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RESEARCH ARTICLE

EXIGENCY ANALYSIS OF STATE ROAD TRANSPORT SYSTEM IN INDIA

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ABSTRACT

Owing to increasing personal incomes, long distance passengers aspired for luxury services in rural operations. In the current scenario of globalization, public transport service needs introspective sensitivity towards the quality of service offered. A well-developed transport network facilitates the integration and interdependence of different sectors by aiding quick and adequate movement of people and material. When transport systems are deficient in terms of capacity or reliability, they can have an economic cost such as reduced or missed opportunities. This paper is focusing on expected and provided services by state road transport in India. The study also advocates for the reformation of state road transport undertaking and also discusses how public transit program is worthwhile, and how to optimize transit services to maximize benefits.

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INTRODUCTION

After Independence, the government of India gave high priority to building roads and road transport for rural development. Since independence, though the Indian Railways improved its services and expanded its network substantially, it could not compete effectively with road transport for transporting passengers. With the enactment of the road transport corporation Act 1950 and amendments to the motor vehicles act 1939 the government of India paved the way for speedy nationalization of passenger road transport, establishment of STUs(State Road Transport Undertakings) and empowering these to grant permits. Consequently, all the Indian states established STUs and started nationalizing bus operations. As a result of STU initiatives in many states basic infrastructure such as bus depots, service centres, modern bus stations, etc. were built. STUs created and cultivated the ever expanding market in passenger road transport from the 1950s through the 1980s. According to the association of STUs the share of STUs buses in the total number of buses in the country grew from 20 percent in 1950 to 50 percent in 1980. However with the liberalization of economy arising out of changes in the policy environment, implemented through amendments to the motor vehicle act 1988, STUs started facing severe competition from private vehicles and operators since the early 1990s. Changes in the motor vehicle act in 1988 led to the scrapping of overriding priorities and privileges conferred upon STUs providing an easy entry to private operators (of buses, mini-buses, jeeps three-wheelers etc. with and without stage carriage permits) into the public transport sector.

Simultaneously, changes in industrial policy resulted in serious competition in the automobile industry. Liberalizes availability of two-wheelers and cars resulted in upper middle class and middle class drifting away from public transport. In the recent years, the road transport sector is witnessing a strong and vigorous growth despite it facing momentous barriers to inter-state freight and passenger movement. Public investment over six decades has produced a massive road network. The total road length increased from about 400,000 km to 4.7 million km between 1951 and 2011. Surfaced road length accounted for 54 percent of total road length in 2011, compared with 39 percent in 1951. India is home to the world's second largest road network, which carries some 85 percent of the country's passenger traffic and 65 percent of its freight (MoRTH).

Studies on road transport

A study conducted by Lago, Patrick and McEnroe (1981) focuses on passengers' responses to change in headways, aggregate vehicle miles and components of travel time. They also evaluate other services attributes as reliabilities and comfort of ridership related to transit services of America and Canada. They found that satisfaction level of commuters toward the services of public transport is to some extent. According to John Gunaseelan (1995) the productivity efficiency of Pattukottai Azhagari Transport corporation limited (PATC) from 1982/83 to 1989/90. For analyzing the productivity he used fleet strength, fleet utilization, routes operated and fuel consumption as input and effective kilometer as output. DEA techniques are applied by him for analysis. He concluded that DEA index is fluctuating during the study period. A study by Kumar (1998) examined the nature and pattern of organizational conflict as between management and employees and also explored various types of conflicts that

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occurs in PRTC and observed effect of complex relationship in PRTC. He emphasized that there is lack of sound personnel policy and suggested some machinery of conflict resolution. Kumar (2001) describe the key role of public sector in transformation of the country. He mentioned that every sector of economy has under control of public sector but government followed a disinvestment policy due to the losses of public sector undertakings are incurred year after year. He has stated that road transport also act as vehicle in economic upliftment. The author has highlight the performance of Himachal Road transport Corporation which covers mainly Shimla division. In his opinion government should adopt a good policy to improve HRTC as compared to private operators. A study conducted by Schneider, Guo, and Schroeder (2013) assessed the role and quality of life in services of MnDOT (Minnesota Department of Transportation, United State) and the influence of transportation on quality of life by mode of travel (drive alone, train, bus, carpool/vampool, bike, walk) across the state of Minnesota, U.S. In their study eleven quality of life areas were examined such as education, employment and finances, environment, housing, family, friends and neighbors, health, local amenities, recreation and entertainment, safety. They found overall respondents were satisfied with MnDOT services.

Research objectives

This paper aims to throw light on the current position of State Road Transport Undertakings with reference to increasing travel demands of passenger in India.

MATERIALS AND METHODS

This study is basically relying on secondary source and data obtained from books and reports on Road Transport. To arrive at the projected Passengers BPKMs (Billion per kilometers) and BAU (Business as usual) scenario in which road passenger traffic is assumed to vary with changes in population growth, urbanization and per capita GDP. It is assumed that passenger movement on roads is dependent on the per Capita income, measured by per capita Net National Product, rate of growth of population and the rate of urban population.

Forecasts Travel Demand

Buses constituted 1.3 percent of total registered vehicle population during 2008-09, the latest year for which data on registered motor vehicles is available. The number of registered buses increased by 4.1percent during 2008-09 and as on 31st march 2011, there were 1,486 thousand buses. From 2009-10 to 2010-11, the production of total commercial passenger vehicles increased by 14.6 percent (Table 1). The increase in the sale of commercial passenger vehicles in the domestic sector recorded was 9.7 percent between 2009-10 and 2010-11.

Projected passenger movements

Passenger kilometers are defined as the sum of the length of journeys travelled by all passengers carried by a vehicle. In BAU scenario the projection of passenger traffic is based on the growth of passenger traffic during 1980-81 to 2010-11. The rate of growth of passenger traffic in terms of BPKMs during this period was 8.8 percent per annum. If the rate of

growth of BPKMs continues to be 8.8 percent per annum, then the BPKMs for each year of Twelfth Five Year Plan. It may be noted here that the growth rates of per capita income, measured by per capita Net National Product, population and urban population during 1980-81 to 2010-11 were 4.9 per cent, 1.9 per cent and 2.9 per cent, respectively. Passenger movement on roads is dependent on the per Capita income, measured by per capita Net National Product, rate of growth of population and the rate of urban population. For the years 2000-01 to 2010-11, BPKMs of road transport sector were regressed on the three independent variables as rate of population growth, rate of urbanization and per capita income. It was observed that during 2000-01 to 2010-11, the rates of growth of per capita income, total population and urban population were 8.3 per cent, 1.6 per cent and 2.8 per cent per annum, respectively. Assuming that the growth rates of these independent variables would continue during the Twelfth Five Year Plan period, passenger traffic measured by BPKMs was projected to grow at 7.2 per cent per annum. The passenger traffic projected for each year with base year 2006-07 as per the report of NTDPC (National Transport Development Policy Committee) is given in Table 2. To achieve the projected BPKMs the number of buses would need to increase during the Twelfth Five Year Plan. If an annual growth rate of 9 per cent for commercial passenger carriers is assumed for the Twelfth Five Year Plan, the projected domestic sales would be as shown in Table 3.

Assessment of Buses required during the Twelfth Five Year Plan

To determine the requirement of buses during the Twelfth Five Year Plan, one needs to take into account not only the new sales, but also the buses which are already plying. For the purpose of calculating the requirement of buses, the 'per bus BPKM performed' during a year has been calculated. In the absence of data from the private sector, the requirement of buses has been calculated on the basis of the actual figures available for public sector buses. During the year 2009-10, the BPKM per public sector bus, or State Road Transport Undertaking (SRTU), was observed to be 0.005. Assuming that the performance of private sector buses would be at least as good as that of the better performing SRTUs, the BPKM per private sector bus for a year was taken to be 0.008. A weighted average of 0.007763 of public and private sector buses have been used to arrive at the buses required during the Twelfth Five Year Plan under alternative scenarios of growth of BPKMs (Table 4).

Need of public transport

Public Transportation serves as a cheap and convenient mode of transport for all classes of society, saves fuel and reduces congestion and pollution. It is vital to economic development & social integration of the country. Cross-country comparison of buses (both SRTU and others) indicates that the bus penetration in India is lower as compared to even some of the developing countries like Thailand, South Africa, Brazil, Australia, Mexico, Malaysia and U.K. One such mode of Public Transportation in India is the State Road Transport Undertakings (SRTUs). SRTUs assume a place of Prominence in the country. The reporting forty six SRTUs held a total of 1,40,497 buses during the period April-March 2014-15. Twenty three SRTU's recorded an increase in their fleet strength as

Table 1. Production and Domestic sales of commercials passengers vehicles

Commercials passengers vehicles	Production		Domestic sales	
	2009-10	2010-11	2009-10	2010-11
• Maximum mass upto 5 tonnes	13,260	14,882	13,638	16,327
• Maximum mass exceeding 5 tonnes but not exceeding 7.5 tonnes	21,486	23,126	20,775	21,153
• Maximum mass exceeding 7.5 tonnes but not exceeding 12 tonnes	10,039	12,854	9,906	12,844
• Maximum mass exceeding 12 tonnes but not exceeding 16.2 tonnes	35,888	41,409	33,076	34,437
• Maximum mass exceeding 16.2 tonnes	84	289	101	272
Total commercial passenger carriers(1 to 5)	80,757	92,560	77,496	85,033

Source: MoRTH, 2011

Table 2. Projection of Passenger Traffic with base year 2006-07

Year	Projected Passenger Traffic (BPKM)
1950-51	31
1970-71	210
1990-91	1671
2006-07	4657
2011-12	9329
2016-17	17272
2021-22	35043
2031-32	163109

Source: NTDP Research

Table 3. Projected Domestic sales of commercials passengers vehicles during 12th plan

Commercials passengers vehicles	Projected Domestic sales (in numbers)					
	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
• Maximum mass not exceeding 7.5 tonnes	48,853	44,530	48,538	52,906	57,668	62,858
• Maximum mass exceeding 7.5 tonnes	51,833	56,498	61,583	67,125	73,166	79,751
Total commercial passenger vehicles	92,686	101,028	110,121	120,031	130,834	142,609

Source: MoRTH, 2011

Table 4. Number of Buses required during 12th plan: 2011-12 to 2016-17

Year	Buses Required
2012-13	1,092,784
2013-14	1,173,664
2014-15	1,257,541
2015-16	1,344,605
2016-17	1,435,062

Source: MoRTH, 2011

compared to the previous period 2013-14, the largest fleet size being that of Maharashtra SRTC. There was a vast variation in the spread of SRTUs across States/Union Territories (UTs) during 2014-15. In the total fleet, the share of the State of Maharashtra was the largest (17.91%), followed by Karnataka (17.10%) and Tamil Nadu (14.33%). It has been observed that there are no SRTU buses in some of the populated states of Chhattisgarh, Jharkhand and Madhya Pradesh. Other states having no SRTU services are Manipur and Pondicherry. The average number of persons per bus for the reporting SRTU was 7606. The average number of buses per 10 lakh population for all the States/UTs in which the reporting SRTUs were plying was 131. The State of Bihar had the largest number of persons per SRTU bus (4, 55,274) and the Union Territories of Andaman & Nicobar Islands had the lowest number of persons per SRTU bus (2004). Conversely, the number of buses per ten lakh population was the lowest in Bihar (2) and the highest in Andaman & Nicobar Islands (499). The average age of the fleet of the reporting SRTUs ranged from 2.0 years to 11.8 years. Bihar SRTC accounted for the highest proportion of over-aged buses (100%) during the period April-March, 2014-15 followed by North Bengal STC (68%), Tamil Nadu STC (Salem) Ltd (67.85), Metro TC (Chennai) Ltd (56.85%). BEST Undertaking, Pune Mahamandal and PUNBUS did not have any over-aged buses

in their fleet. Out of the forty six reporting SRTUs, eleven SRTUs recorded a rise in their staff strength during 2014-15. Maharashtra SRTC had the largest staff strength of 1, 07,500. There was a decline in the staff strength of 31 SRTUs. Metro TC (Chennai) Limited recorded the highest increase of 1,237 in the number of staff deployed by it while the staff strength of Delhi TC recorded the highest decline of 2,639 during 2014-15 as compared to 2013-14. The average occupancy ratio increased from 68.1% during 2013-14 to 69.0% during 2014-15. The highest occupancy ratio of 98.5% was registered by Andaman and Nicobar ST. The lowest was that of Sikkim NT at 33.1%. Amongst the eight SRTUs plying in metropolitan cities, Bangalore Metropolitan TC had the largest fleet strength of 6,649 and Chandigarh TU had the lowest fleet strength of 432. All the SRTUs incurred losses. The largest loss was that of Delhi TC (Rs.3, 991.47 crore). The largest fleet size during the period April-March 2014-15 was that of Maharashtra SRTC (17,957), followed by Andhra Pradesh SRTC (12,079) and Telangana SRTC (10,329). These three SRTUs accounted for 12.8%, 8.6% and 7.3% respectively of the total fleet strength of SRTUs. These SRTUs were followed by Uttar Pradesh SRTC (9,415), Karnataka SRTC (8,321) and Gujarat SRTC (7,765) accounting for 6.7%, 5.9% and 5.5% respectively in the total fleet strength of SRTUs for the period ending April- March 2014-15.

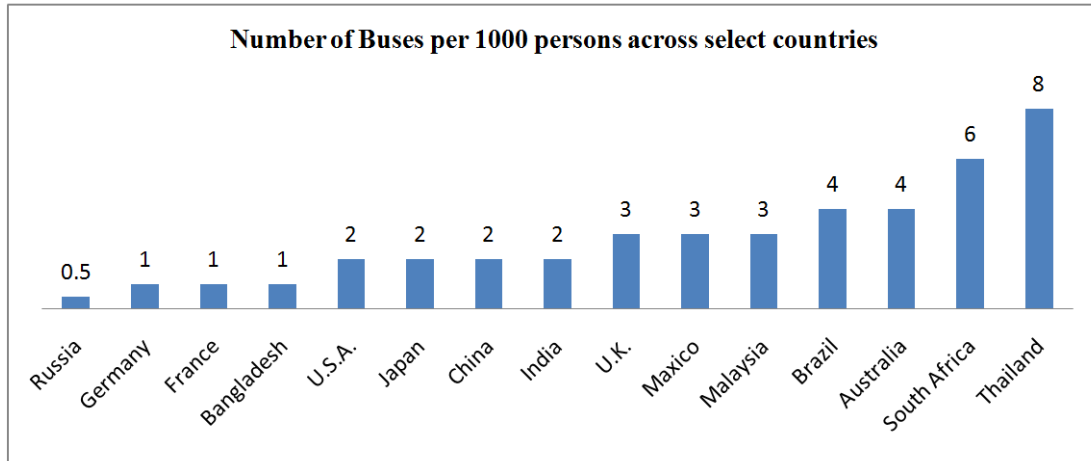
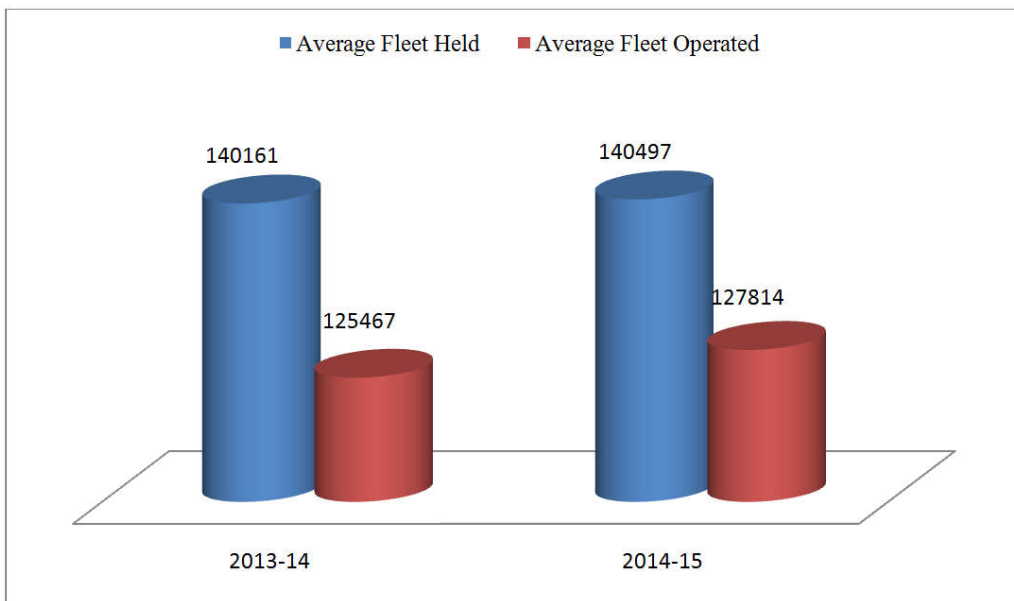
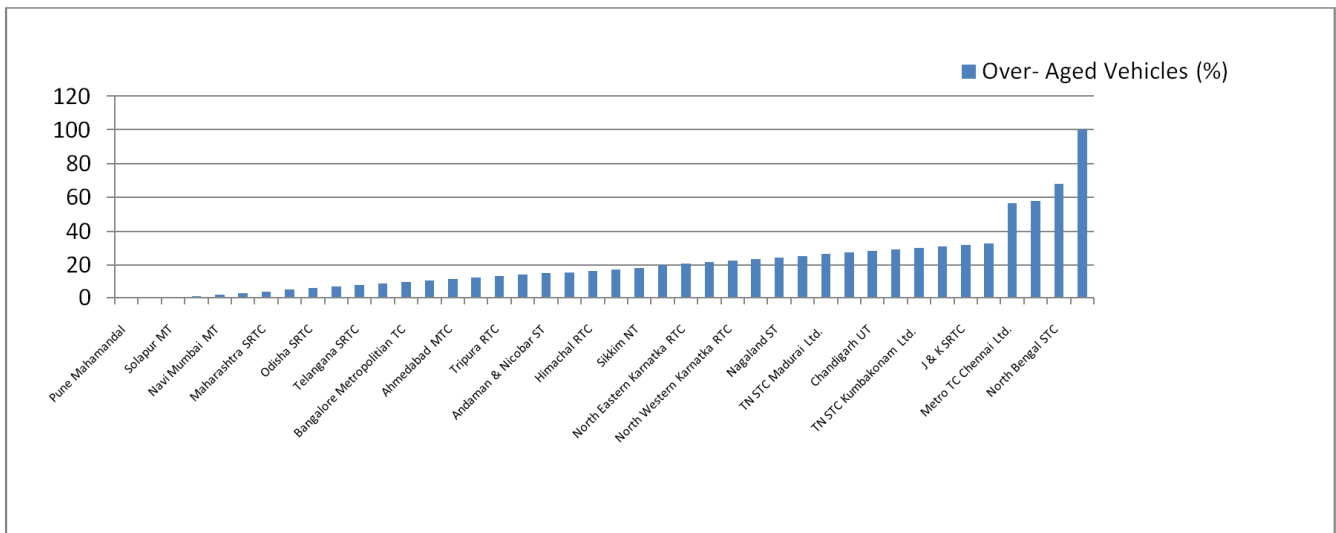


Fig. 1. Source: MoRTH, 2014



Source: Review of the performance of state road transport undertakings (passenger services) for April, 2014 – March, 2015

Fig. 2. Fleet Utilization of SRTUs



Source: MoRTH, 2016

Fig. 3. Over-Aged Vehicles (%)

The top five SRTUs accounted for 41% of the fleet size. The smallest five SRTUs in terms of fleet strength were Solapur MT (183), Sikkim NT (85), Meghalaya STC (63), Tripura RTC (47) and Mizoram ST (33) contributing only 0.3% to the total fleet strength. Out of the 46 reporting SRTUs, 23 SRTUs registered an increase in their fleet strength during 2014-15 as compared to the previous year, 22 SRTUs reported a decline and only 1 SRTU reported the same fleet strength. In absolute terms, Haryana SRTC recorded the highest increase of 263 buses in its fleet strength during 2014-15. In relative terms, the highest increase of 123% was recorded by Solapur MT. The average age of the fleet is one of the important determinants of its physical productivity. The average age of the fleet of the reporting SRTUs ranged from 2.0 years to 11.8 years. As on 31st March 2015, Bihar SRTC had the oldest fleet, with an average age of 11.8 years, followed by Pepsu RTC (10.5), J&K SRTC (10.4 years) and Sikkim NT (10.0 years). The lowest average age of fleet was that of Solapur MT and Calcutta SRTC at 2.0 years and 3.4 years respectively. State Exp.TC TN Ltd., Rajasthan SRTC and Karnataka SRTC also had relatively low average ages of 4.1 years, 4.2 years and 4.2 years respectively. In terms of over-aged vehicles, Bihar SRTC accounted for the highest proportion of over-aged buses (100%) during the period April-March, 2014-15 followed by North Bengal STC (68%), Tamil Nadu STC (Salem) Ltd (67.85) & Metro TC (Chennai) Ltd (56.85%). BEST Undertaking, Pune Mahamandal and PUNBUS did not have any over-aged buses in their fleet. 23 SRTU buses had shown an increase in bus fleet size during 2014-15 as compared to the previous year 2013-14. However, this increase was not accompanied by a rise in the staff strength. Only 8 out of this 23 SRTU buses reported an increase in staff strength during 2014-15.

Road Accidents

The number of total accidents reduced from 19,378 in 2013-14 to 18,249 in 2014-15. However, the number of fatal accidents also decreased from 4,023 in 2013-14 to 3,986 in 2014-15. In percentage terms, the total accidents and fatal accidents decreased by 5.8% and 0.92% respectively. The share of fatal accidents in total accidents increased to 21.84% during 2014-15 as compared to 20.76% during 2013-14. The highest number of accidents reported was by Maharashtra SRTC (3,172) out of a total number of accidents (18,249) reported by 46 SRTUs during 2014-15. The highest fatal accidents reported was by Andhra Pradesh SRTC(467) followed by Maharashtra SRTC(418), Telangana SRTC(380) and Uttar Pradesh SRTC(294) out of a total of 3,986 fatal accidents reported by 46 SRTUs during 2014-15. Above data shown only of road accidents by SRTUs while according to the National Crime Records Bureau (NCRB), the number of pedestrian deaths in road accidents in the country rose to 7,088 in 2015 from 6,690 the previous year which is serious concern.

Suggestions

Both freight and passenger movement by road is expected to rapidly expand in the coming years which is a big challenge. Therefore the need to boost state road transport to dispense economic and required service.

- To encourage accident free service can be provide some extra incentives to the drivers.
- Strengthen the SRTU by fleet modernization, replacement of over-aged buses, Technological

upgradation, punctuality and create reliability, up gradation of bus infrastructure/bus terminals, stops etc.

Conclusion

The public sector bus based transport system provides an alternative mode of transportation. Low vehicle ownership in India make people rely on public transport which is also insufficient to cater to their requirements leading to an uncomfortable, congested and unsafe journey. This low penetration of buses leads to overcrowding in buses and other vehicles used for public transport which may be one of the reasons for alarming road accident scenario in India. In comparison of other developing countries India has lower buses penetration. Growth rates of passenger traffic were projected to grow at 7.2 percent per annum during twelfth five year plan and average number of persons per bus for the reporting SRTU was 7606 which is very high to meet the travel demand of passenger. In 2007, road sector accounted for nearly 87 percent of the total emission from the transport sector and this number is expected to increase four times by 2030 (CPCB, 2011). During the year 2009-10, the BPKM per public sector bus, or State Road Transport Undertaking (SRTU), was observed to be 0.005. Assuming that the performance of private sector buses would be at least as good as that of the better performing SRTUs, the BPKM per private sector bus for a year was taken to be 0.008.

REFERENCES

- Armando Lago, M., Mayworm Patrick and J. Mathew EnRoe. 1981. Transit Service Elasticities. *Journal of Transport Economics and Policy*. Volume_XV_No_2_99-119.
- Association of State Road Transport Undertakings (ASRTU) 2016 under the agies of ministry of Road Transport and Highways, Government of India.
- Ingrid E. Schneider, Tian Guo, and Sierra Schroeder, 2013. Quality of Life: Assessment for Transportation Performance Measures. Tourism Center & Department of Forest Resources, University of Minnesota, United State. Retrieved from <http://www.lrrb.org/pdf/201305.pdf>.
- Jegadesh Gandhi, P and John Gunaseelan. : *Operational Economics of Public Transport Sector - A Study of PATC*, Southern Economist, Dec 1, 1988, pp. 17-19
- Kumar Rakesh, 1998. *Organizational Conflict in Pepsu Road Transport Corporation*. Doctoral dissertation. Punjabi University, Patiala.
- Kumar, Santosh, 2001. *Performance appraisal of Himachal Road Transport Corporation*. Doctoral dissertation. Himachal Pradesh University, Shimla.
- Mehta, Udai S. *Research Study of the Road Transport Sector in India*. The Ministry of Corporate Affairs, Government of India.
- National Crime Records Bureau Ministry of Home Affairs Government of India, New Delhi.
- National Transport Development Policy Committee, 2013. *Trends in Growth and Development of Transport*.
- Report of the sub-group on passenger and freight traffic assessment in the Twelfth five year plan (2012-17). MoRTH Sep, 2011.
- Review of the Performance of State Road Transport Undertakings (SRTUs) Passenger Services. Ministry of Road Transport and Highways. Government of India, Transport Research Wing, New Delhi.