CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Road safety is very important fundamentals in road engineering. One of the main things that need to be prioritized in road safety is the environment of the road in order to prevent road public hazard or crash. As recorded in the World Health Organization (WHO) report in 2013, around 1.24 million of life has been lost due to road crash. After 5 years, by gathering information from 180 countries WHO indicates that in 2015, the total number of road traffic deaths is expected to reach 1.25 million per year. It seems that the statistics of crashes that occurred throughout the world have been increasing by 1% per year. These numbers of death are something that needs to be concerned for the road safety in the whole world.

According to Abdul Manan (2012), Malaysia has the highest road fatality risk per 100 000 population among the ASEAN countries. In the past 5 years, there are more than 6 000 fatal cases and over 250 00 injuries are recorded all over Malaysia. Based on research source from the Royal Malaysian Police (PDRM), fatality data due to underreporting severe injuries is up to 600% and minor injuries is up to 1400%.
There are many factors that could be the cause of fatal accidents such as the driver’s attitude itself, vehicle’s condition, weather’s condition and the surrounding road environment (Pasetto, 2011). Driver’s attitudes such as drink and drive or red light running contribute to increase of percentage in fatality. Sometimes, vehicle’s condition also could be the reason why accidents happened such as brake defect or tyre defect which happen because drivers do not check before the journey. Other than that, the road side environments that are not maintained properly also give rise to crash percentage cases (Wang, 2002).

Road safety does not involve the drivers alone but also the relationship with the road environment and the vehicles. Depending on how the road environment been designed and structured, the vehicle that being driven by human is influenced, for example in most cases is the speed (Pasetto, 2011). Drivers tend to speed up whenever they are sure that the path they are taking can be considered safe visually but in the end, they involve in crash because the road condition does not appeared clear as it seems from far distance.

There are few factors of road environment that can be listed out where one of them is the objects within and nearby the roads can be obstacles for the vehicle’s path (Edquist, 2009). The objects include signage, trees, median, divider, traffic light, lanes and others. Some of the problems such as dangerous road geometric design, inadequate capacity in roads, incompatible and unsafe pavement, problematic slope surface in road building and long vertical slopes can be very dangerous to road users (Esmaeeli, 2010). These problems may influence the vehicle’s speed where the vehicle lose its balance and then lead to crash. There are several areas that had high chance of crash risk in the urban area including the roundabout, straight road, signalized intersections and unsignalized intersections (Royal Malaysian Police, 2011).

In a study by Polus in 2005, at roundabout, there are less right angle and left turn head-on collision crash happened as the geometric aesthetics of the road help lowered the vehicle’s speed while passing through this area. This might be because round about design for turning is strategic compared with at the intersections. A source by Statistical Report Road Accident, Royal Malaysian Police in 2003 stated that 215 fatalities
happened at intersection compared with 23 in roundabout. This shows that the higher risk of crash happened at intersections area.

Traffic signals are often implemented to provide for efficient movement and to improve traffic safety. Nevertheless, severe crashes still occur at signalized intersections (Polders et al, 2015). On account of those statements, signalized intersections areas are still at risk. Rear-end accidents are the most common accident type at signalized intersections since the diversity of actions taken increases due to signal change (Xuedong et al, 2005). Thereby, observations and mitigations measures need to be done at those area to find out what factors could be the spark of the problem.

In urban area especially at signalized intersection, the road environment situation affected the road fatality by its traffic composition (Edquist, 2009). In situation where the existing road has no specific lanes for each composition according to sizes and types of vehicle probably could contribute to high crash. This is because the design of the road is not suitable to be applied at the intersections. The critical road environment conditions could play a significant role in rear-end accidents and they may contain all kinds of non-driver related factors such as lighting conditions, the roadway surface conditions, highway characteristics, traffic volume, the weather conditions, and so on (Xuedong et al, 2005).

A case study at the particular signalized intersection is to be conducted to identify the road environment factors that lead to road crash. As what have been stated about the road safety situations in Malaysia, it is very important to know which factors that contributes to road crash at the signalized intersections. Kuantan is considered as urban area with the population of 1.50 million reported by Department Of Statistics Malaysia in 2010. Kuantan town have many signalized intersections that could have high chance of vehicle crash thus, it has been chosen as the study area of this research. The map of Kuantan town in overall can be viewed in Figure 1.0 as shown.