C-42: Estimation of saturation flows at signalized intersections

J M S J Bandara, I P Sunanda, L G A Edirisinghe, R M N D Ratnayake,
U C Widanagamachchi
(Dept of Civil Engineering, University of Moratuwa)

Effectiveness of a traffic signal at an intersection will be based on the signal phasing sequence, cycle time and green times allocated to different approaches. Selection of above parameters is dependent on the intersection geometry, traffic flow and mix at a given time. It is also dependent on the saturation flow assumed to represent the maximum number of vehicles in equivalent passenger cars that cross a stop line during one hour of green period. At present, saturation flow value developed in UK to suit European standard is being used. The objective of this study is to estimate the saturation flows at signalized intersections in Sri Lanka to evaluate the appropriateness of using the UK value.

Seventeen intersections were selected out of 20 that were signalized at that time. Total approach width, number of lanes and lane width were collected. Four different time periods: morning peak, evening peak, off peak, mid day school peak, to represent different traffic flow, mix situations were selected for data collection. Vehicles were classified into 8 groups. Saturation flow measurements the total lane flows in each lane were counted. At least 10 such observations per approach per time period were taken.

Data collected was summarized and analysed using Lotus 123 and SPSS statistical packages. Saturation flows were analysed by location and by number of lanes while controlling for lane width and total approach width etc.

It was observed that saturation flow in PCU (Passenger car equivalent) values vary significantly with the number of lanes and the individual lane width. It can be seen that when the number of lanes per approach increases the saturation flow decreases, if the lane width is the same. Further, it is seen that for a given number of lanes saturation flow increases with the increase in lane width. It is also observed that the saturation flow does not significantly vary with the time period.