Methodology to Find Alternative Paths Using GIS

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In recent years Sri Lanka has experienced a high growth in urban population and the number of private vehicles. Most evident feature of such a trend is urban road congestion; roads in some areas are also facing unexpectedly high traffic flow which causes a lot of time waste in transit and huge losses to the economy of the country. Therefore, it is important to find alternative routes during times of traffic congestion. GIS technology can be used for this purpose, to find alternative paths between two nodes and graphically represent it. This will not only help manage the existing highways efficiently but will also help traffic planning studies.

Alternative path between two nodes can be node independent or link independent. Furthermore, the meaning of the node independent path is path which cannot go through specific node or nodes in its best path. The route which is not use a particular link or links of its best path can be defined as link independent path. These paths are important for transport engineers and urban planners in accessibility studies, disaster management and traffic management work. Best path between any two nodes can be found using minimum path algorithms. TransPlan model developed by the Transportation Engineering Division of the University of Moratuwa facilitate finding best paths between any two nodes on the National Road network in Sri Lanka. It is not possible to find alternative paths between two nodes using TransPlan.

The objective of this study is to develop a method to find the node independent and link independent alternate paths using Geographic Information System (GIS) and make a model to find the alternative paths of A, B and selected main roads within City of Colombo by customizing the ArcGIS network analysis tool using Visual Basic 6.0. Method used and examples of application are presented in the paper.

Key Words: Alternative path, GIS, Customize the GIS using VB6