Evaluation of Red Motorcycle Box to the Traffic Flow, Occupancy Rate and Stop Line Violation at Signalized Intersection in Bogor

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Abstract

Aim of this paper to evaluate of red motorcycle box to the traffic flow, occupancy rate and traffic violation. The traffic flow analysis method used Indonesia road capacity manual while the occupancy rate and traffic violation method used the guideline of red box monitoring. Analysis result show that after implemented the red box, the traffic flow are increased 15.64%. The occupancy from 20% to 34% due to access blocking to the red box by non-motorcycle vehicles while the red box has occupied by motorcycle only from 33% to 68%. The number of stop line violation has decreased up to 89.88%.

Background

The number of motorcycle's population until the end of 2013 was reach the peak around 85.45 million units and the sales was reach 7.22 million units. The accumulation of motorcycle disorderly movement at signalized intersection during waiting at the red light is a negative impact due to high motorcycle population. The red box is an alternative solution to increase signalized intersection performance

Red motorcycle box at signalized intersection basically developed from the concept of Advance Stop Lanes (ASLs) for bicycle. An ASLs, also called advanced stop box or bike box, are road markings at signalized road intersection allowing certain types of vehicles to head start when the traffic signal changes from red to green. Advanced stop lines for bicycle are implemented widely in the United Kingdom, the Netherlands, Denmark, and other European countries. Therefore, this concept is try to implement for motorcycles.. Red motorcycle box which is developed to split queue between motorcycle and other types vehicles when waiting at red light (Idris, 2007).

Separation of motorcycles from other types of vehicle is expected improve performance of signalized intersections to be more orderly, safely, and smoothly. The trial implementation of the red box at Pajajaran-Pangrango in Bogor City is shown in Figure 1.

Figure 1. Implementation of Red Box for Motorcyle in Bogor

Method

Research methodology is divided into traffic survey method and analysis method. Traffic data surveyed is the volume of all types of vehicle at three time segments, in the morning, afternoon and evening, where each session is equal to 10 red light phase. Furthermore the data analysis, to evaluate the performance of red box implementation requires method of analysis which include traffic flow, occupancy rate and stop line violation. Analysis method of Traffic Flow data was collected per 6 seconds to analysis the number of traffic flow at green light. Analysis Method of Occupancy Rate can be counted by the occupancy to the capacity of the red box during the red light. The stop line violation rate can be counted by the number of motorcycles that violate the stop line.

Results

Data collection of traffic volume was conducted from before to after implementation of red motorcycle box. Analysis result show that after implemented the red box, the traffic flow are increased up to 15.64%. The occupancy rate to the capacity of the red box show the low rate from 20% to 34% due to access blocking to the red box by non-motorcycle vehicles. Meanwhile, the red box has occupied by motorcycle only show the moderate rate from 33% to 68%. It means there are still non-motorcycle vehicles has occupied the red box due to lack of discipline and rules awareness. In addition, the number of stop line violation has decreased up to 89.88%.

Conclusions

Evaluation of the red motorcycle box showed a significant result. The traffic flow increased, the number of stop line violation decreased. On the other hand, the occupancy rate show the moderate rate. The important point is the red box is quite effective to make the intersection more orderly, safely and smoothly

Citations:

- Motorcycle's population until the end of 2013 was reach the peak around 85.45 million units and the sales was reach 7.22 million units. (AISI, 2014).
- Separation of motorcycles from other types of vehicle is expected improve performance of signalized intersections to be more orderly, safely, and smoothly. (Idris, 2007).

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