PERFORMANCE OF THE PUBLIC ROAD TRANSPORTATION SYSTEM: A CASE STUDY OF THE KERALA STATE ROAD TRANSPORT CORPORATION

Dissertation submitted in partial fulfillment of the
requirements for the award of the degree of
Master of Philosophy
in
Applied Economics
of the Jawaharlal Nehru University, New Delhi,

MARIAMMA SANU GEORGE

CENTRE FOR DEVELOPMENT STUDIES
TRIVANDRUM
1993

I hereby affirm that the research for this issertation titled Performance of the Public Road ransportation System : A Case Study of the Kerala State Road ransport Corporation being submitted to the Jawaharlal Nehru iiversity for the award of Master of Philosophy in applied :onomics was carried out entirely by me at the Centre for ievelopment Studies, Trivandrum.

:ivandrum,
..8.1993.

Mariamma Sanu George

Certified that this dissertation, the nafide work of Smt.Mariamma Sanu George, has not been nsidered for the award of any other degree by any other iversity.

idul Eapen

Dr.P.MohananPillai

Supervisors

.P.S.George,
rector,
ntre for Development Studies.

CONTENTS

LIST OF TABLES

LIST OF ANNEXURES

LIST OF CHART

CHAPTER 1

INTRODUCTION

Transport plays a vital role in the growth and development of economies. It broadens the market, fosters greater factor utilisation, promotes greater division of labour and facilitates labour movement towards better and more gainful employment. It breaks geographical barriers and opens up new vistas, reserves and potentialities of production. The development of an efficient transport system is therefore a sine qua non of development of an economy.

Today the developing countries are fortunate in being able to skip the transport stages, and are not restrained by the lack of development of transport technology. However there are other restrictions, which may be equally, if not more difficult than those faced by the industrial nations in the past. The transport dilemma in developing countries manifests itself in the form of non-availability of adequate capital for investment (and that often imported) and a scarcity of technological and managerial know-how, which must also be imported. Infrastructure development for transportation is woefully lacking in developing countries. Hence, transportation and economic activity

are interdependent; the constraints on both reinforce each other and develop into a vicious circle.

The different forms of transport available in the country comprise of road, rail, air, shipping and inland waterways. Each of these main methods of transport can be subdivided in various ways. There are underground, overhead, and surface rail services, domestic and international air services, and coastal and international shipping lines. Though the extent of contribution by airways and inland waterways is not significant, the growing traffic demand, both freight and passenger, is served by all the four modes. Among the different modes of transport, the major share of passenger and goods transport is catered throughout the country by road and rail transport. These two modes are in a way competitive as well as complementary.

Today, road transport is one of the most vital infrastructural input in a developing country such as India. Road transport can be classified by the method of transportation used, the main ones being car, lorry, bicycle and bus. Its flexibility, ability to penetrate into hitherto inaccessible areas, the personalized services it offers for goods and passenger transport and, above all, its ubiquity, has made road

transport irreplaceable by any other mode of transport. The passenger road transport, is now provided by the State governments, private operators and cooperative agencies.

The major issue in transport economics relates to the problem of pricing and the role of government, which distinguishes a 'public transport enterprise' from 'private transport enterprise'. Transport economics is an area of study in which the economist has to measure that which appears to be unmeasurable, and to deal not only with tangible scarce resources but also with more elusive items on which no market has ever bestowed a price {1}.

Today there is ample altercation about the advantages and performance of all types of public enterprises in relation to private enterprises{2}. The relative advantages of state or public enterprise to a private enterprise differs from one country to another and it cannot be analyzed universally without taking into account the framework of political and social institutions, traditions and history, and the stage of economic development, of the particular country to which the analysis is applied {3} ; also, the objectives, goals and perceptions differ.

Public enterprises are instruments of
public policy with two dimensions i.e., a 'public' and an
'enterprise' dimension. The 'public' dimension refers to
public purpose and the 'enterprise' dimension refers to
the commercial function of the enterprise, the purely
financial aspect. In contrast, a private enterprise is
generally characterised by one dimension i.e., to
maximize financial returns for the enterprise. While the
economic problems facing the private investor as well as
Government or public undertakings are the same, since the
role of the public sector differs from that of the
private sector, the approach to these problems has to be
in the interest of social welfare and not in terms of
profit alone.

The State or public enterprise when
it undertakes any economic activity has not only to take
into account the gains to that undertaking but its impact
on other economic activities also. It cannot recuperate
financial losses of the undertaking by restricting output
and increasing prices. It has to take into consideration
the distribution aspect also. According to Praxy
Fernandez, financial profitability and productive
efficiency are two measures cardinal to the evaluation of
performance. Financial profitability of an enterprise

emerges out of the margin which exists between the cost of production and the sales value. Productive efficiency determines what the cost of production will be; both concepts are within the same continuum {4}. It is difficult to have a common yardstick for measuring efficiency of a public enterprise keeping in view both its 'public' and 'enterprise' dimension.

Amartya Sen(1983) raised some important issues relating to the performance evaluation of public enterprises in India. "In the absence of any well-formulated alternative criterion, the public tends to judge success or failure of public enterprises by profits. This might be at least partly unjustified, but it is fairly inescapable in the absence of a different system of performance evaluation" {5}. The methodology for measuring the efficiency of a public and private enterprise should be different since pricing differs between the two types of enterprise. And also a uniform price policy for all public enterprises is not possible because they are varied in nature and serve different objectives.

It is often asserted that public utilities and services are performing badly primarily due to the pricing policy which has its roots in the marginal

cost pricing principle. According to this pricing
principle, the price should be fixed at a level where it
is equal to marginal cost. In decreasing cost industries,
where average cost would be above marginal cost, charging
a price equal to marginal cost would mean that total
costs are not covered resulting in loss to the
undertaking. In a transport industry, its products are
service kilometres and passengers carried and the price
for the services rendered by it is expressed in terms of
fares. The accepted policy in regard to road transport
services is to fix fares so as to cover the cost of
operation, capital consumption allowance and interest
charges and fares do not change very frequently. Usually
by the time the government and the public approve the
fare revision, the cost increase of inputs overtakes the
fare hike.

In India, the largest segment of the
passenger road transport industry is the nationalized
motor transport, which comes next to railways. But it is
often criticised for its poor performance, poor caliber
of passenger service, inefficient and bureaucratic
management, wasteful expenditure, irresponsible labour
force, etc. The efficiency of a public sector passenger
road transport system depends mainly on the

organisational set up, adequate number of buses and personnel for operation and availability of funds for the related infrastructural requirements.

A micro level empirical analysis is undertaken in this study to understand the factors which influence the performance of the public transportation system through a case study of the Kerala State Road Transport Corporation. In this preliminary chapter we attempt to review the literature on the subject and highlight the objectives, methodology, data base and chapter scheme of our study.

REVIEW OF LITERATURE

One of the first studies on road transport corporations was done by V.V.Ramanadhan(1948) on the Andhra Pradesh Road Transport Undertaking. He briefly touched upon the form of the organisation,but he did not evaluate its overall performance. After tracing the growth of the undertaking he pointed out the likely problems it might face and recommended a Corporation form of set-up under the Road Transport corporations Act (1950) to provide for greater autonomy {6}.

An inter-firm analysis of financial performance of twenty-five selected public road transport

undertakings was done by Mahesh Chand(1982).He analyzed the association between different financial indicators using rank correlation method. The rank correlation between the size of the undertaking and different financial indicators was quite low {7}. Keshava's (1972) study covered the Bihar Road Transport Corporation from 1959-60 to 1965-66. He developed a methodology for assessing management's contribution to changes in profitability over time. He pointed out that the ratio of urban to rural services operated remained unchanged during this period and some factors such as operating cost per unit of service, load factor and the utilization factor, were amenable to managerial influence {8}.

Rajeshwar Rao (1982) made an attempt to study the management efficiency and effectiveness in managing the Delhi Transport Corporation. He emphasized the need for greater governmental support and control,optimum use of available resources and sound financial management practices, among other factors, to improve efficiency {9}. Arora's (1987) study brought out the fact that the passenger road transport industry in Punjab, consisting of public sector undertakings and private operators, suffered from declining revenue and increasing costs. Since the demand for transportation had

increased, more investment should flow into this industry. He also pointed out that further nationalisation of passenger transport in Punjab would only increase losses rather than yield profits. He also made an inter-firm analysis and underlined the need to improve the managerial and technical skill of the employees of the public sector undertakings {10}.

R.K.Mishra and R.Nandagopal(1991), showed from the experience of the Tamil Nadu transport system, that there was an interrelation between organisational innovativeness and efficiency {11}, between competition and efficiency {12}. The competition had been generated through the creation of several State run passenger road transport corporations. The subsequent improved quality of decision making has reduced the cost per kilometer in the STUs in Tamil Nadu. They also raised the issues of privatisation and of restructuring the passenger road transport industry in terms of ownership, management and financing.

Many important studies of Kerala State Transport Corporation (hereafter KSRTC) were done by Government appointed committees. Collin (1949) examined the working of the State Transport services {13}. K.P.Vellu Pillai (1956) examined the operation of

services, vehicle utilisation, maintenance system, audits
and finance of KSRTC {14}. Individual studies of the
KSRTC were done by D.Jayadeva Das, Alwin Prakash, Ibrahim
and Vijayakumar on various aspects of its functioning.
Jayadeva Das (1971) looked into the administration of
KSRTC and the problems connected with its management.
However, he did not undertake a detailed study of its
performance {15}. Alwin Prakash's study (1977) was an
economic analysis of the performance of the Corporation
for the period 1959-71. He analysed the financial
performance of the Corporation and to what extent the
social objectives had affected the performance. The
social objectives he analyzed were services on uneconomic
routes, operation of city service in Trivandrum city,
providing fare concessions to students and subsidising
newspaper transportation. The study revealed that despite
the change over from a departmental undertaking to a
corporation, the operation and the quality of services
rendered to the public by the Corporation remained
unsatisfactory. The factors responsible for this were
found to be the lack of control over cost on personnel
and materials, operation of uneconomic routes and
concessional fares to students and for transportation of
newspaper bundles {16}. P.Ibrahim's (1978) study sought

11

to trace the interrelationship between transport facilities and economic growth as revealed by the experience in the three erstwhile regions of Kerala namely,Malabar, Cochin and Travancore, during the period from the second half of the 19th century till 1947. The study revealed that there were wide differences in the rate and pattern of growth of transportation as between the different regions. In the Travancore and Cochin region, the major emphasis was given to road and water transport while in the Malabar region it was railways {17}. Vijayakumar (1982) built up a decentralized corporate model for the corporation taking into consideration the geographical factors, the development of other modes of transport and the role of KSRTC in the overall transport plan of the State. He pointed out that the unitary system of management was one of the weaknesses which led to the operational failures {18}.

Despite its acknowledged role as an important component of the economic infrastructure and considerable debate on the poor performance of the Corporation over the last few years, no recent study analysing the performance of Kerala State Road Transport Corporation in terms of economic parameters has been undertaken. We attempt to fill this lacuna. To some

extent our study updates A.Prakashs' study on a financial evaluation of the corporation. However, it differs in its attempt to emphasise the physical indicators of performance as also its regional aspect. In this study we propose to examine:

1. The performance of KSRTC.in terms of physical and financial indicators are also used.

2. To discern factors accountable for the poor performance, both internal and external to the corporation.

3. To evaluate and analyze inter-regional performance of KSRTC in terms of the zones into which it is divided. We have not rigorously incorporated the corporation's major social objectives in appraising its performance, but have emphasised physical performance to overcome some of the limitations of a financial approach.

SOURCES OF DATA

The data for evaluative purposes are collected from the Head Office of Kerala State Road Transport Corporation and also from secondary sources such as Administrative Reports of Public Undertakings;

Reports on the Performance of National Road Transport
Undertakings compiled by the Central Institute of Road
Transport, Pune; Statistical Handbook; Kerala Economic
Review, and other published material. Various Reports
such as Government Committee Reports, Reports of the
Committee on Public Undertakings, Reports of the Planning
Commission, studies done by Indian Statistical Institute
and by State Planning Board, Kerala, are also used. The
study covers the seventeen year period, from 1970-71 to
1986-87 and to some extent analyses performance in
comparison with the all-India average of State Transport
Undertakings, since data on all-India averages are
available only from 1981-82 onwards. This gives us some
idea of KSRTC's relative performance.

METHODOLOGY

Assuming KSRTC as a "firm" we will be
examining productivity trends using conventional measures
of partial and total factor productivity. Following this
we shall analyse certain other physical and financial
indicators.
The physical performance will be evaluated using
variables such as:

a) Bus Staff Ratio: 14

It denotes the number of persons employed per bus. A low bus staff ratio would suggest lower relative cost and hence higher efficiency. Besides the aggregate staffing pattern, we will look into the category wise pattern of staff and its changes over time in order to find out whether there is a tendency towards bureaucratisation.

b) Fleet Utilization:

It is the percentage of vehicles put on road to the total fleet of buses held.

c) Vehicle Utilisation:

It designates the daily performance of vehicles i.e., average number of kilometers operated by a bus per day.

d) Age of fleet and its pattern :

This is an important factor determining fleet utilization ratio and daily vehicle utilization. It is studied in terms of the economic life of a bus. The economic life of a bus is the period estimated either in number of years or in kms run by the bus since it was commissioned into service.

e) Passengers carried:

An output variable is the total number of passengers carried per bus per day. There is a positive relationship between the number of passengers carried and efficiency of the undertaking in terms of higher earnings.

We are also interested in examining the growth of the Corporation in the light of the impact of alternative means of transportation, in particular private transport.

The financial efficiency will be evaluated using the following variables.

a) Revenue or earnings/effective km:

It is calculated by dividing the gross revenue earned by the total effective kms operated. It measures the earnings of the undertaking and depends on the rate of fare charged and the number of passengers carried which depends on the nature of service rendered - short distance or long distance.

b) Cost or Expenditure per effective km:

It is calculated by dividing total cost incurred by total effective kms operated.

c) Net profit or loss:

It is the difference between total revenue and total cost including interest rate, depreciation and taxes.

d) Earnings per vehicle:

It is worked out by dividing the total earnings realised in a day by the number of vehicles operated in a day.

The transport Corporations set up by Governments are run with an ultimate goal of rendering service to the public, which is dependent upon their operational efficiency. The efficiency of service is evaluated using :

a) Bus population ratio:

It indicates the total population carried per bus and the accessibility of bus service rendered throughout Kerala.

b) Breakdowns :

Another variable used to evaluate the performance of service rendered is the number of breakdowns incurred by the fleet and this is inversely related to productivity. The higher the number of breakdowns per 10,000 effective kms run, the lower is the

efficiency of the undertaking. Therefore, a declining trend in either the total number of breakdowns or breakdowns per 10,000 kilometers is indicative of a rise in the efficiency of service.

c) Accidents:

One of the determinants of the quality of service and efficiency of a transport undertaking is the number of accidents that occur in the course of operation of one lakh effective kms.

CHAPTER SCHEME

The first section in the second chapter brings out a historic perspective of passenger road transport and the intervention of the State in the development of passenger road transport in India. In the second section we examine the growth and development of the Kerala State Road Transport Corporation (KSRTC). The third chapter examines the efficiency of KSRTC. Here we have analyzed performance using single factor productivity, total factor productivity indices, physical and financial ratios. In the following chapter an attempt is made to evaluate and analyse the relative performance of the different zones within KSRTC. For this we have

studied the three zones into which the Corporation is divided and the performance of the city service has been compared with the performance of the three zones. The variability in the performance between the three regions and city service has to some extend been explained using internal and external factors. The last chapter gives a brief summary and conclusions emerging from the study.

NOTES AND REFERENCES

{1}   Sharp.C.H., Transport Economics, Macmillan Studies
      in Economics.

{2}   Kaldor,   Nicholas   (1980)   Public   or   Private
      Enterprise- The Issues to be Considered, in Public
      and Private Enterprise in a Mixed Economy, edited
      by Baumol W.J, Proceedings of a Conference held by
      IEA.

{3}   Ibid.

{4}   Fernandez,   Praxy,   Promises   and   Performance,
      mimeograph undated.

{5}   Sen,   Amartya,   (1983),"Carrots   Sticks   and
      Economics: Perceptions, Problems and Incentives",
      Indian Economic Review, Vol.18, No.1, Jan-June.

{6}   Ramanadhan, V.V., (1948), Road Transport in India,
      The Universe Publishers Limited, Lucknow.

{7}   Mahesh Chand, (1982), Financial Performance of
      Road Transport Undertaking, Lok Udyog, April.

{8}   Keshava G.P., (1972), " Measurement of Managements
      Contribution to Profitability : Case study of
      Bihar State Road Transport Corporation", Economic
      and Political Weekly, 26 August.

{9}   Rajeshwar Rao,K.(1982)"Management Effectiveness in Transport Operations : A case study of Delhi Transport Corporation", Lok Udyog, July.

{10}   Arora, S.K., (1987), Economics of Management in Road Transport Industry, Deep & Deep Publications, New Delhi.

{11}   Mishra, R. K. and Nandagopal, R., (1991), "Efficiency and Organisation Innovativeness in Passenger Transport", Management Review, Vol 6, No.1&2, Jan-Dec.

{12}   Mishra, R. K., and Nandagopal, R., (1991) "Efficiency through competition in passenger road transport in India : The case of Tamil Nadu State Transport Undertakings", The Journal of Institute of Public Enterprise, Vol. 14, No:1, pp 1-22, March.

{13}   Collins, A.E.L.,(1949), United State of Travancore and Cochin State Transport Services, Government of Travancore and Cochin.

{14}   Vellu Pillai, K.P.,(1956),Report on the Travancore Cochin State Transport Department, Government of Travancore and Cochin.

{15}   Jayadeva Das,D., (1971), Administration of KSRTC., Ph.D Thesis, University of Kerala, October.

{16} Prakash, Alwin B., (1977), <u>An Economic Assessment of the Performance of KSRTC</u>: 1959-71, Unpublished Ph.D thesis, University of Kerala, September.

{17} Ibrahim, P.,(1978), " Transportation Development in Kerala ", <u>Social Scientist</u>, March, Vol 6, No 8.

{18} Vijayakumar, K.C., (1982)," A Corporate Model of KSRTC", <u>Lok Udyog</u>, August.

TH- 5300

CHAPTER 2

THE PASSENGER ROAD TRANSPORT - A HISTORICAL PERSPECTIVE

Alfred Marshall (1922) wrote; "Probably more than three quarters of the whole benefit (to England) derived from the progress of manufacturing during the 19th century has been through its indirect influence in lowering the cost of transport of men and goods, of water and light, of electricity and news : for the dominant fact of our age is the development not of manufacturing, but of the transport industries..... It is they which have done by far the most towards increasing England's wealth". The above observation in the case of England is probably more true for today's world. In the case of India, the importance of passenger road transport in accelerating socio-economic development was recognised after Independence. State participation in providing bus services in India formally began with the passing of the Road Transport Corporations Act, 1950. But it is whorthwhile to trace briefly the history of nationalised bus transport service which evolved as the best form of organisation in official thinking for making passenger road transport serve social interest and offer better services.

PRE-INDEPENDENCE PERIOD

The second half of the nineteenth century marks a new era in the development of transport facilities in India. Mechanized road transport has a comparatively short history. The first motor vehicle came to India in 1898 and it remained a luxury of the rich for several years, which changed with the advent of the First World War. The number of motor vehicles of all kinds went up from 4,419 in 1913-14 to 25,950 in 1928-29 {1}.As the strength of these vehicles slowly increased, there were several provincial enactments to control and regulate their movement with a view to safeguard the lives of pedestrians, and for the purpose of registration. The first all-India enactment dealing with the operational control of motor vehicles, the Indian Motor Vehicles Act, came into force in 1914.

Soon after the first World War, the military vehicles which were rendered surplus were diverted to civilian use. Therefore, by the early 1920's, once the novelty turned into convenience, there was an unexpected and unprecedented growth of vehicles due to the growth in demand, which led to unhealthy competition between motor vehicles and railways. In the late 1920s,

due to the adverse circumstances heralding the global depression, competition became more unhealthy and there was a shrinkage of traffic.

But still, the bus operators resorted to unfair and cut - throat competition in order to increase their share of traffic and profit, facilitated by their greater flexibility of operation, rate cutting policies and greater freedom in the absence of regulatory provisions. However rural areas and tribal belts were largely ignord and most of the operations were concentrated only on profitable routes. Consequently, Indian railways which were owned and operated by government had to suffer tremendous losses {2}. This brought to the fore the need for regulation of the industry, both internally and in relation to the railways.The Indian Motor Vehicles Act(1914) could not cope with the new pressures and had to be supplanted. Thereupon, the Government of India appointed various Committees {3} (Mitchell- Kirkness (1932), Wedgwood (1937)) to suggest ways and means of saving railways from the cut-throat competition, and for co-ordination of motor transport.

With the recommendations of these Committees in view, the Government enacted a new

legislation in 1939,entitled the Motor Vehicles Act of 1939.The purpose of this legislation was to regulate road transport on the basis of healthy competition in the industry itself and with the railways. The Act provided for driving licenses, registration of vehicles, regulation of motor transport and the flow of traffic through State and Regional offices, fixing fares and freights, compulsory insurance of motor vehicles and setting up of motor transport departments in the States for regulation of motor transport.

In 1943, the Post-War Reconstruction Report of the Technical Sub-Committee to the Sub-committee on Transport (on the future of road transport and road-rail coordination), drew the attention of the Government to the need for "regular, speedy and comfortable motor service, enforcement of maintenance and other safety measures, prevention of flooding roads by motor transport concerns resulting in cut-throat competition". The Sub-Committee further urged that in order to have "civilised facilities for travel commensurate with the density of the traffic and the service which that traffic can support.....the conditions requisite must inevitably result in the replacement of the smaller owner by larger companies" {4}.

The recommendation was reiterated in 1945, by the Transport Advisory Council and also by the Post-War Committee on Transport. In pursuance of these recommendations, several State Governments used compulsion as well as persuasion to reorganise individual operators into bigger units.The scheme was known as the Tripartite Scheme, under which joint stock companies were to be organised in the States, whose shareholders were to be Indian Railways, State Governments, and motor bus operators, contributing 35 percent, 35 percent and 30 percent of share capital respectively. If individual bus operators could not buy shares in cash, their buses could be accepted in lieu of shares allotted to them.The profits were to be distributed among the three parties on the basis of their share in capital contribution {5}. In the beginning the scheme was welcomed but failed to take off because of the suspicion on the part of the private operators who felt their voice would not be heard since it was not an arrangement among equals. Thus, when the recommendations suggesting a sort of controlled monopoly to avoid unhealthy competition failed, the need for nationalisation was so strong that the government took steps to control and regulate passenger road transport.

POST INDEPENDENCE PERIOD:NATIONALISATION OF
PASSENGER ROAD TRANSPORT

Soon after Independence in 1947,the Government of India, in response to rising aspirations of the masses, adopted the path of planned development relying heavily on the state sector and followed it up with the Industrial Policy Resolution of 1948. But, road transport did not find a place in the immediate priorities since no mention was made of this sector in the Resolution.

Subsequently, the importance of road transport in accelerating socio-economic development was recognised and by that time there was a clear acceptance of a socialistic pattern of society as the guiding philosophy. However, the nationalisation of passenger road transport was resorted to not merely on welfare considerations but also as a result of the compulsions arising out of the failure of private operators to provide safe, economic and adequate services to the ever increasing commuting public. The very first attempt to nationalise passenger road transport was made in 1948 by bringing in a Road Transport Corporation Act which resulted in the establishment of the Bombay State Road Transport Corporation {6}. The Act was subsequently

revised and replaced by the Road Transport Corporations Act, 1950 {7}.

The Road Transport Corporations Act, (1950), did not compel any State to enforce complete and immediate nationalization of road passenger services. It only enabled the State Governments to establish Road Transport Corporations for the whole or any part of the State in order to offer to the public, trade and industry, the advantage of development of road transport, and improve the facility for road transport in any area. The notable feature of the Act (1950) was that it provided considerable scope for Corporations to function as commercial enterprises (clause 22 of the Act). According to this Act, the objectives of public transport were to provide, promote, or secure an efficient, adequate, economical and properly co-ordinated transport service, and while doing so, to abide by the "business principle". Under this Act, the corporation was also permitted to borrow money and expected to generate adequate internal resources for its growth. Since the corporation was a public enterprise, it was expected to run on a commercial basis on the one hand while on the other it was required to discharge certain social obligations.

Although road transport nationalization got national acceptance as reflected in Policy Statements and Plan Schemes, the State Road Transport Corporations which were set up in different States lacked sufficient funds to go in for large - scale nationalization. It was the responsibility of the State and the Central Government to provide capital to the Road Transport Corporation as stated in Section 23 of the Road Transport Corporation Act. The capital participation by the Union government through the Indian Railways was the incentive offered to the State governments, under this Act. The ratio of the contribution between the State Government and Central Government towards the capital of the Corporation was 4:1 till the end of 1968-69 and thereafter in the ratio 2:1 {8}. There were two more sources by which capital requirements could be met - internal resources and raising of loans [debenture bonds]. It may be noted that the central government contribution was limited to those years in which the Corporation made a profit or at least incurred no loss.

In 1953, the Planning Commission appointed a Study Group to suggest ways and means for the development of passenger road transport. The recommendations of the study group included a reduction

of at least 20 percent in the tax burden on motor transport and a reduction in competition among different modes of transport. The Tax Inquiry Commission, 1953-54, touched upon the financial aspects of the passenger road transport in India. It suggested that the taxation policies of Central and State Governments were required to be coordinated in order to fix the maximum tax burden of the STUs {9}. The Commission further suggested that 75 percent of the State motor vehicles tax should be transferred to State road funds. The Motor Vehicles Taxation Inquiry Committee, set up in 1966-67, recommended a reduction of the heavy burden of tax on motor vehicles and the introduction of single point tax for inter-State road transport.

In the Industrial Policy Resolution of 1956, road transport was mentioned as the eleventh of 12 items in Schedule B, which listed industries to be progressively State owned and in which the State would generally take the initiative in establishing new undertakings but in which private enterprises would also be expected to supplement the efforts of the State {10}. In 1956, the Planning Commission also gave a directive to State Governments either to form Road Transport Corporations where there were none or to convert

Government owned transport undertakings into Road Transport Corporations.

The constitutional validity of nationalisation of passenger road transport has been well established in chapter four (A) of the Motor Vehicles Act 1939 and amended in 1969 to give more effective powers to the State Governments to nationalise road transport services expeditiously. It is held by several courts and Supreme Court as justified under Articles 19 (6) (11) and 31 (2a) (2b) of the Indian Constitution. Also chapter four A has been added to the schedule of the Constitution in 1977. Therefore, the States were free to nationalise without any difficulty.

There were also attempts to form viable units in the private sector. The Road Transport Reorganisation Committee (1959), also called the Masani Committee and the Committee on Transport Policy and Co-ordination set-up in 1966, suggested the formation of viable units in the private sector {11}. The 1966 committee, recommended that the small operators should join together to form viable units and have a fleet of ten or more vehicles in each unit. The Ministry of Shipping and Transport subsequently appointed a study group on viable units, and its report in April 1968

suggested the formation of viable units to minimize costs, build up facilities and provide better facilities to employees {12}. The efforts to organise viable units failed due to the inability of private operators to co-operate and offer efficient and adequate services to the public.

However, the big boost to the formation of private units has come with the recently enacted Motor Vehicles Act, 1988 superseding the Motor Vehicles Act of 1939, which has done away with the draft schemes for nationalization. According to this Act, submitted by the National Transport Policy Committee and the Working Group On Transport for the Seventh Plan in 1980, nationalisation in future should be based on the efficiency of the STUs. The emphasis was on the removal of uncertainty and enable private operators to provide services on routes not likely to be run by the public sector and avoid parallel operation by public and private operators. The Committee specifically suggests the need for cost-based transport pricing and avoidance of indirect or hidden subsidies. This has apparently caused reasonable fear among STU s since it might slow down the process of nationalization over time {13}.

Transport Development over the Plans

In concurrence with the policy to encourage growth of road transport in the public sector various schemes were implemented in the Five Year Plan. In brief the First Five Year Plan (1951-56) proposed to bridge missing links on national highways and increase the fleet strength of the STUs. The second Five Year Plan (1956-61) proposed to complete on going road works and nationalise passenger services in phases. The third Five Year Plan (1961-66) suggested the take over of some bus routes. The Annual Plans (1966-69) proposed to reduce disparities existing in the various states in respect of road development programs and initiate efforts to augment services on the existing routes of the STUs. The Fourth and Fifth Five Year Plans (1969-74 and 1974-79) envisaged development of rural roads, strengthening of services on the existing routes of nationalised STUs and developing national highways with improvements in road standards. Higher priority was to be given to the growth of public transport as opposed to privately owned transport. The Annual Plans in this period aimed towards the completion of spill-over schemes and undertaking major schemes to strengthen the workshop facilities of the STUs {14}.

The Sixth Plan (1980-85) proposed to evolve a rational pricing structure for the STUs so as to ensure profitability and an adequate contribution to the national resources. The Seventh Plan (1985-90) had an ambitious program of revitalising the passenger road transport. It aimed at replacement of obsolete assets, maximum utilization of the existing capacity, and specifically provide accessibility to villages. It also suggested the introduction of a cost - based price structure to improve the financial viability of the STUs. {15}. However, it is not clear whether the new Motor Vehicles Act would lead to a modification of the Seventh Plan objectives.

An analysis of passenger road transport services provided in different States shows that there is no uniform practice in regard to the management. The pattern of management varies from State to State. The activities of the undertakings are managed in three forms viz., public corporations, departmental undertakings and government companies {16}.

PASSENGER ROAD TRANSPORT IN KERALA

In Kerala, during the interregnum between World War 1 and the Great Depression, the State of Travancore made rapid strides in motor transport. The first motor vehicle was registered in the year 1912, and became a more common mode of transport only after World War 1. By 1921 there were 152 motor vehicles in Travancore. Within a decade it multiplied to 1667. However, due to the adverse circumstances following the global depression, road and rail transport registered only a marginal increase subsequently. This was accompanied by a decline in the number of automobiles in use from 1667 in 1931 to 1274 by 1937, since in a number of routes there existed more buses than the actual requirement of the public {17}.

Owing to the cut throat competition that prevailed among the private operators, there was unnecessary waste of capital and other resources. The State Government was convinced that transport was a fundamental need and should be run on a sound basis. A Transport Reorganisation Committee was constituted and it recommended that an expert should be appointed to work

out a transport scheme. Accordingly, Mr E.G. Salter, who was the Assistant Operating Superintendent of the London Passenger Transport Board was appointed as the Superintendent of Transport and a new Department namely the State Transport Department was organised for passenger road transport service in the erstwhile princely State of Travancore in Kerala on 29-9-1937 {18}.

The routes first nationalised were Trivandrum - Cape Comorin and Nagercoil-Colachel covering a distance of 112 kms. The Transport Department initially had only 39 buses which were operating between four main routes, viz. Trivandrum, Nagercoil, Kolachel and Capecomorin {19}. Consequent on the integration of Travancore and Cochin in 1949, the nationalised ferry service run by the erstwhile Cochin State was also transferred to this Department on the first of December 1949 and the name of the Department was changed to Travancore Cochin State Transport Department and the transport services were extended to the Cochin area also.

The Travancore - Cochin Government appointed A.E.L.Collins to study the working of the State transport services in the State {20}. According to the findings of the study,State transport service of Travancore and Cochin had a sound foundation but the

margin earned by the Department was entirely due to overcrowding. The study recommended standardisation and enhancement of the fleet by restricting the purchase of vehicles to two makes, timely replacement of overaged fleet, switching to diesel engines, construction of a tyre building workshop, increasing the number of seats and improving maintenance and operations. Thus,the report of A.E.L.Collins may be regarded as the first authorative study conducted by a transport expert {21} on the working of the State Transport system in Kerala.

With the formation of the Kerala State on November 1st 1956, the name of the Department was changed to the Kerala State Transport Department {22}. In the same year, a one man Commission submitted a report on the functioning of the State Transport Department {23} and stressed the need for setting up a statistical section in the Department which would help in decision making. Upto the end of 1964-65 the State Transport Department was carrying on the development activities of the nationalised road transport sector outside the ambit of the Five Year Plans.

In 1965, the State Transport Department was converted into an autonomous corporation in view of the policy decision taken by the Government of

India and the Planning Commission that the contributions of the Government of India would be given only if the transport undertaking was converted into an autonomous organisation {24}. Thus, by their Notification No. 5345/TC4/65/PW dated 10-3-1965 {25}, the Kerala State Road Transport Corporation was established with effect from 15th March 1965 on the lines embodied in the Road Transport Corporation Act, 1950 inorder to expedite the process of nationalization and receive financial assistance from the Central Government.

Thus, from the point of view of organisation, the functioning of the Corporation can be divided into two periods:

(1)   As a departmental undertaking from September 1937 to April 1965, a period of 27 years.

(2)   As a Corporation since April 1965.

The capital requirements of the KSRTC are met by,

(1)   contributions from the State Government,

(2)   contributions from Central Government represented by Southern Railways,

(3)   internal resources,

(4)   loans (debenture bonds)

The State Government and Railways contributed in the ratio 4:1 towards capital expenditure of KSRTC till the end of 1968-69 and thereafter in the ratio 2:1. A Notification (No.4936/TC4/65/PW dated 22-3-1965) was issued by the Government of Kerala under Sub Section (1) of Section 34 of the Road Transport Act, 1950 transferring all the assets and liabilities of the State Transport Department to the KSRTC. with effect from April 1, 1965 {26}. At the time of establishment of the Corporation, it had a capital contribution of Rs 504.04 lakhs {27} which increased to Rs.5294.24 lakhs (Rs 3632 lakhs contributed by the State Government and Rs 1662 lakhs by the Central Government) by 31st March 1987. Interest is payable on capital contribution at 6.25 per cent per annum. In addition, the Corporation owed loans amounting to Rs.2779 lakhs (State Government : Rs 1657 lakhs, Life Insurance Corporation of India : Rs 919 lakhs and others : Rs 203 lakhs) as on 31st March 1987.

The Corporation's capital assets constitute vehicles, buildings, land, plant and machinery, which increased many fold since the time of inception of the Corporation. The relative share of capital expenditure on vehicles which was 62.69 percent in 1964-65 increased to 80.26 percent by 1986-87 {28}.

The Kerala State Road Transport Corporation has a three tier administrative system {29}. The management is vested with a Board of Management. The Board usually formulates the policies of the Corporation subject to the broad guidelines and framework provided by the Government. It consists of nine members including the Chairman. They are classified into officials and non-officials. There are seven officials and two non-officials who are part time members {30}. The officials category is further categorised into two sub-categories, viz., 'Ex-officio 'and ' Non-official'. Of the officials, five are nominated by the Government of Kerala and the other two by the Railway Board. One member of the Corporation is appointed as the Chairman and Managing Director (CMD) by the Government of Kerala. In the initial stages the posts of Chairman and General Manager were held by two persons. During the period of our study both posts were held by the same individual. The official members hold office unless Government decides, otherwise issued by a notification in the Official Gazette and the non-official members hold office for a period of three years from the date of appointment and are eligible for re-appointment {31}.

The central office of the Corporation, 'Transport Bhavan' at Trivandrum, which houses the various departments, is the controlling and co-ordinating agency, headed by the CMD. The CMD is assisted by the Executive Directors, Senior Managers, the Chief Accounts Officer, Industrial Relations Manager, Manager, Management Studies, Law Officer and the Secretary. The Chief Accounts Officer (CAO) controls the entire accounts section. He is assisted by the Deputy Chief Accountants and Audit Officers (Dy CAO) and their subordinates (AAO). Industrial Relations Manager (IRM) is assisted by a Chief Labour Officer (CLO) and Assistant Labour Officer (ALO). Manager of Management Information Studies (M,MIS) is assisted by the Assistant Statistical Officier (ASO). The Law Officer (LO) is assisted by a Deputy Law Officer (Dy LO).

The various operational sectors are divided into Depots and sub-Depots and the actual responsibility of the operation of schedules rests with these units. At the time of its formation there were altogether ten depots and two sub-depots under the Corporation{32}. With the expansion of operation new units came into existence and at present(1987) there are 14 revenue districts, 27 depots and 23 sub depots. Thus,

in one revenue district there are depots and sub-depots but the number in each district varies. In the late 1980's the depots and sub-depots have been divided into three divisions or zones with a view to improve the efficiency and quality of operation through some decentralised decision making {33}. This was suggested by the Arbitrator in his Arbitration Award 1973 {34}.The zones are under the control of three Senior Managers(SM), who directly report to the Chairman and Managing Director.The traffic branch is headed by a Senior Manager, who is from within the Corporation and he is assisted by the Chief Traffic Officer, Works Officer and Works Manager of the Regional workshop for the repair and maintenance of the fleet.

The depots in each region are engaged in the operation of services under the charge of a District Transport officer (hereafter D.T.O). A sub-depot is smaller than a depot and it is put under the charge of an Assistant Transport Officer. The job of the District Transport Officers and Assistant Transport Officers involves resource management of each depot which implies the efficient utilisation of men and materials. These officers are promoted from the cadre of conductors on the basis of seniority. The Chief Traffic Officer is under

the control of Operations Manager. This is also a
promotion post and the selection is by seniority from
among the D.T.Os {35}. The present organisational
hierarchy can be seen in the chart on page 44.

The maintenance organisation consists
of a Divisional, central, regional and depot workshop.
The Divisional Workshops were started in September 1972.
The Divisional Workshops mainly attend to half-yearly
maintenance and repairs for obtaining fitness
certificates from the Regional Transport authorities. The
Central Workshop at Trivandrum and Regional Workshop at
Alwaye were taken over (March 1965) from the erstwhile
departmental undertaking. The central and regional
workshops are under the control of the Works Managers and
they concentrate only on major repairs to vehicles. The
Central Workshop and the Regional Workshops carry out
major overhauling and reconditioning of vehicles, engines
and other major repairs. The depot workshop is attached
to depots and sub-depots. Depot workshop functions under
a foreman while the sub-depot workshop is under a
chargeman. The depot workshop concentrates on the minor
repairs of vehicles and daily and weekly maintenance of
the vehicles{36}. The routine maintenance,lubrication,
top-up of oil levels, etc. on the basis of kilometres

ORGANISATION CHART OF THE K.S.R.T.C

```
                                           CMD
    ─────────────────────────────────────────────────────────────────────────
    :   :     :    :    :    :     :    :    :    :         :
    CAO :     :    :    :    :     :    :    ED   ED        ED
    &   :     :    :    :    :     :    :    :    :         :
    FA  :     :    :    :    :     :    :    :    :         :
    :   CV&SO IRM  MPA  MMIS SECY  :    LO   CE   CTM   CP&S  ME
    :   :     :    :    :          :    :         :     :    :
    :   :     :    :    :          :    :         :     :    :
    :   :     :    :    :          :    :         :     :    :
    Dy  VO    CLO  :    :          :    Dy LO     Dy.   :    :
    CAO       :    :    :          :              CTM   :    :
              :    :    :          :                    :    :
              ALO  APO  ASO        :                    ACP&S AWM

    ─────────────────────     ─────────────────────     ─────────────────────
          SM SOUTH                  SM CENTRAL                SM NORTH
            :  :  :  :  :    :  :  :   :  :  :    :   :  :  : :  :
    CTO   CTO  :  :  : WM :  CTO :  :   :  : : CTO  :  :  : WM :
    (SOUTH)(CITY  :  :  :     :  :  :   : WM :  :   :  :  :  :   :
          SERVICE): :  :     :  :  :   :  :  :   :  :  :  :   :
    :     :    :  :  :     :  :  :   :  :  :   :  :  :  :   :
    DTO   DTO  :  :  :     : DTO :  :   :  : DTO  :  :  :   :
    :     :    :  :  :     :  :  :   :  :  :   :  :  :  :   :
    ATO   ATO  APO AEE AWM WO ATO APO AEE AWM  WO ATO APO AEE AWM  WO
```

KEY TO THE CHART

CAO & FA   – Chief Accounts Officer and Financial Advisor.
Dy CAO   – Deputy Chief Accounts Officer.
AAO   – Assistant Accounts Officer.
CV & SO   – Chief Vigilance and Security Officer.
VO   – Vigilance Officer.
IRM   – Industrial Relations Manager.
CLO   – Chief Labour Officer.
ALO   – Assistant Labour Officer.
MPA   – Manager Personnel Administration.
APO   – Assistant Personnel Officer.
M,MIS   – Manager, Management Information System.
ASO   – Assistant Statistical Officer.
Sey   – Secretary.
LO   – Law Officer.
Dy LO   – Deputy Law Officer.
ED   – Executive Director.
CE   – Civil Engineer.
CTM   – Chief Traffic Manager.
Dy CTM   – Deputy Chief Traffic Manager.
CP & S   – Controller of Purchase and Stores.
ACP & S   – Assistant Controller of Purchase and Stores.
ME   – Mechanical Engineer.
AWM   – Assistant Works Manager.
SM   – Senior Manager.
CTO   – Chief Traffic Officer.
DTO   – District Traffic Officer.
ATO   – Assistant Traffic Officer.
AEE   – Assistant Executive Engineer.
WM   – Works Manager.
WO   – Works Officer.

operated and major repairs and replacements of reconditioned units are done at the depot garages. Assistant Works Managers (AWM) are responsible to the Works Managers (WM) and they in turn are directly responsible to the Mechanical Engineers (ME) who are further responsible to the Executive Directors. The Civil Engineer (CE) is responsible to the Executive Director of Traffic.

The importance of a stores department in the corporation is undeniable and a central store is set up in Trivandrum, a regional central store at Alwaye and sub-stores attached to the units {37}. The stores department discharges its functions through four branches viz.(a) stores, (b) purchases, (c) stock accounts and (d) stock verification {38}. The activities of these branches are controlled by the Controller of Purchase and Stores (CPS). The central store and regional store is under the immediate control of chief store keepers who are directly responsible to the Assistant Controller of Purchase and Stores (ACPS). Every operating unit is provided with stores. Thus the organisational set up is faily elaborate; however that it has impinged on the 33 corporations functioning is not the major focus of our study.

The period after the formation of the
Corporation has been one of growth and set back. At the
time of its formation in 1965, the corporation possessed
901 buses operating 661 schedules along 533 routes having
a total route length of 17,832 km {39}. It carried 139.9
million passengers in 1964-65. After 22 years, the number
of buses increased to 3,019.With these buses, 3,162
schedules are operated. The number of passengers who made
use of the services of the Corporation increased almost
five fold to 756.25 million. The net capital employed
increased from Rs 496.9 lakhs to Rs 8,087.24 lakhs within
the 22 years. The total number of employees of the
Corporation more than tripled increasing from 7,698 in
1965 to 26,972 in 1986-87. In the first two years the
Corporation was making a profit. During 1965-66 the
profit earned was Rs 40.55 lakhs and it increased to Rs
60.80 lakhs in 1966-67. It started making a loss from
1967-68 [net loss Rs 4.09 lakhs] {40}. By 1986-87 the net
loss was Rs 1413.79 lakhs and the accumulated loss was Rs
9621 lakhs {41}. Therefore, in the following chapter an
attempt is made to examine the performance of the
Corporation over the period 1970-71 to 1986-87 and
identify reasons for the heavy losses incurred, despite
its impressive growth in physical terms (See table 2.1).

TABLE 2.1

GROWTH OF KERALA STATE ROAD TRANSPORT CORPORATION

(1964-65 TO 1986-87)

YEAR	NO.OF BUSES	NO.OF SCHE-DULES	NO.OF ROUTES	ROUTE KMS	PASSENGERS CARRIED (Millions)
1964-65	901	661	553	17832	139.9
1965-66	921	697	600	19878	158.5
1966-67	1006	799	695	23231	189.15
1967-68	1109	970	856	29777	221.06
1968-69	1304	1128	936	35679	255.59
1969-70	1446	1214	1123	44320	292.74
1970-71	1561	1257	1262	48113	310.64
1971-72	1695	1381	1462	54149	314.65
1972-73	1874	1534	1687	62043	332.55
1973-74	1956	1595	1917	84539	351.34
1974-75	2110	1726	2354	93770	421.71
1975-76	2244	1847	2568	109570	518.33
1976-77	2480	2078	3024	137724	511.14
1977-78	2622	2315	3340	145434	555.64
1978-79	2822	2446	3845	153741	632.84
1979-80	2935	2500	3933	158690	706.4
1980-81	3112	2568	3729	160579	706.95
1981-82	3182	2564	3696	157618	689.9
1982-83	3276	2655	3744	161685	691.55
1983-84	3295	2863	3792	165808	702.83
1984-85	3239	3075	3804	170514	735.39
1985-86	3070	3089	3819	171473	734.91
1986-87	3019	3162	3827	171942	756.25

Source : Administrative reports of KSRTC.

NOTES AND REFERENCE

{1}   Mishra R.K. and Nandagopal.R.,(1991),Privatisation of State Transport Undertakings in India : Scope and Modalities, THE   Journal of Institute of Public Enterprise,Vol.14, No.1, March,pp33-46.

{2}   Ibid.

{3}   Inorder to study about rail-road co-ordination,the Government of India appointed a two-man Committee comprising K.G.Mitchell and L.H.Kirkness in 1932. The Mitchell-Kirkness Committee was the first committee to point out that the competition between railways and road transport was mainly in the field of passenger traffic. The committee recommended that the number of licenses for buses on any route should be restricted and that conditions, such as issue of time - tables, publication of schedule of fare and compulsory insurance of motor vehicles should also be prescribed in order to raise the business to better and more economic levels and to eliminate unhealthy competition and thereby offer better services to the public. It also suggested the creation of a Central Advisory Broad of Communications. Consequently a Transport Advisory

Council was formed in 1935 consisting of the Communications Ministers of various provinces to draft the motor vehicle bill. Following this in 1937, the Government appointed another committee, the Wedgwood Committee, which also studied the rail-road problems.

{4}   Sudarsanam, Padam., (1990), Nationalization of Passenger Road Transport :Looking Back and Looking Forward, Journal of Transport Management, November.

{5}   Ibid.

{6}   Ibid.

{7}   Ibid.

{8}   Report on the Working of the Kerala State Road Transport Corporation, (1977), Committee on Road Transport, Government of Kerala, May, pp9.

{9}   Mishra and Nandagopal, op.cit., pp33-46.

{10} Mishra and Nandagopal, op.cit., pp33-46.

{11} Raman,A.V.,(1990),The Rationale of Nationalisation of Passenger Road Transport, Journal of Transport Management, October.

{12} Ministry of Shipping and Transport, Report of the Study Group on Viable Units, Government of India, New Delhi, 1968.

{13}   Raman, op.cit.

{14}   Mishra, R.K. and Nandagopal,R., (1991), op.cit.pp
        33-46.

{15}   Ibid.

{16}   Mahesh Chand, (1980),"Current Issues in Public
        Road Transport Management", Lok Udyog, August.

{17}   Ibrahim, P., (1978), Transport Development in
        Kerala, Social Scientist, March, Vol 6, No.8.

{18}   Pillai, T.K.V., (1940), Travancore State Manual,
        Government of Travancore, Trivandrum, Vol 3, pp
        495-497.

{19}   Report on the Administration of the Transport
        Department for the year 1113 M E (20 September
        1937 - August 1938), Government of Travancore,
        Trivandrum, 1939, ppl.

{20}   Collins, A.E.L.,(1949), United State of Travancore
        and Cochin State Transport Services,Government of
        Travancore and Cochin.

{21}   Collins, A.E.L, Road transport Superintendent of
        Nizam's State Railway, Hyderabad was appointed .by
        the then Travancore-Cochin Government to study the
        working of the State transport services of the
        State, and make recommendations for improvement.

{22} First Report of the Committee on Public Undertakings 1970-71, KSRTC, Secretariat of the Kerala Legislature, Trivandrum,March.

{23} Vellu Pillai, K.P.,(1956),Report on the Travancore Cochin State Transport Department, Government of Travancore and Cochin.

{24} Report on the Working of the Kerala State Road Transport Corporation, (1977),op cit p 9

{25} First Report of the Committee on Public Undertakings 1970-71, op cit.

{26} Ibid.

{27} Report on the Working of the Kerala State Road Transport Corporation, (1977), op.cit.p9.

{28} Administration Report, 1986-87, Kerala State Road Transport Corporation.

{29} Report on the Working of the Kerala State Road Transport Corporation, (1977), pp10.

{30} First Report of the Committee on Public Undertakings 1970-71, op.cit.

{31} Ibid.

{32} Report on the Working of the Kerala State Road Transport Corporation, (1977), op.cit.

{33} Administration Report, 1988-89, Kerala State Road Transport Corporation.

{34} Vijayakumar K.C.,(1982), A Corporate Model for KSRTC., <u>Lok Udyog</u>, August. The suggestion to reorganise the working of the of the undertaking into three zones each under the control of a Deputy General Manager was put forward by A.Kunjukrishna Pillai, 1973.

{35} Ibid.

{36} <u>Report on the Working of the Kerala State Road Transport Corporation, (1977)</u>,op.cit.

{37} <u>Administration Report</u>, 1986-87, Kerala State Road Transport Corporation.

{38} Vijayakumar.K.C.,(1982), op.cit.

{39} <u>Report of the High Level Committee on Physical Infrastructure and Transport,</u> State Planning Board, Trivandrum, 1984 January, Government of Kerala.

{40} <u>First Report of the Committee on Public Undertakings 1970-71</u>, op.cit.

{41} The accumulated loss was arrived at after setting off Rs 6511 lakhs written off by Government from the dues payable to them. Report of the Comptroller and Auditor General of India for the year ended 31st March 1989, No.2 Commercial, Government of India.

CHAPTER 3

PERFORMANCE OF KSRTC

This chapter examines the overall performance of KSRTC. Since KSRTC is a public sector undertaking, one is faced with the problem of selecting a suitable performance criterion. The controversy regarding the suitable criteria for evaluating the efficiency of public enterprises stems mainly from the fact that the performance of public enterprises can be viewed from several angles. The choice of an appropriate criterion for assessing the performance of the public enterprises would depend on the approach, that is adopted for looking at performance. In the present study we have taken into account both the physical and financial performance.

It may be argued that the performance of a public undertaking may be evaluated on the basis of the realisation of the objectives with which it has been started. These objectives may be multiple and diversified, and may be social, economic or commercial. The achievement of any one of these objectives set for the enterprise or a combination of them, would refer to the efficiency of the enterprise. As we have seen in chapter 2, according to the Road Transport Corporation

Act of 1950, the objectives of the public road transport were to provide, promote, and secure an efficient, adequate, economical and properly co-ordinated transport service, and while doing so, to abide by " business principle".

Recently, a great deal of interest has been expressed in improving productivity in the transportation industries. Usually, vehicle miles (effective kilometers) or revenue passengers is taken as output to measure productivity in road transport {1}. In this chapter, assuming the Kerala State Road Transport Corporation to be a 'firm' we use the techniques used in other sectors to measure the efficiency of the corporation. Not withstanding the obvious problems in employing productivity indices to a public utility, the analysis, we hope, would enable us to discuss certain broad directions of change. Such an approach is justified by economists like John.R.Meyer and Jose.A.Gomez Ibanez.{2}

This chapter is organised in the following way: In the first section we shall measure the productivity of the corporation using the partial productivity indices and total factor productivity indices. We also examine the relationship between wage

rate and labour productivity and the trends in capital intensity. In the second section, an attempt is made to explain the observed trend in partial and total factor productivity indices in terms of other physical and financial performance indicators specific to a transport enterprise.

Our analysis of the performance of KSRTC covers the period 1970-71 to 1986-87. Since the data exhibit some variation in certain indicators of growth, such as number of buses, schedules, routes, number of passengers carried etc a period wise analysis would be more useful in analysing broad trends in the different indicators. The entire span accordingly has been divided into two sub-periods; 1970-71 to 1978-79 and 1978-79 to 1986-87.

MEASURES OF PRODUCTIVITY

Productivity can be measured using the partial productivity index and total factor productivity index. It may be defined as a measure of the efficiency with which resources are converted into commodities and services. Higher productivity is a means to better levels of economic well being and greater

national strength. Therefore, productivity change is both the cause and the consequences of dynamic forces operating in an economy - technological progress, accumulation of human and physical capital, entrepreneurship, and institutional arrangements {3}.

PARTIAL PRODUCTIVITY

The ratio of output to a particular input is termed as a partial productivity ratio. Hence, there could be as many indices of partial productivity as there are factors of production. While each index has its own use, the most important and most often used are the labour and capital productivity indices.

Thus, the volume of output which is the numerator of the productivity ratio is dependent upon the quantities of factor inputs of labour and capital employed, the state of technical knowledge and its availability, organisational characteristics, the scale of operations, the manner in which the factors are utilised, the degree of capacity utilisation and more generally the efficiency with which the entire production process is organised overtime in relation to changes in demand, competition, relative factor prices, technical knowledge, and organisational practices.

Conceptually, labour productivity is a ratio between output and labour input. In the study, output is estimated as value added, which is the sum of profit (or loss) and personnel cost. In order to express value added at constant prices, we have deflated the current value by the wholesale price index of All commodities. Regarding the measurement of labour input, we have taken the total number of employees in the corporation which includes the administrative, traffic and workshop staff.

The definition and measurement of capital productivity is analogous to labour productivity. It is the average product per unit of capital input. Both conceptually and statistically, the measurement of capital presents difficult problems. The quantity and quality of capital influences not only the productivity of capital but also that of labour and total output.The first important issue in the measure of capital input, is the selection between the capital stock and flow series. Most of the empirical studies (eg., Ahluwalia{4}, Goldar{5} and Hashim and Dadi{6}) have used the stock data under the assumption of constant relationship between the stock of capital and flow of

capital series. We have used the capital stock data for our analysis.

The second issue in the measurement of capital input is the choice between the gross stock and the net stock of capital. Even though the net capital stock has got its own theoretical significance in productivity analysis, most of the studies adopted gross capital stock as the indicator for several reasons. In this chapter, we have taken value of gross capital stock at constant prices as a measure of capital input. To obtain the estimates at constant prices we deflated capital stock by using wholesale price index of transport and machinery equipment. Needless to add, to calculate capital productivity, value added is divided by the deflated capital stock.

TOTAL FACTOR PRODUCTIVITY

Since the partial productivity indices are simply the average product of labour and capital, our analysis is supplemented with total factor productivity index which has often been referred to as a measure of the "unexplained residual" or as a measure of the degree of technological progress.

Technological progress can take many forms such as new products, new processes and new methods of organisation. The use of new technologies in production processes frequently reduces the labour and other inputs needed to produce a unit of output. These reductions in turn reduce the cost of production and the employment requirements for a fixed output level. But productivity means improvement in the quality of inputs and labour, better utilization of plant and equipments, and economies of scale in addition to technical progress.

According to Dennison (1961), improvements in the quality of labour and economies of scale by greater utilisation of capacity may lead to substantial gains in total factor productivity, without strictly involving an advance in knowledge{7}. Increase in productive efficiency over a period of time implies net saving in all the inputs taken together in producing a given level of output or getting more output per unit of total input.

The total factor productivity is measured as the difference between the growth in output and the sum of the growth rates of the inputs, that is labour and capital, weighted by their respective shares.

It was introduced by Tinbergen in 1942, when he attempted an international comparison of productivity growth.

There are different methods of measuring the total factor productivity and the measures differ on account of the differences in the underlying production function. However, the three different indices most often used in empirical research are Kendrick's arithmetic measure {8}, Solow's geometric measure {9}, and the Translog productivity index {10}.

Here, we shall discuss briefly the methodology of estimating these total factor productivity indices, namely, Kendrick, Solow and Translog. There is an extensive literature on the choice of an appropriate index of total factor productivity which vary from one another with regard to the weighting scheme involved. Now let us discuss these indices.

THE KENDRICK INDEX (1961)

Let our homogeneous output be Y, and the two factors of production denoted by labour L, and capital K, and w0 and r0 denote the factor rewards (earnings) of labour and capital respectively in the base year of the study (here it is 1970-71). We have the Kendrick's index for the year 't' as

$$At = Yt \; / \; w\theta Lt \; + \; r\theta Kt$$

Under the assumptions of constant returns to scale, perfect competition and payment to factors according to their marginal product, the total earnings of labour and capital in the base year will be exactly equal to the output of that year; so that A0 is equal to unity by definition.

The Kendrick index may be interpreted as the ratio of actual output to the output which would have resulted from increased inputs in the absence of technological change. While the Kendrick index is easy to calculate and understand, it suffers from an important defect that it is based on a linear production function and therefore, fails to allow for the possible diminishing marginal productivity of factors.

THE SOLOW INDEX (1957)

Solow has proposed yet another measure of technical change, in which technical change is interpreted as a short-hand expression for any kind of shift in the production function. Such a shift is indicated by the inclusion of a time trend variable.

The Solow index of total factor productivity is based on the Cobb-Douglas production

function which assumes unitary elasticity of substitution. According to Nelson (1965) this is not a serious draw back {11}. He has shown that the fact of non-unitary elasticity of substitution is unlikely to make significant difference to the estimates of total factor productivity. Therefore, under the assumption of competitive equilibrium the Solow index and the Kendrick index are equivalent for small changes in output and inputs.

Under the assumptions of constant returns to scale, autonomous Hicks-neutral technological progress and payment to factors according to marginal product, the following equation is obtained.

$$A'/A = [Y'/Y] - [1-\propto L'/L +(\propto) K'/K] \text{ -------(1)}$$

Where,

Y denotes output, L labour, K capital, $\propto$ the share of labour, $1-\propto$ is the share of capital, K'/K is the rate of change of capital per person, L'/L is the rate of change of labour and dot stands for time derivates.

From equation (1), the discrete form is obtained as

$$\hat{A}/A = [\hat{Y}/Y] - [(1-\propto)\hat{L}/L +\propto \hat{K}/K] \text{ --------(2)}$$

Once computation of $\hat{A}/A$ is done (for different years) with the help of equation (2), the Solow

index is obtained using the following identity (taking A0 as unity),

$$A(t+1) = A(t) [1 + \hat{A}/A]$$

TRANSLOG INDEX (1973)

The translog index is a discrete version (developed by Tornquist) of the continuous Divisia index. Translog index numbers are symmetric in data of different time periods and also satisfy the factor reversal test approximately. The translog index of technological change is based on a translog production function, characterized by constant returns to scale. It allows for variable elasticity of substitution and does not require the assumption of Hicks-neutrality {12}.

For application to data at discrete points of time, an approximation to the continuous Divisia index, known as translog index, may be used, which assumes a translog function. Constant returns to scale is assumed for all factors.

In the next section, we have presented the estimates of partial productivity, capital intensity, labour intensity, wage rate and total factor productivity using the three indexes overtime for KSRTC.

The gross value added at constant prices is taken as the measure of output. This is obtained by adding 'profit/loss' and 'wage' as reported in the data sources of the Corporation.For correcting price changes, the yearly current values have been deflated (single deflation) by a suitable price index. For this purpose, the price indices have been taken from Index Number Of Wholesale Prices in India. Here, gross value added is deflated with All Commodity price index.

The share of capital is taken as one minus the share of labour in value added, i.e., we have assumed constant returns to scale in the production process. In the case of labour input, there are three alternative measures available: 'man-hours', 'workers' and 'total employees'. Denison (1961), disfavours taking man-hours as a measure of labour input. He points out that a reduction in man-hour per week leads to an increase in labour input per hour.We have taken 'total employees' as the measure of labour input. Also, we have not made any attempt in the present work to correct labour data for quality differences arising from age, sex, educational and occupational composition of the labour force.

TRENDS IN PARTIAL PRODUCTIVITY INDICES:

Annual growth rates of partial productivity indices during the period 1970-71 to 1986-87 are shown in table 3.1. Table 3.1 shows that there is wide variation in the growth rate of partial productivity indices during the period under consideration. It is instructive to note that both labour and capital productivity index has followed more or less the same pattern. To be more specific, both these indices have been characterised by a high degree of fluctuations and a slight upward trend is discernible in the last two years of analysis.

It is useful to study the pattern of capital intensity which shows the unit of capital requirement per unit of output. Capital size or technology plays a dominant role in determining the level of output and hence the labour productivity. Capital per person = K/L = capital/labour, i.e., average capital per person. In order to calculate wage rate, wage bill is deflated by using all commodity price index. Then the deflated wage bill is divided with the total number of staff. This gives the wage per persons.

TABLE 3.1

TRENDS IN PARTIAL PRODUCTIVITY
(at contant prices)

(Base year 1970-71=100)

YEAR	LABOUR PRODUCTIVITY INDEX	GROWTH RATE	CAPITAL PRODUCTIVITY INDEX	GROWTH RATE
1970-71	100.00	0.00	100.00	0.00
1971-72	103.83	3.83	103.26	3.30
1972-73	84.67	-18.45	75.65	- 25.30
1973-74	67.05	-20.81	66.11	- 12.60
1974-75	112.26	67.43	138.35	109.30
1975-76	104.98	- 6.48	142.55	3.00
1976-77	133.33	27.01	159.18	11.70
1977-78	127.59	- 4.31	143.52	- 9.80
1978-79	110.34	-13.52	133.53	- 7.00
1979-80	96.55	-12.50	122.62	- 8.20
1980-81	117.62	21.82	144.43	17.80
1981-82	74.71	-36.48	99.25	- 31.30
1982-83	89.27	19.49	114.65	45.70
1983-84	96.93	8.58	117.68	2.60
1984-85	99.23	2.37	113.38	- 3.65
1985-86	104.21	5.02	127.86	12.77
1986-87	135.25	29.79	156.02	22.02

SOURCE: Estimated from Administrative Reports of KSRTC, 1971-87.

TABLE 3.2

GROWTH RATES OF CAPITAL INTENSITY, WAGE RATE
AT CONSTANT PRICE
(base year 1970-71=100)

YEAR	WAGE RATE INDEX	GROWTH RATE	CAPITAL INTENSITY INDEX	GROWTH RATE
1970-71	100.00	0.00	100.00	0.00
1971-72	87.44	-12.60	100.59	0.59
1972-73	114.36	30.80	111.65	11.00
1973-74	103.33	- 9.60	101.06	- 9.48
1974-75	100.26	- 3.00	81.18	-19.75
1975-76	104.10	3.80	73.65	- 9.28
1976-77	103.33	- 0.70	83.88	13.89
1977-78	110.77	7.20	88.94	- 6.03
1978-79	122.05	10.20	82.47	- 7.27
1979-80	111.28	- 8.80	78.82	- 4.43
1980-81	105.38	- 5.30	81.29	3.13
1981-82	107.18	1.70	75.41	- 7.23
1982-83	101.54	- 5.30	78.00	3.43
1983-84	108.21	6.60	82.24	5.44
1984-85	117.44	8.50	87.65	6.58
1985-86	114.10	- 2.80	81.41	- 7.12
1986-87	121.54	6.50	86.59	6.36

SOURCE: Estimated from Administrative
            Reports of KSRTC, 1971-87.

68

Table 3.2 shows the trend in wage rate and capital intensity. The capital intensity shows a declining trend from 1973-74 to 1981-82, with the exception of two years; it increases to some extent in the following years and then declines. The annual average rate of growth in wage rate shows almost no trend, in the last few years it has started to increase due to the decrease in staff.

Table 3.3 shows the growth in total factor productivity using Kendrick, Solow and translog indices. It is seen from the table that there is no systematic growth in total factor productivity estimated by these indices. The indices show a negative growth rate. Comparatively, the translog index shows a better picture of productivity. The increase in this productivity index may be because of the changes in the embodied technology, which may not be due to improvement in the overall efficiency of the Corporation.

Table 3.4 gives the simple average of annual growth rates of labour productivity, capital productivity, capital intensity and wage rate for the two sub periods 1970-71 to 1978-79 and 1978-79 to 1986-87.

TABLE 3.3

TOTAL FACTOR PRODUCTIVITY

YEAR	KENDRICK	SOLOW	TRANSLOG
1970-71	- 2.07	0.0000	0.0000
1971-72	- 2.74	- 0.0074	0.0480
1972-73	- 2.59	- 0.2220	- 0.2907
1973-74	- 2.31	- 0.2190	- 0.3567
1974-75	- 3.75	- 0.2655	0.5475
1975-76	- 3.81	- 0.1373	- 0.1034
1976-77	- 6.06	- 0.1612	0.3313
1977-78	- 6.75	- 0.0772	- 0.0176
1978-79	- 7.71	- 0.0255	- 0.2183
1979-80	- 6.62	- 0.0124	- 0.1564
1980-81	- 8.52	- 0.0413	0.2523
1981-82	- 5.56	- 0.1535	- 0.4390
1982-83	- 7.60	- 0.0569	0.2497
1983-84	- 9.20	- 0.0891	0.1177
1984-85	- 9.92	- 0.1145	0.0703
1985-86	- 9.57	- 0.1152	- 0.0037
1986-87	- 12.27	- 0.0865	0.2856

SOURCE: Estimated from Administrative
            Reports of KSRTC, 1970-87.

The average ratio of capital to labour during the period 1971-87, witnessed a negative growth rate (-0.51) per annum. In the same period the average annual growth rate of capital productivity was 8.06 per cent. Average growth rate of labour productivity over the period 1970-71 to 1986-87 was 4.55 per cent, for the period 1970-71 to 1978-79 it was to 4.34 per cent and for the period 1978-79 to 1986-87, the average growth rate was only 2.73 per cent.

It is evident from the table that the performance of the corporation, when viewed in terms of all the indices has deteriorated during the second period. To be more specific, the capital productivity growth rate declined from 8.90 per cent in the first period to 5.63 per cent in the second period. It implies that capital has not been fully utilised. There was a sharp decline in the growth rate of labour productivity during the second period. This may be due to the reduction in the number of buses and therefore the labour could not be effectively utilised or because the labour must have been deployed increasingly in non productive sectors like administration, etc. The decline in the wage rate may reflect the overmanning discussed above.

Interestingly the decline in the productivity indicators has been accompanied by a decline in the capital intensity.

TABLE 3.4

GROWTH IN PRODUCTIVITY, CAPITAL INTENSITY AND WAGW RATE
(ANNUAL AVERAGE %)

	1971-87	1971-79	1979-87
CAPITAL INTENSITY	- 0.51	- 1.80	- 0.12
CAPITAL PRODUCTIVITY	8.06	8.90	5.63
LABOUR PRODUCTIVITY	4.55	4.34	2.73
WAGE RATE	1.70	3.26	1.26

SOURCE: Estimated from tables 3.1 and 3.2.

From the variables worked out earlier, we attempted to assess the impact of the 'scale economies' on productivity. In order to analyse the economies of scale, we have run a multiple regression equation. Here, labour productivity is taken as function of total labour (L), capital intensity (K/L) and time (T), where time is supposed to capture the effects of technical (disembodied) efficiency, and the labour variable in the following estimated equation, refers to the economies of scale effect on productivity.

$$Y = 10.934 + - 0.689 \text{ (L)} + - 0.697 \text{ (K/L)} + 0.035 \text{ (T)}$$
$$(0.795) \qquad (0.725) \qquad (0.0394)$$

t value = $\quad$ - 0.8589 $\qquad$ - 0.9615 $\qquad$ 0.9007

R^2 = 0.1019

Thus from the above results, it can be observed that there is no scale effect because the coefficient of labour, capital intensity and time is insignificant though negative. In the case of labour it is -0.689, capital intensity -0.697 and for time it is 0.035. Thus it reveals the existence of constant returns to scale technology of production function.

In the above productivity analysis we have presented a total picture of the performance of KSRTC assuming it as a firm in the conventional sense. Since the objectives of the transport corporation are different from that of a purely commercial productive enterprise, the above analysis can only be treated as indicative of broad trends. The most important question is how to account for the observed trend in the partial and total factor productivity indicators. With a view to answer this question and to get a better understanding of performance, we have supplemented the productivity analysis with other performance indicators. The

performance indicators we have selected are all expressed in ratios of relevant variables.

FLEET UTILISATION

One of the factors that determine the efficiency in a transport enterprise is capacity utilisation. The major factor which determines capacity utilisation is fleet utilisation. Fleet utilisation indicates the percentage of buses on operational duty rather than on reserve or in workshop under repairs.

Kerala State Road Transport Corporation had a fleet strength of 3,019 buses as on 31-3-1987 and this is almost double as compared to 1970-71 when the total strength of the fleet was 1,561 {13}; the highest fleet strength was 3,295 in 1983-84. In the beginning it had different makes of buses e.g.Tata Mercedez Benz, Ashok Leyland, Bedford, Dodge, etc. Since there were difficulties in maintaining a heterogeneous fleet it now concentrates only on two makes of buses; Leyland and Tata Mercedez Benz. Standardisation is necessary for economy/efficiency in maintenance and storing of spare parts, thereby reducing costs and increasing productivity.

At any particular point of time the total fleet can be divided into three categories:

1. Buses on operational duty i.e., scheduled services.
2. Buses in reserve.
3. Buses in workshop or fleet under repair.

The increase in fleet strength may be only a rough estimate of the performance of the undertaking, since the fleet may increase without a proportionate increase in the scheduled services thereby reducing the capacity of the undertaking to produce transport services rather than increasing it. It would therefore be relevant to examine the distribution of the fleet between scheduled services on the one hand, and buses in reserve and under repairs on the other (see Table 3.5 and annexure 3a.1).

A higher percentage of buses on scheduled service would mean a higher degree of utilization and would, therefore raise productivity. The Motor Vehicles Act stipulates the permissible percentage of spare vehicles at 14 and hence fleet utilisation below 86 per cent is considered as less than normal {14}. The percentage of fleet utilisation in KSRTC in 1964-65, the

year immediately prior to the formation of the Corporation was 88.4. This had gradually increased and in 1967-68 reached the level of 91.4. Thereafter, it began to decrease. In 1986-87 the fleet utilisation was only 72.30 per cent {15}.

It is interesting to note that the level of fleet utilisation is much lower as compared to the all India average. During 1986-87, fleet utilization in KSRTC was 72.30 per cent, where as the all India average was 87.70 per cent. From Table 3.5 it is evident that the difference in fleet utilisation between all India average and in KSRTC has increased overtime.

The compound growth rate of average buses on road was 3.50 per cent per annum for the whole period while it was 6.40 per cent per annum for 1970-79 it declined sharply to 0.2 percent per annum during 1979-87.

It can be said that the KSRTC has not been able to keep a higher number of buses on road or in scheduled services, especially during the second period. Therefore, its efficiency on this account has been consistently low when compared with the all India average. The low percentage of fleet utilization in the KSRTC. is mainly due to the large proportion of buses in reserve and workshop.

6TABLE 3.5

PERCENTAGE OF FLEET UTILISATION IN KSRTC.

YEAR	PERCENTAGE SHARE OF BUSES ON ROAD	PERCENTAGE SHARE OF BUSES IN RESERVR & REPAIR	ALL INDIA AVERAGE * OF PERCENTAGE SHARE OF BUSES ON ROAD
1970-71	86.68	13.32	
1971-72	83.18	16.82	
1972-73	85.74	14.26	
1973-74	83.52	16.48	
1974-75	83.22	16.78	
1975-76	83.78	16.22	
1976-77	86.28	13.72	
1977-78	83.99	16.01	
1978-79	83.89	16.11	
1979-80	83.56	16.44	
1980-81	80.64	19.36	
1981-82	77.20	22.80	84
1982-83	75.30	24.70	82
1983-84	73.77	26.23	84
1984-85	79.88	20.12	84
1985-86	73.45	26.55	85
1986-87	72.30	27.70	88

NOTE: *   Data available from 1981-82 only from Performance Statistics of STUs, Central Institute of Road Transport, Pune.
SOURCE: Estimated from Administrative Reports of KSRTC, 1971-87.

How does one explain the lower level of fleet utilisation? One probable line of enquiry is in terms of the age structure of the buses {16}. If the stock of buses constitute more of old age buses, one could expect more breakdowns and therefore the number of buses in reserve and repair would increase. On the other hand, due to poor workshop facilities there may be delay in the maintenance of the vehicles. This may also be due to delay in procuring the spare parts needed for the repair. It is to these questions we now turn.

AGE PROFILE OF FLEET

Table 3.6 (see Annexure 3a.2 also) shows that at the end of the financial year 1986-87, almost a quarter of the buses were more than ten years old. The percentage was highest in 1982-1983 and then the number of buses above ten years declined to some extent. On the whole this proportion was higher in the second sub period. During this period the percentage of buses in reserve and repair increased at a higher rate than in the previous years. Almost two thirds of the buses are of age 1-10 for the whole period. The average of buses above ten years of age was 25.21 per cent for the period 1970-87. In the case of buses less than one year, the average has

come down from 9.42 percent to 7.4 percent by the second period.

TABLE 3.6

AGE-WISE COMPOSITION OF BUS FLEET (%)

YEAR	LESS THAN ONE YEAR	LESS THAN TEN YEARS	MORE THAN TEN YEARS
1970-71	8.97	67.46	23.57
1971-72	9.14	64.90	25.96
1972-73	16.22	57.63	26.15
1973-74	9.05	68.40	22.55
1974-75	10.33	68.06	21.61
1975-76	7.31	72.24	20.45
1976-77	10.32	68.15	21.53
1977-78	7.40	67.56	25.04
1978-79	9.11	63.93	26.97
1979-80	9.06	63.44	27.50
1980-81	5.43	67.16	27.41
1981-82	4.53	66.09	29.38
1982-83	7.75	59.31	32.94
1983-84	9.77	61.31	28.92
1984-85	10.77	65.58	23.65
1985-86	3.71	74.66	21.63
1986-87	5.50	71.32	23.19

SOURCE: Estimated from Administrative Reports of
           KSRTC, 1970-71 to 1986-87.

The compound growth rate for buses aged less than one years, less than ten years, more than ten year as calculated from Annexure 3a.2 shows that it was only 1 percent per annum, 4.2 percent and 3.9 percent per annum respectively during 1970-87. From the above analysis it is clear that the percentage of buses in age group less than one year declined by the second period. This could explain the decrease in the capital productivity in the second period.

INCIDENCE OF BREAKDOWNS AND ACCIDENTS

The increase in the percentage of buses in reserve and repair can be explained using another measure of operational efficiency i.e., the number of breakdowns incurred by a transport undertaking. The relationship between efficiency and number of breakdowns is inverse. A small number of breakdowns per 10,000 kilometres means higher fleet utilisation and an increase in revenue, less discomfort to the passenger and better quality of service.

The breakdowns per 10,000 effective kilometres was 1.3 in 1964-65 {17}. This increased to

2.88 in 1979-80 and then decreased to 1.37 in 1986-87. This was the lowest during the period of analysis. But it was double the national average, which was only 0.75 breakdowns per 10,000 effective kilometres. The increase in the number of breakdowns cannot be attributed to dearth of maintenance staff in the Corporation, as it is seen that the number of maintenance staff per bus increased from 2.86 in 1970-71 to 3.20 by 1986-87. Apart from the heavy incidence of overaged buses there are several other causative factors like higher daily utilisation of buses, poor road conditions, non-availability of spare parts in time, absence of coordination between operating staff and maintenance staff and between maintenance staff and stores staff, lack of qualified staff, etc.

Table 3.7 shows that between 1970-71 to 1975- 76, the total number of breakdowns increased from 21672.0 to 43049.0 but declined during the next two years. Over a period of seventeen years the highest number of breakdowns occurred during 1979-80 i.e., 66732.0; it declined from the following year and reached 26264.0 in 1986-87. Similar is the behaviour of the breakdowns per 10,000 effective kms which shows an increasing trend upto 1979-80, a decline trend thereafter

TABLE 3.7

BREAKDOWNS PER 10,000 EFFECTIVE KILOMETRES

YEAR	TOTAL NO. OF BREAKDOWNS	BREAKDOWNS PER 10,000 EKM	ALL INDIA AVERAGE *
1970-71	21,672	2.02	
1971-72	27,640	2.41	
1972-73	26,630	2.16	
1973-74	29,264	2.20	
1974-75	35,796	2.27	
1975-76	43,049	2.41	
1976-77	35,362	1.71	
1977-78	37,461	1.84	
1978-79	58,575	2.80	
1979-80	66,732	2.88	
1980-81	62,227	2.72	
1981-82	54,889	2.59	1.29
1982-83	49,842	2.29	1.03
1983-84	45,773	1.89	1.02
1984-85	42,958	1.77	0.93
1985-86	33,889	1.68	0.94
1986-87	26,264	1.37	0.75

NOTE: *   Data available from 1981-82 only from Performance Statistics of STUs, Central Institute of Road Transport, Pune.

SOURCE: Estimated from Administrative Reports of KSRTC, 1970-87.

thereafter. The average breakdowns per 10,000 effective kilometres was almost the same during the sub-periods (2.20 in 1970-79 and 2.22 in 1979-87).

Another factor which could explain the increase in the number of buses in reserve and repair in a passenger transport undertaking is the number of accidents that occur during a period. The relationship of accidents with efficiency is inverse. Other things being equal, higher number of total accidents or higher number of accidents per lakh effective kilometres of operation, reduces the number of scheduled services and results in a loss to the undertaking. The average of accidents per 1 lakh effective kilometres was almost the same during the two sub-periods(2.40 in 1970-79 and 2.20 during 1978-87).

Table 3.8 highlights the much higher incidence of accidents in KSRTC relative to all-India. The number of accidents was highest during 1978-79. The number of accidents per lakh effective kilometres has come down to 1.97 by 1986-87, but when compared to the national average, which is 0.63 per lakh effective kilometres, it is very high. This indicates that KSRTC has to make further improvements in its quality of service. One interesting point is that during the two

years 1978-80, both breakdowns per 10,000 EKM and accidents per lakh EKM was highest.

TABLE 3.8
ACCIDENTS

YEAR	TOTAL ACCIDENTS	ACCIDENTS/1 LAKH EKM	ALL INDIA AVERAGE *
1970-71	2995	2.70	
1971-72	2951	2.40	
1972-73	2951	2.20	
1973-74	3001	2.20	
1974-75	3645	2.30	
1975-76	4475	2.50	
1976-77	4381	2.20	
1977-78	4976	2.40	
1978-79	5813	2.70	
1979-80	5609	2.50	
1980-81	5507	2.40	
1981-82	4810	2.30	0.81
1982-83	4379	2.00	0.82
1983-84	5004	1.70	0.80
1984-85	5518	2.20	0.73
1985-86	4651	2.00	0.65
1986-87	4704	1.97	0.63

NOTE: *   Data available from 1981-82 only from
          Performance Statistics of STUs,Central
          Institute of Road Transport, Pune.
SOURCE: Estimated from Administrative Reports
          of KSRTC, 1970-87.

On the whole, the analysis has shown that performance of KSRTC in terms of the fleet utilisation has deteriorated overtime. This was attributed mainly to an increase in the number of over aged buses partially explaining the high percentage of buses under repair, higher rates of breakdowns and accidents.

THE STAFF-BUS RATIO

Now let us examine the role of labour which is another major factor influencing the overall performance of the Corporation. A better ratio to analyse both the inputs i.e., staff and buses, is staff-bus ratio. Staff-bus ratio is the ratio of total number of employees to the average number of buses on road {18}.

The staff employed in Kerala State Transport Corporation is divided into three major categories:

   1. Administrative staff.

   2. Traffic or operational staff.

   3. Workshop or maintenance staff.

The Corporation had on its rolls a total of 7,698 staff at the time of its formation and by 31-3-1987 it increased to 30,849. Out of the major

categories, Administrative staff accounted for 4,387 (14.2 per cent), operational staff 19,414 (62.9 per cent) and maintenance staff 7,048 (22.8 per cent). The increase in employment has not been continuous; while it grew from 13,702 in 1970-71 and 28,095 in 1979-80 to 30,777 in 1982-83 it showed a decline in 1983-84 to 27,549, increasing to 32,174 in 1984-85, but again declined to 32,042 and 30,849 in the subsequent years.

The absolute increase in the total staff was 2.03 times between 1970-71 to 1978-79 while it increased by 2.25 times between 1978-79 and 1986-87. As is expected the operational (traffic) staff constitutes the major share of the total staff i.e., 62.93 percent as on March 31, 1987. Table 3.9 shows that while in the earlier sub period the growth in workshop staff was fairly high, resulting in an increase in its share by 1978-79 with a near constant share for traffic staff, the share of administrative staff declined. However in the subsequent period there was an overall decline in the growth of staff, but the decline was sharpest in workshop staff followed by operational staff; the relative share of administrative staff increased. The increase in fleet in reserve and repair may be due to the decrease in workshop staff and operational or traffic staff. The

compound growth rate of the operational staff has come down from 8.10 percent per annum to 2.20 percent per annum, while in the workshop staff it has become negative; growth rate in administrative staff is higher at 2.40 percent per annum. This is at least suggestive of a tendency towards bureaucratisiation.

The staff-bus ratio can be worked out for each group, viz., traffic, workshop and maintenance and administration. Table 3.10 show that staff per bus ratio in Kerala Road Transport Corporation was higher than the national average of 9:1. This suggests the existence of surplus labour. The seventeen years data analyzed, shows that the number of staff per bus has gone up from 11.1:1 in 1970-71 to 14.0:1 in 1986-87.

It is evident from table 3.10 that during the seventies the staff bus ratio remained more or less constant, but the ratio has increased in the eighties and in the terminal year the ratio was 14.56.

Therefore, to operate one bus, KSRTC uses more staff than the national average. It is evident from the fact that the compound growth rate in employment in KSRTC. over a period of 17 years works out to be 7.30 percent per annum, while the compound rate of growth of average number of buses on road is only 3.50 percent.

87

TABLE 3.9

CATEGORY-WISE GROWTH IN STAFF AS ON 31st MARCH

CATEGORY	1970-71	1978-79	ABSOLUTE INCREASE IN STAFF	COMPOUND GROWTH RATE
TRAFFIC	7,909 (57.7)	15,983 (57.6)	2.02	8.10
WORKSHOP	3,516 (25.6)	8,238 (29.6)	2.34	9.90
ADMINIS-TRATION	2,277 (16.6)	3,530 (12.7)	1.55	5.10
TOTAL	13,702 (100.0)	27,751 (100.0)	2.03	8.10

CATEGORY	1978-79	1986-87	ABSOLUTE INCREASE IN STAFF	COMPOUND GROWTH RATE
TRAFFIC	15,983 (57.6)	19,414 (62.9)	1.21	2.20
WORKSHOP	8,238 (29.6)	7,048 (22.8)	0.86	NEGATIVE
ADMINIS-TRATION	3,530 (12.7)	4,387 (14.2)	1.24	2.40
TOTAL	27,751 (100.0)	30,849 (100.0)	1.11	1.20
1971-87	13,702	30,849	2.25	7.30

SOURCE: Estimated from Administrative Reports of KSRTC, 1971-87.

Note :   Figures in brackets are percentages to total staff.

TABLE 3.10

BREAK-UP OF STAFF-BUS RATIO

YEAR	TRAFFIC	WORKSHOP	ADMINIS-TRATION	TOTAL	ALL INDIA AVERAGE * TOTAL
1970-71	6.43	2.86	1.85	11.14	
1971-72	7.23	2.88	2.13	12.25	
1972-73	6.74	3.14	1.73	11.61	
1973-74	7.04	3.17	1.81	12.02	
1974-75	7.17	3.29	1.85	12.31	
1975-76	7.26	3.15	1.93	12.34	
1976-77	6.68	2.89	1.66	11.25	
1977-78	6.82	2.77	1.55	11.14	
1978-79	7.38	3.80	1.63	12.81	
1979-80	7.08	3.25	1.90	12.23	
1980-81	7.28	3.01	2.01	12.30	
1981-82	7.87	3.44	2.08	13.39	9.65
1982-83	8.28	3.43	2.31	14.02	9.78
1983-84	8.02	3.24	2.02	13.29	9.76
1984-85	7.86	3.31	2.07	13.23	9.75
1985-86	8.64	3.27	1.96	13.87	9.50
1986-87	8.82	3.20	1.99	14.56	9.02

NOTE: *   Data available from 1981-82 only from
           Performance Statistics of STUs,Central
           Institute of Road Transport, Pune.

SOURCE: Estimated from Administrative Reports
           of KSRTC, 1970-87.

This clearly shows that the growth of fleet has lagged behind the increase in employment. The "surplus labour" or underutilisation of the staff further reduces labour productivity. As a result, personnel cost as a proportion of total cost has increased to 44.11 per cent by 1986-87 (as we shall see later).

So far our discussion was in terms of input utilisation viz., capital and labour. It is now necessary to examine some other performance indicators in terms of output. Output in a road passenger transport industry can be expressed in any of the following forms.

(1) Annual gross or scheduled kilometres per bus.

(2) Annual effective kilometres per bus.

(3) Total number of passenger carried per bus.

Annual effective kilometres (hereafter EKM) can be defined as the average number of kilometres covered by a bus (of the fleet) in a year. From this we can obtain bus or vehicle utilisation. It is obtained by dividing effective kms by the number of buses on road per day.

$$\text{Vehicle Utilisation} = \frac{\text{Total effective kms}}{\text{No. of buses} / 365}$$

Another aspect which needs to be noted is the difference between scheduled Kms and the actual Kms covered by an undertaking's fleet. The difference is referred to as dead kilometres, which was high between 1977 and 1987. Table 3.11 shows the EKM per bus and the dead kilometres (or missed kilometres).

The effective Km per day per bus has increased from 232.53 Kms per bus per day in 1970-71 to 295.89 Kms per bus per day in 1986-87. When vehicle utilisation of KSRTC is compared with the national average we find that the Corporation's relative performance is good. However the low fleet utilisation and high vehicle utilisation suggests that there is the over utilisation of buses by the Corporation.

Dead kilometres is due to increase in unscheduled trips, extra services on scheduled routes and chartered services (for student tours, festivals, etc). There appears to be near constancy in the extent of dead kilometres overtime, except for a short period when it increased in the latter half of the seventies.

The third indicator is the number of passengers carried per bus during the year. The profitability of the corporation will increase according

TABLE 3.11

VEHICLE UTILISATION

YEAR	DEAD KILOMETRES	TOTAL EFFECTIVE KMS /BUS/ DAY	ALL INDIA AVERAGE *
1970-71	15.62	232.53	
1971-72	14.86	241.23	
1972-73	12.18	244.03	
1973-74	13.40	252.05	
1974-75	12.46	270.59	
1975-76	16.01	284.61	
1976-77	11.38	281.97	
1977-78	21.28	251.85	
1978-79	20.44	272.88	
1979-80	19.22	267.38	
1980-81	18.83	270.32	
1981-82	24.65	274.52	261.3
1982-83	23.37	263.29	257.0
1983-84	17.71	277.19	262.6
1984-85	17.37	270.92	261.4
1985-86	15.43	273.05	267.1
1986-87	17.89	295.89	272.4

NOTE:* Data available from 1981-82 only from Performance
      Statistics of STUs, Central Institute of Road
      Transport, Pune.

SOURCE:Estimated from Administrative Reports of KSRTC,
      1970-87.

TABLE 3.12

PASSENGERS CARRIED BY KSRTC

YEAR	TOTAL PASSENGERS CARRIED IN LAKHS	PASSENGERS CARRIED PER BUS PER DAY
1970-71	3,106.41	691.81
1971-72	3,146.56	689.25
1972-73	3,325.55	672.25
1973-74	3,513.45	658.31
1974-75	4,217.12	735.81
1975-76	5,183.38	827.47
1976-77	5,111.43	710.52
1977-78	5,556.45	679.33
1978-79	6,328.48	800.41
1979-80	7,064.08	842.71
1980-81	7,069.52	835.77
1981-82	6,899.09	853.61
1982-83	6,919.55	843.50
1983-84	7,028.39	802.05
1984-85	7,353.96	818.49
1985-86	7,349.15	869.33
1986-87	7,562.59	941.36

SOURCE: Estimated from Administrative Reports
           of KSRTC,1970-87.

to the increase in passengers carried through the increased revenues earned. Therefore, passengers per bus per day is a major criterion for judging the efficiency of the undertaking.

Table 3.12 shows the number of passengers carried for a period of 17 years 1970-71 to 1986-87 and the number of passengers carried per bus per day. The number of passengers carried per bus per day has increased by 36.07 percent over a period of 17 years, while the number of total passengers travelling by KSRTC buses increased by 143.45 percent. The compound growth rate of passengers carried was 5.4 per cent per annum during 1970-87. However there was a visible deceleration in the rate of growth of passengers carried in the second sub period.

The decrease in the growth rate of passengers carried may be due to the shortage of buses. It suggests that the undertaking must have lost traffic to the alternative modes of transportation.

FINANCIAL EVALUATION

As noted earlier one of the objectives of the corporation is to be a self financing concern. How far it has fulfilled this objective in the

sense of earning a profit following business principles and discharging its social responsibility may be examined below.

In a road transport undertaking profits directly depend upon its operational efficiency which in turn is a function of revenue and cost of operation. In this context, the financial evaluation of the performance of KSRTC is examined in terms of three variables.

1.Revenue or income.

2.Cost or expenditure.

3.Profitability.

There are different sources of revenue and these can be divided into operating and non-operating revenue (annexure 3a.3). Income received from transportation of passengers and incidental sources constitutes revenue. It accrues mainly by sale of tickets to the travelling public, from passenger luggage, by offering buses on contract, mail subsidy and paper subsidy. Income from sources not directly related to transportation of passengers constitutes non-operating revenue. It consists of advertisement charges, rent and miscellaneous receipts. The latter accrues from the sale

of scrap material, profit on sale of fully depreciated vehicles and work done for outside parties etc.

The other dimension of finance is cost. The break up of total cost into its constituents and their behaviour overtime will provide some insight into the cost increases in KSRTC. We have divided the total cost into two broad categories (annuexure 3a.4) and they are:

A. Operating Expenditure.

B. Non-operating Expenditure.

A. OPERATING EXPENDITURE:

1. Personnel cost or expenditure on establishment.

2. Fuel and lubricant cost.

3. Material cost which includes tyres and tubes and spare parts.

4. Taxes paid to the state government.

5. Depreciation on investment.

6. Rents.

7. Insurance.

8. Other items which do not come under any of the above categories i.e., advertising and publicity.... etc.

B.   NON-OPERATING EXPENDITURE:

   9. Debt charges.

   10. Interest paid to the government for loans taken.

Net profit, is the difference between the total revenue and the total cost including interest payments, depreciation and taxes. From 1970 to 1987 the corporation has not made any profit (see annexure Table 3a.5). The level of deficit rose unabated for the first 12 years by almost 16 times since 1970-71.

An analysis of item - wise expenditure is shown in Table 3.13 and annexure 3a.6. In a labour intensive undertaking like road transport, manpower management assumes special significance since it meets its lakhs of customers every day through its thousands of operating staff. It may be seen from the table that the cost on personnel accounts for the largest single item of expenditure.

As expected, all items of operating expenditure show an increase overtime; however the increase in personnel costs and fuel costs has been relatively higher. While the share of the former has gone upto 45 percent from about 40 per cent in 1970-71, that of fuel increased from 17 per cent to 21 per cent between 1970-71 and 1986-87.

Table 3.13
BREAK-UP OF OPERATING EXPENDITURE PER EFFECTIVE KILOMETER (Paise)

	1	Share %	2	Share %	3	Share %	4	Share %	5	Share %	6	Share %	7	Share %	8	Share %	9	Share %	10
1970-71	51.09	39.66	22.22	17.25	24.36	18.91	14.14	10.98	8.72	6.77	0.02	0.02	0.17	0.13	1.40	1.09	6.70	5.20	128.82
1971-72	50.12	38.70	23.40	18.07	23.69	18.29	13.40	10.35	9.54	7.37	0.17	0.13	0.33	0.25	1.54	1.19	7.32	5.65	129.51
1972-73	67.58	42.21	24.72	15.44	27.62	17.25	20.43	12.76	11.28	7.05	0.15	0.09	0.44	0.27	1.70	1.06	6.17	3.85	160.09
1973-74	73.66	42.13	23.46	13.42	34.31	19.62	21.13	12.08	11.87	6.79	0.24	0.14	0.26	0.15	1.57	0.90	8.35	4.78	174.85
1974-75	85.33	48.49	29.36	16.68	22.88	13.00	15.69	8.92	11.61	6.60	0.13	0.07	0.21	0.12	1.90	1.08	8.88	5.05	175.99
1975-76	83.38	43.19	34.34	17.79	40.10	20.77	13.72	7.11	10.76	5.57	0.09	0.05	0.49	0.25	3.42	1.77	6.77	3.51	193.07
1976-77	77.70	38.03	36.41	17.82	41.16	20.14	26.91	13.17	10.90	5.33	0.11	0.05	0.46	0.23	3.92	1.92	6.76	3.31	204.33
1977-78	90.52	40.25	37.96	16.88	46.56	20.70	21.17	9.41	12.44	5.53	0.14	0.06	0.59	0.26	4.29	1.91	11.23	4.99	224.90
1978-79	115.27	44.09	39.81	15.23	48.30	18.47	30.02	11.48	13.03	4.98	0.14	0.05	0.54	0.21	4.02	1.54	10.34	3.95	261.47
1979-80	118.24	42.66	44.38	16.01	49.65	17.91	29.44	10.62	14.53	5.24	0.21	0.08	0.52	0.19	4.92	1.78	15.26	5.51	277.15
1980-81	134.01	42.86	66.50	21.27	59.31	18.97	22.28	7.13	16.85	5.39	0.18	0.06	0.52	0.17	5.80	1.85	7.22	2.31	312.67
1981-82	164.31	40.78	89.21	22.14	76.21	18.91	34.63	8.59	19.24	4.77	0.34	0.08	1.21	0.30	7.98	1.98	9.81	2.43	402.94
1982-83	166.47	40.65	93.37	22.80	73.63	17.98	36.42	8.89	20.67	5.05	0.37	0.09	1.32	0.32	6.26	1.53	11.02	2.69	409.53
1983-84	177.68	41.74	97.66	22.94	65.80	15.46	37.94	8.91	21.63	5.08	0.24	0.06	1.93	0.45	7.48	1.76	15.30	3.59	425.66
1984-85	204.70	43.05	105.67	22.22	66.39	13.96	41.96	8.82	25.29	5.32	0.55	0.12	2.03	0.43	9.15	1.92	19.79	4.16	475.53
1985-86	221.46	42.89	106.03	20.53	82.25	15.93	40.85	7.91	29.95	5.80	0.80	0.15	3.13	0.61	9.53	1.85	22.36	4.33	516.36
1986-87	232.23	45.27	109.40	21.32	69.68	13.58	37.96	7.40	27.45	5.35	0.91	0.18	6.64	1.29	8.67	1.69	20.09	3.92	513.03

KEY : 1. Personnel cost or expenditure on establishment.
2. Fuel and lubricant cost.
3. Material cost which includes tyres and tubes and spare parts.
4. Taxes paid to the state government.
5. Depreciation on investment.
6. Rents.
7. Insurance.
8. Other items which do not come under any of the above
categories i.e., advertising and publicity etc.
9. Debt charges and interest paid to the government for
loans taken.
10. Total cost -

SOURCE: Estimated from Administrative Reports of KSRTC, 1970-87.

NOTE : Col 9 is the percentage of non-operating expenditure.
We have estimated total cost and earnings in terms of total effective kilometers.

97

TABLE 3.14

EARNINGS PER EKM, COST/EKM AND COST/REVENUE RATIO

YEAR	EARNINGS/EKM (Paise)	TOTAL COST/ EKM (Paise)	COST /REVENUE (in percent)
1970-71	117.24	134.12	114.40
1971-72	125.08	135.34	108.20
1972-73	132.39	166.55	125.80
1973-74	139.59	181.36	129.93
1974-75	160.69	182.05	113.29
1975-76	173.38	200.40	115.59
1976-77	199.24	209.69	105.25
1977-78	210.09	230.83	109.87
1978-79	222.52	268.07	120.47
1979-80	235.21	284.67	121.03
1980-81	272.09	306.17	112.53
1981-82	324.55	412.07	126.97
1982-83	351.56	419.81	119.41
1983-84	364.52	435.69	119.53
1984-85	397.74	486.39	122.29
1985-86	442.89	529.10	119.47
1986-87	468.33	526.43	112.70

SOURCE: Estimated from Administrative Reports
            of KSRTC, 1971-87.

In the context of overall financial performance, cost has to be seen in relation to earnings. We have estimated total cost and earnings in terms of total effective kilometres. As Table 3.14 shows, average revenue per effective km has increased from 117.24 paise per km to 468.33 paise per km while total cost per EKM increased from 134.12 paise in 1970-71 to 526.43 paise in 1986-87. Hence cost to revenue has fluctuated over the years but has always been higher than 100 and has shown an increasing tendency over the years.

To conclude, in this chapter we tried to examine both physical and financial performance of KSRTC assuming the Corporation as a 'firm'. The conventional measures of productivity did not show any encouraging trend. We have also attempted to explain the decline in productivity in terms of other physical indicators such as fleet utilisation, vehicle utilisation, age profile of fleet, incidence of breakdowns and accidents, staff-bus ratio, discrepancy between scheduled and effective kilometres and number of passengers carried all of which show discouraging tendencies, the cumulative impact of which has been poor financial performance. Hence both in physical and financial terms, the performance has been unsatisfactory.

In the next chapter we shall examine the inter regional aspect of the transport network provided by KSRTC and relative performance of the zones within the organisation.

NOTES AND REFERENCES

{1} John R.Meyer and Jose A. Gomez Ibanez, (1980) Measurement and Analysis of Productivity in Transportation Industries, Edited by John.W. Kendrick and Beatrice.N.Vaccara, New Developments in Productivity Measurement and Analysis.

{2} Ibid.

{3} M.Ishaq Nadiri (1970), Some Approach to the Theory and Measurement of Total Factor Productivity, A Survey, Journal of Economic Literature, Vol.2, p. 1137.

{4} Ahluwalia Judge, (1985), Industrial Growth in India: Stagnation Since the Mid-Sixties, Oxford University.

{5} Goldar, B.N., (1986) Productivity Growth in Indian Industry

{6} Hashim, B.R. and Dadi, M.M., (1973), Capital Output Relations in Indian Manufacturing (1946-64), M.S.University of Baroda, Baroda.

{7} Dennison, E.F.,(1961) 'Measurement of Labour Input: Some Questions of Definition and Adequacy of the Data", in Output, Input and Productivity Measurment, NBER.

{8}   Kendrick J.W., (1961) Productivity Trends in the
       United States, NBER.

{9}   Solow, R.M.,(1957) 'Technical change and aggregate
       Production Function' Review of Economics and
       Statistics, AUGUST.

{10}   Goldar, B.N., (1986) op cit.

{11}   Nelson, R.R., (1965) "The CES Production Functions
       and   Economic   Growth   Projections   "Review of
       Economics and Statistics, Vol 1.

{12}   Mehta, S.S, Productivity, Production Function and
       Technical change   (A Survey   of some   Indian
       Industries).

{13}   Administrative Reports of KSRTC, 1971-87.

{14}   Committee on Road Transport, Report on the working
       of the Kerala State Road Transport Corporation,
       May 1977.

{15}   Administrative Reports of KSRTC, 1971-87.

{16}   The norms adopted by different STUs for vehicle
       retirement are not uniform. While some retire them
       after they have covered the targeted distance,
       others adopt age criteria for replacement. There
       is no uniformity even in the norm of stipulated
       distance which varies widely from 1.35 lakh kms to

103

8 lakh kms. Under the age criteria, the norm varies from 3 years to 10 years.

{17}   Committee on Road Transport, op cit.

{18}   Performance Statistics of STUs, Central Institute of Road Transport, Pune.

ANNEXURE

TABLE 3a.1

FLEET HELD IN KSRTC

YEAR	AVERAGE NO. OF BUSES ON ROAD	BUSES IN RESERVE & REPAIR	AVERAGE NO OF BUSES HELD
1970-71	1,230.20	189.00	1,419.20
1971-72	1,256.20	254,00	1,510.20
1972-73	1,354.70	225.30	1,580.00
1973-74	1,462.30	288.60	1,750.90
1974-75	1,570.20	316.70	1,886.90
1975-76	1,716.20	332.30	2,048.50
1976-77	1,970.90	313.50	2,284.40
1977-78	2,083.80	397.20	2,481.00
1978-79	2,166.20	416.00	2,582.20
1979-80	2,296.60	451.90	2,748.50
1980-81	2,314.70	555.60	2,870.30
1981-82	2,235.20	660.20	2,895.40
1982-83	2,244.90	736.30	2,981.20
1983-84	2,437.60	400.40	2,838.00
1984-85	2,430.40	612.00	3,042.40
1985-86	2,309.70	835.00	3,144.70
1986-87	2,201.00	843.10	3,044.10

SOURCE : Administrative Report of KSRTC,
         1970-71 to 1986-87.

TABLE 3a.2

AGE STRUCTURE OF BUSES

YEARS	LESS THAN ONE YEAR	BETWEEN 1 & 5 YEARS	BETWEEN 5 & 10 YEARS	MORE THAN 10 YEARS
1970-71	140	634.00	418.00	368.00
1971-72	155	663.00	437.00	440.00
1972-73	304	668.00	410.00	490.00
1973-74	177	765.00	571.00	441.00
1974-75	218	775.00	660.00	456.00
1975-76	164	852.00	767.00	459.00
1976-77	256	862.00	828.00	534.00
1977-78	194	815.00	954.00	656.00
1978-79	257	831.00	972.00	761.00
1979-80	266	870.00	991.00	807.00
1980-81	169	1,073.00	1,017.00	853.00
1981-82	144	1,085.00	1,017.00	935.00
1982-83	254	934.00	1,008.00	1,079.00
1983-84	322	931.00	1,088.00	953.00
1984-85	349	988.00	1,135.00	766.00
1985-86	114	1,064.00	1,228.00	664.00
1986-87	166	1,034.00	1,117.00	700.00

SOURCE: Administrative Report 1970-71 to 1986-87.

TABLE 3a.3

REVENUE (Rs in lakhs)

YEAR	OPERATING REVENUE	NON OPERATING REVENUE	TOTAL REVENUE
1970-71	1,201.16	24.08	1,225.24
1971-72	1,360.66	23.07	1,383.73
1972-73	1,557.97	40.31	1,598.28
1973-74	1,831.82	45.89	1,877.71
1974-75	2,442.56	39.05	2,481.61
1975-76	3,044.51	45.32	3,089.83
1976-77	4,012.61	29.22	4,041.83
1977-78	4,310.02	38.65	4,348.67
1978-79	4,675.26	59.06	4,734.32
1979-80	5,200.42	73.33	5,273.75
1980-81	6,038.31	107.59	6,145.90
1981-82	6,845.11	123.85	6,968.96
1982-83	7,516.79	117.91	7,634.70
1983-84	8,729.48	163.31	8,892.79
1984-85	9,516.50	199.71	9,716.21
1985-86	10,021.00	217.06	10,238.06
1986-87	10,911.00	165.75	11,076.75

SOURCE: Administrative reports, KSRTC.,1970-87.

TABLE 3a.4

EXPENDITURE (Rs in lakhs)

YEAR	OP:COST	NON OP:COST	TOTAL COST
1970-71	1,276.26	125.37	1,401.63
1971-72	1,351.55	145.65	1,497.20
1972-73	1,858.01	152.67	2,010.68
1973-74	2,239.74	199.88	2,439.62
1974-75	2,591.62	231.68	2,823.30
1975-76	3,348.42	224.58	3,573.00
1976-77	4,007.90	245.93	4,253.83
1977-78	4,401.76	353.22	4,754.98
1978-79	5,343.29	360.55	5,703.84
1979-80	5,872.96	510.74	6,383.70
1980-81	6,665.91	216.54	6,882.45
1981-82	8,424.34	405.83	8,830.17
1982-83	8,607.61	459.91	9,067.52
1983-84	9,966.60	615.74	10,582.38
1984-85	11,086.10	744.74	11,830.84
1985-86	11,376.36	808.54	12,184.90
1986-87	11,748.31	798.21	12,546.52

SOURCE: Administrative reports, KSRTC.,1970-87.

108

TABLE 3a.5

FINANCIAL POSITION OF KSRTC   (Rs in lakhs)

YEAR	TOTAL REVENUE	TOTAL COST	PROFIT/ LOSS
1970-71	1,225.24	1,401.63	- 176.39
1971-72	1,383.73	1,497.20	- 113.47
1972-73	1,598.28	2,010.68	- 412.40
1973-74	1,877.71	2,439.62	- 561.91
1974-75	2,481.61	2,823.30	- 341.69
1975-76	3,089.83	3,573.00	- 483.17
1976-77	4,041.83	4,253.83	- 212.00
1977-78	4,348.67	4,754.98	- 406.31
1978-79	4,734.32	5,703.84	- 969.52
1979-80	5,273.75	6,383.70	-1,109.95
1980-81	6,145.90	6,882.45	- 736.55
1981-82	6,968.96	8,830.17	-1,861.21
1982-83	7,634.70	9,067.52	-1,432.82
1983-84	8,892.80	10,582.38	-1,689.40
1984-85	9,716.21	11,830.84	-2,114.59
1985-86	10,238.00	12,184.90	-1,946.90
1986-87	11,076.70	12,546.52	-1,469.80

SOURCE: Administrative reports, KSRTC.,1970-87.

TABLE 3a.6

BREAK-UP OF EXPENDITURE (Rs in lakhs)

YEAR	1	2	3	4	5	6
1970-71	533.93	232.19	254.60	147.75	91.12	0.26
1971-72	554.42	258.82	262.05	148.22	105.50	1.83
1972-73	815.89	298.38	333.44	246.58	136.17	1.77
1973-74	990.88	315.63	461.59	284.18	159.63	3.18
1974-75	1323.32	455.40	354.76	243.28	179.98	2.07
1975-76	1486.46	612.25	741.87	244.65	191.77	1.68
1976-77	1576.25	738.65	834.97	545.91	221.20	2.16
1977-78	1864.62	782.07	959.10	436.15	256.27	2.94
1978-79	2452.65	846.99	1027.73	638.80	277.23	2.90
1979-80	2651.49	995.31	1113.32	660.19	325.91	4.82
1980-81	3012.40	1494.84	1333.32	500.82	378.82	4.00
1981-82	3520.89	1911.71	1633.02	742.14	412.38	7.23
1982-83	3595.55	2016.76	1590.36	786.54	446.47	8.05
1983-84	4315.40	2371.90	1598.06	921.55	525.31	5.71
1984-85	4978.95	2570.83	1614.96	1020.70	615.26	13.48
1985-86	5100.02	2441.73	1894.22	940.73	689.71	18.46
1986-87	5534.81	2607.46	1660.64	904.67	654.26	21.66

KEY:1. Personnel cost or expenditure on establishment.
2. Fuel and lubricant cost.
3. Material cost which includes tyres and tubes and and spare parts.
4. Taxes paid to the state government.
5. Depreciation on investment.
6. Rents.

TABLE 3a.6 (cont'd)

YEAR	7	8	9	10
1970-71	1.74	14.67	70.04	55.33
1971-72	3.62	17.09	80.99	64.66
1972-73	5.27	20.51	74.54	78.13
1973-74	3.47	21.18	112.32	87.56
1974-75	3.33	29.48	137.65	94.03
1975-76	8.82	60.92	120.69	103.89
1976-77	9.30	79.46	137.10	108.83
1977-78	12.19	88.42	231.29	121.93
1978-79	11.49	85.50	220.02	140.53
1979-80	11.62	110.44	342.13	168.61
1980-81	11.74	130.38	162.37	154.17
1981-82	25.90	171.07	210.27	195.56
1982-83	28.59	135.29	238.05	221.86
1983-84	46.93	181.78	371.56	244.18
1984-85	49.47	222.45	481.32	263.42
1985-86	72.10	219.39	514.96	293.58
1986-87	158.19	206.62	478.70	319.51

KEY: 7. Insurance.
     8. Other items which do not come under any of the
        above categories i.e.,advertising and publicity
        etc.
     9. Debt charges
     10.Interest paid to the government for loans taken.

SOURCE: Administrative Reports, KSRTC,1970-87.

111

CHAPTER 4

INTER-ZONE ANALYSIS

In the preceding chapter on the basis of the analysis done, with the help of productivity indices and other indicators, the physical and financial performance of the Kerala State Road Transport Corporation was evaluated at a macro level. However, being a huge Corporation, only a disaggregated study will enable us to obtain a better understanding of the performance of the Corporation. In this chapter, we shall discuss the performance of the Corporation at a micro level, viz.,the three zones into which the Corporation is divided - south,central and north. City service is operated only in the southern region. We have excluded it from the south and analyzed it separately.

The Kerala State Transport Corporation had fourteen revenue districts by 1987, with twenty - seven depots and twenty-three sub-depots. The revenue districts, depots and sub-depots are further clubbed into three regions or zones (See annexure Table 4a.1). The administrative set up of each region and city service is given in chapter two. Very detailed information at the depot level is not available. However,

some perspective on the differential performance of these

zones can be obtained from the data available. The city

service and the three regions have got different number

of depots and sub-depots (see annexure table 4a.1). There

are fourteen depots and five sub-depots in the south

zone. In the central region there are eight depots and

eight sub-depots. The north zone has five depots and six

sub-depots. The city service has got two depots and two

sub-depots. The depots and sub-depots (hereafter referred

to as units) were started in different years (see

annexure table 4a.2) due to demand from the public as

also political reasons {1}.

Table 4.1 shows the growth of the

three regions and the city service.For comparison and to

analyse the differential changes between years and

between the three regions and city service, we use the

two sub-periods viz., 1970-71 to 1978-79 and 1978-79 to

1986-87. The data show that the overall growth of the

three regions and the city service is not uniform.

In 1970-71, city service was operated

from one unit only. It increased to two by 1978-79 and in

1985-86 again two more units were added to it. When there

was only one unit it possessed 186 buses and 1,221 staff

to operate 167 schedules along 414 routes. It carried 558

TABLE 4.1

GROWTH OF CITY SERVICE AND THE ZONES

YEAR	UNITS	NO.OF BUSES HELD	STAFF	SCHED- ULES	PASSENG- ERS CAR- RIED	NO.OF ROUTES
CITY						
1970-71	1	186	1221	167	559	414
1978-79	2	258 (38.7)	1907 (56.2)	189 (13.2)	1051 (88.2)	716 (72.9)
1986-87	4	397 (53.8)	3334 (74.8)	169 (-10.6)	1407 (33.8)	1278 (78.5)
SOUTH						
1970-71	3	569	4285	505	1412	464
1978-79	14	1161 (104.0)	9517 (122.1)	1156 (128.9)	3169 (124.4)	1825 (293.3)
1986-87	19	1274 (9.7)	11600 (21.9)	1639 (41.8)	3457 (9.1)	2383 (30.6)
CENTRAL						
1970-71	4	543	4172	481	1014	353
1978-79	9	722 (33.0)	5771 (38.3)	661 (37.4)	1441 (42.1)	943 (167.1)
1986-87	16	752 (4.2)	7188 (24.6)	756 (14.4)	1716 (19.1)	1328 (40.8)
NORTH						
1970-71	1	122	864	104	121	63
1978-79	8	439 (259.8)	3786 (338.2)	440 (323.1)	666 (446.7)	361 (473.0)
1986-87	11	622 (41.7)	5326 (40.7)	598 (35.9)	983 (47.4)	578 (60.1)

Note: Figures in brackets denote the percentage change.

SOURCE: Administrative Reports of KSRTC 1970-71 to 1986-87.

lakh passengers during 1970-71. By 1978-79, when the number of units increased to two, there was increase in the number of buses held (38.7 percent),in the number of staff (56.2 percent),in the number of schedules (13.2 percent), in the number of passengers carried (88.2 percent) and in the number of routes (72.9 percent). Thereafter, when the number of units increased, the number of buses owned for the operation of city service increased by 53.8 percent,the number of staff by 74.8 percent and number of routes by 78.5 percent while the percentage change in the number of passengers carried was only 35.8 growth in the and growth in the number of schedules was negative. Here, the point to be noted is that while the number of staff, buses and routes increased in the second sub period the number of schedules remained almost the same.

The south zone had three units with 4,285 staff and 569 buses, to operate 505 schedules on 464 routes during the beginning of our analysis. It carried 1,412 lakh passengers. By 1978-79, as the number of units increased to fourteen, there was an increase in the number of buses owned (104.0 percent) and in the number of staff (122.1 percent). Hence with the increase in the units, buses and staff, the number of routes

increased by 293.3 percent,and schedules by 128.9 percent. Thereby, the passengers carried increased by 124.4 percent. But when we compare the growth of south zone in during 1978-79 to 1986-87 with that of 1970-71 to 1978-79, it is clear that the percentage change was very low with regard to the buses owned (9.7), staff (21.91), schedules(41.8), routes (30.6) and passengers carried (9.0).

The central zone by 1970-71 had four units with 4,172 staff and 543 buses, to operate 481 schedules on 353 routes. It carried 1,441 lakh passengers. By 1978-79, the number of units increased to nine, with an increase of 33.0 percent in the number of buses owned, 38.3 percent in the number of staff, 37.4 percent in the number of schedules, 42.1 percent in the number of passengers carried and 167.1 percent in the number of routes. By 1986-87, seven more units were started. But the growth in the number of buses held was only 4.2 percent, in the number of staff 24.6 percent, schedules 14.4 percent, routes 40.8 percent and passengers carried, 19.1 percent. Thus after 1978-79, when the service of the central zone was expanded, the growth in the number of buses owned, schedules, routes, staff declined.

In 1970-71 the north zone had only one unit with 864 staff and 122 buses, to operate 104 schedules in 63 routes and it carried 121 lakh passengers. With the increase in number of units to eight by 1978-79, the number of buses owned increased by 259.8 percent, the number of staff by 338.2 percent, the number of schedules by 323.1 percent, number of routes by 473.0 percent and number of passengers by 446.7 percent. By 1986-87 three more units were started, with only 41.7 percent increase in the number of buses held, 40.7 percent increase in staff, 35.9 percent increase in schedules, 60.1 percent increase in routes and 47.4 percent increase in the number of passengers carried.

Thus, we find there is considerable variation between the regions and city service in its growth throughout the period of our analysis. The increase in the growth of units, staff, number of buses held, number of passengers carried, number of schedules and routes was not uniform between the city service, south, central and north region. When the two sub-periods are compared, the percentage increase was very high in the first period with a subsequent decline in the second period in the south, central and north zones in regard to the staff, buses held, schedules, routes and passengers

carried. But in the case of city service, while the percentage change in the number of schedules operated and passengers carried declined compared with the first sub-period, there was an increase in the percentage of buses owned, number of routes and staff. Therefore, due to the differential growth and due to the distinctive feature with regard to the kind of services (city, ordinary, fast passenger, express) provided in the three regions and city service, an inter-regional analysis is useful to understand its impact on the over all performance of KSRTC.

The growth in the size of the three regions and city service has led to an increase in the assets of the Corporation. As a public "enterprise",the growth of the Corporation also depends on the " enterprise" dimension. Now let us see if the variation in the growth between the regions and city service is reflected in the financial performance, which in turn is a function of revenue and cost of operation. In a passenger road transport undertaking, the financial performance depends on the earnings and cost incurred by the effective kilometres run, the number of buses on road, the passengers carried. The financial performance of the three zones and city service is appraised in terms

of only one variable i.e., revenue {2} . No information on cost is available depot wise.

   We take the operating revenue of the three zones and city service which accrues mostly by the sale of tickets to the passengers travelling in the Corporation buses. That the fare structure varies according to the type of service is clear from Table 4.2. Hence fare per km is higher for longer distance travel. To analyze the variability in financial performance, we have taken (a) earnings per effective kilometre per day; (b) earnings per bus on road per day; and (c) earnings per passenger carried.

Table 4.2

Basic Fare Per Kilometre by Type of Service

Type of Service	Basic fare per kilometre (Ps)			
	1970	1974	1977	1981
City/ordinary	3.3	4.0	5.0	7.0
Fast passenger	3.3	4.3	5.5	8.0
Express	5.0	5.0	6.5	9.0
Deluxe	5.0	6.0	7.5	*

* Deluxe service discontinued from 16.12.1981.

SOURCE: Data taken from Kerala Economic Review, State Planning Board, Kerala Various issues.

Table 4.3 shows the earnings per effective kilometre per day in paise. It is the ratio of total earnings to total effective kilometres per day. It is related to the carrying capacity of the buses, type of servic and fare structure {3}. In the south zone the earnings per effective kilometre per day varied from 0.33 paise in 1970-71 to 1.29 paise by 1986-87. In the central zone the earnings per effective kilometre per day varied from 0.30 paise to 1.29 paise by 1986-87 while in the north zone it varied from 0.30 paise to 1.20 paise by 1986-87. The earnings varied from 0.26 to 1.14 for the city service.

Through out the period of analysis the performance of the south region was better. The average of earnings per effective kilometre per day during the first period was 0.46 paise in the south region, 0.43 paise in the central region, 0.43 paise in the north and 0.41 paise for the city service. During the second sub-period, the average of earnings per effective kilometre per day increased more than twofold in all the regions and for the city service and was again higher at 0.92 paise in the south, 0.89 paise in the central, 0.87 paise in the north and 0.90 paise for the city service. The average of earnings per effective kilometre per day

TABLE 4.3

EARNINGS PER EFFECTIVE KMS PER DAY (IN PAISE)

YEAR	CITY	SOUTH	CENTRAL	NORTH
1970-71	0.26	0.33	0.30	0.30
1971-72	0.28	0.36	0.32	0.31
1972-73	0.28	0.37	0.35	0.35
1973-74	0.30	0.40	0.37	0.37
1974-75	0.38	0.44	0.43	0.42
1975-76	0.43	0.49	0.46	0.45
1976-77	0.53	0.56	0.53	0.52
1977-78	0.58	0.59	0.54	0.59
1978-79	0.65	0.61	0.56	0.58
1979-80	0.66	0.65	0.62	0.64
1980-81	0.74	0.76	0.70	0.72
1981-82	0.88	0.81	0.83	0.85
1982-83	1.00	1.00	0.90	0.84
1983-84	1.03	0.99	0.91	0.87
1984-85	1.14	1.06	1.01	1.00
1985-86	1.14	1.19	1.21	1.16
1986-87	1.14	1.29	1.29	1.20

SOURCE: Estimated from Administrative Reports of
KSRTC 1970-71 to 1986-87.

in the south and city service was comparatively higher than central and north region due to the short distance services rendered by the Corporation in the south and city service.

Earnings per bus on road per day is derived by dividing passenger earnings by buses on road per day. It depends on the number of passengers carried and on the type of service operated. It is higher for the north and central zone relative to the south zone and the city service. Table 4.4 shows earning per vehicle on road per day increased from Rs 130.81 in 1970-71 to Rs 774.97 by 1986-87 for the city service. In the south zone, it increased from Rs 275.71 in 1970-71 to Rs 1459.4 by 1986-87. In the central, it increased from Rs 283.30 to Rs 1,511.44 during the same period. In 1970-71, the earnings was Rs 331.87 in the north region and it increased to Rs 1,390.43 by 1986-87 (except for 1977-78). The daily earnings per bus on road increased throughout the period of analysis in the all the zones. The north zone performed better than the other two regions except in 1977-78, 1985-86 and 1986-87.

Table 4.5 shows average earnings per passenger carried. It is estimated by dividing total earnings by the number of passengers carried in a year.

TH-5300

TABLE 4.4

EARNINGS PER VEHICLE ON ROAD PER DAY IN RS

YEAR	CITY	SOUTH	CENTRAL	NORTH
1970-71	130.81	275.73	283.32	331.86
1971-72	152.44	318.63	309.81	352.16
1972-73	172.15	328.00	329.32	384.99
1973-74	176.88	359.67	369.78	415.23
1974-75	210.55	436.14	470.90	513.64
1975-76	248.90	510.96	515.29	585.56
1976-77	298.46	580.79	591.70	643.78
1977-78	346.04	518.71	568.63	554.68
1978-79	380.3	605.70	615.48	637.48
1979-80	387.55	636.22	641.40	696.90
1980-81	454.93	755.21	734.77	791.92
1981-82	539.92	846.47	831.56	974.33
1982-83	549.87	941.89	937.37	992.82
1983-84	534.62	1012.82	966.14	1065.12
1984-85	646.42	1080.99	1053.37	1141.64
1985-86	654.67	1258.36	1245.37	1249.64
1986-87	774.97	1459.40	1511.42	1390.44

SOURCE: Estimated from Administrative Reports of KSRTC 1970-71 to 1986-87.

TABLE 4.5

AVERAGE EARNINGS PER PASSENGER CARRIED (PAISE)

YEAR	CITY	SOUTH	CENTRAL	NORTH
1970-71	15	36	46	95
1971-72	18	41	53	100
1972-73	18	44	58	108
1973-74	18	52	63	100
1974-75	22	55	69	123
1975-76	26	57	67	135
1976-77	29	77	90	164
1977-78	29	76	88	154
1978-79	29	71	87	133
1979-80	33	67	89	138
1980-81	37	82	96	148
1981-82	44	91	115	161
1982-83	47	105	130	163
1983-84	62	113	135	205
1984-85	58	122	146	202
1985-86	62	130	154	218
1986-87	66	138	172	230

SOURCE: Estimated from Administrative Reports
of KSRTC 1970-71 to 1986-87.

It increased throughout the period of analysis in all the regions and city service. The difference in the earnings per passenger is due to the varying fare structure which depends on the kind of service conducted. Among the three regions the earnings per passenger carried was lowest in the south region while the highest was in the north, throughout the period of analysis. This is mainly due to the difference in the fare structure for short and long distance service. There is not much variation between south and central in the average earnings per passenger, but the variation in the performance between south and north; and central and north is very high. The average earnings per passenger travelling by city service was lower than south, central and north because of the short distance service it renders.

Thus, we find there is variability in the earnings per effective kilometre per day, earnings per vehicle on road per day and earnings per passenger carried. The earnings per effective kilometre per day is high in the south and city service which is due to the higher number of passengers carried by it, while in the north region it is less because the passengers carried per effective kilometre is less. On the other hand, earnings per vehicle on road per day and earnings per

passenger carried is high in the north is to the higher fares for the long distance service it renderes. For instance it is estimated that the average distance travelled by passengers in city service was 9.4km, in the south 16.13km, central 18.58; and north 26.88kms (4).

Apart from the factors mentioned above viz. fare structure and distance travelled let us analyse other factors which would help to explain the variability in earnings. We have seen in table 4.1 that the growth in terms of buses owned, staff, passengers carried etc are not uniform. Therefore, factors like the proper asset utilisation, passengers carried, productivity of labour, starting buses on uneconomic routes due to political and other reasons {5}, ticketless travel {6}, social obligations, such as providing services on in economic routes, charging concessional fares from students, legislators and disabled persons, competition from private buses and other modes of transport etc affect the performance of the Corporation. We shall analyze some of the factors mentioned above.

Obviously, earnings can be increased if the schedules are scientifically planned to enable proper asset utilisation. Asset utilisation can be measured by fleet and vehicle utilisation. Fleet

utilisation, as stated earlier is the percentage of the
average number of buses on road to the average number of
buses held by the unit i.e. average number of buses on
road/average number of fleet held * 100 {7}. Vehicle
utilisation, which is measured in kilometres obtained per
bus per day is another component of asset utilisation.
Therefore, the earnings of each region and city service
depends to a great extent on asset utilisation.

The analysis in the third chapter
clearly shows that fleet utilisation has come down and
the number of buses in reserve and repair has gone up.
This has brought down the quality of service rendered by
the Corporation to the public. Now let us analyse the
performance of the three regions and city service in this
respect.

Table 4.6 shows the comparative
position of fleet utilisation of the three zones and the
city service. The performance of the city service which
is operated only in the Trivandrum district varies from
78.30 percent to 93.52 percent while in the south zone it
varies from 70 to 89 per cent, central zone 70 to 85 per
cent and north zone, 70 to 86 percent. During the period
of analysis the highest fleet utilisation, in the south
zone was in 1970-71 (89.91 percent) and the lowest in

127

1986-87 (70.56 percent).In the central zone,in 1972-73, fleet utilisation had risen to 85.52 percent. Then it started to decline and reached 71.20 percent by 1986-87. In the north zone, the fleet utilisation varied from about 70 percent to 86.57 percent between 1970-71 and 1986-87. The decline in fleet utilisation is due to the increase in the number of buses in reserve and repair.

The fleet utilisation was higher in the 1970s than in the 1980s in the three regions and for the city service. It indicates that the percentage of buses in repair and reserve was higher in the 1980s than in the 1970s. Between the three regions the south zone has done better than the other two regions during the whole period of analysis while the city service was able to perform better than the three zones throughout the period of analysis.

In the previous chapter we had seen that fleet utilisation for KSRTC was lower than the national average. This is true of city service and all the three zones. The low fleet utilisation could be due to both external and internal factors. Internal factors like improper resource management, high age structure of the buses {8}, over utilisation of buses, increase in accidents,breakdowns etc.influence the proper utilisation

TABLE 4.6

FLEET UTILISATION (%)

YEAR	CITY	SOUTH	CENTRAL	NORTH	ALL INDIA AVERAGE *
1970-71	91.29	89.91	83.80	78.31	
1971-72	90.40	82.61	82.78	76.66	
1972-73	89.04	85.49	85.52	82.02	
1973-74	89.66	84.77	80.83	82.04	
1974-75	93.52	85.99	78.37	78.87	
1975-76	90.81	85.81	79.40	81.05	
1976-77	89.69	89.59	82.79	83.27	
1977-78	80.77	88.78	79.95	83.73	
1978-79	84.10	87.08	77.43	86.57	
1979-80	86.29	86.62	78.19	82.98	
1980-81	83.63	83.19	72.87	77.50	
1981-82	82.28	78.29	72.47	71.66	84
1982-83	81.95	78.42	71.09	70.76	82
1983-84	80.27	75.86	70.39	70.35	84
1984-85	81.31	80.42	72.26	70.51	84
1985-86	78.30	74.63	72.83	70.54	85
1986-87	80.91	70.56	71.20	71.61	88

NOTE:* Data available from 1981-82 only from Performance
Statistics of STUs, Central Institute of Road
Transport, Pune.

SOURCE:Estimated from Administrative Reports of KSRTC
1970-71 to 1986-87.

of fleet. Another reason for the low fleet utilisation is the increase in time taken for repair and maintenance of the buses due to lack of modernisation of workshop facilities and lack of availability of spare parts. There are also external factors {9} like damage caused by public nuisance, poor road conditions, etc.

Vehicle utilisation, which is a better measure has a positive relationship with efficiency. Table 4.7 shows the vehicle utilisation of the three zones. Among the three regions the south region was doing badly, the north region better and the city service the worst. When we compare the performance of south and central region, we find that the central region performed better except in 1981-82 and 1985-86. In the case of central and north, the north region did better than the central region.

The north region had high vehicle utilisation than south, central and city service and this is reflected in the earnings per vehicle in the north region. From 1981-82 onwards, the vehicle utilisation of the three regions was much higher than the national average of the State Transport Undertakings while it was very low for city service. This implies that the buses are not used to the full extent in the city service.

TABLE 4.7

VEHICLE UTILISATION (kms)

YEAR	CITY	SOUTH	CENTRAL	NORTH	ALL INDIA AVERAGE *
1970-71	138.26	227.37	259.62	299.04	
1971-72	146.88	240.33	262.41	311.45	
1972-73	171.07	241.15	260.55	298.30	
1973-74	161.54	248.33	273.56	307.67	
1974-75	152.88	269.73	298.96	332.90	
1975-76	158.99	286.85	306.79	360.30	
1976-77	154.60	284.19	305.42	337.40	
1977-78	163.08	240.25	287.86	258.41	
1978-79	159.39	271.18	302.27	298.93	
1979-80	161.10	269.86	283.04	300.25	
1980-81	167.66	273.92	285.92	302.25	
1981-82	168.39	285.42	276.16	313.15	261.3
1982-83	150.88	258.63	286.55	324.47	257.0
1983-84	158.60	281.62	289.84	334.14	262.6
1984-85	155.56	279.29	285.97	311.53	261.4
1985-86	178.95	288.66	282.66	295.07	267.1
1986-87	186.61	309.51	321.64	316.25	272.4

NOTE: * Data available from 1981-82 only from Performance Statistics of STUs, Central Institute of Road Transport, Pune.

SOURCE: Estimated from Administrative Reports of KSRTC 1970-71 to 1986-87.

However, high vehicle utilisation in the zones coupled with low fleet utilisation suggests a certain degree of over utilisation of vehicles. While in the case of city service it suggests a degree of under utilization. This lowers the efficiency and increases the maintenance of the vehicles and thereby reduce fleet utilisation.

Vehicle utilisation also depends on manpower productivity. Manpower productivity or labour productivity is the kilometres operated per employee of KSRTC per day and it is arrived at by dividing the total kilometres operated per day by the number of employees. There is a positive relationship between efficiency and manpower productivity.

Table 4.8 shows the manpower productivity of the three regions and city service during 1970-87.Throughout the period of analysis the north region did much better than the other two regions and city service. There is not much difference in the performance between south and central regions. The performance of the city service was very poor compared to the three zones. The labour productivity of the three regions and city service is much lower than the national average of State Transport Undertakings.

TABLE 4.8

MANPOWER PRODUCTIVITY PER DAY (KMs.)

YEAR	CITY	SOUTH	CENTRAL	NORTH	ALL INDIA AVERAGE *
1970-71	19.23	27.15	28.30	32.99	
1971-72	22.59	24.22	26.90	30.60	
1972-73	19.05	24.00	27.40	30.00	
1973-74	18.64	23.37	27.86	34.38	
1974-75	20.00	26.63	28.19	31.10	
1975-76	19.71	27.73	31.04	35.53	
1976-77	20.69	31.95	31.40	34.58	
1977-78	18.31	26.90	29.37	29.32	
1978-79	18.12	28.79	29.29	29.97	
1979-80	17.03	28.25	26.33	29.67	
1980-81	19.98	27.95	24.96	28.99	
1981-82	18.00	26.27	23.73	26.14	27.4
1982-83	15.66	24.00	23.92	25.21	26.9
1983-84	16.36	25.67	25.73	25.10	28.4
1984-85	16.26	24.88	23.51	25.75	28.1
1985-86	17.69	24.22	22.27	24.52	28.7
1986-87	17.98	23.97	23.97	26.47	30.2

NOTE: * Data available from 1981-82 only from Performance Statistics of STUs, Central Institute of Road Transport, Pune.

SOURCE: Estimated from Administrative Reports, KSRTC., 1970-87.

133

TABLE 4.9

AVERAGE BREAKDOWNS PER 10,000 EFFECTIVE KILOMETRES

YEAR	CITY	SOUTH	CENTRAL	NORTH	ALL INDIA AVERAGE *
1970-71	2.20	2.40	1.88	1.30	
1971-72	2.90	2.90	2.10	1.70	
1972-73	2.50	2.50	1.98	1.30	
1973-74	2.40	2.50	2.15	1.40	
1974-75	1.70	2.50	2.33	1.70	
1975-76	1.10	2.73	2.45	1.60	
1976-77	1.10	1.73	1.93	1.50	
1977-78	1.00	1.86	2.04	1.70	
1978-79	2.65	3.11	2.66	2.48	
1979-80	4.05	3.19	2.78	2.19	
1980-81	2.50	2.76	2.91	2.46	
1981-82	2.55	2.67	2.67	2.31	1.29
1982-83	2.30	2.57	2.08	2.06	1.03
1983-84	1.95	2.26	1.68	1.52	1.02
1984-85	1.50	1.94	1.76	1.57	0.93
1985-86	0.90	1.79	1.91	1.48	0.94
1986-87	0.55	1.44	1.45	1.44	0.75

NOTE:* Data available from 1981-82 only from Performance Statistics of STUs, Central Institute of Road Transport,Pune.

SOURCE:Estimated from Administrative Reports of KSRTC 1970-71 to 1986-87.

The number of breakdowns of buses, which is an internal factor affecting the fleet utilisation is another measure of the operational efficiency of a transport undertaking. There would be an inverse relationship between the number of breakdowns and operational efficiency.

Table 4.9 shows that, south zone, has a larger number of breakdowns per 10,000 effective kilometres. The average number of breakdowns per 10,000 effective kilometres increased from 2.40 in 1970-71 to 2.73 by 1975-76. Eventhough in the next two years there was some improvement, from 1977-78 onwards the number of breakdowns increased and within three years it reached 3.19 breakdowns per 10,000 effective kilometres. Since 1979-80, the breakdowns in the south region has come down and reached 1.44 by 1986-87.

In the central zone, the number of breakdowns per 10,000 effective kilometres varied from 1.45 in 1986-87 to 2.91 in 1980-81. In the case of the north region, the number of breakdowns are the lowest though there was a sharp increase since 1978-79. In recent years there is some improvement. In the case of city servicee which showed a larger number of breakdowns per 10,000 effective kilometres almost throughout the

period peaking at 4.05 in 1979-80, there has been a sharp decline in the last few years.

When we compare the three zones the operational efficiency of the north zone is much better than the other two, and the performance of central zone was better than the south region throughout the 17 years.

The average number of breakdowns per 10,000 effective kilometres, in the city service and the three regions was higher than the national average. But in the case of city service it was lower than the national average from 1985-87.

Another indicator of the quality of service is the number of accidents involving the fleet of an undertaking during a given period of time which has an inverse relationship with efficiency. As accidents increase, fleet utilisation declines and the expenditure increases.

Table 4.10 shows the comparative performance of the three zones and city service of the Kerala State Road Transport Corporation.The city service and central zone appear to have the highest incidence of accidents. While the number of accidents per one lakh effective kilometres increased from 2.0 to 3.95 by 1979-80, in the city service and declined therafter, in

TABLE 4.10

AVERAGE ACCIDENTS PER 1 LAKH EFFECTIVE KILOMETRES

YEAR	CITY	SOUTH	CENTRAL	NORTH	ALL INDIA AVERAGE *
1970-71	2.00	2.30	3.23	2.50	
1971-72	1.90	1.93	2.93	2.20	
1972-73	2.20	1.60	2.83	2.10	
1973-74	2.50	1.65	2.75	1.90	
1974-75	2.80	1.85	2.75	1.80	
1975-76	3.10	2.03	3.20	1.90	
1976-77	3.00	2.02	2.98	0.80	
1977-78	2.90	2.16	2.88	1.90	
1978-79	3.60	2.36	3.62	2.03	
1979-80	3.95	2.31	3.11	1.71	
1980-81	2.65	2.26	3.11	1.60	
1981-82	2.60	2.11	3.05	1.55	0.81
1982-83	2.45	1.82	2.74	1.21	0.82
1983-84	2.65	1.52	2.35	0.92	0.80
1984-85	2.80	2.13	2.57	1.69	0.73
1985-86	1.78	2.08	2.15	1.71	0.65
1986-87	1.88	1.96	2.24	1.65	0.63

NOTE:* Data available from 1981-82 only from Performance
       Statistics of STUs, Central Institute of Road
       Transport, Pune.

SOURCE:Estimated from Administrative Reports of KSRTC
       1970-71 to 1986-87.

the central zone there was some reprieve only by the early half of the eighties. On the whole the number of accidents appear to be lower in the south zone.

In the north zone, accidents per 1 lakh kms declined sharply from 2.5 in 1970-71 to 0.80 in 1976-77. There was an increase since then reaching 1.65 by 1986-87. In all the three regions and city service, the number has come down by 1986-87.

The performance of north zone is by and large the best among the three zones for the greater part of the period under study, a larger number of accidents is observed in the central zone and city service. The average number of accidents per 1 lakh effective kilometers of the three regions and city service was much higher than the national average eventhough there was some improvement in the late eighties. Therefore, the high incidence of accidents is one of the factors affecting the efficiency of the Corporation. As accidents increase, the number of buses in reserve and repair increase, fleet utilisation declines, expenditure increases due to maintenance and compensation, earnings declines and quality of service goes down.

Another internal factor which affects earnings is the number of passengers carried. Table 4.11 shows that the average number of passengers carried per effective kilometres was higher in city

service throughout the period of analysis for obvious reasons. It varied between 5.43 and 8.33 passengers per effective kilometer. Among the three regions south carried more passengers per kilometre and north carried

TABLE 4.11

AVERAGE PASSENGERS CARRIED / EFFECTIVE KILOMETRES

YEAR	CITY	SOUTH	CENTRAL	NORTH
1970-71	6.52	3.33	2.35	1.17
1971-72	6.17	3.23	2.22	1.13
1972-73	5.43	3.11	2.18	1.19
1973-74	5.65	2.80	2.14	1.35
1974-75	6.01	2.93	2.27	1.25
1975-76	6.33	3.15	2.52	1.20
1976-77	6.28	2.65	2.16	1.14
1977-78	7.32	2.84	2.24	1.39
1978-79	8.33	3.17	2.34	1.61
1979-80	7.69	3.52	2.56	1.69
1980-81	7.40	3.38	2.66	1.77
1981-82	7.60	3.25	2.63	1.93
1982-83	7.95	3.48	2.51	1.88
1983-84	6.23	3.22	2.46	1.55
1984-85	7.14	3.18	2.52	1.81
1985-86	5.98	3.34	2.85	1.94
1986-87	6.43	3.41	2.73	1.91

SOURCE: Estimated from Administrative Reports of
        KSRTC 1970-71 to 1986-87.

the least. However, as was pointed out earlier, average earnings per passenger was high in the north and central while it was low in the south zone. In the north region the earnings per passenger is high inspite of low passengers carried per kilometre which is due to the longer distance on average travelled by the passenger for which the fare is higher. In the south and city service with higher number of passengers per effective kilometre, the earnings per passenger is lower due to the short distance travelled on average. It may also be due to the higher number of student commuters on concessional fares depending on the public transport system due to non-availability of private buses.

Apart from the type of service operated there are other reasons for the variation in earnings between city service and zones. One reason is the accessibility to passenger transport. Accessibility refers to how far the transport service has reached or penetrated to serve a particular region.

Table 4.12 gives the district wise bus population ratio and the ratio of private buses to public buses. The service rendered by public buses per lakh of population was highest in Trivandrum district {10} (25.23) and the lowest in the Malappuram district

(2.07). At the same time, the private buses per lakh population was lowest in Trivandrum district (15.22) and was highest in Trichur district (43.30). In Alleppey and Quilon district both public and the private sector are offering services,but the absolute level of accessibility of buses is lower in both the regions. In Trivandrum and Alleppey districts the competition the public sector has to face from the private sector is very low when compared to the other regions. The competition from private buses is very high in the Malappuram district.

Now let us analyze the accessibility of buses both private and public to the urban and rural areas per lakh population. Table 4.13 shows that except for Trivandrum, Alleppey and Kottayam districts transport facilities for the urban (U) and particularly rural (R) population are served mainly by private buses.

Information on private buses which is given by districts, has been clubbed into the zones - south, central and north as shown in preceding tables for a period of nine years - 1978-79 to 1986-87 (see Table 4.14). The ratio of public to private buses is estimated to show the extent of competition between the two modes of passenger transport in the three zones.

TABLE 4.12

ACCESSIBILITY OF BUS FACILITIES TO THE TOTAL POPULATION
IN KERALA - 1981

DISTRICTS	PUBLIC BUSES PER LAKH POPULATION	PRIVATE BUSES PER LAKH POPULATION	PRIVATE / PUBLIC
SOUTH ZONE			
TRIVANDRUM	25.23	15.22	0.60
QUILON	12.61	17.88	1.42
ALLEPPEY	17.86	17.36	0.97
CENTRAL ZONE			
KOTTAYAM	17.57	35.71	2.03
ERNAKULAM	9.83	35.08	3.57
TRICHUR	6.61	43.30	6.55
NORTH ZONE			
PALGHAT	3.60	22.60	6.29
MALAPPURAM	2.07	21.77	10.52
KOZHIKODE	6.81	35.14	5.16
CANNANORE	6.10	24.81	4.07

SOURCE: Public buses estimated from Administrative
Report of KSRTC, 1981.

Economic Review of Kerala, 1981.
Census of India, 1981.

Note : The broad division of the districts into zones,
south central and north is also given

TABLE 4.13

ACCESSIBILITY OF BUS FACILITIES TO URBAN
AND RURAL POPULATION - 1981

DISTRICTS	PUBLIC BUSES/ LAKH POPULA- TION (U)	PRIVATE BUSES/ LAKH POPULA- TION (U)	PUBLIC BUSES/ LAKH POPULA- TION (R)	PRIVATE BUSES/ LAKH POPULA- TION (R)
SOUTH ZONE				
TRIVANDRUM	100.00	60.31	33.76	20.36
QUILON	95.86	135.95	14.52	20.59
ALLEPPEY	112.52	109.38	21.24	20.65
CENTRAL ZONE				
KOTTAYAM	187.48	381.13	19.38	39.40
ERNAKULAM	32.93	117.48	14.02	50.02
TRICHUR	31.36	205.45	8.38	54.89
NORTH ZONE				
PALGHAT	35.68	224.27	4.00	25.15
MALAPPURAM	28.08	295.48	2.23	23.52
KOZHIKODE	25.07	129.34	9.35	48.26
CANNANORE	31.27	127.18	7.58	30.84

SOURCE: Public buses estimated from Administrative
Report of KSRTC, 1981.

Economic Review of Kerala, 1981.
Census of India, 1981.

Table 4.14 shows that competition
from private buses was very low in the south zone {11}
when compared to the central and north region. The demand
for transport facilities are met mainly by the private
buses in the central and north. As we have already seen,

the passengers carried by the KSRTC buses in the central and north was low and over much longer distance than the south. However the increase in the ratio in the south reflects the increasing demand for transport facilities, in the south zone, and the inability of KSRTC to cope with this demand.

Now let us analyse the impact of competition from other modes, especially three wheelers, two wheelers and four wheelers due to the inadequate bus system.

TABLE 4.14

RATIO OF PRIVATE BUSES/ PUBLIC BUSES

YEAR	SOUTH	CENTRAL	NORTH
1978-79	0.74	1.65	2.17
1979-80	0.79	1.80	2.15
1980-81	0.84	1.92	2.26
1981-82	0.91	2.17	2.71
1982-83	1.11	2.57	3.01
1983-84	1.22	2.65	3.15
1984-85	1.52	3.36	3.74
1985-86	1.76	3.93	3.97
1986-87	2.11	4.36	4.42

SOURCE: Economic Review of Kerala,
1978-79 to 1986-87.

Administrative Report of KSRTC,
1978-79 to 1986-87.

144

Table 4.15, shows the accelerated growth
of other modes of transport. From the table it is clear that
the competition from other modes has been increasing from
1978-79 onwards in the south, central and north region. In
the south, it increased from 36.41 to 88.52 by 1986-87, in
the central it increased from 45.26 to 141.37 and in the
north it increased to 121.32 by 1986-87 from 51.90 in 1978-
79. As a consequence, of the growth of other modes of
transport, the problems due to congestion, pollution and
energy consumption for public transportation gets aggravated.
Thus, the competition from private buses and other modes of
transport is high in the north and central region than in the
south region.

Summing up, in this chapter, we analysed
the inter zonal performance of KSRTC in order to enhance our
understanding of the factors underlying performance.Despite
the poor overall performance of the corporation, there was
some inter zonal variability.The variability in earnings was
to some extent due to the different services operated by the
Corporation and thereby due to the different fare structure.
Other factors such as asset utilisation, passengers carried
per effective kilometer, accessibility of bus services,
competition from private buses and other modes of transport,
also affected performance in the 3 regions and city service
differentially. The north region was able to earn more

revenue per vehicle and per passenger than the rest due to its relatively longer distance service, competition from private buses, growth in other modes of transport. Despite the lesser number of passengers carried it had higher labour productivity and vehicle utilisation. In the city service inspite of better fleet utilisation and larger number of passengers carried, the earnings, per passenger and per vehicle is low due to the low fare charged for the short distance services, low vehicle utilisation and low labour productivity; competition from private buses is relatively low. This finding we feel has major policy implication which we take up in the next chapter.

TABLE 4.15
RATIO OF OTHER MODES OF TRANSPORT/ PUBLIC BUSES

YEAR	SOUTH	CENTRAL	NORTH
1978-79	36.41	45.26	51.90
1979-80	41.07	53.75	55.31
1980-81	43.74	57.66	60.96
1981-82	47.05	64.59	70.31
1982-83	51.60	74.92	79.10
1983-84	58.73	89.43	102.87
1984-85	61.46	95.78	95.71
1985-86	69.71	114.24	99.11
1986-87	88.52	141.37	121.32

SOURCE: Economic Review of Kerala,
        1978-79 to 1986-87.
        Administrative Report of KSRTC,
        1978-79 to 1986-87.

NOTES AND REFERENCES

{1}   Information provided by an officer of KSRTC.

{2}   Unit-wise data of cost is not available.

{3}   Different fares are charged for the different kinds of services.

{4}   Kerala, Economic Review 1987, State Planning Board, Trivandrum.

{5}   Information provided by an officer of KSRTC.

{6}   Data not available.

{7}   Performance Statistics of STUs, Central Institute of Road Transport, Pune.

{8}   Unit wise data of age structure of buses is not available.

{9}   Information provided by an officer of KSRTC.

{10}   City service is included under Trivandrum district and therefore south zone.

{11}   In this table buses held by city service is included in the south zone.

ANNEXURE

TABLE 4a.1

UNITS IN ZONES AND CITY SERVICE

DEPOTS

SOUTH ZONE	CENTRAL ZONE	NORTH ZONE
Quilon	Ernakulam	Guruvayoor
Alleppy	Kottayam	Cannanore
Kayamkulam	Trichur	Sultan Battery
Vizhinjam	Alwaye	Palaghat
Attingal	Palai	Kozhikode
Neyyattinkara	Perumbavoor	
Changanacherry	Muvattupuzha	
Chengannoor	Mala	
Kottarakara		
Thiruvalla		
Pathanamthitta		
Nedumangad		
Attingal		
Parasala		
Trivandrum Central		

SUB-DEPOTS

SOUTH ZONE	CENTRAL ZONE	NORTH ZONE
Poovar	Vaikom	Perinthalmana
Haripad	Sherthali	Thamarassery
Punalur	Puthucad	Ponnai
Kattakkada	Kothamangalam	Kasargode
Adoor	Erattupetta	Payyannur
	Thodupuzha	Malappuram
	Chalakkudy	
	Ponnkunnam	

CITY SERVICE

DEPOTS	SUB-DEPOTS
Pappanamcode	Vikas Bhavan
Trivandrum City	Peroorkada

Source: Administrative Report of KSRTC, 1988-89.
Census of India, 1971.

TABLE 4a.2

NUMBER OF UNITS

YEAR	CITY	SOUTH	CENTRAL	NORTH
1970-71	1	3	4	1
1971-72	1	3	4	1
1972-73	1	4	4	1
1973-74	1	4	4	1
1974-75	1	4	4	1
1975-76	1	6	4	1
1976-77	1	6	4	2
1977-78	1	8	5	2
1978-79	2	14	9	8
1979-80	2	14	10	8
1980-81	2	14	11	8
1981-82	2	15	11	8
1982-83	2	15	11	8
1983-84	2	15	12	9
1984-85	2	15	12	9
1985-86	4	17	15	10
1986-87	4	19	16	11

SOURCE: Administrative Reports of KSRTC,
1970-71 to 1986-87.

CHAPTER 5

SUMMARY AND CONCLUSION

To conclude this study, which aimed at an economic analysis of the Kerala State Road Transport Corporation for a period of seventeen years from 1970-71 to 1986-87, we put together the main findings. Like most of the developing countries, India adopted the path of planned economic development and transport was recognised as an essential component of economic development,since it facilitated the movement of material inputs and outputs of the various sectors of the economy as also for carrying people. There are different modes of passenger and goods transport; road transport is the most important one because of its flexibility and ability to penetrate into hitherto inaccessible areas to offer its service. Transport services are undertaken either by the public or by private sector or both. The role and objectives of public enterprise is different from that of private enterprise, therefore, investment and pricing is also different. Accordingly, the methodology used to evaluate the performance of both the enterprises has to be different, and there has been a

tremendous debate on the methods of evaluating performance of public enterprises in developing countries, both in official and academic circles all over the world. However, it is being icreaseingly opined that financial evaluation is important for assessing the long term viability of a public enterprise.

Public passenger road transport is faced with a dilemma - while social responsibilities such as low fares and provision of service on uneconomic routes are being imposed on these undertakings on the one hand; on the other they are also being subjected to severe criticism for accumulated losses. Keeping in view the importance of the undertaking and the huge investment involved, an appraisal of the performance of the Kerala State Road Transport Corporation which made substantial losses over the entire period was undertaken in this study which has the following objectives :

1.   To evaluate the performance of KSRTC. in terms of partial and total factor productivity. Other physical and financial indicators are also used.

2.   To evaluate and analyze the regional or zonal variation in the performance of KSRTC.

3.   To discern factors accountable for the poor

performance, both internal and external to the

Corporation.

However, we have not rigorously

incorporated the Corporation's major social objectives in

appraising its performance but have emphasised the

physical indicators of performance to overcome the

limitations of a financial approach.

The analysis is based primarily on

secondary sources of data for a period of seventeen

years, 1970-71 to 1986-87. The data on the all-India

averages of the State Transport Undertakings for a period

of seven years is used for comparison (1981-82 to 1986-

87).

The study begins with a brief

historical overview of development in the motor transport

sector. In India the second half of the nineteenth

century marks a new era in the development of transport

facilities. The first Indian Motor Vehicles Act came into

force in 1914. But since it could not cope with the new

pressures in the growth of vehicles and the cut-throat

competition between operators and rail and road, it was

supplemented in 1939. Soon after Independence, in most of

the States in India, emphasis was given to

nationalisation of passenger road transport services. A
national policy was adopted in 1948, of progressively
nationalising road transport operations, by bringing in a
Road Transport Corporation Act empowering State
Governments to undertake the organisation of road
services. The major reason for resorting to
nationalisation was the failure of the private operators
to provide safe, economic and adequate services to the
ever increasing commuting public. This Act was
subsequently revised and replaced by the Road Transport
Corporation Act, 1950. According to this Act, the
objectives of public transport were to provide, promote
or secure an efficient, adequate, economical and properly
co-ordinated transport service, and while doing so to
abide by "business principle". The 1950 Act, enabled the
State governments to establish Road Transport
Corporations for the whole or any part of the State in
order to offer to the public the advantages of road
transport. The capital of State Road Transport
Undertakings was provided by State and Central Government
as stated in section 23 of the Road Transport Corporation
Act.

The Kerala State Road Transport
Department was converted into an autonomous Corporation

in 1965, on the lines embodied in the Road Transport Corporation Act, 1950, inorder to expedite the process of nationalization and receive financial assistance from the Central Government. The management of the Corporation was vested with a Board of Management which consisted of nine members including the Chairman. The corporation was divided into depots and sub-depots which were recently organised into three zones, South, Central and North. At the time of the formation of the Corporation there were altogether ten depots and two sub-depots, by 1987 it has expanded to twenty-seven depots and twenty-three sub-depots. The maintenance service is done in the Divisional, Central, Regional and Depot workshops. The Corporation possessed 901 buses operating in 661 schedules along 533 routes having a total route length of 17,832 kilometres and carried 139.9 million passengers at the time of its formation. By 1986-87, the number of buses increased to 3,019, over a three fold increase, operating 3,162 schedules. The commuters however increased by five fold to 756.25 million. The number of staff increased by more than the percentage increases in buses from 7,698 in 1965 to 27,448 by 1987. The Corporation could run on profit only during the first two years of its formation (1965-66 and 1966-67). Since then

KSRTC has been making loss. The cumulative loss as on 31-3-1987 stood at Rs 96.21 crores. In addition to this, the written off dues amounted to Rs.65.11 crores. Prima facie, therefore, there is evidence of unsatisfactory performance as indicated by the accumulated loss. We therefore, go deeper into the factors responsible for the accumulated loss in KSRTC from 1970-71 to 1986-87.

The analysis reveals that the reasons are manifold and inter-related in nature. Assuming the Corporation is a "firm" we have estimated the performance of KSRTC. in terms of conventional measures like partial productivity and total factor productivity (TFP). We have calculated the TFP growth using three commonly used measures, namely Kendrick, Solow, and Translog. All have demonstrated discouraging trends suggesting poor performance almost throughout the period. We have also attempted to measure performance in terms of physical and financial indicators.

The operational performance depends mainly on fleet utilisation and vehicle utilisation. While fleet utilisation is an efficiency indicator showing the proportion of vehicles put on road to the total fleet held, vehicle utilisation indicates the effective kilometres performed per bus on road per day.

The all-India average of fleet utilisation which was 84 percent in 1981-82 gradually improved to reach 87.7 percent in 1986-87 while in KSRTC it has come down to 72.3 percent from 86.68 percent in 1970-71; vehicle utilisation was higher than the all-India average. The low fleet utilisation is due to the increase in average number of buses in reserve and repair, which in turn depends on the age of the fleet and the maintenance practices being followed. If the average age at which the bus should be replaced is taken as seven years then about 46 percent of the total fleet of KSRTC is overaged. Distributing the buses into four age groups for the two sub-periods we find that the share of buses in the second period in the age group of less than one year has come down from 9.76 to 7.07 percent and from 36.08 to 31.82 percent between the age group 1 to 5, while it has increased from 30.39 to 34.29 percent between 5 and 10 years and from 23.77 to 26.83 percent in the case of buses above 10 years. Although the data on average number of breakdowns per 10,000 effective kilometres and accidents per 1,00,000 effective kilometres show a declining trend overtime, these are above the all India averages and this improvement is not sufficient to increase fleet utilisation which is much lower when

compared to the all-India average. The productivity of vehicles depends to a large extent on their proper maintenance. Apart from labour productivity, facilities in the workshops and its modernisation, play a major role in this respect.

An analysis of the staff-bus ratio shows an increasing trend overtime. This is made clearer when compared to the all-India average. The staff bus ratio of KSRTC which was 13.39 in 1981-82 increased to 14.56 in 1986-87. During the same period, the national average of staff bus ratio showed a decline from 9.65 to 9.02. This suggests that there is some over staffing in the Corporation. The number of passengers carried by its fleet which is the output of a passenger transport undertaking has increased overtime. But the compound growth rate which was 8.2 percent in the first period has come down to 0.7 in the second sub-period due to the low fleet utilisation and growth of other modes of transport. This poor physical performance was reflected in the financial performance of the Corporation. The data shows that, with the revenue earned it was not possible to cover the cost. Higher cost and low revenue have resulted in a declining trend in profitability. A break-up of cost showed the principal factors responsible for increase in

157

cost. It turned out to be personnel, fuel and lubricant
and material cost, which is mainly due to the increase in
staff and increase in the number of buses above five
years. The increase in the staff cost (44.11 percent of
total cost in 1986-87) has been much steeper as compared
to that of other input costs. Next to staff, is the cost
of fuel and lubricants which account for 20.78 percent
of the total cost of operations and the material (tyres,
tubes and spare parts) cost which accounts for 13.23
percent of the total cost.

Inorder to see if this poor overall
performance of the Corporation conceals zonal variations
we analyzed the performance of Trivandrum city service
and the three zones into which the Corporation is
organised. Some variability in the performance between
the three regions and city service in the earnings
observed due to certain external and internal factors.
The internal factors we have taken for analysis are asset
utilisation, breakdowns, accidents, labour productivity,
passengers carried and the external factors are
competition from other modes of transport, in particular
from private buses and accessibility of bus facilities.
It is of interest to note that the earnings per effective
kilometre, earnings per vehicle and earnings per

passengers carried in the city service is lower inspite of better fleet utilisation and higher number of passengers carried than in all the zones. This may be due to the shorter distance travelled involving lower fare low vehicle utilization and a virtual lack of competition from private buses. Apart from these we find that, labour productivity and vehicle utilisation is low in the city service. In the south region, earnings per effective kilometres is higher than the rest due to high number of passengers carried per effective kilometre and also since the competition from private and other modes of transport is less than the other regions but earnings per bus and per passenger were lower. The fleet utilisation is better than the other two regions but breakdowns is higher than the other two regions and city service. In the central region the public buses have to face competition from the private buses and fleet utilisation was very low and accidents was much higher than city service, south and north. Therefore, the earnings per vehicle were lower than the other two zones. The north region appears to have performed relatively better in terms of most of the indicators. It was able to earn more revenue per vehicle and per passenger than the rest inspite of competition from private buses, growth in other modes of transport,

low accessibility of public buses and lesser number of passengers carried. This shows that in the north zone the public transport provides less of ordinary short distance service, which is being provided largely by private transport. We also find that the manpower productivity and vehicle utilisation is relatively higher. Hence, to some extent the variability in the earnings of the three regions and the city service is due to the different services operated by the Corporation and due to the different fare structure as also differential asset utilisation.

To conclude, the performance of the Kerala State Road Transport Corporation was generally unsatisfactory in the period 1970-71 to 1986-87. The two sub-periods into which we divided the total period show that there was deterioration in performance of the Corporation in the second period. The main reason for the poor performance is the low fleet utilisation and low quality of service on account of the increase in the number of overaged buses, higher staff bus ratio and low labour productivity. The poor quality service is reflected in the high frequency of breakdowns and accidents. The ratio of breakdowns and accidents was higher than the all-India average, due primarily to high

incidence of overaged buses in the fleet, while the high accident ratio to some extent may be due to exogenous factors beyond the control of management such as heavy traffic flow arising due to high density of population and poor road conditions. Without achieving a reasonable level in terms of physical performance the Corporation cannot attain financial viability. In sum,if the financial performance of KSRTC is to be improved, the physical performance has to be improved.

Our study has provided some in sights into the future restructuring of the Corporation to improve its economic efficiency. Such measures have to come in a package, and we are not competent enough to suggest the nature of such a total package which, inter alia, would include managerial and organisational aspects. However our study has highlighted two measures which have to be a major element of the reform package - one is the modernisation of the fleet and second is the rationalisation of staffing pattern which at present pull down the productivity of the Corporation. An interesting aspect of our study is the regional dimension of the problem of efficiency and cost effectiveness. As elaborately discussed in chapter 4, the corporation at present operates uneconomically in the regions, where in

the absence of competition from private road transport it caters to short distance travel by running overaged buses and therefore earning much lower revenue per bus and per passenger. By implication the KSRTC should increasingly confine its operations to long distance travel, leaving short distance travel to a well regulated system of private transport services.

BIBLIOGRAPHY

Agarwal M.D,   (1987)   Efficiency of Public Enterprises in India, Prateeksha Publications, Jaipur.

Agarwal,Dr.V.K,   (1984)   "Public Enterprises in India : Sharma,O.P.Prof., Achievements and Challenges ", Lok Udyog, December.

Ahluwalia Judge,   (1985)   Industrial Growth in India : Stagnation since the mid-sixties, Oxford University.

Ahmed, Zia U,   (1981)   "Financial Profitability and Losses in Public Enterprises", Public Enterprise, 2(1),pp 8-21.

Amaresh Bagchi,   (1987)   Review of Plan Financing in Kerala During Govinda,M.R., the 6th Plan,National Institute of Public Finance and Policy, New Delhi, December.

Amey, L.R.,   (1969)   Efficiency of Business Enterprises, London, George Allen and Unwin, p.10.

Anandaraj,.R,   (1987)   Firm Level Analysis of Productivity Change in the Cotton Textile Industry in India: 1965-66 to 1978-79, M.Phil Thesis submitted to Jawaharlal Nehru University, New Delhi.

Aroon.K.Basak.,   (1975)   "Management and Performance of Public Enterprises in Developing Countries : The Need for Further Research",Lok Udyog,June.

Arora, S.K.,   (1987)   Economics of Management in Road Transport Industry, Deep & Deep Publications, New Delhi.

Atkinson,A.B.,   (1980)   Lectures on Public Economics, McGraw Hill Book Co. UK .

163

Ayyar, J.M.,   (1976)   "Public Sector Profits in True
                              Perspective Lok Udyog,
                              September.

Bagade, M.V.,   (1986)   "A new look at Performance
                              Appraisal of STUs", Journal of
                              Transport Management, April.

    "   (1991)   "A Model for Achieving Urban
                              Mobility", Journal of Transport
                              Management, September.

    "   (1991)   "Urban Transport Scenario in
                              South Asian Countries", Journal
                              of Transport Management,
                              December.

Balasubramanian,K.M   "Traffic Problem in Metropolitan
                              Cities", (1981) Yojana, Vol.25,
                              No.6, April.

Banergi, A.,   (1975)   Capital Intensity and
                              Productivity in Indian
                              Industries, Macmillan, Delhi.

Bapat, N..,   (1979)   "Losses in Public Sector
                              Enterprises, Government should
                              not Interfere into Day-to-Day
                              Affairs", Yojana, December,
                              Vol.29.

Behara,A.S.,   (1991)   "Methodologies for Augmentation
                              of Bus Services on Existing
                              Routes in STUs", Journal of
                              Transport Management,September.

Bhalla,G.S.,   (1971)   "Financing Public Enterprises in
                              India", Lok Udyog, July.

Bhupatkar.A.P.,   (1990)   "STUs and Public Sector in
                              India: An Overview", Journal of
                              Transport Management, October.

Boadway, Robin.W,(1979)   Public Sector Economics,
                              Winthrop Publishers Inc.,
                              Cambridge Massachusetts.

Bright Singh,D.,   (1973)   "The Vital Role of Public Sector
                              in our National Economy",
                              Yojana, Vol.17, November 15.

Caves, R.E.,   (1981)   "Productivity Growth,Scale
                               Economies and Christensen,L.R
                               and Capacity Utilisation US
                               Railroads, 1955-Swanson, J.A,
                               74", American Economic Review,
                               Vol.71.

Central Institute of   Performance Statistics of STUs,
Road Transport,   Pune

Chandrasekhara Rao,(1990)"Productivity and Operating
Madhavi Latha, K.,   Efficiency in Public
                               Enterprises: A Study,Prajnan,
                               No.1.

Chaturvedi,Dr.M.C,(1981)   "Performance of Public Sector
                               Transport Undertakings", Yojana,
                               Vol.5, January 26.

Chopra,T.S.,   (1991)   "Financing Arrangements for
                               State Transport Undertakings,
                               Journal of Transport Management,
                               July.

Chowdhry,prof.R.K.,(1972)"Transportation : The Challenge
                               to Mobility", Lok Udyog, April.

Colins,Jones,   (1972)   "The Private Transport
                               Revolution in Britain",
                               Transport Journal,Vol 22, No.1,
                               January.

Collins, A.E.L., (1949), United State of Travancore and
                               Cochin State Transport Services,
                               Government of Travancore and
                               Cochin.

Das,N.,   (1977)   "On the Working of a Public
                               Transport Undertaking",
                               Management Accountant, July.

Dennis Rajakumar,J,(1991) Effectiveness of Incentive
                               Schemes in Kattabomman
                               Transport Corporation Ltd,
                               Thirunelveli, A Project Report,
                               April.

Dennison, E.F.,   (1961)   'Measurement of Labour Input :
                              Some Questions of Definition
                              and Adequacy of the Data", in
                              Output, Input and Productivity
                              Measurement, NBER.

Deshmukh,A.R.,   (1991)   "Creative Accounting : A New
                              Social Cost Benefit Approach to
                              Read the Balance-Sheet of STUs;
                              A Case of MSRTC", Journal of
                              Transport Management,September.

Dholakia,H.B.,   (1978)   "Relative Performance of Public
                              and Private Manufacturing
                              Enterprises in India, Total
                              Factor Productivity Approach,
                              Vol.13, Economic and Political
                              weekly, Review of Management,
                              February.

        "   (1980)   "Trends in Economic Efficiency
                              of Indian Railways ", Lok Udyog,
                              April.

Dholakia,H.B.,   (1976)   "Total Performance Evaluation
Khurana,R.,   System for and Public
                              Enterprises, Lok Udyog,Vol.1,
                              No.4.

Drucker, P.F.,   (1975)   Management : Tasks,
                              Responsibilities, Practices,
                              Bombay, Allied Publishers,Pvt.
                              Ltd.

Dutt,A.K.,   (1979)   "Organisation and Management of
                              Delhi Transport Corporation",
                              Nagarlok, Vol.11, No.1,
                              January-March.

Dutt,K.M.,   (1982)   "Pricing by Public Enterprises-
                              An orientation to Suit all
                              Interests", Lok Udyog, May.

Dutt,R.C.,   (1981)   "Has our Public Sector Failed?",
                              Mainstream, 19(21-22),
                              January 26.

Dutt,R.L.,   (1976)   "Objectives of the Public
                                Sector, <u>Lok Udyog</u>, Vol.10,
                                February.

Fernandez,Praxy.J(1981)   <u>Promises and Performance : A</u>
                                <u>Search for a Credible System of</u>
                                <u>Evaluating the Efficiency of</u>
                                <u>Public Enterprises : A</u>
                                <u>Monograph</u>, International Centre
                                for Public Enterprises in
                                Developing Countries,
                                Ljubligana.

        "   (1975)   "Public Sector:Performance and
                                Prospects", <u>Lok Udyog</u>, 9(2) May,
                                pp 61-3.

Geoffry,Francis, (1974)   "Transport and society",
                                <u>Transport Journal</u>, March.

Goldar, B.N.,   (1986)   <u>Productivity Growth in Indian</u>
                                <u>Industry</u>.

Government of   (1968)   <u>Report of the Study Group on</u>
India   <u>Viable Units</u>, Ministry of
                                Shipping and Transport, New
                                Delhi.

        "   (1971)   <u>Review of Public Sector Road</u>
                                <u>Transport 1969-70</u>, Ministry of
                                Shipping and Transport, New
                                Delhi, December.

        "   (1980)   <u>A Reference Manual</u> ,Ministry of
                                information and broadcasting,
                                Publications Division, New
                                Delhi.

        "   (1980)   <u>Report of the National Transport</u>
                                <u>Policy Committee</u>, Planning
                                Commission, New Delhi.

        "   (1984)   <u>Report of the Working Group on</u>
                                <u>Road Transport for the 7th Five</u>
                                <u>Year Plan, 1985-90</u>, Ministry of
                                Shipping and Transport, New
                                Delhi, November.

	(1989)	Frame Work of Sixth Five Year Plan 1980-1985, Planning Commission, New Delhi.
	(1991)	A Study on the Performance of STUs, Planning Commission, New Delhi,September.
Government of Kerala,	(1965)	Road Transport Corporation Act, Rules, Notifications,Orders and Regulations.
..	(1977)	Report on the Working of the Kerala State Road Transport Corporation, Committee on Road Transport, May.
	(1984)	Report of the High Level Committee on Physical Infra -structure and Transport, State Planning Board, Trivandrum, January. Administrative Reports of K.S.R.T.C, Trivandrum.
	(1989)˙	Report of the Task Force on Road Development,Eighth Five-Year Plan 1990-95, State Planning Board, Trivandrum.
Government of Travancore,	(1939)	Report on the Administration of the Transport Department for the year 1113 ME (20 September 1937 - August 1938), Trivandrum.
Gupta,M.,	(1982)	"Productivity Performance of the Public and Private Sector in India: A Case Study of the Fertiliser Industry", Indian Economic Review, 18, No. 24.
Halder.D.K.,and Satyabrata,Basu	(1979)	"Financial Performance of the CSTC Vis-a- Vis Private Operators : A Comparative Study", Nagarlok, Vol.11 No.2, April-June.

Hanumantha,Ch.Rao,(1992) "Bus services before and after Nationalisation in Srikakulam - A study", Journal of Transport Management, February.

Hanumanthappa,K.,(1976) "Cost Control in Road Passenger Transport - A Study with Particular Reference to K.S.R.T.C", The Management Accountant, June 4.

Hashim, B.R. and (1973) Capital Output Relations in
Dadi, M.M., Indian Manufacturing (1946-64), M.S.University of Baroda, Baroda.

Hemalatha Rao, (1987) Financial Performance of Public Enterprises : A Study of Karnataka Electricity Board, Printwell, Jaipur.

Ibrahim ,P., (1978) "Transportation Development in Kerala", Social Scientist, March, Vol 6, No 8.

Ishaq N.M., (1970) "Some Approaches to the Theory and Measurement of Total Factor Productivity: A Survey", Journal of Economic Literature, Vol .2, p. 1137.

Jain,J.K., (1973) Transport Economics, Allahabad.

James.O.Wheeler and , Economic Geography, 2nd Edition,
Peter.O.Muller John Wiley and Sons, New York, Chichester, Brisbane, Toronto, Singapore.

Jayadeva Das .D.,(1971) Administration of K.S.R.T.C., Ph.D Thesis, University of Kerala, October.

Jegadish Gandhi P &(1990) "Operational Dynamics of STUs in
John Gunaseelan G., Tamil Nadu : A focal Study", Journal of Transport Management, August.

John R.Meyer and (1980)   Measurement and Analysis of
Jose A. Gomez Ibanez   Productivity in Transportation
                             Industries, in New
                             Developments in Productivity
                             Measurement and Analysis, Edited
                             by John .W. Kendrick
                             and Beatrice.N.Vaccara.

Jussawalla,Mrs.M.F,(1971) "Efficiency and the Public
                             Sector", Lok Udyog, June.

Kaldor Nicholas, (1980)   Public or Private Enterprise -
                             The issues to be considered in,
                             Public and Private Enterprise in
                             a Mixed Economy, edited by
                             Baumol W.J, Proceedings of a
                             Conference held by IEA.

Kantharia,G.J., (1992)   "Urban Passenger Transport and
                             the Traffic Scenario", Journal
                             of Transport Management, August.

Katti,B.K.,   (1991)   "Fleet Size and Manpower
Shastri,D.A.,   Requirements for a Medium Size
                             City Bus Organisation", Journal
                             of Transport Management, August.

Kaushal, R.K.,   (1970)   "Economics of Scale in Bus
                             Transport", Journal of Transport
                             Economics and Policy, January,
                             pp 29-36.

Kendrick, J.W., (1961)   Productivity Trends in the
                             United States, NBER, General
                             Series, 71, Princeton University
                             Press, New York.

Kendrick, J.W., (1980)   New Developments in Productivity
Vaccara,B.N.,   Measurement and Analysis, The
                             University of Chicago Press,
                             London.

Keshava, G.P.,   (1972)   "Measurement of Managements
                             Contribution to Profitability :
                             Case study of a Bihar State
                             Road Transport Corporation",
                             Economic and Political Weekly,
                             Vol.7. No.35, 26 August.

Krishnaswamy,K.S,(1981)   "What Ails the Public Sector?",
                          Eastern Economist, January 9.

Mahesh Chand,   (1980) "Current Issues in Public Road
                          Transport Management", Lok
                          Udyog, August.

      "   (1982) "Financial Performance of Road
                          Transport Undertaking", Lok
                          Udyog, April.

Man Mohan Singh, (1992) "Problems of Public Transport in
                          India with Special Reference to
                          Bombay", Journal of Transport
                          Management, February.

Mathew, M.O.,   (1972) "Complementary Roles of Roads
                          and Railways", Mobile Journal,
                          Vol 10, April.

Mathur, N.D.,   (1979) "Profitability in Public
                          Enterprises", Lok Udyog, Vol.13,
                          No.1, April.

      "   (1990) Price Policy in Public
                          Enterprises, Jaipur.

Mishra,R.K.,   (1980) "Pricing and Returns in Public
                          Enterprises", Lok Udyog,
                          November.

Mishra,R.K. and   (1991), "Efficiency and Organisation
Nandagopal,R.,   Innovativeness in Passenger
                          Organisation", Management
                          Review, Vol 6, No.1&2, Jan-Dec.

      "   (1991) "Efficiency through competition
                          in passenger road transport in
                          India : The case of Tamil Nadu
                          State transport undertakings",
                          The Journal of Institute of
                          Public Enterprise, Vol. 14,
                          No:1, pp 1-22, March.

      "   (1991) "Privatisation of State
                          Transport Undertakings in India:
                          Scope and Modalities",The
                          Journal of Institute of Public
                          Enterprise, Vol.14, No.1, March,
                          pp33-46.

Mohanan Pillai,P,(1990)   "Some Aspects of Performance of State Sector Enterprises in Kerala", Economic and Political Weekly, Vol.17, No.24.

Moonis Raza &   (1986)   Transport Geography of India, commodity flows and the regional Structure of the Indian Economy, New Delhi.
Yash Aggarwala,

Mridula Shah,   (1967)   "Commercial Profitability Vs: Social Profitability", Lok Udyog, Vol.1, No.7, September.

    "   (1968)   "Passenger Transport by Autonomous Public Corporations - 1, Lok Udyog, Vol.2, No.5, August.

    "   (1968)   "Passenger Transport by Autonomous Public Corporations - 2, Lok Udyog, Vol.2, No.6, September.

Nash,C.A.,   (1976)   Public Vs Private Transport, Leads University.

National Council of(1962) Techno - Economic Survey of Kerala , New Delhi.
Applied Economic
Research,

    "   (1969)   Regional Transport Survey of Kerala, New Delhi.

Nayyar,A.K.,   (1979)   "Management of City Transport in Ahmedabad", Nagarlok, Vol.11, No.1, January-March.

Nelson, R.R.,   (1965)   "The CES Production Functions and Economic Growth Projections", Review of Economics and Statistics, Vol 1.

Pasricha,Dr.P.S,   (1992)   "Urban Traffic Scenario and some Solutions", The Indian Roads and Transport Development Association, Newsletter, No.2, February.

172

Patankar,P.G.,   (1979)   "Traffic Management in Urban
                            Transport", Nagarlok, No.2,
                            Vol.11, April-June.

Pathak,M.G.,   (1990)   "Alternative Evaluation
                            Criterion for STUs as Public
                            Enterprises ", Journal of
                            Transport Management, October.

"   (1992)   "The Myth of STUs loss",
                            Financial Express,
                            February 29th.

Patro.U.N.,   (1992)   "Working Capital Management in
                            STUs : With Special Reference to
                            OSRTC, Journal of Transport
                            Management, August.

Pillai,Gangadharan,V,   The Public Sector in Kerala,
                            Kerala Acadmy (1970) of
                            Political Science, Trivandrum.

Prakash,Alwin B.,(1977)   An Economic Assessment of the
                            Performance of K.S.R.T.C:1959-71
                            Unpublished Ph.D thesis,
                            University of Kerala, September.

RajeshwarRao,Dr.K,(1982)   "Management Effectiveness in
                            Transport Operations : A case
                            study of Delhi Transport
                            Corporation", Lok Udyog, July.

Ramakrishna,B.,   (1980)   "Public Sector Problems - The
                            loss from Unused Capacity",
                            Capital, Vol.17.

Raman, Dr.A.V.,   (1990)   "The Rationale of
                            Nationalisation of Passenger
                            Road Transport", Journal of
                            Transport Management, October.

Ramanadhan, V.V.,(1948)   Road Transport in India, The
                            Universe Publishers Limited,
                            Lucknow.

"   (1957)   Economics of Rail-Road Policy,
                            MSR Murthy and Co.,
                            Visakhapatnam.

"   (1974)   Pricing and Investment in Public
                            Enterprise ,(ed), Oxford and IBH
                            Publishing Co., New Delhi.

Sat Parkash,   (1973)   "Transport in a Growing
                            Economy", Yojana, Vol.17,
                            November 15.

Satyanarayan,J.,   (1985)   The Working of the Andhra
                            Pradesh State Transport
                            Corporation, Centre for Economic
                            and Social Studies, Hyderbad.

Satyanarayana,Dr   (1992)   "Does Privatisation of Passenger
                            Transport serve the public
                            interest?", Journal of Transport
                            Management, May.

Satyanarayana,R.B,(1981)   "Tools for Measurement of
                            Efficiency in State Passenger
                            Road Transport Corporations",
                            Lok Udyog, February.

Secretariat of the(1971)   First report of the committee on
Kerala Legislature,   public undertakings 1970-71,
                            KSRTC, Trivandrum, March, based
                            on the Report of the Comptroller
                            and Auditor General of India for
                            the year ended 31st March, No.2
                            Commercial.

Sen Amartya,   (1983)   "Carrots Sticks and Economics:
                            Perceptions, Problems and
                            Incentives", Indian Economic
                            Review, Vol.18, No.1, Jan-June,
                            pp1-17.

Sengupta,R.,   (1980)   "Prices and Profit in Public
                            Sector Steel Industry : A Case
                            Study", Economic and Political
                            Weekly, Annual Number, February.

Shah,V.K.,   (1977)   "Economics of Scale in Passenger
                            Transportation : A case study of
                            Gujarat State Road Transport
                            Corporation,Anvesak, Vol. 7(2),
                            December, pp.207-214.

Sharma,G.D.,   (1969) "Public Enterprises in Ancient India", <u>Lok Udyog</u>, July.

Sharp,C.H.,   <u>Transport Economics</u>, Macmillan Studies in Economics.

Sinha,J.N., and   (1970) <u>Wages and Productivity in Selected Indian Industries</u>,
Sawhney, P.K.,   Vikas Publishing House,New Delhi

Solow, R.M.,   (1957) "Technical change and aggregate Production Function", <u>Review of Economics and Statistics</u>, Vol.39, August.

Sreekumar,T.T.,   (1988) <u>Urbanisation in Kerala, 1900-1981</u>, Unpublished M.Phil Dissertation Submitted to Jawaharlal Nehru University, New Delhi, Centre for Development Studies, Trivandrum.

     "   (1990) "Neither Rural Nor Urban-Spatial Formation and Development Process", <u>Economic and Political Weekly</u>, September, pp 1-8.

Srinivastava,S.K,(1953) <u>Transport Development In India</u>, S.Chand & Co.,New Delhi,pp.3-11.

Srivastava,S.K., (1971) <u>Economics of Transport [with special reference to transport development in India]</u>, S.Chand & Co.(Pvt) Ltd.,New Delhi.

Subhash,Vaidya,   (1991) "Route Profitability Analysis in a State Transport Undertaking", <u>Journal of Transport Management</u>, July.

Subrahmanyan,P., (1987) <u>Organisational set up of Road Transport (a focal study of Andhra Pradesh State Transport Corporation)</u>, B.R. Publishing Corporation.

Sudarsanam,P., (1978) "Public Sector Road Transport Management - A Rejoinder", Lok Udyog, April.

" (1990) "Nationalisation of Passenger Road Transport : Looking Back and Looking Forward",Journal of Transport Management, November.

" (1992) "State Transport and the New Economic Compulsions : Strategies for Survival", Journal of Transport Management, February.

" (1992) "STUs : Case for subsidies", Financial Express, June 19.

" (1992) "State Transport - The new economic compulsions", Economic Times, June 11.

Sunny, K.P., (1990) "Uneven Development of Kerala's Transport System : Some Economic Aspects,Economic and Political Weekly, September 15.

Suresh Kumar, (1991) "Public Enterprise Policy and Reform Measures - The Indian Experience", Public Enterprise, Vol.11, No.4, December.

Trivedi,P., (1986) "Public Enterprises in India : If not for Profit, then for what ?", Economic and Political Weekly, Vol.21 , No.48 , Review of Management, November 29.

Vaidyanathan,A.,(1990) "State's Role in Development", Economic and Political Weekly,Vol.25, No.26, June.

Varghese.K.E., (1976) The Development and Significance of Transport in India 1834-1882, New Delhi.

Vellu Pillai,T.K,(1940)   Travancore State Manual,
                         Government of Travancore,
                         Trivandrum, Vol 3, pp495-497.

Vellu Pillai,K.P,(1956)   REPORT ON THE TRAVANCORE COCHIN
                         STATE TRANSPORT DEPARTMENT,
                         Government of Travancore and
                         Cochin.

Venu, S.,   (1978)   "Cost - Benefit Analysis in the
                           Transportation Sector", Lok
                           Udyog, September.

Vijayakumar,K.C, (1979)   "Operating Cost of Public Sector
                         Road Transport Corporation in
                         India", Lok Udyog, August.

      "   (1982)   "A Corporate Model of
                         K.S.R.T.C., Lok Udyog, August.

Vinod Parekh,   (1976)   "Profitability and Social
                         Objectives in the Public
                         Sector", Lok Udyog, October.

Zahir,M.A.,   (1984)   "A Proposed Model for the Study
                         of Organisational Effectiveness
                         in a Developing Country like
                         India", Lok Udyog, August.

****