An Approach to Estimate the Vehicle Travel Time on Un-signalized Two Lane Roads

Gayani S. Galappaththi[1], Loshaka Perera[2], Saman Bandara[3]

Reliable travel time estimation for a given route is important in transport planning. Even though the developed countries in the world have different methods of forecasting travel time from a simple road network to a complex transport network, local availability of such methods are lacking mainly due to the inadequacy of data or investments for the implementation.

Several qualitative factors such as geography, weather, time of travel etc. and quantitative factors such as road geometry, traffic flow etc. affects the time taken to travel. But the fluctuations in these factors cause significant changes in the travel time. There are no any travel time estimation models currently used in the country during the planning stage or in the monitoring stage to check the efficiencies or enhance the current conditions of the road network. The objective of this study is to develop a relationship using different land use patterns to estimate the travel time on three leg intersections accurately for road links in order to build a model for travel time estimation on un-signalized two lane roads.

Trip attraction and trip generation in regions depends on the land use pattern of that area and cause the differences in vehicle travel. Due to this reason this study focus to develop a travel time estimation technique that can be implemented by considering different land use types such as residential, commercial, industrial, accessibility, agricultural/forest coverage etc.

Two lane road sections of three national highways in Sri Lanka; Peliyagoda-Puttalam road (A03), Colombo-Kandy road (A01), Ambepussa-Trincomalee road (A06) were considered for this study to associate the different land use types, different vertical and horizontal alignments and its correlation with vehicle travel times. For this study, travel time data along the roads was collected during peak hours of the day using a GPS (Global Positioning System) data logger. Time taken to travel, Travel length, presence of commercial length, additional number of access roads (access roads present other than intersection connection roads) and number of schools or temples in the intersection were collected for each intersections. Multivariate regression analysis is used to develop the relationship between the land use pattern and the travel time. The model showed a significant positive correlation with Travel length and Commercial length present.

Key words: Three Leg Intersections, Travel Time Estimation, Land Use Pattern, Transport Planning

Authors Details:

1. Graduate Research Student, Department of Civil Engineering, University of Moratuwa, Sri Lanka.gayanisn@gmail.com,0717407093

2. Senior Lecturer, Department of Civil Engineering, University of Moratuwa, Sri Lanka.perera.loshaka@gmail.com,0112650567 (ext :2128)

3. Professor, Department of Civil Engineering, University of Moratuwa, Sri Lanka.bandaras@sltnet.lk,0112650567 (ext :2129)