REVIEW OF LITERATURE

A review of literature is the mirror of earlier studies, which enriches the researcher, and helps identify the gaps for the future research. Many studies on transport sectors have been conducted in different parts of India. In the recent years, one can find many research works are being carried out in India on bus transport. As the present study is concerned with the performance evaluation of Tamil Nadu State Transport Corporations, an attempt is made to review the literature available so that a great insight in the bus transport sector is obtained. Like any researcher, sufficient effort is taken to understand earlier researches on bus transport sector.

In recent years research facilities on transportation and transport are provided in major Indian Universities and research institutes like CIRT, CRRI, and ARAI.

For academic discussions, the literature on Indian Bus Transport after 1970s alone is browsed and reviewed in this chapter. The author has classified the work done by many researchers into two broad categories namely ‘Studies on the performance of the Bus Transport Sectors’ and ‘Studies on the Cost and Profit in the Transport Sectors’. In both categories, relevant papers in different reputed journals and books published by great academics are reviewed.
STUDIES ON THE PERFORMANCE OF THE BUS TRANSPORT SECTORS

Krishnamoorthy (1969)\(^1\) has made diagnostic study of financial performance of STUs using data relating to element of cost, income and trips operated.

Arora (1970)\(^2\) in his book 'Economics of Management in Road Transport Industry' has evaluated the performance of Nationalised Road Transport Undertakings and private operators in Punjab. He has used time series data of Punjab Roadways (PR) and Pepsu Road Transport Corporation (PRTC) for evaluation of physical and financial performance and then compared PR with Haryana Roadways, Manipur State Transport and Nagaland State Transport and PRTC with Andhra Pradesh, Gujarat, Rajasthan, North Bengal and Kerala State Road Transport corporations. Since Punjab Roadways is a departmental undertaking under RTC Act, similarly organised undertakings have been selected for such comparison. It is felt that it is not fair to compare Punjab with essentially hill area operations of Manipur and Nagaland State Transport Undertakings.

Pioneering work done in India by Anantha (1971)\(^3\), divides the key result and performance areas in transport operations into two categories:

---


quantitative and qualitative. His six fold classifications of quantitative standards are schedules, vehicles, materials management, earnings, crew utilisation, man-hour costs and passenger satisfaction. In order to achieve these quantitative standards, according to Anantha, it is necessary to have back up of such qualitative standards, like better industrial relations, and agreements on targets set etc., the active support and co-operation of workers, public and higher authorities are required for achieving the physical and quantitative standards.

Datta (1971)\textsuperscript{4} has analysed the effects of percentage of vehicles in scheduled services, vehicle utilisations and kilometres run per litre of diesel oil on the rate of return from investment, and calculated the correlation coefficient between the pairs of the above variables and the rate of return from investment. Having analysed vehicle productivity, labour productivity, cost and revenue trends, pre-tax profitability, post-tax profitability, and the performance of 24 State Transport Undertakings.

Krishnamurthy (1971)\textsuperscript{5} presented an outline of the genesis of the Andhra Pradesh Road Transport Corporation and statistics relating to variable costs, fixed costs, gross income, net income, cancelled trips, and number of delayed trips for different districts in Andhra Pradesh. The review of the Sector-wise analysis of the corporation made by him revealed the local factors that were responsible for the differences in the performance at


different regions. He also suggested some measures for improving performance.

Analysing the causes of poor financial performance of public sector transport, Banerji (1972)\(^6\) opines that, "one of the main causes contributing to the financial difficulties of Nationalised (Transport) Undertakings is inflexibility of their fare structure. The fare standards of various undertakings have not been fixed on a scientific basis. Even as the operational costs go on increasing because of increase in incidence of taxation, rise in prices of vehicles and spare parts, and increase in cost of staff, it is not possible for the undertakings to raise the fares in time and to the extent needed because of public pressure".

Hanumanthappa (1972)\(^7\) research highlighted the structural aspects of Karnataka State road transport capital, cost and employment, pricing procedure, investment policy and managerial control. He analysed the problems of economic viability and the potentiality of road transport as a vehicle of regional development.

Venkaji Rao (1973)\(^8\) has evaluated the managerial problems of State Transport Undertakings with special reference to Mysore State. He has identified certain administrative problems, which come in the way of improving the performance of State Transport Undertakings. They were 1.

---


\(^7\) Hanumanthappa, K. : Pricing and Planning of Road Transport with particular reference to Karnataka State Road Transport Corporation, Unpublished Thesis, Bangalore University. 1972.

Balancing the transport requirements of the community as against other facilities served, based on costs, income and availability of finance. 2. Dealing with peak-loads. 3. The most efficient utilisation of vehicles and staff on the basis of the moving has given loads of passengers and 4. Envisaging of traffic planning in future. There are a few basic issues, which have to be noted while evaluating the performance of State Transport Corporations. He has also observed that there is a need for setting performance measures and comparing it with standards and taking corrective action wherever necessary.

Joseph (1973) has indicated the scope for investments in the nationalized bus transport and suggested ways to improve the performance of public transport services. The methods include are the extension of “cross-subsidization principle” to peak hour traffic in Madras and other city services, effective check on pilferage, incentive to bus crew members and elimination unfair competition between private and public bus services.

Sastry (1974) has evaluated the performance of state transport corporation in terms of financial variable for various States for the period 1960 – 70 and identified the poor and better working transport undertakings.

Sharma (1975) analysed the working of Rajasthan Road Transport Corporation in terms of its organizational set-up, management, financial management, and operational efficiency and performance appraisal.

---


Pereira (1975)\textsuperscript{12} made study on the financial performance of the Pallavan Transport Corporation and observed that PTC, like many other metropolitan transport service was incurring loss mostly due to leakage of revenue, the magnitude of which varies from 8 per cent to 15 per cent of the total revenue on a modest estimate. He stressed that the financial readability of transport system is dependent on the integrity and efficiency of the checking staff.

Hanumanthappa (1975)\textsuperscript{13} has analysed the ‘Cost Control’ measures in Kerala State Road Transport Corporation. The major objective of his study has been to analyse the transport operating cost. For that purpose he has classified the expenditure into the following four broad categories Viz. 1. Cost of personnel, 2. Cost of material 3. Depreciation, 4. Other overheads like rent, rates, and welfare, superannuating benefits, general contingencies and 5. Taxes. He explained the techniques of cost control with reference to groupings of costs under six categories Viz. A) Materials, b) Manpower, c) Machines, d) Methods, e) Money and f) Markets. He concluded that material cost could be reduced through efficient inventory control. He also suggested that effective steps might be taken to utilise the manpower to optimum level.

\textsuperscript{11} Sharma, S.D. : Working of State enterprises in Rajasthan, Sterling Publisher, New Delhi, 1975.


Anthony Tomazinis (1975)\(^{14}\) in his book Productivity, Efficiency and Quality in Urban Transportation systems, discusses in considerable detail performance measures for public bus transportation. He divided his analysis into efficiency measures for the Operator-Supplier on the one hand and the users on the other. According to him Operator Supplier’s efficiency measures should be able to assist them to assess or determine in absolute or relative terms the success they have had in achieving desirable objectives in the following five areas of concern; 1. Unit costs 2. Input of resources 3. Relative distribution of costs 4. Provision of service and 5. Collection of revenue. He concludes that physical measures of service produced play a predominant role for the supplier, while measures of quality of service achieved become very important from the user’s point of view.

Santhosh Sharma (1976)\(^{15}\) has made a pioneering study in the productivity parameter in road transport system and also discussed economies and diseconomies in nationalized bus operations in the area of cost components, fuel and tyre management, materials management, and traffic management. He advocated a total system approach while searching for an optimal solution. The bus system is actually a part of bigger system, the total environments, and it would be necessary for the bus company management to fully interact and integrate with the total system, the quality of service depends on the actions and interactions of four agencies viz., operators, users, society and the government.


\(^{15}\) Shanthosh Sharma : Productivity in Road Transport, Association of State Road Transport Undertakings, New Delhi, 1976, pp. 13 – 36.
He also states that in a city operation, it is generally not possible to get more than 225 Kms per bus per day whereas mofussil operation of a bus can schedule 400 to 500 Kms per day per bus.

The following guidelines could be formulated in any vehicle maintenance policy Veeramani (1976)\(^\text{16}\) a) maintenance agreement should be such that a positive check is made at periodical intervals of time i.e., daily, weekly, and monthly b) vehicle inspector should ensure that unsafe vehicle are kept off from the road, c) under chases inspection facility should be made available, d) supervisors are made responsible for the maintenance condition of the vehicle. Modern society functions effectively because of the transport links that have been gradually built up over centuries. It is efficient because developments in science and technology have been introduced to transport, thus increasing the range and effectiveness of the various types of vehicle.

Santhosh Sharma(1976)\(^\text{17}\), in his book has arrived a norm of ten workers per bus for urban transportation and P.G Patankar has taken an average of 8.33 worker per bus.

The Transport Expert Committee appointed by the Government of Tamil Nadu in 1974 recommended the norms for each bus should be fixed as follows:


\(^{17}\) Santhosh Sharma : "Productivity in Road Transport, CIRT, Pune, 1976, pp. 66-67."
### Chapter 3

<table>
<thead>
<tr>
<th>Conductors</th>
<th>2.50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drivers</td>
<td>2.50</td>
</tr>
<tr>
<td>Technical</td>
<td>1.25</td>
</tr>
<tr>
<td>Administration and others</td>
<td>1.25</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>7.50</strong></td>
</tr>
</tbody>
</table>

The **Pattabiram Committee**\(^{18}\) constituted by the Government of Tamil Nadu in 1976 also recommended the same norm of 7.50 workers per bus as a reasonable and adequate on the whole.

**Alwin Prakesh** (1977)\(^{19}\) analysed the financial and physical performance of the Kerala State Road Transport Corporation during the period 1959 to 1971. He found and deduced that the operation of the transport in Kerala was not efficient because of its high vehicle staff – ratio due to under – utilisation of transport man power and fall in kilometre per litre due to bad road, over – loading and incidence of over-aged buses.

Echoing the same type of analysis **Satyanarayana** (1978)\(^{20}\) attributes poor maintenance, inadequate supply of units by workshop and increasing age of the vehicle and in the decline in fleet utilisation. The APSRTC as showed a decline trend in the fleet utilisation from 92% in 1979-80 to 88% in 1981-82.

---


Sudarsanam\(^{21}\) (1978) viewed that public sector transport could not meet the true cost of operations to the customer because of protected fares. It was for this reason that many transport executives argued that losses in the nationalised transport industry were artificial. They arose out of the Government's desire to protect the passengers from the price escalation in the supply market.

Underwood (1979)\(^{22}\) states: 'Some of the key data that might be developed and used as part of performance evaluation programme include: revenue passengers, revenue, operating expenses, vehicle miles, vehicle hours, passenger miles or vehicle miles, scheduled vehicles, total vehicle fleet, spare ratio, subsidy/passenger trip, rides/capita, revenue/expense, revenue/passenger, revenue/passenger mile, revenue/hour, cost/hour, passenger/mile/vehicle, total employees, passenger miles/employee, and drivers wages. The basis understanding of these statistics and their application in measuring performance are essential management skills that must be greatly improved.'

Shitole\(^{23}\) (1979) has examined passenger and goods transport business in the Kolhapur city during 1961-62. According to him the low level of efficiency was mainly due to low rate of fleet utilisation since for vehicles which were not on the road, their fixed cost becomes direct loss, and the fleet

---


utilisation rate is far below compared to other public transport undertaking in the country.

Williams Martin\textsuperscript{24} (1979) stated that analysis of the cost output relationship of bus transportation system would give an insight into economic efficiency of transport. With a fixed bus fleet, short term cost function could be evolved for output in terms of bus mileage. Generally State owned bus systems were not allowed to choose a level of output that maximise profits. They were required to supply all the output, which was demanded at regulated rates.

The National Transport Policy Commission (NTPC) popularly referred as Pandey Committee (1980)\textsuperscript{25} has studied in detail the incidence of tax on road transport. The NTPC has rejected the theory of taxation on ‘benefit principles’. According to the ‘benefit principles’ the tax collected from a particular sector or industry must be spent on that sector alone. The Pandey committee has observed that there is nothing wrong in using road transport taxation as an instrument of general revenue so long as a portion of these taxes is passed on to the general body of users of roads and consumers of commodity carried by road.

A case study conducted by CIRT\textsuperscript{26}, Pune in 1981, states that the services offered to the travelling public are measured in the growth of km


\textsuperscript{26} STUs in India, A Case Study of performance and problems and prospects, CIRT, Pune, 1981, p. 70.
operated per year as well as per day. An ideal transport planning should aim at increasing trend in the rate of growth of km operated. Only then the objective of running a transport corporation will be achieved. The average rate of km operated for STUs functioning in India is 7%.

By adopting econometric model, **Mahesh Chand (1983)** made inter firm analysis of public transport undertakings and intra – firm focus on the Karnataka Road Transport Corporation.

**Mohan Doss** (1983) in his studies made a historical review of road passenger transport in Tamil Nadu and analysed the cost spectrum and pricing policies of the State Transport Corporations. He suggested reforms in the costing system and organisation set-up in public transport corporations.

As **Sanare (1984)** observed there is a need for setting standards of performance, measuring performance, and comparing it with the standards and taking corrective action when necessary.

**Ramanathan, (1984)** states that the leakage might take place through relatively high levels of wages or through surplus staff and low productivity- two features found associated with many public enterprise in developing and developed countries. The likelihood of such leakage is

---


29 Sanare : Key Issues of Transport Policy in Developing Countries, Ventshe Gesellsch Aftur, Germany, 1984, p 140.

30 Ramanathan, V.V : The nature of Public Enterprises, Groom Helen Ltd. London 1984, p. 4
greater, the nearer the enterprise is to the following situations. “The employees have political strength to attract the government’s support to their generous wage and staff members claims, overly or covertly and the directors, for various reasons, are too weak to resist there”. Similar situation of high staff strength ratio is noticeable in the World Bank survey in 1985.

Patankar (1985)\textsuperscript{31}, in his another macro study of the financial performance of STUs for the period 1976-77 to 1982-83 indicated that the operational cost as whole has not increased in the same proportion as prices of major inputs, which means that transport operation in the nationalized sector were not in any more efficient, if not better, than the private operators. He also provides a sound theoretical background base on evaluation of performance. The methodology adopted by all these authors is more less the same.

On the other hand the Planning Commission Exercise\textsuperscript{32} (1985) states that the possibility of evasion of taxes by private operators for want of centralised control cannot be entirely ruled out. By adopting rank criteria, the planning commission has made a comparative analysis of the physical and financial performance of STUs of the period 1980-81 to 1984-85.

Fielding (1985)\textsuperscript{33} identified seven dimension of the performance of a bus transport system namely output per unit of cost, utilisation of service,


revenue generation per unit expense, labour efficiency, vehicle efficiency, maintenance efficiency, and safety.

Raman\textsuperscript{34} (1986) in his study concluded that the conventional methodology of ratio analysis couldn’t be applied in isolation, as in the above study, of the real situation or the characteristics of the industry. After analysing the financial results of 9 State Road Transport Corporations in the States of Andhara Pradesh, Bihar, Gujarat, Rajasthan, Kerala, Karnataka, Uttar Pradesh, Madhya Pradesh and Maharashtra.

Raman\textsuperscript{35} (1986) derived that the present capital structure is entirely debt in nature even in respect of the capital contributions by Central and State Governments on which STUs pay interest as a charge on expenditure and a restructured capital content would result in improving the financial performance. The poor financial viability of SRTCs is more due to the environment in which they operate like administered fare structure, unabsorbed social burdens and high incidence of taxation.

Patanker\textsuperscript{36} (1986) outlines a set of possible parameters to judge the quality of service in STUs they are punctuality and regularity of service, passenger amenities, passenger comforts in a bus, waiting time, incidence of breakdowns and accidents, type of vehicle, environmental aspects and nature and number of public complaints. Based on 1984-85 data of 8 State Transport

\textsuperscript{34} Raman, A.V. : Conventional Methodology of Ratio Analysis, Journal of Transport Management, April 1986 p 22.


Undertaking, he found out that though the breakdown rate is getting reduced every year there is still a large variations amongst different STUs and hence they have a scope to improve their own performance. The analysis indicated that about one-third of the total breakdowns are caused due to tyre punctures, one-third on account of engine system and the rest are mostly form transmission, break and suspension systems. The accident rate varied between 0.08 and 7.36 per lakh of Kms.

By adopting the Data Envelopment Analysis, Bagade\(^\text{37}\) (1986) has found out that Tamil Nadu State Road Transport Corporations ranked first in its physical performance when compared with Andra, Gujarat, Karnataka, Maharashtra, and Utter Pradesh State Road Transport Under takings in 1985-86.


Bagade (1986)\(^\text{39}\) The mid- term appraisal of VII th observed that on the basis of productivity indicators, (fleet utilisation, vehicle and staff productivity and fuel consumption) Tamil Nadu, Gujarat and Maharashtra States Road Transport Corporations have achieved high rate of performance.

---

37 'A New Look at Performance Appraisal of STUs', JTM, April 1986, Annexure II.
Alan Armstrong – Wright (1986)\textsuperscript{40} has suggested a norm of 8% to 10% of loss of Scheduled Kilometre. This 10% loss may due to age, traffic congestion, diversion, accidents, availability of crew etc.

Koteeswaran (1987)\textsuperscript{41} presented a package of possible measurable factors to analyse and assess the quality of service of State Transport Corporations under four major areas: 1. Effectiveness, 2. Efficiency – physical, 3. Efficiency – economics, and 4. Social obligations. Applying the yardsticks, he found out that nationalised bus services system in Tamil Nadu maintained high level of effectiveness, physical efficiency, financial viability and fulfilling social obligations in terms of bus shelters, bus terminals comfort to the passengers and employee’s welfare.

Prasad Kumar\textsuperscript{42} (1987) has examined the operational effectiveness in Public Sector Road Passenger Services of Tamil Nadu Public Transport Corporations. The major problems exercising among the transport corporations are optimisation of size-cost-machine and organisational design so as to maximise managerial efficiency and provide the best operational efficiency.

The Planning Commission in its “Mid – Term appraisal of Seventh Plan (1987) has pointed out that there was a distinct improvement in the fleet


utilisation, vehicle productivity, staff productivity and fuel consumption of STUs as against the target set in the beginning of VII th plan.

**Subramaniyan (1987)** has studied the organizational set-up of the APSRTC. Critical re-examinations of the administrative structure of the APSTRC with a view to promote performance standards.

**Purushotham (1987)** has evaluated the operational efficiency on the Warangal Division of APSRTC for the period 1976-77 to 1983-84.

The study on profitability and productivity of Cheran Transport Corporation Limited, Coimbatore by **Rajeswari (1987)** aimed toward measuring the productivity of CTC in terms of various parameters such as fleet utilisation, vehicle utilisation, cost per kilometre etc. The study concluded that the productivity of the Cheran Transport Corporation has increased during the study period.

**Patanger (1987)** rightly observes, it is the best course to monitor the operation on each round trip and do the classification of trips such as A-Covers Total Cost, B-Covering Variable Cost but not total cost, C-Does not cover even variable cost.

---


The Luthra Committee\(^{47}\) (1988) pointed out that there are wide difference in the performance, efficiency and productivity of the STUs. Most of the STUs face serious financial constraints as they need capital contribution form government for augmentation and replacement of their over aged buses and expansion of the fleet strength.

By adopting the new safety index for 1986-87, Bagade \(^{48}\) in his study has found that Cheeran Transport Corporation occupied the 9\(^{th}\) rank out of ten referred State Transport Undertakings. His safety index for improvement in 1986 – 87 over 1985-86 for the same 10 transport corporations, shows on comparison that Cheeran is to borrow 10\(^{th}\) rank.

Tapade \(^{49}\) has made a study on the salient features of the incentive schemes pertaining to Nasamony, Pandian Road ways, Marudhu Pandiyar, Jeeva, and Kattabomman Transport Corporations in Tamil Nadu along with Andra Pradesh, Gujarat, Orissa, Madhaya Pradesh, Kadamba, Delhi and Arunachal Pradesh Transport Undertakings. The quarterly review of few cell of CIRT for the period July–September 1987 shows that for mofussil operation Kattabomman Transport Corporation had the highest KMPL (2666) for topping and 711 for total consumption including topping up and oil change. Jeeva Corporation, which stood next, had 2528 KMPL for topping up and 722 for total consumption.


Ratan Kumar Singh (1988) evaluated the physical and financial performance of Bihar State Road Transport Corporation for the period 1959 to 1979 and advocated for more nationalization of bus route in Bihar.

Patankar (1988)\(^50\) analysed and suggested the economics of menthol as an alternative transport fuel.

Satyanarayana\(^51\) (1988) focused on some of the important measures in fuel conservation in road transport sector, like better fuel efficient engines, weight reduction through lighter bodies, better maintenance of vehicles, better driving habits, etc.

Shivaji Shing (1988)\(^52\) outlined a pragmatic approach to fixation of fares for luxury and express services in STUs. He opined that the intending passenger for those services has a high rate of consumer surplus since he is prepared to pay higher rate rather than go without the service. This is the reason contributing for the inelasticity of demand for luxury and express services. The higher fares proposed for these services that might not act as deterrent for the intending passengers.

Mathusoodana Perumal\(^53\) (1988) has analysed the financial and physical performance and capital financing of PRC, Madurai. By rank


correlation method, he found out that the Thiruvalluvar Transport Corporation occupied 5th rank in terms of physical performance parameters when compared with other 8 State Transport Corporations, including PRC in Tamil Nadu during the period 1976-77 to 1982-83. He advocated reallocation of staff between maintenance and traffic as per the norms of STUs, introduction of new routes and proportional motor vehicle taxation of the basis of rate of return of Transport Corporations.

Alen Amstrong and Write and Sebastain Thiriez (1988) have suggested a range of 3 to 8 employees per operating bus. They cite low labour cost, labour intensive work, labour laws, and union regulations as reasons for high labour ratio. They particularly observed that it may not be possible to reduce staff were services are curtailed. This is what happened in Bihar Transport Corporation.

Jegadesh Gandhi and John Gunaseelan (1988) in their study pursued the physical and financial performance of the Pattukottai Azhagiri Transport Corporation from 1982-82 to 86-87. It was observed that despite the losses incurred in the first two years of its operation, the PATC generated surpluses in the subsequent three years. The rate of return on capital employed has exceeded the prescribed minimum rate (6 per sent) 6.6 in 1986-87. The occupancy ratio ranges between 67 per sent and 75 per sent. The fuel efficiency has increased from 3.72 km per liter in 1983-84 to 3.92km per litre


in 1986-87. The bus staff ratio is comparatively low at 7.3 as against all India prescribed norm of 9.0. A well-knit staff incentive package has directly contributed to the recorded high-level operational efficiency of PATC.


Sivaramu (1989)^7 says that there are thousands of public enterprises attached to State Governments that interact more directly with the public, such as Road Transport Corporation whose study has been neglected.

Bagade’s^8 (1989) analytical study on the effect on the staff productivity on staff cost per kilometre revealed certain salient features: (1) the wage level in Kerala SRTC, Maharashtra SRTC, Andhra Pradesh SRTC, Karnataka SRTC and Tamil Nadu SRTCs is identical at Rs. 56 per employee per day, (2) the improved staff productivity has reduced the cost on staff per kilometre from 2.25 in case of Kerala SRTC to Rs. 1.27 (i.e. by 45 percent), (3) Total Staff per bus 1000 Kms is least (21.40 persons) in case of Tamil Nadu Transport Corporations and highest (41.26) persons in the case of Kerala Transport Corporation. Almost double the strength of staff was provided to render similar services to the travelling public, and (4) in case of traffic staff, Tamil Nadu, Guajarat, Karnataka and Andhra Pradesh transport

---


corporations are close on neighbourhood around 16 persons per 1000 Kms, Maharashtra, Uttar Pradesh Corporations show increasing trend.

A comparative study (1989)\(^{59}\) of bus accidents of all state Transport Corporations in Tamil Nadu shows that out of all fatal road accidents, grievous injury accidents and minor injury accidents, the transport corporations' vehicles involve 19 percent, 43 per cent, 16 per cent respectively.

It is also found that (1989)\(^{60}\) Thirivalluvar Transport Corporation drivers are responsible for 88 per cent of rear and other vehicle accidents.

Regular Bus Accident Analysis for all State Transport Corporations in Tamil Nadu is carried in the Institute of Road Transport, Chennai. The institute identifies in 1989 that the contributory factors for accidents as to fault of the driver, fault of mechanical defects, fault of other vehicle drivers, fault of the cyclist, fault of pedestrians, fault of passenger and defects in road surface.

The measurement of the performance can reveal the true nature of operation and the strength and weakness of the STUs. Such study has to begin in the examination of the role played by STUs as a public enterprise. It is necessary, therefore, to look in to the context, nature of the public enterprise.


Burkhardt\textsuperscript{61} advocates four kinds of measurements to evaluate transit performance (1) Resources efficiency (2) Service Efficiency (3) Cost efficiency (4) System productivity.

According to Patangar\textsuperscript{62}, the transport equation is a complete one with many parameters and it could be wrong to optimise only one or two parameters, as the improvement in one might deteriorate the other. For (e.g.) optimum fleet utilisation in terms bus on service cannot be the only aim. Together with it must be optimised the vehicle utilisation in terms of kilometre operated and seat capacity.

Satyanarayana\textsuperscript{63} (1990) discussed the behavioural aspects in management control of diesel conservation in Indian Road Transport Corporations with reference to APSRTC Corporation. The fuel efficiency of a vehicle unit was related to management control systems, operational controls including driving speeds, driving habits, and mechanical maintenance of the vehicles including de-rating of fuel injunction pumps and other technical controls. He has concluded that considerable saving on HSD oil, and the conservation depends on improved fleet maintenance and consequently fleet utilisation and vehicle utilisation.

\textsuperscript{61} Jon E. Burkhardt. : Performance Measures, 9\textsuperscript{th} National Conference on Rural Transportation, U.S. Department of Transportation, 1990.

\textsuperscript{62} Patangar. : Road Passenger Transport In India, CIRT, Pune, 1985. p.114.

The fuel performance of the various State transport undertakings for the past five years from 1983 - 84 to 1988 - 89 was reviewed by CIRT\textsuperscript{64}, Pune (1990) by adopting a three-way categorization: 1. STUs who have shown improvements in their fuel performance (Kms per litre), 2. STUs that have stagnated their performance in fuel efficiency, and 3. STUs who have shown declining trend in their fuel performance. The average fuel KMPL combined for all STUs together was 4.07 during the years 1983-84 and 84-85 which improved to 4.13 during the year 1986-87 and 4.24 during the year 1987-88. Thus there is an improvement in the fuel performance of STUs.

Mohd. Akbar Alikhan\textsuperscript{65} (1990) analysed the financial management of SRTUs in Maharstra State Road Transport Corporation, during the period from 1970 - 71 to 1984 - 85. According to him the main reasons for increase in costs were inflationary tendencies, operational performance, operation of bus services on bad and Kacha roads etc. The depreciation expenses cost of spares parts and cost of tyre and tubes increased during this study period.

Sri Raman, Raman and Bagade\textsuperscript{66} (1990) evolved a cost and financial model for State Transport Undertakings based on financial data relating to 1989 - 90. A cost model would show the relationship between costs incurred and the output produced. In the case of State Transport Undertakings the cost model should reveal the relationship between cost of


operations and volume of operations. They have classified costs into personnel cost, material cost, taxes, interest, depreciation and miscellaneous cost and measured the relationship between each category of cost and the volume of operations.

The second type of analysis is to identify the relationship between unit cost and vehicle productivity, employee productivity, energy productivity and material productivity. The results show that low productivity is found in the combination of vehicle and employee productivity and vehicle and energy productivity. The study concluded that the State Transport Undertakings that had a higher employee and energy productivity alone could reap better returns to scale.

Russ Ginesde\textsuperscript{67} (1990) examined the urban public transport in Spain provided by statutory monopolies with local authorities determining route coverage, fares and service levels: the operators were municipal or franchised private firms. The author analysed the industry in terms of cost structure, demand response and decisions concerning allocate efficiency, with the aim of discussing which policies allows the achievement of the maximum social surplus. The study concluded that there were potential savings, which could be attained through competitive pressure on buses operated in the industry. Moreover, the results suggested that there were potential efficiency gains through a better combination of fare and service quality.

Lammond\textsuperscript{68} (1991), a UNDP expert seconded to India, has made a study of the transport system in India and tried to evolve parameters for managerial control. According to him optimising utilisation of the main assets (Vehicles) and minimising operating costs were the special problems in Nationalised Undertakings in India. Fleet utilisation (Percentage of total fleet on road), vehicle utilisation (kilometres per day per bus) and earnings per kilometre were the three main parameters necessary for effective control. Analysing these further, Lammond has listed eight factors; kilometres run, earnings, buses operated on routes, earnings per bus/day (by route), vehicle cost per bus/day, margin per bus/day over variable costs, fixed cost per bus per day, and profit/loss per bus per day.

John Gunaseelan\textsuperscript{69} (1992) in his in-depth study evaluates the performance of PATC in its physical, financial, personnel management and social performance. The study also made an attempt to compare the level of passengers satisfactions with PATC and private buses in North Arcot Region through a newly evolved “passenger satisfaction scale”.

Sudheer\textsuperscript{70} (1992), made a comparative study in KSRTC (Kerala State Road Transport Corporations Vs Private Sector) has pointed out that the defects and causes for the continuous loss faced by the KSRTC, the research being the negative variation of daily income of Rs. 40 per day and something


comparatively high operating expenditure, thereby recurring an excess of 0.86 paise per km of expenditure over income.

Patel (1993) analysed the economic life, physical life, and capital cost of a bus in State Transport Undertakings. The physical life of a bus consisted of the cost of maintenance and repairs. The capital cost of a bus consisted of acquisition cost of the vehicle and the interest cost on the investment made for acquisition of the bus. The cost of operation maintenance and repairs include the cost on diesel, lubricants, tyres, batteries, new assembled engine, spare parts and consumable and labour for maintenance and repairs. He concluded that the cost on spare parts and consumable and cost on staff for maintenance might be inversely proportional to the kilometre done per day by a vehicle in different life ranges.

Sunney and Anil Kumar (1993) have examined the performance of State Road Transport Undertakings in India, during the period from 1981-82 to 1991-92. The major objective of his study was to analyse the financial performance, and physical performance of State Transport Undertakings. They have concluded that the physical performance of State Transport Undertaking depends largely on vehicle productivity, which in turn depends on the age of the fleet. The major causes for poor financial performance are; bus-man ratio, higher taxes, social obligations, political interference in day to day working, lack of commitment among workers, and lack of professionalism among top management.

---


Om Prakesh\(^{73}\) (1997) has given the following six approaches for testing the efficiency of a public enterprise: 1. profit and loss approach, 2. balance sheet approach, 3. fiscal approach, 4. employment approach, 5. productivity approach and 6. development and stability approach.

**STUDIES ON THE PROFIT IN THE TRANSPORT SECTOR**

According to a study made by Sant\(^{74}\) (1972) the profitability of Nationalised Transport Undertaking over a period of twenty years changed from year to year due to factors such as: 1. Direct taxes and indirect taxes, 2. Rise in wages, allowances and improvement in service conditions due to labour settlements and labour legislation, 3. Market conditions relating to shortages of chassis, stores, equipment etc, resulting in large scale sickness of vehicles, 4. Changes in the mode of depreciation, rates of interest, provision of certain statutory and non-statutory funds etc. All these factors, in the opinion of Sant, varied operating profits from year to year. Besides, administrative inefficiency and lack of planning might also be responsible for the fall in profit. If the profits turned into losses due to the imposition of tax or higher wages, or loss of revenue due to political agitation or natural calamities, it was no longer a measure of inefficiency of the undertaking. In other words, efficiency of an undertaking arose in its determination in reducing controllable costs in order to enhance profit or reduce loss.

\(^{73}\) Om Prakesh, 'A study into the profitability of government companies' Oxford and IBM publishing house Co., New Delhi, 1997, p. 19.

Devashyam\textsuperscript{75} (1985) diagnosed that profitable investment is possible, only if the management is determined to control the cost effectiveness.

Murthy\textsuperscript{76} (1986) has taken the period 1982, 1983, 1984 and studied how the seasonal factors that determine cost and revenue of transport operations and their ultimate effect on cost fare relationship. It is observed that there is a relationship between cost fare and season. Even if revenue is not generated adequately, there is a need for continuous expansion of fleet strength.

Basing on 1983-84 data, Murthy\textsuperscript{77} (1986) has made an inter-firm analysis of 15 State Transport Undertakings (11 Corporations from Tamil Nadu) in terms of parameters like fixed cost, variable cost, average fleet operated, traffic revenue, effective kilometres operated, rate of vehicle utilisation, cost per bus (CPB), cost per kilometre (CPK), earnings per kilometre (EPK). A comparative study between Andra Pradesh State Road Transport Corporations (APSRTC) and Thiruvalluvar Transport Corporation, Tamil Nadu shows that TTC occupied the last and 15\textsuperscript{th} rank in terms of CPB while the APSRTC got the 4\textsuperscript{th} rank. But in terms CPK, EPB and rate of vehicle utilisation, TTC ranked first among the 15 transport corporations while APSRTC rank 13\textsuperscript{th}, 12\textsuperscript{th} and 11\textsuperscript{th} respectively.


Sharma and Agarwal (1986) have analysed the working capital management of Rajasthan State Transport Corporation in 1982 in order to study the impact of its effects on the liquidity position, inventories and profitability. They observed that the corporation has not been able to manage its working capital requirements effectively. So it is advocated for overall control, working capital budget may be prepared and for the components of current assets, modern techniques of inventory management, cash budget and aging of receivables may be used.

Koteeswaran (1987) emphasized more rigorous professional audit in State Transport Corporations at all levels – internal, statutory and accounts general – for more meaningful information both to the public and the management.


Patankar and Bagade (1987) examined the profitability in road passenger transport during the period 1985-86. The authors classified the cost into controllable and non-controllable with reference to the following

---


variables viz; 1. Occupation ratio, 2. Vehicle utilisation, 3. Fleet utilisation, 4. Vehicle productivity, 5. Staff cost per km and 6. Material cost per km. They studied the relationship between variables by combining one or more variables through regression analyses and concluded that the profitability was greatly influenced by occupation ratio and vehicle utilisation. Fleet utilisation independently did not affect the profitability. The analysis thus indicated that occupation ratio; vehicle productivity and staff productivity were the key parameters, which influenced the profitability.

Vijaya Ramanujam\textsuperscript{82} (1987) suggested various safeguards against the pilferage of revenue in public transport system like ensuing adequate and regular bus services and deployment of additional conductors during peak hours, effective routine and surprise line checking system, use of pre-printed denomination tickets, maintenance of conductor-wise recovery register, increasing the ground reservation, i.e., by collecting the fare from the passengers before they board the bus by means of advance reservation especially in long distance routes, introduction of incentive based on collection and other benefits, etc.

The Planning Commission of India, Association of State Transport Undertakings (ASRTU) and the Ministry of Surface Transport, Government of India has repeatedly brought up this issue with the states several times but all efforts are in vain. Today when STUs are facing financial crisis on one hand and acute competition on the other, some of the State Governments are re-examining there past policy.

Gawhane\(^3\) (1989) elaborated various methods by which STUs can maximize their traffic revenue. His package included assessment or route and traffic behaviour and economies, effective bus and crew scheduling, introduction of express services, night express service, luxury, semi – luxury and deluxe / air condition services, running special services to fairs and festivals, proper control over cash ticket section, cash generation through reservation charges for scheduled buses and incentive scheme for drivers and conductors after identifying the different modes of traffic revenue leakage.

Subhas Vaidya\(^4\) (1991) analysed the route wise profitability in State Transport Undertakings with special reference to Punjab Roadways and Pepsu Road Transports Corporation. The study analysed route-wise profitability of operations of 233 inter-state routes operated by two (Pepsu Road Transport Corporation and Punjab Roadways) State Transport Undertakings. The study revealed that improvement in vehicle utilisation was the main reason for better profitability in transport undertakings.

Durgesh Nandini\(^5\) (1993), in her book 'Financial Structure of Public Utilities', states that there are a number of causes, which can be attributed to the increasing deficits in the STUs. The lack of standard cost based fare structure and absence of timely adjustments of fare as a result of change in the cost of inputs are the major causes of these losses. They are also attributable to operations of uneconomic roads due to social and political

---


reasons. The incidence of taxation and number of other financial matters may also be cited as cause of such unprofitable working operation of these STUs. It is therefore, necessary that the productivity of road transport should improve by replacement of over aged and obsolete fleet, provision of maintenance facilities, in service training of staff and improved organisation, management and operation practices.

Kannan\textsuperscript{86} (1993) made an analysis in Cheran Transport Corporation and observed that the corporation's earning per kilometre increased gradually over the years. He has taken the parameters occupancy ratio, fleet utilisation, vehicle utilisation, staff cost per kilometre, materials cost per kilometre and vehicle productivity to determine the earning per kilometre. His conclusion was that fleet utilisation was high but the occupancy ratio was around 70 per cent, which was mainly due to unscientific time scheduling. In many routes, more number of buses at a particular time competed with one another. Running four or five bus at a time and creating virtual vacant for half an hour affected the revenue very badly. It was suggested to modify the time schedule in all the routes otherwise occupancy ratio would not increase. Earning per kilometre was significantly influenced by staff cost. It was noted that the crew did not have any identity with the organisation, even after they were made permanent with the entire terminal benefits and gratuities.

Pereira\(^{87}\) (1994) made an analysis of Pallavan Transport Corporation and observed that the corporation, like many other metropolitan transport services was incurring loss mostly due to leakage of revenue. He stressed that the financial viability of a transport system was dependent on the integrity and efficiency of the checking staff.

In India, the nationalisation of bus transport was started only in late 1960's. Particularly in Tamil Nadu, it began its momentum in the year 1967.

The survey of literature shows that most of the studies on Road Transport Corporations have been conducted at macro level or inter country studies. Empirical studies on the physical performance of State level Road Transport Corporation are not found much. Similarly studies on the road transport corporations in the light of profitability or financial performance are also very few. The contribution that STUs could make for the economic development at the sectoral level was not analysed in great detail. It was further noticed that corporation studies of STUs were also scanty. And further it is observed that only few studies were made on Tamil Nadu State Transport Corporations. So in this present study, the researcher has made an attempt to examine the physical and financial performance of State Transport Undertakings of Tamil Nadu during 1989-90 to 2000-01.

\*\*\*