

METHODOLOGY TO OPTIMIZE FOR PEDESTRIAN DELAY AND VEHICULAR DELAY IN A SIGNAL NETWORK

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ABSTRACT

Efficiency of an arterial network could be enhanced by optimizing the user costs of the network incurred due to delay and other socio-economic factors. Until recently, research mostly focused on minimizing vehicular delay to optimize user costs. Currently no tool exists to balance delays to both vehicles and pedestrians. A methodology is developed that employs known techniques and available tools to identify optimal signal coordination plans. Pedestrian delay patterns were obtained from previous research. Delay data for vehicles was based on modeling peak-hour traffic conditions in urbanized areas of a hypothetical city. The signal optimization software Synchro Version 3.2 was used to investigate the variations in vehicle delay with different signal coordination plans and offsets. Delays to vehicles and pedestrians with respect to various offsets were analyzed. Results revealed that the best offsets for vehicles and pedestrians were not necessarily the same. Consequently a signal coordination plan to benefit both should consider the total user costs of the system. Higher user costs could be encountered if pedestrian progression was not considered and only vehicles were considered. The offset generating the optimal user cost could be different from the best offset for vehicles or pedestrians. A balance could be achieved between pedestrian delay and vehicular delay to arrive at an optimal signal coordination plan. Significant implications of such a trade-off are discussed in view of current transportation trends.