



## **PROFILING MALAYSIAN DRIVER STYLE (AGGRESSIVE AND PASSIVE)**



**BACHELOR OF MECHANICAL ENGINEERING TECHNOLOGY  
(AUTOMOTIVE TECHNOLOGY) WITH HONOURS**

**2022**



**Faculty of Mechanical and Manufacturing Engineering  
Technology**



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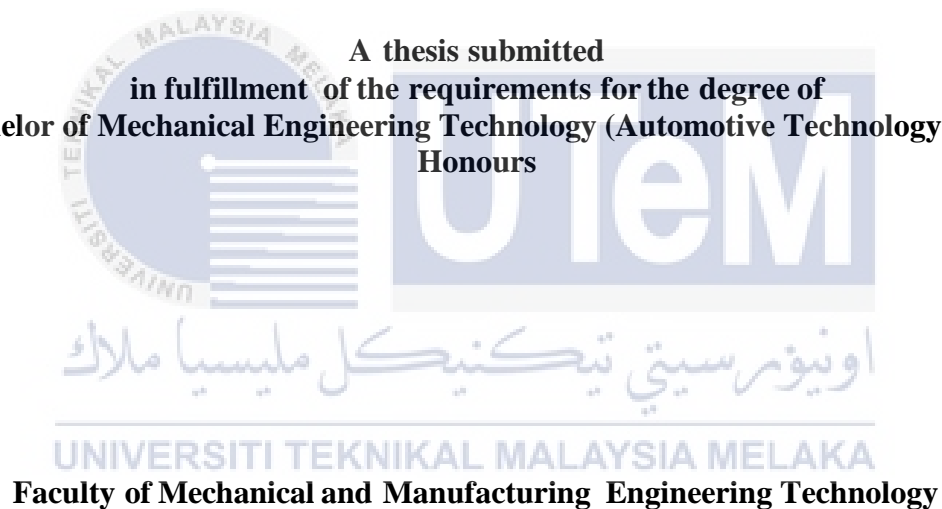
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Honours**

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**PROFILING MALAYSIAN DRIVER STYLE (AGGRESSIVE AND PASSIVE)**

**SITI NUR AMIRAH BINTI AZIZI**

A thesis submitted  
in fulfillment of the requirements for the degree of  
**Bachelor of Mechanical Engineering Technology (Automotive Technology) with  
Honours**



**UNIVERSITI TEKNIKAL MALAYSIA MELAKA**

**2022**

## DECLARATION

I declare that this choose an item entitled “Profiling Malaysian Driver Style (Aggressive and Passive)” is the result of my own research except as cited in the references. The choose an item. has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

Signature



Name

: Siti Nur Amirah Binti Azizi


Date

: 18/1/2022



## APPROVAL

I hereby declare that I have checked this thesis and in my opinion, this thesis is adequate in terms of scope and quality for the award of the Bachelor of Mechanical Engineering Technology (Automotive Technology) with Honours.

Signature :   
Supervisor Name : Dr. Nur Hazwani Binti Mokhtar  
Date : 27/01/2022



## DEDICATION

This thesis is dedicated to those who have inspired me along the way to completing it.

Thank you.



## ABSTRACT

Over the last few years, numerous deaths due to road accidents have been reported. Problems arise when the factor that contributes to the road accident is the driver behaviour itself. This happens when certain driver behaviours can cause a road accident, such as an aggressive driver. Driving aggressively can endanger other road users. This research describes the classification of driver behaviour briefly into aggressive and passive driver by utilizing questionnaires. In this research, two methods have been used to get the result which is data collection by conducting a questionnaire and analyzing the data by using SPSS Analysis to make sure the questionnaire is reliable and the variables is correlate to each other. Without these methods, this research is likely difficult to complete. This research also shows that there are few factors that can cause road accidents, and one of them is driver behaviour. Driver behaviour has the highest percentage in contributing to road traffic accidents that can cause deaths. Driver behaviour can be categorized into three groups which are Violations, Errors, and Lapses. The statistic also has shown that driver behaviour is strongly correlated with road accidents.



## **ABSTRAK**

*Sejak beberapa tahun kebelakangan, banyak kematian akibat kemalangan jalan raya telah dilaporkan. Masalah timbul apabila faktor yang menjadi penyebab kepada kemalangan jalan raya adalah pemandu itu sendiri. Ini berlaku apabila terdapat tingkah laku pemandu tertentu yang boleh menyebabkan kemalangan jalan raya seperti pemandu yang agresif. Memandu secara agresif boleh membahayakan pengguna jalan raya yang lain. Penyelidikan ini menerangkan secara ringkas klasifikasi tingkah laku pemandu menjadi pemandu yang agresif dan pasif dengan menggunakan soal selidik. Dalam penyelidikan ini, dua kaedah telah digunakan untuk mendapatkan hasilnya iaitu pengumpulan data dengan menjalankan soal selidik dan menganalisis data menggunakan 'SPSS Analysis' untuk memastikan soal selidik boleh dipercayai dan pembolehubah adalah berkait antara satu sama lain. Tanpa kaedah ini, penyelidikan ini mungkin sukar diselesaikan. Dalam penyelidikan ini juga menunjukkan bahawa terdapat beberapa faktor yang menjadi penyebab kepada kemalangan jalan raya dan salah satunya adalah tingkah laku pemandu. Tingkah laku pemandu mempunyai peratusan tertinggi dalam menyumbang kepada kemalangan jalan raya yang boleh mengakibatkan kematian. Tingkah laku pemandu boleh dikategorikan kepada tiga kumpulan iaitu 'Violation', 'Error', and 'Lapses'. Statistik juga menunjukkan bahawa tingkah laku pemandu sangat berkaitan dengan kemalangan jalan raya.*

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## ACKNOWLEDGEMENTS

In the Name of Allah, the Most Gracious, the Most Merciful

First and foremost, I would like to thank and praise Allah the Almighty, my Creator, my Sustainer, for everything I received since the beginning of my life.

I would like to acknowledge and give my biggest thanks to my supervisor, Dr. Nur Hazwani Binti Mokhtar for the guidance and encouragement during the process of completing my thesis. Her advices has been quite helpful in completing my thesis paper. I had also like to express my gratitude to my friends who have given their comments and suggestion in order for me to improve my writing.

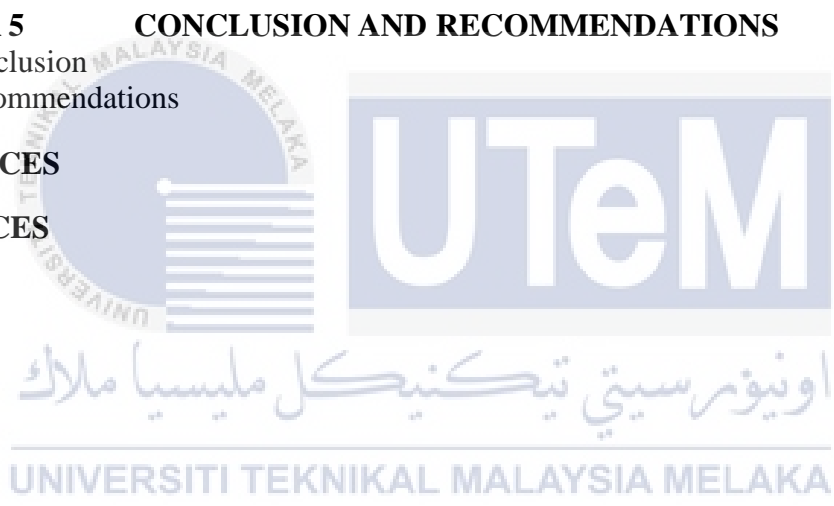
Last but not least, from the bottom of my heart a gratitude to my beloved family, especially my parents for giving me their moral support. I am extremely grateful for their love, prayers, and encouragement.



## TABLE OF CONTENTS

	<b>PAGE</b>
<b>DECLARATION</b>	
<b>APPROVAL</b>	
<b>DEDICATION</b>	
<b>ABSTRACT</b>	<b>i</b>
<b>ABSTRAK</b>	<b>ii</b>
<b>ACKNOWLEDGEMENTS</b>	<b>iii</b>
<b>TABLE OF CONTENTS</b>	<b>iv</b>
<b>LIST OF TABLES</b>	<b>vi</b>
<b>LIST OF FIGURES</b>	<b>vii</b>
<b>LIST OF SYMBOLS AND ABBREVIATIONS</b>	<b>viii</b>
<b>LIST OF APPENDICES</b>	<b>ix</b>
<b>CHAPTER 1 INTRODUCTION</b>	<b>10</b>
1.1 Background	10
1.2 Problem Statement	11
1.3 Research Objective	12
1.4 Scope of Research	12
<b>CHAPTER 2 LITERATURE REVIEW</b>	<b>13</b>
2.1 Introduction	13
2.2 Road Traffic Accidents	14
2.3 Statistic of Road Accidents	15
2.4 Factor of Road Traffic Accidents	17
2.4.1 Speed and Road Accidents	18
2.4.2 Drunk Driving and Road Accidents	19
2.4.3 Drowsy Driving and Road Accidents	21
2.5 Previous Study Related to Measure Driver Behaviour	22
2.6 Driver Behaviour Questionnaire (D.B.Q)	25
2.6.1 Questionnaire	26
2.7 Summary of Chapter	30
<b>CHAPTER 3 METHODOLOGY</b>	<b>31</b>
3.1 Introduction	31
3.2 Survey Question and Development	33
3.3 Pilot Survey	34

3.4	Cronbach's Alpha Analysis	35
3.5	Main Survey	36
3.6	Analysis	36
3.7	Summary of Chapter	37
<b>CHAPTER 4 RESULTS AND DISCUSSION</b>		<b>38</b>
4.1	Introduction	38
4.2	Results and Analysis of Research	38
4.2.1	Descriptive Statistic of Demographic	39
4.2.2	Reliability and Validity of Construct	41
4.2.3	Discriminant Validity	43
4.2.4	Hypothesis Test	43
4.2.5	Goodness of Fit Indicators	44
4.2.6	Structural Equation Modelling (SEM)	45
4.2.7	Driver Behaviour Comparison Among Driver Style	46
4.2.8	Correlation Between Variables	47
4.2.9	Regression	48
<b>CHAPTER 5 CONCLUSION AND RECOMMENDATIONS</b>		<b>50</b>
5.1	Conclusion	50
5.2	Recommendations	50
<b>REFERENCES</b>		<b>52</b>
<b>APPENDICES</b>		<b>55</b>



## LIST OF TABLES

TABLE	TITLE	PAGE
Table 1.1	Death by Category of Road Users for 10 years (2009-2019)	11
Table 2.1	Road Traffic Accidents in Malaysia	16
Table 2.2	Percentage of Road Traffic Deaths Involving Alcohol in Malaysia	20
Table 2.3	Effect of Blood Alcohol Content	21
Table 2.4	Previous Study Related to Driver Behaviour	24
Table 2.5	Demographic Questionnaire	27
Table 2.6	Driver Behaviour Questionnaire	28
Table 3.1	Value of Cronbach's Alpha and The Internal Consistency (Farahiyah Akmal Mat Nawi, 2020)	35
Table 4.1	Descriptive Statistic of Demographic	40
Table 4.2	Reliability and Validity of Construct	42
Table 4.3	Discriminant Validity	43
Table 4.4	Summary of Hypothesis Test	44
Table 4.5	Goodness of Fit Indicators	45
Table 4.6	Driver Behaviour Comparison among Driver Style	47
Table 4.7	Correlation between Variables	48
Table 4.8	Model Summary	49
Table 4.9	ANOVA	49
Table 4.10	Coefficient Table	49

## LIST OF FIGURES

FIGURE	TITLE	PAGE
Figure 2.1	Statistic of Road Accidents in Malaysia (2010-2019)	14
Figure 2.2	Statistic of Road Fatalities in Malaysia (2010-2019)	15
Figure 2.3	Fatal Crashes by Speeding Status	18
Figure 2.4	Accidents Because of Speeding	19
Figure 2.5	Number of Crashes Happened Because of Drowsy Driving	22
Figure 2.6	Driver Behaviour Questionnaire	26
Figure 3.1	Flowchart of Research	32
Figure 4.1	Structural Equation Modelling	46



## LIST OF SYMBOLS AND ABBREVIATIONS

WHO	-	World Health Organization
D.U.I	-	Driving Under Influence
D.W.I	-	Driving While Intoxicated
B.A.C	-	Blood Alcohol Content
D.B.Q	-	Driver Behaviour Questionnaire
CR	-	Composite Reliability
AVE	-	Average Variance Extracted
GFI	-	Goodness of Fit Index
AGFI	-	Adjusted Goodness of Fit Index
CFI	-	Comparative Fit Index
CMIN/df	-	Normal Chi-Square to Degree of Freedom
RMSEA	-	Root Mean Square Error of Approximation
SRMR	-	Standardized Root Mean Squared Residual
NFI	-	Normal Fit Index

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## LIST OF APPENDICES

APPENDIX	TITLE	PAGE
APPENDIX A	DEMOGRAPHIC QUESTIONNAIRE	55
APPENDIX B	DRIVER BEHAVIOUR QUESTIONNAIRE	59



# CHAPTER 1

## INTRODUCTION

### 1.1 Background

Road traffic accidents are one of the top causes of death globally, which causes an estimated 1.5 million people killed each year and injuring up to 50 million more (WHO, 2017). It is currently ranked eighth, but by 2030, it is expected to go up to the fifth place. In 2016, there were over 500,000 road accidents in Malaysia, with 7152 people killed. This tragedy has had a significant economic impact, and the overall costs associated with these disasters is extremely high. According to studies, road traffic accidents cost the country's gross domestic product (G.D.P.) an average of 1.5 percent. For example, the cost of road accidents in 2016 was predicted to be RM9.21 billion, up to RM581 million from 2015 (Nur Shazwani Rosli, 2017).

Accidents and road traffic safety are major public health problems worldwide. However, in terms of transportation safety, there are significant regional differences between countries. Despite major regional differences in traffic safety, the factors contributing to different accident risk numbers in different countries and areas have remained mainly unstudied (Abdulbari Bener, 2017). Research on road safety has underlined the need to research and intervene in violent driving to avoid collisions and fatalities (Francisco Alonso, 2019).

According to traffic accident investigations, in road traffic accidents, human factors are either the main cause or a contributing factor. Driving skills and driving style are two different elements that define human factors in driving. Driving skills are a combination of



information processing and motor skills that develop through training, practice, or driving experience. Specific driving patterns, or the way a driver likes to drive, are referred to as driving style. Over time, a driving style develops, but it does not always become safer due to driving experience (Abdulbari Bener, 2008).

## 1.2 Problem Statement

In Malaysia, road accidents are a severe problem that needs to be resolved by authorities and the government to prevent them from occurring frequently. For over 1.25 million people, road traffic accidents are one of the biggest causes of death (World Health Organization, 2018). According to data from the Department of Road Safety (J.P.J) (2017), the number of incidents involving all types of vehicles has increased in recent years, from 2009 to 2019.

Table 1.1 Death by Category of Road Users for 10 years (2009-2019)

CATEGORY	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
CAR	1405	1405	1389	1389	1258	1399	1258	1358	1358	1167	286	13876
MOTORCYCLE	4067	4036	4169	4169	4294	4179	4203	4485	4485	4128	944	43013
WALKERS	589	626	530	530	455	515	482	511	441	407	115	5201
BICYCLE	224	192	172	156	159	124	107	123	162	122	46	15587
BUS	31	77	29	32	60	29	20	29	23	39	15	384
LORRY	213	202	247	194	210	221	223	186	199	1992	29	2116
VAN	91	97	93	86	80	73	71	65	62	47	29	794
4x4	78	154	151	159	158	129	130	142	113	88	15	1317
OTHERS	47	67	97	147	100	146	112	122	123	94	4	1059
TOTAL	67745	6872	6877	6917	6915	6674	6046	7152	6740	6284	1483	69365

Based on **Table 1.1**, it shows that during 2015 and 2016, the number of accidents increased. Many factors can cause road traffic accidents. One of the factors is the driver behaviour itself. There are so many drivers' behaviour that can cause road accident, such as driving aggressively. By driving aggressively, it can endanger other road drivers. Previous studies has found that aggression in traffic has resulted in approximately 1.2 million victims, and the number is constantly rising (Nazlin Hanie Abdullah, 2020). However, in driving

sometimes, there are two types of drivers that can be classified which are passive and aggressive. There are some drivers that can make them called passive drivers, such as following all the traffic laws whenever driving on the road

### 1.3 Research Objective

The main reason for this study is to classify the driver behaviour into aggressive and passive by utilizing questionnaire. So, based on the problem statements stated above, below are the specific objectives for this study:

- a) To design and develop questionnaire (Driver Behaviour Questionnaire)
- b) To analyse driver behaviour using SEM
- c) To determine relationship between driver behaviour which are Violation, Error, and Lapse.

### 1.4 Scope of Research

These are the scope of this research:

- i. Understand the factor that influenced the driver behaviour and classify the driver behaviour into a passive or aggressive driver
- ii. The target of this study is the driver aged from 18 until above 60 years old with at least five years of driving experience
- iii. This study focuses on collecting data by using a Questionnaire divided into two factors: the first one is characteristic of the driver (Demographic), and the second one is related to driver behaviour (Violation, Error, Lapse).

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 Introduction

In most nations, irresponsible drivers have been regarded as the primary cause of traffic accidents. Malaysia is no exception, with a 93 percent increase in total automobile accidents from 2000 to 2015, as well as a 17 percent increase in mortality rate (Ahmat & Hazman, 2018). Even though many actions had been taken, the statistics of accidents is still increasing every year. Previous studies has found that there are two types of driver behaviours which is aggressive and passive. However, both types of driver behaviour are highly harmful to other drivers, and gender seems to play a key role in this behaviour.

Speeding, driving close to the car in front, breaking traffic laws, inappropriate lane change, and weaving are all examples of aggressive driving. The list is long. Most drivers drive aggressively from time to time, and many of them are entirely unaware of it. Even though the percentages of drivers who drive aggressively and ordinary violations are minor, they can still danger other road users as they use roads every day to commute to work and social activities. Although some said that being a passive driver and driving slowly is the safest approach, it can still endanger other road users and aggressive drivers. Driving slowly can block traffic and create unintended havoc for other road users. Therefore, this act cannot lead to safer driving conditions.

## 2.2 Road Traffic Accidents

Road safety has always been a severe issue in scientific studies. Road traffic accidents are one of the more studied elements since they have a direct impact on the social environment as a result of many people's deaths or lasting disabilities, as well as a financial issue due to the costs of repairing or replacing damaged property or individuals (Laura Eboli, 2020). Every day, there are a large number of vehicles on the road, and traffic accidents can occur at any time and in any location. Some accidents result in fatalities, which means people die in that accident. According to World Health Organization (WHO), every year, more than 1.2 million people die in road traffic accidents around the world, with an even more significant number of people suffering non-fatal injuries, affecting the health and well-being of accident survivors and their families (Jonathan J.Rolison, 2018).

In 2016, there were over 500,000 traffic accidents in Malaysia, with 7152 people killed. This disaster has had a significant economic impact, and the total costs involved with these accidents were extremely high. According to reports, road traffic accidents cost the country's gross domestic product an equivalent of 1.5 percent. **Figure 2.1** shows the number of traffic accidents in Malaysia that has increased during the last ten years. **Figure 2.2** shows the number of fatalities has been steadily decreasing from 7152 in 2016 to 6167 in 2019 over the last ten years.

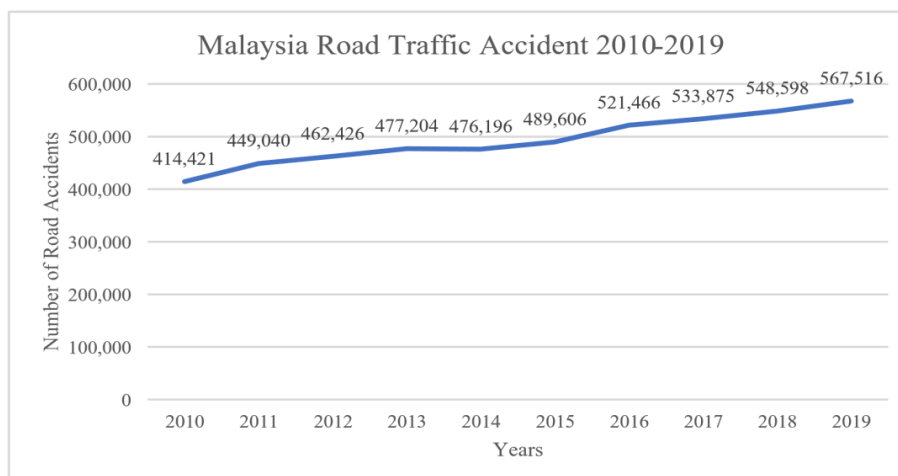


Figure 2.1 Statistic of Road Accidents in Malaysia (2010-2019)

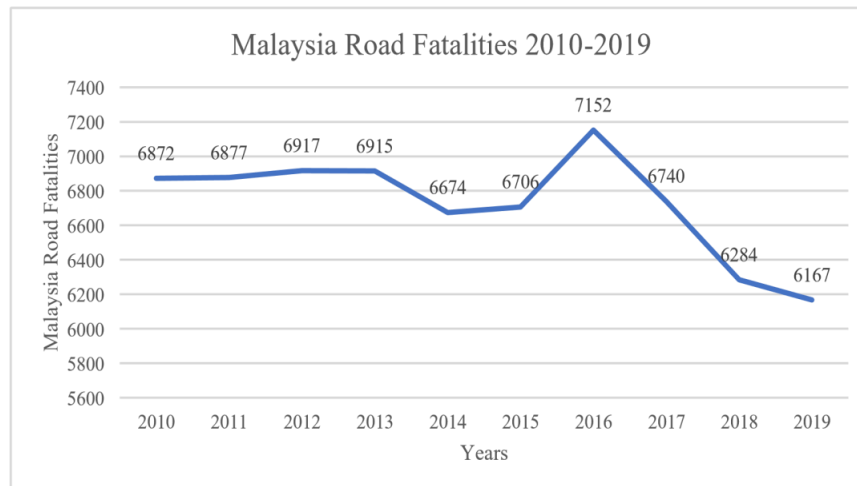


Figure 2.2 Statistic of Road Fatalities in Malaysia (2010-2019)

### 2.3 Statistic of Road Accidents

Road transportation appears to give a nation and individuals numerous benefits, particularly in increasing the working environment, financial assets, training offices, and health facilities. However, despite transportation's importance in the network, transportation can also have a harmful impact, which is road traffic accidents. Sometimes, road traffic accidents can happen because of the negligence of road users themselves that fatal accidents. Furthermore, road safety factors such as streetlights that do not function well and no safety signs in risk areas of accidents also can contribute to road accidents (Khairul Amri Kamarudin et al., 2018).

Table 2.1 Road Traffic Accidents in Malaysia

Year	Registered Vehicles	Population	Road Crashes	Road Deaths	Serious Injury	Slight Injury	Index per 10,000 Vehicles	Index per 100,000 Population	Index per billion VKT
2005	14,733,585	26,045,500	328,264	6,200	9,395	31,417	4.21	23.80	19.58
2006	15,790,732	26,549,900	341,252	6,287	9,253	19,885	3.98	23.68	18.69
2007	16,813,943	27,058,400	363,319	6,282	9,273	18,444	3.74	23.22	17.60
2008	17,773,084	27,567,600	373,330	6,527	8,868	16,879	3.68	23.68	17.65
2009	18,933,237	28,081,500	397,330	6,745	8,849	15,823	3.56	24.02	17.27
2010	20,006,953	28,588,600	414,421	6,872	7,781	13,616	3.43	24.04	16.21
2011	21,311,630	29,062,000	449,040	6,877	6,328	12,365	3.23	23.66	14.68
2012	22,590,123	29,510,000	462,423	6,917	5,868	11,654	3.06	23.44	13.35
2013	23,434,640	30,213,700	477,204	6,915	4,597	8,388	2.95	22.89	12.19
2014	25,101,192	30,708,500	476,196	6,674	4,432	8,598	2.66	21.73	10.64
2015	26,301,952	31,186,100	489,606	6,706	4,120	7,432	2.55	21.50	9.60
2016	27,638,067	31,633,500	521,466	7,152	4,506	7,415	2.59	22.61	10.70
2017	28,738,194	32,049,700	TBA	6,470	TBA	TBA	2.35	21.03	9.59

Table 2.1 shows Malaysia's road traffic accidents statistic that Road Safety Department Malaysia (J.K.R). Ministry of Transport Malaysia has collected. The information indicates the number of registered vehicles each year, relating to road crashes and road deaths. The data also shows the number of effects from road accidents, which are severe injury and slight injury.

The total number of road traffic accidents in Malaysia has been gradually increasing from 2005 until 2016 and has reached its peak at 521,466 in 2016. The data also shows that 2016 has the highest number of registered compared to other years, which strongly indicates the transportation is related to road accidents. According to Institute for Health Metrics and Evaluation, road accidents need serious attention as it is one of the top five causes of deaths in Malaysia.

## 2.4 Factor of Road Traffic Accidents

Because of the rising number of traffic accidents, road safety is becoming increasingly important. As a result, it is important to assess the severity of an accident and the factors that influence it. The three most essential factors are driver behaviour, vehicle construction and condition, and infrastructure condition (Lenka Komackova, 2016). However, driver behaviour has the highest percentage of causing road accidents which is about 95 percent of road accidents happened because of driver behaviour (Mohd Nasir bin Nawawi, 2018). Thus, this is proving that unsafe driving behaviour is the most dangerous factor. Excessive speeding, weaving in and out of lanes, and driving through stop signs or red lights are examples of unsafe driving that endangers the driver and other road users.

Human factors are a sole or contributing element in road traffic accidents in previous studies. The human factor in driving can be categorized into two parts which are skills and driving style. The term of driving skills refers to a driver's ability to process information and their motor skills (Burcu Tekeş, 2020). Meanwhile, individual driving habits or how a driver chooses to drive are referred to as the driving style or driving behaviour (Nasir, 2019). Furthermore, previous studies has discovered that human behaviour, particularly human aggressive driving behaviour, is responsible for the growing number of accidents. There is a high correlation between unsafe driving behaviour and being involved in a road accident.

In addition, to increase road safety, all risk factors connected with road accidents and the accidents's severity must be identified. However, some aspects discovered to have a mixed effect on road traffic accidents and accident severity are currently being debated. For example, some studies identified a positive connection between speed and the frequency of accidents, while others found the opposite.

## 2.4.1 Speed and Road Accidents

As is known, speeding on the roads is an issue all over the world, and the effects from it can endanger all other road users. Disobeying the stated limit of speed or driving at high speeds considered excessive for road or climate factors for a specific timeframe or in a particular location is referred to as speeding (Suliman A. Gargoum, 2016). Whether it exceeds the speed limit or driving too fast for the conditions, speeding is a big contributor to accidents. Speed has been recognised as a major cause of traffic accidents in individual vehicles and commercial and public passenger vehicles. According to Royal Malaysia Police (RMP) statistics, the number of drivers or motorcyclists involved in speeding-related traffic accidents was 4 percent in 2010 and 4.4 percent in 2011 (M. S. Ahmad, 2017). **Figure 2.3** shows the fatal crashes by speeding status. The figure below shows that in 2006, the fatal crash by speeding is higher than fatal crashes by not speeding. This proves that speeding can endanger many road users live including the driver itself.

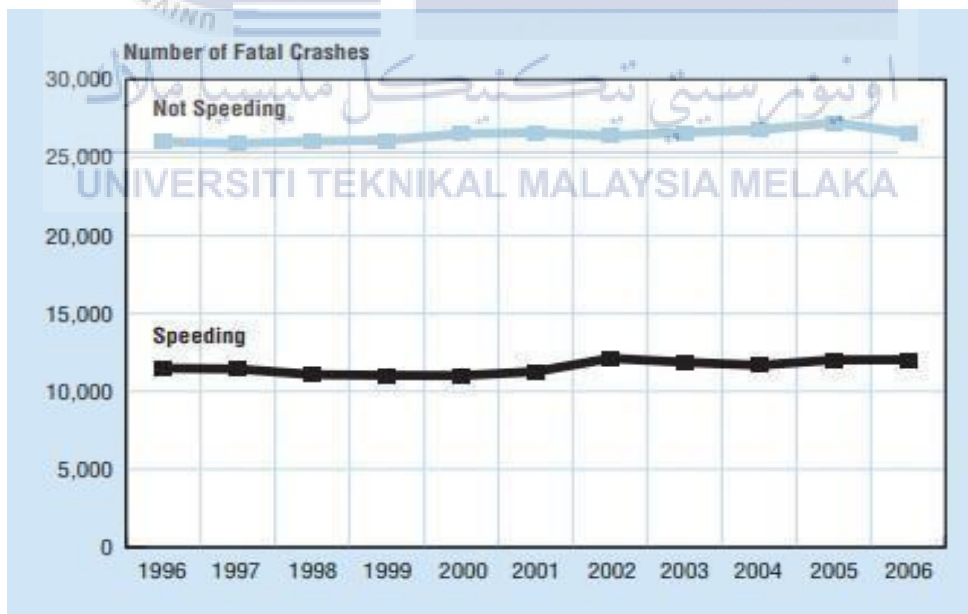


Figure 2.3 Fatal Crashes by Speeding Status

Speeding affects the ability of the driver to safely steer around curves or obstructions in the road, lengthen the distance a vehicle should travel to stop, and lengthen the vehicle's