



OPTIMAL FREQUENCY SETTING FOR CIRCULAR BUS ROUTES IN URBAN AREAS

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Abstract:

closed bus routes. Transit passengers, in many cases, deal with overlapping bus routes with some routes sharing common sections and stops. Passenger assignment problem is a major task in frequency setting of bus service which aims to minimize passengers and operator costs. In this work, mixed integer mathematical formulation based on passenger choice problem is developed to track each proportion of passengers in selecting bus routes for 0- and 1- trips transfer. The proposed model would help for a given transit network and total bus fleet size to minimize network total travel time. It would optimally distribute frequency among bus routes, regarding passengers' interests in selecting bus routes. It differs from traditional models, since it helps in tracking different users while they are moving on the network. Numerical examples are given to clarify the proposed mathematical formulation. Circular bus routes operational performance is tested using Mandl's network benchmark problem. Genetic Algorithm has been implemented with Matlab language in solution procedure. Comparing results with previous work indicates that circular bus routes manage in minimizing average user travel time for the same operator cost. The results from this study would help in further work to optimize transit vehicle size and stops distances along each single bus route.

Keywords:

Circular bus routes - Frequency setting - Mixed Integer Programming - Genetic Algorithm

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