

OPTIMAL SIGNAL TIMING FOR AN OVERSATURATED ARTERIAL INTERSECTION AT ROAD NETWORKS

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Abstract

Traffic congestion occurs frequently at downtown intersections during rush hours, at road construction zones as well as at accident sites. Under such circumstances, traffic flow exceeds intersection capacity causing queuing of automobiles that cannot be eliminated in one signal cycle. The objective of this work is to present a discrete minimal delay model to minimize the delay time of vehicles at each intersection by minimizing the total number of vehicles at each intersection at the signalized two intersections arterial. Discrete dynamic optimization models are developed and an algorithm to solve them is presented. The optimal cycle length and the optimal assigned green time for each approach are determined for the case of two-phase control. The initial number of vehicles at each lane at the intersections is counted by a camera which is the most exact method among other existing methods. The model is developed to minimize the number of waiting vehicles from cycle to cycle. The proposed model is solved by the method of sequential quadratic programming coded in MATLAB environment.

Keywords: *optimal signal timing, arterial intersection at road networks*