

Solving the problem of traffic congestion in Kandy city using a minimum cost network flow algorithm

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Traffic congestion is a problem faced by almost all cities around the world during the peak hours of the day. Over the time, experts have employed different methods to overcome this problem. One such approach is the use of network optimization algorithms to find the optimum traffic flow in the road network.

In this report, it is attempted to find an optimum traffic flow plan to overcome traffic congestion on roads leading to Kandy city, and to illustrate the use of above mentioned algorithm to solve the problem of traffic congestion.

In solving this problem, a minimum cost network flow is used with upper and lower bounds on the flow along each arc. They indicate the maximum and minimum capacities of the road segment represented by the respective arc. The costs assigned to each arc represent the suitability of the respective road segment for vehicle transportation considering factors like the capacity and the condition of the road (lower the cost higher the suitability). Nodes represent junctions in the road network and arcs represent road segments connecting each junction. An optimum traffic plan was obtained using the above method based on the data available.

Although this study is carried out based on the data related to Kandy city, this method could be used to find an optimum traffic plan for any road network to overcome traffic congestion when the relevant data are available.

As the final solution to this problem is highly dependent on the maximum allowable traffic flow along a particular road and the cost involved, it is very important to find a reliable and efficient method to find those values based on the condition and the capacity of a particular road.