Strategy to Identify Optimum Travel Routes for Improvements in an Urban Area

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Transportation is a basic requirement in any city in the world for its economic, social and other developments. Different cities in the world use various means of transportation to achieve their goals and objectives. In general, minimum travel time, comfort and safety can be considered as primary objectives of any cities transport plan. In urban cities, it's a well-known fact that transport planning is imperative to achieve its day to day and long term goals. Congestion is very commonly seen condition in most of the urban areas in the world and there is no exception for Sri Lanka as well.

In an urban context, users may have various origins and destinations in their travel needs varying over the time. These needs may have primarily arisen due to the land use mix or social desires. However, it is transport planners duty to full fill these transportation needs of users effectively under given circumstances. In that aspect identification of high demanding origins and destinations are very important and recognizing minimum distance or minimum travel time routes are critical. Proper information or planning system would direct users effectively and could able to cut off unnecessary congestion significantly. Thus, this study will explain a strategy to identify travel routes in urban area with respect to time and distance variables, where improvements can be done to reduce congestion effectively.

Identification of prominent OD pairs, traffic flow conditions and capacities at different corridors, travel distances between OD's, travel time between OD's and most preferred routes by users can be considered as main inputs in this nature of study.

Colombo city was selected as a case study and Origin-Destination (OD) surveys were carried out at number of selected locations along with traffic flow counts, taken at main and sub corridors connecting to Colombo city. Based on the OD survey analysis, prominent origins and destinations were recognized and travel time between each and every combination of origin and destination were measured multiple times, in peak and off peak conditions. Based on the collected data minimum travel time between OD's and minimum travel time route were identified.

Using the Arc GIS software, a road network plan was developed and minimum distance routes were identified between OD's. Further, there are instances where users use completely or slightly different routes to reach their destinations other than mentioned above and thus those routes were also recognized as commonly used routes to see what deviates from the minimum distance or minimum time path.

Comparison of three different routes obtained from the study revealed many problems and counter measures were given to improve the efficiency of existing conditions cost effectively.

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