CHAPTER – II

REVIEW OF LITERATURE ON URBAN TRANSPORT AND MANAGEMENT
CHAPTER II

REVIEW OF LITERATURE ON URBAN TRANSPORT AND MANAGEMENT

2.1 INTRODUCTION

2.2 ISSUES COVERED IN URBAN TRANSPORT AND MANAGEMENT

2.3 REVIEW OF BOOKS ON URBAN TRANSPORT

2.4 RESEARCH ARTICLES

2.5 RESEARCH LITERATURE
CHAPTER II
REVIEW OF LITERATURE ON URBAN TRANSPORT AND
MANAGEMENT

2.1 INTRODUCTION:

The purpose of this chapter is to review the literature on Urban Transport and Management available in different books, research papers and articles as well as in different doctoral research theses which are useful in further studies.

2.2 ISSUES COVERED IN THE URBAN TRANSPORT AND MANAGEMENT

The different issues covered in the urban transport system and management are:

- Financial performance
- Physical performance
- Commuters’ satisfaction
- Quality of service
- Productivity of Resources
- Promotion of Economy
- Safeguard of Environment
- Enhancement of image of the city
- Route network system
- Infrastructure
- Depots, workshop, terminals etc.
- Social burden
- Operating Environment
- Nature of traffic and traffic congestion
- Waste of energy
- Role and importance of Public Transport

2.3 REVIEW OF BOOKS ON URBAN TRANSPORT

2.3.1 M.K. Agarwal in his book ‘Urban Transportation in India’ published in 1996, discussed different issues and problems related to urban transportation in India and solutions of them. According to him, growing economies like India are not able to respond effectively to the need and urge for mobility. For instance, while the growing population of motor
vehicles, rising volumes of passengers and freight traffic, heavier axle loads and the inescapable need for better roads, uninterrupted movement and high-speed facilities would require massive infusion of funds, in reality, the plan out-lays for the transport sector in India are progressively declining over successive five year plans. This is despite the fact that road transport in India is among the most highly taxed in the world and earns sizable revenue for the exchanger through different forms. As against earnings, the expenditure on roads and road transport is currently around 30 to 35% whereas in some advanced countries the expenditure varies between 69 and 95% (and in some cases even more) of the revenue from roads. He also pointed out that, in most of the cities the dominant system is road based which caters the bulk of transport demand. The availability of buses is quite low (about 0-25 per cent per 1000 population against 1 to 2 in advanced countries) and their operation and management, far from elegant. As a result the public transport users have to face many inconveniences in satisfying their travel needs. In some developed and developing countries many versions of bus transit (like urban bus trolley bus, guided bus) are available, but in Indian cities the buses generally comprise of standard buses or the mini buses. In general, standard bus operations are managed by public sector agencies and mini buses are privately owned and operated. The public sector bus undertakings are generally in the red, partly due to non-professional management and partly due to social obligations. Various measures (e.g. bus lanes, bus ways priority to bus transit, rational fare structure with compensation for social losses, deregulation, optimization of schedule and routes) to improve the productivity of bus transport have been tried in many cities of the world and these measures need to be instituted to store the health of sick public bus transit undertaking. Further he stated that, parking problem is one of the concomitant problems of urban transportation. This problem is multiplying due to increased density of
population, increased vehicles ownership levels and performance of vehicle owners to park vehicles as close to their destination as possible. Kerb side parking, loading and unloading of goods on carriageway are the common features most conspicuous in different city areas. Off-street parking lots are a rarity and if available, are poorly utilized. Road side parking is a major cause of a large number of accidents. That is why there is an urgent need for evolving comprehensive parking policies for different sizes of cities and for various uses so as to design and develop appropriate parking facilities.

He also discussed the funds problem. Urban Transport requires funds for capital investment for creation of new facilities or the augmentation of existing ones; timely renewal and replacement of assets, operation and maintenance and also to cover working losses. The author has suggested different ways to mobilize the funds like- Tax on all beneficiaries, Transport development levy on all properties, property betterment levy, levy on business establishments, levies on owners of private automobiles and goods carriers, parking and congestion charges. He also advocated that setting up of companies with legal backing for urban transport development could also be thought of who could devise appropriate measures such as floating of bonds, arranging loan from banks and private institutions etc, and channelising the investible funds of Bank, UTI, IDBI, ICICI & Pension Fund. He also suggested to attract private finance through the principle of Build Operate and Transfer (BOT).

He stated that over crowding and congestion is also major problem. This can be solved through various low cost, intermediate costs, high cost and sophisticated solutions. The low cost solution would imply traffic demand management measures, traffic restrain and traffic re-circulation measures. The intermediate cost/high cost solutions include engineering measures, such as widening and up gradation of roads, improvement of intersections, construction of bypasses, construction of Flyovers, construction of bus
stops/terminals, taxi stands, parking facilities, construction of urban freeways, improvement of existing transit system by fleet augmentation, and upgradation of public transport and bus operation management system etc. The other high cost solutions include construction of bus-ways and introduction of high speed tramways and low level LRT. The sophisticated solutions could mean high level LRT rapid rail transport system and metros. According to him the problems related to urban transport can be solved through proper land use and town planning. Author has discussed the pollution problem specialty noise and air pollution. It can be reduced by improving design and maintenance of motor vehicles, better up-keep of roads, traffic discipline re-routing commercial vehicles, ‘no horn’ zones, ban on percussion horns, synchronization of signals etc. Step to curtail air pollution include: reducing usage of private vehicles particularly two stroke engine vehicles by encouraging public transport, reducing the pollution at source by improved vehicle design, shifting sites of stone crushing and hot mix plant etc. Further, he also throws light on enhancing road safety; such as road safety education and safety campaigns, drivers training and testing merit-based licensing system, regular vehicle inspection, better enforcement of traffic rules and regulations and provision of motor vehicle Act-1988 (Particularly in respect of speed overload, protrusion or spillage of goods, alcoholic driving, head and rear lights) identification of correction of black spots, conspicuous road signage and route marking, police patrolling, prompt attention to accident victims and removal of block ages, mandatory safety audit for road projects. Indense CBDs intelligent highway technology, of which many versions are available, can be used.

The problem of consumption of oil and energy is also explained in detail. He pointed out various measures to conserve oil and save energy, such as improvement in vehicle technology with fuel efficient engines,
institutions of traffic management measures and non-transport solutions such as staggering of working hours and improved telecommunication services to curtail non-essential travel.

At the end, he remarked that efficient urban transport means efficient cities and efficient cities means efficient economies.

2.3.2 A Book of Readings entitled Urban Transport published by CIRT, Pune

This is a compilation of selected, published papers of distinguished authors in the recent past in the Indian Journal of Transport Management. The book deals with various topics of urban transport in India such as, traffic congestion and delays, road accidents, pollution, management of urban infrastructure, energy etc. The very first research article is of N. Ranganathan entitled “India’s Urban Transport Scenario – 2021 Issue and Perspectives”. In this article N. Ranganathan pointed out that, urban transport is an important sector in the sustainable development of urban areas. Inadequate urban transport leads to a number of problems. First is congestion and delays. Due to increased vehicular traffic on limited and almost stagnant road capacity. The volume capacity ratio is over one at many locations. The speeds are continuously decreasing to level as low as 5-10 kmph in central area. This lead to increased time of travel resulting in loss of productive man-hour.

Second problem is Accidents: India has the dubious distinction of having one of the highest incidences of road accidents. There were nearly three lakh road accidents with more than 60000 fatalities in 1993 urban areas contributed to a major share of these accidents. The number of
accidents in 12 metropolitan cities, in the year 1993 were 45653 with 5197 fatalities. This is a major social concern and economic loss.

Third problem he has stated is that of pollution in cities due to traffic is assuming alarming proportions. The central pollution control board had, in 1988-89, estimated the air pollution levels due to traffic in 12 metropolitan cities. The estimated vehicular emission load as on Mar. 87, ranged from 47.80 tones per day (Nagpur) to 871.92 tones per day (Delhi). Of the estimated total pollution load of 2998 tones per day, carbon monoxide accounted for a major share of nearly 70% followed by Hydrocarbons (22.5%), Nitrogen Oxides (11.75%), sulphur dioxide (0.82%) suspended particulate matter (0.98%).

The forth problem is resources consumption like use of land, energy and capital etc. Nearly 15 to 20% of urban developed land is under transport use but with no satisfactory level of service. Vehicular parking seems to be encroaching on all available urban land dominating urban landscape.

Energy: “Transport accounts for nearly one third of the commercial energy consumed in country within the transport sector, oil based energy is the most pre dominant accounting for nearly 60% of the total energy consumed. ‘Urban transport’ is estimated to account for a share of 20% of energy consumed by the Transport Sector”.

Capital: Large investments are being made in urban transport system development operation and use. Urban households spend nearly 10 per cent of their income on travel.
**Time:** With congestion and delays on one hand and increasing trip lengths on the other, time of travel is increasing. Most of the travel is made during the most productive hours of day. As travel is only a derived demand, time spent on it is a great loss.

Further he pointed out the low productivity of resources. Due to poor urban transport system the productivity of resources in all sectors of economy is adversely affected. Even within this sector the productivity of its component parts like trucks, buses, private vehicles etc. is adversely affected resulting in a vicious circle of lower and lower capacity leading to higher and higher demand for resources. The vehicle utilization of public transport buses in urban area is as low as of 160 to 180 km. (except in a few cities like Bombay and Madras)

He has discussed the problem of inequity of access and stated that the public transport service, developed mostly by public expenditure, needs to provide equity of access to all people, to all locations and at all times. In practice it is not so. A large number of people, disadvantaged in one way or the other, do not have easy access to transport service. Larger areas of the urban centers, particularly the peripheral and fringe areas, have very poor transport service. Paradoxically, a large percentage of low income people live in these peripheral and fringe areas. Their access to opportunities-economic, educational, health, recreational etc gets limited.

The author has pointed out that the Urban Transport Planning Process in India is criticized for many reasons like

- It is static in nature
- There is no true integration between land use and transport
- It is more sequential than interactive
• It is carried out by individual cities without reference to a national or a regional (State) policy
• It is more visionary than pragmatic
• It is not linked to resource availability and institutional limitations
• It is not continuous, comprehensive and co-ordinate
• It suffers from bottle neck fixation and technology fixation.
• More efforts and resources are spent in data collection but that data and information is not accessible to others interested and becomes obsolete or lost.
• It is more concerned with developing high cost systems like metros and neglects the potentials of low cost system like bus.
• It completely neglects the rate potentials and needs of intermediate public transport system.
• Strategies like demand management, pricing etc are not examined.
• It is more concerned with hardware building, and does not analyze transport service options.
• It neglects issues of equity.
• It limits itself to long term objective and neglects short term problems and needs.
• It is overly concerned with passenger movement demands and needs and neglects those of goods and services.
• The transports models though appear to be sophisticated are limited in sensitivity and suspect in accuracy.
• It takes too long time and consumes large resources.

Second research article is of Taranjeet Singh Chopra entitled “Emerging Transportation Scenario in Delhi”. In this article, the author has discussed different aspects and problems of DTC. Firstly he pointed out that there has been a massive induction of personalized vehicles in all urban
areas in the country. Delhi however, absorbed more number of automobiles than Mumbai, Calcutta and Madras put together. As a result of this the congestion on roads is increasing not so much on account of the increase in number of buses but more due to the increase in other motorized vehicles. The tremendous increase in the number of motor vehicles has seriously affected the traffic conditions in different parts of the city in several ways including parking. He also mentioned that a large scale of parking vehicles on road has not only reduced traffic capacity of existing roads but also has created safety problems as well. The traffic management plays an important role in ensuring optimum utilization of Urban Bus Transportation. The optimization of speed of buses help in not only lowering the operational costs but carrying capacity of the system is also maximized. An increase in congestion and lowering of speeds seriously affects the regularity of bus services as the schedules prepared for operation of buses are difficult to maintain. It also results in more wear and tears for the buses, higher fuel consumption etc.

The author has stated that Delhi was the first city in India to adopt privatization of bus services in a big way. When the private operators were associated with city services along with DTC buses, it was also consciously decided that each route would be run by both private as well as DTC buses. Simultaneously, neither traffic planning structures nor infrastructure facilities were created to manage the schemes likewise enforcement structures were also not strengthened i.e. no provision was made for private bus operations to be watched by time-keepers and route inspectors etc. The experience has shown that the above mentioned policy lacunae contributed significantly to the in-discipline in city bus services in Delhi.

He also pointed out why there is a general feeling that a private operated bus is more economical than a DTC operated bus. A private operator will operate his bus only till such time when he gets some return
out of his investment. As soon as the private operated bus becomes un-
remunerative or the margin of profit is reduced below his expectation, the
private operator will withdraw his buses irrespective of emergency or the
need of the public. However, DTC has to operate its services irrespective of
the financial constrains largely in social interest. Apart from this DTC has
to make provision for infrastructural facilities like depots, workshops,
terminals, Queue shelters etc with investment on land, building and
manpower and also for observance of various labour laws resulting into
higher cost of manpower. The private operators on the other hand park their
buses on streets and there is no parallel investment as such and the staff
engaged by them work for extended hours on meager salaries.

The author also mentioned in this article that privatization would not
release the pressure on the Government to allocate the capital resources for
DTC. According to him, in most cases a single bus operator provides small
proportion of the capital and major capital need is met by borrowing from
the Nationalized Banks and financial institutions. Thus, it is the private
ownership which is predominantly supported by public funds through
public financial agencies.

It is a sad commentary on the existing state of affairs that the many
advantages of nationalized bus services being provided by DTC are
ignored. The socio economic advantages extended by the corporation’s
services far outweigh the case of privatization. DTC is too crucial a public
utility to be left in the hands of the private operators for their narrow selfish
commercial objectives. He advocated that the Government continues to be
the owner of the organization, it needs to be sorted out as to what sort of
relationship there should be between the Government and the management.
Commercialization of DTC will imply that it must enjoy more powers in its
pricing, investment and operational matters. Another related issue with
regard to commercialization of DTC would entail fixing responsibility for
the cost of social obligations carried by it in the form of various concessional passes, provision of un-economic services, provision of special services like U-specials, office goers specials etc. Such social obligations would need to be quantified and the issue with regard to pricing/subsidy resolved thereof.

He also recommended that public transport should attract car users and other personalized and hired mode of transport, by giving amenities in the form of bus terminals, queue shelters and suitable information system like display of route maps, time table etc.

2.4 RESEARCH ARTICLES:

2.4.1 Mohinder Singh’s – paper titled “Traffic Crisis in Big Cities Causes and Cures.” In this paper author firstly points out that the traffic in big cities is in a mess; the bigger a city, the greater the mess. A large city that way is mechanically different from a small city as a buffalo is mechanically different from a sheep. The buffalo may be only twice as tall and long as a sheep but twenty times as heavy. He also mentioned that people of every metropolis are dissatisfied with their city transport system, often to the point of public protest. According to the author following are some traffic congestion causes.

- Private autos
- Modern business and living styles
- Vast amounts of goods are needed to service a relatively high consumption urban populace
- Faulty city planning
- Bad or inconsiderable driving
- Unsatisfactory or inadequate public transport
Further, the author has also suggested the measures to overcome the problem of traffic congestion.

- Better city planning
- Wider and faster roads
- More parking spaces, efficient traffic control
- More buses and trains & underground railways
- Efficient system of levying parking charges
- Controlling entry of car into central areas at peak traffic hours

2.4.2. Omprakash Agarwal’s paper titled “Resolving Urban Gridlock.”
According to him, long term vision coupled with short term and medium term measures are necessary if the problems of urban air quality, congestion and energy security have to be resolved.

The author discussed the following causes of urban gridlock.

- Failure of urban transport planning
- Failure to foresee the needed investments in urban transport system
- Increasing land prices in city centers forces people to look at suburbs for residential purposes.
- Increased personalized transport.

Further, author suggested a frame work for mitigating the problem. He has pointed out that each urban area has its own unique demographic and spatial characteristics. As such, mitigation methods will be different for each of them. It is therefore, necessary to first study the traffic and transportation characteristics of each city and then evolve a long term
strategic plan. Such a long term plan must also spell out the medium and short term goals to be achieved as intermediate steps towards the long term objective. He also mentioned that transport planners also recognize that there are both engineering solutions and economic solutions. Engineering solutions aim at providing the necessary capacity to meet the demand, whereas economic solutions aim at reducing demand through a more complete recovery of the costs borne by society. These include the cost of various externalities such as increased pollution, reduced speed, etc. Pricing strategies, however, have to keep in view the essential nature of the service for the poorer sections of society, though proper targeting of any indirect subsidies will help in reducing the total cost of society.

The long term vision:

The first task should be to develop a long term vision for each city. This vision should be integrated urban transport and land use planning in such a manner that travel needs are minimized and better accessibility to public transport becomes possible. Business and residential areas that are well interspersed entail shorter trip lengths as compared to an urban form that has a single business district surrounded by a sprawling residential suburb. High density commercial area and residential areas, around public transit stations improve access to public transit and are attractive to a commuter. Small self-contained, clusters are desirable in mega-cities from a transport perspective as people tend to move to residences that are closer to their place of work or seek work closer to home. A cluster approach also makes it easier to provide better public transport coverage, as connecting cluster centers are often adequate to meet the public transport needs. Short, intra-cluster trips can usually be accomplished by walking, cycling or Para-transit.
Medium term goals:
The main goal for the medium term is to improve the public transport system and phase in cleaner technologies.

Improvements in public transport should aim at:
Increasing capacity and coverage:
   Higher capacity and wider coverage make public transport more accessible to people. These can be achieved by deploying more vehicles and by adding more routes. In either case, it means additional investments, though not of a very high order.

Improving service quality:
Image of public transport system is closely related with service quality. Improved service quality makes public transport attractive and draws people away from personal vehicles. He mentioned that public transit providers do not give adequate attention to passenger reaction towards service quality. Frequency of service, operating time, route structure, punctuality, reliability, safety, cleanliness, level of crowding, network connectivity, ease of interchange etc. are important determinants of service quality and have to be kept in mind to attract greater ridership. Providing good “Park and Ride” facilities at bus/metro stations, convenient ticketing facilities, easy interchange from one mode to the other and good feeder services will go a long way in improving patronage. Scientifically planned route structure and schedules will make travel by public transport more acceptable improving cost recovery.

It is a common belief that public bus systems are essential services for poorer sections of society and so have to be priced low. But author has suggested that public transport agencies should not operate only one kind of service. Public transport should go for a host of premium services like
expensive services, sitting only services; air-conditioned services etc. can be operated at higher prices. These premium services draw the middle income group away from two wheelers and three wheelers, thereby reducing both the number of vehicles as well as the heterogeneity in city traffic. This reduces congestion. Reduction in the number of two stroke vehicles also helps to reduce pollution.

Choosing the right technology:

In this case he has pointed out that there is a virtual continuum of public transportation technologies ranging from low capacity traditional bus system, operating on a shared right of way, to very high capacity, underground, rapid rail system. Each of these technologies has its own characteristics in terms of capacity, speed, capital cost, operating cost, requirement of urban space and impact on the environment. Each has its own suitability for given demand pattern and urban forms.

While bus system have a lower capacity and are better suited to meet the demand of a more dispersed urban form, rapid rail systems are better suited for high demand linear corridors. Bus systems offer a lot of operational flexibility whereas rail system can operate only on fixed rails. Bus systems need far lower capital investments compared to rail systems, but may have higher per unit operating costs. Recent innovations in bus system, with articulated buses operating on dedicated lanes, have demonstrated the ability to match light rail system in their passenger carrying capacity, and at a much lower capital cost.

A choice of technologies, thus, depends on the nature of the demand, the urban form and the capital investment possible.

Phasing in clean technologies: One of the objectives in the medium term should be the phasing in of less polluting technologies, either through cleaner fuels or better designed engines. Some cleaner fuels like Compressed Natural Gas (CNG) and EV technology.
Short term measures:

Some of the short-term options for mitigating the problems of urban gridlock are as follows:

- Improving capacity utilization through short-run investment.
- Restricting the use of vehicles.
- Fiscal measurements to discourage vehicle use.
- Encouraging non-motorized modes.
- Institutional Arrangements.

2.4.3 Tripta Goel’s- Paper entitled “Urban Bus Transit System in Delhi- an assessment of the quality of service”.

In this paper the author presents a comparative study of assessment of the quality of service provided by private and public bus transport in Delhi.

The author has chosen following nineteen travel attributes for comparison.

1. Frequency on weekdays
2. Frequency on Evenings
3. Frequency on Saturdays
4. Frequency on Sundays
5. Destination choice
6. Journey time in bus
7. Punctuality
8. Dependability
9. Ease of travel
10. Crew help


15. Ease of boarding and alighting 16. Safety of passengers

17. Route information 18. Time table information

19. Stop information

The survey revealed that:

- Private buses are better than public buses in respect of service accessibility and reliability.
- Public buses have been rated better than private buses on safety service, information, comfort, convenience and journey time.

Based upon the study, the author suggested that:

- The frequency of public buses should be improved especially of private buses.
- Safety of the passengers should be increased.
- Passenger information system may be upgraded, to suit the needs of the commuters.

The author has also stated that it is necessary to conduct periodical surveys to study the bus transport system in order to get the feedback from public for further improvement of the services.
2.4.4 G. Somayajulu. “Customer Value Management- A key to Success in Public Transport Services”.

This article provides a framework for the STUs in order to create superior customer value through customer value management which would eventually form the under pinning of all successful marketing strategies in future.

The author has pointed out that the Deregulation and increased competition are reshaping the Indian passenger transport services industry and lowering the traditional barriers to entry. Deregulation is lifting the old restrictions on the kinds of services private transport operators can offer and the area where they can offer them. Existing players with decades of experience are becoming irrelevant and upstart competitors with very little capital and innovative customer centric approach are snatching away years of hard-earned market share. Established players who could decide what, where and how much of their service have been their power, suddenly shifting into the hands of the customer. Now public transport operators are forced to reinsert their culture structure and service offering to match the strategic challenges and opportunities presented by the new economic scenario. Organization that won’t be able to redefine themselves will most likely vanish and the human cost of that is unforeseeable.

The author has pointed out that many of the studies have emphasized the importance of service quality and customer orientation, but a discussion on the basic components of what constitutes customer value that ultimately determines the customer satisfaction and loyalty has not been reported in the literature. The perceived cost of availing the transport services by the passengers have not been studied. He stated that value is customer’s perception of the balance between the quality of goods and services that a firm provides and its price.
Qualitatively components of value comprise of:

- Benefits, the customer idea of how much benefit he/she is going to derive from product or service and
- Cost the total amount of resources expended by the customer to acquire a product or service.

The value of a customer need is the benefits minus the cost i.e.

\[
\text{Value} = \text{Benefit} - \text{Cost}.
\]

If the value is positive, customers are satisfied and if the value is negative, the customer will be dissatisfied. Basically, customers should get more than what they give. Value is defined by the customer end-goals and customer trade-offs benefits vs. price.

A simple procedure for calculating value is as follows:

- Get customer’s perceptions of the relative importance of product benefits.
- Get benchmarking figures for business and for competition.
- If the business outperforms a competitor it receives a portion of the importance allocated to that benefit.
- The overall relative advantages/benefits are calculated by averaging the importance and these are then compared with the relative costs of using the service to compute its relative performance.

There are four basic options to increase value:

- Increase benefit and maintain cost.
- Maintain benefits and reduce cost.
- Increase benefits and reduce cost.
- Increase benefit more than increase in cost.

The author throws the light on the sources of benefits and sources of cost.

**Sources of Benefits:**
The firm’s role in value creation is to provide consumer benefits by enhancing product features (product benefits and service benefits) and providing brand/company benefits. Factors affecting passengers’ perceptions of benefits include:

- Functional factors such as price, quality and product features.
  The features most preferred by customers of transport services include punctuality, safety, reliability, regularity and customer service.
- Intangible factors as emotional associations with product and social and ethical reasons (environment friendly brands).

Benefits can be encapsulated in a simple equation given below-

\[
\text{Benefit} = \text{Product benefits} + \text{Service benefits} + \text{Brand/Company benefits.}
\]

**Sources of cost:**
The cost of using a service has two components i.e. monetary and non monetary costs. In identifying the costs that customers pay to acquire a service the no monetary component of cost should also be given due importance. Demand for a service is not just a function of monetary price
alone but is influenced by no monetary costs such as time cost, search cost, convenience costs, psychic costs etc.

Author has also pointed out the importance of customer value management- According to him the passenger transport sector witnessed explosion after deregulation an explosion that has shaken the very foundation of many STUs. Yet while these momentous changes have turned the whole industry topsy-turvy, one fundamental truth remained unchanged: the need to create a compelling value proposition, which will earn lasting customer loyalty. The importance of establishing a strong value proposition is substantiated by looking at the current high cost of acquiring customers in any sector. This acquisition cost is an investment, which earns a return only if the customer return-placing critical importance in developing a strong value proposition. It is quite clear that the perception of value created by the service provider can be the difference that keeps customers coming back and telling others about it. On the flip side, a poor perception can be disastrous to the organization-disgruntled customers relate their experiences to more people than satisfied customer do about their experiences.

Prosperity of an organization depends upon its ability to create value for various stakeholders, by offering products and services that meet the stated and latent needs of the users in the highly competitive and rapidly changing but interdependent market place. The author has concluded that customer value management can help STUs rebound and restore them to their former pre-eminent position.9
2.4.5 A.V Sardesai’s paper titled “Productivity Improvement and Cost Reduction at Depot and Workshop Levels”.

The author suggests some technological advances for improving the productivity of the manpower employed in garages/workshops. He has pointed out that mechanics in most of the workshops suffer from ill-designed work areas, lack of proper jigs and fixtures. Moreover, hardly any time and motion studies are carried out to find out the time spent on many repair activities. Industrial engineering techniques are rarely, if ever used. The poor mechanics, therefore, are handicapped and productivity comes down. In addition the costs are also not controlled. One can imagine the time wasted whether at the maintenance pits/bays or the different sections inside workshop like machine shop, various assembly sections etc, for want of proper tools and tackles including job-holding devices. There is a loss of interest and motivation because of such happenings, which is very essential for the well being and profitability of the business. Further author has also pointed out that the workshop and maintenance staff ratio of different STUs reveals wide ranging differences amongst the member undertakings. This may be due to different organizational system. Like 3 tier system of Maharashtra, 2 tier system of Andhra Pradesh and the single tier system employed by Rajasthan state transport undertakings (RSRTC). For example, all depots of RSRTC carry out the maintenance schedules at the depot level itself, upto and including fitness certification as required by Regional Transport Office authorities. The two major workshops of RSRTC at Ajmer and Jaipur carry out only engine overhauls and major repairs of aggregates, like axles, transmission system, fuel injection system etc. The Punjab roadways also has a nearly similar set up. The 2 divisional workshops at Amritsar and Jullundhar carry out engine overhauls and major repairs of aggregates. The policies of the mechanical engineering departments in respect of the different schedules of maintenance to be
carried out also greatly affect deployment of technical manpower. It may also happen that there is a genuine shortage of technical manpower. But overall, as compared to other categories of staff viz, the running staff comprising of drivers and conductors, checkers bus station staff, traffic inspector and controller and other administrative staff etc. The contribution of the technical staff towards productivity needs to be examined. An attempt is made to find out the same by analyzing the relation between technical staff ratio and the total effective kms operated, though there is a contribution by other categories of staff also.

The author has suggested different ways and means for improving productivity such as –

1) In – Situ Brake Lathe- 2) Aerosol Maintenance products

3) Pneumatic tools 4) Garage equipments

5) Clean rooms 6) Portable bus washing machine

7) Japanese management techniques

The author has pointed out that some STU workshops provided their workers with some time and labour saving devices. He has given the following examples:

(1) The Trivandrum central workshop of Kerala state road Transport Corporation has provided a fixture for testing of starter motors after repair/rewinding.

(2) Vizianagaram zonal workshop of Andhra Pradesh state transport corporation has devised a special machine to test the complete assembly
to injectors and the fuel injection pump simultaneously and together as a set. This saves the valuable time which is otherwise lost on testing the two units separately. Actually these assemblies need to be tested together since they supplement each other.

(3) Kalwa workshop of Thane Municipal Transport undertakings has designed and fabricated a machine to perform the cleaning of wheel drum. This saves a lot of time otherwise spent on manually doing this work and also ensures good and near perfect cleaning of the surface in a shorter span of time.

The above examples indicate that even with small measures taken to save time and labour spent on doing simple mechanical jobs in the day to day routine of automobile maintenance the life of an average worker can be made simple and easy.

The author further concluded that all STUs should adopt new time and labour saving technique and devices which will enhance productivity and reduce the cost.10

2.4.6 Mini bus operations in some district of Tamil Nadu -

A case study by Dr Nadogopal and P. Chinnaiyan. In this paper, the researchers have taken Tamil Nadu mini bus operation for two districts and explained the benefits of mini bus to commuters and owners.

Considering the importance of road transport in rural Tamil Nadu the state government introduced the mini bus scheme in 1997. The mini bus scheme was introduced with the intention of providing the rural population with the required transport facilities to go to urban areas for their business, marketing activities and every other activity that might call for such transport. As per the government order No. 547 Home (Tr.III) Department, private operators were allowed to ply mini buses in the un-served rural
areas for a total distance of 16 kilometers only of which one kilometer be in the served area in the approved route scheme whenever necessary.

The number of seats not to exceed 25+1. Mini buses may be operated in the rural areas and in routes where no other state carrier is being operated. It is obvious that commuters are satisfied if they get transport facilities which were not accessible previously in their area. The researchers conducted survey and get some responses from the commuters.

The 95% of the respondents believe that that they have benefited by the mini bus scheme and 91.33% of them satisfied with the service provided by the operators. The study also showed that the mini bus scheme had a positive response from not only the rural people who had no previous mode of transport but also from those who had vehicles of their own. It was observed that minibuses have replaced the other modes of transport like bullock cart, vans, cycle and motor bikes. Also the minibus scheme supported the rural activities of every villager i.e farmer, student, office goers or a business person by providing easy access to the destination transport of rural commodities, safety and reducing the walking distance 72.33% of the respondents were satisfied with the frequency and 75.33% of the respondents expressed satisfaction on the minibus being operated on convenient time schedule.

As far as operators are concerned, that they were satisfied with the scheme however, by considering cost and benefit from their point, they were not satisfied. 90% of the owners were not satisfied in terms of the profitability of scheme. It was mainly because of the reason that only limited number trips were permitted in a specified route i.e frequency per day and more number of bus owners are permitted in the same route. Poor road condition higher fuel consumption and high maintenance cost were the major problems expressed by the owners.

To sum up:
1) Mini bus scheme is the solution to cover unserved area

2) Many of rural commuters got benefited by mini bus scheme.

3) Mini bus operators were not satisfied on the point of profit. This is an indispensable factor for effective and efficient management and growth.

2.4.7 A C Maunder and T C Mbara’s (1994)

Article titled ‘The effect of ownership on the performance of stage bus service in Harare, Zimbabwe’ is a summary of report prepared by them on behalf of govt. of Zimbabwe reveals that the stage bus industry, is intensively discussed lot in the developing as well as developed world. Proponents of private sector ownership and free competition argue that such conditions generate an efficient and effective stage bus service. Others promote varying levels of government control and investment including ownership, because of market imperfections and a loss in social welfare. A C Maunder and T C Mbarus have further explained reasons for and the objects of the government of Zimbabwe decision in 1988 regarding direct investment and participation in urban stage bus services in the major towns and cities of Zimbabwe, together with the initial effects of this process in Harare, the capital of Zimbabwe using operational, financial and service level data from pre government involvement to the present day.

Prior to 1980, bus services were provided under a Franchise Agreement by a subsidiary of the UK united Transport overseas services company which guaranteed the company a 20 per cent return on capital. After the country’s independence in 1980, the government regarded urban public transport service as a key sector of the economy culminating the acquisition of a 51 per cent shareholding in the Zimbabwe united passenger company in 1988. It is quite clear that government participation has greatly assisted in
improving the levels of service offered to the travelling public. The fleet size as well as its composition has increased and this has contributed to.

(a) A significant reduction in number of breakdowns per 10000 km. Operated over the last three years (the present average of 0.93 per 10000 km, compared to the past average of 3.5 per 10000 km, is attributed to the scrapping and replacement policy implemented during the past 1988 period)

(b) A gradual reduction in average passenger waiting time (since 1988 passenger waiting time has declined by 36.6 per cent despite the fact that more passengers are traveling than in the past.

(c) A considerable improvement in bus productivity in terms of daily kilometrage operated (although this has recently declined due to critical shortage of experienced drivers)

(d) A gradual reduction in dead kilometrage (as the new buses replace the old ageing models which were mainly used for split duties due to their unreliability)

(e) A high level of fleet availability during the peak period has been maintained and the off peak fleet utilization has increased (the latter has seen from about 35 per cent prior to 1988 to the present 48 per cent, a clear indication of the productivity of new vehicles which are capable of operating throughout the day).

Thus the result in Harare have illustrated that public sector ownership does not necessarily have to lead to declining productivity and operational performance.

Improvements in level of service, however, appear to have been achieved at a cost most of the buses have been acquired through increased
borrowings thus affecting the financial viability of zupco’s Harare division.12.

2.5 RESEARCH LITERATURE:

2.5.1 M.C Dixit (1972) Doctoral research work titled “A Study of the Poona Municipal Transport Administration with reference to its Service Efficiency from 1959 onwards”. The researcher has recorded his detailed observation on the administrative aspects like inventory, a fleet expansion, personnel training, revision of fare rates calculation of depreciation on bus fleet and complaint handling etc and operational aspects like scheduling, route planning, modification expansion etc. He has made comprehensive suggestions in each area. Since the researcher has mainly addressed the route operation problems his suggestions have a strong local character with a particular emphasis on route modification to bring in additional revenue.13 It covers period from 1959 to 1972 after which a lot of changes have occurred in the situation which need to be studied.

2.5.2 M.M Shinde (1990) Doctoral research work titled “The Study of City Bus Service with reference to Sangli and Miraj submitted to Shivaji University, Kolhapur. The researcher has studied the performance of city bus operation in Sangali and Miraj.

The findings of the research work are
1) Top officers at the MSRTC’s Sangali divisional office are negligent about the difficulties of the passengers at different bus stops nor do they oversee the issues involved in giving better passenger service;
2) Most buses on all routes get overcrowded at the point of origin;
3) Bus frequency distribution on many routes is uneven;
4) Drivers, conductors and controllers do not exert themselves for giving better service to the passengers;

5) There is an inadequate communication between the bus terminals maintenance wings and the administrative officers of the respective depots;

6) Nowhere in the entire bus system except at one bus stop any queue is maintained and controlling arrangements provided.

7) There is a lack of awareness on the part of the society and the local authorities on the importance of city bus service.

8) There is no future planning to acquire new buses extend service network and stress on better service.

In view of these findings the researcher has submitted comprehensive suggestions regarding route rationalization, maintenance of time table, passenger control, decongestion of bus traffic on main corridors, fuel conservation etc.

This research work covers the working of MSRTC related to Sangali and Miraj City bus service.

2.5.3 N. Y. Rajeshirke (2000) Doctoral research work titled “A study of Administration of Kolhapur Municipal Transport with special reference to its Service Efficiency” submitted to Shivaji University, Kolhapur. The researcher has recorded his detailed observations on the different aspects like, operating performance and financial performance and quality of service.

The researcher has pointed out some facts, they are as follows:

1) Lack of spare buses

2) Improper planning by traffic department of municipal transport

3) More number of breakdowns and accidents
4) More number of dead and cancelled kilometers.
5) Inadequate number of roadworthy buses for operation
6) Low public image of Municipal Transport undertaking

The researcher has also suggested some measures for municipal transport improvement in service. These are as follows:

1) Appropriate bus service mix- (ordinary, limited and non stop)
2) Special Holiday Tickets
3) Reduction in fare to attract passenger on special routes
4) Replacement the old age buses
5) Proper utilization of buses
6) Introduction of quality circle programme in the workshops
7) Computerization of work of all departments

N. Y. Rajeshirke’s work is limited to Kolhapur Municipal Transport Undertaking.

The research work in the past has concentrated on STUs. Most of studies on Road Transport Corporation have been of macro level. Studies on urban public transport regarding administration, performance & efficiency are also very few. Studies on NMMT undertaking has not been carried out by any organization or a researcher. Hence the study on administration, performance & efficiency of NMMT undertaking is must and relevant.
REFERENCES

2) Ibid. P. 8
3) Ibid. P. 10

