I. Introduction

Traffic flow conditions often change during a certain period, then the number of vehicles specified by certain traffic (known as traffic density) often changes. In order to determine congestion rate, the important traffic variables are vehicle density and its velocity [1]. As in the case of traffic flow in Jalan Cimareme, Bandung Barat, Indonesia. The conditions density and velocity of traffic flow often change within a certain time, where the randomness of traffic has a high level. Therefore traffic congestion can happened anytime.

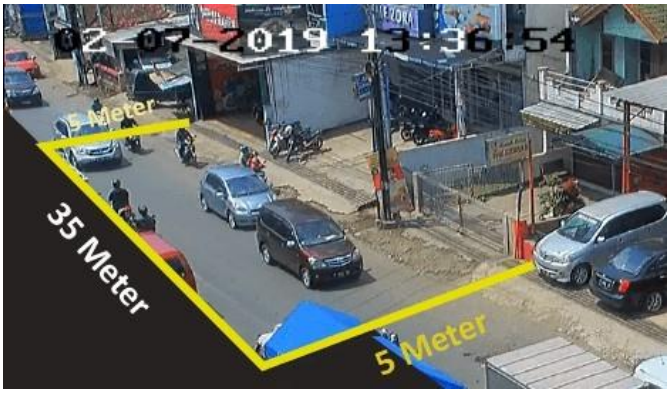

Fig. 1. Observation domain

The phenomenon of traffic congestion in some districts con- tinues increasingly from time to time. One of several factors is due to the current inadequate development of transportation trends, or in other words the imbalance between popula- tion growth and infrastructure development in transportation [2]. The macroscopic model or commonly known as LWR (Lighthill, Whitham and Richards) traffic flow model is the mathematical model of traffic flow which takes into account the density propagation due to its average velocity. Besides, this model consists of several conditions, namely traffic, speed, and density in a time interval, where conditions are used as variables to explain traffic problems such as traffic jams.

In previous research [3], [4], traffic flow model is given to simulate vehicle movement on road density using the velocity-density function. Velocity-density function is obtained from observational data which consists of the relationship between density and vehicle velocity. However, in real traffic conditions, density and velocity of vehicles observation can be obtained in various characteristics and values. Therefore the velocity-density functions obtained from observation data also can be in various types. For this case, a grouping of various characteristics and values of density and velocity from vehicles observation is needed.In this study, K-means clustering will be used to classify data types based on classification and comparison into two classes (light and traffic). In this research, K-means clustering will be used to classify data types according to density and velocity into two classes (light and jammed). Furthermore in each cluster, the velocity-density function will be obtained by linear regression approach.

Here, a traffic flow simulation using LWR model as previous research [4] will be used. However, in this research velocity-density function in the traffic flow model will be given from the clustering technique by finding two clusters. Centroids of each cluster that are obtained from K-Means clustering will be used to determine the grouping of simulation results. Therefore in the simulation, such an area will be automatically clustered as light or jammed situation by using Euclidean distance.

Parts of this paper are organized as follows in Section 2, models and numerical schemes of traffic flow barriers are presented and K-Means Clustering also presented. Shows the experiment results with evaluation also further analysis of the results is presented and examined in Section 3. Last, the conclusions of this paper are presented in section 4.