



Operational performance of Punjab Roadways and Pepsu Road Transport Corporation A Comparative study

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Abstract - In Punjab, the bus transport service is being provided by state owned corporations i.e. Punjab Roadways and Pepsu Road Transport Corporation. Punjab Roadways is a departmental undertaking controlled by transport department, Punjab. The present paper attempts to evaluate and compare the operational performance of Punjab Roadways and Pepsu Road Transport Corporation Ltd (PRTC). The present paper is based on secondary data taken from various sources like statistical abstracts of Punjab, Annual Reports of the companies and various websites. The period of study is from 1999-2000 to 2011-2012. The indicators taken for study are number of staff employed, daily vehicle utilization, and number of buses held, breakdown rate of vehicle, and accident rate of Punjab Roadways and Pepsu Road transport Corporation Ltd (PRTC). The analysis has been done by using percentage analysis, ratio analysis, and exponential growth rate. The study found that both the transport corporations showed improvement in their operational performance and the PRTC is placed at higher level as compared to Punjab Roadways, on the basis of various indicators taken in the study.

I. INTRODUCTION

Punjab, a state in the Indian union, is situated in north- west India. It is bounded on the north by Jammu and Kashmir, on the east by Himachal Pradesh, on the south by Haryana and Rajasthan and on the west by Pakistan. The word 'Punjab' is compounded of two Persian words, Panj ('five') and Ab ('water'), thus signifying the land of five waters, or rivers. The origin can perhaps be traced to 'Panchanada', sanskrit for "five rivers", the word used before the advent of the Muslims with a knowledge of Persian to describe the meeting point of Jhelum, Chanab, Ravi, Beas and Sutlej rivers, before they joined the Indus. The name 'Punjab' subsequently came to be used for the land through which these rivers flow. Punjab, with a total area of 50,362 square kilometer, has different modes of transport, like buses, taxis, auto-rickshaws and cycle-rickshaws, which connect various parts. These modes of commutation make it easy for people to travel within the state. The roadways and railways are the main modes of transportation within the state. There is a broad road network of 60,825 kilometers, which passes through the state and it includes both state and national highways. In Punjab bus transport service is being provided by state owned corporations i.e. Punjab Roadways and Pepsu Road Transport Corporation. Punjab Roadways is a departmental undertaking controlled by transport department, Punjab. The present paper attempts to evaluate and compare the operational performance of Punjab Roadways and Pepsu Road Transport Corporation Ltd (PRTC).

II. THE OBJECTIVES OF THE STUDY ARE

1. To evaluate the operational performance of Punjab Roadways.
2. To evaluate the operational performance of Pepsu Road Transport Corporation (PRTC)
3. To compare the performance of Punjab Roadways and Pepsu Road Transport Corporation (PRTC).

III. METHODOLOGY

The present paper is based on secondary data taken from various sources like statistical abstracts of Punjab, Annual Reports of the companies and various websites. The period of study is from 1999-2000 to 2011-2012. The indicators taken for study are number of staff employed, daily vehicle utilization, and number of buses held, breakdown rate of vehicle, and accident rate of Punjab Roadways and Pepsu Road transport Corporation Ltd (PRTC). The analysis has been done by using percentage analysis, ratio analysis, and exponential growth rate.

IV. PUNJAB BUS TRANSPORT

In Punjab, bus transport service is being provided by state owned corporations i.e. Punjab Roadways and Pepsu Road Transport Corporation. Punjab Roadways is a departmental undertaking controlled by transport department, Punjab. The



department of transport is functioning under the provisions of motor vehicles Act, 1988. Punjab Roadways being commercial department organization is completely controlled by Ministry of transport in the state and covered by the rules, civil service rules and punishment and appeals rules as are applicable to other departments of the state. Punjab Roadways came into being in the year 1948 with a fleet of 13 buses, which rose gradually to its highest strength of 2407 buses in the year 1985. It was an expanding department providing a reasonably efficient and comfortable passenger bus service in the state and at the same time creating opportunities for employment for the younger generation who were recruited as drivers, conductors and technicians. Punjab Roadways has 18 depots viz Chandigarh, Roopnagar, Ludhiana, Moga, Jagraon, Nangal, Jalandhar-1, Jalandhar-2, Nawanshehar, Batala, Pathankot, Hoshiarpur, Amritsar-1, Amritsar-2, Taran Taaran, Patti, Ferozepur and Mukatsar. The vision of Punjab Roadways and PUNBUS buses is to provide a reliable, efficient and economical means of Passenger transport to the common man of Punjab. Since 1990-91, Punjab Roadways has been incurring losses due to dilapidated condition of its buses but after launching PUNJAB STATE BUS STAND MANAGEMENT COMPANY LIMITED (PUNBUS) in the transport authority has started generating revenues. PUNBUS was incorporated on 07-03-1995 with the Registrar of Companies, Jalandhar with 100% equity participation of State of Punjab. Certificate of Commencement of Business was issued by the Registrar of Companies, Jalandhar on 06-06-1995. Punjab Roadways & PUNBUS will act as a socio commercial department with the objective of providing the highest revenues possible along with the objective of providing bus service at concessional rates or free of charge to some special need worthy categories of passengers and providing bus service to certain commercially non viable areas where there are very few other means of transport.

The Pepsu Road Transport Corporation, Patiala was set-up on 16th of October, 1956 under the provision of the Road Transport Corporations Act, 1950 with a view to provide efficient, adequate, economic and properly co-ordinate operation system of Road Transport Services in the State. It commenced passenger transport operations with a meager investment of Rs. 25.00 lacs and the fleet of 60 buses covering 11,107 daily scheduled kilometers on 15 routes with 345 employees. At present, the PRTC had owned 912 ordinary buses, 2 AC buses and 24 HVAC buses and 36 hired buses under KM Scheme, 600 routes (including inter-state routes) covering a daily mileage of 349928 kilometers. It has 4744 employees as on 31.8.2009. There are 10 depots of the Corporation located at Patiala, Bathinda, Kapurthala, Barnala, Sangrur, Budhlada, Faridkot, Ludhiana, Chandigarh and Special Cell of KM Scheme at Patiala. The Head office of the corporation is situated at Patiala. The operation of the bus services by PRTC is not only confined to Punjab State, but it has also been providing bus services to the neighboring states like Haryana, Himachal Pradesh, Rajasthan, Jammu & Kashmir, Uttar Pradesh, Uttaranchal and Union Territories of Chandigarh and Delhi. The PRTC provides services not only on intercity routes but also links the remote villages with the nearby towns and cities. It is also extending free/concessional travel facilities to various categories of commuters as per the instructions of the State Govt. from time to time. Pepsu Road Transport Corporation is governed by the Board Of Directors headed by the Chairman. The Pepsu Road Transport Corporation has two tier system of Management. The Managing Director is the Chief Executive of the Corporation who is assisted by Addl. Managing Director along with the officers of the various branches in the Head Office. The General Manager heads the Depot Administration and is assisted by various branch officers.

Punjab roadways and PRTC both undertakings providing free/half-concessional/concessional travel facilities to various categories like police personnel, school students, college students, ITI students, freedom fighters, blind and handicapped persons, secretariat employees, women above 60 years of age, widow of terrorist victims, and thalasaemic and cancer patients etc. Punjab roadways also provide buses on hire to other government departments and to private parties at the charge for Rs 21.32 per km, and also for haltage at the charge of Rs 70 per hour. PRTC runs Bachat card scheme for adults and for children at the concessional rates of Rs 150 per day and Rs 60 per day respectively. PRTC also provides return ticket scheme on Patiala- Amritsar routes and Patiala- Delhi route.

V. PERFORMANCE EVALUATION

Staff Bus ratio: Staff bus ratio is an important indicator for analysis of the performance of transport sector. It is calculated by dividing the total staff by the number of buses or the size of the fleet. i.e.

$$\text{Staff bus ratio: } \text{Total staff} / \text{No. of buses}$$

The lower this ratio is, the higher will be the efficiency of the staff employed in the undertaking and higher the ratio is, lower the efficiency of the staff employed in the undertaking. The staff bus ratio for Punjab roadways and PRTC for the period 1999-2000 to 2011-2012 has been shown in the table 1.



Table1: Staff to bus ratio in Punjab Roadways and PRTC

Year	PUNJAB ROADWAYS			PRTC		
	Staff	No. of buses	Staff bus ratio	staff	No. of buses	Staff bus ratio
1999-2000	11736	2369	4.95	5061	1126	4.44
2000-2001	11035	2369	4.65	5037	1142	4.41
2001-2002	11304	2066	5.71	5028	1120	4.48
2002-2003	11074	1857	5.96	4571	1037	4.4
2003-2004	9850	1712	5.75	4488	1012	4.43
2004-2005	9256	1712	5.4	4669	1021	4.57
2005-2006	8568	1316	6.51	5017	1035	4.84
2006-2007	7958	976	8.15	4893	1013	4.83
2007-2008	7392	781	9.46	4600	1007	4.56
2008-2009	7015	692	10.13	4866	974	4.99
2009-2010	6575	671	9.79	4715	974	4.84
2010-2011	6033	624	9.66	3908	1118	3.49
2011-2012	5362	730	7.34	4376	1076	4.06
Exponential growth rate	-6.37	-12.02		-1.15	-0.62	

Source: statistical abstract of Punjab, from 1999-2000 to 2011-2012.

The assessment of table 1 showed the number of buses held and number of staff held by Punjab Roadways and Pepsu Road Transport Corporation in Punjab. For analysis of the efficiency of public transport undertakings staff bus ratio for the period of thirteen years from 1999-2000 to 2011-2012 was calculated. In case of Punjab Roadways the number of buses held showed negative exponential growth rate with 12.02. In 1999-2000 there were 2369 buses, which reduce to 1316 in the 2005-2006. In 2008-2009, 2009-2010 and 2010-2011 buses held by organization were 692, 671 and 624 respectively. But in 2011-2012 buses increased to 730 in number. Punjab Roadways staff employed also showed negative exponential growth rate with 6.37. In 1999-2000 staff was 11736, which decreased to 8568 in 2005-2006. It constantly reduced to 6575, 6033 and 5362 in 2009-2010, 2010-2011 and 2011-2012 respectively. Staff bus ratio in the year 1999-2000 was 4.95, which increased to 5.40 in year 2004-2005, it showed that efficiency was decreased because more number of staff employed to per bus. In 2008-2009 staff bus ratio were 10.13, which reduced to 7.34 in the year 2011-2012 it means efficiency was improved as the ratio decreased. PRTC also recorded negative exponential growth rate 0.62 and 1.15 for number of buses held and number of staff employed. In 1999-2000, PRTC held 1126 buses which decreased to 974 in 2009-10 but it further increased to 1118 in 2010-11 and 1076 in 2011-12. PRTC staff employed showed constant reduction from 5061 in 1999-2000 to 3908 in 2010-11. But it increased to 4376 in 2011-12. Staff bus ratio was constant with minor fluctuations; it was 4.44 in 1999-2000, 4.57 in 2004-05 and 4.84 in 2009-10. Further it was decreased to 3.49 in 2010-11, but it increased to 4.06 in 2011-12. If we compared performance of both transport undertakings, we concluded that the performance of PRTC was better as compared to the Punjab Roadways. The number of buses held, number of staff employed and bus staff ratio were higher in PRTC than that in the Punjab Roadways.

Staff employed kilometer ratio: Staff used to operate one hundred kilometer of measuring efficiency. It is also an important indicator for checking the efficiency of the undertakings. It calculated by staff employed per bus divided by kilometres operated by transport undertaking.

$$\text{Staff used for 100 kilometres of operation} = (S*100) / K$$

Where, S – stands for staff employed per bus and

K – Stands for average vehicle utilization in terms of kilometres.



The lower this ratio is, the higher the efficiency of the staff employed in the undertaking and higher the ratio, lower the efficiency of undertaking. The staff employed kilometer ratio for Punjab roadways and PRTC for the period 1999-2000 to 2011-2012 has been shown in the table 2.

Table 2: Daily vehicle utilization by Punjab Roadways and PRTC

Year	Punjab Roadways	Staff kilometre ratio	PRTC	Staff kilometre ratio
	Daily vehicle utilization (kilometre)		Daily vehicle utilization (kilometre)	
1999-2000	225	2.2	253	1.75
2000-2001	227	2.04	259	1.70
2001-2002	219	2.60	274	1.63
2002-2003	238	2.50	280	1.57
2003-2004	225	2.55	299	1.48
2004-2005	206	2.62	306	1.49
2005-2006	210	3.10	317	1.52
2006-2007	195	4.17	325	1.48
2007-2008	176	5.37	318	1.43
2008-2009	105	9.64	310	1.60
2009-2010	104	9.41	310	1.56
2010-2011	145	6.66	304	1.14
2011-2012	165	4.44	265	1.53
Exponential growth rate	-5.38		1.13	

Source: statistical abstract of Punjab, from 1999-2000 to 2011-2012.

The analysis of table 2 showed the performance of Punjab roadways and PRTC in terms of staff employed to the number of effective kilometres operated by transport undertakings in Punjab. Punjab roadways recorded negative exponential growth rate with 5.38. In year 1999-2000 Punjab roadways operated 225 daily vehicle kilometres which reduced to 195 in 2006-07. It further decreased to 104 in 2009-10, 145 in 2010-11 and increased to 165 in 2011-12. As the daily vehicle kilometres decreased staff kilometre ratio increased. In 1999-2000 it was 2.20 which increased to 4.17 in 2006-2007 and in 2009-10 it increased to 9.14. As the ratio increased efficiency of Punjab Roadways decreased. But in last two years ratio was decreased to 6.66 in 2010-11 and 4.44 in 2011-12, it showed that efficiency of Punjab roadways increased in last two years. PRTC showed positive exponential growth rate for period of thirteen years for daily vehicle utilization in kilometres. In 1999-2000 it was 253, which increased to 310 in 2009-10 but it decreased in 2011-12 to 265. PRTC showed constant staff kilometer ratio with minor changes, it was 1.75 in 1999-2000, decreased to 1.48 in 2006-07 and increased to 1.53 in 2011-12. PRTC staff kilometer ratio was lower as compared to the Punjab roadways and indicates higher degree of transport efficiency in PRTC.

VI. SIZE AND COMPOSITE OF FLEET

Under this size of the fleet and its growth over the years are studied. Higher the rate of growth of the fleet, more the efficient the undertaking. The number of buses held by Punjab roadways and PRTC for the period 1999-2000 to 2011-2012 has been shown in the table 3.

Table 3: Number of Buses Held by Punjab roadways and PRTC in Punjab

YEAR	Punjab Roadways		Pepsu Road Transport corp.	
	Buses	Annual% increase/decrease	Buses	Annual% increase/decrease
1999-00	2369	100(base)	1070	100 (base)
2000-01	2369	Nil	1142	6.72
2001-02	2368	-0.04	1142	Nil
2002-03	2368	Nil	1142	Nil
2003-04	2368	Nil	1142	Nil
2004-05	1591	-32.82	1092	-4.38
2005-06	1427	-10.31	1122	2.74
2006-07	1427	Nil	1118	-0.53
2007-08	1427	Nil	1150	2.86



2008-09	1568	9.88	1089	-5.31
2009-10	1568	Nil	1089	Nil
2010-11	1568	Nil	1089	Nil
2011-12	1568	Nil	1089	Nil
Exponential growth rate	-5.2089		-0.23443	

Source: statistical abstract of Punjab, from 1999-2000 to 2011-12.

Table 3 showed the number of buses held by Punjab roadways and PRTC. Analysis of table showed that the growth of fleet held by Punjab Roadways has 2369 buses which were stable with 2368 for 2001-02 and 2002-03. In 2004-05 number of buses was decreased to 1591. In next 2005-06, 2006-07 and 2007-08 it was constant with 1427 in numbers. Buses were increased to 1568 for next four years i.e. 2008-09, 2009-2010, 2010-11 and 2011-12. Punjab roadways recorded negative exponential growth rate with 5.20. For calculating annual increase and decrease, number of buses in 1999-2000 has taken as base year. In 2001-02 there was annual decreased by 0.04 and in 2005-06 it further decreased to 32.82, but in 2008-09 it increased to 9.88. Pepsu Road Transport Corporation also showed negative exponential growth rate by 0.23. In 1999-2000 organization had 1070 buses which increased to 1142 and it stabled for four years till 2003-04. In year 2004-05 it decreased to 1092 and in next year it increased to 1122 in 2005-06. For last four years number of buses decreased to 1089 from 2008-09 to 2011-12. In 2000-01 it showed decrease in value by 4.38 percent. It was found that PRTC perform well as compared to Punjab Roadways. Exponential growth rate value cleared the picture as PRTC have negative value by 0.23 but Punjab Roadways decreased its fleet by faster rate with 5.20.

Breakdowns: breakdown means buses stop to work due to mechanical and non mechanical reasons. Breakdown rate is defined with respect to per 10,000 effective kilometers and is expressed as under:

$$\text{Breakdown rate per 10,000 Effective kilometers} = (\text{Total number of breakdowns} * 10,000) / \text{Total effective kilometers}$$

Higher the number of breakdowns per 10,000 kilometers lowers the efficiency and productivity. The number of breakdowns occurred by Punjab Roadways and PRTC for the period 1999-2000 to 2011-2012 has been shown in the table number 4.

Table 4: Breakdown rate of Punjab Roadways and Pepsu Road Transport Corporation

Year	Punjab roadways			PRTC		
	Breakdown	Kilometre	Ratio	Breakdown	Kilometre	Ratio
1999-2000	52	195427000	2.66	72	98811000	7.28
2000-2001	53	189451000	2.80	60	109513000	5.47
2001-2002	60	186898000	3.21	82	114029000	7.19
2002-2003	70	165666000	4.22	78	111205000	7.01
2003-2004	81	143234000	5.65	22	112854000	1.94
2004-2005	86	129000000	6.67	24	113970000	2.10
2005-2006	86	87444000	9.83	30	118718000	2.52
2006-2007	-	64305000	-	24	120341000	1.99
2007-2008	35	41734000	8.38	23	117369000	1.95
2008-2009	32	26447000	12.09	21	112804000	1.86
2009-2010	45	25345000	17.75	21	112804000	1.86
2010-2011	16	33095000	4.83	15	118936000	1.26
2011-2012	27	44059000	6.12	13	114488000	1.13
Exponential growth rate	-8.82	-17.18		-13.54	0.788	

Source: statistical abstract of Punjab, from 1999-2000 to 2011-12.

Analysis of table 4 showed the rate of breakdowns over the kilometer operated by Punjab Roadways and PRTC. In case of Punjab Roadways breakdown rate was decreased by 8.82 but PRTC recorded higher negative exponential growth rate by 13.54. Punjab Roadways breakdowns were 52 in the year 1999-2000 which increased in 2005-06 to 86, but in 2007-08 it decreased to 35 and further decreased to 27 in 2011-12. In case of PRTC, there were 72 breakdowns in 1999-2000, which increased to 82 in year 2001-02. But after 2002-03, the rate of breakdowns decreased constantly and in 2011-12 it were only 13. In 1999-2000, Punjab roadways breakdown ratio was 2.66, which increased to 9.88 in 2005-06. It further increased in 2009-10 to 17.75. It means that the efficiency was decreased due to increased in breakdown rates. In the year 2010-11 and 2011-12 it decreased to 4.83 and 6.12, which is good sign for improving efficiency. PRTC have 7.28 breakdown ratios in 1999-2000, but it decreased to 1.99 in 2006-07 and 1.13 in 2011-12. It showed that PRTC perform well as compared to Punjab Roadways in terms of breakdowns and breakdowns ratio. PRTC was more concerned for reducing the breakdowns for improving efficiency.



Accidents: Another determinant of the quality of service and efficiency of a transport undertaking is the number of accidents suffered by it.

Accident Rate per lakh of effective kilometers:

Total number of accidents per annum * 1, 00,000 / Total effective kilometers per annum

The relationship between efficiency and accidents is inverse i.e. the higher the number of the accidents and hence lower the productivity. The number of accidents occurred by Punjab roadways and PRTC for the period 1999-2000 to 2011-2012 has been shown in the table 5.

Table 5: Accident rate of Punjab Roadways and PRTC

Year	Punjab roadways			PRTC		
	Accidents	Effective kms	Accidents per lakh kms	Accidents	Effective kms	Accidents per lakh kms
1999-2000	8000	195427000	4.093	24000	98811000	24.288
2000-2001	7000	189451000	3.6948	22000	109513000	20.088
2001-2002	8000	186898000	4.2804	24000	114029000	21.047
2002-2003	8000	165666000	4.8289	20000	111205000	17.984
2003-2004	7000	143234000	4.8871	22000	112854000	19.494
2004-2005	9000	129000000	6.9764	24000	113970000	21.058
2005-2006	8000	87444000	9.1487	30000	118718000	25.269
2006-2007	6000	64305000	9.3305	24000	120341000	19.943
2007-2008	5000	41734000	11.9806	23000	117369000	19.596
2008-2009	4000	26447000	15.1245	21000	112804000	18.616
2009-2010	3000	25345000	11.8366	21000	112804000	18.616
2010-2011	3000	33095000	9.06481	15000	118936000	12.611
2011-2012	1000	44059000	2.2696	13000	114488000	11.354
Exponential growth rate	-12.2552	-17.18		-3.18575	0.788	

Source: statistical abstract of Punjab, from 1999-2000 to 2011-12.

The analysis of table 5 showed data regarding the rate of accidents held by Punjab Roadways and PRTC. Punjab roadways showed negative exponential growth rate with 12.25 which was a good sign for indicating the efficiency of organization. It means that over the period of thirteen years the rate of accident occurred by Punjab Roadways decreased. In year 1999-2000, it was 8000 but it decreased to 6000 in 2006-07 and further decreased to 1000 in 2011-12. PRTC showed negative exponential growth rate with 3.18, which was a good sign as the rate of accidents decreased. But PRTC rate of accidents was more than the rate of accidents as compared to Punjab Roadways. PRTC recorded 24.28 per cent accidents per lakh kms with increased in 25.26 per cent in 2005-06 but it decreased to 11.35 per cent in 2011-12. PRTC got succeed for preventing accidents, but in that case Punjab roadways did better for prevention of accidents.

VII. FINDING

1. The performance of PRTC was better as compared to the Punjab Roadways. The number of buses held, number of staff employed and bus staff ratio were higher in PRTC than that in the Punjab Roadways.
2. PRTC staff kilometer was lower as compared to that in Punjab roadways, and indicates higher degree of transport efficiency in PRTC.
3. The size of fleet was higher in Punjab Roadways as compared to that in PRTC throughout the period of study. Further, the size of fleet decreased for both the transport corporations during the period of study but the fleet sized decreased at a higher rate for Punjab Roadways (EGR=5.2%) as compared to that in PRTC (EGR=0.23%) during the same period.
4. The number of breakdowns was lesser in PRTC as compared to Punjab Roadways during the period. The number of breakdowns decreased at a higher rate in PRTC (EGR=-13.54%) as compared to that in Punjab Roadways (EGR=-8.82%) during the same period.
5. The rate of accidents was more in PRTC as compared to that in Punjab Roadways. The PRTC recorded 24.28 per cent accidents per lakh kms which increased to 25.26 per cent in 2005-06 but it decreased to 11.35 per cent in 2011-12. For both the corporations, the number of accidents was reduced during the period but, the Punjab Roadways performance better on this front as compared to PRTC during the same period.



VIII. CONCLUSION

To conclude, the study found that both the transport corporations showed improvement in their operational performance and the PRTC is placed at higher level as compared to Punjab Roadways, on the basis of various indicators taken in the study.

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