

CHAPTER 2

FACTOR AND SOLUTION FOR TRAFFIC CONGESTION AT INTERSECTION OF THE TWO-WAY ROAD FROM AYER HITAM TO KLUANG AND TO THE ENTRANCE OF UTHM KAMPUS BANDAR

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2.1 INTRODUCTION

The industrial rapid growth in Malaysia has made roads as the main alternative in connecting parties related to collaboration. Thus, road construction is quite high demand, and the costing often will be an issue as the uses of high-grade aggregate will be in large amounts to ensure the quality of road construction. Road design consists of multiple layers of varying thicknesses, depending on the stresses expected, to sustain the most diverse environmental conditions and remain serviceable for several decades.

Therefore, this study was conducted to study the issues and traffic congestion at the intersection of the two-way road from Ayer Hitam to Kluang and to the entrance of UTHM Kampus

Bandar, Parit Raja, Johor especially at peak hour such as kids going back from school or time back from work. Besides, the configuration of road cross-sections such as no yellow box junction, road width and road shoulder width are also among the main factors in road accidents and traffic congestion [1]. This shows that the rate of road accidents that occur in each country is still uncontrollable, so it is now a factor in the selection of the study area. Road factors, such as road structure, shoulder width and environmental factors, such as weather also affect accidents, but limited research has been done to see how driver behavior affects the risk of accidents and traffic congestion [2]. Next, the focus of this study is to identify the relationship between road intersections and traffic congestion for comfort and smooth traffic flow.

2.2 ROAD ACCIDENTS

A road accident can generally be defined as an unwanted event occurs due to a vehicle losing control, resulting in a collision with an object, or causing property damage, injury to drivers, passengers and other road users [3]. Due to road accidents is one of the main killers in the world in addition to chronic diseases such as heart disease, stroke and lung infections and difficulty breathing [4]. Road accidents are becoming more and more troubling because they are one of the main causes of loss, injury, disability, and death at the global level. Furthermore, congestion at the entrance to the intersection occurs during the daily rush hour, which is early in the morning during work hours and in the evening. Road users need to evaluate traffic conditions and consult each other to avoid accidents [8].

2.3 TRAFFIC FLOW DEFINITION

Traffic flow is the study of the intersection between vehicles, drivers, pedestrians, cyclists, tourists and other infrastructure (including highways, signs, and traffic control devices) by understanding and building an ideal road network with effective

development of movement problems and minimal traffic congestion [5]. Traffic can be characterized as the movement of pedestrians, vehicles and goods along a roadway, and the biggest challenge for traffic engineers is often the volume of traffic and road capacity that led to congestion. Traffic congestion is a condition in a road network characterized by slower speed and longer travel times. Information about traffic congestion is needed by vehicle drivers, traffic police, and road construction planners.

2.4 ROAD INTERSECTION

This intersection is also referred to as a road intersection, where two or more roads meet on one road at a point of conflict [5]. The intersection is an important part of the road that is usually used for the smooth flow of traffic in areas of major accidents. According to him, the number of dangers for pedestrians' legs and drivers of two-wheeled vehicles are also high at road intersections.

2.3 MATERIALS AND METHODS

A road accident can generally be defined as an unwanted event occurs due to This study uses the quantitative approach by randomly sending structured questionnaires to the local residents in Parit Raja. The data collection methods are important because the use of appropriate methods can increase the value of the study [6]. The data collection process needs to observe the correct steps to ensure that complete information is collected consistently with the needs of the study. Information collected through appropriate data collection techniques can affect the validity and credibility of the data. The data collection process aims to obtain feedback and research information to answer objectify. The selection aspect of the sampling design, whether it is in the form of probability or not, is actually closely dependent on several factors such as the actual purpose of the study, the sampling determination framework, the size and number of appropriate samples, available skilled personnel, finances and the time

period [7].

The questionnaire is constructed using Google Form, an open online survey tool, and the results are stored in Google Drive Data Storage. The questionnaires are divided into 3 parts which correspond to the objectives of this study. Part A covers the background of the respondents, Part B is to identify the factors affecting traffic congestion, Part C is to cover the solution to reduce traffic congestion. Besides, the respondents need to give scores from range 1 to 5 where the range is from strongly disagree to strongly agree. In another word: 1- strongly disagree, 2- disagree, 3- neutral, 4- agree, 5- strongly agree.

Once the data and information are obtained by the researcher, data analysis was carried out. The data and information obtained were filtered and analyzed first according to the scope of the study outlined in order to be more structured. Data analysis for this study uses SPSS statistics to facilitate data processing by the researcher, graph, table or diagram form.

2.4 RESULTS AND DISCUSSION

Determination The summary of the findings about the factors caused traffic congestion were shown in Table 2.1. Based on observations in the study area, there are the 4 factors that affect the traffic congestion chosen by the respondents. The first factor about traffic congestion worsens during peak hours. The peak hour is only one aspect of a larger set of issues related to traffic congestion. Vehicles are the most obvious cause of traffic congestion, especially around traffic lights, and the largest source of such vehicles is entered and exit the intersection. The second factor is about young, and less experienced drivers cause traffic congestion. The presence of inexperienced young drivers is among the greatest challenges encountered by motorists and car owners. 96.8% of respondents said they were concerned with the level of conflict between citizens, traffic police, and drivers on the roads

because of young and inexperienced drivers. The third factor is about the infrastructure facilities on the federal road.

Transport investments, especially road construction, have historically been dominated by government funding. Pervasive low-density patterns worsen traffic congestion and reduce the viability of other, higher-capacity modes of transportation. Traffic management at intersections in Malaysia has become increasingly difficult, causing locals to complain. This causes congestion in that region. Road accidents is the last factor. Due to rising economic activity, population, and car ownership, road traffic has increased dramatically. Drivers think there's a crash when they can't move forward in traffic and crashes slow traffic for several reasons.

Table 2.1: Factor affecting traffic congestion

No	Element	Percentage (%)	
		Yes	No
1	Do you think traffic congestion worsens during peak hour?	99.7	0.3
2	Do you think young and less experienced drivers cause traffic congestion?	95.8	4.2
3	Are you satisfied with the infrastructure facilities on the federal road?	15.7	84.3
4	Have you experienced severe traffic congestion due to a road accident?	57.1	42.9
5	Do you have difficulty staying in the correct line?	36.1	67.8
6	Do you always check the condition of vehicle before starting a journey?	77.1	22.3
7	Do you find it difficult to enter the intersection?	97.9	2.1

From the descriptive statistics Table 2.2, the top five possible solutions to reduce the traffic congestion with the highest mean will be focused on more details about it. The first solution is about using a public transport. Public transit gives up road space for residents. Traffic congestion is reduced, discouraging city living and work. Traffic congestion will intensify until we rethink mobility due to urbanisation and increased transit needs in large cities. The next solution involves carpooling. Sharing rides has additional benefits, such as reducing the need for repairs. Most respondents are in favour of implementing this proposal to reduce congestion. The third solution involves providing faster assistance to vehicles involved in a collision. Local transport authorities need more funding and power. The United States Congress created MPOs to coordinate all modes of ground transportation within a specified area. With better tools at their disposal, they might be able to create more methodical processes.

Figure 2.2: Possible solution of traffic congestion (N=283)

Solution to reduce traffic congestion	Mean	Std. Deviation
Use alternative routes to go to home during traffic congestion.	4.79	0.43
Change the departure time to avoid possible traffic congestion.	3.92	0.57
Improve the management of traffic lights.	3.76	0.62
Enforce existing road traffic laws for bad driver behavior.	4.51	0.59
Use public transport.	4.63	0.56
Carpooling rather than driving alone.	4.77	0.49
Faster assistance to vehicles involved in an accident.	4.73	0.52

Few traffic-reduction initiatives will work without substantially increased local planning for growth and transportation, especially for expediting relief to vehicles involved in accidents. Fourth, use alternative roads. Delays may bother drivers and expense

companies and cities can alleviate traffic congestion, encourage alternative ways, reduce motorway congestion by promoting less congested roadways and improve public transport to make car-free travel easier. Last, enforce existing road traffic laws for bad driver behavior. Instead than relying on traditional traffic monitoring systems, the authors of this research propose an alternative system based on individual driver behaviour changes to predict future congestion. The quick reduction in fatalities and injuries that has been demonstrated when best practices are implemented suggests that better traffic enforcement should be a central component of any comprehensive road safety policy.

As a result, congestion on the roads is typically worst during the day's peak hour. the most factor that affecting the traffic congestion is during a peak hour. Peak hour is the period of day when both traffic and the number of people using public transport are at their highest. This happens in the morning and in the afternoon or evening, when most people are going to or coming from work. Morning is the busiest time of day. It is difficult for cars coming from the Kampus Bandar to get through the intersection when there is a traffic congestion. Similarly, vehicles coming from Ayer Hitam face difficulty entering the intersection.

According to the findings from the survey's respondents, the use of alternative routes will be the primary focus of the potential solutions that can reduce the traffic congestion. Taking public transportation and participating in carpooling initiatives are two other solutions to the problem of traffic congestion.

2.5 CONCLUSION

Traffic makes long-term traffic management difficult. Traffic theory, traffic congestion analysis, and solutions are needed for this year-long final project. This analysis examined traffic conditions, traffic congestion reasons, and solutions. Studies demonstrate that the same factors generate traffic bottlenecks on Ayer Hitam-Kluang as in other states. various elements or combinations have various effects. In terms of demand and supply, Parit Raja's strong economic and social activity and

quantity of major passenger automobiles are both demand variables. During the traffic poll, community members said they could help researchers find traffic congestion sources. The researcher found nine traffic issue factors through observation and analysis. The researcher only categorised the five factors that received the most votes: peak-hour traffic, young and inexperienced drivers, federal road infrastructure shortages, and road accidents. They discovered why Jalan Ayer Hitam-Kluang has so many automobiles. Road users, especially Parit Raja locals, might show their anger with traffic congestion, which is caused by human activity. If you wish to fix road traffic, consider this method. The survey participants agreed on ways to reduce traffic. Carpooling, stricter enforcement of traffic regulations against dangerous drivers, public transportation, alternative routes, and faster collision help. The study achieved its second goal.

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