

## **optimization of traffic light waiting time using monte carlo simulation at the Tanah Hajj intersection in Mataram city**

Urban mobility is a crucial aspect of modern city life, where transportation systems play a vital role in supporting daily activities. The increasing use of transportation demands optimal traffic management to prevent congestion. One of the frequent congestion points of concern is the Tanah Haji intersection in Mataram City, which often experiences long queues due to inefficient traffic light management. To address this issue, the Monte Carlo simulation method was employed to evaluate and optimize the traffic light duration in each direction of the intersection. The study results indicate that the optimal green light duration is 22 seconds for the westbound direction with a vehicle flow difference of 3.56%, 20 seconds for the eastbound direction with a difference of 8.13%, 35 seconds for the southbound direction with a difference of 6.96%, and 30 seconds for the northbound direction with a difference of 14.56%.

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