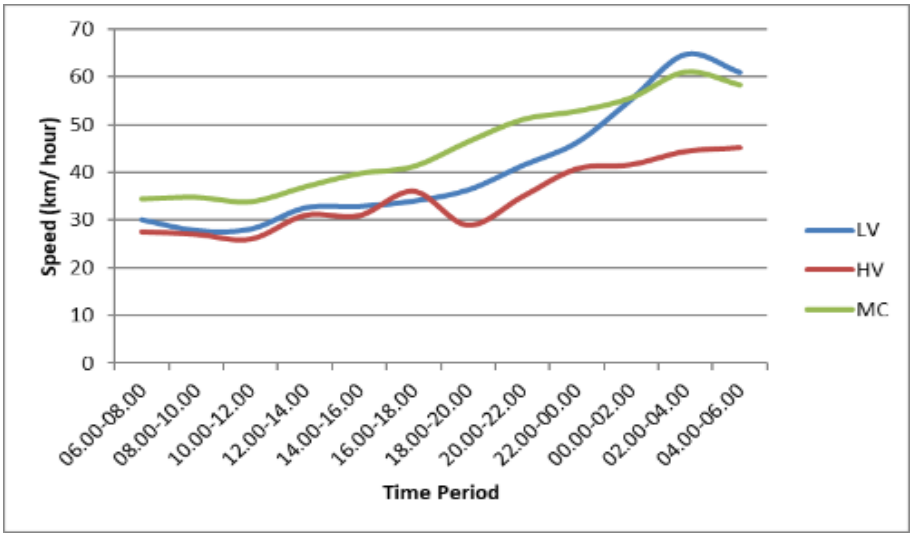



(b) BTP-Telkomas

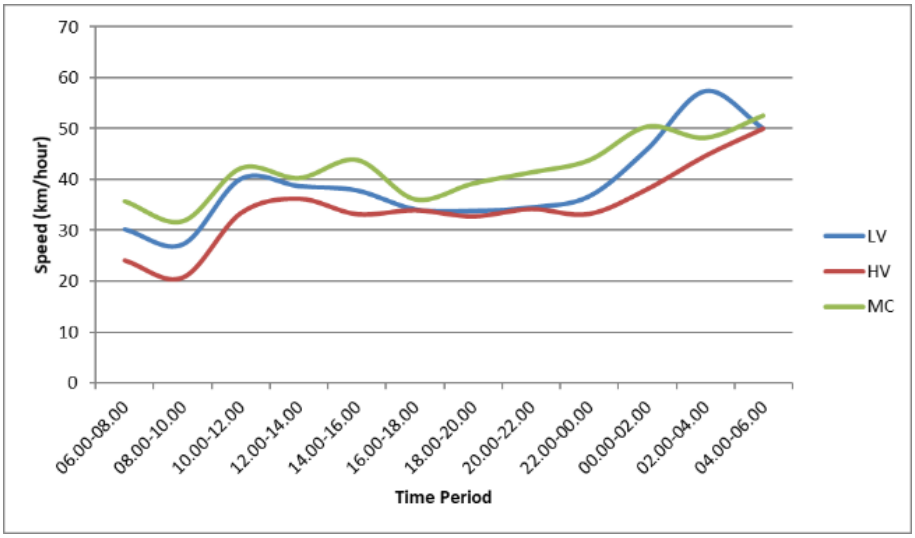
**Figure 3**. The total volume of vehicles on (a) (b)

## The Speed of Vehicles

The speed of vehicles that are passing the observation area of Jalan Perintis Kemerdekaan with total samples as much 30 for two hours period as long as 24 hours. The following Figure 4 shows the speed of total vehicles during the total time period.



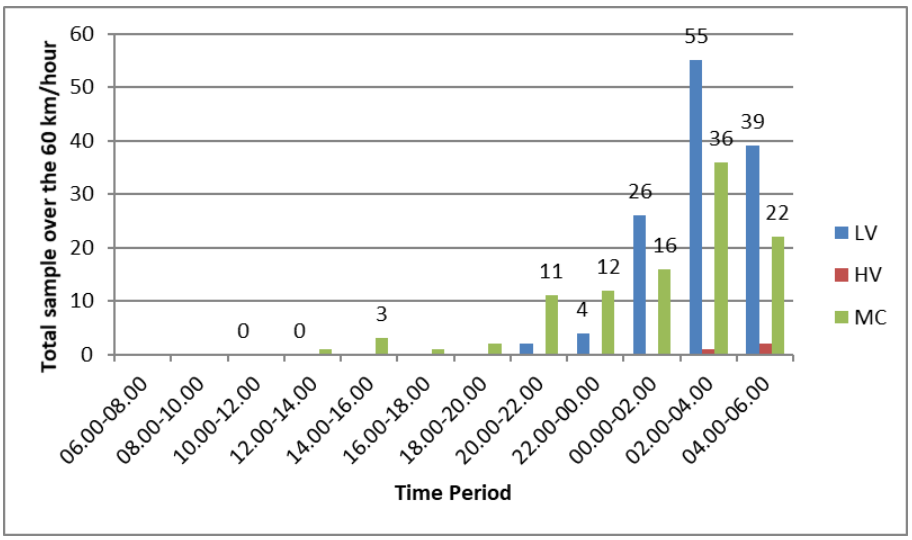

(a) Telkomas-BTP



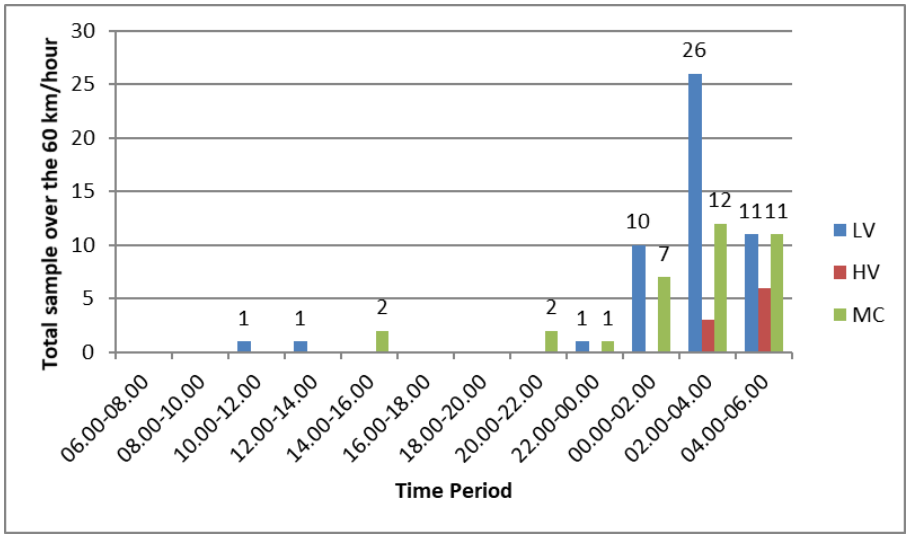

(b) BTP-Telkomas

**Figure 4**. The average speed of vehicles through Telkomas-BTP (a) Telkomas-BTP (b)

The vehicles that over the restrict of the maximum speed 60 km/hour, especially to national roads are done speeding in the midnight till dawn. A higher speed increases the likelihood of an accident. The general relationship holds for all speeds and all roads, but the rate of increase in accident risk varies with initial speed level and road type. Large speed differences at a road also increase the likelihood of an accident. The situation for direction on Telkomas-BTP, as much 3 samples or around 2, 15% occurs during morning-afternoon with motorcycle speeding and over the speed, on the other hand, at night till midnight as much as 55 samples or around 97,85% the light vehicles perform speeding. On the contrary, at the BTP – Telkomas direction, as much 4 samples for motorcycle and light vehicles or around 4, 26% speeding during morning-afternoon, and around 95, 74% in the night till midnight. The following Figures 5 show the total sample for 24 hours over the maximum speed of the national road.




(a) Telkomas-BTP




(b) BTP-Telkomas

**Figure 5**. The total samples over the speed on Telkomas-BTP (a) Telkomas-BTP (b)

## The Drivers Behavior

In the measurement characteristics of driver behaviour, some of the questions are asked to respondents. The questions related to speeding are described more clearly on the following figure 6.

1. The percentage of speed with speeding behaviour

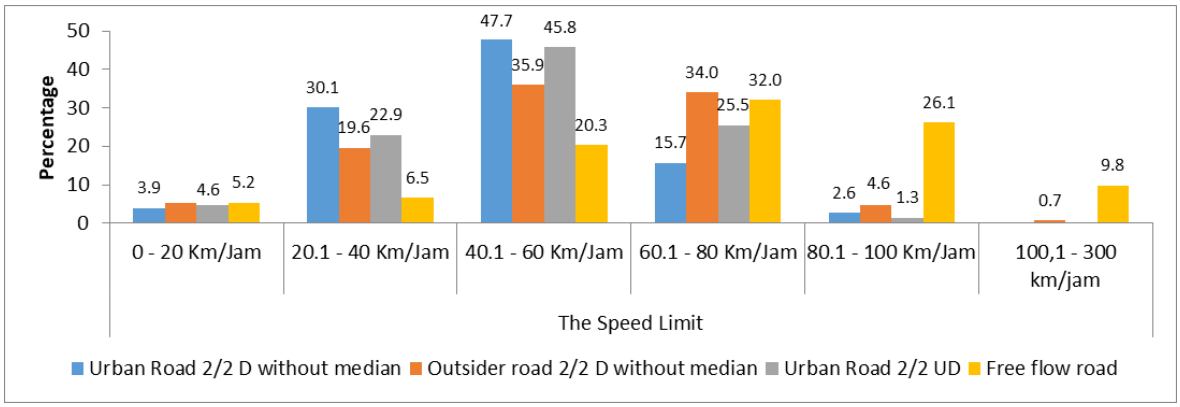



**Figure 6**. The speed with speeding behaviour

Figure 6 describes the majority of vehicles in an urban area is a comparison to an urban road of a vehicle's speed between 40 – 60 km/ hour, not only for urban area roads separated and not. These situations are validated with the speed vehicle on observation sample and tested for normality, variance, and the difference that finally shows the relationship between the driver behaviour on-site with the assumption from respondents using an online questionnaire.

2. The Influence of "Speeding" Behavior
   The following percentage shows the influence of speeding according to reason and their opinion.

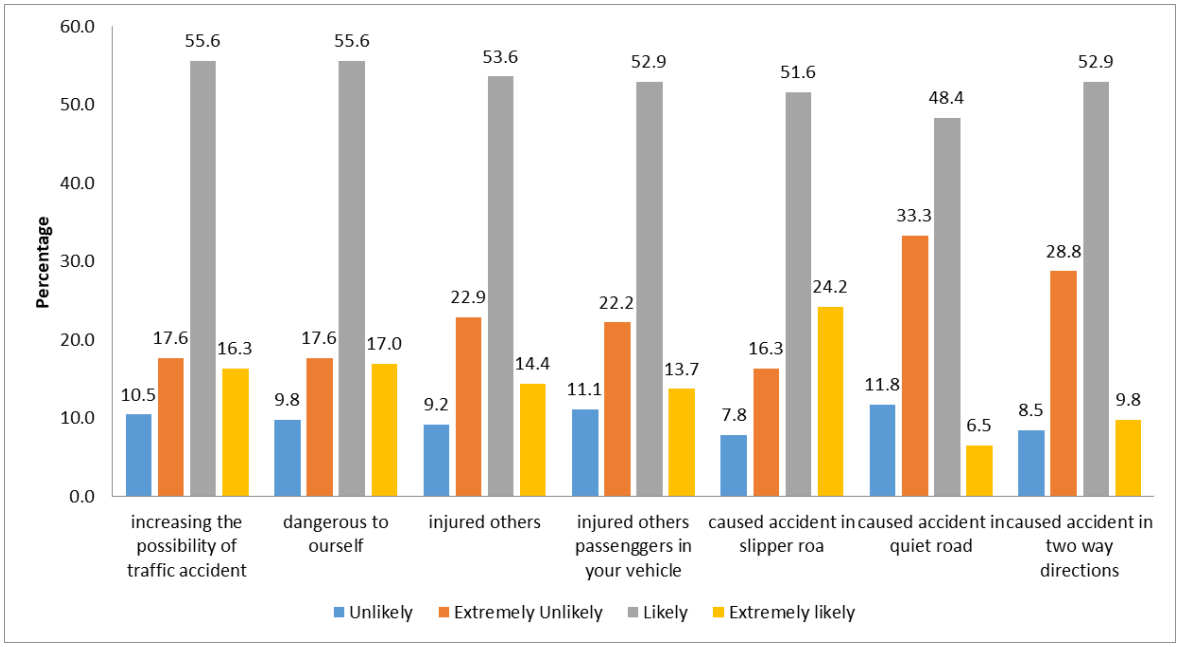



**Figure 7**. The influence of "Speeding"

3. The Opinion about "Speeding"

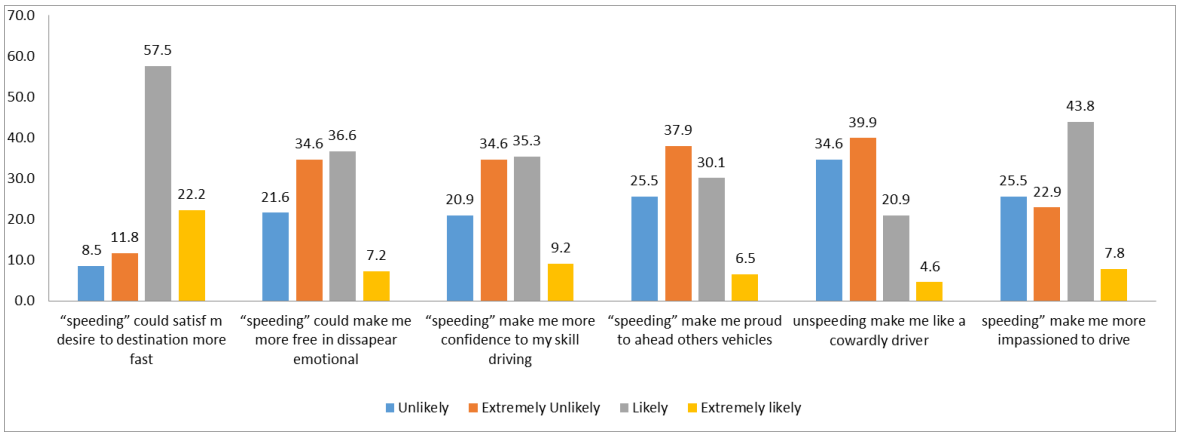
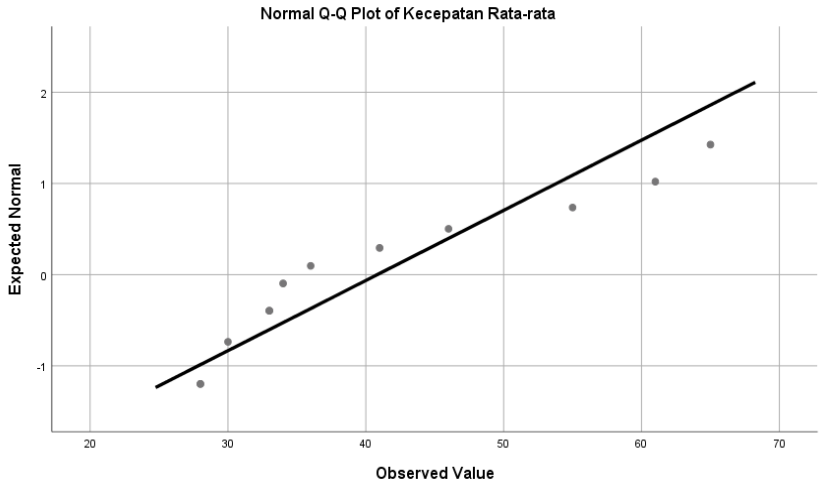


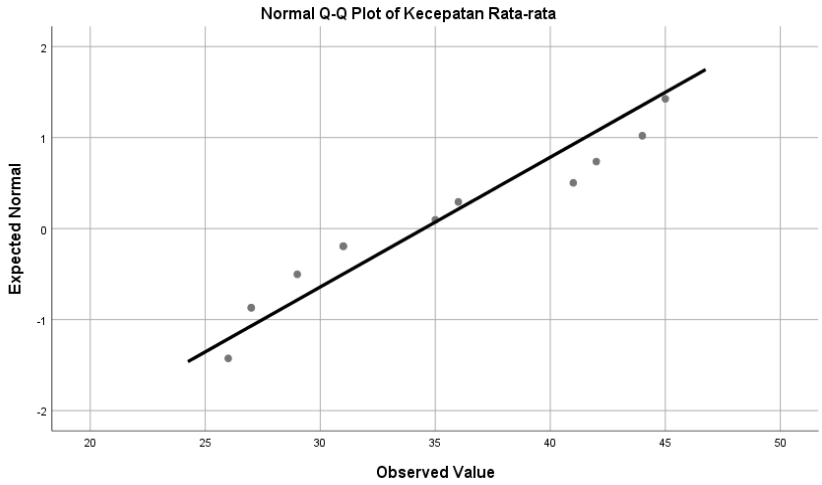

**Figure 8**. Opinion about "Speeding"

## The Relation of Speed to Speeding

The speed of vehicles is varying while speeding is performed according to the driver. The following relation between the average speed with the preference of questionnaire for total direction.




(a) Light Vehicles (LV)




(b) Heavy Vehicle (HV)

**Figure 9**. The average "speeding" for LV and HV for Telkomas – BTP

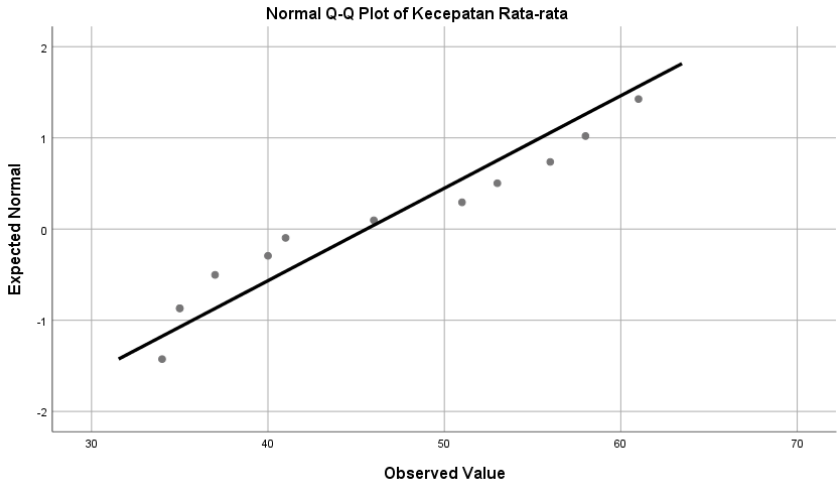
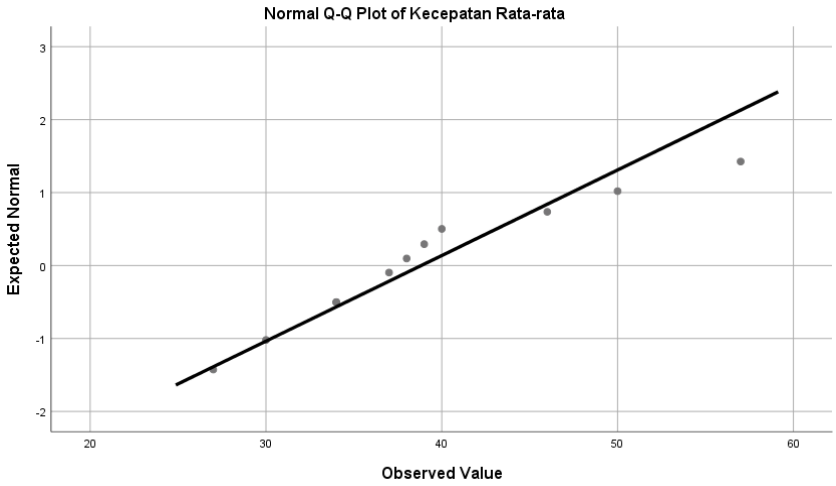
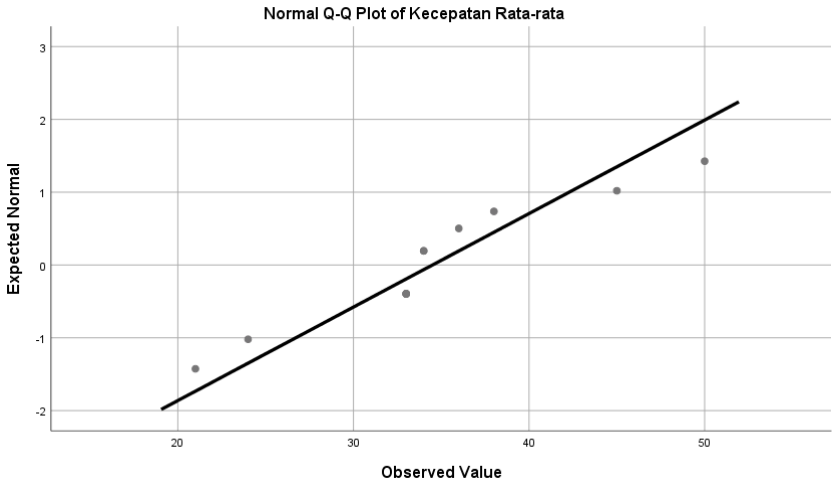



**Figure 10**. The average speed of "speeding" motorcycle (MC) for Telkomas – BTP




(a) Light Vehicle (LV)




(b) Heavy Vehicle (HV)

**Figure 11**. The speed average of "speeding" with LV and HV for BTP – Telkomas

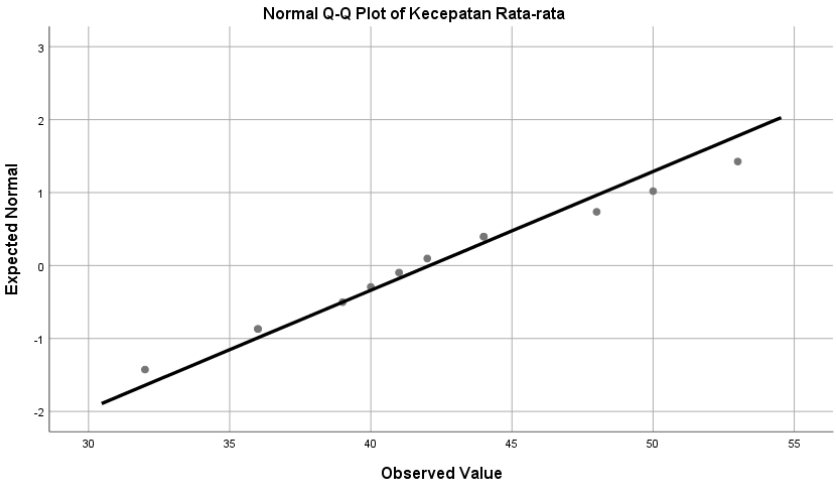



**Figure 12**. The speed average of "speeding" of motorcycle (MC) for BTP – Telkomas

The normal plot data is conducted to see the distribution of data collection. These are needed to see the value of site observation and matched with interview data. The test procedure for both data shown in F-Test and T-Test related to the formula of site speed observation with the perception of people relate to speeding is describes on the following table 2.

**Table 2**. The statistical test of observation and questionnaire

| Test Result | Direct. Telkomas – BTP | | | Direct. BTP - Telkomas | | |
|---|---|---|---|---|---|---|
| | LV | HV | MC | LV | HV | MC |
| T-Test | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| F-Test | 0.038 | 0.076 | 0.002 | 0.217 | 0.048 | 0.073 |

The T-test shows the speed of the observation sample is likely relatively. The Varian of F-Test also shows that unity is dominated. This is occurring because there are more or a small part of vehicles over the speed limit.

## CONCLUSIONS

According to analysis and discussing to the driver over the speed limit due to the possibility of a traffic accident in national road segment in Makassar, the conclusions as follows:

1. The majority of respondents choose the speed of vehicles while speeding or over the limit for an urban area is between 40 – 60 km/hour while the speed is likely with average speed. This speed is likely to speed of observation due to the perception of people is included in the range 42 – 60 km/ ours.
2. The driver behaviour of vehicles with over the minimum speed often occurs in the night till midnight, while the light vehicle reaches the sample with 106 km/hour. The heavy vehicle with 69 km/hour, and the most dangerous and potentially of a traffic accident is heavy vehicle touch speed with 94 km/hour.
3. The majority respondent agrees that the potential due to the over the speed limit of vehicle is dangerous and injurious.
4. The majority of authority is agreed that the main causes driver with speeding behaviour is to achieving the destination directly and faster.

## UNKNOWLEDGEMENT

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