CHAPTER 1

INTRODUCTION

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1.1 INTRODUCTION

Transport system is an essential ingredient of almost everything man does to supply himself with the necessities of life.\textsuperscript{1} K.K. Saxena says, “The transport system acts with reference to the area it serves in the same way as a candle does in a dark room”.\textsuperscript{2} Modern means of transport have broken the distance and united the whole world into a single and small one. In fact the history of civilization is based and built upon the history of transport.

The Keskar Committee on Road Transport Taxation observed: “In large areas of the world, lack of transport is a primary obstacle to economic and social development. Poor transport is a major factor in world hunger”. The Keskar Committee further holds: “There is a definite relation between mobility and poverty; countries with low standards of living are characteristically countries with inadequate methods of moving”. Mobility equally influences the quality of life people lead and the way they earn their living. Without transport system through its widespread network, the society’s mobility would become stagnant; the society then will become myopic, secluded and probably dead.

\textsuperscript{1} Final Report of the Road Transport Taxation Enquiry Committee, Government of India, New Delhi, November 1967, p.6.

Transport, which provides both place and time utility, plays a pivotal role in the overall development of a country from the embryonic stage of development to the most advanced stage. The transport system of a country is the barometer of its economic progress. Proper functioning and steady growth of economy of a country largely depend upon its efficient transport system. As a source of massive tax revenue to the State exchequer, transport system performs a variety of useful functions in all the social, economic, industrial, cultural or political aspects of the society. It paves the smooth way for effective mobilisation of the country’s resources and helps achieve the objectives of development plans. A well-developed system of the transport is instrumental in increasing the level of consumption, production and distribution, thereby accelerating the rate of economic growth.

1.2 MEANING AND IMPORTANCE OF TRANSPORT

Transport is a service or facility by which persons, goods and properties are conveyed from one place to another. It is an organised industry created to satisfy the basic needs of the society. The need for the conveyance of goods arises because they are often produced in one region and desired and distributed in the other. The transport of persons arises from the need of individuals to move from place to place to satisfy their needs connected with business, social, cultural or recreational interests.
Transport is the life-blood of commerce. The growth of domestic and foreign trade largely depend on transport. There is hardly any country in the world which is not dependent on other regions for food, raw materials, and finished products. Most of the countries of Western Europe look up to Asia and America for supply of food and materials. The U.S.A., Canada and Argentina would not have raised so much of wheat to supply to the world market if there had not been proper provision of cheap conveyance by land and water. Besides this, the transport facilities have succeeded in totally destroying the monopolistic positions of many producing countries. Transport has played a vital role in the consolidation and development of many thinly populated countries like Australia, South Africa, Canada and U.S.A. The facilities of easy and frequent transport system in covering very long distances in these countries have enabled the permanent settlement of millions of European immigrants.

It is not only economic development but, social and cultural developments of a state are also equally influenced by the development of transport. Transport makes the growth of large cities possible and urbanisation is the indirect effect. The role of transport system in the development of the country/society cannot so easily be ignored in the years to come.
1.3 ECONOMIC, SOCIAL AND POLITICAL EFFECTS OF TRANSPORT

1.3.1 Economic Effects of Transport

Efficient transport system creates time and place utilities and thereby affects the demand for goods and the value of goods. Transport helps in getting commodities which cannot be produced in a region due to unsuitable natural conditions. Thus, transport makes production efficient and purposeful. “It is economically advantageous for each community to specialise in the production of goods which it can produce more efficiently than other communities and to transport the goods so produced between the communities, provided the cost of transport does not exceed the relative different cost of production. High transport cost tend to limit the extent to which communities can engage in economic specialisation and exchange their products and to decrease thereby economic efficiency”.

1.3.2 Social Effects of Transport

Transport raises the standard of living by decreasing the cost of production and increasing the quality and variety of goods. Transport helps the spread of education and culture. It enables travel of people of different regions, customs, manners and languages and social contact en masse. It also enables exchange of ideas, culture and intelligence, as well as understanding and outlook. The

establishment of personal contact through transport system has put an end to rural isolation.

1.3.3 Political Effects

Transport promotes national unity and integration. A big country cannot be well administered and held together without an adequate, proper and successful system of transport and communication. On the political side, poor transport makes exceedingly difficult to achieve national unity. Transport strengthens national defence. Almost in all countries, military considerations are upper-most in the projection of transport system.

1.4 CLASSIFICATION OF TRANSPORT

Transport system can be classified in different ways depending on the types of transport, the ways and means of transport and also the motive power used in transport. There are mainly three types of transport, namely, Land Transport, Water Transport and Air Transport.

Figure 1.1 explains the classification of transport. Roads and railways come under land transport; inland waterways and ocean routh under water transport and aeroplanes under air transport.

FIGURE 1.1

CLASSIFICATION OF TRANSPORT

TRANSPORT

LAND
  ROAD
    Rural
    Urban
    Unsurfaced
    Surfaced
  RAIL
    Steam
    Diesel
    Electric
    Coastal

WATER
  INLAND
    Rivers
    Canals
    Lakes
  OCEAN
    Seas
    beyond national limits

AIR
  NATIONAL
    within the Country
  INTERNATIONAL
    Outside Territorial limits of the Country
1.5 ROAD TRANSPORT

Road transport occupies an important place in the country’s transport system. A variety of vehicles are used in road transport. They range from the animal drawn cart to the fast moving motor vehicles. The fast-moving vehicles consist of cars, jeeps, vans, buses, trucks, agricultural tractors, 3-wheelers 2-wheelers like scooters, motor cycles and the like. The slow moving vehicles consist of animal drawn carts, horses, cycles and cycle-rickshaws. Fast moving vehicles are the result of industrial revolution. They are mechanised and use petrol or diesel. Road transport system has recorded a phenomenal growth over the past years in view of certain obvious advantages it has over other modes of transport. Now alternative fuels like gas and propulsion system are developed for road transport and the growth of road transport is likely to become more accelerated.

1.5.1 Significance of Road Transport

To keep pace with the economic development of the country and consequent surge in demand for transport services, both passenger and freight, various modes of transport have experienced substantial growth over the years. Road Transport, however, is the most dominant mode of transport for movement of both passengers and goods and is likely to continue to enjoy this status
increasingly in the coming years too. The users’ preference of road transport is on account of its inherent advantages, like easy availability, adaptability to individual needs, door to door service and reliability. At present, 80 per cent of passengers and over 60 per cent of freight are estimated to move by roads. It also acts as a feeder service to Railways, Ports and Air Traffic. There are areas in the land which can not be reached through rail and air transport. The road transport is the only means which provides access to both the mainland and the far-flung hill areas of the country.

It is generally said that India lives in its villages. There are 5,76,000 villages in India scattered all over the country and the rural population is estimated to be 80 per cent of the total population. For a country of India’s size, roads and road transport provide the massive infrastructure linking all villages, hamlets and other rural habitats with towns, cities, metropolises and all other urban centres. Thus, roads and road transport break the isolation of India’s villages and pave the way for extensive development. In a way, road transport acts as essential arteries which remove regional imbalances and equalises potential differences.

Also, road transport yields a significant amount of revenue to the government. The revenue generated by the government from the road transport sector by way of direct and indirect taxes has been increasing over the years, from Rs.47.4 crores in 1950-51 to Rs.18,297.9 crores in 1996-97.6

1.6 PASSENGER ROAD TRANSPORT

The road transport encompasses both the passenger and cargo segments. The passenger segment of road transport is the bread winner for lakhs of people. At present, the passenger road transport demand is met by both public and private sectors. Across the country, the State Road Transport Undertakings operate 23 per cent of the total bus transport as on March 31, 2000 and the rest is with private operators. Passenger road transport was exclusively in the private sector during the first half of the last century. The reasons for injecting public sector into bus transport was to provide unexploitative and fair employment opportunities, in addition to ensuring reasonably adequate and efficient transport services to the public. Since independence, passenger road transport in India has been growing fast and has acquired considerable importance as a discrete economic activity with huge growth potential. Road's share of passenger movement is

doubled in the past 50 years. The travel by public transport is projected to increase to 362 billion passenger kms. in 2001 out of which, the share of buses is estimated to be 264 billion passenger kms. (72%).

With the removal of quantity control on the manufacture of motorised two-wheeler vehicles in the 1980s and subsequently on cars, jeeps and the like, the commuters revealed their preference to the personalised modes of transport. Hence, there was a steady spurt in the growth of personalised modes of transport which showed that two wheelers constituted 69 per cent and cars and jeeps 12.5 per cent (including taxis) to total registered motor vehicles as on March 31, 1997. Thus, the personalised passenger modes of transport were 81.5 per cent of the total registered motor vehicles in India.

1.7 PUBLIC PASSENGER BUS TRANSPORT

The common carrier or stage carrier is known as public passenger bus transport. These are transport systems with fixed routes and schedules, available for use by all persons who pay the established fare. The first regular use of buses


took place in New York in 1905 by the Fifth Avenue Coach Company. Majority of the developing world’s inhabitants are dependent on public passenger bus transport service for their mobility needs.

Bus transport has become the primary mode of transport not only in rural areas but also in urban areas for the movement of the public from one place to another. The economic compulsions restricted the options for rural and urban mobility and made bus transport the main choice. Its flexibility, higher ability to penetrate into inaccessible areas, above all, its ubiquity made bus transport an essential ingredient of rural life.

Thus, public passenger buses indeed form a vital part of the economic and social fabric of all our towns and cities, enabling people to work, to shop, to socialize and to many such activities. “On an average, about 600 people travel per day per bus in rural areas. In metros it is about 1600.”

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The public passenger bus transport is run by both public sector and private sector. As passenger bus transport is mainly a service sector in nature, some of the states decided upon nationalisation of bus transport services by establishing State Transport Corporations in order to ensure that the services were run with public interest. The government offers different types of bus services to the people such as urban services, rural services and long distance express services. The patronage for public passenger bus transport constantly increases due to its flexibility in operations, cheaper fares and wider coverage of the areas hitherto uncovered.

1.8 REVIEW OF PREVIOUS STUDIES

There are a number of studies undertaken on the function and role of the road transport industry in India and abroad. The available literature mainly consists of the reports submitted by the specially constituted committees by the government, articles and research papers published in different journals, doctoral theses and books. A few studies which have certain bearing on the present study are reviewed for the purpose of designing the present study.

V.V. Ramanadham in his book ‘Road Transport in India’ (1948) has studied the role of road transport in the development of the country.12

12. V.V. Ramanadham, Road Transport in India, The Universe Publication Limited, Lucknow, 1948.
V.V. Ramanadham's book 'Nationalised Road Services in Hyderabad' (1955) deals with pricing, rail-road co-ordination, organisational structure and finances of State Road Transport Corporation in Andhra Pradesh.¹³

R.C. Sexena’s Ph.D thesis entitled ‘The Transport Development in New Madhya Pradesh’ (1960) deals with the origin and growth of transport in the state of Madhya Pradesh.¹⁴

Patnakar Vyankatesh (1961) has made an in-depth study of the relationship between growing sizes of cities and the pattern of inter-urban transportation as a business proposition in specific urban areas.¹⁵

Agnihotri Shashi Prakash in his Ph.D. thesis on ‘The Role of Road Transport in our Developing Economy’ (1963) has analysed the importance of road transport in the developing economy of India.¹⁶

¹³V.V. Ramanadham, Nationalised Road Services in Hyderabad, Orient Publishing Company, Madras, 1955.


Prof. M.O. Mathew’s book ‘Rail and Road Transport in India’ (1964) based on his Ph.D. thesis, deals with the concept of optimum size in relation to the road transport organisation. It also examines the optimum size and organisation of road and rail transport units in India.\(^1\)

The committee on ‘Transport Policy and Co-ordination’ set up by the Transport Department, Government of India (1966) has suggested that all the developmental needs should be met from self-financing. In this respect it has attached much importance to the question of forms of management operated by state governments.\(^2\)

Ramadoss’s Ph.D study on the title ‘Nationalised Road Passenger Services in India’ (1967) has dealt with the size, organisation and cost factors of road passenger services in India.\(^3\)

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A study on ‘Bihar State Road Transport Corporations’ (1969) undertaken by the Planning Commission, Government of India has stressed the need for decentralizing the management to utilise the human resources for better performance.\(^{20}\)

Krishnamoorthy (1971) has examined the external factors influencing road transport in India. He has rightly pointed out that inefficient traffic management and lack of control would increase the cost.\(^{21}\)

A.W.H Lammond in his article ‘Management Control in Road Transport Undertakings’, (1972) has studied the transport system in India to evolve parameters for managerial control. According to him, optimum utilisation of the vehicles and minimum operating cost are the special problems in nationalised undertakings in India.\(^{22}\)

E.S.Sasthry, in his study, ‘Physical and Financial performance of some State Transport Undertakings in India’ (1975) has made an attempt to establish the

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influence and makes a thread-bare analysis of the relationship between the size and performance of the undertaking by physical and financial indices.\textsuperscript{23}

The Pattabiraman Committee (1976) appointed by the Government of Tamil Nadu has studied the structure and performance of road transport in the state and made strong suggestions for the bifurcation of big corporations.\textsuperscript{24}

B. Alwyn Prakash (1977) has attempted to analyse the performance of the Kerala State Road Transport Undertakings during 1959-71. He has analysed the operation, revenue, cost, social benefits and organisational and managerial structure of Kerala State Road Transport Undertakings.\textsuperscript{25}

P. Sudarsanam (1978) has observed that bus and crew scheduling is one of the most decisive factors in the performance of a transport undertaking.\textsuperscript{26}


\textsuperscript{24} Pattabiraman Committee Report on Transport Sector in Tamil Nadu, Government of Tamil Nadu, Madras, 1976.


R.C. Sinha in his ‘Concept of Economy in Road Transport’ (1978) has considered road transport as an industry of mass consumption. He has suggested that a mere profit and loss evaluation would not give a correct picture of the undertaking. Further, economic operation will be in relation to efficient use of the resources for the benefit of the society.  

B.R. Stokes in his article ‘The need for and use of performance indicators in urban transport’ (1979) has stated that basic efficiency indicators relate units of cost or work of employees or vehicles to units of service or other types of inputs.

Prof. J. Sathyanarayana in his study entitled ‘The Working of the Andhra Pradesh State Road Transport Corporation’ (1980) has analysed the cost-fare relationship, organisational set-up, capital structure, financial policies, personal practices and management information system in Andhra Pradesh State Road Transport Corporation.


K.C. Vijayakumar in his study ‘Passenger Transport Operations in Co-operative Sector in Kerala’ (1980) has pointed out that the organisational set up and managerial problems contributed to low profitability.\(^{30}\)

‘The National Transport Policy Committee’ constituted by Indian Planning Commission (1980) has recommended that the main objectives of state participation in road transport should be to provide adequate, efficient and economically run passenger services.\(^{31}\)

P.C. Jain in his research on ‘Working Capital Problem of Public Enterprises in India with Special Reference to Selected Undertakings’ (1980) has concluded that in transport service current assets were kept fairly at a higher rate mainly due to contingent payments and large level of inventories required to be held as compared to credit or loan obtained on short term basis.\(^{32}\)

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The study made by CIRT regarding working capital management in STUs (1980) has pointed out that in case of STUs, the problem of cash management and inventory management would pose considerable challenge to the financial manager.  

P.S. Hameed in his article ‘Road Transport Units in Public Sector’ (1981) has made recommendations not only for the provision of better transport service at a minimum price but also for the measures to improve better relations with the travelling public.

The report, ‘The Mini Bus and the Public Transport System of Kualalumpur’, by Janieson Mackey and Partner (1981) has stated that mini buses benefit substantially the passengers in terms of i) faster journey, (ii) slightly shorter waiting times (iii) greater penetration into the central area and (iv) cheaper travel for distance over 7 miles (11 kms). The mini bus helped the operators to minimise the cost and maximise the profit.


M.V. Bagade (1982) has observed that loss incurred in transport undertakings despite improvement in productivity, efficiency and economy is due to escalating cost structure and high incidence of taxation. He has suggested that the government can consider the reimbursement of social cost incurred in operating on non-remunerative routes. He strongly pleads for total nationalisation of road transport which alone can provide basic amenities to passengers.  

A.V. Raman in his article ‘Financial Problems of Nationalised Transport Undertakings’ (1982) has stated that the continuous losses of State Road Transport Undertakings are due to oppressive taxation, uneconomic fare structure and limited financial resources.

The study entitled ‘Road User Cost Study in India - A Final Report’ (1982) published by the Central Road Research Institute has yielded valuable results pertaining to the traffic flow under typical Indian road and traffic conditions, cost of operation of vehicles as governed by the road-way factors, accident rate and cost and savings in travel time. While diagnosing the malady it also comes out


with remedy in conserving fuel, designing better road system and framing up measures to improve the efficiency of road transport.\(^{38}\)

Herman Fleiger (1984) has given his views that the question of business efficiency of the transport has to be subordinated in the interest of national economy to social and cultural interest. Therefore, many transport undertakings have to operate uneconomic passenger services in the public interest resulting in heavy losses. According to him losses have to be tolerated as they enable additional section of the public to use public transport and to direct passengers from private car to public transport.\(^{39}\)

A study by Devasagayam (1985) has stated that State Transport is unique in three senses namely (i) in infrastructure, (ii) public utility service and (iii) a commercial venture. He has analysed vehicle productivity, labour productivity, cost, revenue, profitability before and after tax and the performance of 14 State Road Transport Undertakings in Tamil Nadu. He has concluded that the SRTU can be converted into profitable investment if only the management is oriented towards the control of cost effectiveness.\(^{40}\)

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38. Road User Cost Study in India-A Final Report, Central Road Research Institute, New Delhi, 1982.


Mr. Santhosh Sharma in his book ‘Productivity in Road Transport’ (1985) has stated how the various modern management theories of system analysis, operation-research, work enrichment through work design and the like can be translated into a practical scheme for implementation in bus operations.\(^{41}\)

P.G. Patankar in his book ‘Road Passenger Transport in India’ (1985) has made an indepth analysis of the operational efficiency and financial performance of State Transport Corporations. He has measured the operational economics by taking into account the difference between the revenue and cost. The problem of uneconomic fares and unlimited financial resources has been analysed in detail in the study.\(^{42}\)

J. Satyanarayana’s scholarly analysis (1985) has dealt with the causes for losses in Andhra Pradesh State Transport Undertaking, the adequacy of the corporation, organisational set-up, its cost and fare structure and the method of cost computation for fare revision for better performance.\(^{43}\)

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The study entitled ‘Study on the Performance of State Road Transport Undertakings’ undertaken by the Indian Planning Commission (1986) has analysed both the physical and financial performance by taking into account all the State Transport Undertakings in India. The study group also points out that the corporations in Tamil Nadu are examples of more efficient run organisations.\footnote{44}

C.D. Jocob, D.A.C. Maundar and P.R. Fouracre, in their study entitled ‘Characteristics of Conventional Public Transport Services in Third World Cities’, (1986) have analysed the growing demand for public transport in recent years. The study has suggested that the transport policies obviously have to be planned in the light of urban development objectives, operating systems and resources available.\footnote{45}

M.V. Bagade in his study ‘A New Look at Performance Appraisal of State Transport Undertakings’ (1986) has attempted to evolve a methodology for the objective appraisal of the performance of the STUs. He has suggested the methodology for the comparison of performance of different units within the organisation.\footnote{46}

S.S. Murthy in his study ‘Criteria for Evaluation of STUs’ (1986) has highlighted the limitation of the conventional parameters of evaluating the performance of STUs and has suggested new methodology known as ‘Capital Recovery Index’ which emphasizes the ability of STUs to generate cash and recoupment of investments.\(^\text{47}\)

A special study conducted by ‘Central Institute of Road Transport’ (1986) has thrown light on hetrogeneity of taxation of various governments. It has also brought out the fact that the road transport taxation had assumed critical dimension as its incidence was dominant and the State Transport Undertakings under the present system require tax relief.\(^\text{48}\)

Gopalakrishnan and Swaminathan (1986) have studied the cost of operation and profitability of the private and public sector bus transport operators in South Arcot District of Tamil Nadu. This comparative study reveals that the private sector operators are more successful in the areas of productivity and profitability than the public sector operators.\(^\text{49}\)


48. Road Transport Taxation in India – A Study of its Incidence and Impacts in STUs, CIRT, Pune, 1986.

K. Balasubramaniam in his article entitled ‘Tamil Nadu Road Transport Industry Hit by Lack of Funds’ (1987) has discussed the poor financial position of various State Transport Corporations in Tamil Nadu and has stressed the need for more funds to make the corporations sound so that they can offer better service to the society.\(^{50}\)


Charles Downs' study ‘Private and Public Local Bus Services Compared: The case of New York city’ (1988) is a comparison of private and public local bus services in New York city. He has observed that there was difference in the cost effectiveness of both operations and the difference was associated with difference in the size of the organisation involved.\(^{52}\)

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A careful and detailed study by G.S. Umrigar, et.al on bus operations in India (1989) has led to the conclusion that for better efficiency and a higher level of service, healthy competition through private participation was desirable. Their recommendation is for an appropriate regulatory framework for a co-operative public-private mixed operation. The public agency should co-ordinate the operation, but the private operators should also be consulted in planning the system.  

S. Vadivelu in his doctoral thesis entitled ‘A Study of Urban Public Passenger Transport in Madurai City’ (1988) has analysed the household travel demand, modal choice and the daily physical and financial performance of the public transport modes in the city of Madurai. He has also evaluated the role of different modes of public transport in the overall transport system of the study area.  

Sudarsanam Padani in his book ‘Bus Transport in India’ (1990) has sought to examine the impact of organisational structure of selected road transport


corporations on their performance. He has made an attempt to identify the weak points in the organisational structure of the selected road transport corporations on the basis of their performance over a decade, in order to find suitable and necessary remedy to strengthen the structure.  

P.G. Patankar in his book ‘Road Passenger Transport in India’, (1990) has identified various problems besetting the road passenger transport. He offers suggestions to help the nationalised transport sector to move forward and play its intended role in the development process.  

Sundari’s article (1990) is an elaborate and exhaustive discussion on nationalisation of bus transport process in Tamil Nadu. Her discussion centres around the pros and cons of the nationalisation of bus transport industry in Tamil Nadu.  

S. Uma considered ‘Working Capital Analysis in State Road Transport Undertakings in Tamil Nadu’ (1990) for her Ph.D. thesis which highlights the


working capital position of three parent transport undertakings before and after bifurcation and three offshoot corporations. She has also pointed out the factors determining the size of working capital in the corporations.  

Haunumantha Rao, in his paper ‘Comparative study of certain traffic parameters in selected STUs’ (1990) has evaluated the performance of major STUs in India using certain selected traffic parameters such as vehicle utilisation, crew utilisation and occupation ratio.

P. Jegadish Gandhi and G. John Gunaseelan in their paper ‘Performance Evaluation of STUs in Tamil Nadu’ (1991) have made a modest attempt to evaluate the role of nationalised bus transport system in Tamil Nadu. They have analysed the physical performance of transport service in terms of accessibility, service level, service mix, occupancy ratio and efficiency of service. They have also studied the productivity trends of employees in transport service and focus on the operational economics.


The expert committee formed by the Government of Tamil Nadu under the chairmanship of R. Thillainayagam (1991) has taken efforts to analyse the working of the STUs in Tamil Nadu to streamline their operation, preference, audit system, organisational set up and management and the service conditions of their employees.  


A. Vijayakumar and others in their article ‘Performance of Tamil Nadu State Road Transport Corporations: An Evaluation’ (1993) have described and analysed the physical and financial performance of the State Transport undertakings in Tamil Nadu.


A. Vaidyanathan and N.K. Nair in their article, 'Government Policies and Productivity: The Asian Scene' (1994) have attempted to find out the relationship between productivity techniques as a micro level phenomenon and higher performance under all macro policy environment. The authors review the experiences in the Asian region in general and Japan, the Republic of Korea, China, Singapore, Hong Kong and India in particular.  

'Fare policies - A Book of Reading' (1995) contains reproduced articles which reflect a bewildering and often contradictory array of views. The authors are looking at different facets of truth from different angles. The articles help the readers and researchers to understand the past for, the future is built hopefully on the foundations of the past.  

Pierre Wunch in his article, "Cost and Productivity of Major Urban Transit System in Europe: An Exploratory Analysis", (1996) has tried to evaluate the productive performance of the transit system in major European cities. He has made inter-modal and inter-city comparisons and identified economics


of density and vehicles capacity as essential factors in performance. He has concluded that costs and subsidies have an effect on performance.  

S. Krishnamoorthy in his Ph.D thesis (1997) has evaluated the operating performance in terms of physical and financial parameters of the study unit representing the public sector and of the competing private sectors in the urban and rural market segments of the public passenger road transport.

Yogendra Narain (1998) discusses the present conditions of the State Transport Undertakings and gives various measures to tune up the efficient functioning of the State Transport Undertakings in India.

S.M. Sarin in his article, 'Transport Scenario and Development of Productive Road Infrastructure in India' (1998) has highlighted the


development of transport infrastructure in independent India and the related technological developments.\textsuperscript{69}

M. Koteeswaran in his paper ‘Upgradation of Technology in Urban Bus - Some Policy Issues’ (1999) has explained the problems facing the bus industry and stressed the need for a modern bus so that which would make the passenger find the bus friendly.\textsuperscript{70}

M.K. Thomas in his Book (2000) has highlighted the beginning and growth of public sector bus transport in India. The book also gives the physical and financial performance evaluation of road transport corporations in India during the post Independence era. It is a true account of the historical perspective of bus transport in India.\textsuperscript{71}

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\item[69.] S.M. Sarin, “Transport Scenario and Development of Productive Road Infrastructure in India”, \textit{Indian Highways}, Indian Road Congress New Delhi, January 1998, pp.51-60.
\end{itemize}
1.9 SCOPE AND NEED FOR THE STUDY

In the infrastructure sector, road passenger transport has an important role to play. In the Ninth Plan, road transport has been allocated Rs.223.39 billion which accounts for 18 per cent of the total transport outlays. Thus, the government assigns priority to the development of roads and road transport.

At present, there are 67 State Transport Undertakings (STUs) in the country, operating 1,18,074 buses to provide transport services in urban, rural and hill areas. The total capital invested in STUs amounts to Rs.828.71 million. There are 7.93 lakh employees working in these corporations. The private sector also has invested substantial amount of capital in this industry, as it handles two-thirds of the total passenger traffic.

The STUs have been serving the public for the last five decades. The performance of most of the State Transport Undertakings has come under severe criticism because of heavy losses incurred by them in the past years. Some of these undertakings are very sick with large amounts of accumulated deficits running into crores of rupees. Considering the importance of passenger public road transport service industry as a prime public utility for the mobility of the people, it is appropriate to have a performance evaluation to frame a balance sheet of their success and failure and their contribution to the society.
Accordingly, the physical and financial performance of the Tamil Nadu State Transport Corporations (TNSTCs) has been evaluated in terms of its different dimensions. The performance of the Tamil Nadu State Transport Corporations is also compared with the competing private operators to ascertain the relative efficiency and productivity levels. The study also aims at focussing on the operational framework of ‘mini buses’ introduced recently in Tamil Nadu and fully operated in the private sector.

Thus, this study is aimed at generating valuable micro level information through a scientific approach which, in turn, will help planners and policy makers to evolve suitable macro level policies and strategies in respect of passenger road transport.

1.10 OBJECTIVES OF THE STUDY

Within the overall scope of the study, the following specific objectives have been framed and achieved in the process of this research.

1. To understand the role of various service segments of the public sector passenger bus transport industry in Tamil Nadu.

2. To evaluate the operational efficiency of the public sector passenger bus transport in Tamil Nadu with reference to its different segments in terms of the various standard parameters.
3. To evaluate the sectoral performance, both in terms of physical and financial variables, of the public and private sectors in the city/town bus services.

4. To ascertain the implications of the public policy of subsidies and concessions on the financial performance of the Tamil Nadu State Transport Corporations.

5. To focus on the various aspects of the 'mini bus' operations in Tamil Nadu operated exclusively in the private sector.

6. To make suggestions in the light of the findings of the study for the improvement, if found necessary, of the overall performance of the Tamil Nadu State Transport Corporations.

1.11 LIMITATIONS OF THE STUDY

The present study does not bring under its purview the performance of ghat services of the state transport. The reason for such an omission is that the ghat services account for a negligible 3.5 per cent of the total fleet of the state transport. However, this study does not suffer from this limitation obviously in view of the insignificant role played by the ghat services in the public passenger bus transport in Tamil Nadu.

The inter sectoral comparison between the public sector and private sector for the mofussil services also has not been attempted in this study. It is due to the
fact that the maximum route length of the mofussil services of the private sector is only 120 kms. (routes beyond this length are nationalised) and it is 705 kms. in the public sector and more than 45 per cent of the total fleet of the mofussil segment of the public sector buses are operated in routes above 120 kms. of length. This makes the inter sectoral comparison in mofussil services incompatible.

1.12 THE STUDY PERIOD

For the purpose of evaluating the performance efficiency of the Tamil Nadu State Transport Corporations, relevant data were collected for the financial year from April 1, 1999 to March 31, 2000. The data related to the same period were collected for the private sector also. From the aggregate values relevant to the period 1999-2000, the average daily values in respect of the various service characteristics were computed. As mini buses have been introduced only recently the data related to the mini buses were collected for the period from January 31 2001 to March 31, 2001 and from these aggregate values the average daily values were computed.

1.13 THE STUDY AREA

The entire State of Tamil Nadu in which both the public and private sectors operate the public passenger bus transport has been taken as the study area. The
public sector dominates the passenger bus transport in Tamil Nadu by operating 75 per cent of the total number of buses. There are 21 State Transport Corporations which operate different types of services such as city, mofussil, express, metro and ghat to cater to the needs of the travelling public of Tamil Nadu. The Tamil Nadu State Transport Corporations own 17033 buses as on 31 March, 2000 and it has a huge workforce of 1,26,239 employees.

The private sector operates only 25 per cent of the total number of passenger buses in Tamil Nadu. Its operating area is restricted to city and mofussil segments. The total fleet of the private sector as on March 31, 2000 is 5591 making a total fleet strength of the passenger bus transport in both the sectors 22,624 as on March 31, 2000.

Mini buses have been introduced in Tamil Nadu to be operated in the hitherto unserved rural areas. Mini bus service is rendered by private sector. There are 3,963 mini buses in Tamil Nadu as on March 31, 2001.

1.14 DATA AND METHODOLOGY

This study mainly depends on secondary data for its analysis (mostly unpublished). All the required data were collected from the transport operators of both public and private sectors. To achieve the objectives of the study the analysis has been made in three parts.
In the first part of the study, the performance efficiency of the public sector bus transport in respect of different types of services is made. Also, the implications of the free or concessional travel facility to students (provided by the State Transport Corporations) on the financial performance of the State Transport is studied. In the second part of the analysis, a sectoral comparison, between the public sector and private sector operators is made to assess their relative efficiencies. In the third part of the analysis, the role of mini buses in providing transport facilities in the unserved areas is analysed.

For the first part of the analysis, the physical and financial performance data relating to each type of service of the public sector were collected from the public sector operators. Physical performance data include information on the total fleet strength, fleet operated, number of routes operated, number of trips performed, number of kilometres operated and the number of passengers carried. Financial performance data were collected in respect of total fare revenue earned, revenue per kilometre, revenue per trip, revenue per bus, revenue per route, cost incurred both at the aggregate level and at the disaggregate level (cost per year, cost per bus and cost per kilometre operated), profit per year and profit per kilometre. Secondary data in terms of physical and financial performance were collected from the unpublished records of the head quarters of Tamil Nadu State Transport Corporations situated in various parts of the state, the Chairman’s cell of
the transport department, Chennai and from the administrative reports of the public sector operators published by the transport department of the state government. These data have been analysed and interpreted in Chapter IV.

For the second part of the study, the physical and financial performance data relating to the public sector city buses plying in the major cities in Tamil Nadu were collected from the public sector operators. Corresponding data were also collected from the private operators operating in the respective areas. These data were generated from the trip invoices in respect of all buses maintained by the conductors for the study period. A careful perusal of the records of the private operators and the records of the private bus owners' association provided necessary additional data. Such data collected from the two sectors are comparable. The interpretations and derivations are recorded in Chapter V.

For the last part of the study, the physical and financial performance data relating to the 'mini buses' were collected from the mini bus operators through a sample survey. The trip invoices in respect of all buses constituted the major source of information. Data relating to route, route length—both served and unserved length and other additional pieces of information were collected from the Regional Transport Offices of the three sample districts. These data are analysed and studied in Chapter VI.
1.15 TOOLS OF ANALYSIS

The second part of the analysis involves the construction of an index named the Relative Performance Productivity Index (RPPI) as developed and used in the doctoral thesis of S. Krishnamoorthy entitled ‘A Study of Urban-Rural Passenger Transport Services with Special Reference to Dheeran Chinnamalai Transport Corporation’ submitted to Madurai Kamaraj University. This index reveals the relative productivity of the public sector and private sector in the city bus transport in Tamil Nadu. This index quantifies the overall input and output efficiencies of the private sector over the public sector.

For the purpose of computation of this index, the actual value of each of the parameters for the public sector is taken to be equal to one (1) and the relative values for the private sector are calculated accordingly with the help of the following formula.

\[
\text{Input or Output Index} = \frac{\text{Actual value of the parameter for the private sector}}{\text{Actual value of the same parameter for the public sector}}
\]

As there are four input parameters, four input indices are obtained; likewise, two output indices are obtained from the two output parameters. From these, a single common input index (overall input index) and a single common output index (overall output Index) are obtained by way of geometric mean. Now the
overall productivity of the private sector over the public sector is computed with the help of the following formula and the resultant index is named as “Relative Performance Productivity Index”.

\[
\text{Relative Performance Productivity Index (RPPI)} = \frac{\text{Overall Output Index Value}}{\text{Overall input Index value}}
\]

This index is preceded by percentage analysis which helps to identify the market shares of the two sectors in terms of both inputs and outputs.

1.16 OPERATIONAL DEFINITIONS

Certain technical terms and phrases have been used in this thesis. Unless otherwise stated, they are used in specific meanings as described below. Most of these definitions have been adopted from the compendium of transport terms as published by the Central Institute of Road Transport (CIRT), Pune.

State Transport Undertaking

State Transport Undertaking means an organisation providing passenger road transport service and the ownership of the organisation is one of the following:
i) the central or state government.

ii) any road transport corporation established under Sec.3 of the Road Transport Corporation Act, 1950.

iii) any municipality or any municipal corporation

iv) company owned or controlled by the central government or state government.

Road Transport Service

Road Transport Service means carrying passengers or goods or both by road for hire or reward by motor vehicles.

Nationalisation of Road Transport

Taking over the road transport (Goods or Passenger) services for operation by the State Transport Undertaking from any private agency doing the business.

Percentage Fleet with STUs

This refers to the portion of the total buses operated by the State Transport Undertaking. This can be calculated with the help of the following formula.

\[
\text{Percentage Fleet with STUs} = \left( \frac{\text{Number of Buses in Nationalised Sector}}{\text{Total Number of Buses} / \text{Vehicles (Private + Public)}} \right) \times 100
\]

The percentage should be worked out for passenger buses and goods vehicles separately.
Stage Carriage

Stage carriage means a motor vehicle constructed or adapted to carry more than six persons excluding the driver which carries passengers for hire or reward at separate fares paid by or for individual passengers either for the whole journey or for stages of the journey.

Contract Carriage

Contract carriage means a motor vehicle which carries passengers for hire or reward and is engaged under a contract, whether expressed or implied, for the use of such vehicles as a whole for the carriage of passengers mentioned therein and entered into by a person with a holder of a permit in relation to such vehicles or any person authorised by him in this behalf on a fixed or an agreed rate or sum on a time basis or from one point to another.

Mini Bus

According to Tamil Nadu Motor Vehicles Rules 1989, mini bus has been defined as “a stage-carriage constructed on a wheel base of 370 cms. and carrying or adapted to carry more than six passengers but not more than twenty five passengers excluding drivers and conductors.”
Permit

Permit is issued by the State or Regional Transport Authority or an authority prescribed by in this behalf under Motor Vehicles Act authorising the use of a motor vehicle as a transport vehicle.

Route

Route means a line of travel which specifies the highway/road which may be traversed by a motor vehicle between one terminus and another.

Route Length

The distance between origin and destination of a route is called route length.

Route Kilometres

The actual distance in kilometres between two terminal points of a route is route kilometres.

Average Route Distance

The average route distance is computed by dividing the sum total of the route kilometres of all the routes operated by the unit by the total number of routes in operation at a given time.

\[
\text{Average Route Distance} = \frac{\text{Total Route Kilometres of all the Routes}}{\text{Total Number of Routes}}
\]
Trip

Journey from one point to another is called a trip and every return journey is another trip.

Scheduled Trips

Total trips planned for operation as per the published time table are called scheduled trips. It includes bazar trips, fairs and festival trips which are regularly operated.

Trips Operated

Total number of trips actually operated out of total scheduled and extra trips are called trips operated.

Scheduled Kilometres

Total effective kilometres required to be operated by a depot/division/undertaking during the period as per the bus schedules of the unit.

Average Scheduled Kilometres

It is the total schedule kilometres for the period divided by the number of days during the period.

Effective Kilometres

Kilometres actually operated by public service buses for purposes of earning revenue are known as effective kilometres.
**Kilometre Efficiency**

It refers to percentage of total effective kilometres excluding kilometres operated through ‘extra trips’ to scheduled kilometres.

**Peak, Slack and Normal Periods**

Peak period is the period when the demand for traffic is maximum.
Slack period is the period when the demand for traffic is minimum.
Normal period is the period when the demand for traffic is neither high nor low.

**Seating Capacity**

Seating Capacity is the number of seats available in a bus to the passengers excluding the seats allotted to driver and conductor.

**Average Seating Capacity**

\[
\text{Average Seating Capacity} = \frac{\text{Total Seating Capacity of all Buses}}{\text{Number of Buses}}
\]

**Seat Kilometres**

Seat Kilometres are worked out by multiplying the average seating capacity and effective kilometres.
Fare

The authorised payment for travelling in a public service vehicle is called fare. It includes sums payable for a season ticket or in respect of the hire of a contract carriage.

Fare Structure

A fare structure enables the owner of a public service vehicle to charge passengers for their journey based on

i) length of journey

ii) type of routes like urban, mofussil, hill-area and the like.

iii) type of services like ordinary, express, luxury and deluxe.

iv) time and day of operation like day service, night service, holiday service and special service.

Passenger

Persons travelling in public service vehicles, other than the crew or employees of the permit holder are called passengers.

Total number of passengers include all persons carried either at full fare or at concessional fare. A child passenger shall be treated on par with adults for working out the total number of passengers carried.
Average number of passengers carried per day are calculated by dividing the total number of passengers carried during the period by the number of days in the period.

**Occupation Ratio**

Occupation ratio is the percentage of passenger kilometres to seat kilometres.

\[
\text{Occupation Ratio} = \frac{\text{Passenger Kilometres}}{\text{Seat Kilometres}} \times 100
\]

**Fleet held**

The total number of buses by the unit (Depot/Division/Undertaking). The buses held by a unit will consist of:

i) Buses on road
ii) Buses held as spares
iii) Buses in workshops
iv) Buses under routine inspection
v) Idle buses

**Fleet Utilisation**

Fleet utilisation is the ratio of the number of buses on road to the fleet held by the unit. Fleet utilisation is always expressed as percentage.

\[
\text{Percentage Fleet Utilisation (for a day)} = \frac{\text{Number of Buses on Road}}{\text{Number of Fleet Held}} \times 100
\]
Bus Productivity

Bus productivity is the effective kilometres operated per bus held.

\[
\text{Bus Productivity} = \frac{\text{Effective Kilometres per Day}}{\text{Buses Held per Day}}
\]

Staff Ratio (per bus on road)

It is the ratio of the total staff employed on the last day of the specified period to the number of buses on road on the same day.

\[
\text{Staff Ratio} = \frac{\text{Total Staff Employed}}{\text{Total Number of Buses on Road}}
\]

Productivity Per Employee

The total effective kilometres operated for a period divided by total man days paid for.

Earnings per Kilometre (EPKM)

The earnings per kilometre or EPKM is related to the carrying capacity of the buses, fare structure and the earning potential of routes.

\[
\text{EPKM} = \frac{\text{Total Receipts}}{\text{Total Effective Kilometres}}
\]
**Earnings Per Bus (On Road/Held)**

When the bus is selected as a unit of measurement, the resultant rate will be earnings per bus. Earnings per bus can be expressed either in terms of number of buses on road or the number of buses held as required.

\[
\text{Earnings Per Bus (On Road/Held)} = \frac{\text{Total Earnings (Traffic/Gross) during the Period}}{\text{Average Number of Buses (on Road/Held) during the period}}
\]

**Operating Cost**

The total cost incurred in connection with the business of transport of passengers is termed as ‘operating cost’. The ‘operating cost’ includes all items of expenditure incurred in connection with operation of services excluding taxes, interest on capital, appropriations from the net revenue and income tax.

**Cost Per Kilometre (CPKM)**

The cost per kilometre or CPKM is computed by dividing the total cost by the total effective kilometres.

\[
\text{CPKM} = \frac{\text{Total Cost}}{\text{Total Effective Kilometres}}
\]

**Rate of Accident**

Rate of accidents is the relative measure of incidence of accidents to total effective kilometres.
\begin{align*}
\text{Rate of Accident per lakh of Effective Kilometres} & \quad \text{Total Number of Accidents} \\
& \quad \frac{\text{Total Effective Kilometres}}{\text{Total Effective Kilometres} \times 100000}
\end{align*}

**Break Down**

Stoppage of buses due to mechanical defects or other failures making the bus unfit to operate without attention to it irrespective of time involved.

### 1.17 CHAPTER SCHEME

This thesis is organised in seven chapters. The first chapter-**Introduction** - explains the meaning and importance of transport, the origin and significance of road transport and the role of passenger bus transport. This chapter further contains the review of previous studies, scope and need for the study, objectives of the study, limitations of the study, data and methodology, operational definitions and the chapter scheme.

The second chapter - **Roads and Road Transport-A National and State Level Scenario** - gives an account of road development in India, present position of road network in India, road transport in India, passenger bus transport in India, growth of roads in the State of Tamil Nadu and development of road transport in Tamil Nadu.

The Third Chapter - **Public Passenger Bus Transport Industry in Tamil Nadu - A Profile of the Public Sector**-elaborates the public sector bus transport
in Tamil Nadu. It explains the Nationalisation of bus transport in Tamil Nadu and formation, growth and functioning of the State Transport in Tamil Nadu.

The fourth chapter - **Performance of the Public Sector Bus Transport in Tamil Nadu - An Intra-Sector & Inter-Segment Analysis** - brings to the fore the performance of the Tamil Nadu State Transport Corporations with reference to various segments under different route classifications.

The fifth Chapter - **Performance of the City Bus Transport - An Inter-Sectoral Analysis** evaluates the role played by both the public sector and private sector in providing transport services in the city transport segments in Tamil Nadu. It also evaluates the performance of the public sector city bus transport in comparison with its competing private operators.

The sixth chapter - **Mini Bus Performance in Tamil Nadu** - focuses on the effective role played by mini buses run by the private operators in the hitherto unserved rural areas.

The seventh chapter - **Summary** - throws light on the findings of the present study and the conclusions derived from them. This concluding chapter also contains some suggestions based on the findings of the study.