Case Study of Queue Growth Equalization for Urban Traffic Signal Optimization

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Abstract

In the oversaturated network, the queues formed in the downstream link spill over into the adjacent intersections and eventually block a significant portion of a network. In order to postpone spill-over (or even gridlock), the authors recently developed the queue growth equalization (QGE) method that can equalize queue growth rates across the links at the network level. This paper proposes the modified QGE method in order to optimize traffic signal timings and cycle lengths for the real-world network, considering pedestrian crossings and a complicated geometry. Based on the collected traffic data, the proposed method determines the optimized green times and cycles in two different cases. The traffic simulation results validate that the optimized signal settings substantially outperform the current signal setting in all performance measures.