

SERVICE EFFICIENCY : A COMPETITIVE EFFECTIVENESS STUDY
IN BUS TRANSPORT INDUSTRY IN INDIA

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BUS TRANSPORT SERVICE IN TAMIL NADU

1. Passenger transport service is extended by many bus operators belonging to both public and private sectors in Tamil Nadu State, India. Co-existence of both the Public and Private sector in this public utility service leads to competition between the two. The policy of the Tamil Nadu government relating to the role of the private sector in running passenger transport has been one of allowing limited competition. Ever since the formation of the State Transport Undertakings (STUs) in the year 1971, private sector has been allowed to operate only to a limited extent. The present policy of the government is that a single private bus operator can run only upto 5 vehicles. However, this ceiling on individual bus operator has in no way restricted the extent of competition between the public and private sectors. The extent of such competition is generally more in mofussil routes.
2. The passengers have opportunity to travel in the buses operated by both private operators and government corporations. Therefore, comparative evaluation of passenger transport service extended by private operators and government corporation buses from the point of passenger service should be of an interesting study. Such a comparative evaluation is expected to reveal the extent of satisfaction derived by the passengers in both the buses and also the areas for improvement in the bus services operated by both private sector and government sector.

OBJECTIVES OF THE STUDY

3. The principal purpose of the present study is to compare the performance of Pattukottai Azhagiri Transport Corporation Limited (PATC)* with that of private bus operation using the rider of passengers' satisfaction in these sectors.

METHODOLOGY AND TOOLS USED

4. Satisfaction of the passengers on the various aspects of their travel is abstract and qualitative. It cannot be measured directly. It can be measured only indirectly through their opinions or responses to

* PATC is one of the 19 Public Sector Transport Undertaking in Tamil Nadu which operates buses in North Arcot Region, which comprises of North Arcot Ambedkar District, Tiruvannamalai Sambuvarayar District, Western part of the South Arcot District and Northern part of the Chinglepet District of Tamil Nadu.

various aspects of their travel. A scale by name "Passenger Satisfaction Scale" (PSS) has been constructed to measure the level of satisfaction of each passenger respondent. The scale is a Likert type-five points scale containing 40 items relating to the various aspects of travel. These 40 items have been grouped under five heads as given below, with the number of items under each head in brackets. i. Passenger Comforts (10), ii. Punctuality and Regularity (10), iii. Safety and Reliability (6), iv. Crew Related Satisfaction (6), and v. Social Responsibility (8). The responses of the respondents to the items have been recorded on five degrees of satisfaction. The most desired response is awarded four scores and the least zero. Thus the Passenger Satisfaction Scale has maximum score of 160 (40x4). The Passengers Satisfaction (PS) score of the individual respondent formed the basis for analysis and interpreting the PS. Paired 't' test has been applied to ascertain the significance of the difference in the average satisfaction scores between PATC and Private bus operations. A sample of 300 commuters have been chosen and interviewed. Convenience sampling method was adopted. The respondents were chosen from different towns of North Arcot Region (Tamil Nadu, South India) where PATC has its depots.

PASSENGER SATISFACTION

AVERAGE PASSENGER SATISFACTION SCORE

5. The passenger satisfaction scores of the respondents range from 44 to 158 (Table I) for PATC bus operation and their average satisfaction score is 99.61. Out of 300 respondents, 148 respondents have their respective

TABLE 1

VARIATION IN PASSENGER SATISFACTION OF THE RESPONDENTS BETWEEN PATC AND PRIVATE BUSES

Bus Operation	Average Satisfaction Score	Range	No. of Respondents	
			Above ASS	Below ASS
PATC	99.61	44 - 158	148	152
PRIVATE	97.85	02 - 154	168	132

satisfaction scores above the average and 152 respondents below the average. It has been observed that the Passenger Satisfaction Scores of the sample respondents in private buses is 97.85 and the individual scores range from 2 to 154. The number of respondents above the average satisfaction score were 168 and 132 respondents were below the average satisfaction score. As the average PSS is above 60 percent in both the sectors of bus operations, it is inferred that commuters are satisfied with regard to private bus operations too. However, as the mean satisfaction score is higher for PATC buses than that for private buses it can be inferred that the respondents are relatively more satisfied with their travel in PATC buses than in private buses.

LEVEL OF PASSENGER SATISFACTION

6. The respondents were further classified into three groups with regard to their level of satisfaction (Table II) viz., 1. Low Satisfied, 2. Medium Satisfied and 3. High Satisfied on the basis of their individual Passenger Satisfaction Scores. In the case of PATC buses, out of 300 respondents, none falls in the category of 'Low Satisfaction'. There are 255 respondents representing 85 per cent, in the 'Medium Satisfaction' group and 45 respondents representing 15 percent in the 'High Satisfaction' group. With regard to private buses, out of 300 respondents, 5 respondents representing less than 2 per cent have 'Low Satisfaction', 248 respondents in 'Medium Satisfaction' group constituting 82 per cent and 47 respondents representing 16 per cent of the sample, are in 'High Satisfaction' group. This observation further confirm the previous inference that the passengers are satisfied with both the operation of PATC buses as well as Private buses.

TABLE II

EXTENT OF PASSENGER SATISFACTION OF THE RESPONDENTS

Bus Operation	Level of Satisfaction			Total
	Low	Medium	High	
PATC	Nil	255 (85)	45 (15)	300 (100)
PRIVATE	05 (02)	248 (82)	47 (16)	300 (100)

TABLE III

DIFFERENCE IN PASSENGER SATISFACTION BETWEEN
PATC AND PRIVATE BUSES : PAIRED 't' TEST

No. of Respondents	Difference		't' Value	Significance
	Mean	SD		
300	1.7	28.00	1.05	NS

7. The Paired 't' Test reveals that the difference in the average satisfaction scores between PATC and Private buses is not statistically significant (Table 3). Hence, the hypothesis that the passenger are more satisfied with their travel in PATC buses than in private buses is rejected.

COMPONENTS OF PASSENGER SATISFACTION

8. Satisfaction of the passengers with their travel arises from the extent of satisfaction they get from various aspects of their travel. Therefore the Passenger Satisfaction Scale constructed in this study consists of items relating to 40 aspects of travel. These 40 items have been grouped under five head(components) and the relevant questions related to each head have been given under the heads, as shown in Table IV. The extent of overall passenger satisfaction derived by a passenger depends on the extent of satisfaction derived by him from the various aspects of his travel under these heads. Hence the extent of the respondents' satisfaction with the various aspects has been attempted and a comparison has been made between PATC and private buses so as to identify the strong and weak areas in relation to each other (vide Table IV).

PASSENGER COMFORTS

9. Any passenger, young or old, male or female, educated or uneducated, would expect the bus operators to provide a comfortable travel. Good seating arrangements, proper ventilation, sufficient space inside the bus, proper lighting, cleanliness and ease in boarding and alighting are the aspects that may provide comforts to the passengers which, in turn, may enhance the level of satisfaction. It is observed that the average satisfaction score of the respondents as to the 'Passenger Comforts' in PATC buses is 25.85 (65 per cent) against the total score of 40. The number of respondents above and below the average satisfaction

TABLE IV

COMPONENTS OF PASSENGER SATISFACTION
IN TRAVELING IN PATC BUSES

S.No	Components	Public		Private	
		Average Satis- faction score	SD	Average Satis- faction score	SD
1	Passenger Comforts	25.85	6.03	27.08	7.59
2	Punctuality and Regularity	24.21	6.73	23.42	7.36
3	Safety & Reliability	15.54	3.91	13.62	4.74
4	Crew Related Satisfaction	14.86	4.39	14.30	4.60
5	Social Responsibility	19.15	5.03	19.43	5.24
6	Overall Passenger Satisfaction	99.61	20.80	97.85	23.88

score are 165 and 135 respectively. The average satisfaction score of sample respondents for private buses is 27.08 (68 per cent) which is marginally higher than that of PATC buses and the number of respondents above and below the average satisfaction score are 167 and 133. It is inferred that the passengers are relatively more satisfied with regard to Passenger Comforts in private buses than in PATC buses. This is in spite of the fact that PATC mostly plays the lead role in introducing new buses by replacing the buses after 6 years of operation or 7 lakh Kms run, whichever is earlier. The lower satisfaction in this component for PATC buses may be attributed, to some extent, to the poor maintenance of buses, including uncleanliness, non-replacement of broken or worn-out parts and unattended minor repairs, whereas the private bus operators give more attention to these aspects.

PUNCTUALITY AND REGULARITY

10. Punctuality and regularity is another criterion for the efficient operation of buses. If the operator does not follow punctuality, it may cause great hardship to the commuters - not only that they may go to their place of destination late, but at times some of them may also miss the changeover bus/train, which further delays

their travel. Regularity must also be adhered to, in the sense that there should be no cancellation of any service/trip, which may disappoint the commuters. An attempt has been made to study the opinion of the sample respondents with regard to Punctuality and Regularity. It has been observed that the average Passenger Satisfaction Score for Punctuality and Regularity of bus services has been 24.21 (61 per cent) for PATC operations and 23.42 (59 per cent) for private bus operations out of the total score of 40. The number of respondents above and below the average satisfaction score has been respectively 151 and 149 for PATC buses and 160 and 140 for private buses. It is inferred that the passengers are satisfied with the Punctuality and Reliability of both the operators viz., PATC and Private. However, comparison of PATC and private operators in this regard reveals that the passengers' satisfaction is relatively more for PATC buses than for private buses.

SAFETY AND RELIABILITY

11. No accidents, negligible break-downs and consistency of speed are some of the aspects that the commuters would expect from any bus operator. The related questions of this nature were posed to the sample respondents under the heading 'Safety and Reliability' and their opinion were sought as to their satisfaction with these aspects in PATC and private buses. It has been noted that PATC buses have been placed in the high order, where the average passenger satisfaction score is 15.54 (65 per cent) out of the total score of 24 and the average score for private buses is 13.62 (57 per cent). The number of respondents above and below the average score has been 158 and 142 for PATC buses and 167 and 133 for private buses respectively. It is inferred that the level of satisfaction as to 'Safety and Reliability' has been higher in PATC buses than in private buses. The reason for this phenomenon may be that the PATC drivers are well-trained and work for limited hours in a day. Apart from this, PATC buses maintain consistency in speed, whereas the private buses stop at many unauthorised stops, thereby wasting time and afterwards run at a greater speed to cover the distance within the stipulated time, which may, in turn, lead to accidents.

CREW RELATED SATISFACTION

12. Crew members are the persons who have significant role to play in determining the passengers' satisfaction. They are the persons who have direct contact with the passengers of different background and needs. Courteous behaviour and helpful attitude of the crew is expected to enhance the level of satisfaction of the commuters. Passengers' average satisfaction scores

with regard to crew-related aspects have been 14.86 (62 per cent) against the total score of 24 for PATC buses and 14.3 (60 per cent) for private buses. The number of passengers above and below the average satisfaction score has been 169 and 131 respectively for PATC buses and 167 and 133 respondents in the case of private buses. Thus, it is inferred that the attitude of the passengers towards the crew has been almost the same both in the case of PATC buses as well as in the case of private buses. Difference in ownership has not contributed to difference in crew related satisfaction.

SOCIAL RESPONSIBILITY

13. Business organisations are not only economic institutions but also a social system and the products and consequences of business are inevitably social in a far broader sense than being economic. This philosophy equally applies to the business of bus operation too. Social obligations that the bus operator may undertake include concession to specific categories of less privileged passengers, such as the handicapped, the aged and students, plying buses in uneconomic routes and operating services during the lean period, late night and early morning hours. It has been observed that the average satisfaction score is 19.15 (60 per cent) for PATC against the total score of 32 and for the private buses it is 19.43 (61 per cent). The number of respondents whose satisfaction scores are above the average satisfaction score are 146 and below the average satisfaction score are 154 for PATC and the respective figures for private buses are 147 and 153.
14. It is inferred that the respondents are satisfied with regard to the social obligations rendered by both the operators. However, the respondents are marginally more satisfied with the operation of private buses in this regard than with the PATC buses, which is supposed to cater to the needs of the society in a bigger way than the private operators. Being a big operator, PATC is better placed in discharging social responsibility than the private bus operators. However, at times, the organisation's rules and regulations make the PATC unable to reach the needy people, whereas in the case of Private bus operations facilities such as concessions, carrying luggage etc. have been made available with less formalities, at times, the conductor of the bus himself uses his discretion and allows such concessions.

PASSENGER SATISFACTION INDEX (PSI)

15. Passenger satisfaction is the key to successful traffic management. In the present analyses, the overall passenger satisfaction of the respondents as well as

their satisfaction as to the different components such as comfort, punctuality and regularity, safety and reliability, crew related satisfaction and social responsibility have been studied for both PATC and private bus operation and comparison has been made thereto. In order to arrive at a single figure which may depict the level of passenger satisfaction for easy comparison, Passenger Satisfaction Index (PSI) has been designed for the two sectors on the line of Quality Service Index (QSI) as developed by Dr.P.G.Patankar (1986). PSI is a weighted Index computed by assigning appropriate weights for different service factors. As Safety and Reliability is the most important aspect that a passenger would expect from a bus operator than any other comfort or facility, the maximum weight of 30 is assigned to it; it is followed by punctuality and regularity for which 20 weights have been assigned. The rest of the components viz., passenger comfort, crew related satisfaction and social responsibility have been given equal weights of 10 each. Thus it has been attempted to arrive at a single figure of PSI by multiplying the Average Satisfaction Scores of the respondents for the different questions under each component by the respective weight assigned to the component. This process is depicted in the formulae given below:

$$PSI = \frac{AW_1 + BW_2 + CW_3 + DW_4 + EW_5}{W_1 + W_2 + W_3 + W_4 + W_5}$$

where,

A = Average Satisfaction Score for Passenger Comforts
 B = Average Satisfaction Score for Punctuality and Regularity
 C = Average Satisfaction Score for Safety and Reliability
 D = Average Satisfaction Score for Crew related Satisfaction
 E = Average Satisfaction Score for Social Responsibility

W₁ = Weight assigned to Passenger Comfort = 10
 W₂ = Weight assigned to Punctuality and Regularity = 20
 W₃ = Weight assigned to Safety and Reliability = 30
 W₄ = Weight assigned to Crew related Satisfaction = 10
 W₅ = Weight assigned to Social Responsibility = 10

The PSI, thus computed has been 19.36 for PATC and 18.67 for private buses. It is inferred that passengers are relatively more satisfied with PATC buses than with private buses in North Arcot Region.

CONCLUSION

16. The study of passengers' satisfaction reveals that the passengers are satisfied with the operation of buses run by public as well as private sector in North Arcot Region of Tamil Nadu State of Indian. However, the passengers are relatively more satisfied with public sector bus operation, namely PATC, than the private sector operation. The level of passenger satisfaction with regard to the different operational aspects of PATC and private bus operation reveals that the passengers are relatively more satisfied with the 'Punctuality and Reliability' followed by 'Safety and Regularity' of PATC buses whereas in the case of private buses, passengers are relatively more satisfied with 'Passengers' Comfort' than that in PATC buses. As to the aspects of 'Crew behaviour' and 'Social Responsibility', the passengers are equally satisfied with both the sectors. From above observation of the passenger satisfaction with regard to varies service factors, it is concluded that the Public Transport Corporation may play a high profile in case of long route services, with its vast potential to operate such route with large number of fleet, huge number of crew, adequate maintenance and infrastructural facilities. In the case of short route service the STUs can play low profile leaving a big share to the private sector, which can afford to provide more personalised service than the public sector corporations.

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