

ABSTRAK

Analisis Kapasitas Dan Kinerja Jalan Dengan Model Greenshield Dan Model Underwood (Studi Kasus : Jalan Tol Jagorawi Km 19 + 600)

Penelitian ini bertujuan untuk mengetahui model matematis hubungan arus – kecepatan – kepadatan pada ruas jalan Tol Jagorawi Km 19+600 berdasarkan Model Greenshields dan Model Underwood. Metode pengumpulan data kecepatan dan arus lalu lintas kepadatan didapatkan dari hubungan arus, kecepatan dan kepadatan melalui video cctv pada periode pagi hari pukul 06.00 – 12.00. Hasil analisis model matematis hubungan kecepatan dan kepadatan arah Bogor – Jakarta yang terbaik adalah Model Greenshield adalah $68,59 - 0,1163D$ sehingga diperoleh $Q_{maks} = 10118$ smp/jam, dan $U_m = 34,295$ km/jam, dan $D_m = 295,018$ smp/km. Demikian juga arah Jakarta menuju Bogor menggunakan Model Greenshield diperoleh $Q_{maks} = 9265$ smp/jam, $U_m = 32,695$ km/jam, dan $D_m = 283,385$ smp/km. Hasil analisis model matematis hubungan kecepatan dan kepadatan arah Jakarta – Bogor untuk Model Greenshield adalah $67,39 - 0,1189D$ sehingga diperoleh $Q_{maks} = 9.265$ smp/jam, dan $U_m = 32,695$ km/jam, dan $D_m = 283,385$ smp/km. Derajat kejenuhan arah Bogor – Jakarta tertinggi terjadi pada periode pukul 06.00 – 07.00 yaitu sebesar 0,97. Sedangkan untuk arah Jakarta – Bogor tertinggi terjadi pada periode pukul 11.00 – 12.00 yaitu sebesar 0,95.

Kata Kunci: Arus, Kecepatan, Kepadatan, Model Greenshields, Model Underwood.

ABSTRACT

Analysis of Capacity and Road Performance with Greenshield Model and Underwood Model (Case Study: Jagorawi Toll Road Km 19 + 600)

This study aims to determine the mathematical model of the flow - speed - density relationship on the Jagorawi Toll Road Km 19 + 600 based on the Greenshields Model and the Underwood Model. The method of collecting data on traffic speed and density is obtained from the relationship between flow, speed and density through cctv video in the morning period at 06.00 - 12.00. The results of the analysis of the mathematical model of the relationship between speed and density in the direction of Bogor - Jakarta the best is the Greenshield Model is $68.59 - 0.1163D$ so as to obtain $Q_{max} = 10118$ smp / hour, and $U_m = 34.295$ km / hour, and $D_m = 295.018$ smp / km. Likewise, the direction of Jakarta to Bogor using the Greenshield Model obtained $Q_{max} = 9265$ smp / hour, $U_m = 32.695$ km / hour, and $D_m = 283.385$ smp / km. The results of the mathematical model analysis of the speed and density relationship in the Jakarta - Bogor direction for the Greenshield Model are $67.39 - 0.1189D$ so that $Q_{max} = 9,265$ smp / hour, and $U_m = 32.695$ km / hour, and $D_m = 283.385$ smp / km. The highest degree of saturation of the Bogor - Jakarta direction occurred in the period 06.00 - 07.00 which amounted to 0.97. While for the direction of Jakarta - Bogor the highest occurred in the period at 11:00 - 12:00 which amounted to 0.95.

Keywords: Flow, Speed, Density, Greenshields Model, Underwood Model.