

1. Introduction

High-velocity vehicles can cause traffic accidents [1]. One of the solutions to reduce vehicle velocity is by making a velocity limiting tool. The velocity limiting tool is called road humps [2]. Road humps are elevated part of the road using asphalt or cement added transversely on the road [3, 4]. Road humps have a function to reduce vehicle velocity. Based on the size and shape, there are several types of road humps namely rumble strips / rumble bar, speed bump, speed tables and speed hump [2]. The size of road humps can affect the velocity, so the velocity of the vehicle when going through road humps can be variation. Fig. 1 illustrates the height and width road humps.

The relation of vehicle velocity and the size of road humps can be described using linear regression model. Generally, linear regression have three models. First model is simple linear regression, it describes the relation between a dependent variable and an independent variable. Second model is multivariate linear regression, it describes the relation between several dependent variables and several independent variables. Third model is multiple linear regression, it describes the relation between a dependent variable and several independent variables.

In this paper, four scenario multiple linear regression models approach will be given to predict the velocity of the motorcycle in road humps. The model is formed based on the relation between the independent variable and the dependent variable. The velocity of the motorcycle is represented as dependent variable (y). The size of road humps is represented as independent variable (x), where height of road humps as x_1 and width of road humps as x_2 . Multiple linear regression models will be tested with the simultaneous test of regression models to determine the influence of independent variables on the dependent variable.

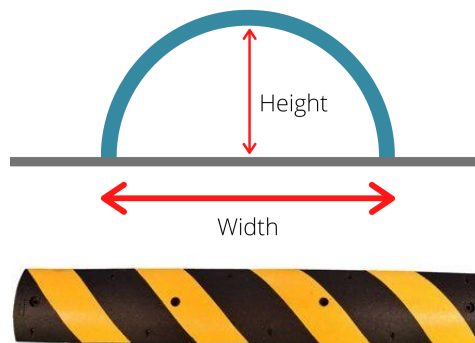


Figure 1: Measuring road humps

The aim of this paper is to predict motorcycle velocity in road humps using four scenarios of multiple linear regression models and calculate the accuracy of the four models. The multiple linear regression model that will be given consists of a general form of multiple linear regression model, a multiple linear regression model with an interaction term, and two second-order polynomial regression models in two variables. This study uses observation data on 12 road humps around Telkom University, Perumahan Batununggal, Jalan Mengger, and Perumahan Pengairan.

This paper is constructed as follows, in Section 2, Statistical model such as multiple linear regression and the simultaneous test of regression models. Methodology of simulation is explained in Section 3. In Section 4, further analysis of the result is presented. Finally, the the conclusion of the paper is presented in Section 5.