C-44: Development of a road network database for Sri Lankan roads

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Sri Lanka has a generally well distributed network of roads the total length of which is about 100,000 km. Out of these roads, those classified as Class A and B belong to the national highway network amounting to about 11,000km. Presently, these roads are managed by the Road Development Authority (RDA).

The objective of this research was to analyse the road system as an entire network, since one road affects the flows on the other roads. Transport planners require to estimate the expected demand for the new road and the corresponding reduction or increase in traffic volume on the other roads. In such a case, the road network system will be helpful in finding the linkages for improvements and the paths for directing traffic.

A road network can be expressed in terms of nodes and links. A node for the Road Network for Sri Lanka is defined as an intersection of Class A and/or Class B roads. A node is identified by a 6 digit number. A road between 2 nodes is defined as a link. A link is identified by the start node number and the end node number. A unique classification number is therefore available for each link. Road names and road classification numbers were provided by the RDA.

The survey team measured the road width, side walk width, shoulder width and centre median width of each link of this network. The length of a road was directly read from the vehicle (speed) distance meter to an accuracy of 100 m. In addition road roughness, gradient and curvature were also included. The survey team also observed the number of access and exit points on each link, the land use on both sides of the road, parking facility available, bus halts, pedestrian crossings and schools.

The road inventory database developed is capable of defining the entire road network in terms of nodes and links and their arrangement and in addition link lengths, road widths and other geometric parameters. Minimum path(s) between any pair of nodes can be calculated considering the lengths of the links. The programme assumes that the vehicles travelling between 2 nodes will use the minimum distance path considering that the travel time is proportional to the distance.

The above database can be used for estimating the speed, capacity, level of service, free flow speed and other parameters requested for evaluating the performance of a road network. The network database also enables the identification of the most critical links for development. The programme can be used to identify the most suitable road side survey locations for transport planning studies, and to estimate the traffic flow between selected zones based on the data collected at identified locations.