



# State Policies Affecting Competition: Passenger Road Transportation Sector



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## Preface

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Increasingly competitive pressure while facilitating entry and exit lie at the heart of the liberalisation programme that India had followed over the past fifteen years. Yet there remain concerns in many quarters that competition is incompatible with another cherished goal of Indian Society, namely universal access to important public services. As a result there is a widespread body of legislation which explicitly limits competition in key areas of public interest, with unfortunate effects on quality of service, efficiency, productivity and the like. These issues arise both at the Centre and State levels, and even at the level of individual cities.

Inter-city bus transport is a vital service for millions of rural Indians and is regulated at the level of each state. However, to our knowledge till date there has been no systematic study on the state-level policies affecting competition in this sector. The Competition Commission of India (CCI) has sponsored the present project as part of its larger programme of analysis and advocacy with the ultimate goal of bringing about greater competition so as to enhance the efficiency of the development process.

The study has offered NCAER an opportunity to study the economic benefits related to competition, and its impact on profit, efficiency, market structure etc., through survey of operators and thereby to throw new light on the existing state-level transport policies. Following a survey of international case studies/best practices, NCAER has also carried out a major exercise in stakeholder analysis in seven states as a part of representative sample of different regions of the country. On the basis of three indices, namely Competition Index, Efficiency Index and Composite Customer Satisfaction Index, we have analysed the transport sectors of the concerned states.

Apart from the analysis, we have made a list of state-specific recommendations and defined the contours of a proposed model for enhancing the competition. Policy planners, researchers specialists would find this report useful. This may also help states determine key changes depending upon the recommendations and proposed model. NCAER wishes to acknowledge the contributions and encouragement received from Shri Vinod Dhall and Shri Augustine Peter, Member and Economic Advisor, Competition Commission of India, respectively.

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## List of Acronym

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ASRTUs	Association of State Road Transport Undertakings
CCI	Competition Commission of India
CPTA	County Public Transport Authority
CRRRI	Center Road Research Institute
EPF	Employee Provident Fund
EU	European Union
FPSB	First price sealed bid
GL	Göteborgsregionens Lokaltrafik
HKL	Helsinki City Transport
LBL	London Bus Limited
LRT	London Regional Transport
LT	London Transport
LTB	London Transport Buses
MPTA	Municipal Public Transport Authority
MRTP	Monopolistic and Restrictive Trade Practice
MSRT	Maharashtra State Road Transport
OVGF	Operational Viability Gap Fund
PCA	Principal Component Analysis
PTA	Passenger Transport Authority
PTAs	Passenger Transport Authorities
RTA	Regional Transport Authority
SPSB	Second price sealed bid
SRTC	State Road Transport Corporations
SRTUs	State Road Transport Undertakings
STA	State Transport Authority
USO	Universal Service Obligation
YTV	Helsinki Metropolitan Area Council

# Executive Summary

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## **Objective of the Study**

The objective of the study is to advocate enhanced competition and institutional reforms to engender greater competition within the passenger road transport sector across the states of India. The study also aims to increase the efficiency in using the economy's productive capacities to attain the desired economic and social ends.

The intention is to begin with a limited agenda and look intensely at the public transportation policies of some selected states. The seven states chosen represent different regions and at different levels of economic development. The primary survey was conducted in Maharashtra, Rajasthan, West Bengal, Orissa, Tamil Nadu, Kerala and Himachal Pradesh. These cover the four broad regions (North, South, East and West) or “zones” of India and are also in varying stages of prosperity. The study would depend on secondary information as well as primary survey data. The relevant policies of the state governments are examined thoroughly as part of “Internal Learning” and the global experience in injecting competition within public transportation systems is disseminated through “External Learning”.

## **Methodology**

The study focuses on “Internal Learning” and “External Learning”. For external lessons it looks at reforms initiated by other countries and whether competition helped governments and consumers elsewhere. For Internal Learning, as stated above, the states have been covered to understand and appreciate the state-level competition constraints that may impinge on consumer welfare and efficiency are highlighted which affect efficiency.

## **External Learning**

This study includes eight case studies from different countries pertaining to reforms in the passenger transport sector. The countries included in the study are United Kingdom, United States, France, Sweden, Finland, Kyrgyzstan, Chile and Sri Lanka.

The universal experience upholds the validity of competitive tendering as a means of selecting the right private sector operator for public transportation operators. In the US, the benefits include cost reduction for operators and ticket price cuts for consumers. In Finland, competitive tendering brought about a reduction in operator compensation and has enabled additional time-table departures. In Sweden, competition has reduced costs for all local and county authorities and has resulted in a fall in subsidy payouts to local and county authorities. Similar effects have been achieved in Chile, Krygzstan and Sri Lanka.

### **Internal Learning**

The primary survey was conducted in Maharashtra, Rajasthan, West Bengal, Orissa, Tamil Nadu, Kerala and Himachal Pradesh. It highlights the key empirical findings for a comprehensive list of policy variables and gives details on the basis of the primary survey of the bus operators. The states have been ranked on the basis of three indices based on primary and secondary data.

The competition arrangement has been assessed on the basis of entry barriers, lack of contestability and anti-competitive practices. For entry barriers the variables are Average Registration Time, Permanent and Temporary Permits and Single Window Clearance.

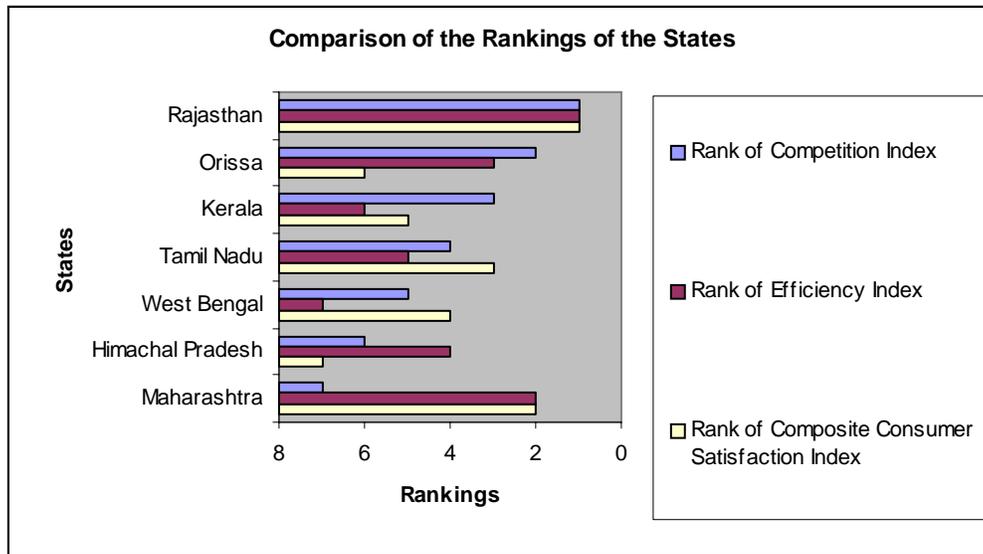
We have constructed three indices for seven states of the four different regions of the country. They are:

1. Competition Index
2. Efficiency Index
3. Composite Consumer Satisfaction Index

The results are reported below:

### Competition, Efficiency and Composite Consumer Satisfaction (Indices and Ranking)

States	Competition Index	Efficiency Index	Composite Customer Satisfaction Index	Rank of Competition Index	Rank of Efficiency Index	Rank of Composite Consumer Satisfaction Index
Rajasthan	0.838	0.893	0.622	1	1	1
Orissa	0.764	0.636	0.462	2	3	6
Kerala	0.721	0.438	0.470	3	6	5
Tamil Nadu	0.622	0.517	0.597	4	5	3
West Bengal	0.602	0.052	0.509	5	7	4
Himachal Pradesh	0.595	0.631	0.409	6	4	7
Maharashtra	0.569	0.688	0.607	7	2	2



Some of the main findings of the study based on the indicis are:

- Rajasthan ranks first in respect of the Competitive Index. Among the six indicators analysed, Rajasthan tops in respect of two- permit charges for more than one region, operation of public and private bus on the same routes- both inter-state and intra-state. On the other hand, Maharashtra is at the bottom for all concerned indicators except permit charges for more than one region.

- Rajasthan also leads in the area of Efficiency Index. Among the five indicators analysed, Rajasthan is ahead in two of the indicators: effective kilometres per staff per day and kilometres per litre of HSD. West Bengal finishes last. It is at the bottom for three indicators. They are: surplus before tax, percentage of fleet utilisation and effective kilometres per staff per day.
- In case of Consumer Satisfaction Index, Rajasthan again comes at the top of the ranking. Maharashtra, Tamil Nadu, West Bengal, Kerala, Orissa and Himachal Pradesh are at the second, third, fourth, fifth, sixth and seventh positions respectively.
- Consumer Satisfaction is higher in case of the public sector than that of the private sector in three states – viz: Rajasthan, Tamil Nadu and Himachal Pradesh. On the other hand, for the states of Maharashtra, West Bengal, Kerala and Orissa, private sector generates higher consumer satisfaction than public sector buses.

### **State-specific Recommendations**

On the basis of the three indices we have made different recommendations for different states. These include:

- The ratio of private buses to total buses is highest in Orissa and lowest in Maharashtra. To improve competitiveness, Maharashtra and Himachal Pradesh should attract private operators into the sector.
- In the field of operation of public and private buses on the same routes (inter-State), both Rajasthan and West Bengal are at the top. It is quite expected that Maharashtra should be at the bottom. The state should take steps to end public sector monopoly in every route to promote competition in each of the routes.
- In case of surplus earning (before tax) per effective km, Maharashtra is the best performer and West Bengal the worst. West Bengal should increase its surplus earnings. The same recommendation is applicable for Kerala as well.
- Rajasthan is also the most efficient in the use of HSD (the indicator is kilometre per litre of HSD). The most inefficient user of HSD is Himachal Pradesh. But Himachal Pradesh is a hilly region where more HSD is needed per km than in the non-hilly

states. Yet, there is scope for introducing fuel economy, which Himachal Pradesh should consider.

- The average waiting time for a bus is highest in Tamil Nadu and lowest in West Bengal and Orissa. So Tamil Nadu should reduce waiting time for public sector buses to improve the satisfaction level of the consumer. Rajasthan should also follow this recommendation.
- The public sector bus service is most punctual in Himachal Pradesh while Orissa's is the worst. So Orissa should improve the punctuality of its public sector service so as to provide more satisfaction to the consumer.
- Public sector buses are mostly overcrowded in Tamil Nadu. The situation is also not good in Maharashtra. They should follow the policy of Rajasthan, which is the best performer in this field.

### **Internal Learning Based on Secondary Data**

The first legal and regulatory framework governing motorised transportation in India was the Indian Motor Vehicles Act, 1914. It was subsequently replaced by the Motor Vehicles Act, 1939. The latter Act was amended several times. The current Motor Vehicle Act, 1988 came into force on July 1, 1989 and is applicable over the whole country. It defines the powers of central and state governments with regard to the regulations for: selection of drivers and conductors of stage carriages, registration of vehicles, control of transport vehicles, entry barrier (enabling provision under the Motor Vehicles Act, 1988), special provisions relating to state transport undertakings, construction, equipment and maintenance of vehicles, control of traffic, insurance of vehicles and dispute settlement mechanism.

## Partial Productivity Measures-State Transport Corporations

States	Revenue /Bus km (Rs per Bus Km)	Surplus before tax/Bus km (Rs per Bus Km)	Fuel & Lubricant cost/Bus km (Rs per Bus Km)	Personnel cost/Bus km (Rs per Bus km)	Tax/Bus km (Rs per Bus km)	Total cost /Bus Km (Rs per Bus Km)	No. of Staff/Bus	Surplus After tax (Rs per Bus Km)	Bus Km Travelled/ day/Bus	Average No. of passenger/ Bus/day	Tariff paise per passenger km	Fleet Utilisation (In Percentage)
Rajasthan	16.09	2.03	6.16	5.06	1.84	15.90	5.02	0.19	95	261	40	96.9
Maharashtra	20.55	3.49	7.53	6.49	2.92	19.97	6.90	0.58	85	413	63	96.7
Tamil Nadu	16.16	0.25	6.79	6.35	0.69	16.58	6.76	-0.44	114	930	32	95.9
West Bengal	13.63	-17.40	8.66	16.85	0.00	31.04	11.90	-17.40	58	670	45	98.8
Kerala	20.48	-4.15	8.98	10.05	0.53	25.16	9.10	-4.68	81	866	48	80.5
Orissa	15.53	1.97	7.89	2.13	0.97	14.53	5.31	1.00	81	NA	41	98.8
Himachal Pradesh	18.65	-2.30	8.51	7.98	2.35	23.30	4.75	-4.65	58	NA	47/74	98.1

An analysis of partial productivity measures shown in the above table yields the following insight:

- Rajasthan STC is able to control its total cost per kilometre due to its high labour productivity and is also able to contribute adequate amount of revenue to the state exchequer.
- West Bengal and Kerala STCs, even after levying substantially higher tariffs *vis-a-vis* Rajasthan's by 12 and 20 per cent respectively, earn negative net revenue per Bus-Km due to the prevalent low labour productivity, fleet utilisation, etc.
- Maharashtra is forced to levy a substantially higher tariff *vis-à-vis* Rajasthan to earn a surplus per Bus Km.
- Tamil Nadu STC posts excellent productivity measures in all spheres except in labour productivity due to the problem of overstaffing as well as due to higher personnel wages, perhaps due to extraneous measures outside the control of the management.
- The case of Himachal Pradesh is unique as it is a land-locked state with no alternative mode of transportation and the existence of hilly terrain compounds the difficulties in holding down costs and yet giving the public an inexpensive service.

Competition policies could be considered as the main catalyst in Rajasthan for its efficient performance over the more affluent Maharashtra. In the eastern region, Orissa STC's better performance over that of West Bengal could also be attributed to pro-competition policies.

## Principal Component Analysis

A Principal Component Analysis (PCA) was conducted to assign weights to variables that best describe efficiency of operations of state transport undertakings in the passenger bus transportation segment. The PCA is an objective method of assigning weights. The PCA yielded the weights for variables (variables and their weights- Revenue per Bus-Km: 19.9, Cost per Bus-Km: 20.4, Fleet Utilisation:19.3, Load Factor:4.2, Staff per bus on road: 16.7, Accidents per lakh kilometre:19.5, Fuel use efficiency: Omitted by the model). Rankings of STCs, based on composite indices are given in the following table.

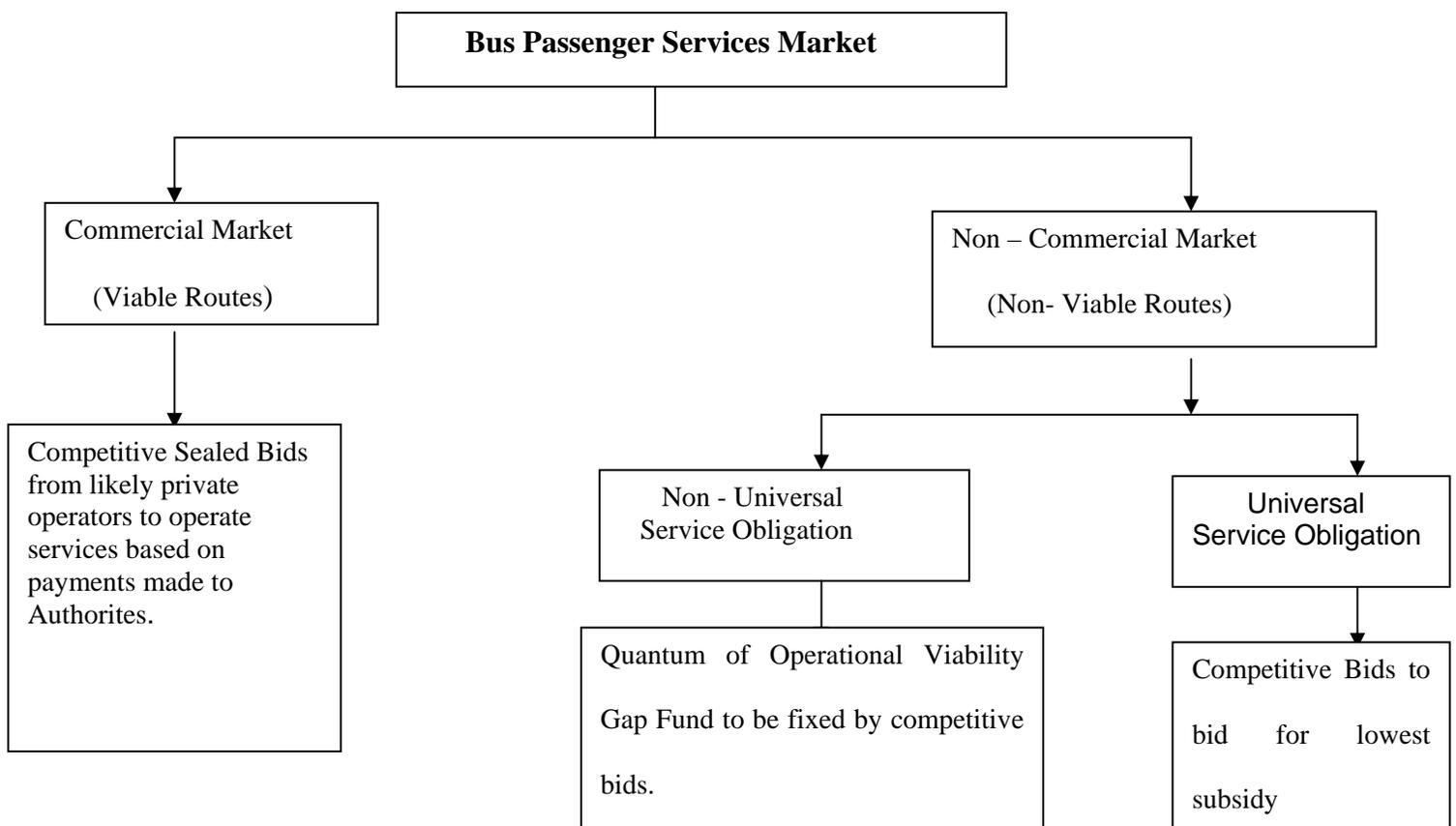
**Rankings based on PCA**

<b>STCs</b>	<b>Rank</b>
Maharashtra	1
<b>Andhra Pradesh</b>	2
Gujarat	3
Uttar Pradesh	4
Karnataka	5
Rajasthan	6
Kerala	7
Tamil Nadu	8
Himachal Pradesh	9
West Bengal	10
Orissa	11

These match our rankings of public transportation undertakings on the Efficiency parameter, thus validating the primary survey of operators, state undertaking transport corporation and the customer perception on the efficiency and adequacy of the private and state run bus transport undertakings.

## Division of Bus Routes

The bus routes can be divided into two parts: commercial routes and non-commercial routes. Commercial routes are profitable routes and non-commercial routes are those which are non-profitable. But both of these routes are socially required for the country. Non-commercial routes are non-profitable routes but those are socially required routes.



## Proposed model for commercial routes

Competitive tendering is proposed for selecting private operators for commercial routes. The government chooses what services to competitively tender and selects the private provider from which it purchases the services. The public sector retains policy control over the service, while the competitive market produces the service under public scrutiny.

Competitive tendering is being used around the world for a variety of public services, including public transport.

### **Non-Commercial Routes**

Mainly non-profitable, remote, inaccessible areas fall in the ambit of a non-commercial market. Unreliable services, low vehicle numbers and vehicle diversity, as well as poor integration of services and planning are the underlying characteristics of these routes. The problem of disinterest among the operators in the provision of these services in the non-commercial or non-profitable routes can be dealt with by adopting competitive subsidy bidding process in these areas. In this case we are proposing two alternatives: USO or Viability Gap Funding.

### **Universal Service Obligation (USO)**

USO ensures that basic services are available to all without any preclusion, at an affordable price to all citizens across the country. The objective of this policy is to ensure safe, affordable, quick, comfortable, reliable and sustainable losses and difficulties to certain sections of the society, mainly poor. It is proposed that the government should generate the USO fund, which shall be managed separately, and the government should make contributions to the fund. The USO Fund should be ring fenced, so that it is not a part of the Consolidated Fund of India and the balance should not be credited to it. It should be the responsibility of the regulating authority to monitor the performance of the franchise in these markets so that transparency in operations is assured. Competitive tendering should be the criteria for choosing franchise in the route.

### **Operational Viability Gap Fund (OVBF)**

Non-commercial services with Operational Viability Gap Funding refers to adopting competitive bidding practices, wherein the lowest subsidy bidder should be awarded the contract.

### **Role of Regulator at Federal/State level**

The state-level policies should be in tune with the provisions of the Competition Act, 2002. The fares are recommended for regularisation by the regulating authority and not the operating authority. The regulating authority should be responsible for the application of USO norms in the non-commercial markets so as to ensure no preclusion. The regulator should systematically plan and develop the bus service as a network of services and routes. The regulator should protect the rights of the bus passengers.

### **Approach to improve Competition policies at State level**

We have evolved three important indices (Competition Index, Efficiency Index and Consumer Satisfaction Index) based on different indicators. Based on the performances of different states, we have arrived at different recommendations for different states to improve competition in the passenger road transportation sector.

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# Chapter 1: Introduction

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This chapter discusses the importance of the study in Indian context by analyzing growth pattern of motor vehicles over a period of time and its current status.

This chapter has seven sections: section 1.1 relates to the Background of transport sector, section 1.2 discusses need of the study, section 1.3 states the main objective of the study, section 1.4 relates to scope of the study, section 1.5 gives the methodology of the study, covering aspects such as survey design and sample size, section 1.6 discusses current status of public transport and section 1.7 covers growth of motor vehicle in India.

## **1.1 Background**

The importance of infrastructure for sustained economic development is well recognised. Adequate and efficient infrastructure lowers transaction cost, has strong backward and forward linkages, directly impacts the quality of life and acts as a catalyst in the growth and development of an economy.

Transport is a crucial component of infrastructure. A well-developed transport network facilitates the integration and interdependence of the different sectors by aiding quick and adequate movement of men and material. Therefore, if agriculture and industry make up the “body” of the Indian economy, transport and communications constitute its “nerves”. The transport system helps in expanding the market for goods and by doing so, it aids reaping the benefit of division of labour and thereby large-scale production. It is essential for the movement of raw materials, fuel, machinery etc., to the places of production. The more extensive and continuous the production in any sector, the greater will be the need for transport facilities.

The demand for transport is likely to go up with population increase and economic growth, coupled with rapid urbanisation. Transport development helps to open up remote regions and resources for production. Regions may have abundant agricultural, forest and mineral resources, but they cannot be developed if they continue to be remote and

inaccessible. By linking backward regions with relatively more advanced ones, transport development helps in the better and fuller utilisation of resources.

Expansion of transport facilities, in turn, helps industrialisation directly. The demand for locomotives, motor vehicles, ships etc., leads to the start of industries that specialise in the production of these goods. Expansion of transport is, thus, of fundamental importance for an emerging market like India. According to the Tenth Five Year Plan, a transport system is not only the key infrastructural input for the growth process but also plays a significant role in promoting national integration, which is particularly important in a large country like India. In a liberalised set-up, an efficient transport network becomes all the more important to increase productivity and enhance the competitive efficiency of the economy.

New scientific initiatives in public transportation are necessary for improving the situation of public transport system, but it is not sufficient by itself. The sufficient condition is financial sustainability of those projects that emerge from these new initiatives. In a capital-scarce country like India, no loss making system can be sustained for a long time. For sustainability of a modern public transport system, profit earning is necessary for both public and private operator. Internal resources fund public passenger road transport in India, market borrowings and equity capital provided by the central and state governments. The overall financial performance of urban State Road Transport Undertakings in India (SRTUs) in India appears to be gloomy and they are heading for a severe financial crisis. As the earnings per km have grown slower than the costs per km, the losses per km have grown by nearly 7 per cent per annum in 1990s (Figure-3). Such a situation has arisen because of continuing inefficiency in operations and uneconomical operations to meet the universal service obligation. In addition, the motor vehicle taxation regime taxes bus more than it does personal vehicles resulting in a higher cost of operating a bus.

Overview of regulation on Competition- The predecessor of the Competition Act 2002, the MRTP Act, 1969, had its genesis in the Directive Principles of the State Policy embodied in the Constitution of India. It was enacted pursuant to the recommendations of

the “Monopoly Inquiry Commission”. It had a mandate of enabling the State to direct its policy towards ensuring that the ownership and control of material resources are equitably distributed to serve the common good and to prevent the concentration of wealth and means of production which would be detrimental to all. The Act provided for the control of monopolies and the prohibition of monopolistic and restrictive trade practices. By restrictive trade practices it connotes to such trade practices which prevents, distorts or restricts competition, obstructs the flow of capital of resources into the stream of production and tends to manipulate prices.

The reformative philosophy of the Monopolistic and Restrictive Trade Practices (MRTP) Commission entailed mere “censuring” a delinquent enterprise and directing it to offset the loss caused by it to an aggrieved person. It was found to be ineffective over a period of time in combating the irresistible urge to reap unreasonable profits by resorting to and repeating the objectionable business practices by enterprises. Accordingly, in pursuant to international trends and pursuant to the recommendation of the Raghavan Committee, the Competition Act was enacted. The globalisation of the world economy, in which India is an active participant, gave rise to the need to have a modern competition policy and law. In the current scenario, a need was felt for framing the policies and regulations which were restricting competition. Measures were required for preferring anti-competitive practices, with adequate powers to the regulators to take corrective action.

The Competition Act concentrates more on the issues of consumer freedom and freedom of economic activities, rather than on the aspect of controls and monopolies. The three important objectives are welfare of the consumers, improvement in economic efficiency and prevention of concentration of economic power. The word “Competition” in the Act means sellers striving independently for buyers’ patronage to maximise profits (or other business objectives). Further, a buyer prefers to buy a product at a price that maximises his benefits, whereas a seller prefers to sell product at a price that maximises his profit.

The objectives of the Act are to be achieved through the instrumentality of the Competition Commission of India (CCI), which has been established by the Central

Government with effect from October 14, 2003. The CCI has the aim of centralising under one umbrella all controls to eliminate the negative aspects of competition. The functions of the CCI include prohibition of anti-competitive agreements and abuse of dominance, and regulate combinations (mergers or amalgamation or acquisition) through a process of enquiry.

The salient features include regulatory mechanism for prohibiting abuse of one's dominant position. Such abuse of dominant position include imposing unfair or discriminatory condition in purchase or sale of goods or services, or setting unfair or discriminatory prices in the purchase or sale of goods and services. It regulates the restricting of production of goods and services or limiting or restricting technical or academic development relating to goods or services to the prejudice of consumers. It further regulates practices resulting in denial of market access. It governs the different aspects of mergers and acquisitions. In this, there are provisions that debar persons or enterprises from entering into combinations that cause, or are likely to cause, an appreciable adverse effect on competition within the relevant market in India.

The redressal of grievances is done through a process of filing of complaints, enquiry and then adjudication. Any person, consumer, consumer association or trade association may make a complaint against anti-competitive agreements and abuse of dominant position. The Central Government or a State Government or an authority established under any Law may make a reference for an enquiry. The Commission can also initiate *suo motu* enquiry. After enquiry, the investigation report is received from the Director-General and later the Commission adjudicates the matter after hearing the parties and passes orders as it deems fit.

## **1.2 Need for the Study**

Demand for transportation is increasing in India at a very great pace. There has been unprecedented growth in the number of motor vehicles over the past few years. Vehicles of all shapes and sizes are competing for road space on our limited road system, which, in contrast, has shown only marginal growth. Therefore, society is facing the problems of slow-moving traffic, air and sound pollution and road safety. The implicit cost to society on this account is immense. In this context, serious thought ought to be given immediately to the need for having sustainable growth in the transport sector by taking into account road safety and environmental issues. The regulatory and legal frameworks governing the sector are comprehensive enough with regard to infusing competition in the sector and efficiently allocate resources so that both prices (to the consumer) and costs (to the producer) are kept down. There should also be no unnecessary transaction costs and pecuniary externalities. However, to keep up with rising demand and with international best practices, policies need to be identified which facilitates competition. Moreover, the discrepancies between prescribed and the observed measures need to be identified which impose arbitrary constraints in competition. For example, some measures to discourage personalised use of modes of transport would have to be implemented. This can be done by improving the efficiency of the public transport system, charging higher user charges for availing facilities like parking and by creating pedestrian facilities.

## **1.3 Objective of the Study**

The need for the study with its focus on the passenger transport segment is necessary due to the numerous controls and permits and non-competitive policies that affect consumer welfare. In view of this, it is necessary to see if pro-competitive policies have helped governments and consumers elsewhere in the world. A number of policies may result in barriers to competition and hence high prices to consumers as well as poor quality output leading to poor outcome for the government as well. The need for competition in a sector is to allocate resources efficiently as more intense competition lowers costs and improves service quality. Competition arrangements like entry barriers, lack of contestability and

anti-competitive practices like exclusive dealing, tie-in arrangement, abuse of dominance, cartel etc has a direct impact on the prices and quality of services in particular and resource allocation in general.

From the producer's point of view, a policy environment has impact on the level of profits, the level of efficiency and on the market structure. In case of profits at a disaggregated level, the impact will be on total revenue or the direction of change in revenue, the total cost, the growth in fleet size and carrying capacity. In case of efficiency, policy environment has an effect on labour productivity, capital productivity and total factor productivity. Besides, the level of competitiveness could also be ascertained by some indicators like the public-private market share or the concentration ratio, which may be calculated through the Herfindahl index. Taking into account the policies of the different state governments, consumer satisfaction has been ascertained through a survey. The variables taken are punctuality, frequency, extent of coverage, fare, comfort, time taken, etc. Thereafter, responses on these variable have been used to develop a composite index which can then be correlated with the policies. The primary objective of the study is:

1. To study and analyse the state policies related to the passenger road transport sector in states, namely: Himachal Pradesh, Rajasthan, Maharashtra, Kerala, Tamil Nadu, Orissa and West Bengal with specific reference to the existing competition arrangements there.

Existing competition arrangements with respect to passenger transport in the seven states would be analysed taking into account the following aspects:

- entry barriers
- lack of contestability
- anti-competitive practices
- exclusive dealing
- tie-in arrangement
- abuse of dominance

- Cartel; etc.

For instance, the schemes that are likely to have significant adverse impact on competition are:

- ❖ Direct or indirect fixing of fares, by members of the scheme.
  - ❖ The sharing of markets by, for example, by allocating particular routes or frequencies to particular operators, by members of the scheme
  - ❖ The raising of barriers to entry by, for example, setting the standards of a quality at levels that deter or prevent a significant proportion of current or available bus operators from providing the bus services
  - ❖ Bundling a significant proportion of tendered services to render impossible the tendering for their services by smaller operators
2. To conduct an Impact Assessment of various state policies on parameters such as market share, profitability, efficiency and customer satisfaction.

Specifically three indices were constructed. They are:

- Competition Index
  - Efficiency Index
  - Customer Satisfaction Index
3. To bring about greater competition within the passenger transport sector across the states in India and also within the state boundaries-In other words to lubricate the efficiency of development across borders.
  4. To advocate enhanced competition and institutional reforms in the passenger transport sector.
  5. To attain the desired economic and social ends so as not to preclude any section while promoting competition and efficiency.

#### **1.4 Scope of the Study**

The study concentrates on seven states in India. The states have different levels of economic development within the same region. The advantage of selecting such a sample is that it facilitates comparison of the impact of respective state level competition policies on the sector's performance.

The states included for the study are:

Western Zone: Maharashtra and Rajasthan

Eastern Zone: West Bengal and Orissa

Southern Zone: Tamil Nadu and Kerala

Northern Zone: Himachal Pradesh

Originally, only the first six states were to be studied. However, following CCI's suggestion, Himachal Pradesh was included. It was mentioned that due to its unique geographical terrain, the inclusion of the state might offer some interesting insights. The study focuses on – “internal learning and external lessons”. For external lessons it looks at reforms initiated by other countries and whether competition helped governments and consumers elsewhere. For internal learning, as stated above, the states have been covered to understand and appreciate the state-level competition constraints that may impinge on consumer welfare and efficiency.

#### **1.5 Survey Design and Sample Size**

Primary data collection is conducted in the selected seven states. Care was taken that in each state all the relevant stakeholders were adequately represented in the sample. Keeping in mind the scope and coverage of the study, three stakeholders were covered:

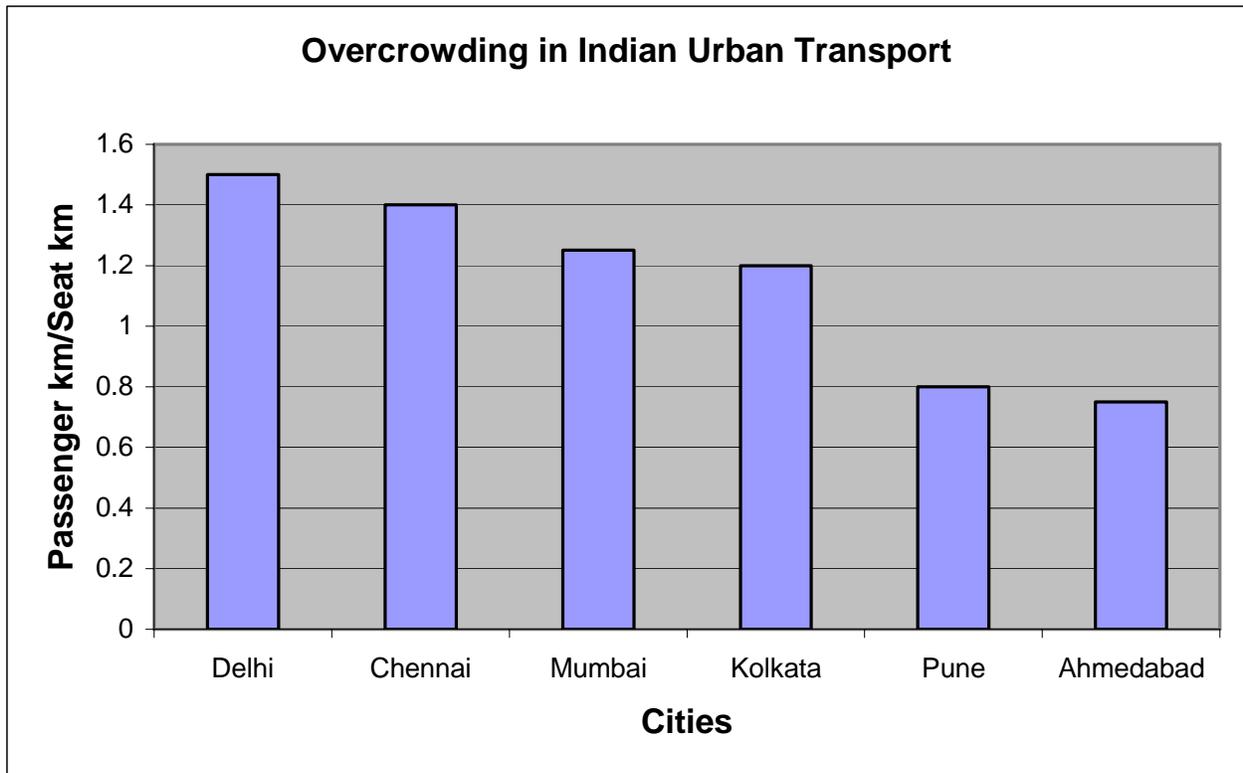
1. State Transport Authority.
2. The Bus Operators – State Transport Corporation and Private Operators
3. Users of the service – Both inter and intra-state users of the service were covered as part of the study

## **1.6 Current Status of Public Transport**

The basic mode of public transport is generally provided by the respective State Road Transport Corporations (SRTCs). However the buses provided by/available SRTCs are not able to cater to the increased demand. Therefore, it becomes essential to allow private sector participation to fill the gap between demand and supply. However, the policies of the country may not always take into account the need for a competitive economy that would enhance the transport economy's performance for the society at large.

Determinants of transport demand include changes in population, household incomes, industrial and commercial activities etc. In India, the sharp rise in demand for public transport has overwhelmed the existing public transport system in India. Trains and buses in most of the cities are overcrowded. The number of Passenger Km per Seat Km, which shows the level of overcrowding in buses is about 1.5 in Delhi, 1.25 in Mumbai, 1.4 in Chennai and 1.2 in Kolkata. However, it is less than one in Ahmedabad and Pune (Figure-1). Severe congestion on roads has slowed down most buses to a crawl during most of the day. On suburban rail lines, peak hour trains often carry more than twice their maximum design capacity, leading to inhuman travelling conditions.

**Figure 1.1: Overcrowding in Indian Urban Transport**



**Source: PRTC Education and Research Services LTD, Urban Transport in Developing Countries.**

These congested conditions in public transport vehicles, stations and rights-of-way not only increase travel time but also make it dangerous. Tens of thousands of passengers of public transport are killed or injured every year. As a consequence of insufficient service quantity and poor service quality, public transport has been losing its market share in many cities. Dissatisfied public transport passengers are increasingly turning to the private car, and, to the relatively low-cost motorised two-wheelers, which have experienced a boom in ownership and use in past few years. The deteriorating quality of public transport service reinforces the impact of the rapid decentralisation of Indian cities. Both the trends have encouraged a shift away from space saving public transport toward individual motorised transport. This has greatly increased roadway congestion, further reduced travel speeds, and aggravated track safety problems.

## **1.7 Growth of Motor Vehicles in India**

In 2003, 67 million vehicles were plying on Indian roads (Table 1). According to statistics provided by the Ministry of Road Transport and Highways, Government of India, the annual rate of growth of motor vehicle population in India has been about 10 per cent per annum during the last decade. The primary problem is not the number of vehicles in the country but their concentration in a few selected cities, particularly in metropolitan cities. It is noteworthy that 32 per cent of these vehicles are plying in metropolitan cities alone, where only about 11 per cent of the total population live.

**Table 1.1 Number of Motor Vehicles Registered in India (1951-2003) (in thousand)**

<b>Year (as on 31<sup>st</sup> March)</b>	<b>No. of Motor Vehicles Registered in India</b>	<b>Two Wheelers</b>	<b>Cars, Jeeps &amp; Taxies</b>	<b>Buses</b>	<b>Goods Vehicles</b>	<b>Others</b>
1951	306	27	159	34	82	4
1961	665	88	310	57	168	42
1971	1865	576	682	94	343	170
1981	5391	2618	1160	162	554	897
1991	21374	14200	2954	331	1356	2533
2000	48857	34118	6143	562	2715	5319
2001	54991	38556	7058	634	2948	5795
2002	58924	41581	7613	635	2974	6121
2003 (P)	67033	47525	8619	727	3488	6674

**Source: Transport Research Wing, Ministry of Road Transport & Highways, Government of India,**

Urban public passenger transport fleets have been growing in India over the years carrying millions of commuters at relatively low fares. As to how low the fares in India are can be gauged from the fact that against an average fare of more than Rs.50.00 per km in Europe, commuters in various cities in India pay an average fare between Rs.2 to 5 per km. Despite increasing fleet strengths and stable low fares, a marked feature of India's urban transportation scene is a clearly revealed public preference for private individual modes of transport like motor cars and two wheelers. The number of such

privately owned automobiles far exceeds that of public transport bus as can be seen in the table below.

**Table 1.2: Population of vehicles in major cities as per Central Road Research Institute (CRRI) study**

Vehicle type	Estimated population of registered vehicles (in thousands)					
	Delhi	Mumbai	Kolkata	Chennai	Bangalore	Hyderabad
Motor cars	9221	341	292	238	234	133
Two-wheelers	2231	441	356	949	1162	857
Bus	41	13	31	5	35	12

Source: <sup>16</sup>Auto Fuel Policy Report, GOI, 2001

Along with their phenomenal growth in numbers, distances travelled by privately owned automobiles within cities are also substantially high as revealed by the traffic survey estimates made by the Central Road Research Institute (CRRI) as given in table 1.3 below.

**Table 1.3: Vehicle wise distances travelled in major cities as per Central Road Research Institute (CRRI) study:**

Vehicle type	Estimated travel in vehicle kilometers (in lakhs)					
	Delhi	Mumbai	Kolkata	Chennai	Bangalore	Hyderabad
Motor cars/Jeeps/Vans	300.85 (37.9%)	94.90 (31.08%)	90.41 (39.14%)	50.30 (20.18%)	51.12 (15.67%)	39.10 (15.23%)
Two-wheelers	338.23 (42.69%)	95.09 (31.14%)	71.21 (30.83%)	134.50 (53.95%)	203.67 (62.43%)	143.69 (55.96%)
Buses (diesel)	17.98 (2.27%)	10.00 (3.27%)	16.18 (7%)	6.10 (2.45%)	8.48 (2.6%)	10.52 (4.1%)
Buses (CNG)	10.53 (1.33%)	0	0	0	0	0

*figures in parenthesis show percentages of travel distances by vehicle type in total travel by all modes of motorised road transport*

Source: Auto Fuel Policy Report, GOI, 2001

The domination of personalised transport in city travel has implications for the country's economy and for urban air quality. ( Auto Fuel Policy Report, GOI, 2001)

The need for an assessment of the regulatory framework and its working is becoming necessary due to the rise in vehicle population and the increased demand for mobility as reflected in rising utilisation rates of personal vehicles. The problem has been accentuated by the gradual reduction in the share of public transport of total road transport. The decline in the penetration of public transport has led to a greater dependence on personal modes of transport, which are more energy intensive, occupy more road space per person, and have higher levels of emissions per passenger kilometer travelled. One important concern is the reliability, punctuality, and overall quality of public transportation.

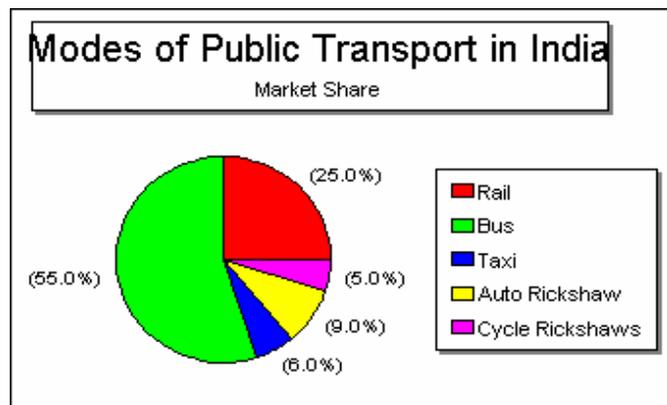
Although, over the years, mobility and accessibility have increased in India, there are severe problems like delays, congestion, accidents, vehicular pollution, energy wastage etc. These problems have heavy economic, social and environmental costs. The main reason for this is the prevailing imbalance in the modal split of transportation besides inadequate transport infrastructure and its sub-optimal use. The public transport system has not been able to keep pace with the rapid and substantial increase in demand. Bus services, in particular, have deteriorated. Public transport is vital for the vast majority without access to private transport.

An efficient public transport system needs at least two modes of services: a fixed route service and a demand response service. Measures need to be taken in the short run to enhance the quality of public transport service and to impose constraints on the use of private vehicles. In the long run, there needs to be effective land use planning and the introduction of new transit systems at least in metropolitan cities.

One of the reasons for the problems prevailing in the transport sector is an inadequately integrated transport system. This is due to the fact that various regulatory bodies related to the transport sector are working in a compartmentalised and fragmented manner. A

healthy competitive environment, accompanied by appropriate regulation, would result in social welfare maximising prices. The need of the hour is therefore to create a policy environment that encourages competitive pricing and co-ordination between alternative modes of transport in order to provide an integrated transport systems that assures the mobility of goods and people at maximum efficiency and minimum cost. A unified transport regulatory body is needed to fulfil these objectives.

**Figure 1.2: Modes of Public Transport in India**

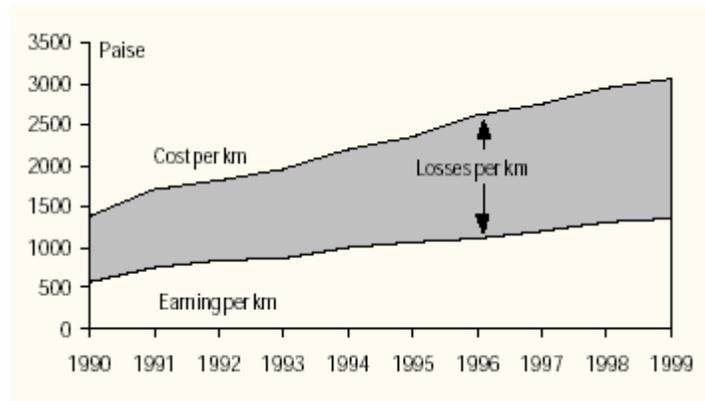


Source: PRTC Education and Research Services LTD, Urban Transport in Developing Countries

Given the opportunity, people reveal widely divergent transport preferences. But in many places the transport authorities favour a basic standard of bus service provided by closely controlled, large undertakings. Actually it comes from the perception of great economies of scale in the size of the firms providing bus services, which is a misconception.

The public transport system may be viable even in the condition of rising transport demand in the country, if the private and public sectors play their appropriate roles. For successful implementation of an efficient public transportation system in the country, planning at both micro and macro levels are necessary. Micro-level planning will analyse the ground condition of the particular city or state and macro planning will analyse the total trend of the country and will successfully co-ordinate all micro plans in the country. In general, Indian cities have not made much progress in implementing demand side management measures, such as congestion pricing, restraints on parking, etc.

**Figure 1.3 Performance of ASRTU**



Source. ASRTU 2000

There exists a vicious circle of continuous losses leading to inadequate funds for capital expenditure and poor management of the fleet, which, in turn leads to poor operational performance, causing even higher losses. Current operations must be reviewed to identify areas for reform.

Passenger transport is largely disorganised, resulting in fierce and unhealthy competition with the public sector undertakings in the country. These operations are common in larger cities where there is a large commuting population.

The public transport system needs to adjust to the changing pattern of demand. For that, continuous investment is necessary. If required investments come from its earnings only then would rise the question of its long-term sustenance. Therefore, it needs to reduce its capital-output ratio as far as possible without compromising the quality of the services. It should charge optimal-level fares, so that the operation of one additional journey, or an increase or decrease in the rate charged would reduce the total surplus of revenue over direct cost of transportation.

Such a scenario follows from observing international best practices, whereby restructuring of public transport indicates a move towards unbundling the monolithic and integrated services into more manageable and compact constituent units. The advantages emerging from such a restructuring exercise enables the separation of activities that are natural monopolies from activities that are not natural monopolies. Such separation makes it possible to bring in competition in non-natural monopoly activities.

## **Chapter 2: Competition Issues related to Bus Transport**

### **Sector: Theoretical Issues and Empirical Evidence**

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This chapter covers theoretical issues related to competition in the transport sector, current policy scenario and state-level policies affecting competition. The basic objective is to critically analyze the Central Motor Vehicle Act and to study the state specific Motor Vehicle Rules. Thereafter, the policy implications of the rules and regulations governing the Motor Vehicle Act will be analyzed.

This chapter has five sections: section 2.1 discusses the theoretical issues related to competition policies in the transport sector and state level policies affecting competition, section 2.2 relates to the Central Motor Vehicle Act and the state specific regulations in the transport sector, section 2.3 covers market structure, section.2.4 discusses the fare policy and section 2.5 discusses route policy.

#### **2.1 Theoretical issues related to competition in the Transport sector**

Competition means a free play of the invisible hands in determining the price of a commodity. Here it would mean price of public transport. This service which comes within the basic activities of the government, involves delivery of an efficient, adequate transport facility for intra and inter state travel at a reasonable price. The concern for a government in providing the same makes it necessary to frame regulatory and legal policies. This may involve some policies, which hinder a free participation from the private sector, and if a free participation of the private sector is allowed, decision making may not be allowed in route or fare policies. Here we look at the policies, which hinder competition. In a latter chapter we have taken some proxy variables which connote to such policies and a competition index has been calculated for the surveyed states. Comparing across the indices we have been able to pinpoint the policies which have found a low weight in the index and thereby have decreased the value of the indices. Competition crucially depends on the policy and the market environment. The philosophy of successful implementation of competition is associated with abolition of restriction, i.e., free movement of market forces. Therefore enhancement of competition in any field

depends upon unrestricted market environment. In general competition policy applies to sectors where structural conditions are compatible with a normal functioning of competition (whether the market functions well in practice or not is another matter). Regulation would usually concern markets where fixed costs are so high that no more than one firm would profitably operate. Other industries subject to regulation might be industries that are in a transitory phase. Both are the cases, which are not properly applicable for Indian public transport (road transport) system. Here a regulatory body would usually supervise the transport sector to try to ensure a smooth transition towards a regular functioning of competition in the market. Now examine the market environment of public transport sector specially passenger road transportation.

### **2.1.1 State level policies affecting competition**

The variables which have been included are:

#### **2.1.1.1 Entry barriers:**

Entry barriers mean policies, which do not give freedom to new players to enter the market. The incumbent which is the government here may due to concern about the quality of service and price for it may impose regulation regarding price structure, choice of routes because private players may be otherwise concentrated in more profitable routes and therefore some other geographical area may remain under supplied. For a uniform transport facility across the geographic area of a state and taking the competing alternate modes into account new players may be given permits.

The issue arising is the transaction cost. For plying on a route a player needs to register. The time of registration varies across the states. The more the time taken for registration, the more the anti-competitive element. A delay in issuing permits or registering would mean inter-temporally a loss in revenue. The opportunity cost goes on increasing the more the delay in the formalities in the issuance of permits. At a disaggregated level the variables affecting entry are:

## **1. Average time required for registration to get permit**

Permit is a restrictive instrument in the field of public transportation for private operators. More specifically it is a supply restrictive tool. Actually this is responsible for creating anti-competitive environment in transportation system. In dynamic sense, market environment becomes efficient as supply response takes lesser time to meet the demand. Generally India is a demand constrained country but the overcrowded public transportation tells something different. In this sector the gap between demand and supply is not just positive, it is also very prominent. Therefore, the public transportation system in India is supply constrained in nature. In this case shortages in every field prove poor responses in supply side of the market. In a supply constrained market, restriction on supply makes it difficult to play the market forces which automatically contaminates the environment of competition. Hence it can be argued that as the time taken to get the permit becomes lower, the market becomes more competitive for public transportation as supply response will be quicker.

## **2. Duration of permit: The variable which has been considered to analyse duration of permit is Temporary permit/Permanent permit**

The permit system in India is discretionary in many aspects. In case of public sector there is no permit system. It is applicable only in the case of private operators. There are two types of permits- temporary permit and permanent permit. In the previous section it is discussed that the permit system makes the supply response slower and consequently the market environment becomes anti-competitive. The concept of temporary permit is a permit for six months and that of permanent permit is a permit for five years. Generally permit is an entry barrier and none of the vehicles have the lifetime of few months. Therefore, if an operator gets temporary permit, then he must have to spend more time to get the next permit. In other words, the operator will face the entry barrier several times the lifetime of the vehicle. Hence it can easily be understood that entry barrier becomes stronger in case of temporary permits. Therefore, as the ratio of temporary permits

divided by permanent permits issued by the states becomes higher the situation becomes anti-competitive.

### **3. Facility of single window clearance for getting permits.**

A single window clearance would mean clearance can be had from one authority. This would save time and effort and thus would again decrease the transaction cost. This facility is competition enhancing.

### **4. Requirement of taking single permit to operate on all routes, separate permit for every route, a new permit in case of replacement of routes.**

Policy which requires only a single permit to ply on all routes is more competition enhancing than policies which require separate permits for every route and a new permit for replacement of existing routes.

### **5. Amount of registration fees charged per year**

Higher the amount of registration fees the higher is the anti-competitive element. When a potential operator is trying to enter a market the amount of registration fee may be minuscule in comparison to the investment in the sunk capital and operating cost. This variable may not show the level of competition. However, it was observed to be different across the states.

### **6. Regulations for the operator**

Such regulation would hinder competition. An investor keeping into consideration long-term gains and the consequent optimal size of the fleets and the routes on which they would be used decides such issues.

### **7. Total fleet size/population**

The size of the operating unit is usually measured in terms of the number of vehicles operated, sometimes weighted to take into account variations in vehicle size. Other parameters, which may be used in certain circumstances, are the number of employees, number of operating depots, total route length in kilometers, or the geographical area

served. Here we are considering total fleet size, i.e., the ratio of total fleet size and population, i.e., fleet size in per capita sense, which is an important indicator of competitive environment in public transport sector. To facilitate the provision of service which can be regulated in tune with demand at different time of the day or week, in different directions, and on different section of routes, it is normally desirable for minimum operating unit, i.e., total fleet size to be sufficiently large in terms of number of vehicles, to provide the entire service. It explains two important things.

- Firstly, as the ratio becomes high in any state of country like India, it implies that there are so many private operators in the field.
- Secondly, as the value of the ratio is increasing quite speedily it implies that the entry of the new supplier is not restricted, i.e., free entrance into the market is possible.

It also ensures that the benefits of the competitions are ultimately transferred to the consumer through safe and comfortable journey.

## **8. Maximum number of vehicles Operated**

If there is ceiling in case of maximum number of vehicles operated by a particular operator then the market environment becomes anti-competitive. In case of market operation any restriction imposed by external authority diverges the market solution from its optimum solution. Generally in perfectly competitive market the size of the industry is determined by the market demand and supply curves. If restriction on supply is imposed with ceiling on prices then there will be loss of both consumer's surplus and producer's surplus.

There is another angle by which this type of restriction can be described as anti-competitive. Generally the cost of production becomes lower in case of bigger production unit. Big firms enjoy different types of externalities, which is impossible for a small firm. Therefore any other external authority should not restrict the size of the operator. The operator should be free to decide the number of vehicles itself and not by the regulatory authority.

The restriction on the number of vehicle on a particular route is also restrictive condition for competition. This type of restriction is imposed only because of the shortages of vehicles in the state. By this restriction regulatory authority tries to distribute the vehicles in different routes. But it should be changed. The direction of private investment is always towards profit and if the level of profit is externally restricted (not by market condition) then it never gives optimal solution and consequently the environment diverges from competitive solution.

The ceiling on the number of transport operator on a particular route is another form of restriction. It is also a barrier to entry into the market and consequently it is considered as an indicator of anti competitive market environment. In perfect competition the number of firms in the industry is determined by the profit level of the industry, which is a natural market phenomenon, not by the artificial restriction of any exogenous factor. A competitive solution fails to give optimum solution if there is externalities in production system or any restrictive condition present in the exchange system.

## **9. Determination of Route Network, Fare, Fleet size and Time table**

Under this heading we are going to discuss two important structural aspects which are crucial determinants of competitive environment of the public road transport sector. The first one is participation of both public sector and private sector on a route. If there is no public-private coexistence in a route, i.e., if private sector participation is restricted by regulation, the situation will be completely anti-competitive.

In case of participation by both the sectors (public and private) on a particular route, there will be comparatively more competition than in a situation where there is a public monopoly. But still it is not fully competitive. Generally public good has two special characters- non-excludability and non-rivalry. In General Equilibrium theory externalities exist when any economic agent- a firm or consumer- find that his objectives (profit maximisation or utility maximisation) are affected by the behaviour of other agents. Such interdependence has always been ruled out; the presence of such externalities would

result in a breakdown of the relation between equilibrium and the optimum. Therefore the presence of public sector actually destroys the link between equilibrium and optimum and consequently the first Fundamental Theorem of welfare economics fails, i.e., the competitive equilibrium does not induce an optimal state. The presence of public sector is not the best way to establish competitive environment in any sector. The situation will be perfectly competitive if there will be only private sector operators operating freely in the system.

The second aspect is participation of both the sectors in decision making role about route network, fare, fleet size and time table determination. This is a crucial factor for enhancing competition in public transportation. If the private sector gets the chances to involve in decision-making body then the environment becomes more competitive in nature. A monopoly operator, whether state owned or private, may provide a cohesive network of services, but may abuse its position by restricting supply and charging higher fare than would apply under competition. It is quite likely to be inefficient, particularly if it is the public sector. In this situation regulation will be needed to prevent the abuse of monopoly, and to ensure that reasonable standards of services are met, at reasonable fare levels. A monopoly may leave gaps in its service which, if enforcement of regulation is weak, will be filled by illegal operators, providing an inferior standard of services. Where the industry comprises both public and private sector operators, regulation must ensure that neither sector has unfair advantages over the other. Regulation which prevents efficient deployment of vehicles and stifles innovation should be minimised, and where there is competition, operators should be allowed to compete on both price and service in an orderly manner. This can only be possible when both the public and private operators take part in the decision making process.

## **2.2 Current Policy Scenario**

Competition in the passenger transport sector in general can exist between different stakeholders, like the public sector and the private sector and between different service

providers within such stake holders. For the private operators delivering transport services, competition can be of different types like:

- Incidental: within a corridor, where two or more operators use the route en route to different destinations
- Targeted: where an operator deliberately sets out to compete with an established operator on the same route
- Network: where two operators operate competing service network within the same geographical area

The dynamics of the market structure must be viewed taking into consideration the overall transport policy of the Central Government as well as the enabling policies of the different states. From the demand side, price alone is not the main determinant of demand for public transport and should not therefore be viewed in isolation from other factors. Other factors could be the quality and efficiency of the service delivered by the public and the private sectors, the availability of alternate modes, the geographic nature of the state– for instance it is landlocked, *et al.* Such factors have made an impact on the resultant long-term demand and supply dynamics and the policy formulation. The overall long-term policy, which lays down objectives and guidelines, has not been uniform across the states. Instances have been found of competition hindering legislation and clandestine operations carried out by the private sector, the supply for such services being made possible by the associated profitability of specified routes and therefore misallocation of resources devoted to this sector.

### **2.2.1 Motor Vehicle Act and State-Specific Regulations**

The first legal and regulatory framework governing Motor Vehicles in India was the Indian Motor Vehicle Act, 1914. It was subsequently replaced by the Motor Vehicle Act, 1939. This Act has been amended several times. A need was felt for a new Act on account of the changes that have occurred in transport technology, pattern of passengers and freight movement, development of road network in the country and particularly the improved techniques in the motor vehicle management.

The current Motor Vehicle Act, 1988 came into force on July 1, 1989 and is applicable over the whole country. It defines the powers of central and state government with regard to the regulations for:

- Selection of drivers
- Selection of conductors of stage carriages
- Registration of Motor Vehicles
- Control of transport vehicles
- Entry Barrier (Enabling Provision Under the Motor Vehicle Act 1988)
- Special provisions relating to state transport undertakings
- Construction, equipment and maintenance of vehicles
- Control of traffic
- Insurance of vehicles
- Dispute Settlement Mechanism

In the present section we look at the provisions made for the above in the Act and the state-specific legislation.

**(i) Selection of drivers (Motor Vehicle Act 1988)**

As per the Motor Vehicle Act, it is mandatory for individuals to hold a valid driving license for driving any motor vehicle. The minimum age limit prescribed for getting this license is 18 years. In case of motor-cycles with engine capacity not exceeding 50cc, the minimum age is 16 years. This license issued under this Act is effective throughout India. It prescribes the class of vehicle and in case of bus drivers this class is transport vehicle. The regulations for issuing driving licenses are same for all states in the country and no bus driver can operate a vehicle without a valid licence.

## **State-specific requirements**

**Tamil Nadu:** Besides training, eye testing must be done every year. The selection criteria for the drivers of SRTC includes minimum qualification of 10<sup>th</sup> standard pass, 168 cm height, 50 kg weight, physical fitness and experience/ driving skills.

**Kerala:** Besides a valid licence, medical check-up and training are the other criteria for selection of the driver in the state.

**Maharashtra:** A valid licence is mandatory for the drivers of the state. Also the minimum qualification for them is 7<sup>th</sup> standard pass and they are also required to clear a screening test. STC drivers also undergo regular medical check-up (once in a year) in the early phase of their career and after 45 years of age.

**Orissa:** Only medical check-up is required for selection in the entire state which is done once in a year.

**Himachal Pradesh:** Besides the prescribed training requirements and medical check up, the maximum age limit for the driver is 55 years.

**West Bengal:** The eligibility criteria for the selection of drivers include driving licence and minimum educational qualification upto the 10<sup>th</sup> standard.

**Rajasthan:** For private vehicles, only licence is mandatory, whereas training is also required for the drivers of the SRTC buses. No medical check-up is required for the bus drivers of the state. Other selection criteria for the drivers include secondary education upto the 10<sup>th</sup> standard, maximum 32 years of age and a valid licence for heavy vehicles that is minimum of 3 years old.

## **(ii) Selection of Conductors (Motor Vehicle Act 1988)**

It is mandatory for the conductors of stage carriages to hold a valid conductor's license as per the Act of 1988. The prescribed age limit for such a licence is minimum 18 years. However, the required educational qualifications may vary across states. The licence issued is applicable within the state boundary.

### **State-specific requirements**

**Tamil Nadu:** Training and eye testing is done once in a year.

**Kerala:** Besides a valid licence, medical check-ups and training are the other criteria for selection.

**Maharashtra:** Conductors are selected on the basis of marks obtained in the 10<sup>th</sup> standard. Merit is determined by giving 75 percent weightage to marks obtained and 25 percent to personal interview. Medical check-up is required at the time of selection only.

**Orissa:** Only medical check-up is required in the state, which is done at the time of selection.

**West Bengal:** Conductor licence is necessary. The minimum educational qualification for a conductor's licence is 4<sup>th</sup> Standard pass.

**Rajasthan:** For conductors besides a valid licence, training is also required. No medical check-up is required for the bus drivers of the state. Other selection criteria for the drivers include secondary education upto the 10th standard and maximum 32 years of age.

### **(iii) Registration of Motor Vehicles (Motor Vehicle Act 1988)**

A certificate of registration issued by the state government is a basic necessity for operating the vehicle across the country. The validity of the certificate is 15 years for vehicles not used for public purposes. In Rajasthan, the same holds good for transport vehicles (which includes stage carriages as well as contract carriages) as well. However, in the case of change of ownership or place of residence, a new certificate specifying the same is required from the concerned authority.

To obtain a valid registration certificate it is essential across all the states for the vehicle to carry a fitness certificate. This certificate is valid throughout the country but it cannot exceed the age limit of the vehicle. The age limit of vehicles may vary from state to state.

### **(iii) Control of Transport Vehicles**

For the use of any transport vehicle a valid permit issued by the State Transport Authority (STA) or Regional Transport Authority (RTA) is required. The permit prescribes the place and manner in which the vehicle is to be used.

#### **Application for Issuance of Permit**

Any individual or company may apply for a permit as per the central Act. The particulars to be attached while submitting the application have been specified. Since Maharashtra and Kerala follow the Central Motor Vehicle Act, the particulars required by the concerned authority for grant of permits are the same.

#### **Stage carriage**

An application in respect of stage carriage or as a reserve stage carriage shall contain following:

1. Route or routes required (to avoid oversupply of buses on a specified route)

2. The type and seating capacity of each vehicle
3. The minimum and maximum numbers of daily trips proposed to be provided and the time-table for the normal trips. In Maharashtra, permits are known to have been cancelled despite the paucity of buses
4. The number of vehicles to be kept in reserve. Arrangements to be made for housing, maintenance and repair of the vehicles.

**Contract carriage:**

The application shall contain the following:

1. Route or routes required- to prevent oversupply of buses on a specified route.
2. The type and seating capacity of each vehicle.

**State-specific requirements**

**Rajasthan and Himachal Pradesh-** In the case of stage carriages, the proposed fare to be charged is also to be submitted along with the application. However, this must match the state government-fixed fares as it alone wields the power to fix the fare structure.

**Orissa-** The application should include a copy of the registration certificate, fitness certificate, insurance certificate and tax clearance certificate.

**Tamil Nadu-** In case of stage carriage, the proposed fare to be charged is also to be submitted along with the application form in addition to the above details.

**West Bengal-** The proposed fare to be charged and copy of the time-table (according to which they may temporarily operate their buses) are to be submitted along with the application form in addition to the above details.

### **Conditions of Permit:**

If RTA decides to grant a permit it may attach to the permit any one or more of the following conditions:

1. Area of operation
2. Commencement of permit from a specified date
3. The minimum and maximum number of daily trips to be provided. Operator cannot change route, as the permit is route specific
4. Exhibit fare table and timetable in vehicle
5. Bus Stops: passengers shall not be taken up or set down except at specified points
6. Maximum number of passengers
7. Vehicles of a specified type fitted with body conforming to approved specifications shall be used
8. Specified standards of comfort and cleanliness shall be maintained
9. Fare Structure as per the approved fare table
10. Ticketing System: tickets issued to passengers shall show the fares actually charged  
Also, the operator is to maintain record of tickets issued in a specified manner
11. A record of the vehicles kept as reserve

Arrangements made for the housing, maintenance and repair of vehicle

Specified bus station maintained by the government shall be used and rent or fee shall be paid for their use

The holder of permit shall furnish to the RTA such periodical returns, statistics and other information as state government may from time to time prescribe.

The RTA can, at any time, vary the conditions of the permit by giving one month's notice

The conditions of the permit are the same as specified above for Maharashtra, West Bengal and Kerala since they follow the Central Act of 1988. The variations in other states are:

**Rajasthan-** Besides the above conditions, the transport vehicle is to carry a fitness certificate, particulars of the insurance policy, first aid box and a conductor in addition to the passengers carried. In a contract carriage, a list of passengers travelling in the vehicle is to be maintained for each trip.

**Orissa-** In a contract carriage a list of passengers travelling in the vehicle is to be maintained for each trip.

**Tamil Nadu-** Besides the above conditions, the transport vehicle is to carry a fitness certificate and four wooden chokes to prevent the motion of the vehicle when stationary. A maximum of 15 standing passengers are allowed during fairs and festival seasons, provided an additional motor vehicle tax is paid for them. Also, no audio equipment is to be played in the vehicle.

**Himachal Pradesh-** Besides the specified conditions of the Central Act, the conductor and drivers of the buses of state are to wear uniform as per the Himachal Pradesh Motor Vehicle rules.

#### **(v) Entry Barrier (Enabling Provision under the Motor Vehicle Act 1988)**

As per the Motor Vehicle Act, 1988, there are no entry barriers for operations in a state. Any transport vehicle can be used if it carries a valid permit, which may be obtained at any time. The State Transport Authority (STA) or Regional Transport Authority (RTA) of the concerned state issues the permit.

#### **State-specific requirements**

However the states have imposed their own restrictions as per their state-specific policies.

**Maharashtra-** Public transportation was nationalised in 1974. Since then, all intra state routes are reserved for public operations and no private operators are allowed.

**Rajasthan-** Permit can be obtained by any private operator for both stage and contract carriages except the routes reserved for public bus operations as per the nationalisation policy of 1950.

**West Bengal and Orissa-** Private operators can obtain permit for both stage carriage and contract carriage except for the routes reserved for public operations as per the policy of nationalisation.

**Tamil Nadu-** All the 30 districts in the state were nationalised in 1967 and private operations are allowed only on a few routes on which they have been running their buses prior to nationalisation. Therefore no new permits are being granted to private operator.

**Kerala-** Private operators are free to apply for a permit on any route of their choice except those reserved under the nationalisation policy of 1957.

**Himachal Pradesh-** The state transport authority has imposed complete ban on grant of new permits on 100 per cent national/ state highways. Also, permits for temporary operations and to contract carriages have been discontinued with. Private operators may, however, apply for operations in rural areas.

### **Variation in Permit**

As per the Motor Vehicle Act, 1988, an application to vary the conditions of any permit shall be treated as an application for the grant of a new permit except in the following cases:

1. When an increase in the frequency of service is sought, without any increase in the number of vehicles.
2. When the terminal is altered and the distance altered by such changes does not exceed 24 km.

3. In case of extension, the distance covered by extension does not exceed 25 km from the terminal.

The transport authority can make any such variation if it is satisfied that the change is in favour of the public and that it is not necessary to grant a separate permit in respect of the original route as so varied or extended.

The above condition holds same for all the states covered under the study.

### **Exit Barrier**

There are no exit barriers. As per the Act, an operator may curtail operations at any time by informing the concerned authority. The state also has the right to cancel or suspend the permit based on the following grounds:

- Breach of any condition specified.
- If the holder uses or allows a vehicle to be used in any manner not authorised by the permit.
- If the holder ceases to own the vehicle covered by the permit.
- If the holder obtained the permit by fraud or misrepresentation.
- If the holder acquires the citizenship of any foreign country.

### **(vi) Special Provisions Relating to State Transport Undertakings**

If the state government feels that for the purpose of providing an efficient, adequate economical and properly co-ordinated road transport services it may be necessary in the public interest to reserve certain routes or areas for operations, it may do so under the provision of this Act. On such routes only temporary permits with one-year validity can be issued. As per the Act the state transport undertaking may, in the public interest, operate additional services for the transportation of passengers on special occasions such as festivals.

For example in Kerala in 1998, temporary permits were issued to private operators to ply stage carriages on the notified routes since no application for the permit was made by the state transport undertaking.

### **(vii) Construction, Equipment and Maintenance of Vehicles**

Under this Act the central government has the power to make regulations on construction, equipment and maintenance of motor vehicles for the following:

- Dimension of vehicle and load carried
- Particulars of tyres and spare parts
- Speed governors
- Environment standards: Emission norms and noise levels
- Safety measures: Equipment essential for the safety of drivers, passengers and other road users
- Placement of audio: Visual or radio, tape recorders in public vehicles
- Warranty of vehicles and related norms

### **State-specific requirements**

**Orissa-** use of multi-toned and other devices producing harsh and loud noise is not permissible under rules.

**Kerala-** tinted glasses banned in public transport.

**Maharashtra-** as per the directive of the Government of India, Maharashtra State Road Road Transport (MSRT) is bound to purchase the vehicles having EURO-I norm engine for controlling pollution since April 2000.

**Tamil Nadu-** in order to avoid road accidents, it is mandatory to paint an eye on the head lamps in black on all vehicles.

Besides the above rules the state government can also make regulations on

- Seating arrangements.
- Periodical testing and inspection of vehicles and fees to be charged for the test
- Particulars other than registration marks to be exhibited in the vehicles

**(viii) Control of Traffic**

It is mandatory for all vehicles to follow the maximum and minimum speed fixed under this Act. The state government may, however, vary the same in the interest of public safety or convenience either in the entire state or in a particular area or road. No vehicle which is not fitted with pneumatic tyres is allowed to be driven in any public place.

The speed limit imposed in various states are as under:

**Table 2.1: Maximum Speed Limit in various States**

State	Maximum Speed Limit (in km per hour)
Tamil Nadu	60
Rajasthan	60
Kerala	60
Maharashtra	65
Orissa	40

**Himachal Pradesh-** On any hill marked by traffic sign, no person shall drive a motor vehicle with the clutch pedal / depressed or with any free wheel or other device in operation which press the engine from the driving wheels and prevents the engine from acting as a brake when the vehicle is travelling down an incline. On all hill roads all drivers shall observe the following rules:

- No motor vehicle shall overtake another, except at a place where the whole road is clearly visible for at least 180 meters ahead
- The driver while taking turn on every bend and curve shall give a horn

**Maharashtra**– Restricted the use of private luxury buses and heavy vehicles due to nuisance and inconvenience caused by them to the citizens.

### **Provision of Bus-Shelters**

The state government or any concerned authority determines places at which motor vehicles may stand either indefinitely or for a specified period of time and also the places at which public service vehicles may stop for a longer time than is necessary for boarding or dropping passengers.

**Tamil Nadu** - Private as well as public buses are parked inside the bus terminal and a flat fee is charged from the private operators for it, which is based on the grade of the bus.

**Kerala**- Private operators park their vehicles inside the terminal for which they pay a flat fee.

**Mahrashtra**- Private operators park their vehicles outside the bus terminals in the state.

**Orissa**- In the state private as well as public buses are parked inside the bus terminal.

**Himachal Pradesh**– Private operators can park inside the bus stations.

**West Bengal**- Private operators can park inside the bus stations.

**Rajasthan**- Private operators park their vehicles outside the bus terminals in the state.

### **(ix) Insurance of vehicles**

In order to operate bus every operator has to obtain insurance policy against third party risk for vehicles, except those owned by the State Transport Undertaking.

## **(x) Dispute Settlement Mechanism**

For settlement of disputes the state governments have constituted a motor accidents tribunal for the purpose of adjudicating upon claims for compensation in respect of accidents involving deaths or injury to any person or property of third party or both.

**Tamil Nadu** –Disputes raised by passengers/ consumers are dealt by the transport corporations through their public relations officers and in some cases by consumer forums. In few cases consumers also resort to filing writ petitions before the courts for redress.

Dispute between State Transport Corporations and private operators, is presented before the concerned Transport authorities or the State Transport Appellate Tribunal.

Also the State transport undertaking have been instructed to settle the accident claims through Lok Adalats and reach mutual settlement.

**Kerala-** Any person aggrieved by the decision of RTA can approach State Transport Appellate Tribunal.

**Mahrashtra**– The legal department of the corporation deals with legal cases filed in various courts against the corporation. Besides this the legal department also gives advise regarding legal matters to various department units in the corporation.

**Orissa**– Persons may appeal to the State Transport Appellate Tribunal against the decisions of STA and RTA regarding issuance of permits. Second Motor Accident Claim Tribunal holds the cases of Motor accident claims.

**Himachal Pradesh**– State Transport Tribunal supervises and regulates the activities of Regional Transport Tribunals and adjudicates intra– state disputes. State Transport Appellant Tribunal is an appellate body. It hears the appeals of the State Transport Tribunal.

**West Bengal** - If a person disagrees with the decision of STA and RTA regarding issuance of permits, he may appeal to the State Transport Appellate Tribunal authority against the orders passed. There is also a Vigilance commission and a public grievance assistance cell, which takes care of public grievances/ complaints received.

**Rajasthan-** the legal department of the Transport Department and Regional Transport Department deals with legal cases filed in various courts against the corporation.

The summary of state specific regulations are listed in Table 2.1.

**Table 2.2: State Specific Regulation**

State	Motor Vehicle Rules followed by States	Requirement for Selection of driver (in addition to licence)	Application for Issuance of permit( in addition to requirements of Central Motor Vehicle Act, 1988)	Conditions of permit (in addition to the conditions specified in central motor vehicle act, 1988)	Entry Barrier	Special provisions relating to State Transport Undertaking	Construction, equipment and maintenance of vehicles	Dispute Settlement Mechanism
Himachal Pradesh	Himachal Pradesh Motor Vehicle Rules	<ol style="list-style-type: none"> <li>1. Medical checkup.</li> <li>2. Maximum age limit 55 years.</li> </ol>	The proposed fare to be charged.	Conductor and driver have to wear uniform.	<ol style="list-style-type: none"> <li>1. The State Transport Authority has imposed complete ban on grant of new permit on 100 percent National/State Highways.</li> <li>2. Stopped the grant of permit for temporary operations and to contract carriage.</li> <li>3. Private operators can apply for operations in rural areas.</li> </ol>			Persons may appeal to State Transport Appellate Tribunal
Kerala	Central Motor Vehicle Act	<ol style="list-style-type: none"> <li>1. Training</li> <li>2. Medical check-up</li> </ol>			Private operators are free to apply for permit on any route except for the routes reserved as per the policy of nationalisation.	In 1998 temporary permits were issued to private	Tinted glasses banned in public transport	

						operators to ply the stage carriages on the notified routes since no application for the permit was made by state transport undertaking		
Maharashtra	Central Motor Vehicle Act	<ol style="list-style-type: none"> <li>1. Minimum qualification-7<sup>th</sup> standard.</li> <li>2. Screening test.</li> <li>3. Medical check-up</li> </ol>			Since nationalisation (1974), Intra state routes have been reserved for public operations and no private operators are allowed.		As per direction of government of India, MSRT is bound to purchase the vehicles having EURO-1 norm engine for controlling pollution.	The legal department of corporations deals with legal cases.
Orissa	Orissa Motor Vehicle Rules	Medical check-up	A copy of: <ul style="list-style-type: none"> <li>• registration certificate.</li> <li>• Fitness certificate.</li> <li>• Insurance certificate.</li> <li>• Tax clearance certificate.</li> </ul>	Contract carriage: list of passengers for each trip travelling in vehicle.	Private operators can obtain permit for both stage carriage and contract carriage except for the routes reserved for public operations as per the policy of nationalisation.		Use of multi toned and other devices producing harsh and loud noise is not permissible under rules.	Persons may appeal to State Transport Appellate Tribunal

Rajasthan	Rajasthan Motor Vehicle Rules	<ol style="list-style-type: none"> <li>1. For private operators: only licence is mandatory.</li> <li>2. For public operators: <ul style="list-style-type: none"> <li>• Minimum qualification 10<sup>th</sup> standard.</li> <li>• Maximum 32 years of age.</li> </ul> </li> </ol>	The proposed fare to be charged.	<ol style="list-style-type: none"> <li>1. Transport vehicle has to carry fitness certificate.</li> <li>2. Particulars of the insurance policy.</li> <li>3. First aid box.</li> <li>4. Contract carriage: list of passengers for each trip travelling in vehicle.</li> </ol>	Private operators can obtain permit for both stage carriage and contract carriage except for the routes reserved for public operations as per the nationalisation policy of 1950.			The legal department of corporations deals with legal cases.
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Tamil Nadu	Tamil Nadu Motor Vehicle Rules	<ol style="list-style-type: none"> <li>1. Minimum qualification- 10<sup>th</sup> standard.</li> <li>2. Height 168 cm, 50 kg weight, physical fitness.</li> </ol>	The proposed fare to be charged.	<ol style="list-style-type: none"> <li>1. Transport vehicle has to carry fitness certificate.</li> <li>2. 4 wooden chokes to prevent the motion of the vehicle when kept in stationary position.</li> <li>3. Allowed maximum of 15 standing passengers during fairs and festivals.</li> </ol>	Private operators are allowed only on a few routes on which they have been running their buses prior to nationalisation.		Mandatory to paint an eye on the head lamps in black on all vehicles.	<ol style="list-style-type: none"> <li>1. Disputes by passengers- Transport corporations and by consumer forums.</li> <li>2. Dispute between state transport corporations and private operators- Transport Authorities or State Transport Appellate Tribunal</li> </ol>
West Bengal	West Bengal Motor Vehicle Rules	<ol style="list-style-type: none"> <li>1. Minimum qualification 10<sup>th</sup>.</li> <li>2. Experience.</li> </ol>	<ol style="list-style-type: none"> <li>3 The proposed fare to be charged.</li> <li>4 A copy of time table.</li> </ol>		Permit can be obtained by any private operator for stage and contract carriage except for the routes reserved for public operators as per the policy of nationalisation.			Persons may appeal to State Transport Appellate Tribunal

### 2.3 Market structure in the States:

#### Private participation:

The policy of private participation would directly show the level of competition allowed in the sector. For the states the table 2.2 shows the market share of the private and public operators.

**Table 2.3: Market share of private buses**

States	2001	2002	2003	2004	2005
Himachal Pradesh	36.0	40.0	46.1	49.2	49.6
Tamil Nadu	25.4	21.3	21.3	21.1	20.9
Orissa	93.8	94.8	95.2	95.7	96.8
Rajasthan	85.3	82.0	81.2	81.9	82.4
Maharashtra	10.7	10.1	9.4	8.8	7.0
West Bengal	85.0	85.0	84.6	85.0	85.0
Kerala	85.4	85.4	86.5	82.6	82.6

**Figure 2.1: Market Share of Private Buses**

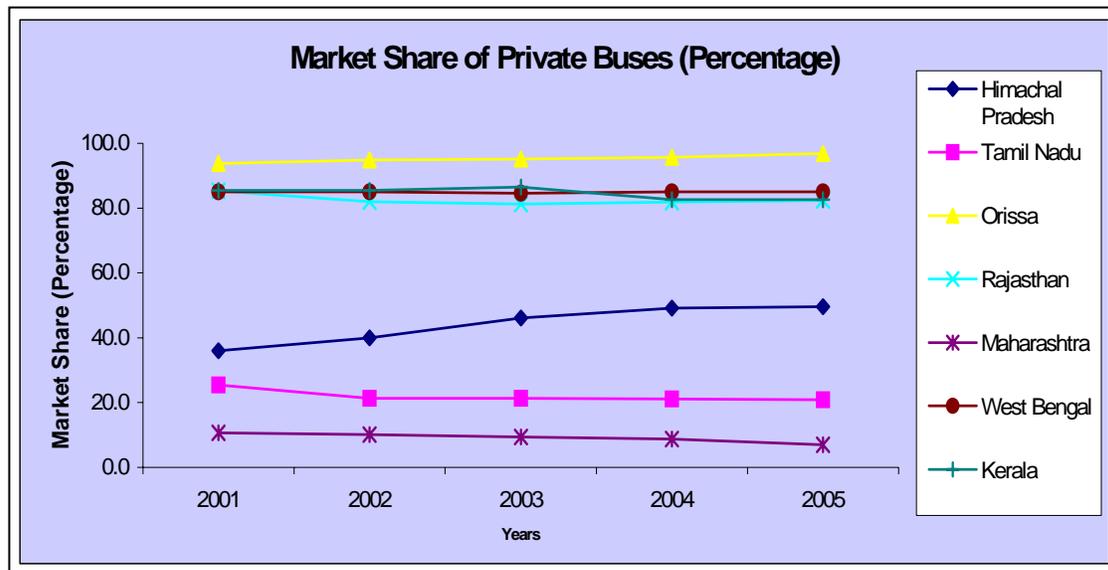


Figure 2.1 and figure 2.2 shows the market shares of private and public buses in all the seven states. The market share of private buses in Orissa is highest over period of five years and lowest in case of public buses. In Maharashtra the share of public buses is highest among all the states while lowest in private buses.

**Figure 2.2: Market share of public buses**

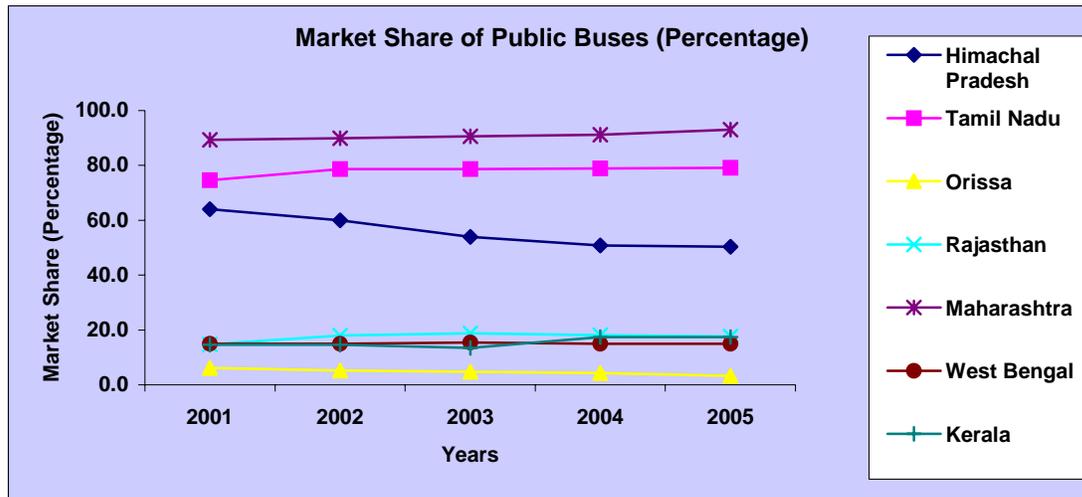
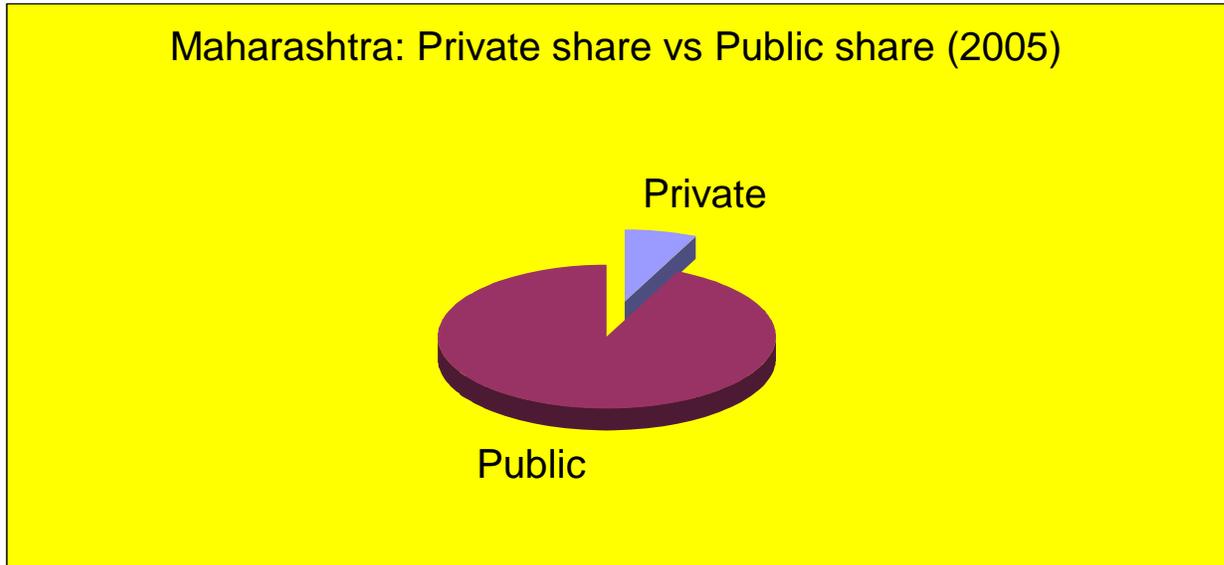
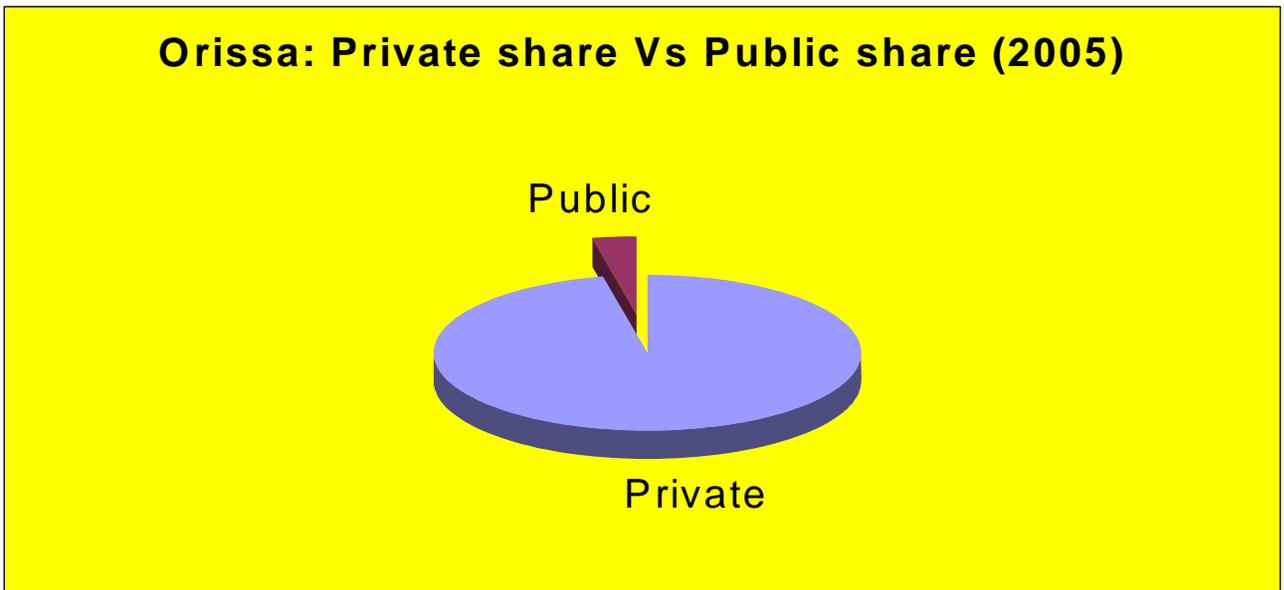


Figure 2.3 and 2.4 clearly represent the two extreme cases. For instance, as is clear from Figure 2.3, in Maharashtra, only 7 per cent of the total buses are privately owned. Rest 93 per cent are owned by the public sector. This clearly shows that in Maharashtra hardly any competition exists between the public and private sector buses. On the other hand in Orissa, more than 90 per cent of the buses are privately owned.

**Figure 2.3: Maharashtra: Private Share vs. Public Share**



**Figure 2.4: Orissa: Private Share vs. Public Share**



## **2.4 Fare Policy:**

### **Orissa**

State Transport Authority/Regional Transport Authority may attach to a stage carriage permit the condition that the stage carriage in respect of which permit is granted shall carry passenger at such fares as the said authority may, after giving the holder of the permit an opportunity to make representation and after taking into consideration the matters specified fix hereunder, in that behalf from time to time, namely:

- (i) The condition of roads on which the stage carriage plies
- (ii) The density of traffic on the routes
- (iii) The cost of operation of the stage carriage; and
- (iv) Other matter affecting the interest of the public generally.

STA/RTA may attach to a stage carriage permit the condition that not more than a specified number of passengers shall be carried on such stage carriage at any point of time.

### **Tamil Nadu**

Fare is fixed by the government and applicable for State Transport Corporation buses and private operators. The fare was last revised in Tamil Nadu on 6/12/2001. The fare is fixed separately for City, Town, Mofussil, Hill operation and Express Services.

### **Kerala**

As per Section 67 of the Motor Vehicle Act, state governments are empowered to fix fares for stage carriages and contract carriages. Normally fares are fixed on demand by the operators consequent on escalation in operating cost which includes cost of fuel, maintenance, taxes, salary of crew etc. In Kerala the fares of stage carriages are fixed by verification in the official gazette.

### **West Bengal**

The State government fixes the fares and it is applicable for both State Transport Undertaking and private operators. However, the private operators can charge less fare, due to competition, than the fares fixed by state government if permitted by the regulatory agencies.

### **Rajasthan**

The State government fixes the fares for the State transport undertaking and others. The fare is charged in slab of five kilometers. Minimum fare will be for five kilometers. For Ordinary bus, Express/ Mail service, semi deluxe, deluxe service and air-conditioned services the per kilometer per passenger rates are Rs 0.46, Rs 0.50, Rs 0.55, Rs 0.75 and Rs 1.25 respectively. However, it has been observed that the private operators in Rajasthan charge lower fares, due to competition, than fares fixed by the government.

### **Himachal Pradesh**

The state government fixes a ceiling on the fare to be charged which is applicable for both state transport corporation and private operators. No private operators can charge fares exceeding the ceiling, but can charge less than that.

## **2.5 Route Policy:**

### **Orissa**

Salient points of Orissa route policy are as under:

- A single permit is not issued to operate on all routes.
- One is to acquire separate permit to operate on each route.
- A new permit is required in case of replacement of old bus.
- A new permit is required in case of replacement of old route.
- Prior permission is required by private operator to change the route.
- Public and private operators operate on the same routes in case of inter state as well as intra state routes.
- No route is reserved for public operator either for Inter state or for Intra state.
- Prior permission is required for withdrawing a bus from a route.

- Prior permission is required for withdrawing a route.
- There is no penalty for withdrawing either the bus or the route.

### **Maharashtra**

Though Maharashtra is 100 per cent nationalised state in transport sector but private operators are operating on inter state routes. In order to compete with private Clandestine Operations and to provide faster and safe service specially on short distances, where the clandestine operation is high, the corporation has introduced 200 mini buses having 20 seating capacity. These buses are run on short distances and on high traffic routes and are operated as conductor less service.

### **Tamil Nadu**

In view of the nationalization policy, no new route permits for stage carriages are granted to private operators. Only variation is that, revision of timings are considered. All requests for operation of new routes are met by State Transport Corporations after due survey of the route condition, viability of the operation etc.

### **Kerala**

Salient points of Kerala route policy are as under:

- There is a policy of single window clearance for giving permit.
- Private operator has to take approval before starting operation.
- A single permit is not issued to operate on all routes.
- One is to acquire separate permit to operate on each route.
- A new permit is required in case of replacement of old route.
- A new permit is required in case of replacement of old bus.
- Prior permission is required by private operator to change the route network.
- Public and private bus operators operate on the same route for inter state and intra state.

- Some routes are reserved for public operators for inter state as well as for intra state as per the nationalisation policies.
- Prior permission is required for withdrawing a bus from a route.
- Prior permission is also required for withdrawing from a route.
- There is no penalty for withdrawing a bus.
- Any person can apply for a route of his choice as per section 80 of the Motor Vehicle Act. An application for a permit shall not be refused ordinarily. Therefore no restriction is imposed in granting permits for passenger vehicles.

## **West Bengal**

Salient points of West Bengal route policy are as under:

- Private operator has to get approval before starting the operation.
- A single permit is not valid on all routes.
- Separate permit is not required for every route.
- A new permit is required in case of replacement of the route.
- Prior permission is required by private operators to change the –
  - (a) Route network
  - (b) Fare
  - (c) Fleet size
  - (d) Time table schedule
- Public and private operators are allowed to operate on routes for inter state and intra state.
- No routes are reserved for public operators for inter state and intra state.

## **Rajasthan**

Rajasthan has the open route policy. As a policy, permit to operate a bus on any route is given to anyone willing to operate the bus.

1. It is mandatory for an operator to wait for approval before starting operations.

2. A single permit is not allowed to operate on all routes.
3. One is to take separate permit for every route.
4. A new permit is required in case of replacement of old bus.
5. A new permit is required in case of replacement of route also.
6. Prior permission is required by private operators to change the route network.
7. Public and private bus operators can operate on the same routes subject to nationalisation policy and restriction of km operated.
8. Some routes are reserved for public operators for inter state and intra state routes as per nationalisation policies.
9. Prior permission is required for withdrawing a bus from a route.
10. Permission is also required for withdrawing a route.
11. No penalty is imposed for withdrawing a bus.

### **Himachal Pradesh**

A complete ban on grant of permits on 100 per cent National/State Highway has been imposed by the state government.

### **Summary**

The current Motor Vehicle Act, 1988 came into force on July 1, 1989 and is applicable over the whole country and, in addition to Central Motor Vehicle Rules some states follow their own rules. It defines the powers of central and state government with regard to the regulations for selection of drivers, selection of conductors of stage carriage, registration of Motor Vehicles, control of transport vehicles, entry barriers, special provisions relating to state transport undertakings, construction, equipment and maintenance of vehicles, control of traffic and insurance of vehicles. The variables which defines the state level policies affecting competition are entry barriers such as, average time required for registration to get the permit; duration of permit; facility of single window clearance; requirement of taking single permit to operate on all routes; separate permit for every route; a new permit in case of replacement of routes; amount of registration fees charged per year; regulations for the operator; total fleet size/population; maximum number of vehicles operated and determination of route network; fare, fleet

size and time table. Maharashtra and Orissa are the extreme cases in terms of market share of private and public buses. In the year 2005, market share of private buses in orissa was 96.8 per cent while the share of public buses in Maharashtra was 93 per cent. The state government fixes the fares to be charged which was applicable for both State Transport Undertaking and others. Route policy varies from state to state, for instance, while Rajsathan has open route policy, Himachal Pradesh imposed a ban on grant of permits on 100 per cent National/State Highway, Maharashtra on the other hand is 100 per cent nationalised with respect to Inter State Road Transport while, Tamil Nadu has frozen the private entry in passenger road transport sector.

## Chapter 3: International Case Studies

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In the present chapter eight case studies of different countries pertaining to reforms in the passenger transport sector have been studied and analyzed. The countries included in this chapter are United Kingdom, United States, France, Sweden, Finland, Kyrgyzstan, Chile and Sri Lanka. The basic objective is the external learning from the reform process adopted in these countries.

The present chapter has eight sections. Section 3.1 covers United Kingdom, 3.2 United States, 3.3 France, 3.4 Sweden, 3.5 Finland, 3.6 Bishkek ( Kyrgyzstan), 3.7 Chile and 3.8 Sri Lanka.

### **3.1 United Kingdom**

In the U.K., privatisation and de-regulation of passenger road transport took place simultaneously; however, there are many policy options available such as:

- Public enterprise with regulation
- Public enterprise with de-regulation
- Private enterprise with regulation
- Private operation with de-regulation

#### **3.1.1 Passenger Road Transport in U.K can be broadly categorised into two:**

(a) Policy within London: In this case the policy adopted is privatisation with regulation.

Regulation is with respect to:

- fares
- route network
- frequency
- concessions
- bus passes
- co-ordination with other modes

(b) Outside London: in this case the policy is privatisation and deregulation. Here the operators are free to set their own fares and routes. The private operators are not regulated by the road transport authority in any way

### **3.1.2 Bus operations in U.K can be broadly categorised into two:**

- (a) Commercial operations- 85 per cent operations in U.K fall in this category and Commercial operations are fully deregulated.
- (b) Tendered operations- Like government subsidies and socially desirable services fifteen per cent operations in U.K account for tendered operations. Government is responsible only for tendered services.

### **3.1.3 An Overview Of Deregulation**

In UK, the conservative government of Margaret Thatcher (1979-1990) began a wave of market privatisations aimed at reducing government burden. Legislation in the early 1980s paved the way toward the privatisation of inter-city and eventually, urban bus services throughout Britain. The Thatcher Government argued that bus patronage had continued to decrease in the 1970s and 1980s, despite a substantial rise in government subsidies for these services. This policy shift, away from public sector planning and operation of services to a free market system, culminated in the 1985 Transport Act, which effectively deregulated urban bus services in areas outside of London, i.e., severely limiting the powers of the metropolitan authorities or Passenger Transport Authorities (PTAs). Under the 1968 Transport Act, these Authorities were given powers to oversee the planning and the contracting out of transport services.

After 1986, the PTAs were reduced to contracting out only the “socially necessary” service (10 percent of the market) and to provide local information and planning guidance. It was only in Greater London where public transport services were regulated through a competitive tendering programme.

Major structural changes were made in bus operations in the U.K since 1985. As a result the composition of market share between public and private buses changed drastically (Refer table3.1).

**Table 3.1: Market share of Public and Private Buses (1985–1996)**

<b>Kms operated</b>	<b>1985</b>	<b>1996</b>
Private Buses	8%	95%
Public Buses	92%	5%
Total	100%	100%

<b>Passenger journeys</b>	<b>1985</b>	<b>1996</b>
Private	3%	93%
Public	97%	7%
Total	100%	100%

The above table shows that the private operators contribution to the bus transport has increased substantially in terms of the kms operated and passenger journeys.

For instance in terms of kms operated the share of private buses increased from 8 per cent in 1985 to 95 per cent in 1996. Similar trend is noticed in terms of passenger journeys.

### **3.1.2 United Kingdom (Excluding London)**

#### **3.1.2.1 Existing regulatory regime**

Ownership of the bus industry in U.K is almost entirely in the hands of the private sector, and the 18 companies owned by authorities are required to operate commercially. There are nine ownership groups, of which seven are public limited companies, most of which have other interests, such as railway franchises, or overseas investments. Some of these, and in particular those which have remained private companies, are among the most progressive and customer oriented businesses in the industry. Alongside there are many small firms providing bus services.

The Transport Act 1985 returned the industry to a contestable market, subject of course to safety regulation.

The Transport Act of 1985 was a deliberate attempt to free the bus industry from burdensome controls, bureaucratic management, and over-dependency on local authority subsidies and other political interference. The Act had removed price control from all bus services, although the largely state-owned companies made little use of this freedom. The 1985 Act is often seen as providing for ‘deregulation and privatisation’, but it is better described as intending economic and regulatory reform, since in some ways the regulatory structure became more intrusive.

The regional Traffic Commissioners have powers to ensure safety, and may restrict the number of vehicles permitted by the Operator’s Licence, or suspend the licence and put the firm out of business. Penalties for late running have been imposed increasingly on bus companies, with no attention being paid to the many occasions when lateness has been due to traffic congestion which is beyond the operator’s control. Thus there is an industry which is reasonably profitable and mostly market-driven, though dependent upon subsidy in London. However, the public image of the industry is not very high.

### **3.1.2.2 Consequences**

Nevertheless, the benefits that have flowed from the liberalisation of the bus industry (outside London) since then have been considerable.

#### **➤ Quality Of Services**

- Between 1970 and 1986 local **bus service supply** outside London decreased by 22 percent; since deregulation it has increased by 24 per cent (DETR, 1999). Between 1986 and 1998, in British metropolitan areas, the number of passenger km by private car increased by 32 percent (Great Manchester and Merseyside) and 78 per cent (Tyne and Wear) while in British metropolitan areas, since deregulation, there has been a strong decline in bus services patronage: between 1986 and 1998 the number of passenger journeys decreased by 40 per cent.

- **Accessibility to bus services** has changed little. In metropolitan areas 92 per cent of households lived within 6 minutes walk of a bus stop in 1996/98, slightly more than in 1985/86. A similar change has taken place in urban areas. In rural areas the proportion has increased from 74 per cent to 77 per cent.
- Since deregulation, **frequency of bus services** has increased: the percentage of households with at least one service every 15 minutes was equal to 28 in 1985/86. This increased to 34 per cent in 1993/95. Over the same period the proportion of households with less than one service every sixty minutes fell from 14 to 10.

➤ **Cost**

Before deregulation, that is, between 1970 and 1985 the cost per bus-km in Britain metropolitan areas had increased by 25 per cent whilst the cost per passenger journey had increased by 52 per cent. However, after deregulation efficiency (cost per vehicle km) of public transport in British metropolitan areas is on average 3.5 times higher than in Germany, France and Italy. Effectiveness (cost per passenger km) is about twofold in British metropolitan areas.

**Table 3.2 – Local public transport in Britain metropolitan areas: evolution of the main parameters before and after the deregulation**

	<b>1978-1985</b>	<b>1985-1998</b>
Bus km	-15%	19%
Passenger Journeys	-30%	-42%
Cost per Bus km	26%	-54%
Cost per Passenger Journey	52%	-5%

Source: [www.stm.info/transportsejc2004/presentations/ppt/Ramella](http://www.stm.info/transportsejc2004/presentations/ppt/Ramella)

➤ **Public support**

Between 1978 and 1985 subsidies had increased by 41 per cent. After deregulation, subsidy per passenger km is three times lower in Britain metropolitan areas. The increase of service frequencies, with decreasing total costs and subsidies, indicates the empirical

weakness of the argument for subsidization of public transport in order to achieve user economies of scale and confirm the theory of “leakage” from subsidy to cost. The empirical evidence shows that subsidization of public transport seems to be worthwhile only on social grounds and that the aim of satisfying the mobility needs of people without access to a car can be fulfilled with much lower levels of subsidization than the present ones in Germany, France and Italy.

**Table 3.3: Subsidization of Public Transport in UK**

	<b>1978-1985</b>	<b>1985-1998</b>
Public subsidies	41%	-49%
-concessionary fare reimbursement	32%	-1%
-public transport support	47%	-72%

Source: [www.stm.info/transportsejc2004/presentations/ppt/Ramella](http://www.stm.info/transportsejc2004/presentations/ppt/Ramella)

However, in the English Metropolitan Counties, concerns with deregulation were related to the environment and also to a further decline in public transport patronage. This drop in use has been attributed to a number of key factors, including,

- a rise in real fares,
- a lack of service dependability, and
- limited access to integrated fares and information.

In time, most of the remaining users did in fact, become familiar with bus services, however, many authorities and users claimed that operators were not receptive to user needs (e.g., effectively excluding a significant sector of the population).

### **3.1.3 London**

#### **3.1.3.1 Implementation of Competitive Tendering**

London Transport (LT) has the world's largest public transportation bus system, with more than 5000 buses and carrying 1.1 billion annual linked trips. Between 1970 and 1985 real costs per vehicle km rose by 79 per cent. In response, the British parliament

enacted legislation that ultimately led to the conversion of the entire system to competitive contracting- a process that was completed by 1999.

In LT, the policy is separated from operations. LT usually competitively contracts by public transport route but has competitively tendered areas as well. Companies may receive a single contract extension if their services have met quality standards and if they are willing to reduce their cost per km by at least 2.5 per cent during the extension period.

### **3.1.3.2 Developments after promulgation of the legislation**

During 1984, the London Regional Transport (LRT) was formed as a statutory undertaking reporting to the Secretary of State for Transport. The job of running the buses was then placed under the responsibility of a separate subsidiary owned by LRT - London Bus Limited (LBL). The long standing monopoly of London Transport was thus broken by a mandatory requirement for LRT and its subsidiaries to invite tenders for various services and accept the tenders if they appear to provide a satisfactory service at a lower cost.

London Regional Transport thus, began to invite tenders for selected bus routes operated by London Bus Limited. As an in-house company, LBL also could compete for tenders along with other bus companies. The overall objective of London Regional Transport and its subsidiaries was **"to provide or secure the provision of public passenger transport services..."** with due regard to **"the transport needs ... of greater London" with "efficiency, economy and safety ..."**. The LRT's total income (including grants) was required to meet all expenses taking one accounting year with another. Suitable changes in the legislative framework have been brought forward and a white paper on buses on the policy initiatives of the Government was published in 1984.

As a result of the Legislation LRT was made responsible for public transport operations, with a direct role for passenger information, fare levels, bus shelters and customer services. However, it owns no fleet, no employees, no crew, no garages or inventories.

The tendering system brought in competition among operators, but the main advantage was in introducing "competition off the road" instead of the "competition on the road ". In the later case public safety gets affected because of likely cat-rat race among operators on the public road.

The LRT was supplied buses both by public and private sector companies. This resulted in creating an environment for competition, since the lowest tenderer would get the contact. Such a competition created lot of pressure on London Bus Limited, to improve its productivity and reduce cost to be competitive.

### **3.1.3.3 Transformation of London Bus Limited**

The transformation of London Bus Limited and its dramatic financial improvement has been a matter of great interest to all transport professionals and administrators. The revenue of London bus limited is largely determined by LRT which sets fare levels and administers grants, including those which cover concessionary passes for the elderly. While LBS's efforts were successfully directed in reducing costs, it became clear that the company was far from competitive with other operators particularly those in outer London which was evident from its low success rate in winning tenders for routes. More than half the routes tendered during the year 1984 and 1985 were won by other operators; As a result, some of the LBS's garages had to be closed.

### **3.1.3.4 The major thrust areas of London Bus Limited can be broadly divided under the following heads:**

#### **➤ Reducing unit cost**

The strategy adopted to reduce the cost was based on eliminating wastage and improving the productivity by constantly maintaining safety and service standards. In a large organisation like London Bus Limited employing over 20,000 people, a strategy for survival could well be mis-understood by the employees. In implementing the strategy employees were made aware about the importance of regular, clear and good

communication both upwards and downwards within the organisation. The main features of the cost reduction programme were:

- One man operation
- Reducing the maintenance costs
- Introduction of new technology
- Creating cost awareness

As a result of these initiatives, the cost of operations came down drastically (about 35%) and the company thus became competitive.

#### ➤ **Market orientation**

The general approach has been:

- Better understanding of the market
- Promotion of services rather than mere publicising
- Seeking new market by innovative services.

The new market orientation improved the customer service and brought tremendous changes in the attitude of staff towards passengers. Although some critics argued that a business orientation for LBL was incompatible for all bus users in London since the pursuit of a financial target would ignore the transport needs of some sections.

#### ➤ **De-centralisation**

The pursuit of decentralisation was further continued for radical re-structuring of the organisation with the objective of:

- Concentrating more on the core function of the operation of buses
- Clarifying lines of responsibility and accountability
- Devolving decision-making away from the centre to the greatest extent practicable

#### ➤ **The market performance**

The market performance revealed the following changes during the period 1985-86 to 1993-94 for the entire bus market:

**Table 3.4: Market performance Passenger Road Transport in UK**

<b>Change in</b>	<b>Costs/bus km</b>	<b>Real Subsidies</b>	<b>Bus kms</b>	<b>Real fares (In percentage)</b>	<b>Passenger Journeys (In percentage)</b>
<b>London</b>	-35.1	-47	24.6	29	-3
<b>Eng Mets</b>	-46.5	-42.5	20.5	49	-35.5
<b>Eng Shires</b>	-36.8	-20.7	24.5	8.8	-20.2
<b>Scotland</b>	-40	-30.5	26.6	2.3	-21.6
<b>Wales</b>	-46.8	-33.3	33.7	N.A	-20.3
<b>Total</b>	-39.8	-38.3	24.2	19.2	-22.5
<b>Excl. London</b>	-41.9	-34.9	24	17.4	-27.4

- It may be seen that the cost/bus km and subsidies came down significantly during the period under review.
- Though the real fares went up, the main advantage was improvement in bus kms, which was due to introduction of large number of minibuses in place of standard buses.
- However, there were specific towns/areas where there were problems of poor service after de-regulation and privatisation, but they were all outside London. The London experiment with LRT has proved to be a grand success.

### **3.1.3.5 Present Scenario**

The London Bus Limited has been privatised during the year 1994-95 and all its subsidiaries have been offered to the private enterprise. Presently, London Bus Limited as such no longer exists and the 'London Transport Buses' (LTB) is now the title used by London Transport to cover all of its bus network planning, tendering, passenger information etc. Hence, London can now be described as an example of a fully-privatised bus operation within a co-ordinated publicly planned framework.

### **3.1.3.6 Consequences**

#### **➤ Cost**

For the period encompassing 1985-2001, real costs per vehicle km for London's bus system fell by 48 per cent in real terms- and at the same time, service was expanded by 91 per cent (or 4.1 per cent annually). Overall it is estimated that in the absence of contracting, costs for London transport would have been \$15 billion higher between 1985 and 2001.

### **Competitive Tendering at London transport buses (Results: 1985-1999)**

London Transport began competitively tendering bus services in 1986, and nearly all services were competitively tendered by the end of fiscal year 1998-1999. The following chart summarizes cost performance from 1985.

**Table 3.5: Cost Performance of London Transport**

<b>Efficiency Parameters</b>	<b>1985-1999</b>
Service Kilometers	+28.5%
Annual Costs	-26.0%
Cost per Kilometer	-42.4%

#### **➤ Quality of Service**

Ridership increased by 3 per cent compared to a nearly 30 per cent decline outside London, where public transport has been deregulated rather than competitively tendered.

## **3.2 United States**

### **3.2.1 Introduction**

United States is a free market capitalist economy and among others it has implemented competitive policies and investment in public transport operations. Increased motorization has led policymakers to attract personal vehicle users to public transport.

Expenditure has tripled on public transportation and measures for cost reduction were introduced by competitive tendering.

### **3.2.2 Competitive Tendering**

US public transport competitive tendering began with the para transit (door to door) services which represented 69 per cent and buses represented 9.2 percent of the public transport service. These services were principally designed for senior citizens and disabled persons. The quickest way to start these services was to seek competitive bids from the private sector.

### **3.2.3 Implementation**

The competitive tendering has been introduced in the many places of United States like San Diego, San Francisco, Dallas-Fort Worth, Minneapolis-St. Paul, Los Angeles, Denver and Las Vegas. The benefits of competitive tendering are cost reduction, increase in fleet size and establishment of local public transport system etc. Cost reduction in these places lies between 40 to 46 percent in all the places. Competitive tendering resulted in maximum cost reduction of 46 per cent in Los Angeles and minimum cost reduction of 40 per cent in San Diego, San Francisco, Dallas, Minneapolis-St. Paul and Las Vegas.

### **3.2.4 Impact of Competition**

Competition and Tendering has had a significant impact in reducing costs, enabling service expansion, increasing ridership and funding for new capital projects in the areas where it has been materially implemented .(White(2000), White and Tough (2005), Kennedy(1995))

But, there has been little impact in the larger portion of the nation in which competitive incentives have been used less.

- U.S. public transport productivity has continued to decline, as overall expenditures have risen by 208 percent from 1970 to 2000, while person miles increased by only 10 percent.
- Overall expenditures increased by 169 percent per person mile.

- From 1970 to 2000, public transport delivered approximately \$0.05 in new value (new passenger miles) per new \$1.00 (inflation adjusted) of government expenditure.

Public transport has become considerably less productive, at the same time that private passenger transport industries have become more productive, principally due to the influence of market forces through deregulation. But it is not just compared to the private sector that public transport's productivity has fallen. Public transport's cost escalation has been more than 1.5 times that of public, a clear indicator that the nation, states and local governments have purposefully spent considerably more money over the past 30 years and nearly three times the expenditure escalation of all levels of government combined. Public transport's expenditure escalation rivals that of health care, a sector for which U.S. cost escalation is internationally notorious. Public transport's expenditure escalation contrasts with road expenditures, which (all levels of government combined) have declined per person mile. Public transport's costs per person mile have risen to the point that they are now three times the full cost (including all cost of vehicle ownership, operation and road infrastructure) per person mile of automobiles.

This has induced some researchers to suggest that the public transport subsidies now targeted to the small percentage of households without automobiles (10 per cent in 2000) would be better spent in providing vouchers for automobile ownership and operation.

### **3.3 France**

#### **Competitive Tendering in the City of Dijon, France**

##### **3.3.1 Introduction**

The City of Dijon is one of the most advanced cities in France with regard to their Urban Transport Plan (PDU in French). The city administration is aiming at rationalising the whole transport system. Studies are also being done on emission impact of public transport, and it seems that filters can reduce the emission up to 90 per cent. The transport network of Dijon went through a phase of intensive development from 1975-1995, and

has been expanding into suburban areas. However, the need to increase the scope (in terms of distance served) of the network arose at a time when the usage of public transport started to decline.

### **3.3.2 Competitive Tendering.**

The local authority of Dijon undertook a tendering procedure as foreseen in French law to find an operator of public transport. The call for tenders for the whole network was launched at the European level in 2002. The authority specified that candidates should provide proposals in order to satisfy the following:

- Control the financial deficit incurred by the public authority.
- Adapt the frequency of services in both densely and less populated areas.
- Replace the use of fossil fuels for alternative energy sources.

### **3.3.3 Objectives**

The objective of tendering was therefore to develop a public transport system which met the needs of the majority of the population and at the same time controlled expenditure. Improving the quality of public transport was also one of the key aims for undertaking competitive tendering and the first tender was awarded on 1 January 2003.

In the call for tender, the Dijon Transport Corporation also included a rules and regulations book in which they included environmental criteria. The criteria focussed on standard for pollutants emitted from vehicles and the maintenance requirements of vehicles. There is also a six-monthly test for controlling the smoke emitted by the buses (25 per cent of the fleet is measured each time). These are all compulsory criteria that have to be respected by the operator of the transport service.

### **3.3.4 Consequences**

- **Quality Of Services**

There has been a positive effect on public transport system resulting in a better public image and acceptance. In the region, one out of every four people, that is, 24 per cent of the population use public transport. There was an increase in passenger numbers. This rise is related to organisational aspects of the transport system, including the increase in frequency of services, the improvement of the flow through priority at crossroads and lower fares. To undertake these changes it was necessary to co-ordinate the actions of various organisations including the authority responsible for the decisions concerning the transport network. This included the Mayor of Dijon for the implementation and regulation of the network and the representatives of the council for the installation of the national road systems. In order to motivate the customers to use the service, various benchmarks were put in place to allow for regular measurement.

These benchmarks included:

- Reliability of buses.
- Quality of the service as perceived by customers.
- Information provided to the customers.
- Handling of complaints made by customers.
- Cleanliness of the buses.

## **3.4 Sweden**

### **3.4.1 Introduction**

The presence of the government in the Swedish transport service has been predominant for many decades. Its role in transportation matters is to secure and provide all the country's citizens with urban transport service.

With the aim to carry out this social goal, it was necessary, to largely subsidise the transportation system. The urban bus market was deregulated in 1989, one of the

principal purposes being to reduce the costs of this service. In other words, to reduce the amount of subsidies.

### **3.4.2 Bus deregulation in Sweden**

For many years, the main characteristic of the Swedish public transport system was its clear dominance by the publicly-owned enterprises. After several years of deregulation a radical change in the market structure was observed. The market share of the state and local authorities had diminished. However, the state-owned and local companies still have 49 per cent of the market, while 33 per cent belongs to foreign capital and 18 per cent belongs to the Swedish private sector.

On a **functional basis**, the Swedish urban bus transport system is organised at two levels;

- County level that covers the country- county public transport authority (CPTA)
- Municipal level which covers the internal limits of a city- municipal public transport authority (MPTA) in middle sized and large cities. This study focuses on the MPTAs.

Before deregulation, with no exceptions, only publicly-owned enterprises had the right to obtain bus schedule licenses, thus excluding private bus companies i.e. each local authority was at the same time regulator and operator. In general, the organisational form before and after deregulation has not changed. The largest and middle sized cities are covered by local transport networks and each network is regulated by a local authority (MPTA) which has introduced, for the most part, the purchaser/provider organisation.

However, the **1989 Transport Act** radically changed the urban bus transport market. Briefly, this law allowed private bus companies to obtain bus schedule licenses. Companies owned by local authorities would compete equally with the private sector and that began to operate in some cities by concessions won in competition with the local bus companies. These concessions were awarded by public bid. Thus, a great number of public bus companies disappeared and were replaced by private enterprises. It is

important to add that two of the larger bus transport enterprises have taken over bus companies from the different local authorities (MPTA).

A **contract** for public transport services normally regulates the following points:

- the geographic area to be served,
- vehicle kilometres, vehicle hours and number of buses,
- bus standard, passenger service and environmental requirements.

In Sweden, the urban bus transport system has and continues to be a strongly regulated activity. Each local authority (MPTA) is still responsible for its own urban transportation system by setting the route structure of the network, the fare level and structure the level of capacity and quality of the service. A substantial difference is that now the local authorities are able to contract private bus companies. These bus companies act as entrepreneurs, i. e. they are paid by the local authorities. In spite of the fact that operating costs for all local authorities are still on average higher than commercial revenues, the experience with deregulation of the public transport system to date has been positive. This conclusion seems paradoxical, but the explanation lies in the fact that costs of operation during the period after deregulation are notably reduced.

Specifically, two **positive results** are worth mentioning:

- i) the competition has reduced costs for all local and county authorities, which signifies that the provided subsidies for the local and county authority have been reduced greatly,
- ii) the production volume expressed in vehicle kilometres, vehicle hours and number of buses has been maintained almost without alteration, which is interpreted as an achievement.

#### **3.4.3 The following case study of Goteborg (Sweden's second biggest city) demonstrates how competitive tendering have been introduced in Sweden.**

**Goteborg** - The city of Göteborg located on the west coast of Sweden is the country's second biggest City with the population of 750,000 with approximately 470,000 living within the city boundaries. The national public transportation formed in 1991 in Göteborg under the name of Trafikkontoret (Traffic and Public Transport Authority). In 1999, a new Public Transport Authority Västtrafik was formed for the new province/county in

west Sweden. This new body took over the former regional authority, Göteborgsregionens Lokaltrafik (GL) and the new authority Västtrafik Göteborgsområdet started to undertake the planning and tendering for the city.

#### **3.4.3.1 Competitive Tendering**

The transport plan for Göteborg formulated a vision based on competition and sustainability. The transport infrastructure was developed in a manner that made best use of existing facilities in order to minimise the use of the private car. The Göteborg region aimed to **improve the overall quality and accessibility of public transport**, as well as its **safety** record. To achieve this Göteborg aimed to develop the public transport system further and to make it more efficient, with the tramways as the base.

#### **3.4.3.2 Objectives**

National law in Sweden required the provision of public transport services to be tendered since the early 1990s. The objective while implementing this national law at the local level, in Göteborg, was to use the new tender specifications and contract agreements to:

- Increase the quality and frequency of public transport services.
- Achieve a better relationship between public subsidies granted by the government and transport provided.
- Maintain social standards in public transport.
- Increase environmental standards.
- Enable small bus companies to access the market.
- Allow public as well as private companies to participate in tenders.

**Goals-** More specifically, during the mid 1990s the on the Board of the Göteborg Traffic and Public Transport Authority set the goal for increasing the number of journeys made by public transport by 20 per cent by 1999 and the cost coverage increased from 28 per cent to 50 per cent in 2-3 years.

#### **3.4.3.3 Implementation**

Tenders for the public transport system were issued in 1992, which covered one third of the bus operation. It was then once again done in 1996 which covered 50 per cent of bus operators and for remainder 25 per cent tenders were issued in the year 1998.

## **Tender Specifications**

Two strategies were chosen:

- The first strategy **targeted emission standards**. Strict emission standards were achieved by directly integrating them into the specifications of the call for tender.
- In the second strategy, **incentives to strive for better results than demanded were set**. In the award phase of the tendering process bonus were given to those, who would achieve even stricter emission standards. Furthermore, incentives for good service quality were set by giving 25 per cent of transport fares to the operator. Normally, all fares go to the authority and the operators are paid by operated vehicle kilometres. Also, contracts containing specific targets were used which set certain performance goals and procedures for monitoring their achievement in terms of quality service etc.

### **3.4.3.4 Consequences**

The introduction of competitive tendering was very successful in the Greater Göteborg Area, as well as in the rest of Sweden. The main aim and effect was to achieve better public transport with the same amount of public subsidies provided for the system.

- **Quality Of Services**

The main indicator of success in public transportation system is the number of passengers transported. In actual fact, between 1990 and 1997 the number of bus-km decreased by 7 per cent, while the number of passenger increased by 7.5 per cent. It can be concluded the system is now used much more efficiently. All environmental standards included in the tendering process were achieved. The competitive tendering was effective in getting with Euro 3 standards buses on the road earlier than the legal requirements. The aim of increasing the share of renewable resources of fuels, hence decreasing the reliance of fossil fuels, was achieved two years earlier. In 1998 fuels from renewable sources covered 15 per cent of total fuel consumption.

- **Cost**

The total cost for running the system increased slightly between 1991 and 1998. While the rising passenger numbers and a marginal fare increase led to a decrease in public subsidies for the city of Göteborg by 30 per cent. Cost recovery also increased from 30 per cent in 1991 to 60 per cent in 2003.

- **Staff Issues**

Wages of bus drivers were kept constant as per the tendering requirements in the first year. However, since 1999 the wages have been increasing due to the growing demand for public transport services and low level of well-trained staff on the employment market.

#### **3.4.3.5 Conclusion**

For those cities willing to undertake a similar project, it is recommended to set specific emission levels as a criterion when tendering and not to demand a specific technology, e.g. demanding diesel fuelled buses. The authority which floats the tender will theoretically then only receive the reduction in emission levels, whilst the suppliers must then provide the adequate technology to achieve the reduction. Competition in Göteborg has shown to bring major cost savings in traffic operation whilst improving social and environmental standards and increasing the number of passengers by 7.5 per cent. Financial savings were used to increase the service level and to reduce ticket prices. Competitive tendering has also enabled modernisation of the bus fleet.

### **3.5 Finland**

#### **Competitive Tendering of Bus Services in the Helsinki Metropolitan Area, Finland 1994-2003**

##### **3.5.1 Existing Regulatory Regime**

The Helsinki region is the only major city conurbation in Finland. The heart of the region, Helsinki itself and its neighbouring towns, Espoo, Vantaa and Kauniainen

together make up the Helsinki Metropolitan Area Council, referred to hereafter by its Finnish acronym, YTV. Regional public transport services arranged by the Helsinki Metropolitan Area Council YTV (i.e. interauthority services crossing the municipal boundaries) were first introduced in 1986. The services were run on the basis of long-term contracts and operator licences granted by YTV. Before 1986, operators were licenced for own routes, from 1986 to 1994, there were protected contracts with YTV, which was done for the first time in Finland to tender bus services. Competitive tenders could be for a route or block of routes. For this, there were common requirements and terms of operation and the contract period was of 2 - 5 years with an average of 4 years. The tender was awarded by an objective evaluation system and the tender price covered 87 per cent of operational unit cost. For public bid, European Union: Open tendering format was used. In practice, the operator licence gave the operator an exclusive right to run services in a given area or on a given route.

In the City of Helsinki, tendering started in 1997. Progress was slow but by 2002, about 98 per cent of tendering was complete. In the City of Espoo, all services were tendered in 1998 while in the City of Vantaa, all services were tendered by 1999.

YTV was responsible for:

- Setting routes, timetables, service requirements.
- Getting in revenue through integrated regional ticketing.
- Getting direct payment that operators pay for contracted bus operations.

### **3.5.2 Contract Structure**

- Each contract specified a fixed price (as offered in tender) for each unit cost class:
  - bus days (number of vehicles in daily operation)
  - driver hours (total active hours in route operation)
  - kilometres (driven on planned route operations)
- Prices were adjusted quarterly by cost index
- Monthly payments were received for realising the operations and the reported service failures deducted by YTV.
- Quality bonus was 0 - 2 per cent of the total payment which was determined by

customer satisfaction surveys.

### **3.5.3 Competitive Tendering**

In March 1991, the new National Passenger Transport Act came into force in Finland. The Act permitted the city municipal authorities and YTV to tender public transport passenger services for which they were financially responsible. In December 1992, the Executive Board of YTV took the decision to undertake competitive tendering for regional bus services, with the aim that the tendered services would begin their operations on January 1, 1995. The National Act on Public Procurement came into effect at the start of 1994. The Act stated that tenders must always be invited for public procurements. Procurements, which exceed a certain threshold value, must observe the procedure defined by the European Union (EU). Since 2000 the EU's threshold value for service sector procurement tendering is EUR 400,000.

YTV has set the following **targets** for competitive tendering:

- Reduction in the costs of transport by, cutting the automatic rising spiral of costs brought about by index-linked contracts etc.
- Improvement in the service level achieved by the resources invested in public transport.
- Added impetus to the increase in productivity gained from using private operators.
- The client ordering the services should also benefit from the increased productivity in bus service operation.

### **3.5.4 Implementation**

The first tender was awarded in June 1994 and the contracts for the services were for three years. The tendered services, comprising 15 per cent of regional bus transport (4.4 million passenger km) began operating on January 1, 1995. Once the contract expired the process was continued by inviting the tenders twice a year. Tenders were then invited once again for all the remaining 85 per cent regional transport services managed by YTV during 1995 and 1996. Since then all the regional bus transport services have been purchased through competitive tendering. Four major tender invitations were arranged in

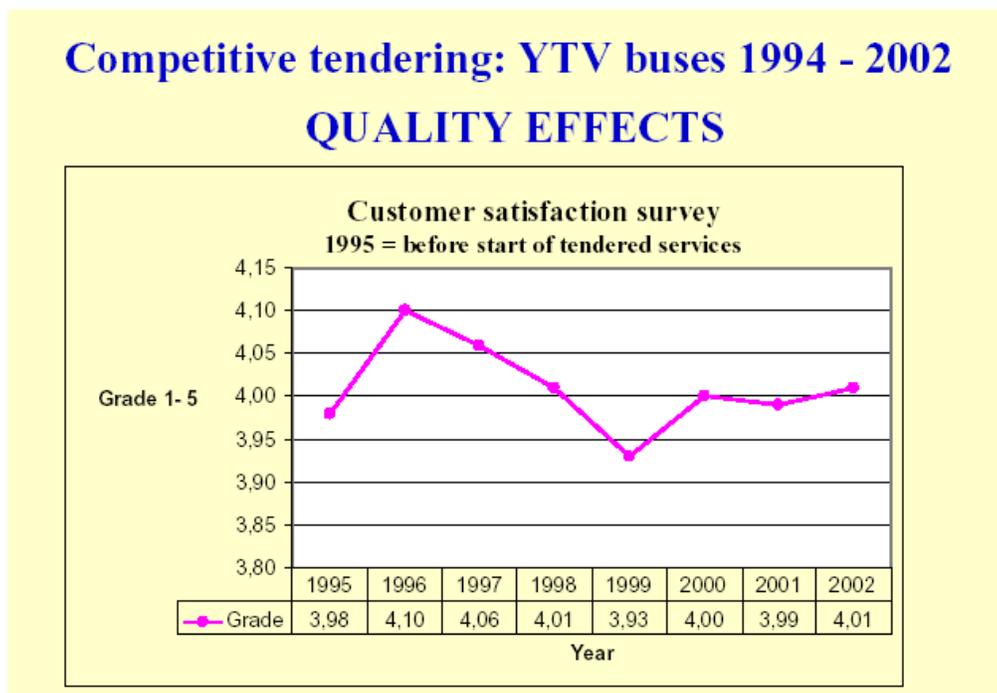
the second round. In between these major tenders, separate tenders were also invited for a few individual routes.

### 3.5.5 Consequences

- **Quality Of Services**

The quality of services has been monitored since 1995 using customer satisfaction surveys. The overall score given in 1995 was 3.98 on a scale of 1 to 5 but started declining in later years due to the sensitivity of score to the quality of bus fleet, the ability to keep to timetables and bus service provision. Competitive tendering brought reduction in operator compensation and has enabled additional timetabled departures. A total of 29.1 million bus kilometres were driven in regional bus services in 1994 and in 2002 the volume of traffic had grown to 34.5 million kilometres, an increase of about 19 per cent as compared to 1994.

**Figure 3.1: Competitive Tendering: YTV Buses 1994-2002 Quality Effects**



- **Fleet**

Competition had resulted in modernisation of fleet and had reduced the average age of buses, which is about 4.5 years today as compared to the figure of 6.5 years prior to competitive tendering. A large number of the new low-floor buses had entered in service. Infact in regional services the proportion of low-floor buses is already more than 50 per cent. Fleet renewal has been guided by the fleet requirements set in the tender specifications and via the principles adopted in awarding tenders. In one tender, however, the emphasis placed on low-floor designs and average age of the bus fleet led to unforeseen results: the low-floor buses brought from Copenhagen by Linjebuss did not meet the expectations of Finnish bus passengers, and their refurbishment to the required standard took some time to complete. Following this, advance inspection of the fleet was added to the terms of the tender, to ensure that such situations do not arise in the future. The increase in low-floor buses was not necessarily due to competitive tendering, as fleet replacement was moving in the direction of low-floor buses anyway. The YTV fleet requirements have been standardised with those of Helsinki City Transport (HKL), so that the same buses can be offered for service in both YTV and HKL traffic. The fleet requirements of Espoo and Vantaa also complied with the YTV requirements.

- **Ticket Prices**

The reduction in operator compensation brought by competitive tendering has also been seen in ticket prices. The price of a 30-day regional ticket fell from FIM 370 (62.2 EUR) in 1994 to FIM 325 (54.6 EUR) in 1997. Infact in 2000 for the first time the ticket prices in regional transport increased.

- ◆ **Staff Issues**

The position of staff in competitive tendering has risen strongly to the fore. Changes of operator have also meant the transfer of drivers from one company to another. Following the strike that affected all services in February 1998, the so-called **Lonka agreement** was drawn up between the employer and employee organisations, which safeguarded the retention of employment benefits for drivers transferring from one

operator to another. Competitive tendering has, however, created uncertainty over employment in the sector, and some drivers have sought employment in other sectors instead. Competitive tendering has, also, increased the extent of bus traffic by over 10 per cent. As a result, there are more jobs in the sector than before. The number of jobs is estimated to have grown by about 250 drivers i.e. an increase of about 10 per cent. However, the level of driver training and bus maintenance has reduced. The biggest problems are those associated with the conditions of employment for drivers and their job security as a result of competitive tendering. The market shares of companies have, however, generally been preserved in the longer term or have even grown, and the demand for drivers has increased considerably. It appears that the staff problems are largely related to short-term fluctuations in driver needs when tenders are lost by one operator and the new operator has not yet sought additional drivers.

- **Costs**

In 2000, regional ticket revenues covered 67 per cent of the expenditure. This figure was at its lowest in 1991, when ticket revenues covered 62.5 per cent of the expenditure on bus service provision. The annual saving in costs can be estimated by calculating the cost of present-day services using the inflation-adjusted unit costs paid prior to competition. The cost of today's regional transport calculated in this way would have been FIM 446 million in 2002, whereas in reality it was FIM 322 million. The estimated benefit of competitive tendering is therefore FIM 124 million. After the first tender, YTV approved the principle that the monetary benefits of competition would be distributed in three ways: the extent of bus service provision would be increased and the service level improved; ticket prices would be reduced; and the contributions from municipal authorities would also be reduced.

### **3.5.6 Lessons Learned**

- There should be harmonization of the tendering principles of all the procuring authorities.
- The rising trend in bus contract prices should be restricted by reducing operator risk and increasing efficiency.

- There is a need to provide operators with a financial incentive to improve quality of service.
- The cost of bus services should be connected to the level of passenger revenue and quality of service.
- Steps should be taken to improve drivers' status, training and conditions.
- Personnel issues like salary levels, contract transfers, and work conditions are critical for success

### **3.6 Bishkek (Kyrgyzstan)**

The Kyrgyz Republic is a small republic in central Asia, formerly a part of the Soviet Union. The total population of the country is 5 million, one fifth of which lives in the capital city Bishkek. During the Soviet period transport services in the city were provided by state owned enterprises operating buses and trolley buses respectively. Following independence the financial and physical situation of the enterprises collapsed and numerous private minibuses appeared. These buses operated largely on routes which were duplicating and supplementing the public sector routes. But the operators did not feel secure, did not invest in large buses, and did not carry exempt or reduced fare passengers.

#### **3.6.1 World Bank's Urban Transport Project**

In **1997**, at the request of the government, **the World Bank began the preparation of an urban transport project** which was intended to refurbish the fleet and to find a new and stable basis on which private companies could contribute in a more effective way to a sustainable urban transport system. International consultants were engaged to develop a **franchising system**. The Ministry of Transport was enthusiastic and supportive. But the Bishkek City administration was clearly less so, with the result that the World Bank concentrated its finance instead on refurbishing the road infrastructure on the major public transport routes. Nevertheless, the government went ahead with introduction of the reform suggested by the World Bank.

The basis of the new regulatory arrangements was **decree 630 of January, 1999**, which established **Bishkek Passenger Transport Authority (PTA)**, largely in accord with the recommendations of the report of the consultants presented by World Bank. This decree gives the PTA the right to define the urban public transport network in the city, and to secure service on the routes by the issuing of franchises on the basis of competitive tendering. Fares, both for the private sector services and for public sector services are determined by the Bishkek Mayors Office and the City Parliament at 3 soms and 5 soms respectively. The public sector operators retain their traditional routes, uncontested. But the microbus services are franchised and regulated by a Public Transport Authority (PTA).

**The first major round of tendering occurred, in 2000.** Since then other routes have been franchised, though it is not clear that these have been competitively tendered. All vehicles carry route numbers and destination boards, and the service is very much more extensive and improved as compared to 1999.

### **3.6.2 Consequences:**

- **Ticket prices**

The public sector operators had a joint season ticket scheme and carried over twenty categories of exempt or reduced fare passengers for which they were in principle recompensed by government. The private sector did not carry either category of passenger. Since that time, and most notably in the last two years, the compensation paid for exempted passengers has fallen far below that calculated by the public sector operator entitlements. Also with fares for the public operators controlled at 3 soms, their finances have continued to deteriorate. Moreover, while the public companies still carry a disproportionate share of exempted and concessionary passengers on their vehicles and due to the limitations of their networks, it means that they no longer offer a spatially comprehensive “safety net” service to the population of the city. This is recognized by the fact that the private buses carry pensioners at a reduced fare of 3 soms during off peak periods.

- **Quality of Service**

The quality of the public sector vehicles has declined. The operating behaviour of some private operators was aggressive and dangerous due to plethora of separate operators overlapping on major sectors or routes.

In developing the new system, regulation of the private sector was effectively entrusted to the management of the public bus undertaking. The head of the PTA is the former general manager of the Avtokombinat. The PTA maintains a comprehensive despatching service as well as a centralized medical inspection, licensing and vehicle inspection staff of 200, all funded either from the monthly franchise charge or from fees collected from drivers (for despatching). The PTA has franchised a proliferation of new route and instigated frequent change of routes and threats of withdrawal of routes, which has made it difficult for private operators to forecast a secure future, however efficient their operation. It was also impossible to secure financing for large vehicles which several operators claimed that they would be willing to seek if the franchising system was less arbitrary.

PTA is facing problems. The management is suspected of being involved indirectly in operations under franchises awarded outside the tendering system. Given the absence of any clear obligations on the PTA in respect of the franchising system and the lack of an independent arbitrator, private operators feel very insecure and oppressed.

The PTA management has been politically very active. In 2002-03, it proposed various pieces of new regulation, including regulation on the closing of routes, and on auctioning of franchises. In this proposal the revenues from these auctions were earmarked to be used to support the unremunerative public enterprises. The private operators have no trust in the organization and argue that this is intended to, and will, make franchising even more arbitrary.

### **3.6.3 Conclusion**

Franchising has been associated with a dramatic expansion and improvement of private sector services. But the association of the PTA with the public sector bus operator is the basis for a suspicion which has not been dispersed by its subsequent behaviour, and which had inhibited the development of large vehicle services by the private sector.

To overcome that suspicion the following changes are required:

- A **single proper franchising law**, superceding all existing laws and regulations, setting out the rights and responsibilities both of the PTA and the franchisees in a form which can, if necessary, be subject to adjudication in the courts.
- An **appropriate administrative structure** in which the PTA is the agent of the city to administer the franchising arrangements subject to the constraints and requirements of the franchising law, in a transparent way.
- A **genuinely independent supervisory board** able to act as an ombudsman to protect private operators against improper administration by the PTA. (This should not be necessary if the franchising law is strong enough and can be enforced in the courts, but may help to remedy matters when trust is absent).
- A **clear network definition**, made publicly available to all bidders, with any changes which adversely affects the commercial viability of an existing franchise being the subject of compensation. The procedure for applying for compensation, and the terms of compensation, should be set out in the contract documents.

A revised policy on concessionary fares and compensation which provides access of concessionary fare passengers to most services (possibly excepting the peak services) and which offers reliable compensation to all operators for the carriage of such passengers. The contracts should be enforced on both parties.

- **Appropriate and transparent adjustments to fares** or franchise payments to account for inflation during the period of the contract. The contract documents shall contain the details of such adjustment and compensatory provisions.

## **3.7 Chile**

### **3.7.1 Introduction**

Urban bus transport in Chile was deregulated in 1980 on the belief that the deregulation of the economy generally leads to an improvement in the allocation of resources and a greater efficiency is achieved in the use of such resources. However, **in response to the deregulation of public transport in Chile** it was served that whilst these policies reduced government spending on transport and promoted innovation, they also resulted in the deterioration of system wide service planning. Most private operators in these countries reduced unit costs and raised kilometer-miles served; however, very few chose to participate in coordinative efforts with other bus or rail operators, and due to a lack of price competition, fares actually rose in real terms. **In an attempt to reduce auto dependency and to improve air quality, government implemented key regulatory reforms in the 1990s.**

### **3.7.2 An Overview of Deregulation**

In **Chile**, some regulated public transport services were being operated by private sector bus companies, the military government of Augusto Pinochet (1973-1990), embarked on a free market campaign to privatise as many urban services as possible. This was done in order to relieve the government from excess burden. This meant the lifting of most regulatory controls, such as the setting of fares, or limiting the number of operators serving a specific corridor.

It was argued that:

- ✓ The free market would allow for greater creativity among operators and this would eventually translate into better and more responsive services for the consumer.
- ✓ Deregulation would also allow operators to set prices closer to real costs which would lower fares and eventually, force inefficient bus operators out of the market.

Thus, over a period of four years, the state-run bus company was allowed to collapse and most regulatory controls were removed. The entry to the sector was effectively deregulated in November 1979, by Decree No. 320, of the Transport and Telecommunications Ministry. The Decree provided for free entry of private operators into the sector.

Policy proponents argued that the public transport system would be “self-regulated” by the route associations and powerful operator groupings that provided support to members.

### **3.7.3 The Impact of Deregulation**

In Chile, public transport deregulation had a number of positive and negative impacts on overall public transport service quality. The former were very few such as,

- ✓ a significant reduction in government spending on public transport.
- ✓ an increase in the number of services on the most profitable routes.

But negative **effects** were much more. They are:

- ✓ it brought about a significant rise in real fares (in Santiago bus fare increased at a rate of 11.5 per cent per annum between 1980 and 1987)
- ✓ Most of the deregulated services altered their routes (passed through the centre of Santiago), this created a chaotic situation throughout the downtown area. Free market transport policies resulted in an oversupply of bus services, i.e. (where the highest level of demand was concentrated). Hence, the result was an oversupply of public transport service in central areas, and very limited route and fare integration.
- ✓ Not only did the addition of buses create congestion on road and promoted cutthroat competition between operators (supported by their route associations), it also contributed to a decline in air quality conditions.

- ✓ The ratio of cost to value of service received increased for most users during the period 1980 to 1987.
- ✓ The microbus fleet grew continuously until 1987 from 1980 onwards, when it was 73 per cent greater than in 1980. In the following two years, the trend was reversed, probably due to worsening demand/supply relationship and forced withdrawal of pre 1967 buses in March 1989.

Thus, a decade of deregulatory practices had resulted in negative externalities, prompting the newly elected governments to consider new forms of public transport regulation. By the late 1980s, stricter area wide measures had to be taken to control vehicle emissions in the environmentally sensitive area, particularly in the downtown area. In addition, deregulatory policies in the public transport sector had resulted in wasteful competition and vehicle safety concerns. For example, along certain routes, bus operators ran parallel routes to the publicly owned Santiago Metro.

#### **3.7.4 Policy Reforms**

Deregulatory policies in Chile were vigorously defended for more than a decade, however, in the 1990s, newly elected governments attempted to regain control over service quality through transport policy reform. A liberal government was elected to replace a conservative one, setting the stage for introduction of new measures. Steps were taken to mitigate the negative impacts of deregulation and restore consumer confidence in public transport.

In Santiago, local planning efforts were introduced which focused on redefining the responsibilities of operators and transport authorities for the efficient provision of services.

#### **Competitive Tendering**

A **competitive tendering programme** was developed by the government in an attempt to carefully regulate supply levels and service features (e.g., routings, safety). Tendering was seen as a regulatory option for providing some entrepreneurial autonomy to

operators, whilst at the same time, allocating industry resources to areas of proven travel demand. Local transport planners established a network of key public transport routes, based on the outputs of an elaborate equilibrium demand-supply model for Greater Santiago. Once these routings were developed, optimal route frequencies and other service specifications were fixed.

### **3.7.5 Outcome**

In Santiago, the local and national governments chose to restructure the provision of bus services around a formal tendering process, ensuring that a set of operating standards were met. Under this approach, government assumed responsibility for all public transport route and service specifications and since 1991, government has adjusted service specifications in certain corridors, in response to transport conditions and patterns. The Santiago system has yielded the following positive results over the past decade:

- ✓ A substantial number of old, polluting buses were retired from the fleet and the total supply of service was reduced to better reflect true demand.
- ✓ This action reduced the number of buses operating in the downtown, and consequently, brought a drop in diesel emissions.
- ✓ In addition, the ongoing tendering of services established an industry standard for maximising vehicle efficiency and providing an improved level of customer care.

Public sector planning of services has allowed government to take a key role in ensuring service dependability and safety, and to provide new services and infrastructure.

- ✓ This has given the regulator an opportunity to review a number of service issues, including minimum frequencies, mainline and feeder routes, designated bus stops, regionwide smart card for fare etc.

In Chile, a return to democracy ushered in a programme of transport re-regulation in Santiago, in which the public transport network was entirely restructured and new routes were exclusively tendered through a formal bidding process. The fact that tendering was

phased-in over a period of time may in part explain the general success of these programmes. The government, prepared the operators for the transition to tendering; however, in Santiago, initial resistance on the part of operators prompted authorities to negotiate with the private operators prior to the first successful round of bidding in 1992-93. The government wisely tendered successively larger areas of Greater Santiago, beginning with the central core of the city. This allowed operators on the periphery ample time to modernise their operations. Clearly, this form of regulation can be instrumental in achieving a desired level of service, as long as the regulator incorporates specific provisions into the bidding process. Nevertheless, regulators do still run the risk of becoming too prescriptive.

### **3.7.6 Benefits**

It is easy to identify the numerous benefits that the tendering process brought to Santiago. Whilst some operators were probably marginalised from the process at the outset, the region has certainly seen some improvements in the quality of service and level of congestion.

Regardless of whether tendering is fully adopted or not, if reforms are to seriously address service quality and system integration, they must involve collaborative planning between authorities and operators. For a programme to succeed, operators must feel as though they have gained something from the discussion, and that they have a vested interest in providing the following:

- ◆ punctuality and reliability;
- ◆ improved physical access to services;
- ◆ reasonable fare structures; and
- ◆ participation in network planning.

### **3.7.7 Conclusion**

The public transport re-regulation is a complicated issue that requires further study. Each city must identify its long-term objectives, weighing the costs and benefits of the strategy

that is chosen. On the one hand, regional transport planning is essential; in order for a system to be sustainable, operators must strive to collectively provide the consumer with a safe and efficient service that can compete with the auto. In order for the private operator to survive, economic incentives must play a key role in the achievement of local service objectives. Thus, system planning must involve not only local authorities, in their capacity as planners; but also, private operators, as service providers and innovators.

### **3.8 Sri Lanka**

In Sri Lanka, the key contributions in passenger transport are made up of buses (68 per cent), private vehicles (24 per cent) and railways (5 per cent) of passenger trips while the actual contribution by three wheelers is just 3 per cent.

#### **3.8.1 Passenger Road Transport:**

Sri Lanka's present transport market has evolved over many years changing with the advances in global technology. During the 16th and 17th centuries it centered around water transport but was replaced by the railways in the latter part of the 19th century. Road transport became popular after the Second World War. Bus transport began as an **unregulated private enterprise** in 1907 and remained so until 1927 when problems of competition began to surface. From then, till 1958, **gradual regulation was introduced** in terms of licensing, fares, safety measures, and corporate structures.

However, the problems of accidents, neglect of rural services and intense competition on popular routes remained unresolved. This led to **the nationalization of buses in 1958** and the formation of a State monopoly, the Central Transport Board, which eventually became one of the world's largest public bus corporations. There were during the first decade after the nationalization of buses (visible benefits to society), however the gradual politicization of the central transport corporation and lack of a clear fares policy led to **service delivery problems**.

To overcome these problems, the private sector was re-introduced in the bus service sector. The **re-entry of the private sector** brought in competition, but contributed little to the improvement of the quality of service received by passengers.

The major cause for it was:

- Regulation was minimal with permits for bus services issued on an individual basis with no pre-requisites required for qualification to operate such services.
- There was in fact, no regulator until 1991 and even then the National Transport Commission Act did not adequately deal with offences, service monitoring, route planning, fare determination etc. Moreover, the act only introduced the Permit System where licenses were issued on the basis of a permit per bus resulting in 18,000 buses being owned by over 15,000 individuals.
- Although fares were not regulated by law, quasi-controls continued. It was within this framework that a **Fares Policy was first introduced in 2002** in order to determine the fare levels annually based on the cost of inputs and quality of output.

Presently, most of the owners have little control over their buses. Some are leased for operations to 3rd party crews that are untrained and often unlicensed. Productivity is low, the costs are high and worker conditions are dismal, as most of them work for 13 to 15 hours. Meanwhile, competition between buses has led to dangerous driving and as a result accident rates have doubled. There is no assurance regarding the quality of service and as such regulation by both the national and provincial authorities is ineffective. For example, schedules are not followed and over-crowding is not controlled.

### **3.8.2 The Need for Reform**

The transport sector in Sri Lanka has not witnessed a qualitative development which is essential to provide for the competitive markets of the modern world- especially as demanded by the commercial and industrial sectors. **An efficient and cost effective public transport system** is imperative.

**Benefits of private sector investment and management of services have not brought about the desired results in Sri Lanka.**

With a few exceptions, the private sector has failed to provide the quality of service that has been expected from it. Although regulated fares and single bus ownership have been quoted as the reasons for this state of affairs, recent study and documentation reveals that a host of **regulatory lapses** are in fact the primary cause of this situation.

### **3.8.3 Problems in the Passenger Road Transport**

- **Large Number Of Single-Bus Owners**

The last 25 years of private bus operations have seen a number of formal companies entering and leaving the industry. The majority of the ownership composed mostly of single-bus owners, although there are few which have upto five or six buses. The present manner in which the industry operates does not provide economies of scale for the larger operators. It is only by employing bus-crews for illegally long hours, by denying them Employee Provident Fund (EPF), and by the crews themselves making a host of illegal payments and breaking the rules required for the safe and courteous carriage of passengers, that the bus operators continue to exist and to compete with one another. Formal corporate entities have not been able to resort to such practices and have thus left the industry. It is therefore, a pre-requisite that the presently oppressive and wasteful climate of bus operation be changed in order for high-profile companies to enter the market and provide qualitatively improved services. This should be done mainly through strengthening the regulating mechanism.

- **Subsidies**

No country has an effective bus or rail service that is entirely free of State subsidy. Subsidy is often used quite productively to influence parameters such as urban traffic congestion, urban sprawl, rural development, mobility for the ultra poor and the social upliftment of under developed areas. **There is a need therefore, to determine the level of subsidy and the targeted benefits of such subsidies in a new transport regulatory framework for Sri Lanka.** Most subsidies in the country are considered as a part of general subsidy to the STCs and that they do not consider them as been given for specific

targeted un-remunerative services. Furthermore, the non-existence of methods of subsidy computation and monitoring methods have not allowed wide scale extension of these subsidies to the private sector operators. There are successful examples however, such as in Queensland in Australia, where Public Service Obligation contracts have been negotiated with negative concessions for servicing community needs where the fare box revenues are inadequate.

## Chapter 4: Data Analysis

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### **4.1 Introduction**

The primary survey was conducted in seven states. The states cover the four broad regions of India. The concerned states are:

Western Zone: Maharashtra and Rajasthan

Eastern Zone: West Bengal and Orissa

Southern Zone: Tamil Nadu and Kerala

Northern Zone: Himachal Pradesh

The sample design was chosen keeping in mind the characteristics of the population under study. The population here refers to the type of stakeholders in the passenger transport sector. The stakeholders are:

1. State Transport Authority.
2. The Bus Operators: State Transport Corporation and Private Operators.
3. Users of the service: Both Inter-state and Intra-state users of the service were covered as a part of the study.

A random sampling procedure was used for the consumer survey. The strata's are 'public buses' service users and 'private buses' service users. The sample size for the consumer's survey was 1400, with 200 each for the seven states. These were further sub divided between intra-state and inter-state. For the second important stakeholder, the "*bus operators*" the sample size was 20 for each state. The idea was to assess the "macro picture" from operator's point of view and synchronise it with micro details obtained from the consumers.

A finding, which on the one hand broadly identifies the policies hindering competition and on the other gives details of the parameters on the basis of which consumers have compared between public and private services have interesting policy implications.

Results show that some states under study have more competitive environment compared to others. By objectively finding an index of consumer satisfaction for both public and private services, it has been forecasted alongside the ranking of the states based on the policy environment, which in turn reflects the level of competition in the sector under study.

This chapter is divided into two broad sections. The first section highlights the key empirical findings for a comprehensive list of policy variables. The section gives details on the basis of the primary survey of the bus operators. Thereafter, the section analyses consumer perception of the private and public bus services. Results indicate that consumer's prefer public bus service to private bus service. In the second section the states have been ranked on the basis of three indices based on primary and secondary data.

The indices are:

1. A Competition Index: it reflects the competitive environment of the different states in the passenger transport sector,
2. An Efficiency Index: it reflects the level of efficiency in the passenger transport sector
3. Customer Satisfaction Index: it reflects consumer perception of the quality of the private and the public bus services.

## Section 1

### **4.1.1 Empirical evidence from survey data for Private operators**

The competition arrangement has been assessed on the basis of entry barriers, lack of contestability and anti-competitive practices. For entry barriers the variables are the *average registration time, permanent and temporary permits* and *single window clearance*. For lack of contestability the variables are *single permit to operate on all the routes, new permits in case of replacement of old buses* and *regulation for the number of vehicles and the maximum number of routes*.

#### **1. Average time required for registration to get permit and duration of permanent and temporary permit.**

The average time required for registration varies across the states from one day to fourteen days, with maximum responses clustering around two days. West Bengal has the highest average time for registration. The duration of permanent permits is sixty months for all the states except for Himachal Pradesh, for which it is forty-five months. Temporary permits are generally for one month.

**Table 4.1.1: Time required for Registration and Duration of permits**

<b>States</b>	<b>Average time required for registration (in days)</b>	<b>Duration of permanent permit (in months)</b>	<b>Duration of temporary permit (in months)</b>
<b>Himachal Pradesh</b>	2	45	3
<b>Kerala</b>	2	60	1
<b>Maharashtra</b>	2	60	1
<b>Orissa</b>	1	60	4
<b>Rajasthan</b>	2	60	1
<b>Tamil Nadu</b>	2	60	1
<b>West Bengal</b>	14	60	4

**2. Single window clearance and provision of requirement of taking permits for plying on different routes.**

The survey data as given in the table 4.1.2 shows that single window facility has been provided in most of the states. With respect to single permit for all the routes 100 percent of the respondents in Himachal Pradesh, Orissa, Rajasthan and West Bengal reported the existence of a single permit. However, it is not in the case of Kerala, Maharashtra and Tamil Nadu. In case of single permits for all the routes, Kerala and Maharashtra have only 9 per cent and 5 per cent respondents saying 'yes' whereas it is zero percent in Tamil Nadu. In all the states new permit is required for replacement of buses.

**Table 4.1.2: Single window clearance and provision of requirement of taking permits for plying on different routes.**

States	Single window clearance (per cent who said yes)	Single permit to operate on all the routes (per cent who said yes)	New permit in case of replacement of old bus (per cent who said yes)
Himachal Pradesh	100	100	100
Kerala	95	9	90
Maharashtra	100	5	100
Orissa	95	100	100
Rajasthan	100	100	100
Tamil Nadu	100	0	100
West Bengal	95	100	100

### **3. Registration fees charged per year and regulations regarding vehicles operated**

The registration fee is nearly the same (between Rs. 400 – Rs. 600) for all the states, with very less variation except for Maharashtra for which it is as high as Rs. 2000. In all the states there is no regulation for the maximum number of vehicles operated, maximum number of routes, maximum number of transport operators and for operating after mid-night. However in Orissa, there is regulation for operating after mid night.

**Table 4.1.3: Average registration fees, regulations for maximum vehicles, maximum routes and for operating post mid night**

States	Average registration fee (in Rupees)	Is there regulation for maximum number of vehicles operated (per cent of respondents that replied 'No')	Is there regulation for maximum number of routes (per cent of respondents that replied 'No')	Is there regulation for maximum number of transport operators(per cent of respondents that replied 'No' )	Is there regulation for operating after midnight (per cent of respondents that replied 'No')
Himachal Pradesh	462	100	100	94	100
Kerala	600	100	100	95	95
Maharashtra	2000	100	100	100	100
Orissa	542	100	100	100	0
Rajasthan	657	95	100	95	100
Tamil Nadu	600	100	100	95	95
West Bengal	600	100	100	100	95

#### **4. Responses of the Private bus operators on miscellaneous Issues:**

##### **(1) Bus Timetable**

For all the states the basis of preparing the bus timetable depends on the demand of passengers. This can be updated at any time.

##### **(2) Regulation for fleet design and maintenance**

There is existence of regulation on vehicle design in all the states. The vehicle design covers: maximum entrance step, height, spacing between seats, axle load, maximum permitted dimensions of the bus, weight, minimum door and aisle width, maximum seating capacity.

##### **(3) Stipulation laid down by government for the selection of the driver and conductor**

This varies from state to state.

For drivers:

- In Rajasthan, Kerala and Himachal Pradesh 10 per cent, 9 per cent and 6 per cent respondents respectively stated that there is stipulation for the selection of the driver.
- In Maharashtra, Tamil Nadu, West Bengal and Orissa nobody replied 'yes'.
- The selection criterion for the driver is the driving licence and minimum educational qualification of twelfth class.

For conductors:

In all the states except Himachal Pradesh there is no stipulation laid down by government for the selection of conductors. The selection criterion is minimum educational qualification of twelfth class.

#### **(4) Training of the driver and the conductor**

For drivers:

- In Maharashtra, Orissa, Rajasthan, Tamil Nadu and West Bengal there is no stipulation laid down by the government for the training of drivers.
- In Himachal Pradesh and Kerala there is no requirement for training of drivers.

For conductors:

In Himachal Pradesh only 6 per cent and in Kerala only 9 per cent of the respondents stated that there was a requirement for training of conductors.

#### **(5) Stipulation laid down by government for medical check-up of drivers**

- In Maharashtra, Orissa, Rajasthan, Tamil Nadu and West Bengal the government does not lay down any stipulation for the medical check-up of drivers
- In Himachal Pradesh and Kerala only 6 per cent and 5 per cent of the respondents stated that there is requirement for medical check-up of drivers.

#### **(6) Legal requirement of owner's legal names and address**

- There is a legal requirement in Himachal Pradesh, Kerala, Orissa, Tamil Nadu and West Bengal for the owner's names and addresses to be displayed on the vehicles. But there is no such legal requirement in Maharashtra.

- There is a legal requirement in Kerala, Maharashtra, and Tamil Nadu for painting of buses with the stipulated colour.

#### **(7) Vehicle fitness certificate for permit**

It is necessary for private operators across the states to take a vehicle fitness certificate for permit in all the states.

#### **(8) Criteria for awarding route to private operators**

Criterion for awarding route to private operators in Himachal Pradesh, Kerala, Rajasthan, Tamil Nadu and West Bengal is based on the demand by the passengers. In Orissa the criteria is demand and shortage of buses in the public domain.

#### **(9) Criteria for withdrawing a bus from a route**

- In Himachal Pradesh, Kerala, Maharashtra, Rajasthan, West Bengal and Tamil Nadu, no prior permission is required for withdrawing a bus from a route. But in case of Orissa, prior permission is required for withdrawing a bus with a notice period of fifteen days.
- All the states follow graduate fare system and the same can be changed as per the government policy.
- The private operators in all the states do not charge concessionaire fares and they do not provide any concessionaire schemes to the passengers. But in case of public buses it is mandatory to give such concessions to students, senior citizens, handicapped people, freedom fighters, Members of Parliament and Members of the Legislative Assembly and Legislative Council of the states.
- In Kerala, Maharashtra, Rajasthan, Himachal Pradesh and Tamil Nadu private operators are not allowed to park their buses inside bus terminals but in West Bengal and Orissa private operators are allowed to park their buses in bus terminals, and for that they have to pay a flat fee.

#### **4.1.2 Empirical evidence of Consumer perception of public and private bus service**

The variables included are:

##### **Statewise response on the skills and training of the staff of public and private buses**

- **For drivers of public and private buses in the states**

In table 4.1.4 we see that a high percentage of the respondents of all the states gave rating of 'excellent' and 'good' to the skill level of the drivers for both public and private services. The percentage was marginally higher for the public buses as compared to private buses.

In Rajasthan, drivers of public buses are significantly better trained than their counterparts in private buses. While in the states of Orissa and West Bengal, the situation is reverse.

**Table 4.1.4: Comparison of drivers of private and public buses**

State	Driver					
	Public			Private		
	Excellent and Good	Average	Poor	Excellent and Good	Average	Poor
Himachal Pradesh	100	1	0	72	28	0
Kerala	80	21	0	78.5	22	0
Maharashtra	99	1	0	96	4	0
Orissa	73	27	0	88	12	0
Rajasthan	99	1	0	72	28	0
Tamil Nadu	87	13	0	81	19	0
West Bengal	71	29	0	85	15	0

- **For Conductors in the states**

In table 4.1.5 we see that the skills and training of conductors in all the states of public buses are significantly better than that of private buses. In the states of Himachal Pradesh, Maharashtra and Rajasthan very high percentage of respondents stated that conductors of

public buses are better than that of private buses. However in Tamil Nadu the respondents stated that there was not much difference in the skill and training levels of the conductors of public and private buses.

**Table 4.1.5: Comparison of conductors of private and public buses**

Statewise scaling of Skills and training of staff ( in percentage)						
State	Conductor					
	Public			Private		
	Excellent and Good	Average	Poor	Excellent and Good	Average	Poor
Himachal Pradesh	99	1	0	32	60	9
Kerala	69.5	31	0	-	34	-
Maharashtra	96	4	0	65	30	5
Orissa	60	40	0	-	22	-
Rajasthan	97.5	2	0	-	33	0.5
Tamil Nadu	78	22	0	65	35	-
West Bengal	63.5	36	0	-	28	-

#### **4.1.3 Consumer perception as a comparison of public buses and private buses**

##### **(i) (a) Safety in Public buses**

In all the states, more than 80 per cent of respondents said there is high level of safety in the public buses.

##### **(b) Safety in Private buses**

In Himachal, Kerala, Maharashtra, Orissa and Rajasthan very few respondents stated that there is safety in private buses while in Tamil Nadu and West Bengal around 50 per cent respondents stated there is safety travelling in private buses.

Hence we may conclude that from bus safety point of view, the passengers prefer public buses to private buses.

**(ii) (a) Comfort in travel in case of public buses**

In Himachal Pradesh, Kerala, Orissa, Tamil Nadu and West Bengal around 50 per cent of the respondents stated that there is comfort in public buses whereas in Maharashtra and Rajasthan around 80 per cent respondents agreed there is no comfort in public buses.

**(b) Comfort in travel in case of private buses**

In the states of Kerala, Maharashtra, Orissa, Rajasthan, Tamil Nadu and West Bengal a high percentage of respondents stated that there is comfort in travelling in private buses whereas, in Himachal Pradesh a very small percentage of respondents reported that there is comfort in travelling in private buses.

Overall, we may infer that that the level of comfort for passengers is more when travelling in private buses as compared to public buses.

**(iii) (a) Regularity of public buses**

In, Kerala, Rajasthan, Tamil Nadu a high percentage of respondents stated that there is regularity in public buses whereas in Himachal Pradesh, Maharashtra, Orissa, and West Bengal this percentage was distinctly small.

**(b) Regularity of private buses**

In Orissa and West Bengal a high percentage replied there was regularity of private buses whereas in Himachal, Kerala, Maharashtra, Rajasthan and Tamil Nadu only around 55 per cent stated that there is regularity of private buses.

**(iv) (a) Information available at public bus depots**

In Himachal, Kerala, Maharashtra, Rajasthan, Tamil Nadu a very high percentage of respondents stated that provision of information dissemination is good at bus depots. However as this percentage was lower for Orissa and West Bengal.

**(b) Information available at private bus depots**

In Orissa a very high and in West Bengal a marginally high percentage of respondents stated that there was good provision of dissemination of information in the bus depots whereas in all the other states a high percentage replied that there was no provision of such information dissemination.

**(v) (a) Information provided by the staff of the public buses**

Except in Orissa and Rajasthan in all the other states a high percentage of respondents replied that the staffs of the buses were co-operative in providing information.

**(b) Information provided by the staff of the private bus**

In all the states around 60 per cent of respondents stated that staffs of the bus were co-operative in providing information.

**(vi) (a) Behaviour of staff in public buses**

In Himachal Pradesh, Kerala, Maharashtra, Orissa, Rajasthan, Tamil Nadu and West Bengal 57 per cent, 70 per cent, 64 per cent, 47 per cent, 95 per cent, 76 per cent, 75 per cent respondents respectively replied that the behaviour of the staff is good or excellent.

**(b) Behaviour of staff in private buses**

In Himachal, Kerala, Maharashtra, Orissa, Rajasthan, Tamil Nadu and West Bengal 49 per cent, 77 per cent, 70 per cent, 70 per cent, 61 per cent, 82 per cent, 73 per cent respondents respectively replied that the behaviour of the staff is good or excellent.

We may conclude that there is significant variance over perception of behaviour of public and private buses staff in Rajasthan. There the behaviour of staffs of public buses is significantly better than behaviour of staffs of private buses. In the other states the behaviour of staffs is on an average similar.

**(vii) (a) Travel time in public buses**

In all the states except Orissa the respondents stated that the travel time taken by public buses was good

**(b) Travel time private buses**

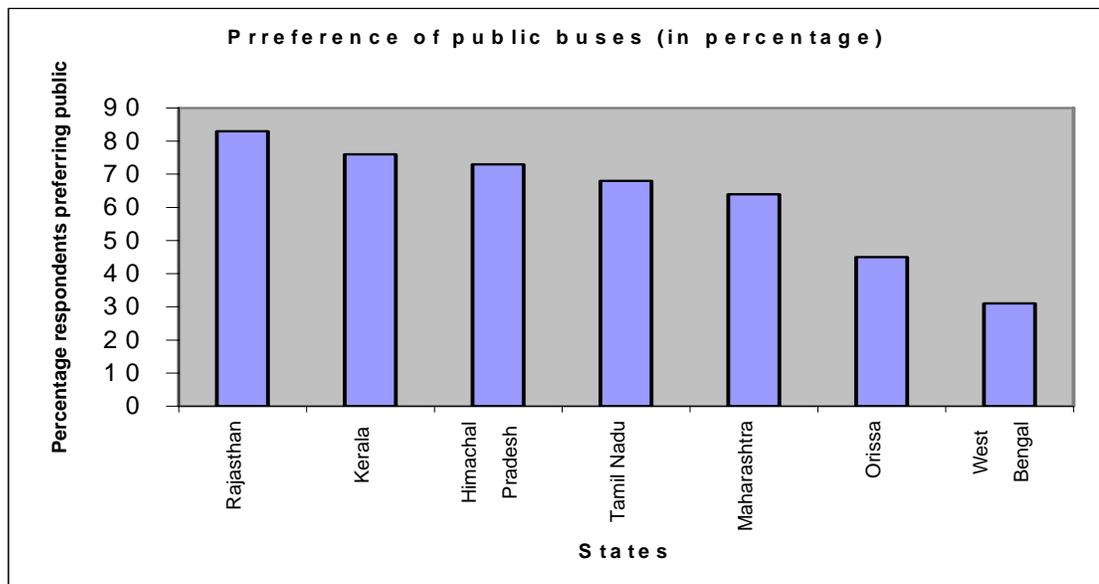
In all the states a very high percentage of the respondents replied that the travel time taken by the private buses was good. However in Himachal Pradesh this percentage was low at 47 per cent.

**4.1.4 Preference of bus service: Public Vs private & Bus Service vs. Rail Service**

**(i) Preference for public bus service**

In Rajasthan 83 per cent of the respondents preferred public buses to private buses followed by Kerala, Himachal, and Tamil Nadu. In West Bengal only 31 per cent of the respondents preferred public buses.

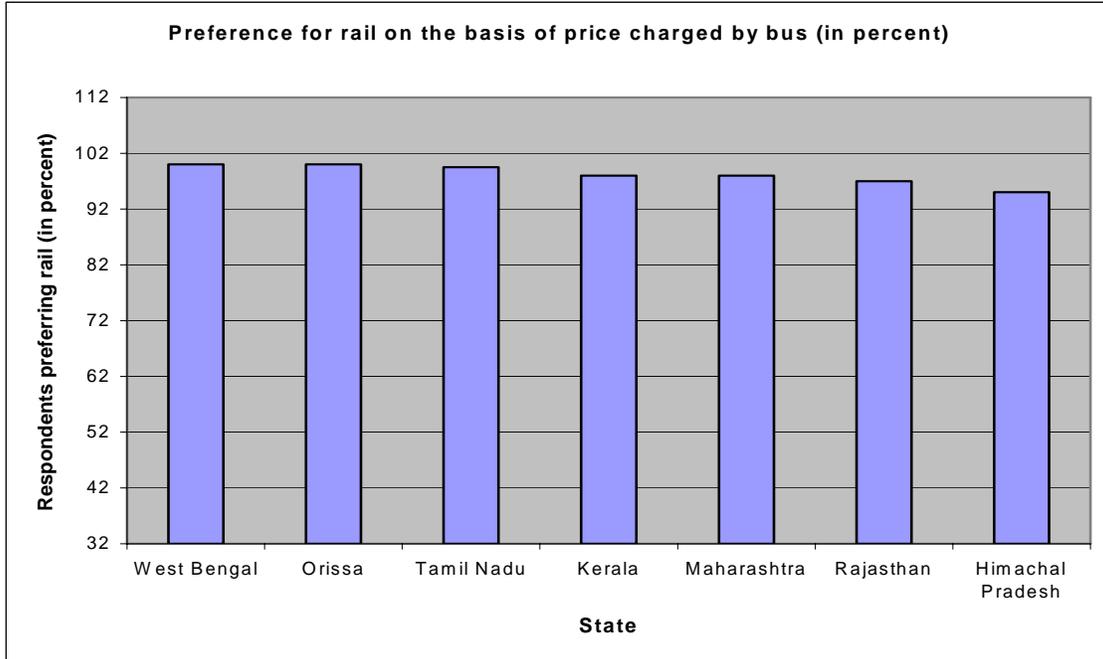
**Figure 4.1.1: Preference for bus service**



(ii) **Preference for Rail service on the basis of price charged by buses:**

As compared to buses more than 95 per cent of respondents in all the states preferred travel by railways over buses.

**Figure 4.2: Preference of Rail travel on the basis of price charged for buses (%)**



**Preference on the basis of efficiency of rail:**

Comparing across the states except Himachal Pradesh where only 47.7 per cent respondents favored rail on the basis of speed, in all the other states a high per cent of respondents favored rail on the same criterion. In case of the parameter safety and comfort in travel, a high percentage of respondents across the states favored rail service. For regularity and behaviour of staffs the responses were more or less same for the states with below 50 per cent favoring rail on this basis. For travel time except Kerala with 16 per cent respondents nobody favored rail mode as compared to buses.

**Table 4.1.6: Preference on the basis of efficiency of rail (in per cent)**

Preference on the basis of efficiency of rail ( in percentage )								
State	speed	safety	comfort in travel	regularity	information provided at bus depots	information provided by staff	behaviour of staff	travel time
<b>Himachal Pradesh</b>	48	100	98	13	0	1	26	0
<b>Kerala</b>	100	99.5	83	28	12	30	46	17
<b>Maharashtra</b>	93	92	64	22	6	5	32	0
<b>Orissa</b>	100	100	88	18	15	23	32	0
<b>Rajasthan</b>	98.5	99.5	97	16	4	3	18	0
<b>Tamil Nadu</b>	99.5	99.5	84	20	2	17	32	0
<b>West Bengal</b>	100	99.5	86.5	6	19	25	40	0

## **Section 2**

### **4.2 Inter-State Comparison in terms of Competition, Efficiency and Customer Satisfaction Index in the context of bus passenger transportation.**

This section presents a comparative study of the existing situation of bus passenger transportation in seven different states in terms of competition, efficiency and composite consumer satisfaction. For this we have created indices based on data collected from primary and secondary sources. This is expected to provide insights on factors that affect competitive environment in the bus passenger transportation. On the basis of the analysis, recommendations have been made, in order to make the sector more competitive.

#### **4.2.1 Indices**

The states under study have specific legislations governing the sector. The policies affect the level of competitiveness in different ways rendering an opportunity for comparing them on a scale of competitiveness, efficiency and customer satisfaction. Three indices have been created covering the different stakeholders. They are:

- Competition index,
- Efficiency index and
- Consumer satisfaction index. This has been done for consumers using private and public services. For constructing the composite indices the following methodologies were applied.

#### **4.2.2 Methodology**

In order to construct the composite competition index, customer satisfaction index and the efficiency index the following steps were followed:

- **Step 1:** Identification of the appropriate variables.
- **Step 2:** Normalizing the variables because Indian states vary in their geographical area, topography, social and economic milieu. The size and composition of the

states is not uniform. Therefore, depending on the variable and what it aspires to measure, each variable was appropriately ‘normalized’.

- **Step 3:** Creating an index of each variable. The following formula is used to obtain each of the indices:

$$I_{ij} = \frac{S_{ij} - \text{Min}(S_{1j}, \dots, S_{7j})}{\text{Max}(S_{1j}, S_{2j}, \dots, S_{7j}) - \text{Min}(S_{1j}, \dots, S_{7j})}$$

Where  $S_{ij}$ , represents the value of ratio  $j$  for state  $i$ . The index is constructed for 7 states and therefore  $i$  ranges from 1 to 7. For measuring the competition index there are six ratios (There are five for the measuring efficiency index and five for the estimating consumer satisfaction index) for which the indices have been constructed and  $j$  refers to the indicator.  $I_{ij}$  is the index value that is derived for state  $i$  over ratio  $j$ . The index value lies between 0 and 1 for each state. The state corresponding to index value 0 is interpreted as having the lowest level of competition index, customer satisfaction index and the efficiency index and the state with an index value of 1 can be said to have the highest level of the same relative to other states.

- **Step 4:** Creating a composite index for each category. Simple arithmetic mean, as given below, was used to calculate the category indices.

$$C_{ik} = \frac{\sum_j^n I_{ijk}}{n}$$

Where  $C_{ik}$  is the category index of the  $i^{\text{th}}$  state for the  $k^{\text{th}}$  category over  $n$  indices within the category.

- **Step 5:** This step is necessary for construction of Consumer Satisfaction Index. Calculating a composite/overall index: This final step requires all category indices (for public and private consumer satisfaction index) to be put together to come up with a composite indicator of relative performance for various states

$$M_i = \frac{\sum_{k=1}^N C_{ik}}{N}$$

Where  $M_i$  is the additive index value for the  $i^{\text{th}}$  category over  $N$  category indices of satisfaction. In this case,  $N$  is 2.

### **4.2.3 Competition Index**

The following indicators of competitiveness are included to estimate the competition index.

1. The ratio of private buses to total buses,
2. Registration time,
3. Permit charges for more than one region,
4. Asymmetry of information
  - Permission to change fleet size,
  - Permission to change time table,
5. Operation of public and private buses on the same routes (Inter State),
6. Operation of public and private buses on the same routes (Intra State).

In case of the first indicator we take the ratios of the numbers of private buses to total buses in the state. Since the ratio is a competition-enhancing factor, so the ratio is directly proportional to the final index. In the second case, we take the average registration time, informed by different operators of the same state. But in constructing the index we consider the reverse of the average registration time of the state. Actually this makes the supply response slower. Similar process is also applicable for permit charges. The data of next four variables, i.e., permission to change fleet size, permission to change time table, operation of public and private bus on the same routes (both for inter state and intra state)

are in binary form i.e. in either ‘Yes’ or ‘No’. In this case we take either the proportion of the frequency of the response ‘yes’ to total responses or the ratio of the frequency of the response ‘no’ to total responses. In case of competition enhancing indicators, operation of public and private bus on the same routes (both inter State and intra state) we take the previous ratio (answer yes/total responses) and in opposite cases, which are anti competitive in nature, we consider the latter ratio (answer no/total responses). In case of variable four we take the difference of the probabilities of answers ‘yes’ and ‘no’. This reflects the asymmetry of information, which is inversely related to competition. Based on the above methodology, the following competition indices for the seven states were obtained (refer table 4.2.1).

**Table 4.2.1: Competition Index for Passenger Transport for seven states**

S. No.	States	Competition Index
1	RAJASTHAN	0.838
2	ORISSA	0.764
3	KERALA	0.721
4	TAMIL-NADU	0.622
5	WEST BENGL	0.602
6	HIMACHAL PRADESH	0.595
7	MAHARASTRA	0.569

As is clear from the table, Rajasthan is at the top of the ranking of the competitive index. Amongst the six indicators analysed, Rajasthan is at the top for three of the indicators. Those are permit charges for more than one region, operation of public and private bus on the same routes (Both Inter-state and Intra-state). On the other hand, Maharashtra is at the bottom of the ranking. Amongst the six indicators analysed Maharashtra is at the bottom for all indicators except permit charges for more than one region. Himachal Pradesh is just above Maharashtra, i.e., at the sixth position in the ranking. Maharashtra becomes at the top of the ranking for one of the indicators, i.e., for permit charges for more than one region. The range for competition Index varies from a high of 0.838 for Rajasthan to a low of 0.569 for Maharashtra.

#### **4.2.4 Efficiency Index**

For constructing the efficiency index, the following variables/indicators are used.

1. Surplus before tax,
2. Percentage of fleet utilisation,
3. Effective Kilometres Per staff per day,
4. Kilometres per litre of HSD,
5. Accidents per lakh effective Kilometres.

The results of efficiency index are shown in table 4.2.2

**Table 4.2.2: Efficiency Index for Passenger Transport**

<b>S. No.</b>	<b>States</b>	<b>Efficiency Index</b>
1	Rajasthan	0.893
2	Maharashtra	0.688
3	Orissa	0.636
4	Himachal Pradesh	0.631
5	Tamil Nadu	0.517
6	Kerala	0.438
7	West Bengal	0.052

As is clear from the table, Rajasthan is once again at the top of the ranking of the efficiency index. Amongst the five indicators analysed, Rajasthan is at the top for two of the indicators, which are effective Kilometres Per staff per day and kilometres per litre of HSD. On the other hand West Bengal is at the end of the ranking. Amongst the five indicators analysed West Bengal is at the bottom for three indicators, which are surplus before tax, percentage of fleet utilisation and effective kilometres per staff per day. West Bengal also performs poorly in case of other two indicators, which are kilometres per litre of HSD and accidents per lakh effective Kilometres. In case of efficiency, Maharashtra performs well. It is at the second position. This is primarily because Maharashtra ranks top in surplus before tax. In other cases it does not maintain its top ranking but performs well.

#### **4.2.5 Consumer Satisfaction Index:**

The indicators used in the construction of this index are:

1. Average waiting time for a bus
2. Skills and training of the staff (driver and conductor)
3. Punctuality of the bus.
4. Quality of bus service which includes stoppage on each stands, over stay at the bus stations, stoppage in between bus stands, overcrowding of buses, method of ticket collection, frequency of breakdown.
5. Parameters like safety, comfort in travel, regularity, information available at bus depots, information provided by staff, behaviour of staff, travel time were also taken into account. Scaling was done on four point scale.

To calculate the above index, we took into account the variables, which influence consumer satisfaction. In case of the first variable, 'average waiting time for bus' we considered the waiting time 'less than fifteen minutes' and standardised it by dividing it by the total responses. In case of skills and training of the staff we considered only the 'excellent and good' responses and standardised it by dividing it by the total responses. By using bus services customers might reach destination 'on time', 'some times on time' and 'never on time'. But we considered mostly on time. In the last variable we gave attention to only excellent and good skills for parameters safety, comfort travel, regularity, information available at bus depots/terminals, information provided by staffs, behaviour of staffs and travel time. Proportion of these variables was taken into account for calculation of the index. So each variable was divided by total responses.

The index was calculated for the satisfaction level attained by customers separately for the public and private buses. These results are reported in table 4.2.3. Thereafter, by using a weighted average (weights being assigned on the basis of market share of public and private buses) a composite consumer satisfaction index was estimated.

#### **4.2.5.1 Customer Satisfaction Index For Different States**

In case of consumer satisfaction index, Rajasthan again comes at the top of the ranking. Maharashtra, Tamil Nadu, West Bengal, Kerala, Orissa and Himachal Pradesh are at the second, third, fourth, fifth, sixth and seventh position respectively. Consumer Satisfaction is higher in case of public sector than that of private sector only in three states – Rajasthan, Tamil Nadu and Himachal Pradesh. On the other hand for the states Maharashtra, West Bengal, Kerala and Orissa, private sector generates higher consumer satisfaction than public sector buses. The performance of public sector in producing consumer satisfaction is poor in the states of West Bengal, Kerala and Orissa. Public buses of Orissa need urgent government intervention to improve its condition. Similar is the situation of private sector buses of Himachal Pradesh. In case of Maharashtra, though the private sector is very small but they produce more consumer satisfaction than public sector buses. It is well known that, there is no regulatory body or monitoring authority for private sector operator in any state. Therefore, it can be said that if private sector operators are monitored perfect monitoring, they might be able to satisfy the consumers of bus passenger transportation to a greater extent

**Table 4.2.3: Customer Satisfaction Index For Different States**

<b>S. No.</b>	<b>States</b>	<b>Consumer Satisfaction Index: Public Road Transportation</b>	<b>Consumer Satisfaction Index: Private Road Transportation</b>	<b>Composite Consumer Satisfaction Index</b>
1	Rajasthan	0.838	0.430	0.622
2	Maharashtra	0.569	0.630	0.607
3	Tamil Nadu	0.622	0.578	0.597
4	West Bengal	0.602	0.602	0.509
5	Kerala	0.721	0.518	0.470
6	Orissa	0.764	0.826	0.462
7	Himachal Pradesh	0.595	0.170	0.409

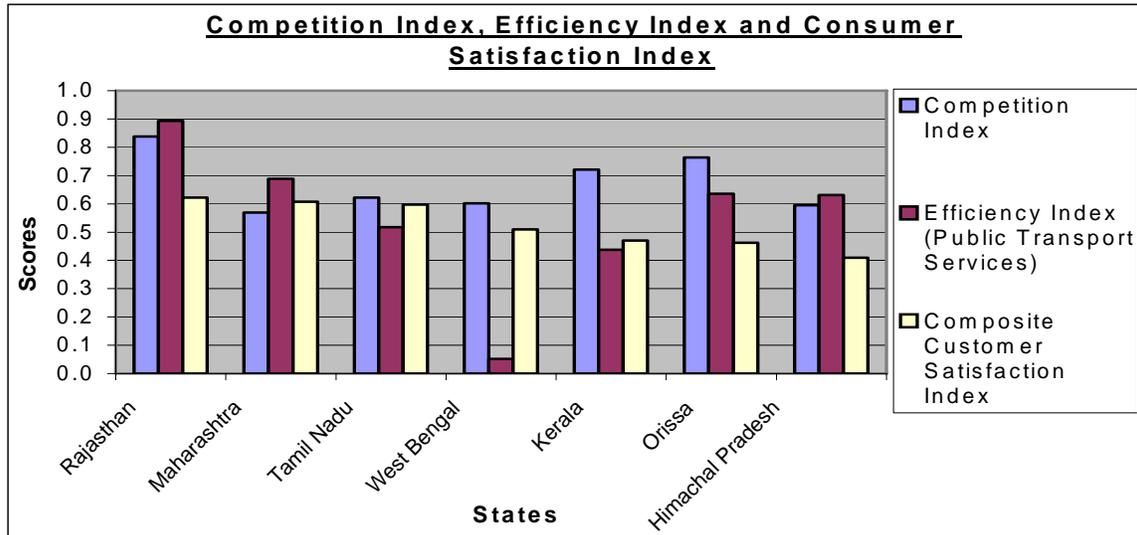
**4.2.5.2 Comparative Analysis of Competition Index, Efficiency Index and Customer Satisfaction Index**

The Competition, Efficiency and Consumer satisfaction indices are given in the table 4.2.4. As it is clear that public transportation is most competitive in Rajasthan and the state ranks top at both of the efficiency and composite customer satisfaction rankings. The picture is just opposite for the state of Maharashtra. It is at the bottom of competitive ranking but holds the second position in efficiency and satisfaction ranking.

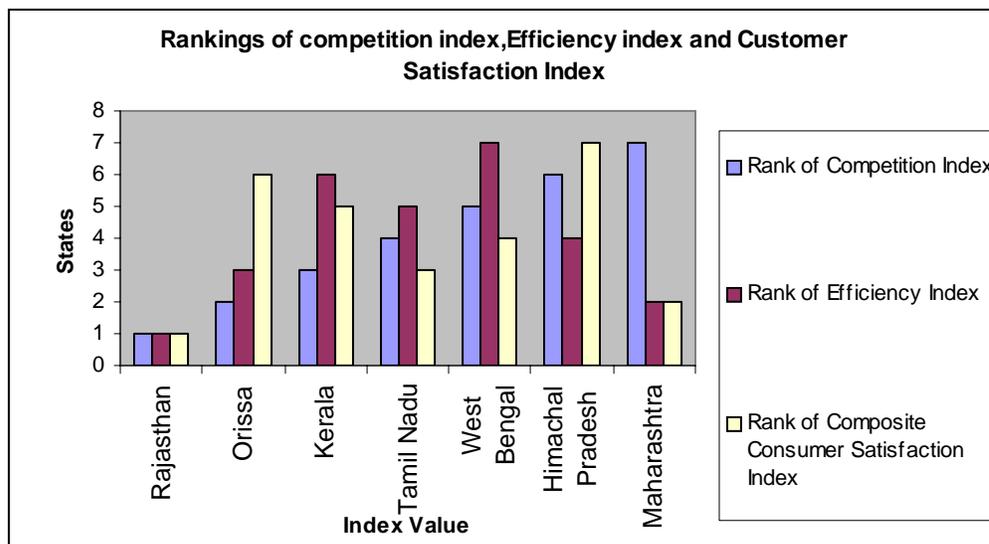
**Table 4.2.4: Competition, Efficiency and Composite Consumer Satisfaction (Indices and Ranking)**

States	Competition Index	Efficiency Index	Composite Customer Satisfaction Index	Rank of Competition Index	Rank of Efficiency Index	Rank of Composite Consumer Satisfaction Index
Rajasthan	0.838	0.893	0.622	1	1	1
Orissa	0.764	0.636	0.462	2	3	6
Kerala	0.721	0.438	0.470	3	6	5
Tamil Nadu	0.622	0.517	0.597	4	5	3
West Bengal	0.602	0.052	0.509	5	7	4
Himachal Pradesh	0.595	0.631	0.409	6	4	7
Maharashtra	0.569	0.688	0.607	7	2	2

**Figure 4.2.1: Competition Index, Efficiency Index and Consumer Satisfaction Index**



**Figure 4.2.2: Ranking of Competition Index, Efficiency Index and Composite Consumer Satisfaction Index**



#### 4.2.6 Partial productivity measures-State Transport Corporations

Apart from three indices, we have estimated several Partial productivity measures of State Transport Corporations such as:

1. Revenue/Bus km (Rs per Bus km)
2. Surplus before tax/Bus km (Rs per Bus km)
3. Fuel & Lubricant cost/Bus km (Rs per Bus km)
4. Personnel cost/Bus km (Rs per Bus km)
5. Tax/Bus km (Rs per Bus km)
6. Total cost /Bus km (Rs per Bus km)
7. No. of Staff/Bus
8. Surplus After tax (Rs per Bus km)
9. Bus kms Travelled/day/Bus
10. Average No. of passenger/Bus/day
11. Tariff paise per passenger km
12. Fleet Utilisation (In Percentage)

**Table 4.2.5: Partial Productivity Measures - State Transport Corporations**

States	Rvenue/Bus km (Rs per Bus km)	Surplus before tax/Bus km (Rs per Bus km)	Fuel & Lubricant cost/Bus km (Rs per Bus km)	Personnel cost/Bus km (Rs per Bus km)	Tax/Bus km (Rs per Bus km)	Total cost /Bus km (Rs per Bus km)	No. of Staff/Bus	Surplus After tax (Rs per Bus km)	Bus kms Travelled/day/Bus	Average No. of passenger/Bus/day	Tariff paise per passenger km	Fleet Utilisation (In Percentage)
Rajasthan	16.09	2.03	6.16	5.06	1.84	15.90	5.02	0.19	95	261	40	96.9
Maharashtra	20.55	3.49	7.53	6.49	2.92	19.97	6.90	0.58	85	413	63	96.7
Tamil Nadu	16.16	0.25	6.79	6.35	0.69	16.58	6.76	-0.44	114	930	32	95.9
West Bengal	13.63	-17.40	8.66	16.85	0.00	31.04	11.90	-17.40	58	670	45	98.8
Kerala	20.48	-4.15	8.98	10.05	0.53	25.16	9.10	-4.68	81	866	48	80.5
Orissa	15.53	1.97	7.89	2.13	0.97	14.53	5.31	1.00	81	NA	41	98.8
Himachal Pradesh	18.65	-2.30	8.51	7.98	2.35	23.30	4.75	-4.65	58	NA	47/74	98.1

An analysis of partial productivity measures shown in the Table 4.2.5 yield the following insights:

- Rajasthan STC is able to control its total cost per kilometre due to its high labour productivity and is also able to contribute adequate amount of taxes to state exchequer even after levying a moderate tariff.
- West Bengal and Kerala STCs even after levying substantially higher tariffs vis-a-vis Rajasthan's tariffs by 12 and 20 per cent respectively earn negative net revenue per bus-kilometre due to the prevalence of low labour productivity, low fleet utilisation etc.
- Maharashtra is forced to levy a substantially higher tariff vis-à-vis Rajasthan to earn a surplus per bus-kilometre. It is ironical that consumers in the state prefer the clandestine operations of the private operators to operations of STCs. The scenario in Maharashtra is clearly an abuse of its dominant position in the state affecting consumer satisfaction adversely.
- Tamil Nadu STC posts excellent productivity measures in all spheres except in the measure labour productivity due to the problem of overstaffing as well as due to higher personnel' wages perhaps due to extraneous measures outside the control of the management.
- The case of Himachal Pradesh is unique in the sense that it is a land-locked state with no alternative mode of transportation and the existence of hilly terrain compounds the problem of having a cost-effective bus transportation alternative that is affordable to the general public.

Competition enhancing policies could be considered as the main catalyst in Rajasthan for its efficient performance compared to its affluent neighbour Maharashtra while in the eastern region, Orissa's STC's better performance over its affluent neighbour West Bengal STC's performance can also be attributed to pro-competition policies. The same kind of conclusion can be deduced in the case of southern region too. Thus for effecting a better performance in STCs, enforcement of competition enhancing policies are a must-otherwise clandestine operation of private operators would emerge resulting in foregone tax revenue.

## **4.2.7 State and Index Specific Recommendations**

### **4.2.7.1 Recommendations Based on Competitive Index**

To improve the competitiveness of bus passenger transportation in the seven states, following state specific recommendations are made on the basis of the performance of those states in different indicators of competitive index.

- The ratio of private buses to total buses is highest in Orissa and lowest in Maharashtra. To improve the competitiveness in public road transportation sector Maharashtra and Himachal Pradesh should improve the participation of private operators in road transportation sector.
- Registration time is considered as one of the barriers of competition in the sector. Registration time is shortest in Orissa. It is longest in West Bengal. West Bengal should take necessary action to reduce registration time for improving competitiveness in the concerned sector.
- Permit charges for more than one region is also considered as a barrier for free entry. In this case Rajasthan is the best performer and Himachal Pradesh is the worst performer. So in Himachal Pradesh permit charges should be reduced.
- Asymmetric information is treated as an anti-competitive factor. Without perfect competition proper competitive environment can not be prevailed. None of the states scores better in this field. So it is recommended that all concerned states should improve their information system.
- In the field of operation of public and private buses on the same routes (Inter State), both Rajasthan and West Bengal are at the top of the ranking. It is quite expected that Maharashtra be at the bottom of the ranking. Maharashtra should take steps to end the public sector monopoly in every route to let competition prevail on each of the route.
- Almost similar is the situation for operation of public and private buses on the same routes (Intra State). Four states, Rajasthan, West Bengal, Tamil Nadu and Kerala have similar score for this indicator and they are at the top of the ranking. Here also Maharashtra is at the bottom of the ranking and the recommendation for the state is same as the previous case.

#### **4.2.7.2 Recommendations Based on Efficiency Index**

To improve the efficiency of bus passenger transportation in the seven states, following state specific recommendations are made on the basis of the performance of those states in terms of different indicators considered in the construction of the efficiency index.

- In case of surplus earning (before tax) per effective kilometre, Maharashtra is the best performer and West Bengal is the worst one. To improve the efficiency of the bus passenger transportation sector, West Bengal should increase its surplus earning. In this case, the condition of Kerala is also not good. The same recommendation is therefore applicable for the state of Kerala.
- Percentage of fleet utilisation is best in Himachal Pradesh. Rajasthan, Maharashtra and Orissa are also performing well. In this field West Bengal and Tamil Nadu are the worst performers. They should improve their performances in the field of fleet utilisation.
- Effective kilometre per staff per day is another important indicator and it is also lowest in West Bengal. In this field Rajasthan is the best performer, while Tamil Nadu also performs well. The other states, mainly West Bengal, Kerala and Himachal Pradesh should follow the policy of Rajasthan to improve their scores on the efficiency Index.
- Rajasthan is also most efficient in the use of HSD (the indicator is kilometre per litre of HSD). The most inefficient user of HSD is Himachal Pradesh. But Himachal Pradesh is a hilly region where more HSD is needed to cross same distance than that of other states. It is recommended that if possible, Himachal Pradesh should try to improve its HSD use.
- Though Himachal Pradesh is a hilly region, compared to other six states the accident level is much lower in the state. All other six states should reduce the accident levels.

#### **4.2.7.3 Recommendations Based on Consumer Satisfaction Index**

To raise the satisfaction level of the consumers of bus passenger transportation in the seven states, following state and sector (public and private) specific recommendations are made on the basis of the performances of those states in different indicators of consumer satisfaction index.

##### **Recommendations for Public sector bus operators**

- The average waiting time for bus is highest in Tamil Nadu and lowest in West Bengal and Orissa. So Tamil Nadu should reduce waiting time for Public sector bus to improve the satisfaction level of the consumer. Rajasthan should also follow this recommendation.
- Skills and training of the staff (driver and conductor) is best in Himachal Pradesh. Skills and training for drivers are worst in West Bengal and that for conductor is worst in Orissa. So in this field both of the states should follow Himachal Pradesh.
- The public sector bus service is most punctual in Himachal Pradesh while that of Orissa is worst. So Orissa should improve punctuality of its public sector bus passenger service to improve the satisfaction level of the consumer.
- In case of overstay Maharashtra should follow Rajasthan to improve passenger satisfaction level.
- Public sector buses of Kerala most frequently give stoppages. This reduces the consumer satisfaction level. In this field the best performer is West Bengal and hence in this field necessary measures are required in West Bengal.
- Public sector buses are mostly overcrowded in Tamil Nadu. The situation is also not good in Maharashtra. They should follow the policy of Rajasthan, which is best performer in this field.
- Method of ticket collection is another important factor, which affects consumer satisfaction level. In this field Rajasthan is at the top of the ranking and West Bengal is at the end of the ranking. West Bengal public sector passenger bus transport sector should take necessary measures to improve its ticket collection method.

- In Rajasthan frequency of breakdown of public sector passenger buses is highest. It is lowest in Maharashtra. Therefore Rajasthan and also West Bengal should solve the problem of breakdown of public sector buses.
- Safety is one of the crucial factors for consumer satisfaction. The safety level is lowest in Himachal Pradesh and highest in Tamil Nadu. Actually all the states should improve bus passenger safety.
- Comfort level in public bus transportation is best in Rajasthan. Previously it was mentioned that the problem of overcrowded public bus passenger transportation is lowest in Rajasthan. In this field Orissa and Kerala require massive improvement.
- In the field of regularity of public sector passenger transportation Orissa needs improvement. In this regard Orissa can follow Tamil Nadu.
- In both of the fields, information available at bus depot and information provided by staffs, Orissa is the poorest performer. In the first case Himachal Pradesh and in the second case Rajasthan should be the models for other states.
- Behaviour of staff is also good in Rajasthan. In this field Orissa requires necessary improvement.
- Generally consumers are very much concerned about the travel time. This indicator is best in Tamil Nadu and worst in Orissa.

### **Recommendations for Private sector bus operators**

- The average waiting time for bus is highest in Himachal Pradesh and lowest in Orissa. So Himachal Pradesh should reduce waiting time for private sector bus to improve the satisfaction level of the consumer.
- Skills and training of the staff (driver) is best in Maharashtra while that for conductor is best in Orissa. Skills and training for drivers are worst in Rajasthan and that for conductor is worst in Himachal Pradesh. So in this states should follow Himachal Pradesh.
- The private sector bus service is most punctual in Maharashtra (though they are the examples of clandestine operations).

- In case of overstay Maharashtra should follow Himachal Pradesh to improve passenger satisfaction level.
- Private sector buses of Orissa most frequently give stoppages. This reduces the consumer satisfaction level. In this field the best performer is Himachal Pradesh and hence in this field necessary measures are required in the state.
- Private sector buses are mostly overcrowded in Orissa. Orissa should follow the policy of Himachal Pradesh, which is best performer in this field.
- Method of ticket collection is another important factor, which affects consumer satisfaction level. In this field Orissa is at the top of the ranking and Himachal Pradesh is at the end of the ranking. Himachal Pradesh private sector passenger bus operators should take necessary measures to improve its ticket collection method.
- In Maharashtra frequency of breakdown of private sector passenger buses is highest. It is lowest in Rajasthan.
- Safety is one of the crucial factors for consumer satisfaction. The safety level is best in Tamil Nadu. Actually all the states should improve bus passenger safety.
- Comfort level in public bus transportation is best in Tamil Nadu. In this field Himachal Pradesh requires massive improvement.
- In the field of regularity private sector bus passenger transportation of Rajasthan needs improvement. In this regard private sector bus operators of Rajasthan can follow that of Orissa.
- In the field of information available at bus depot Kerala is the poorest performer. On the other hand, information provided by staffs is best in Himachal Pradesh. In the first case Rajasthan and in the second case Himachal Pradesh should be the model for other states.
- Behaviour of staff is good in Tamil Nadu. In this field Himachal Pradesh requires necessary improvement.
- Generally consumers are very much concerned about the travel time. This indicator is best in Kerala and worst in Himachal Pradesh.

#### **4.2.8 Main Findings: Principal Component Analysis**

A Principal Component Analysis (PCA) was conducted to assign weights to variables that best describe efficiency of operations of state transport undertakings in the passenger bus transportation segment. The PCA is an objective method of assigning weights (methodology explained in Annex 1). Variables considered for the PCA STCs operators were as under:

- Revenue per bus kilometre
- Cost per bus kilometre
- Fleet utilisation rate (No. of buses on road as a per cent of buses owned by the state transport undertaking)
- Load Factor (Passengers transported per bus per day)
- Staff per bus on road (Total staff/ total buses on road: fleet utilisation rate times the total buses owned by the state undertaking)
- Accidents per lakh kilometre
- Fuel use efficiency of bus (kilometres travelled per litre of diesel)

The PCA carried out was based on the published data (Indian Journal of Transport Management) for the following 13 State Road Transport Corporations

1. Maharashtra
2. Andhra Pradesh
3. Gujarat
4. Uttar Pradesh
5. Karnataka
6. Rajasthan
7. Kerala
8. Tamil Nadu
9. Himachal Pradesh
10. Calcutta STC
11. South Bengal STC

12. North Bengal STC

13. Orissa STC

The PCA yielded the weights for variables. These are listed in Table 4.2.6. With these weights, one could construct a composite index to best describe the performance of each State Transport Undertaking.

**Table 4.2.6: Weights assigned to variables: Based on PCA**

<b>Variable</b>	<b>Weight in per cent</b>
Revenue per Bus-Km	20.4
Cost per bus-km	19.9
Fleet Utilisation (No. of buses on road as a per cent of buses owned by the state transport undertaking)	19.3
Load Factor(Passengers transported per bus per day)	4.2
Staff per bus on road (Total staff/ total buses on road i.e. fleet utilisation rate times the total buses owned by the state undertaking)	16.7
Accidents per lakh kilometre	19.5
Fuel use efficiency (bus kilometres travelled per litre of diesel)	Omitted by the model

The model yields certain interesting insights: Apart from the normal efficiency parameters such as the revenue per kilometre, cost per kilometre, fleet utilisation etc. accidents per lakh kilometre turns out to be a crucial variable in determining the efficiency. In other words, the competition policy should encourage *competition off the road* than *on the road*. Initial tender conditions should filter out contenders based on their norms achieved on accidents per lakh Kms and subsequently two-stage selection process should be chosen on the competitive tendering basis.

Rankings of STCs, based on composite indices are given in Table 4.2.7:

**Table 4.2.7: Rankings based on PCA**

<b>STCs</b>	<b>Rank</b>
Maharashtra	1
Andhra Pradesh	2
Gujarat	3
Uttar Pradesh	4
Karnataka	5
Rajasthan	6
Kerala	7
Tamil Nadu	8
Himachal Pradesh	9
West Bengal STCs	10
Orissa	11

These rankings match our rankings of public transportation undertakings on the efficiency parameter thus validating the primary survey of operators, state undertaking transport corporation and the customer perception on the efficiency and adequacy of the private and state run bus transport undertakings.

#### **4.2.9 Findings of the study**

The main findings of the study have been summarised below:

- As a comparison of the seven states under consideration Rajasthan is at the top of the ranking of the competition index in bus passenger transportation sector
- Rajasthan also secures the top ranking in the efficiency index of public sector bus passenger transportation of the seven states. Rajasthan STC is able to control its total cost per kilometre due to its high labour productivity and is also able to contribute adequate amount of taxes to state exchequer despite levying a moderate tariff.
- In terms of the Composite Consumer Satisfaction Index, Rajasthan is once again at the top in the bus passenger transportation.

- West Bengal is at the bottom of the ranking in the efficiency index of bus passenger transportation of public sector and the efficiency level calculated is found to be very low in comparison to other states.
- Maharashtra is an example of nationalisation of bus passenger transportation but the small private sector (only 7 percent of total bus passenger transportation) is being able to cater to higher levels of satisfaction to the passengers than the public sector. It is ironical that consumers in the state prefer the clandestine operations of the private operators to operations of the STCs. The scenario in Maharashtra is clearly an abuse of its dominant position in the state affecting consumer satisfaction adversely.
- Though there is no regulatory authority or monitoring authority for private sector in any state, in the four states of Maharashtra, West Bengal, Kerala and Orissa, private sector produces higher level of consumer satisfaction than the public sector.

## **Chapter 5: Proposed Model for Competition Enhancement in Passenger Transport Services**

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### **5.1 Advantages of Bus transport**

To meet 1km of passenger travel demand, a car consumes nearly five times more energy than a 52-seater bus with 82 per cent Average Load Factor. The corresponding consumption factor for two-wheelers is 2.6. The comparative fuel costs of a car and a two-wheeler to meet the same travel demand as a public transport bus is 11.8 times and 6.8 times respectively. A car occupies 38 times more road space compared to a bus per Passenger Km. A two-wheeler's requirement of road space is even higher, being 54 times that of a bus. The unaffordable economic costs of personalised transport and its demands on road infrastructure are thus obvious.

In terms of emissions, the evidence that has come up before this Committee shows that automobile pollution is an important but not the only source of air pollution in India's urban centers. A number of other factors are also at play in determining ambient air quality. Further, since the population of public transport vehicles in the overall vehicle population and their share of traffic loads in terms of Vehicle km traveled are extremely low, it may be namely concluded that their contribution to automobile pollution is insignificant. According to Tata Energy Research Institute (TERI), the replacement of a single bus by an equivalent number of two-wheelers would add to air pollution by 27 per cent. Similarly, cars would cause 17 per cent more pollution. Regardless of whether a bus is new or old, it offers large benefits in fuel savings, emissions and safety even when moderately full. The virtues of a Mass Transit System based on buses over personalised modes of transport in terms of multiple gains, economic and social are fully vindicated by evidence gathered. From the standpoint of improving urban air quality, the case for promoting public bus transport is strong indeed (Auto Fuel Policy Report, GOI, 2001).

However, passenger bus transportation is plagued by a number of problems, foremost among them being lack of competition and rising losses. Conventional wisdom holds that passenger road transport services must be provided exclusively by the public sector. It was presumed that the few remaining private providers around the world soon would be subsumed by the inevitable conversion to public operation. Strong arguments were offered for this reliance on protected public monopoly, as it is believed that:

1. Public monopoly would reduce costs, since the public agency would not have to pay taxes and would not be required to earn a profit. Lower costs would also be achieved through the economies of scale available to a larger organisation
2. Public managers and employees would give greater attention to the service of customers, since they would not be deterred by the profit motive. Instead, they would be driven by their commitment to public welfare.

However, the conversion of public transport to public monopolies did not result in lower public transport costs. Despite the relief from taxes, public transport costs increased at an extraordinary rate and consumed public funding that could have produced many of the promised service improvements. The anticipated savings from economies of scale did not materialise. Often, public transportation is characterised by diseconomies of scale. Its use has continued to fall. However, a large percentage of the reduction is related to demographic changes that worked against public transport, such as increased affluence, greater automobile usage, less dense development, inexpensive home ownership programme, etc. In addition, in many areas, public transport riders complain about low service quality.

Instead, it is proposed to broaden horizons and incorporate the competition mechanism in the market place, as it would improve performance and keep costs down. Alternatively, monopoly is characterised by higher prices and limited production. As a result, government has routinely limited the creation of monopolies in the private sector.

At one time, some economic theorists believed that the problems of monopoly were problems of ownership; that only private monopolies were harmful and public monopolies were virtuous because they replaced the profit motive with a public service motive.

However, the people who manage and operate public monopolies are no more virtuous than the people who manage and operate private businesses. Thus, escalating costs combined with declining efficiency, has saddled the government with profound financial challenges. The cost of government continues to rise, fuelled by ever-higher interest charges on national debts, increased public service needs and the continuing escalation of costs among existing public services.

Thus, to maintain a high standard of living, it is necessary that governments become economically efficient. Resources must be allocated efficiently through competition. Liberalisation of public transportation is essential and its economics is no different from the economics of nations (Cox & Love, 1991).

Keeping these considerations in mind, the present chapter proposes an alternate model for the Passenger Road Transport (PRT) sector.

## **5.2 Alternate models for Passenger Road Transport (PRT)**

In this section four alternate models for PRT are discussed. They are:

1. Public Monopoly
2. Public bus operations with free entry/exit of private operators in select routes
3. Public and Private Participation
4. Privatisation Model

### **5.2.1 Public monopoly**

In this model, the entire PRT belongs to the government. Government monopoly (or public monopoly) is a form of **coercive monopoly** in which a government agency is the sole provider of a particular good or service and Law prohibits competition. It is usually distinguished from a government-granted monopoly, where the government grants a monopoly to a private individual or company. In this case there is no other party (private sector) involved in the provision of passenger transport services or any other public utility service.

In many countries, governments run the postal system with competition forbidden by Law in some or all services. Also, government monopolies on public utilities and railroads have historically been common, though recent decades have seen a strong privatisation trend throughout the industrialised world.

#### **5.2.1.1 Features:**

In case of a public monopoly model:

- The pricing and production decisions are taken by the government and are independent of competitive forces because all potential competition is barred
- Effectively a monopoly where there is no opportunity to compete through means such as price competition, technological or product innovation, or marketing
- Government is able to make pricing and production decisions with the assurance that no competition would arise- **non-contestable market**.
- Government may deliberately price-gouge consumers by curtailing efficiency since there are no incentives to keep prices low.

#### **5.2.1.2 Drawbacks:**

- **Excessive operating costs:** Public sector monopolies are plagued by inefficiencies and have failed to produce favourable results. This is mainly due to

the prevalence of public monopoly in the provision of PRT, which leads to escalation of costs due to overstaffing. Inability to charge higher price due to over subsidisation and other political reasons, leads to low returns, ignorance of service standards, lack of technical expertise and lack of innovation.

- **Perverse managerial incentives:** The structure of public monopoly is such that it provides no room for initiative. This is mainly due to absence of provision of both incentives and penalties on the staff. The importance of such a trend is not realised, which could actually give a remarkable boost to productivity.
- **Lack of dynamism:** Global dynamism is essential. It is one of the prerequisites for high growth. The callous attitude in the provision of services in a monopoly sector inhibits such change.

Does the nature of the product (Bus Service) warrant a natural monopoly? An industry is a *natural monopoly* if one firm supplies more efficiently than two or others. For an industry producing a single, homogeneous product, this boils down to the existence of economies of scale being sufficient (but not necessary) for a natural monopoly to exist. In such a case, it is desirable that only one firm is present in the market. Where the industry produces multiple, differentiated products, the existence of scale economies is neither necessary nor sufficient for natural monopoly. In this case, we need to consider whether it is more efficient for a given firm to produce many of the products or few of the products. In the former case, there are economies of scope.

The general view is that there are no significant economies of scale to firm size in the PRT segment. There are, though, some scale economies in terms of cost per Seat km or Passenger Km at the level of the individual bus. Economies of scope could exist for both user and producer. For the producer, economies of scope includes things like economies in scheduling, where joint production of a number of services reduces the total vehicle fleet requirement.

If there are natural monopoly elements in PRT segment (at least at some level of output), then we could argue that it is wasteful to allow entry to the industry. It is better to have a

few large firms (or even just one) to take advantage of the economies of scale and/or scope.

However, monopolistic or oligopolistic behaviour reduces allocative efficiency because the profit-maximising position on the demand curve is at a higher price/lower output position than that which would accrue in a competitive market. As monopolists earn excess profits, consumers face higher prices. Thus, there is a trade-off between allocative efficiency and exploitation. This is important because different tendering regimes have different properties in terms of striking the balance. Thus, the challenge is to design a mechanism which enables the benefits of productive efficiency to be enjoyed without the disadvantages of monopolistic behaviour (Toner, 2001).

### **5.2.2 Public bus operations with free entry/exit of private operators in select routes.**

In this model, both the public and private sector undertake the provision of PRT. The regulation of fares, routes and other related issues is the responsibility of the authority.

The status of public transport in India is such that the respective State Transport Corporations (STCs) generally provide the basic mode of public transport across India established under the State Transport Authority (STA). Private operators may get permits from the respective STAs and run their buses on the decided routes. Thus, theoretically, there exists free entry and exit for these operators.

PRT services provided in Indian states could be a good example of this model. Most states have both public and private bus transport services operating simultaneously. Since the late 1980s, there has been a rapid rise in the share of the private sector in bus transport services. The involvement of private operators has been encouraged in many cities primarily because STCs are faced with mounting deficits and are unable to finance capacity enhancement measures. The share of buses owned by the private sector compared to public sector has changed dramatically over the years. For example, during the period from 2001 to 2005 the market share of private buses in Himachal Pradesh

increased from 36 to 49.6 per cent, while in case of Tamil Nadu the share has decreased from 25.4 to 20.9 per cent over the same period.

Larger cities have a variety of bus service providers. Delhi has bus services provided by small private operators operating on specified routes on the strength of permits issued by the STA and chartered buses which are privately operated (contract carriage service) largely catering to peak-period traffic. Similarly, Bangalore and Hyderabad have basic services and premium services (Pushpak and Metro-liner respectively). Bangalore has private buses contracted out on per km basis by the Bangalore Metropolitan Transport Authority. Kolkata too has several private operators.

However, this model has serious shortcomings. The welfare objective of this public utility service is not met efficiently. The quality aspect in the provision of these services is not up to the mark and the private operators are keener on maximising revenues and minimising costs at the expense of reasonable quality standards. Thus, the essence of a public utility service is lost and the consumers suffer due to long waiting periods at bus stands, accidents due to over-speeding and head running, low safety standards in buses, overcrowding in buses due to less frequent service, etc. (Cox & Love, 1991).

### **5.2.3 Public and private participation:**

This model portrays a close liaison between the public and private sector. Both the sectors work in tandem in the completion of a common task. This includes division of responsibility between the two sectors with regard to infrastructure and operations.

The model paves the way for the introduction of the element of competition by giving equal or full right of participation in the operational activities to the private sector along with the public sector. The regulation or organisational aspects in such a case generally rests in the hands of the government which includes the decisions regarding terms and conditions of the contract, assessment of performance, fare regulation, service standards, routes, schedules, etc. The authority also lays down the rules and regulations for the

operation to be carried out, adhering to which becomes the duty of the appointed operator.

The extent of participation could be determined based on the following two parameters:

1. Provision of infrastructure services
2. Provision of operating services

The first issue that we deal with in this model is the provision of infrastructure services, that is, who would provide these services in case of public and private participation? In the PRT system, the provision of these services include the responsibility of the maintenance and ownership of assets, management or regulation of the operation activities, concessions or subsidies to be granted, etc. These could be shared among the two or be solely the responsibility of one (more oftenly the public sector) of the two sectors. The decision regarding this is solely dependent upon a country's legislative framework and other set priorities.

The second issue caters to the operational aspect: Who would provide the services to the society? The answer to this could be through introducing competition in the provision of these services, which could be done through Competitive Tendering. ***Competitive Tendering*** is the provision of a public service through a competitively awarded contract. The government chooses what services to competitively tender and selects the private provider from whom it purchases the services. Competitive Tendering involves a synthesis of public and private roles. The public sector decides what services should be competitively tendered and what specifications should apply to the service. The competitive market responds to the invitation by the government authority. An operator is selected to provide a specific service for a period. The public sector retains policy control over the service, while the competitive market produces the service under public scrutiny. Competitive Tendering in the PRT sector is being increasingly used around the world. Countries to have introduced Competitive Tendering includes United States, Finland, Sweden, France and Chile.

The fundamental advantage of Competitive Tendering is that it saves money. It brings competitive incentives to the production costs of a public service and reduces costs in two ways:

1. Through provision of service at no more than the competitive (or “going”) rate
2. Lowers net costs because of tax revenues, licenses, and fees paid by private contractors on the public services they operate (Cox & Love, 1991).

A successful example of this is the London case. A 1984 Act of Parliament required that Competitive Tendering of PRT services be introduced in London. Before that, virtually the entire bus services of London Transport was operated under a protected monopoly. The same Act set up the former public bus monopoly as a subsidiary of London Regional Transport (which later re-assumed the London Transport name). Tendering began in 1985 and is being administered by the Tendered Bus Unit of London Transport.

Currently, more than 35 per cent of LT bus service is competitively tendered, amounting to more than 200 routes, 1,500 buses over 90 million annual Vehicle Km. Viewed independently the tendered services of London Transport would be one of the world's largest urban bus networks.

Tendering is expanding at about 5 per cent of LT bus services annually. Sixty per cent of tendered services are operated by 12 subsidiaries of London Bus, which has responded to the competitive environment by reducing costs. A staff of 40 people in the Tendered Bus Unit administers this service. Cost savings have been estimated at 15 per cent and improvement in service quality has been reported. LT determines the route alignments, timetables, and fare structure, service and vehicle specifications as well (Cox & Love, 1991).

NCAER Proposal: Thus, keeping in mind the benefits of Competitive Tendering in the present study, it is proposed to incorporate it in the provision of bus transport services in India.

In this case, the choice of participation of both the public and private sectors in winning contracts is completely upto the legislative structure of any country. However, in our study, we propose confining the STA to the task of regulating fares, fixing routes and schedules, setting quality standards, preparing tender specification etc. They should not be allowed to participate in the tender process. On the other hand, the maintenance of the assets, staffing and quality of service will be the responsibility of the operator.

In addition, the nature of competition introduced should be a controlled one that calls for regular renewal rights of operation rather than free access to the market. Sweden and Denmark are successful examples of such a regime. Their experience reveals that controlled competition could lead to more attractive services at lower costs. It achieves best results in attracting passengers to public transport (provided privately) and uses resources most efficiently (Toner, 2001).

#### **5.2.4 Privatization model:**

In this model, ownership and control are transferred completely to the private sector, subject only to the general commercial Laws of the land. In this case, the only regulation that is appropriate is the one exercised through whatever general monopoly and restrictive practice legislation and institutions exist. Government abrogates all sector-specific powers of intervention by this model.

An example of this model is the operation of PRT service in regions outside London where bus services were deregulated in 1986. The Act of Parliament permitted public transport authorities to competitively tender for services that were not provided commercially. It placed restrictions on the ability of public transport authorities to intervene in or regulate commercial (such as specifying fares, timetables, etc.) operations. Before deregulation, most public transport services were provided by protected public monopolies.

The deregulated system involves a form of separation of policy from operations. Governments administering public transport have been required to set up separate organisations if they wish to continue to own public transport enterprises. In some cases, the publicly- owned enterprises have been sold to private investors.

The deregulated public transport system has received both praise and criticism. There appears to be agreement on the substantial savings in public expenditure. Critics, however, contend that the limitations on public planning prohibit sufficient co-ordination of fares and services. (Cox & Love, 1991).

However, the benefits to the poor from privatisation and liberalisation in general and competition in particular, depends on efficient functioning of the trickle-down effect/mechanism. The trickling down, however, is more a natural process and depends on how quickly various pieces of the jigsaw puzzle fall in place. The main problem is whether the processes could sustain the phase of 'transition'. In other words, the long-term benefits due to a competition culture should be weighed against the short-term losses and difficulties to certain sections of the society, mainly the poor.

### **5.3 Nature of the product**

The major criticism against the privatisation model is that it encourages competition in the market leading to "head-running" rather than competition for the market. This becomes clear with the following example. For instance, it is possible to view different bus services as horizontally differentiated products. If all goods are offered at the same price, consumers would differ as to their most preferred choice. For example, with a 30-minute headway, the 10:00 departure may be chosen over the 09:30, or, 10:30 departure. Hotelling (1929) showed that, in a spatial context, competition would lead to a lesser degree of differentiation than optimal. Transferring this line of reasoning to a temporal setting, suppose a new entrant wished to come in and supply two buses an hour. The optimum for society would be for the entrant to run at 10.15 and 10.45. However, the

optimum for the entrant would be to run just in advance of the existing services (“head-running”). Evans (1987) showed that, overall, small group competition would lead to a higher fare frequency regime than is optimal, representing a welfare loss of between 10 and 12 per cent compared to a perfectly planned regime that maximised net economic benefit subject to a budget constant. Tendering can in principle help move the outcome towards the optimum by encouraging co-ordination rather than competition (Toner, 2001).

#### **5.4 Bus market division**

The bus market is divided into:

- 1) Commercial market (which covers the profitable routes)
- 2) Non-commercial market (which covers the non-profitable routes)

The discrepancy that exists in almost each country in the routes to be covered is in the desirability to access profitable and non-profitable routes. Thus, the policy to be formulated for the provision of these services should be in lieu of this factor. It should incorporate measures to induce operators to ply and provide the same services available on commercial routes to people travelling on non-commercial routes as well.

While recommending the model of Competitive Tendering, we propose to divide the passenger road network into:

1. Commercial Route / Market
2. Non-Commercial Route / Market

##### **5.4.1 Commercial Routes / Market**

Clearly, a prerequisite for making a profit on any transit service is high usership. By and large, transit services with high levels of patronage are found in large urban areas with enough density and well-defined activity centres to form a significant customer base.

The commercial market adheres to the profit making public transit routes. It mainly covers accessible, profitable, thickly populated areas in the periphery, the reason being

the benefit of more routes and greater number of passengers which makes this market more desirable for the operators.

Socio-demographic factors, urban land use patterns, and the geographic distribution of residences and employment might be giving rise to high levels of demand and thus profitable services. Profitable routes usually connect to the region's central business district, serving a number of employment clusters and major activity centres along the way. Population and employment densities are consistently high along profitable corridors.

Thus, keeping its features in mind, the policy so designed should leave lesser responsibility on the operator. What is proposed is that the private operator should not be given even minimal support and the transport authority should collect the payment from the operator. This implies that the costs would be borne by the operator. The fares too would be collected and kept by them. In return, the authority would receive a fixed (predetermined) amount. In this case, the authority shall receive payment from the operator.

For instance, we may discuss the PRT contracting regime for regular routes in New South Wales (Australia). Under the Passenger Transport Act, 1990, regular PRT services are provided under a service contract between the Ministry of Transport and an accredited bus operator. A regular PRT (often called simply a regular route service) is a public passenger service operated according to regular routes and timetables. Service contracts may be issued for a specified region or for a designated route or series of routes. The Act allows for two types of service contract: commercial and non-commercial.

In Australia under a commercial service contract, the operator derives revenue from the collection of passenger fares. The service contract must not exceed eight years and must grant the operator the exclusive right to provide regular route bus services in the contract region or along the contracted routes. The commercial contract incorporates:

- Routes, fare schedules and timetables
- Minimum service levels

- An information management system to facilitate service performance monitoring
- A complaints register
- Records and statistics keeping requirement

#### **5.4.2 Non Commercial Route / Market**

Usually non-profitable, remote and inaccessible areas fall within the ambit of a non-commercial market. Unreliable services, low vehicle numbers and vehicle diversity, as well as poor integration of services and planning characterise the services provided in these areas. The reasons: high rural transport costs and service gaps. Thus, it is essential to design appropriate interventions based on an understanding of the mechanisms by which rural and non-commercial transport services are provided for in a number of developing countries. In order to overcome the problem of disinterest among the operators in the provision of these services in the non-commercial or non-profitable routes, the study proposes that a competitive *subsidy bidding process* be adopted in these areas.

For instance, the Ministry of Transport in New South Wales (Australia), a non-commercial service contract is issued where it is considered that regular route passenger road transport services are needed in regions or routes that cannot sustain a full commercial service. The Ministry pays the operator a contract price for the provision of specified services. Non-commercial contracts do not grant exclusive rights to the operator and they can be for any term, except that in the case of school bus services the term must not exceed eight years. Subsidy bidding is very common in the provision of school bus service.

The study proposes a model of subsidy bidding based on the following four criteria.

- i. **First-best economic efficiency case for subsidy:** There are some scale economies in terms of Cost per Seat km or Passenger km at the level of the individual bus. This means that the efficient response to an exogenous increase in demand across a whole network would be to increase the service frequency, the

network density (distance between routes) and the vehicle size, all by a less than proportionate amounts. There are also scale economies to users arising from the “Mohring effect”. If demand doubles and that is met by a doubling of frequency, then headway and thus waiting time per passenger, are halved. So as demand increases, time and money costs to passengers – other things remaining unchanged – falls. This gives a strong first-best economic efficiency case for subsidy. In that case, it is likely that open entry would lead to too many firms coming into the market, though that depends on the precise method of allocating subsidy.

- ii. **Second-best economic efficiency case for subsidy:** Problems of second-best arise when the assumptions behind the perfect competition model are violated. In the PRT segment, the second-best argument is that “since private car users are charged less than their marginal social costs in congested conditions, there is an advantage in holding public transport fares down so as to encourage marginal car users to switch modes”(Glaister and Lewis,1978). This requires provision of subsidy. While the case is theoretically sound, it is an empirical matter as to whether such policies have much effect. What is clear is that without some form of intervention in the bus market second-best pricing policies cannot be pursued (Toner, 2001).
- iii. **Subsidising Non-Commercial Routes / Markets because of Universal Service Obligation (USO):** The objective of this policy is to ensure safe, affordable, quick, comfortable, reliable and sustainable access of bus transport services to the people travelling to non-commercial areas or living there.
- iv. **Non-Commercial Services with Operation-Viability Gap Funding:** PRT operations may not be financially viable on their own, given the tariffs set at affordable levels. Thus, in order to remove this shortcoming and to bring in private sector resources and techno-managerial efficiencies in routes/areas where preference is given to them in non-commercial markets over commercial markets, Operational-Viability Gap Funding can be resorted. This can be introduced through Public

Private Partnerships (PPP). Primarily, this facility is meant to reduce the operational costs so as to make them viable and attractive to private operators assuring a benchmark return on investment.

It may be mentioned that this policy is different from that of Viability Gap Funding for infrastructure, where governments promote PPP primarily to reduce the capital costs.

#### **5.4.2.1 USO in Telecom Sector: lessons for the Passenger Road Transport Sector**

As regards USO services, a mix of 'universal access' and 'universal service' objectives were targeted in India. The 'Universal Access' policy aims at increasing access to public basic telecom services such as village public telephones in rural or remote villages. 'Universal Service' focuses on ensuring that the cost of telephone services remains affordable to all people, including low-income families and people living in uneconomic areas. Universal service and universal access policies are pursued in developed and developing countries respectively

The case of the provision of telecom services in India poses a suitable example in this case. The Indian Telegraph Act defined USO as the obligation to provide access to basic telegraph services to people in rural and remote areas at affordable and reasonable prices. With this objective, the USO Fund (USOF) came into effect on April 1, 2002. Contributions to USOF comes from the Universal Service Levy, which is presently 5 per cent of the adjusted gross revenue earned by all the operators except pure value added service providers. However, on January 9, 2004, the Indian Telegraph Act, 1885 was amended to provide the USOF "Statutory Non-Lapsable" status. Henceforth, the Fund is to be utilised exclusively for meeting USO and the balance amount credited to the Fund would not lapse at the end of the financial year. Credits to the Fund would be given after prior Parliamentary approvals. The Rules for administration of the Fund were notified on March 26, 2004. The Fund has identified one private and five public oriented telecom facilities in rural areas for financial support. The implementation of USO is through a multi-layered bidding process.

Thus, if the application of the telecom model of USO guidelines is replicated in the provision of bus transport services, it could prove successful.

Keeping this in mind, the study proposes the grant of USO in case of non-commercial routes. In order to make it a success, the study also proposes a methodology for the administration of the USO Fund.

#### **5.4.2.2 Administration of the USO**

We propose that the regulator should have the powers to:

- i. Formulate bidding procedures, including the terms and conditions for the purposes of USO implementation.
- ii. Evaluate the bids called for the purposes of implementation of USO. The bids would be evaluated on the basis of the subsidy amount asked by the operators from the authority and the lowest bidder wins the contract. It is necessary to elaborate this point so as to bring forth the evaluation step more clearly. The operator offers a bid in lieu of the expected capital expenditure (which includes cost and amortisation of the assets purchased by the operator, training and recruitment expenses etc.), operating expenditure (which includes repair and maintenance expenses and others) and estimated revenues. Keeping in mind the nature of this market, it is obvious that the costs exceeded the revenues and the difference comprises the subsidy which is asked for by the operator. The lowest subsidy bid wins the tender. In this case, the authority shall make payment to the operator.

It is also important to note that the lowest subsidy bid is proposed to earmark the ceiling for the entire tender period. This implies that the bid offered is the highest subsidy that should be paid to the operator and should be realised in the last year of the tenure. And starting from the first year, there would be a percentage increase in the amount of subsidy paid every year leading to the final (offered) subsidy amount. The terms and conditions in this regard should be precisely discussed between the authority and the operator at the time of the agreement.

- iii. Enter into Agreement with the Universal Service Provider (operator) for the purpose of implementation of USO
- iv. Settle the claim of Universal Service Provider after due verification and make disbursements accordingly from the Fund
- v. Specify relevant formats, procedures and records to be maintained and furnished by the Universal Service Provider
- vi. Monitor the performance of the Universal Service Provider as per the procedure specified by the operator from time to time

Financial support from the Fund can be provided to meet the Net Cost of providing the specified USO, as per the subsidy / amount procedure specified by the operator and the period for which such support will be provided. The period covered could vary between three and five years.

#### **5.4.2.4 State transport authority's responsibility**

Despite the STA granting the task of operating to the operator, it is left saddled with various other important tasks to be carried out.

1. It is suggested that the collection of reliable data on capital and operating expenditure incurred and revenue generated by the operator in the due course is an important task. This is essential for keeping a check on the operator as they might oversee important aspects in order to minimise costs and maximise revenues. Complete information about these parameters and others may be helpful so that the operator cannot cheat the authority and avoid necessary innovations and quality standards.
2. The above-mentioned task is a cumbersome process as it calls for elaborate data. Keeping in mind the number of regions, it may turn out to be an expensive and time-consuming task. Thus, to save time and effort, it is suggested that the regions be divided into clusters based on similar characteristics, and then data be collected from these

representative sample units. It is also suggested that the economic criteria be adopted for clustering the regions.

3. Data collected should be analysed on the basis of:

- Factors that influence costs and revenues in the base year
- Projected rate of change, year-on-year, of the base year cost and revenue figures

4. Apart from these, the authority should also oversee the consistent supply of the service at benchmarked quality and quantity standards

5. The authority should make constant efforts to reduce corruption and arbitrariness in the system

6. There should be a provision for an easy redress mechanism for the public / operator to resolve their grievances

In addition, it is also important for the authority to take care of certain issues while disseminating subsidies to the operator. These are:

- i. The recipient must actually have public service obligations to fulfil and these must be clearly defined
- ii. How the compensation is to be calculated must be established in advance in a transparent and objective way
- iii. Compensation cannot be greater than the costs to be covered, allowing for a reasonable profit
- iv. If tendering does not choose the undertaking, the level of compensation must be estimated on the basis of costs that a typical enterprise would incur

### **5.5 Award criteria**

The operator who has won the bid may be awarded the contract in the following three ways:

- i. Payment to/from operator for a given tariff
- ii. Lowest tariff

iii. Multi-criteria point formula

In the first criterion, the participating operators offer their respective bids after evaluation of the estimated costs (given fixed fares by authority) and expected (keeping in mind their market conditions) revenues. And, among the bids offered, the authority chooses the highest price/lowest subsidy bid. The contract is awarded keeping the nature of the market in mind. For instance, in the case of a commercial route / market, the contract is awarded to the party that offers the highest payment to the government. In the case of a non- commercial route / market, the contract is awarded to the operator who asks for the lowest subsidy.

In India, this criterion is suggested to be incorporated in the competitive tendering process.

In the second criterion, the bid may be awarded to either of the three:

- (a) To the one who has offered the lowest (cost/subsidy) bid.
  
- (b) To the one who has offered higher than the lowest subsidy bid. In this case, most of the time the reason given is that a higher award is made because of promises of enhanced quality, either extra off-peak/Sunday services or new vehicles. Since the Transport Authority monitors customer perceptions of bus service quality, it is presumably possible to gauge whether passengers actually appreciate such enhanced quality. For instance, in the London Tendering Process the lowest bidder was deemed to have failed a quality threshold in that Transport Authority did not believe that they would be able to sustain the service offered at the price quoted. Therefore in an attempt to avoid the winner's curse, the bid was offered to the party that had offered a higher bid than the lowest subsidy bid.
  
- (c) To the lowest bidder who would receive lower than the bid. This option has been adopted in London when many routes are tendered simultaneously and the option of tendering for package routes is also open. The auction format adopted in the London

Bus routes market is a variant of a combinatorial first price auction. Indeed, bidders submit bids on any number of routes and route packages. Thus, for instance, a bidder may submit a bid on a package without going for a bid on the individual routes included in the package. But, bidders are not allowed to bid more for a package than the sum of the stand-alone bids of that package. The auction format therefore implies that bidders are committed by their route bids. This means that stand-alone route bids define implicitly a package bid with value equal to the sum of the route bids. This rule was motivated by the regulator's wish to detect and exploit economies of scale and scope despite the fragmentation of the network. The auction system adopted in London is therefore an attempt to reach two contradictory objectives. On the one hand, the unbundling of the network is expected to encourage the participation of small bus operators, and consequently to foster competition. On the other hand, the possibility to bid for packages of routes is supposed to allow gains from coordination of synergies and sticking economies of scale and scope (CNI-Working paper, 2006).

But such an option is applicable only in those countries where the phenomenon of competitive tendering has been applied for several years. They have well-functioning input markets, and the majority of the operators have been present in the industry for a considerable length of time.

In the third criterion, the bid offered by the operator is inclusive of all the factors other than the cost/price element. That is, the operator has to include all the services clearly mentioned in the tender, including the fleet size, frequency, service standards, etc. Such a lucid tender process cannot be expected to apply in the Indian context since it is difficult for the new entrants to have such vast and diversified information.

## **5.6 Incentives and penalties**

The form of contract chosen, and the range of incentives and penalties incorporated in various types of contracts, could have a significant impact. For instance, incorrect or

inadequate contract specification may lead to unforeseen reductions in service quality. If the contract is not appropriately designed, contractor behaviour may not live up to expectations. One way to avoid these problems is that incentives and penalty clauses could be introduced into all types of contracts to secure a range of project objectives, including expediency and innovation. The operator may be granted an extension of the contract tenure as an incentive for good performance and those not performing well could be terminated from the next round of tendering. These and many other options could be sought to give a boost to the performance of the operator so that the objectives are achieved.

### **5.7 Types of bidding**

There are three basic options to bidding:

1. Negotiations
2. Sealed bids
3. Auctions

1. Negotiations in the tendering process imply the kind of flexibility in the process which permits negotiations between the authority and the operator with respect to the amount to be paid by the operator after the tender has been offered. Such an option is surely beneficial to avoid the “winner’s curse” effect, but tends to dilute the essence of the competition effect, as the bidder might not quote the actual amount he is willing to offer knowing that it could be negotiated. Thus, it is suggested that while laying down the tender specifications, it is important to be precise as regards allowing no re-negotiations.

2. **Sealed bids** option in the tendering process may be sought through inviting bids either through a single-stage tender process or through a multi-stage tender process. Under a single-stage process, or open tender, tendering is open to all. Letters inviting bids are sent to all the operators. Offers are expected to address the full range of

criteria and conditions specified in the tender documentation. This generally means tenderers need to provide a large amount of information, including design or performance characteristics, along with information on their financial and organisational capacity to satisfy contract requirements. While open tenders may maximise the number of potential contractors, they may impose significant cost burdens on tenderers and contracting agencies.

An alternative to the use of open tendering is the multi-stage tender process. It involves inviting bids from only those operators that have been shortlisted based on certain predetermined qualifications. It has the advantage of reducing the field of potential competitors in the initial stages of the process, leaving the agency with a manageable number of tenders to evaluate. Similarly, those with little chance of winning a contract are spared the costly and time-consuming process of preparing a full tender. On the other hand, operators successfully satisfying initial tender stages would be able to accurately assess the risks of winning the contract and factor this into their bid accordingly.

There are two ways in which sealed bids are invited:

- i. First Price Sealed Bid (FPSB): - the highest bidder wins and pays/receives the bid price
- ii. Second Price Sealed Bid (SPSB): - the highest bidder wins but pays/receives the amount bid by the second highest bidder.

**3. Auctions** are another option for inviting bids. These ‘Open Cry’ auctions are of two types:

- i. Starting low and with ascending bids (English auction),
- ii. Starting high and with descending bids. (Dutch auction)

In cases where the bidders are risk neutral (which would at least be approximately the case for small gross cost tenders) and have different valuations of the tender, all four bidding designs give the same results on average and English / SPSB are directly equivalent in strategies and outcome, as are Dutch / FPSB. In the case where bidders are

differentially risk averse, Dutch / FPSB auctions yield higher expected revenues (lower expected subsidy) to the tendering authority, but may not be efficient in that the bidder who would have won under risk neutrality (or equal risk aversion), that is, the most efficient bidder, may not win, giving rise to the problem of ‘winner’s curse’ (Toner, 2001).

Keeping in mind the above-mentioned options, the sealed bid option is suggested under which bids should be invited through the FPSB option and the bids shall not be open to negotiations.

### **5.8 Difficulties with tendering**

A number of writers have pointed out potential problems with a bidding process (Williamson, 1976). Some of these are listed below:

#### **5.8.1 Number of bids**

It is believed that as the number of bidders increases, the expected lowest price offer falls. Thus, it is good for the regulator to maximise the number of bidders for a given contract. Therefore, the essence of competition is enhanced with growing competition. However, there may be a situation where there is a collusion between bidders to up the price. This is a particular problem if there are few bidders but many contracts and the same bidders are competing with each other (for example, transport consultants bidding for work from DETR). This effect is reinforced by the fact that producing bids cost money and would therefore be built into the tender price. As, in this case, an increase in the number of bids reduces the chances of a particular firm winning, the expected returns from a bid are reduced unless the price is increased. It is therefore vital for the tendering authority to try to minimise the sunk costs for the bidders for taking part in the bidding process by providing as much relevant information as possible. The size of the tender may also have a bearing on the number of bids. For small tenders, almost any operator can bid, whereas small operators may be less inclined to bid for a tender which would require them to increase their scale of operation substantially.

### **5.8.2 The Winner's curse**

Another problem with bidding is the asymmetry of information, which exists between an incumbent and a potential entrant. An incumbent is likely to have better knowledge of cost and demand curves, which would deter others from competing. If a potential entrant bids more/ requires a lower subsidy, the chances would be that they have got it wrong and paid over the odds - the "winner's curse". The problem would be greater for a Net Subsidy Tender than for a Gross Cost Tender. Under the latter, it is primarily over-optimistic forecasts of vehicle speeds (and hence peak vehicle requirements) or labour costs which might lead to differences between operators. The solution is to conduct a SPSB auction, which reduces or eliminates the problem but is not cost-minimising/revenue-maximising. It is thus for the tendering authority to decide what to do. If ex-post renegotiations in the event of difficulties is a possibility, so that the winner be paid more subsidy than they bid up to the amount bid by the second-placed bidder, then perhaps a balance would be struck between avoiding the "winner's curse" and getting close to cost minimisation.

### **5.8.3 The choice between bids**

There is a real difficulty for the tendering authority in choosing between bids in cases where there is more than one dimension to consider, such as bidders offering a range of products (a network of bus services) or different price-quality combinations. In such cases, the value judgements of the decision-makers rule the market. Sometimes, this is overcome by requiring bidders to submit multiple proposals covering a number of tightly-specified price-quality combinations, as well as permitting the bidders to use their professional judgement to decide on an appropriate combination. This sort of menu auction also provides useful information that would be used by the authority if ex-post renegotiations become necessary. It is however not clear how the winning bid could be

identified. In transport, we can use our knowledge of the value of time to decide between (say) a low-cost bid offering low frequency service and a high-cost bid offering high frequency service. But what do we do with something such as reliability, where the empirical evidence is much less? Or when we have to weigh the gains and losses to different groups of consumers?

Even with simple bids, it is not always necessary in the long-term interests of the tendering authority to accept the highest price/lowest cost bid when the tender process is a repeated game. The long-term interests of the authority are best served by maintaining as large a number as possible of plausible competitors for tenders. Given the mobility of the capital employed, operators who lose a succession of tenders may well seek to serve other markets or, alternatively, sell the equipment for use elsewhere. Of course, the greater the value of the tender, the bigger the short-term efficiency gains in accepting the best bid.

#### **5.8.4 Specification, administration and monitoring of contracts**

What do we do if something goes wrong - especially if that “something” is outside the control of the successful bidder? For example, road congestion becomes unexpectedly worse, thus increasing the operator’s costs. Do we make the operator stick to the original price - in which case it might be worth their while defaulting - and the tendering authority has to go to the expense of starting the process again. It might be cheaper to renegotiate the contract with the original supplier. If this is known by the bidders *ex ante*, then they would tend to be overoptimistic revenues, costs, etc. So the process has to be viewed as a sequential game between authority and tenderer rather than a one-off. This imposes extra burdens and hence costs on the authority. There are further problems if the poor performance of the operator means it needs to be replaced, but supply has to be maintained in the interim. Moreover, the incentive to behave responsibly is increased by having many small tenders, since an operator knows that poor performance on one tender may lead to removal from others or disqualification from bidding for new tenders. A bond paid by the operator who is refundable on satisfactory completion of a contract may

also improve compliance. Finally, monitoring is an important function of the tendering authority. Under a gross cost regime, operators always have an incentive to supply less than the contracted amount of service, so the agreement needs to be enforced (Toner, 2001).

## **5.9.Suggested Policy Recommendations**

### **5.9.1. Model proposed: Public and Private Participation- Competitive Bidding and/or Franchising.**

The study proposes the, provision of passenger transport services through public and private participation. The entry of franchise is recommended to be regulated through competitive bidding for granting permits and assigning routes.

In addition, the nature of competition introduced should be that of controlled competition which calls for regular renewal rights of operation rather than free access to the market. In addition, a filter policy should be adopted. In other words, the minimum fleet size should be clearly specified in the contract. Competition may be thwarted by dummy operators in the alternative. Studies have shown that low fleet size results in high attrition rates and creation of “fly by night operators”. Thus, prescription of a minimum fleet size might be an efficiency-enhancing measure, as free access without filters is tantamount to anti-competitive practices.

In case of competitive tendering, sealed bids should be invited and the sealed bid option is suggested under which bids should be invited through First Price Sealed Bid FPSB. In this case, the highest bidder wins. In addition, the bids would not be open to negotiations. An award payment should be made to/received from the franchise depending upon the nature of the market.

## **5.9.2. Passenger Road Transport-Bus Market Division**

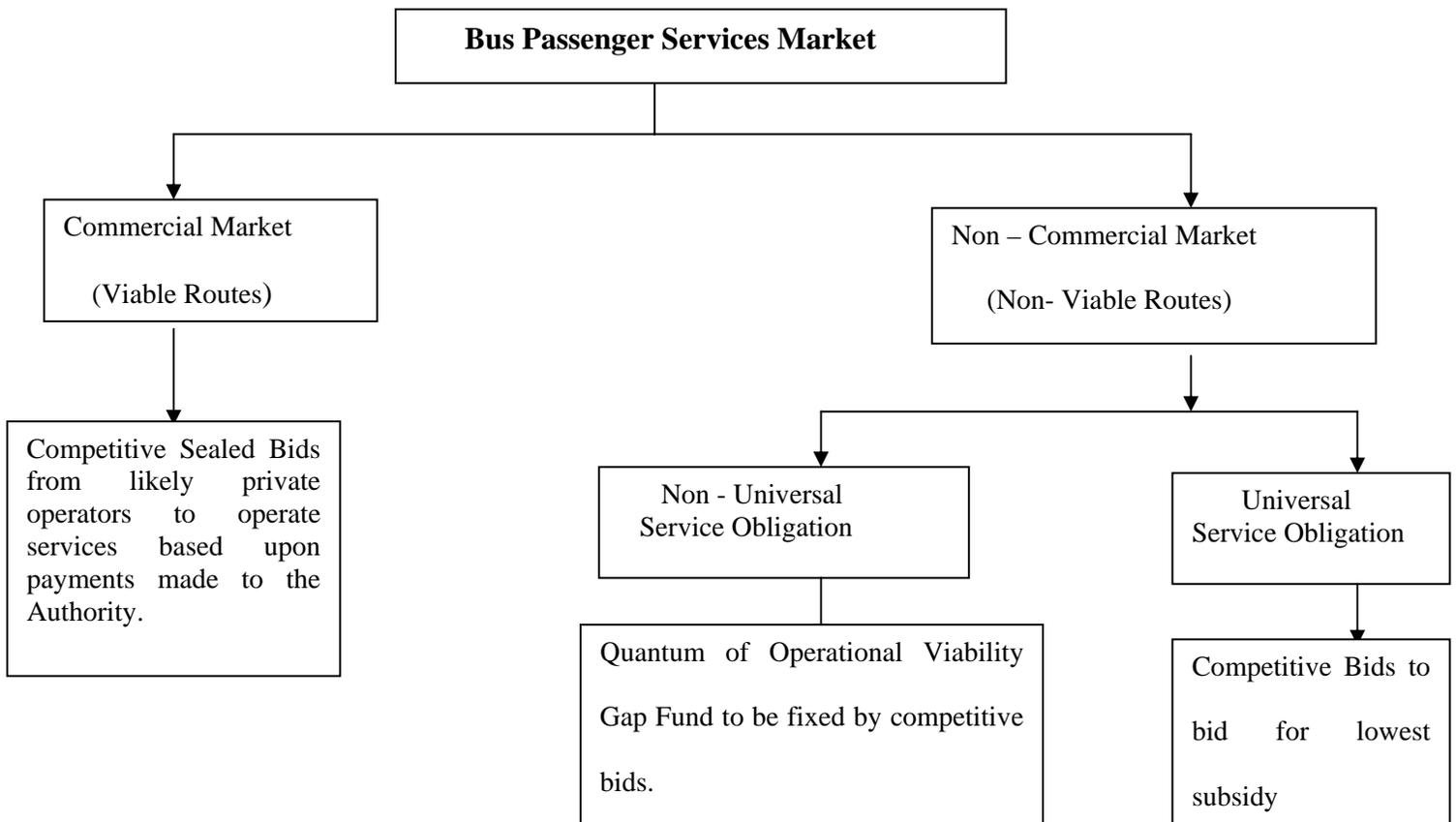
The bus market is divided into two segments:

- 1) Commercial route / market (which covers the profitable routes)
- 2) Non-commercial route / market (which covers the non-profitable routes)

### **5.9.2.1. Model for commercial route / market:**

The commercial market refers to the profit-making public transit routes. It mainly covers accessible, profitable, thickly populated areas in the periphery. For the operators the benefit of more routes and greater number of passengers makes this market quite desirable. Thus, the policy so designed should leave less responsibility on the franchise. What is proposed is that the private franchise should be given minimum or no support at all and the transport authority should collect the sealed bid payments.

**Figure 5.1: Proposed Model of Competitive Tendering for Passenger Road Transport**



### **5.9.2.2. Model for non-commercial route / market:**

Mainly non-profitable, remote, inaccessible areas fall in the ambit of a non-commercial market. Unreliable services, low vehicle numbers and vehicle diversity, as well as poor integration of services and planning, are the underlying characteristics of the kind of services provided in these areas. High rural transport costs and service gaps are responsible for this.

Thus, designing appropriate interventions requires an understanding of the mechanisms by which rural transport services are provided and used in the rural economy of developing countries. The problem of disinterest among the operators in the provision of these services in the non-commercial or non-profitable routes could be dealt with by adopting competitive subsidy bidding process in these areas.

Thus, services in this particular kind of market can be provided either through two ways:

**Non-Commercial- Non Viable but Basic Services-USO Operations:** This refers to adherence to USO norms. It ensures that basic services are available to all without any preclusion at affordable rates to all citizens across the country. The objective of this policy is to ensure safe, affordable, quick, comfortable, reliable and sustainable losses and lessen the difficulties to certain sections of the society, mainly poor.

It is proposed that the government should generate the USO fund which should be managed separately. The government should also contribute to the fund on a recurring basis each year. The USO Fund should be ring fenced, and not made part of the Consolidated Fund of India and the balance should not be credited to it. It should be the responsibility of the regulating authority to monitor the performance of the franchise in these markets so that transparency in operations is assured.

**Through Non-Commercial Services with Operational Viability Gap Funding:** This refers to adopting competitive bidding practices wherein the lowest subsidy bidder should be awarded the contract.

### **5.9.3. Role of regulator at Federal / State level:**

**5.9.3.1. Regulator at Federal level:** Transport is a state subject. But the Centre may monitor the state-level policies to facilitate the Competition Act, 2002.

### **5.9.3.2. Regulator at the State level:**

The main functions of the state regulator would be:

- Fare policy: the fares are recommended to be regularised by the regulating authority and not the operating authority, as the operator could abuse its dominant position by charging high tariffs or may also charge predatory prices to thwart competition.
- The regulating authority should be responsible for the application of the USO norms in the non-commercial markets so as to prevent preclusion.

- Tax restructuring policies: Private bus operators have to pay additional taxes, while their public counterparts are not liable for the same. As a result, there is a built-in disadvantage for the public operators. Moreover, the Value Added Tax has different rates with respect to the public-private services due to which the public operators might have an edge over the private operators as the former pay lower taxes.

Therefore, to give them a level playing field, the same taxation regime should apply to both public and private operators. In addition, private operators do not have access to public bus shelters whereas public operators do. As a result, they park illegally in residential colonies. Instead, a level playing field needs to be provided here. Equal treatment to all is certainly competition enhancing as it militates against the possibility of abuse of dominant position, thereby falling in the bracket of the Competition Act, 2002.

- The regulator should systematically plan and develop the bus service as a network of services and routes. This is essential in the face of the necessity of integration, Firstly,

of the bus services, and, secondly, of the bus service to all other modes of transport. It should be responsive to the constant changes brought about by the progress of technological innovation, land use development, social mobility and economic conditions.

- The regulator should protect the rights of the bus passengers. It should be responsive to the grievances of the passengers. It should have an efficient mechanism in place to investigate complaints made by passengers and take action against violations of rules and regulations by operators.

#### **5.9.4. Approach to improve Competition policies at State level**

**On the basis of the performance of three important indices, namely, Competitive Index, Efficiency Index and Consumer Satisfaction Index, it was analysed that the degree of competition in passenger road transport varies from state to state. For instance, according to the rankings of Competition Index, Rajasthan is highly competitive and Maharashtra is least competitive. In order to bring competition in all the states we have given different recommendations for different states. The approach is generic and can be adopted at the State level.**

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## Annex I: Principal Component Analysis

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The Principal Component Analysis is a multivariate choice method. This approach develops a composite index by defining a real valued function over the relevant variables objectively. Given a set of explanatory variables, if we have to select the most important variable or a limited number of variables from the set, Principal Component Analysis helps. The principle of this method lies in the fact that when different characteristics are observed about a set of events, the characteristic with more variation explains more of the variation in the dependent variable compared to a variable with lesser variation in it. Therefore, the issue is one of finding weights to be given to each of the concerned variables. Weight to be given to each of the variables is determined on the principle that the variation in the linear composite of these variables should be the maximum. Once the weight to be given to each of these variables is decided, we can focus on the important variables in order to reduce the noise in the data. A set of assumptions has been used in our method of construction of a composite index. These are:

- the condition of *weak pareto rule* demands that when a state registers values of indicators uniformly higher than those of the other - the former should have a higher ranking than the latter ones;
- the condition of *non-dictatorship* implies that no single indicator should be considered so significant as to determine the final ordering all by itself;
- the condition of *unrestricted domain* implies that the method should be capable of giving the final ranking for all possible data matrices;
- the final condition is that of *independence* from irrelevant alternatives, which demands that while ranking two , the decision must be guided by the values of the indicators for these units under study alone and not by any other irrelevant phenomenon

Given these general assumptions, the composite index is defined as,

$$C_i = W_1x_{i1} + W_2x_{i2} + W_3x_{i3} + \dots + W_nx_{in}$$

or,  $C_i = \sum W_j x_{ij}$ ,

where  $C_i$  is the composite index for the  $i^{\text{th}}$  observation,  $W_j$  is the weight assigned to  $j^{\text{th}}$  indicator and  $x_{ij}$  is the observation value after elimination of the scale bias.

It is evident from the above formula that to compute the composite index two major components are to be known, i.e., the weights assigned to the indicators and the observation values after elimination of the scale bias for the available indicators. These two have been discussed below in detail.

**Elimination of scale bias**

Variables chosen for any analysis are usually measured in different units and are generally not additive. Hence, it is necessary to convert them in some standard comparable units such that the initial scale chosen for measuring them do not bias the results. The method adopted to standardise the variable is

$$x_{ij} = (X_{ij} - X_m) / \sigma$$

where,  $x_{ij}$  is the scale free observation,  $X_{ij}$  is the original observation and  $X_m$  is the mean of the series and  $\sigma$  is the standard deviation.

The transformed series now would be scale free and would have a mean of zero and a standard deviation of unity.

**Assigning weights objectively using Factor Analytic Model**

Once the bias of measurement is removed from the observations, the crucial problem that remains is that of assigning appropriate weights to the selected indicators. If one has sufficient insight into the nature and magnitude of inter-relationships among the variables and their implications, one might choose to determine the weights on the basis of independent judgement. This way of constructing an index stands exposed to subjectivity.

Assigning equal weight (or no weight) would imply assumption of equal correlation of each indicator with the composite index of importance which would hardly be a realistic approach in this case. Therefore, in this analysis, the weights for individual indicators have been assigned on the basis of the factor analytic model.

Factor Analysis or Principal Component Analysis is a tool used to construct a composite index in such a way that the weights given maximise the sum of the squares of correlation (of the indicators with the composite index). The application of Factor Analysis in this specific case has been accepted in 'objective ranking' of the regions. This method enables one to determine a vector known as the first Principal Component or Factor, which is linearly dependent on the variables, having the maximum sum of squared correlation with the variables.

The weights given to the indicators are chosen in such a way so that the Principal Components satisfy two conditions:

- a). The number of Principal Components are equal to the number of indicators and are uncorrelated or orthogonal in nature.
- b). The first Principal Component or  $P_1$  absorbs or accounts for the maximum possible proportion of variation in the set of the indicators. This is the reason why it serves as the ideal measure of composite index.

## Method

**Step 1** We start by taking the simple correlation coefficients of the  $k$  numbers of indicators. These correlation coefficients may be arranged in a table, which is called the correlation table. The elements of the diagonal would be unity as they are the self-correlated, i.e., the correlation of each  $X_i$  with itself ( $r_{xi \ xi} = 1$  for all the  $i$ 's). The correlation matrix is symmetrical, i.e., the elements of each row are identical to the elements of the corresponding columns, since

$$r_{xi \ xj} = r_{xj \ xi}.$$

**Correlation Table of the set of K Variables**

	$X_1$	$X_2$	$X_3$	$X_k$	$\sum_i^k r_{xi xj}$
$X_1$	$r_{x1 x1}$	$r_{x1 x2}$	..	$r_{x1 xk}$	$\sum_i^k r_{x1 xi}$
$X_2$	$r_{x2 x1}$	$r_{x2 x2}$	..	$r_{x2 xk}$	
“	..	..	..	..	
“	..	..	..	..	
$X_k$	..	..	..	..	
“	$r_{xk x1}$	..	..	$r_{xk xk}$	
$\sum_i^k r_{x1 xj}$	$\sum_i^k r_{xi x1}$	$\sum_i^k r_{xi x2}$	$\sum_i^k r_{xi x3}$	$\sum_i^k r_{xi xk}$	$\sum_i^k \sum_i^k r_{xi xj}$

**Step 2** Sum of each column (or row) of the correlation table is computed, obtaining  $k$  number of sums of simple correlation coefficient.

$$\sum_i^k r_{xi xj} = \sum_i^k r_{xi xj}$$

**Step 3** We compute the sum total of the column (or row) sums-

$$\sum_i^k \sum_j^k r_{xi xj}$$

and we take its square roots.

**Step 4** Finally, we obtain the factor loadings for the first Principal Component  $P_1$  by dividing each column (or row) sum by the square root of the grand total.

$$a_{ij} = (\sum_i^k r_{xi xj}) / (\sqrt{\sum_i^k \sum_i^k r_{xi xj}})$$

It should be clear that the loadings thus obtained are the correlation coefficients of the respective indicator with the composite index.

**Step 5** The  $P_1$  or the first Principal Component is constructed in the following way

$$P_1 = a_{11} x_1 + a_{12} x_2 + \dots + a_{1k} x_k$$

**Step 6** The sum of the squares of the loading of the Principal Component is called the latent root (or Eigen Value) of this component and are denoted by the Greek letter  $l$  with the subscript of the Principal Component to which it refers. For example, the latent root of the first Principal Component  $P_1$  is

$$\begin{aligned} l_1 &= [\text{latent root of } P_1] \\ &= \sum_i^k I_{1i}^2 \\ &= I_{11}^2 + I_{12}^2 + \dots + I_{1k}^2 \end{aligned}$$

The sum of the latent root of all the Principal Components would be equal to the number of indicators:

$$\sum_i^k l_i = k$$

The importance of the latent root or the eigen value lies in the fact that it expresses the percentage of variation in the set of indicators the Principal Component explains. If for example,  $l_1 = 2.797$  and the number of variables are 8, then the  $P_1$  expresses -

$$l_1 / k = (2.797/8)*100 = 35 \% \text{ of the variations of the set of 8 variables.}$$

Tests of significance of the loadings: the loadings in our study have been tested based on the levels of significance of the Pearson Correlation coefficients.

### **Multi-Stage Principal Component Analysis**

In this particular exercise, we have attempted a method of normal or single stage Principal Component Analysis as well as the multi-stage Principal Component Analysis. For performing the single stage Principal Component Analysis, all the indicators are taken together and the procedure discussed above is followed. In case of multi-stage Principal Component Analysis selected variables are divided into well-defined sub-groups depending on the nature of the indicators. Within a sub-group, they have a high degree of inter-correlation, while the canonical correlation between pairs of sub-groups is low on an average. The Principal Component Analysis has then been applied to each of these sub-groups of variables. The first Principal Components obtained from different sub-groups have been treated as a set of new variables and combined at a second stage to

obtain the Final Composite Index. It has been argued that this method overcomes the necessity of taking more than one Principal Component in the analysis, since the correlation among the variables in a subgroup are generally high and consequently, the first Principal Component explains an 'adequate' proportion of the variation in the data matrix. However, the results are almost similar in both the procedure followed in this study which are discussed in the section where the results are analysed.