

ANALISIS KINERJA SIMPANG BERSINYAL MENGGUNAKAN *SOFTWARE PTV VISSIM*

(Studi Kasus : Simpang Bantar Kota Tasikmalaya)

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ABSTRAK

Pertumbuhan jumlah kendaraan di Kota Tasikmalaya menimbulkan permasalahan lalu lintas yang cukup kompleks, terutama pada simpang bersinyal sebagai titik temu arus kendaraan. Salah satu lokasi yang mengalami permasalahan adalah Simpang Bantar Kota Tasikmalaya, yang kerap mengalami kemacetan, antrean panjang, dan tundaan tinggi. Kondisi ini menunjukkan bahwa kinerja simpang perlu dianalisis untuk menentukan solusi perbaikan yang tepat. Penelitian ini bertujuan menganalisis kinerja Simpang Bantar Kota Tasikmalaya melalui perbandingan perhitungan manual berdasarkan Pedoman Kapasitas Jalan Indonesia (PKJI) 2023 dengan simulasi menggunakan *software PTV Vissim*, serta merumuskan alternatif perbaikan. Data penelitian diperoleh dari survei primer berupa volume lalu lintas, geometri simpang, siklus sinyal, dan kecepatan kendaraan, serta data sekunder dari instansi terkait. Analisis kinerja meliputi derajat kejenuhan, panjang antrean, tundaan rata-rata, dan tingkat pelayanan (*Level of Service/LOS*). Hasil analisis menunjukkan bahwa kondisi eksisting Simpang Bantar memiliki panjang antrean rata-rata 47,87 m, tundaan 47,04 detik/kendaraan, dan LOS D berdasarkan simulasi *Vissim*, sedangkan perhitungan PKJI 2023 menghasilkan derajat kejenuhan 0,90, antrean 98,02 m, tundaan 57,81 detik/kendaraan, dan LOS E. Dari lima alternatif perbaikan, Alternatif 3 berupa pengaturan ulang waktu siklus dari 85 detik menjadi 71 detik dengan penyesuaian *intergreen* memberikan hasil paling optimal. Alternatif ini menurunkan tundaan menjadi 38,81 det/smp (PKJI) dan 39,88 detik/kendaraan (*Vissim*), keduanya dengan LOS D. Kesimpulannya, kinerja eksisting Simpang Bantar belum optimal. Dengan penerapan Alternatif 3, tundaan dan antrean dapat berkurang sehingga tingkat pelayanan meningkat.

Kata Kunci: Simpang Bersinyal; Kinerja Lalu Lintas; PTV Vissim; PKJI 2023.

ANALYSIS OF SIGNALIZED INTERSECTION PERFORMANCE USING PTV VISSIM SOFTWARE

(Case Study : Bantar Intersection, Tasikmalaya City)

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ABSTRACT

The growth of motorized vehicles in Tasikmalaya City has created increasingly complex traffic problems, particularly at signalized intersections where traffic flows converge. One of the locations facing such issues is the Bantar Intersection in Tasikmalaya City, which often experiences congestion, long queues, and high delays. This condition indicates the need for a performance analysis of the intersection to determine appropriate improvement solutions. This study aims to analyze the performance of the Bantar Intersection in Tasikmalaya City by comparing manual calculations based on the Indonesian Road Capacity Guidelines (PKJI) 2023 with simulations using PTV Vissim software, as well as to formulate improvement alternatives. The research data were obtained from primary surveys, including traffic volume, intersection geometry, signal cycle time, and vehicle speed, as well as secondary data from relevant agencies. The performance analysis covered degree of saturation, queue length, average delay, and level of service (LOS). The results show that under existing conditions, the Bantar Intersection has an average queue length of 47.87 m, an average delay of 47.04 seconds/vehicle, and LOS D according to Vissim simulation, while PKJI 2023 calculations produced a degree of saturation of 0.90, a queue length of 98.02 m, an average delay of 57.81 seconds/vehicle, and LOS E. Among the five improvement alternatives tested, Alternative 3, which involves adjusting the signal cycle from 85 seconds to 71 seconds with intergreen modification, provided the most optimal results. This alternative reduced delays to 38.81 sec/PCU (PKJI) and 39.88 seconds/vehicle (Vissim), both categorized as LOS D. In conclusion, the current performance of the Bantar Intersection is not optimal. Implementing Alternative 3 can reduce delays and queues, thereby improving the overall service level.

Keywords: *Signalized Intersection; Traffic Performance; PKJI 2023; PTV Vissim.*