

Performance Evaluation of Dynamic Signal Control System for Mixed Traffic Conditions

Authors : Aneesh Babu, S. P. Anusha

Abstract : A dynamic signal control system combines traditional traffic lights with an array of sensors to intelligently control vehicle and pedestrian traffic. The present study focus on evaluating the performance of dynamic signal control systems for mixed traffic conditions. Data collected from four different approaches to a typical four-legged signalized intersection at Trivandrum city in the Kerala state of India is used for the study. Performance of three other dynamic signal control methods, namely (i) Non-sequential method (ii) Webster design for consecutive signal cycle using flow as input, and (iii) dynamic signal control using RFID delay as input, were evaluated. The evaluation of the dynamic signal control systems was carried out using a calibrated VISSIM microsimulation model. Python programming was used to integrate the dynamic signal control algorithm through the COM interface in VISSIM. The intersection delay obtained from different dynamic signal control methods was compared with the delay obtained from fixed signal control. Based on the study results, it was observed that the intersection delay was reduced significantly by using dynamic signal control methods. The dynamic signal control method using delay from RFID sensors resulted in a higher percentage reduction in delay and hence is a suitable choice for implementation under mixed traffic conditions. The developed dynamic signal control strategies can be implemented in ITS applications under mixed traffic conditions.

Keywords : dynamic signal control, intersection delay, mixed traffic conditions, RFID sensors

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