DEVELOPMENT OF DELAY MODEL FOR NON-LANE BASED TRAFFIC AT SIGNALIZED INTERSECTION

MD. HADIUZZAMAN[1], MD. MIZANUR RAHMAN[2], TANWEER HASAN[3] & MD. AHSANUL KARIM[4]

[1]Assistant Professor, Department of Civil Engineering, Bangladesh University of Engineering and Technology, BUET, Dhaka, Bangladesh

[2,3]Professor, Department of Civil Engineering, Bangladesh University of Engineering and Technology, BUET, Dhaka, Bangladesh

[4]Graduate Student, Department of Civil Engineering, Bangladesh University of Engineering and Technology, BUET, Dhaka, Bangladesh

ABSTRACT

Delay is an important parameter for the measurement of the level of performance of signalized intersection. Well-defined procedures are available to measure delay for developed countries. Highway Capacity Manual (HCM) is widely used for capacity analysis of signalized intersection in North America and other developed countries. HCM and all other delay models have been developed assuming lane disciplined and more or less uniform traffic. Their applicability to non-lane based traffic conditions needs to be checked. In this study, a number of intersections have been selected in the city of Dhaka, Bangladesh, and field measurement of delay has been done by the method suggested in HCM 2000. The delay at each intersection is also estimated by Webster delay model, TRANSYT model, Akcelik's model, Reilly's model and Highway Capacity Manual (HCM) 2000 model. Based on regression analysis, modified delay model is developed for non-lane based traffic conditions prevailing in Dhaka city. Based on the findings of this study, it is recommended that the theoretical uniform delay (due to uniform arrival) and the incremental delay (due to random arrival and over saturated queues) in HCM 2000 delay model should be decreased by 20% and 85 %, respectively to better reflect field conditions where traffic does not follow any lane discipline. In addition to those, an intercept term has been proposed to use in the modified HCM 2000 model.

KEYWORDS: Acceleration, Deceleration Delay, Control Delay, Incremental Delay, Non-Lane Based Traffic, Uniform Delay