

Coordination of Traffic Signals on Arterial Streets in Duhok City

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Abstract : The increase in levels of traffic congestion along urban signalized arterials needs efficient traffic management. The application of traffic signal coordination can improve the traffic operation and safety for a series of signalized intersection along the arterials. The objective of this study is to evaluate the benefits achievable through actuated traffic signal coordination and make a comparison in control delay against the same signalized intersection in case of being isolated. To accomplish this purpose, a series of eight signalized intersections located on two major arterials in Duhok City was chosen for conducting the study. Traffic data (traffic volumes, link and approach speeds, and passenger car equivalent) were collected at peak hours. Various methods had been used for collecting data such as video recording technique, moving vehicle method and manual methods. Geometric and signalization data were also collected for the purpose of the study. The coupling index had been calculated to check the coordination attainability, and then time space diagrams were constructed representing one-way coordination for the intersections on Barzani and Zakho Streets, and others represented two-way coordination for the intersections on Zakho Street with accepted progression bandwidth efficiency. The results of this study show great progression bandwidth of 54 seconds for east direction coordination and 17 seconds for west direction coordination on Barzani Street under suggested controlled speed of 60 kph agreeable with the present data. For Zakho Street, the progression bandwidth is 19 seconds for east direction coordination and 18 seconds for west direction coordination under suggested controlled speed of 40 kph. The results show that traffic signal coordination had led to high reduction in intersection control delays on both arterials.

Keywords : bandwidth, congestion, coordination, traffic, signals, streets

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