C-41: A regional traffic model for Sri Lanka

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Regional traffic models are necessary to plan transport infrastructure in keeping with anticipated human settlement patterns and activities. Traffic data of private vehicle movements between any 2 DSDs within the study area was obtained. Socio-economic data such as population, jobs, vehicle ownership, number of households and household size etc. were collected for the study area. Transport data such as distance of road links, travel time were also collected for the A and B Class roads of the study area.

By correlating the vehicle trip rates with socio-economic data and travel data, 3 traffic models were calibrated using regression. Home Based Work Trips (HBWT), Home Based Other Trips (HBOT) and Non Home Based Trips (NHBT) were tested as dependant variable with different socio-economic and travel variables in different functional forms given below:

(1).

$$HBWT = \frac{7.026 * 10^{-3} * POP_i^{0.46397} * JOB_j^{0.77685} * Exp(1.37342 * TvehijHH)}{Ttime^{0.51694} * DISij^{0.97882}} - 1($$

(2).

$$HBOT = \frac{2.032548 * POP_i^{0.27141} * POP_j^{0.265} * JOB_j^{0.32063} * Exp(1.68805 * Tvehij}{Ttime^{0.35495} * DISij^{1.45743}}$$

(3).

$$NHBT = \frac{5.0486 * 10^{-2} * POP_i^{0.73793} * JOB_j^{0.56741} * EXP(1.07572 * TvehijHH)}{Ttime^{0.94214} * DISij^{1.26068}} -$$

where

POP_i	-	Populaiton in i^{th} DSD
JOB_i	-	Jobs (State, Semi Government, Public, Industrial & Private Sectors) in i^{th} DSD
TvehijHH	-	Mulitplication of Total private Vehicles per household in i^{th} and j^{th} DSDs
$Ttime_{ij}$	-	Travel time between i and j DSD in min
DIS_{ij}	-	Minimum distance between i and j DSD in km.

This 3 trip type traffic model can be used for making estimates of future traffic flow between different DSD zones (or similar) within a geographic area. The model is sensitive to input parameters of population, jobs and vehicle ownership as variables indicative of the socio-economic conditions. Changes to the road network are represented in travel time and distance. Thus the impacts to traffic flow due to either improvements to roads, new roads, or deterioration of present road conditions can also be tested in the model.