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DELAY ANALYSIS AT SIGNALIZED INTERSECTION UNDER MIXED TRAFFIC CONDITIONS

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Abstract

Delay is one of the most important performance measures of signalized intersections. Various models including Webster's classical delay formula have been developed in countries with car dominated traffic stream to estimate average delay per vehicle at signalized intersections. Webster's classical delay formula has been formulated under UK situation where the road traffic condition is homogeneous as well as lane based and consequently the formula may not estimate delays accurately under heterogeneous road traffic condition. As a result, it is necessary to modify Webster's delay formula to make it usable under non-lane based mixed road traffic conditions. In this study, the Webster's delay formula has been modified to suit the road traffic situation of India. For this purpose, data have been collected at four signalized intersections of Hyderabad city. Based on these data, a model in the form of multiple linear regression has been developed, which attempts to keep the first and second terms of Webster's delay formula as it is but to modify the adjustment term. The model has been calibrated to form a 'Modified Webster's Delay Formula', which is subsequently validated by comparing the expected delays with observed delays. Results showed that the delay estimated using the Modified Webster's Delay Formula was closer to the observed values.

Keywords: Delay, signalized intersection, multiple linear regression, modified Webster's delay formula