

# The Relationship between Road Condition and Traffic Accidents in Tsukuba Center Area

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## 1. Motivation

Traffic accidents repeatedly occurrence which has menaced people's lives and property. There are a variety of reasons that cause traffic accidents, such as speeding, distracted and drunk driving. But the road condition has been often ignored and neglected. This study aims to analyze traffic accidents through road condition in several aspects.

## 2. Objective

According to the Ibaraki digital map, during 2018, there were 55 traffic accidents happened in Tsukuba center area caused loss of life and property. In addition to some personal behavior, the road condition also as a contributing factor which has an essential influence on traffic safety. Therefore, analyzing the location and number of the signal light, interactions, and road mark by combining traffic accidents map are very crucial for decreasing traffic accidents.

## 3. Study Area

In this study, Tsukuba center area which is heavy traffic in Tsukuba city has been selected as a study area.

## 4. Methodology

(1) Collecting traffic accidents data (location, occurrence, time) in Tsukuba center area from Ibaraki digital map; (2) Recording the location of signal light (a), streetlight (b), road mark (c), the number of forks (d) and lane (e); (3) Analyzing the relationship between road condition and traffic accidents in the study area and providing the suggestion for the area which have a widespread occurrence of traffic accidents.

## 5. Results and Discussion

Figure 1 showing there were 55 traffic accidents happened in Tsukuba center area during 2018. In the total of 55 traffic accidents, more than half of them are the collision. It means that keeping safe speed and the safe interval is very important to avoid traffic accidents. Figure 2 presents a map showing the traffic accidents and road condition of the study area. We can see that traffic accidents have been centered around the intersection. And collision which marked in red color usually happened on the main road. The location of road marks is inversely proportional to traffic accidents. Figure 5 shows the relationship between traffic accidents and prompt marks. When the number of marks is increasing, the number of traffic accidents is decreasing. It means that the number of marks is inversely proportional to traffic accidents. This study provides valuable information to avoid traffic accidents. In the road which always collision should be marked "Attention deceleration". And all the drivers should keep the safe distance between each other.

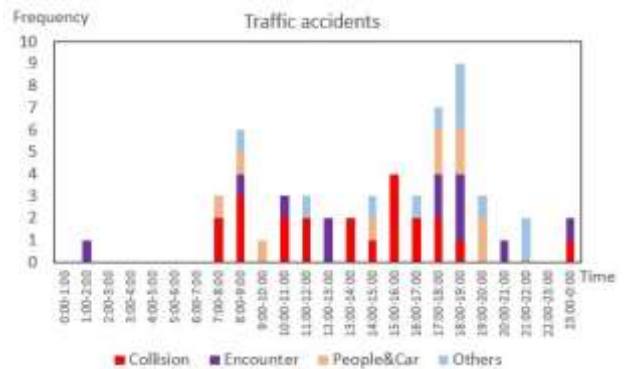


Figure 1. Traffic accidents in different time.

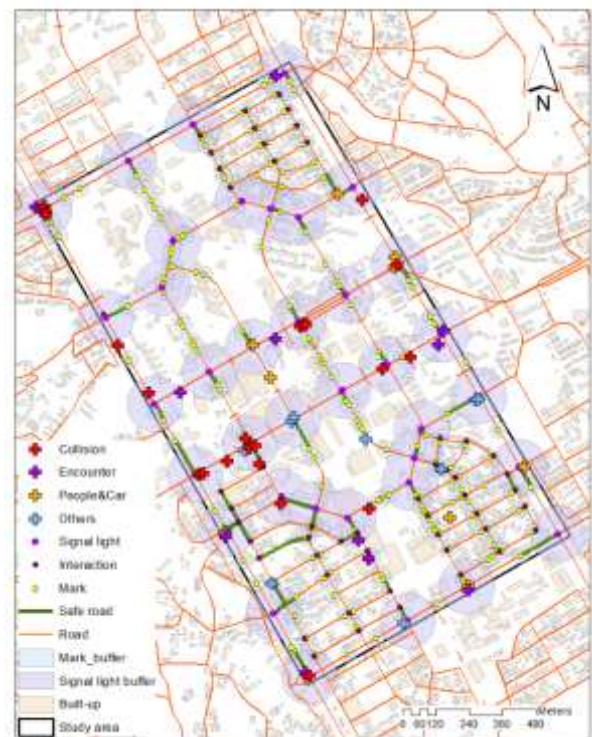


Figure 2. Traffic accidents and road condition of the study area.

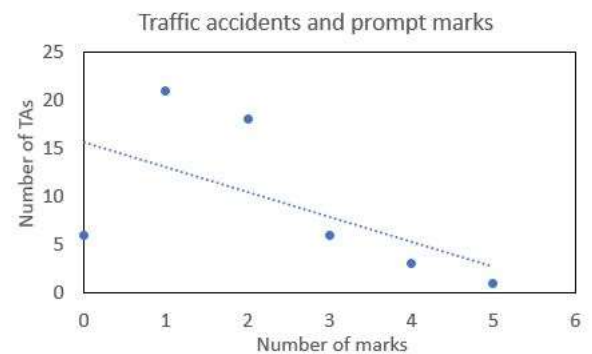


Figure 3. Relationship between traffic accidents and prompt marks.