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ENHANCED SERVICE QUALITY LEADING TO COMMUTERS' SATISFACTION PERKS UP USAGE OF PUBLIC ROAD TRANSPORT

G. Balamurugan and S. Gopi

Department of Management Studies, Mepco Schlenk Engineering College, India

Abstract

In the global environment of intense competition and continuous change, the state road transport undertakings need to focus on improving the level of their services and enhance the daily commuter's satisfaction in order to achieve long-term survival. Evaluating the level of services provided by the existing public mass road transit service providers can help the policymakers to make better decisions for improving commuter satisfaction. The objective of the present research is to (a) measure the level of services provided by the state road transport corporations in Tamil Nadu and (b) evaluate the satisfaction of its daily commuters. An improved method that incorporates the daily commuters, who use both the public and private modes of transport in Tamil Nadu, is deployed for the evaluation. Moreover, the present study investigates the gap between commuters' expectations and commuters' perceptions with regard to the level of the services offered by the state road transport corporations in Tamil Nadu.

The empirical study was undertaken using SERVQUAL (tangibles, reliability, responsiveness, assurance and empathy) questionnaire in the seven zones of Tamil Nadu State Transport Corporations - TNSTC (32 Districts of Tamil Nadu). In total, 2788 questionnaires with valid responses were collected from the daily commuters using both personal and public mode transit. Results showed that there is a negative gap between the perception of the present service offered by the state transport corporations and the expectations of the daily commuters. Further, the proposed model suggested that the tangible dimensions of service quality have significant influence on the commuters' satisfaction towards public mass road transit system in Tamil Nadu.

With these findings, it is concluded that the service dimensions of public transport policy of the Government need a slight change, which would strongly encourage the daily commuters to use public transport.

Keywords:

SERVQUAL, Tangibles, Expectation, Commuters' Satisfaction, Intention

1. INTRODUCTION

In the past few years, Associations of State road transport undertakings in India have focused on the improvement of service quality and daily commuters' satisfaction towards public mass road transport. Improvement of commuters' satisfaction through service quality of public mass road transport is an essential condition for the development of an effective transportation system and to encourage modal shift of personal mode commuter's to public transit for their daily commute [1]. Promoting public mass road transit as a choice for the daily commute is a requirement to meet the future mobility demand [2]. It might have evidenced the positive effects of service quality of public mass road transit on the travel behaviour of the daily commuters' [3] [4]. This fact could mitigate many socioeconomic problems like carbon emission, road accidents associated with the personal vehicles and high consumption of petroleum and diesel products [5].

The purpose of this research is to assess the service quality attributes, based on needs and expectations expressed by the commuters in Tamil Nadu and also to explore the relationship between service quality attributes and the daily commuters' satisfaction towards the public mass road transport in Tamil Nadu.

The SERVQUAL questionnaire proposed by Parasuraman et al. [6] [7] has been used to measure the service quality attributes of public mass road transport. SERVQUAL questionnaire contains five dimensions including tangibles, reliability, responsiveness, assurance and empathy, and twenty-two associated items. Based on the reviews these five dimensions and twenty-two associated items have been identified as more appropriate for evaluating the transport service businesses [8]. To measure the commuters' overall satisfaction level towards the public mass road transport system in Tamil Nadu, an additional section comprising two items was added to the questionnaire. Structural Equation Model (SEM) is proposed to estimate interrelated dependence relationships between service quality attributes and commuters' satisfaction [9].

Contrary to the exponential growth of personal vehicles, public mass road transit system has not improved significantly in Tamil Nadu [10] [11]. There are 34,725 public mass road transit vehicles (public and private stage carriages and mini buses) and 2 crores personal vehicles (moped, motor cycle and scooter) available on road as on March 2019 in Tamil Nadu [12]. Due to the convenience and flexibility of personal vehicles, majority of daily commuters in Tamil Nadu prefer personal vehicle (Car/Scooter/ Motor Cycle) as their primary mode of transport [13]. Considering the aforementioned issues, it is felt necessary that a research is required on the service quality attributes and commuters' satisfaction towards public mass road transit commuting system in Tamil Nadu to make the existing transportation system better for the commuters.

2. METHODS AND MATERIAL

The service quality data is collected through an Intensive survey using a structured SERVQUAL questionnaire which was designed based upon the review of related literatures and a pilot study among daily commuters'[14] [15]. The daily commuters' in Tamil Nadu within the age category of 18-58 years with daily commuting distance of 5-30Km are considered as the population of this research. Both personal and public mass road transit mode commuters are considered in this research. Clustering is used to divide the entire population into seven zones based on the Tamil Nadu State Transport Corporations (TNSTC) (Chennai, Coimbatore, Kumbakonam, Madurai, Salem, Tirunelveli and Vilupuram) [16].

The sample size of an individual TNSTC zone is calculated as 385 (with 95% confidence level) and total sample size is found to be 2695 (385×7 Zones of TNSTC) [17]. The district wise sample

size is attained proportionately and the judgmental sampling method is used to select individual samples. Total sample size of the study is 2788 daily commuters of both personal transport mode and public transport mode from 32 districts of Tamil Nadu (Table.1).

Table.1. Sample Distribution among seven zones

S. No.	Tamil Nadu State Transport Corporations	Sample Size
1	TNSTC, Coimbatore	414
2	TNSTC, Kumbakonam	415
3	TNSTC, Vilupuram	389
4	TNSTC, Salem	396
5	TNSTC, Madurai	391
6	TNSTC, Tirunelveli	393
7	MTC, Chennai	390
Total		2788

Daily commuters' demographic profile (Table.2) indicates that majority of them are male, married, in the age category of 26-35 and engaged in private employment with an average income of Rs.2,50,000 per annum. With respect to the commuting behaviour, majority use personal mode for their regular commute. Among personal mode commuters', two wheelers (moped, motor cycle and scooter) are found to be their primary mode of daily commute.

Table.2. Demographic classifications of respondents

Demographic Classifications		No. of Respondents	(%)
Gender	Male	1459	52%
	Female	1329	48%
Age	18-25 years	692	25%
	26-35 years	999	36%
	36-45 years	706	25%
	46-55 years	322	12%
	Above 56 years	62	2%
Marital Status	Married	1539	55%
	Unmarried	1249	45%
Daily Commute	Public Mode	1586	57%
	Personal Mode	1202	43%

3. ANALYSIS AND DISCUSSION

The data were analyzed using SPSS and AMOS. The content and construct validity were analytically tested for the empirical data that were collected through the SERVQUAL questionnaire. The content validity of the questionnaire was tested with the help of the pilot testing technique. Reliability testing and the goodness of fit to the proposed theoretical model have been used to test the Construct validity. The five dimensions of SERVQUAL questionnaire (tangibles, reliability, responsiveness, assurance, empathy) and the additional factor of measuring commuters' satisfaction were assessed for their reliability, and for the goodness of fit to the proposed theoretical model. Unidimensionality was tested using Explanatory Factor Analysis (EFA) and reliability using the statistical measure "Cronbach Alpha" [18] [19] [25]. All tests concluded that all scales used after minor amendments are valid and reliable (see Table.3 for more details).

Table.3. Construct validity and reliability (*$p > 0.05$)

Construct/Factors	Items	Cronbach Alpha	Significance
Tangibles	6	0.722	0.000
Reliability	4	0.668	0.000
Responsiveness	4	0.850	0.000
Assurance	4	0.912	0.000
Empathy	4	0.753	0.000
Commuters Satisfaction	2	0.822	0.000

The Confirmatory Factor Analysis (CFA) was used to assess the goodness of fit of five major dimensions of SERVQUAL questionnaire. The Root Mean Square Error of Approximation (RMSEA) and the Comparative Fit Index (CFI) are used as the fit indices [20]. A RMSEA of 0.05 or less and a CFI around 0.90 or above have been considered to estimate the model fit and the data validity [21]-[24]. Results indicate that all loadings are significant at the $p<0.05$ level. Extracted measures for all the constructs are reliable and satisfactory and the results are exhibited in the Table.4.

Table.4. Goodness of Fit of the proposed model (N=2788)

S. No.	Indices	Initial Model
1	P Value	0.000
2	RMR	0.263
3	GFI	0.877
4	AGFI	0.831
5	PGFI	0.638
6	CFI	0.900
7	TLI	0.080
8	P-Ratio	0.840
9	NFI	0.599
10	RMSEA	0.0327

The Table.5 shows the results of gap analysis for each service dimension on a seven-point scale based on SERVQUAL model. Considering the results, it was found that there is a gap in every aspect of service quality. The negative sign in the service quality gap in Table.5 indicates that the average of observed expectations of the commuters' is more than their current perceptions.

Table.5. Service Quality Gaps

Dimensions	Expectations (Avg.)	Perceptions (Avg.)	Difference (Gap)
Tangibles	6.51	4.50	- 2.01
Reliability	6.20	4.52	- 1.68
Responsiveness	4.15	4.05	- 0.10
Assurance	6.42	4.55	- 1.87
Empathy	5.50	3.86	- 1.64

As seen on Table.5, gap scores are negative for all five SERVQUAL dimensions. The highest negative gap is described in the tangible dimension (-2.01) and the lowest in the responsiveness dimension (-0.10). Overall, it seems that commuters expect more than they actually receive. Table.6 exhibits the gap scores for all the attributes of five SERQUAL dimensions.

Table.6. SERVQUAL Gap Scores

Attributes	Expectations (Mean)	Perceptions (Mean)	GAP Scores
Tangibles			
Parking Facilities in Bus stops	6.5	3.9	-2.6
Proper Bus Maintenance	6.9	4.7	-2.2
Adequate Facilities in Bus Stand	6.5	4.6	-1.9
Comfortable seats in Buses	6.7	4.8	-1.9
Route & schedule Information in Bus Stand	6.2	4.4	-1.8
Equipping with modern technology	6.3	4.6	-1.7
Reliability			
Punctual arrival and departure	6.3	4.2	-2.1
Error-free services of Transport corporations	6.4	4.5	-1.9
Uninterrupted Transport service	6.1	4.8	-1.3
Drivers readiness to stop at all stops	6	4.6	-1.4
Responsiveness			
Provision of efficient service	4.5	3.9	-0.6
Helpful communication with Clarity	4.8	4.2	-0.6
Accommodation of commuters requests by Bus Driver / conductor	4.3	4	-0.3
Employees Willingness to help commuters	3	4.1	1.1
Assurance			
Feeling of Safety	6.3	4.2	-2.1
Polite response of employees	6.6	4.5	-2.1
Knowledge of Drivers / conductors	6.5	4.7	-1.8
Trust on corporation employees	6.3	4.8	-1.5
Empathy			
Personal attention to commuters	5.6	3.5	-2.1
Courtesy of employees	5.5	3.6	-1.9
Operations of buses convenient to commuters	5.9	4.2	-1.7
Bus Drivers / Conductors loyalty to commuters during difficult times	5	4.1	-0.9

Examining the mean of every single attribute of the SERVQUAL questionnaire (Table.6), it can be concluded that commuters expect Proper bus maintenance (mean=6.9), Comfortable seats in buses (mean=6.6), Polite response of employees (mean=6.6), Adequate facilities in bus stand (mean=6.5), Knowledge of Drivers/conductors (mean=6.5) and Parking facilities in bus stops (mean=6.5). Despite the high expectations of commuters' in the five aforementioned attributes, their actual perceptions are quite unpleasant for the tangible dimensions, as the average mean difference (average gap score) between expectations and perception is -2.01.

The lowest perception scores (below 4) are found in the following areas: (a) Personal attention to commuters' (mean=3.5), (b) Courtesy of employees (mean=3.6), (c) Parking Facilities in Bus stops (mean=3.9) and (d) Provision of efficient service (mean=3.9). The higher perception scores are found in three attributes: (a) Comfortable seats in buses (mean=4.8), (b) Uninterrupted transport service (mean=4.8) and (c) Trust on corporation employees (mean =4.8).

The higher (negative) gap score is found in the "tangible" dimension. More specifically, the Parking Facilities in Bus stops attribute has the highest negative gap score (-2.6). The only attribute with a positive gap score (1.1) is Employees Willingness to help commuters' (indicating that the actual perception of commuters' is higher than their Expectation).

To further support and enhance the results provided from the gap analysis, the Structural Equation Modelling (SEM) technique was also used. The SEM was calibrated by using the AMOS software and the results are exhibited in Fig.1 [19]. The SEM included five independent constructs and one dependent construct, i.e. commuter satisfaction. From the results of SEM it was identified that all the service quality factors (tangibles, reliability, responsiveness, assurance and empathy) had a statistical significant effect on commuter satisfaction. More specifically, the dimension "tangible" was found to have the highest effect on commuter satisfaction (r=0.46), followed by

assurance, (r=0.26), empathy (r=0.18) responsiveness (r=0.12) and reliability (r=0.10).

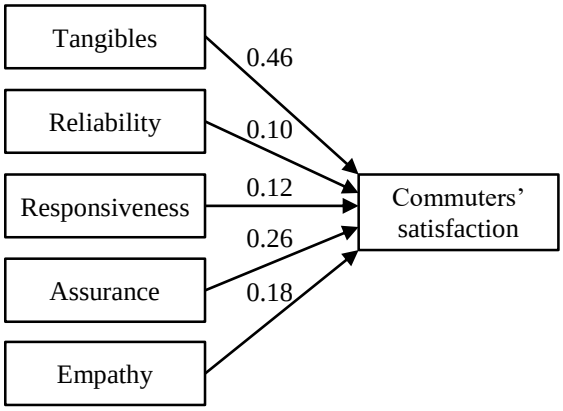

Fig.1. Proposed Structural Equation Model

4. CONCLUSION

The SERVQUAL analysis revealed that for all the service quality dimensions (tangibles, reliability, responsiveness, assurance and empathy) of mass public road transport system in Tamil Nadu, there is a negative gap between the perception of daily commuters and their expectations. Mostly, daily Commuters expect proper bus maintenance, comfortable seats, and polite response of employees, adequate facilities in bus stand, skilled bus drivers/conductors and parking facilities at bus stops from the Transport corporations. According to the results of proposed SEM, service quality dimensions like tangibles, assurance and empathy have more significant influence on commuters' satisfaction towards public mass road transport.

It is evidenced from the results that the tangible factors like proper Bus maintenance, convenient bus seats and parking facilities at bus stops are found to be influencing factors to increase the utilization of public mass road transport in Tamil Nadu. The results of this research may provide useful information for the transport corporations in Tamil Nadu to improvise the level of service quality attributes so as to ensure that its service quality meets commuters' expectations. Hence, the present empirical approach may support policy makers to create an effective and eco-friendly transport system in Tamil Nadu transforming the personal mode commuters to use public mode through service improvements.

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