

**ANALISIS HUBUNGAN VOLUME KENDARAAN TERHADAP ESTIMASI  
EMISI KARBON MONOKSIDA (CO) AKIBAT KEMACETAN DI  
PERLINTASAN KERETA API JALAN BONDOWOSO, KABUPATEN JEMBER**

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**RINGKASAN**

Penelitian ini bertujuan menganalisis hubungan volume kendaraan terhadap estimasi emisi karbon monoksida (CO) akibat kemacetan di perlintasan kereta api Jalan Bondowoso, Kabupaten Jember. Penelitian menggunakan metode kuantitatif dengan pendekatan deskriptif dan analitik. Data diperoleh melalui *traffic counting* selama tujuh hari pada jam puncak saat palang pintu kereta api tertutup. Estimasi emisi CO dihitung berdasarkan Peraturan Menteri Lingkungan Hidup Nomor 12 Tahun 2010, kemudian dianalisis menggunakan regresi linier sederhana dan uji ANOVA. Hasil penelitian menunjukkan total estimasi emisi CO sebesar 48.035,09 gram/jam. Emisi tertinggi terjadi pada hari Jumat sebesar 8.646,56 gram/jam, sedangkan terendah pada hari Minggu sebesar 4.451,02 gram/jam. Analisis regresi menghasilkan koefisien korelasi ( $r$ ) sebesar 0,91 dengan koefisien determinasi ( $R^2$ ) sebesar 0,8281, yang menunjukkan hubungan positif sangat kuat antara volume kendaraan dan emisi CO. Kendaraan mobil memberikan kontribusi emisi terbesar (58%), diikuti sepeda motor (31%) dan truk (10%). Penelitian ini menyimpulkan bahwa peningkatan volume kendaraan akibat penutupan palang pintu kereta api berpengaruh signifikan terhadap peningkatan estimasi emisi karbon monoksida. Oleh karena itu, diperlukan pengelolaan lalu lintas yang lebih efektif untuk mengurangi kemacetan dan emisi kendaraan di lokasi penelitian.

**Kata Kunci :** *Volume kendaraan, emisi karbon monoksida, perlintasan kereta api.*

**ABSTRACT**

*This study aims to analyze the relationship between traffic volume and estimated carbon monoxide (CO) emissions caused by congestion at the Bondowoso Road railway crossing, Jember Regency. A quantitative method with descriptive and analytical approaches was employed. Traffic data were collected using the traffic counting method for seven days during peak hours while the railway crossing gate was closed. CO emissions were estimated based on the Regulation of the Minister of Environment of the Republic of Indonesia Number 12 of 2010 and analyzed using simple linear regression and ANOVA. The results showed a total estimated CO emission of 48,035.09 g/hour. The highest emission occurred on Friday (8,646.56 g/hour) and the lowest on Sunday (4,451.02 g/hour). Regression analysis produced a correlation coefficient ( $r$ ) of 0.91 and a coefficient of determination ( $R^2$ ) of 0.8281, indicating a very strong positive relationship between traffic volume and CO emissions. Passenger cars contributed the highest emissions (58%), followed by motorcycles (31%) and trucks (10%). The study concludes that increasing traffic volume significantly increases estimated CO emissions at the railway crossing. Effective traffic management is therefore required to reduce congestion and vehicle emissions.*

**Keywords :** Traffic volume, carbon monoxide emissions, railway crossing.