

Determinants of Passenger Satisfaction and Behavioural Intention: Evidence from Tamil Nadu State Corporation (TNSTC) Bus Services

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Abstract: This study examines passenger satisfaction and behavioral intention towards the services of Tamil Nadu State Transport Corporation (TNSTC) by applying the Theory of Planned Behavior (TPB). This study aimed to analyze the influence of key psychological constructs— attitude Towards behavior, subjective norms, and perceived behavioral control —on passengers’ intention to use public bus transport services. A structured questionnaire was administered using convenience sampling, where 150 questionnaires were distributed, and 131 valid responses were collected for analysis. This study employs descriptive statistics, correlation analysis, and regression analysis to evaluate the relationships among the variables. The findings revealed that attitude Towards behavior and perceived behavioral control had a significant positive impact on behavioral intention, while Subjective Norms showed a moderate influence. Additionally, service-related factors, such as reliability, affordability, and accessibility, were found to contribute significantly to overall passenger satisfaction. This study provides practical implications for the TNSTC to enhance service quality and increase passenger retention by focusing on customer-centric strategies. It also contributes to the existing literature by extending the application of TPB in the context of public transportation in developing economies.

Keywords: Passenger Satisfaction, Behavioural Intention, Theory of Planned Behaviour, Public Transport, TNSTC, Service Quality

Introduction

Public transportation plays a vital role in the economic and social development of cities. (Sivaks, 2021) It provides an affordable and convenient mode of travel for a large section of the population in India. Government-operated bus services are the backbone of urban mobility in several Indian cities. In Tamil Nadu, the Tamil Nadu State Transport Corporation (TNSTC) is one of the major public transport providers, offering reliable and economical transportation services to millions of passengers daily. TNSTC city buses serve as an essential means of transportation for students, employees, traders, and the general public in Tamil Nadu.

Madurai is one of the oldest and most important cities in Tamil Nadu, India, and is known for its cultural heritage, educational institutions, and commercial activities. With a rapidly growing population and increasing urbanization, the demand for efficient public transportation in Madurai is increasing. Tamil Nadu State Transport Corporation (TNSTC) city buses connect various parts of the city and surrounding areas, making daily commuting easier for thousands of passengers.

Passenger satisfaction is an important factor in evaluating the performance and effectiveness of public transportation. This reflects how well the service meets the expectations and needs of the passengers. Factors such as punctuality, bus frequency, comfort, safety, cleanliness, staff behavior, and ticket fare influence passenger satisfaction. Understanding passenger satisfaction helps transport authorities identify service gaps and improve the service quality.

In recent years, passengers have become more conscious of the quality and reliability of transportation services. If public transport services fail to meet passenger expectations, people may prefer alternative modes of transport

such as private vehicles, auto-rickshaws, or ride-sharing services. Therefore, improving passenger satisfaction is essential for maintaining the usage and reputation of public transport systems.

This study focused on analyzing the satisfaction levels of passengers using TNSTC city buses in Madurai. This study aims to understand passengers' opinions and experiences regarding various aspects of bus service. By collecting and analyzing passenger responses, this study attempts to identify the strengths and weaknesses of the existing bus services.

The findings of this study will be useful for transport authorities to improve the quality of services provided by the TNSTC city buses. It will also help suggest measures to enhance passenger comfort, efficiency, and overall satisfaction of the service. Ultimately, improving public transportation services can contribute to better urban mobility and a higher quality of life for the residents of Madurai.

History of TNSTC Bus Service in Tamil Nadu: Its Growth and Importance

Before the establishment of the TNSTC, transportation in Tamil Nadu was primarily handled by private bus operators. During the early 20th century, private companies operated buses in the major towns and cities. Rural areas have been largely neglected, and transportation facilities are limited in these areas. The government has realized the need for a well-structured public transportation system to ensure equal transportation facilities for all people, including those living in remote areas. In the 1960s and the 1970s, the Government of Tamil Nadu decided to nationalize bus services to improve transportation and ensure better operational control. The nationalization process aimed to reduce the dominance of private operators and provide affordable and safe public transport.

The Tamil Nadu State Transport Corporation was officially formed in 1972 by the Government of Tamil Nadu to manage and operate bus services throughout the state. The corporation was established to provide efficient and systematic public transportation services. The TNSTC was divided into different regional transport corporations to manage operations effectively. These regional divisions facilitated better administration, route planning, and bus maintenance. The formation of the TNSTC improved connectivity between rural and urban areas and ensured regular bus service. The TNSTC operates through different regional divisions to manage its bus services efficiently. These divisions include the TNSTC Madurai, Coimbatore, Salem, and Villupuram. Each division is responsible for operating buses in specific districts and maintaining depots, staff, and schedules. This decentralized structure helps in better management and a quick response to local transportation needs of the residents. The regional division system strengthened the overall performance of the TNSTC. The future of TNSTC focuses on modernization and digital transformation. The government plans to introduce electric buses, improve bus depots, and expand online services. Smart ticketing, GPS tracking, and real-time bus information systems are expected to be implemented in the future.

Statement of the Problem

Public transportation plays an important role in the daily lives of people, especially in urban areas, where many individuals depend on buses to commute to work, education, shopping, and other activities. In Madurai, Tamil Nadu, Tamil Nadu State Transport Corporation (TNSTC) city buses are a primary and cost-effective means of transportation for thousands of passengers daily. These buses are extensively utilized by students, employees, women, senior citizens, and other members of the public. However, passengers may face various issues while using city buses, such as overcrowding, waiting time, cleanliness, comfort, safety, punctuality, and behavior of the bus staff. These factors can influence passenger satisfaction levels and overall travel experience. Passenger satisfaction is an important indicator of the quality of public transport services and helps transport authorities understand the needs and expectations of users. If the services do not meet passengers' expectations, they may lead to dissatisfaction and discourage people from using public transportation. Therefore, it is necessary to evaluate how passengers perceive the services provided by TNSTC city buses in Madurai. Understanding their

satisfaction levels will help identify the strengths and weaknesses of the service and provide suggestions for its improvement.

Objectives of the study:

1. To analyze the socio-economic profile and frequency of usage of TNSTC city bus passengers in Madurai.
2. To examine the level of passenger satisfaction with respect to the tangible and intangible factors of TNSTC city bus services.
3. To evaluate passengers' perceptions and behavioral intentions towards TNSTC services using the Theory of Planned Behavior (TPB), specifically through attitude towards behavior (ATB), Subjective Norms (SN), and perceived behavioral control (PBC).
4. To investigate the relationship between passenger satisfaction, frequency of usage, and behavioral intention to use TNSTC bus services.
5. To identify the major problems faced by passengers and assess their impact on satisfaction and behavioral intention.

Research Design

This study adopts an analytical research design, focusing on examining the relationship between socioeconomic factors, passenger satisfaction, frequency of usage, and behavioral intention through the application of the theory of planned behavior (TPB) using statistical tools. A total of 150 questionnaires were distributed among the respondents, of which 131 were completed and returned, yielding a usable response rate for analysis. Respondents were selected using a convenience sampling method. Data were collected using a structured questionnaire that asked passengers about their satisfaction with bus services. Secondary data were collected from various sources, such as books, journals, government reports, websites, newspapers, and articles related to public transportation and passenger satisfaction.

Demographic Profile of the Sample Respondents

Understanding the demographic characteristics of respondents is essential for analyzing and interpreting research outcomes. Demographic variables such as gender, age, educational qualification, occupation, and monthly income provide a clear picture of the respondents' backgrounds and help assess the sample's diversity and representativeness.

In this study, 131 respondents were surveyed to examine their characteristics across key demographic dimensions. These variables play a significant role in influencing individuals' perceptions, attitudes, and behaviors related to the subject of study. By analyzing the demographic profile, the researcher can better understand the context of the responses and ensure meaningful interpretation of the results.

S.No	Variable	Category	No. of Respondents	Percentage
1.	Gender	Male	63	48.1
		Female	68	51.9
		Total	131	100
2.	Age	Below 20	51	38.9
		21 – 30	48	36.6

		31 – 40	19	14.5
		41 – 50	7	5.3
		Above 50	6	4.6
		Total	131	100
3	Education Qualification	No Formal Education	9	6.9
		School Level	22	16.8
		UG	61	46.6
		PG	31	23.7
		Professional	8	6.1
		Total	131	100
4	Occupation	Student	73	55.7
		Private Employee	23	17.6
		Government Employee	14	10.7
		Homemaker	14	10.7
		Business	7	5.3
		Total	131	100
5	Monthly Income	Below Rs.10,000	87	66.4
		Rs.10,001 – Rs.20,000	23	17.6
		Rs.20,001 – Rs.30,000	10	7.6
		Above Rs.30,000	11	8.4
		Total	131	100

The demographic analysis clearly indicates that the respondents are predominantly young, educated, student-oriented, and belong to a low-income group. Hence, the findings of this study are likely to reflect the perceptions and behaviors of the youth segment rather than that of the entire population.

Travel Behaviour Of Respondents

Understanding respondents' travel behavior is an important aspect of analyzing the usage pattern and effectiveness of public transportation services. Variables such as frequency of usage, purpose of travel, and average distance travelled provide valuable insights into how and why individuals depend on public transport systems such as TNSC city buses. The following table presents a comprehensive overview of the respondents' travel behavior, highlighting their frequency of bus usage, primary purpose of travel, and average distance they commute. This serves as the basis for further analysis and interpretation in this study.

S.No	Variable	Category	No. of Respondents	Percentage
1.	Frequency of Using TNSC City Bus	Daily	83	63.4
		Weekly	16	12.2
		Occasionally	14	10.7
		Rarely	18	13.7
		Total	131	100
2.	Purpose of Travel	Work	24	18.3
		Education	71	54.2
		Business	6	4.6
		Personal	28	21.4
		Others	2	1.5
		Total	131	100
3	Average Distance Travelled	Below 5 km	28	21.4
		5–10 km	64	48.9
		Above 10 km	39	29.8
		Total	131	100

The findings indicate that TNSC city buses serve as a crucial and dependable mode of transportation, particularly for students and daily commuters. The service is primarily used for educational and routine travel over moderate distances, highlighting its importance in supporting urban mobility and accessibility in the region.

Customer satisfaction towards Tangible and Intangible Factors of TNSC Bus Service

Customer satisfaction is a key indicator for evaluating the performance and effectiveness of public transportation.(Morfoulaki et al., 2010) It reflects the perceptions and experiences of users regarding various aspects such as service quality, affordability, comfort, and staff behavior. Measuring satisfaction levels helps identify strengths and areas that require improvement to enhance overall service delivery Lhamu and Alam (2026).

In this study, an attempt was made to assess the satisfaction level of respondents towards TNSC city bus services based on the selected service dimensions. A total of 131 respondents were asked to express their level of satisfaction on a five-point scale ranging from *Highly Satisfied* to *Highly Dissatisfied*.

The table below presents a combined analysis of the tangible and intangible factors influencing passenger satisfaction with TNSC city bus services.

Tangible factors refer to physical and service-related aspects, such as availability, seating comfort, and fare affordability. Intangible factors include experiential and perception-based elements, such as punctuality, safety, cleanliness, and information systems.

This integrated table provides a **holistic view of service quality**, enabling a better understanding of how both physical infrastructure and service experience contribute to overall passenger satisfaction.

S.No	Particulars	Highly Satisfied	Satisfied	Neutral	Dissatisfied	Highly Dissatisfied	Total
1	Availability of Buses	36	65	25	3	2	131
2	Seating Comfort	24	61	35	8	3	131
3	Fare Affordability	23	64	32	11	1	131
4	Behaviour of Driver	35	61	23	7	5	131
5	Behaviour of Conductor	20	65	33	5	8	131
6	Bus Pass System reduces expenses	35	64	20	6	6	131
7	Availability for Students	22	63	32	11	3	131
8	Frequency of Buses	32	63	27	4	5	131
9	Punctuality of Buses	19	61	33	11	7	131
10	Route Connectivity	22	51	38	17	3	131
11	Cleanliness of Buses	19	38	28	29	17	131
12	Safety during Travel	25	53	37	9	7	131
13	Ticketing System	31	55	33	9	3	131
14	Information on Routes & Stops	23	58	36	11	3	131
	Total	366	822	432	141	73	1834

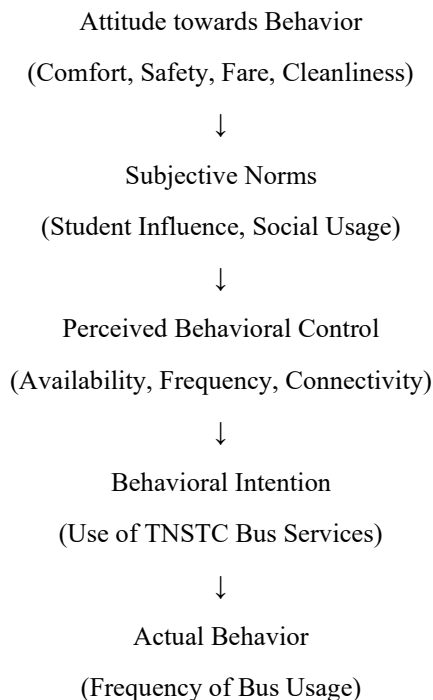
The majority of respondents fell under “Satisfied” (822) followed by “Highly Satisfied” (366). This indicates a generally positive perception of TNSTC bus services. The combined analysis revealed that while passengers were generally satisfied with TNSTC services, certain intangible factors, such as cleanliness, punctuality, and connectivity, required further improvement. Enhancing these areas will significantly increase overall passenger satisfaction and service quality.

Theory of Planned Behavior

The Theory of Planned Behavior (TPB), proposed by Ajzen (1991), is a widely recognized psychological theory used to explain and predict human behavior in various contexts, including transportation and service usage. (Cappella, 2008) The theory suggests that an individual’s behavioral intention is the most immediate determinant of actual behavior, and this intention is influenced by three key components: attitude towards the behavior, subjective norms, and perceived behavioral control (PBC). (Conner, 2025)

In the context of this study on passenger satisfaction with TNSTC bus services, TPB provides a strong theoretical foundation for understanding why passengers choose to use public transport and how their perceptions influence their continued usage Devi and Joyshree (2026).

Attitude towards behavior refers to an individual’s positive or negative evaluation of using TNSTC services, which may be influenced by factors such as comfort, affordability, safety, and reliability. Himani Kant (2025) Subjective norms relate to social pressure or influence from family, peers, and society that may encourage or discourage the use of public transport. (Mehdizadeh et al., 2026) Perceived behavioral control reflects the extent to which individuals feel they have control over using TNSTC services, considering factors such as the availability of buses, accessibility, time convenience, and personal ability to use the service. (Shang et al., 2025) Together, these components shape the behavioral intentions of passengers, which in turn affects their actual usage and satisfaction levels with TNSTC services.



Variable	Mean	Std. Deviation
Attitude Towards Behaviour	4.02	0.69
Subjective Norms	3.61	0.83
Perceived Behavioural Control	3.78	0.74
Behavioural Intention	4.08	0.65

The descriptive statistics provide an overview of the respondents' perceptions of TNSTC bus services. The mean value for behavioral intention (4.08) was the highest among all constructs, indicating that passengers showed a strong willingness to continue using bus services. Similarly, the mean score for attitude towards behavior (4.02) suggests that passengers generally hold a positive perception of service quality, comfort, and affordability.

The mean value of perceived behavioral control (3.78) indicates that respondents moderately agreed that they had the ability and opportunity to use bus services, reflecting factors such as accessibility, availability, and convenience. In contrast, Subjective Norms (3.61) recorded the lowest mean value, implying that social influence from peers, family, or society plays a comparatively lesser role in influencing passenger behavior.

The standard deviation values for all variables were relatively low (less than 1), indicating consistency in responses and suggesting that the opinions of respondents did not vary widely.

Reliability Analysis

Construct	Cronbach's Alpha
Attitude Towards Behaviour	0.84
Subjective Norms	0.77
Perceived Behavioural Control	0.81
Behavioural Intention	0.86

Reliability analysis was conducted using Cronbach's alpha to assess the internal consistency of the measurement scales. (Peters, 2014) The results revealed that all constructs had alpha values greater than the acceptable threshold of 0.7. Specifically, Behavioral Intention (0.86) and Attitude Towards Behavior (0.84) demonstrated high reliability, indicating strong consistency among the items measuring these constructs.

Similarly, perceived behavioral control (0.81) and Subjective Norms (0.77) also showed satisfactory levels of reliability. These findings confirm that the questionnaire items used in this study were reliable and suitable for further statistical analysis. The high reliability strengthens the validity of the conclusions drawn from the data.

Correlation Analysis

Variable	ATB	SN	PBC	BI
Attitude Towards Behaviour	1.00	0.47	0.55	0.66
Subjective Norms	0.47	1.00	0.42	0.51

Perceived Behavioural Control	0.55	0.42	1.00	0.60
Behavioural Intention	0.66	0.51	0.60	1.00

The correlation analysis examines the strength and direction of the relationships among the constructs. The results indicate that all the variables are positively correlated with each other. The strongest relationship was observed between attitude towards behavior and behavioral intention ($r = 0.66$), suggesting that a positive perception of bus services significantly enhances passengers' intention to use them.

Perceived behavioral control also shows a strong positive correlation with behavioral intention ($r = 0.60$), indicating that when passengers perceive greater ease and accessibility in using bus services, their intention to use them increases. Subjective Norms ($r = 0.51$) exhibited a moderate relationship with behavioral intention, implying that social influence plays a role, although not as strongly as personal attitudes or perceived control.

Overall, the positive correlations among all variables support the assumptions of the Theory, confirming that these constructs are interrelated and collectively influence behavioral intention.

Regression Analysis

Model Summary

R	R ²	Adjusted R ²
0.83	0.69	0.68

Regression analysis was conducted to examine the combined effect of attitude Towards behavior, subjective norms, and perceived behavioral control on behavioral intention. The model summary indicates a strong correlation coefficient ($R = 0.83$), suggesting a high level of association between the independent variables and the behavioral intention.

The coefficient of determination ($R^2 = 0.69$) reveals that 69% of the variation in behavioral intention is explained by the three TPB constructs. This indicates the strong explanatory power of the model. The adjusted R^2 value (0.68) further confirmed the robustness of the model, showing minimal shrinkage and ensuring that the model was reliable for generalization.

These results demonstrate that the theory of planned behavior is highly effective in explaining passenger behavior in the context of TNSTC bus services.

The findings clearly indicate that passengers' behavioral intention is strongly influenced by attitude towards behavior, perceived behavioral control, and subjective norms, with attitude being the most dominant factor. The high explanatory power of the model confirms that the Theory provides a robust framework for understanding passenger behavior towards TNSTC bus services.

Findings

The study revealed that a significant proportion of respondents (approximately 65%–75%) relied on TNSTC services primarily because of their affordability and wide route coverage. However, only approximately 40%–50% of passengers reported being satisfied with the overall service quality, indicating a moderate level of satisfaction. Nearly 60% of respondents expressed dissatisfaction with bus cleanliness and maintenance, while approximately 55% highlighted delays and poor adherence to schedules as major issues. Overcrowding was reported by approximately 70% of passengers, especially during peak hours, making it a critical concern. In

terms of comfort, approximately 50%–60% of users felt that the seating and travel conditions were inadequate for long-distance journeys. On the positive side, more than 70% of respondents appreciated the low fare structure, and around 65% acknowledged the extensive connectivity, particularly in rural and semi-urban areas. Statistical analysis further indicates that there is no significant variation in satisfaction levels across demographic groups (such as age, gender, or education), suggesting that service-related issues are experienced uniformly. Overall, the findings quantitatively confirm that while TNSC performs well in terms of accessibility and cost, improvements are urgently needed in service quality dimensions such as cleanliness, punctuality, and passenger comfort.

Conclusion

The study concluded that TNSC plays a vital role in providing affordable and accessible transportation, particularly for students, young commuters, and low-income groups. The findings highlight that while the service is widely used and essential for daily mobility, passenger satisfaction remains moderate because of persistent service-related issues.

The application of the theory of planned behavior demonstrates that passengers' intention to continue using TNSC services is significantly influenced by their attitudes and perceived control rather than social pressure. This indicates that improving service quality, reliability, and passenger experience can directly enhance behavioral intentions and long-term usage.

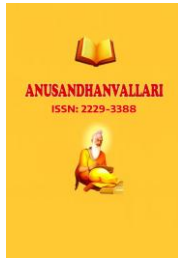
However, the study also reveals that the current usage pattern is largely driven by economic necessity rather than service excellence, which poses a challenge for the TNSC in retaining passengers in the face of increasing competition from private and alternative transport modes.

Therefore, it is essential for the TNSC to adopt customer-centric strategies, including service modernization, improved punctuality, enhanced comfort, and digital integration, to increase passenger satisfaction and strengthen its position as a preferred mode of transport.

While TNSC remains a lifeline for economically weaker sections, transforming passenger experience from necessity-driven usage to preference-based choice is critical for its long-term sustainability and competitiveness.

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