Dynamic Travel Time Discoverer (DTTD) collaboration with Intelligent Transportation Systems

Udila Pilanavithana[1] and J.M.S.J.Bandara [2]

Accurate real-time information provision and short-term predictions of traffic parameters such as volumes, travel speeds and occupancies, is a research topic that has attracted considerable interest in the literature. This is, at least in part, a result of the increasing penetration of Intelligent Transportation Systems (ITS) technologies in everyday life. ITS technologies, with Advanced Traveller Information Systems (ATIS) and Advanced Traffic Management Systems (ATMS) as examples, attempt to deal with the traffic congestion and travel time problems facing commuters in many urban areas worldwide by better synchronizing traffic signals and by assisting drivers on selecting routes based on accurate real-time information on traffic conditions.

Objective of this research was to evaluate the Dynamic Travel Time and Modify the Origin-Destination Flows with latest traffic flow data obtained from minimal number of link counts within the network. Methodology in satisfying the research objective has been developed by a Dynamic Program (Dynamic Travel Time Discoverer - DTTD) to collaborate with analytical software widely used around the world. Methodology was developed to estimate the link flows and calculate the Travel Time while giving opportunity to modify the Origin Destination (O-D) Flows according to the latest information. During the dynamic programming, O-D and Flow matrices are read by the program and calculate the total link volumes according to the above matrices and store in arrays. Secondly, developed Akçelik Speed-Flow model uses to convert total flow values into Travel Time values and case studies have been carried out to validate this model to Sri Lankan conditions. This model produces significantly improved traffic assignment run times and provides more accurate speed estimates which lead accurate travel times to assure the objective of identify the best path based on travel time using minimum real time information available. As an another option, program enables user to modify the link flow values with latest traffic data from minimal number of link counts and re-write the Base Flow matrix with the updated values. When the program re-runs, it concludes the shortest path in travel time basis with the latest updates. In Conclusion, the estimation of link flows and modifying the O - D flows can be performed by two stages modal and travel time projected by the improved speed flow relationship. Projected travel time facilitates the selecting best path or the alternative for the user destination. Furthermore, integrate a method which will automatically update the system data base with the latest traffic data corresponding to road links and give the most up-to-date best travel time path to the road user is proposed as future development.

Keywords*: Intelligent Transportation System, O - D Flow, Link Traffic Flow, Travel Time*

Authors Details;

1. (Mr., Research Student, University Of Moratuwa, Katubedda, Sri Lanka, pilanavithanage@gmail.com and 0112 650 567 - 2130)
2. (Prof., Senior Professor, University Of Moratuwa, Katubedda, Sri Lanka, bandaras@sltnet.lk and 0112 650 567 - 2129)