ABSTRACT

Urban transportation has become one of the daunting problems in the wake of continuous influx of people from rural to urban for job opportunities, recreation, education etc. and the increasing growth rate of population in the urban areas. Though personal motorized vehicle ownership is likely to increase with some rise in real incomes and continue to be concentrated in urban areas, walking, cycling and public transport will remain the most important modes of urban travel in the Third World. Hence, urban transport policy in the Thrid World will be increasingly directed to how best to fulfil this growing demand using current and proposed public transport facilities. There will also be an increased awareness of the possibilities for managing demand such that the burden on public transport facilities is minimized. Out of several policy options for the development of public transport, this thesis conffines itself to Vehicle Scheduling.

Proper vehicle scheduling in the overall economics of a transport organization has its own advantages. By an effective scheduling, if the same number of trips can be operated with lesser number of vehicles, or if more number of trips can be operated with the same number of vehicles, it improves the efficiency and the reliability of the undertaking oto a considerable extent. Scheduling of buses in urban areas is distinctly different from that of mofussil and long distance services. In urban vehicle scheduling, the problem centres

around determining the optimal frequencies on different routes and schedule the vehicles based on the time table which is prepared sequentially for different time periods of a day, whereas in the other case, the problem is to schedule the vehicles to a pre-determined time table. However, the thesis narrows down its focus to urban vehicle scheduling which as a first step, determines the otpimal frequencies subject to certain constraints.

PROBLEM STATEMENT:

Given a set of routes, the problem is to find out the optimal frequencies on the routes taking into consideration the policies of the undertaking in terms of number of minimum and maximum trips to be operated on each route under study, the deman at the maximum loading points on the routes, the available fleet strength etc. The fleet may include different types of vehicles viz Single-Decker, Double-Decker, Mini buses, Compartmentalized buses etc. The objective may be either to maximize the total seating capacity or to minimize the total operating costs subject to the constraints described above. Then, given a optimal headway on a route, the problem is to explore the possibilities of reducing the fleet requirement to service the route.

OBJECTIVES:

1. To develop a quantitative model to determine the optimal headways on a given set of fixed routes.
2. To develop a Decision Support System to determine frequencies and to prepare time tables and schedules for those routes under study.
3. To develop procedures for effecting saving in the fleet requirement on a given fixed route.

METHODLOGY:

For objectives (1) and (2) the methodology is to formulate the problem as a Linear Programming Problem with "No. of trips as the decision variables. For objective (3), Theorems and Procedures are developed using the concepts of Quick and Cut Trips.

The abovementioned methodology were applied in the case of Bangalore Transport Service, Bangalore and Pallavan Transport Corporation, Madras and have yielded practical solutions. The (1) and (2) of the objectives are developed as an interactive IBM/PC compatible software for any urban transport operator as part of DOE and UNDP sponsored projects.