ABSTRAK

Hizkia Radoti Manik. NIM 5213550029: Analisis Tingkat Pelayanan Jalur Pejalan Kaki dengan Menggunakan Metode *Greenshield* (Studi Kasus: Lapangan Merdeka Pematangsiantar)

Jalur pejalan kaki merupakan infrastruktur vital dalam sistem transportasi perkotaan yang mendukung mobilitas berkelanjutan dan kenyamanan pengguna. Kawasan Lapangan Merdeka Pematangsiantar sebagai ruang publik dengan aktivitas tinggi memiliki jalur pedestrian yang berpotensi mengalami penurunan kualitas pelayanan akibat tingginya arus pejalan kaki dan keterbatasan lebar efektif trotoar. Penelitian ini bertujuan menganalisis karakteristik pergerakan pejalan kaki, membangun model hubungan antar variabel menggunakan Metode *Greenshield*, serta mengevaluasi Tingkat Pelayanan (*Level of Service/LoS*) pada tiga segmen lokasi, yaitu Jl. WR Supratman (Lokasi A), Jl. Sudirman (Lokasi B), dan Jl. Merdeka (Lokasi C). Landasan teori mengacu pada Model *Greenshield* (1935) yang mengasumsikan hubungan linear negatif antara kecepatan dan kepadatan, dengan standar evaluasi LoS berdasarkan *Highway Capacity Manual* (HCM 2010) dan Permen PU No. 03/PRT/M/2014. Pengumpulan data dilakukan melalui observasi lapangan selama satu bulan pada tiga periode waktu (pagi, siang, sore) menggunakan metode *manual counting* dan pengukuran waktu tempuh. Hasil analisis regresi menunjukkan hubungan arus–kepadatan bersifat kuadratik dengan korelasi sangat kuat (R^2 = 0,986–0,998), sementara hubungan kecepatan–kepadatan bersifat linear negatif (R^2 = 0,781–0,793). Lokasi A dan B berada pada LoS A untuk seluruh kriteria arus, ruang, dan kepadatan sepanjang periode pengamatan. Lokasi C mencatat arus puncak tertinggi sebesar 16,333 org/min/m dengan LoS Ruang B pada jam siang dan sore akibat lebar efektif trotoar yang hanya 0,4 meter. Penelitian ini merekomendasikan pelebaran trotoar Jl. Merdeka sebagai prioritas peningkatan infrastruktur pedestrian di kawasan tersebut.

Kata Kunci: Jalur pejalan kaki, Metode *Greenshield*, tingkat pelayanan, karakteristik arus, Lapangan Merdeka Pematangsiantar

ABSTRACT

Hizkia Radoti Manik. NIM 5213550029: ***Analysis of the Level of Service of Pedestrian Walkways Using the Greenshield Method (Case Study: Merdeka Square, Pematangsiantar)***

Pedestrian paths are a vital part of urban transportation infrastructure that support sustainable mobility and user comfort. The Merdeka Square area in Pematangsiantar, as a high-Traffic public space, has pedestrian paths that are at risk of experiencing a decline in service quality due to heavy pedestrian Traffic and the limited effective width of the sidewalks. This study aims to analyze pedestrian movement characteristics, develop a model of the relationship between variables using the Greenshield Method, and evaluate the Level of Service (LoS) at three location segments: Jl. WR Supratman (Location A), Jl. Sudirman (Location B), and Jl. Merdeka (Location C). The theoretical framework is based on the Greenshield Model (1935), which assumes a negative linear relationship between speed and density, with LoS evaluation standards based on the Highway Capacity Manual (HCM 2010) and Ministry of Public Works Regulation No. 03/PRT/M/2014. Data collection was conducted through field observations over a one-month period during three time periods (morning, afternoon, and evening) using manual counting and travel time measurement methods. The results of the regression analysis show that the flow–density relationship is quadratic with a very strong correlation (R^2 = 0.986–0.998), while the speed–density relationship is negatively linear (R^2 = 0.781–0.793). Locations A and B were classified as Level of Service (LoS) A for all flow, space, and density criteria throughout the observation period. Location C recorded the highest peak flow of 16.333 people/min/m with LoS B for space during the afternoon and evening due to the effective sidewalk width of only 0.4 meters. This study recommends widening the sidewalk on Jl. Merdeka as a priority for improving pedestrian infrastructure in the area.

Keywords: *Pedestrian walkway, Greenshield method, level of service, flow characteristics, Merdeka Square, Pematangsiantar*