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SIMULASI TRAFIK DI BEBERAPA PERSIMPANGAN UTAMA DI BANDAR RAYA MELAKA

(Traffic Simulation at Several Main Intersections in Malacca City)

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ABSTRAK

Kesesakan lalu lintas pada waktu puncak adalah satu daripada isu yang sering berlaku di Malaysia. Hal ini boleh menyebabkan pembaziran masa, wang serta memberi tekanan emosi kepada pemandu. Sistem kawalan lampu isyarat yang kurang berkesan adalah satu daripada faktor yang menyumbang kepada masalah ini. Walaupun kebanyakan sistem lampu isyarat telah menggunakan teknologi sensor bagi meningkatkan kecekapan, namun masih berlaku kesesakan lalu lintas pada waktu puncak. Kajian ini membuat simulasi terhadap beberapa persimpangan utama di bandar raya Melaka pada waktu puncak bagi menganalisis kesesakan trafik yang berlaku di persimpangan tersebut. Seterusnya, beberapa model susunan sistem lampu isyarat digunakan untuk melihat keberkesanan dalam mengurangkan purata masa menunggu dan jumlah kenderaan yang menunggu di setiap lorong. Suatu model alternatif yang telah dilaksanakan di beberapa buah negara luar turut dimodelkan ke dalam sistem simulasi tersebut. Hasil simulasi menunjukkan purata masa menunggu dan jumlah kenderaan yang menunggu di setiap lorong di persimpangan tersebut dapat dikurangkan dengan menukar urutan dan fasa pada sistem lampu isyarat.

Kata kunci: pemodelan simulasi; lampu isyarat; kesesakan; persimpangan; Arena

ABSTRACT

One of the issues which always happen in Malaysia is traffic congestions during peak hours. It can cause emotional stress to the road user and waste precious time and money. An inefficient traffic light control system is one of the causes of this problem. Despite most traffic light systems nowadays already use sensor-based technology to improve efficiencies, congestion during peak hours still occurs. This study aims to simulate several main intersections in Malacca city to analyse the traffic congestion at the intersections. Then, several alternative models are applied to evaluate the effectiveness in reducing the average waiting time and number of vehicles waiting at each of the lanes. An alternative model which has been implemented in several countries is modelled into the simulation system too. The simulation results show that the average waiting time and average number of vehicles waiting per lane at the intersection can be reduced by changing the order and phase of the traffic light system.

Keywords: simulation modelling; traffic light; congestion; intersection; Arena

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