ESTIMATION OF TRAFFIC PERFORMANCE MEASURES AT SIGNALIZED INTERSECTION IN URBAN CONTEXT

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Abstract

The paper attempts to investigate the estimate the delay-flow relationship and capacity of roads at a signalized intersection by developing a model and to improve the road services at intersections. Various models including Akcelik's model delay formula have been developed in countries with car dominated traffic stream to estimate average delay per vehicle at signalized intersections. The Akcelik's delay formula has been modified to suit the road traffic situation of India. For this purpose, data have been collected at five signalized intersections of Hyderabad city. Based on these data, a model in the form of multiple linear regression has been developed, The significant contribution of this work is in providing an integrating frame work for an estimation process that incorporates (a) the peaking characteristics in the demand flow pattern (b) the designation of flow specific periods within the total flow period in accordance with the observed parking and (c) the estimation of performance parameters associated with each flow period and in combination with other periods. Akcelik's classical delay model clarified several issues related to the determination of peak flow period, as well as periods immediately preceding and following the peak. Based on these data, a model in the form of multiple linear regressions has been developed. The model has been calibrated to form a 'Modified Akcelik's Delay Formula', which is subsequently validated by comparing the expected delays with observed delays. The model developed in this study should be validated from a completely different set of external observations to understand the field applicability of the model. Besides Akcelik delay model, other delay models should also be modified under the heterogeneous road traffic condition to estimate delays for oversaturated conditions.

Key words: Delay, flow period, Akcelik's model, HCM model