

ABSTRACT

Analysis of Road Performance Due to U-turns on Jalan Raya Serpong Km 7, South Tangerang City

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The Serpong Highway KM 7 is a multifunctional area with U-turn facilities that can cause issues such as traffic congestion. The subjects of this study are Point A (far before the U-turn) and Point B (with the U-turn). The purpose of this research is to analyze the relationship between traffic volume, vehicle speed, and density using the Greenshield and Greenberg models, determine the capacity value, and see if the Melati Mas U-turn queue affects the traffic flow characteristics in terms of speed. The study results show that the model that best represents the actual road conditions is the Greenberg model, with an R^2 value of 0,913 for Point A and 0,952 for Point B, resulting in the following relationship equations at Point A (S-D): $S = 149,676 - 23,035 \ln d$; (V-D): $V = 149,676 d - 23,035 d \ln d$; (V-S): $V = 663,75 s \cdot e^{0.043 s}$, and at Point B (S-D): $S = 132,557 - 21,215 \ln d$; (V-D): $V = 132,557 d - 21,214 d \ln d$; (V-S): $V = 517,229 s \cdot e^{0.047 s}$. Additionally, the selection of the Greenberg model is based on the suitability of the resulting capacity with the theoretical capacity of PKJI 2023. The capacity value, degree of saturation, and service level obtained for this road section are levels E and F. Furthermore, the speed conditions on this road are affected by the U-turn queue length of 89,32 meters.

Keywords: Road Performance, PKJI 2023, Greenshield, Greenberg, Queue, U-turn

References: 31

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