Chapter II

Review of Literature
2.1. Introduction

In the previous chapter, the importance of rural passenger transport and objectives, methodology and limitations of the study have been discussed. In this chapter, a review of literature relevant for this study has been presented. Such literature covers operational efficiency of the transport services in rural areas, operators' problems, passengers' transport need, travel and mode choice behavior, and travel problems.

2.2. Janusz C. Supernak et al., in their paper on "International Solution to Rural Transport Problems: How Useful for Developing Countries," focussed on the areas of roads, transport modes, services, and rural transportation planning. They highlighted some common rural transportation problems in both developed and developing countries: unsatisfactory level of road conditions, private ownership of vehicles, access to affordable public transport and regulation, and financial assistance. They also stated that the main problems of commuters' inadequate transport, and financial loss of operation in rural services are prevented by the private sector through encouraging sound government policies and support.1

2.3. In their paper "Predicting Demand for Rural Transit Systems," Burkhardt and Laga focussed on the problems of rural passenger

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transportation in certain technical as well as non-technical areas. Technical issues, such as planning techniques, resource requirements, and performance standards and the non-technical areas progress very little as evidenced particularly in the areas of political leadership and financial stability. They also revealed that costs can be influenced by one or more of the major factors: operating characteristics, regional characteristics, operating speed, and environment and inflation.2

2.4 The Great Britain Department of the Environment in its report in "Review of Rural Transport," stated that the real trouble in assessing transport need in rural areas is due to the scattered nature and varied transit need and it is difficult to match together to form any sensible public transport load.3

2.5 Abaynayaka, Morosiuk and Robinson in their report on "Tables for Estimating Vehicle Operating Costs on Rural Roads in Developing Countries," have stated that operating costs may be estimated for different road geometrics, surface conditions, and attitude and for vehicles of different types with different prices, ages, loads, and engine power.4


2.6. In their paper entitled "Rural Transportation Costs," Ceglowski, Laga and Burkhardt concluded that the total operating costs per vehicle mile are the highest in the rural transport services due to low occupancy and high consumption of fuel. Moreover, in rural transit operations, the bulk of the total system costs are directly attributable to drivers' wages, overhead costs and vehicle capital costs; economics of scale are not obvious in rural transport operations.5

2.7 In a study entitled "Rural Transportation and Corporate Objectives," M.Shivaji Singh found that 97 per cent of routes in Andhra Pradesh were unprofitable, 0.4 per cent of routes attained break even level, and only 2.6 per cent were profitable routes in village link transport service routes formed by the end of March 1980. He also estimated that 23 and 20 per cent obtained a vehicle utilisation of 300 kms and above, and less than 200 kms respectively. He showed that only 6 per cent of routes gained occupancy ratio of more than 80 per cent, and 72 per cent of routes offered traffic demand of 60-80 per cent. According to him, low occupancy ratio and a low vehicle utilisation due to shorter route lengths and bad condition of roads were the main reasons for the unprofitability of passenger transport service in rural areas.6


2.8. P.G. Patankar, in his book entitled "Road Passenger Transport in India," has stated that the rural substandard road is the reason for the high operating cost and operation of conventional buses in rural areas is not quite economic, efficient, and safe for operations.7

2.9 K. Munirathna Naidu in his paper entitled "Road Transport and Rural Development in India," has mentioned that the operating cost of conventional bus system in the fixed routes in rural areas cause uneconomic condition due to scattered and low density of population and uneconomic fare structure framed by the government. And he has also recommended that the running time of rural route services should be extended generously and reasonably so as to enable the slower boarding and alighting of elderly passengers and loading and unloading of commuters' luggage.8

2.10 M.J. Sahabandhu, in his paper "Activity-Based Methodology to Ascertain Transportation Needs and Allocate Financial Support for Rural Bus Service," has discussed the variety of aspects like transportation needs, levels of service, levels of subsidy requirements etc. He has also stated that the regular conventional bus services cannot be served at

7P.G. Patankar, Road Passenger Transport in India, (Pune: Published by Central Institute of Road Transport, Training and Research, 1985).

acceptable costs to the commuters even though it is essential because dispersed irregular transport demand results in high operating cost.\textsuperscript{9}

2.11. R. Ganesan stated in his article on "Economics of Rural Transportation," that conventional buses would require certain minimum standards for optimum service functions and the inferior major district road condition in rural areas results in higher depreciation, heavy fuel and tyre consumption, and lower vehicle utilisation per day due to lower speed.\textsuperscript{10}

2.12 The Expert Committee on Transport Sector (1990-91) has suggested that rural services can be defined in terms of the kilometre operated in the area of Panchayat or Panchayat Union or in the area of any other local authority with the population exceeding 10,000. The committee has also recommended to improve the rural bus service by increasing financial resources, one man operated buses, remission of the tax on fuel oil used in public service vehicles, and considerative fare fixation on cost of the service.\textsuperscript{11} However the above mentioned publications have highlighted only the problems of the operators while plying services in rural areas.


2.13 S.G. Arasangovan in his article on "Rural Transport Planning and Operation," suggested that rural public transportation can be evaluated by operators on revenue, cost factors—capital and operational, resource utilisation such as occupancy ratio, dead kilometres, better kilometre per litre, and optimum utilisation of crew members. Evaluation of their performance by commuters will mainly be on the basis of quality and comfort of service such as convenience, reduced travel time, increased frequency, more comfortable seating, sufficient time at stops, economic fare, dependability, and safety. The present study has taken up and developed this line as a tool of evaluating the performance of a public sector road transport corporation in extending rural service.

2.14 D.J. Banister, in his study on "Transport Needs in Rural Areas - A Review and Proposal," stated that transport needs can only be assessed at certain levels. Because different set of problems arise while assessing the needs, due to differences in passengers' expectations and aspirations and demand may be sometimes over estimated because of the mismatch between stated intention and actual behaviour. Banister found that of the 39 non-metropolitan counties in England there is tremendous variation in levels of mobility, both in the quantity of travel made and in the quality of the modes used by the different groups of commuters in different rural areas.

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In a study entitled "Simple Indices for Diagnosing Rural Public Transport Problems," Ochojna and Brownlee attempted to determine the public transport provision in rural areas through formulation of three simple indices, namely, demand, supply and supply/demand index. They emphasised the demand index and that a village's requirement for transport depends on the interaction of its population structure and the type of facilities present in the village. He stated that supply of transport services can be assessed through the number of frequency made by the commuters. He also found that villagers with less local facility made more frequent trips to the town than the other villagers.¹⁴

The article on "Determining Transportation Needs," by K.C. Koutsopoulos focussed on individuals' different kinds of adjustment in travel behaviour and their influence in transportation need. He concluded that the trip characteristics induced by a number of different factors, such as individual, physical, and social characteristics of the environment. He found that the adjustment of the frequency of travel trips became shorter and fewer if the different purposes are combined in the same trip.¹⁵

Mary Benwell, in her paper on "Social Research in Transport," summarised the recent research activities in France, Germany, and the United Kingdom in the social aspects of transport in terms of three subject


areas i.e. (i) transport users and their behaviour, (ii) the relationship between transport systems and economic and social behaviour, and (iii) institutional behaviour. She concluded that fragmentation of knowledge or lack of an agreed focus on social aspect of transportation is the main drawback.¹⁶

2.18 Stoner and Milion in their study entitled "Behaviour Analysis of Travel and Activity - Determinants of Travel Choice," revealed that a theory behaviour analysis has been adopted from various disciplines including micro-economics, psychology, and sociology. The study also showed that individual travel behaviour may be measured in four dimensions such as psychological (travel comfort), social (occupational/status), economic (income level), and physical (trip frequency).¹⁷ The present study has taken up a number of other demographic and transport usage factors influencing passenger satisfaction along with these factors.

2.19 In their article entitled "Factors Influencing the Transport Behaviour of Man," Panduranga Rao and Rama Rao emphasised that geographic, environmental, social, cultural, economical, and psychological factors, and quality of service (viz., nature of vehicle, journey time, speed of the


vehicle, disturbance, competition, comfort, terminal services, congestion and frequency of trips), are influenced by the passengers' perception in the travel behaviour. They have also suggested that various qualitative factors like time involvement in the journey, cost factor, frequency of the service, dependability of service, convenience and comforts in the travel will be carefully analysed by the users to make choice among available alternative modes. However, the authors did not empirically test the relationship between these factors and passengers' satisfaction.

2.20 In the study entitled "Personal Mobility and Transport Policy," Menderson and Whalley investigated personal mobility from the points of view of the individual. They also looked at basic mobility needs and the different methods of travel, and also reported a survey carried out to determine the travel patterns of adults, teenagers, and primary school children. The authors found that there are significant differences from each other with regard to their perception of most of the dimensions of travel pattern.19

2.21 Mitchelson and Sauthier, in their paper on "Examination of the Psychophysical Function in Travel Mode Choice Behaviour," have given an attention on replacing aggregate correlation mode-split models with a more consumer oriented approach in which psychological variables (e.g.

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perceptual and preferential) and situational variables (e.g. income, age and travel mode access) are used. He has also used attribute scales to assess the commuters' burden, convenience, safety, flexibility, privacy, and comfort. He has also stated that the perceptual sensitivities are determined by calculating the range in part perceptions associated with a particular travel mode characteristic and the situational importance of respondents' sex, age, and status of a parent and at last concluded that perceptions differ among individuals. 20

2.22 The study "An Empirical Investigation into the Determinants of Travel Time," by Prendergast and Williams stated that mean daily travel times depend on several socio-economic and demographic variables such as age, sex, employment status, income, and vehicle ownership, and the results showed clearly that total daily travel time is not constant over different population groupings. He also illustrated population grouping of male, age between 15-60, employed, high income, and vehicle holders' mean travel time per person (in minutes) proportion is higher 30-50 per cent than that of other category of population in the same group. The result also indicates that the average daily travel time would not provide a representative measure of travel behaviour and the author has also

suggested that travel time could not be used with confidence for the purpose of prediction. 

2.23 In the report entitled "National Transportation Policy Needs as Viewed by the Consumer," Ernest Dichter revealed that a major motivation study on commuter psychology found that a dynamic relationship exists between commuter and mode of transport and this relationship consists of three factors, namely (1) perceptions of progress and change, (2) the degree of commuter influence on the mode, and (3) anticipated future changes. He also states that five logical motivations -- convenience, cost, comfort, time, and distance -- are important in the use of mode.

2.24 Hartgen and Tanner in the model on "Investigations of the Effect of Traveller Attitude in a Model of Mode-choice Behaviour," proved that the attitudes of commuters on specific transport qualities such as comfort and convenience are used to measure differences in travel alternatives similar to quantitative measures of attributes such as travel time and cost. Even though many studies cited above discussed the influences of passengers perception on their travel behaviour, these did not attempt

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analyse the influence of perception in varying level of passengers' satisfaction.

2.25 In the study entitled "Some Aspects of the Rural Transport Problem," Anthony G. Hoare stated that two sets of operative forces namely, individual and geographical forces, cause spatial variations in the incidence of rural transport problem. He analysed the inadequacy of rural transport through perception from both sets of forces and compared the same with other problems in the same localities. The results of the study indicated that transport is most commonly coupled with respondents' poor social life and 39 per cent of respondents have cited that transport was a problem. Whereas the percentage of respondents who have cited the other disadvantages of village life were social (18%), shops (13%), water (5%), education and medical (3% each), and others (19%). However, he found that inadequate public transport was the greatest single problem in the overall problems of rural areas.24

2.26 Agarwal and Mahdi, in their paper entitled "Rural transportation in India," have stated that, "in India rural transport is backward; inadequate and inefficient rural transport adversely affected the movement of rural people even after thirty seven years of planning."25 However these studies have discussed only the common passengers' problems in rural


areas and did not attempt to measure passengers' satisfaction with rural transport.

2.27 "Innovations in Rural Bus Services," issued by Department of Transport in Great Britain, agreed that the present system of licensing could hinder the efficient development of new services and that it needs reform. New services, such as mini-buses and shared cars should be developed according to the conditions of demand and should supplement the existing network of conventional buses in rural areas.²⁶

2.28 The report on "The Mini buses and the Public Transport System of Kula Lumpur," submitted by Jamieson Mackey and Partners contended that mini-buses produced substantial benefits for both passengers and operators in terms of (1) faster journey speed, (2) slightly shorter waiting time, (3) greater penetration into the central area, and (4) cheaper travel for distance over 7 miles (11 kms), and it helps to minimise the cost and maximise the profit respectively.²⁷

2.29 The report, "The Rural Transport Experiments a Mid-term Review," by R.J. Balcombe stated that rural transport could be identified with five different operational features, namely, (1) voluntary effort by local residents in organising and operating community transport services; (2)


using small vehicles where demand is small and for narrow roads (3) arranging routes (schedules) according to pre-booked demand; (4) carrying passengers on vehicles making regular journeys for other purposes; and (5) linking remote areas to the main public transport network with feeder services.28

It is understood from the above review of literature that there are different studies conducted about various aspects of rural passenger transport like problems of operators, transport need of passengers and their perception, travel behaviour, and problems of passengers. But most of the studies have been carried out only in foreign countries and in our country there are only few studies on the rural passenger transport. From the foreign experience it is observed that there is a lot of scope to improve the rural passenger transport in our country. Moreover, so far passenger satisfaction, with bus service has not been studied elaborately especially in rural areas. Hence there is a need for the researcher to study the degree of passengers' satisfaction in rural areas and find out their problems in their journey. Thus this review of literature has enabled the researcher to design her study so as to assess the level of passengers' satisfaction in rural areas, using suitable tools and methodology. And also some conclusions have been arrived at and useful suggestions have been made to the people connected with rural transport services viz., the corporation, the bus crew, the government and the commuters.