



Enhancing Passenger Satisfaction in Sri Lankan Urban Bus Transportation: The Critical Role of Service Quality Dimensions

K Wisenthige^{1,*}, Y Wickramasinghe²

Sri Lanka Institute of Information Technology, Malabe, Sri Lanka, SLIIT Malabe Campus, New Kandy Road, Malabe.

ABSTRACT

The long-term success of the transportation providers and customer satisfaction are significantly influenced by the quality of service provided by urban bus transit. This study investigates the factors influencing passenger satisfaction in Sri Lankan urban bus transportation, focusing on service quality dimensions such as reliability, responsiveness, assurance, empathy, safety, cleanliness, and comfort. A survey of 385 passengers was conducted, and correlation and regression analyses were used to explore the relationships between these variables and satisfaction levels. The results reveal that all six dimensions significantly impact passenger satisfaction, with responsiveness showing the highest correlation. The findings suggest that prioritizing these service quality factors can enhance passenger satisfaction and contribute to the overall success of bus companies. However, the study's scope is limited, and further research is needed to explore additional factors and address methodological constraints. This research provides valuable insights for transportation professionals aiming to improve service quality and strengthen customer relationships in Sri Lanka's urban bus sector.

Keywords: Assurance, Bus transportation, Cleanliness & comfort, Passengers satisfaction, Reliability, Responsiveness, Safety, Service Quality, SERVQUAL Model, Sri Lankan Transport Industry, Tangible

© Faculty of
Management Studies
Sabaragamuwa
University of Sri Lanka

ARTICLE INFO

Article history:

Received: 12 July 2024

Accepted: 18 September 2024

Published: 30 June 2025

E-mail Address:

krishanth.w@slit.lk

INTRODUCTION

Urban bus transport was the backbone of mobility for bus passengers after independence which presents significant service quality challenges due to its dynamic nature. Public transportation in Sri Lanka accounts for 68% of total motorized transport, being the only means of transport for most of the population. Private and publicly owned bus transport accounts for nearly 63%, while railways account for only 5% (NTC, 2017). The service quality of bus transportation has not kept pace with passenger comfort and modernization. Additionally, the number of passengers has increased while increasing per capita income has resulted in a decreasing share of public transportation. Increasing the modal share of public transportation will decrease congestion and delays on roads, which is consistent with expensive developments in road infrastructure (Mamcarz et al., 2023). Addressing these issues by improving service quality could significantly enhance passenger satisfaction, contributing to a more sustainable urban transportation system.

According to the Central Bank report, the transport industry has been categorized into broad groups: rail transport, bus transport (private and public), and ports and civil aviation services (CBSL, 2022). There are two types of bus service providers in Sri Lanka: government (SLTB - Sri Lanka Transport Board), which operates red buses, and private operators, which currently use different colors but are planned to be directed to blue by law (NTC, 2021). Government buses tend to adhere more strictly to timetables. The main types of buses are normal/local buses, limited stop/express buses, semi-luxury buses, and AC (Air Conditioned) express buses (NTC, 2017). In all the above mentioned categories passenger satisfaction, is strongly influenced by various service quality dimensions, including reliability, responsiveness, safety, cleanliness, and comfort.

Previous studies has identified key factors influencing passenger satisfaction in public transportation systems globally (Amponsah & Adams, 2016a; Reimer & Kuehn, 2005). With relevance to the Sri Lankan context there are lack of comprehensive and empirically based studies were conducted while creating a gap in the literature. Moreover, importance of improving service quality for bus companies has been frequently highlighted in the literature, the specific dimensions of service quality that most affect passenger satisfaction in the Sri Lankan context have not been thoroughly examined.

To address the identified gaps, this study investigates the factors influencing passenger satisfaction in Sri Lankan urban bus transportation, focusing on key service quality dimensions. This paper aims to investigate the factors influencing passenger satisfaction in Sri Lankan urban bus transportation, focusing on service quality dimensions.

The structure of the rest of this paper is as follows: The Literature Review section offers a comprehensive overview of existing studies on customer satisfaction in urban bus transportation, identifying key research gaps. The Methodology section details the approaches used to collect and analyze data. The Results and Discussion section presents the findings of the analysis and interprets them in relation to the study's objectives. Finally, the Conclusion highlights future research directions and outlines the study's limitations.

LITERATURE REVIEW

Public transport is something quite vital in commuters' daily life; therefore, any assurance of high-quality service will result in a positive satisfaction level among the passengers. Recently, academic interest in the analysis of the determinants of the satisfaction of passengers regarding public transport systems has been taken through the use of models of service quality such as SERVQUAL. Literature review is categorized based on the dimensions of the SERVQUAL model.

Service Quality in Urban Bus Transportation

The service quality in transportation can be conceptualized through the SERVQUAL model, which evaluates service quality as a disparity in customer expectations and perceptions in the service received. Parasuraman et al, (1991) proposed that five dimensions - reliability, assurance, tangibles, empathy, and responsiveness - are critical for assessing service quality. These dimensions, originally designed for general services, have been suitably adopted in the scope of public transportation systems with the purpose of comparing how these variables might be responsible for passenger satisfaction (Zeithaml et al., 1996).

Reliability

Reliability is the degree to which the service consistently meets the promises made to passengers, including punctuality, regularity, and dependability (Cats, 2014). In the context of urban bus transportation, reliability is often measured by how accurately buses adhere to schedules, the frequency

of service, and how well the service addresses passengers' needs without disruption (Amponsah & Adams, 2016a). Reliable services reduce waiting times and the uncertainty of travel, which directly affects passengers' satisfaction and trust in the transportation system (Cats & Gkioulou, 2017).

Several studies have been conducted to examine key factors affecting public transport (PT) user satisfaction, focusing on aspects like reliability, safety, comfort, and crowding. Allen et al. (2019) introduces a Maslow-inspired hierarchy of transit needs, showing how functional, security, and hedonic attributes influence satisfaction in Bus Rapid Transit (BRT) systems. Soza-Parra et al. (2019) highlight the negative effects of crowding and denied boardings on user experience, particularly for younger passengers, while Allen et al. (2018) emphasize the impact of critical incidents (CIs) on service satisfaction and loyalty, drawing on data from Milan's railway services. Together, these studies underscore the importance of improving reliability, comfort, and minimizing negative experiences to enhance satisfaction, aligning with the SERVQUAL model and offering relevant insights for improving urban bus systems globally, including in Sri Lanka.

Responsiveness

Mouwen (2015) and Allen et al. (2018) emphasize the importance of operational factors like on-time performance, travel speed, service frequency, and responsiveness to critical incidents (CIs) in enhancing customer satisfaction in urban bus systems. Mouwen (2015) highlights that improvements in these areas, particularly for older passengers and those in dense urban settings, are key to elevating satisfaction. Similarly, Allen et al. stress the importance of addressing safety, ease of boarding, and CI management to improve the overall passenger experience. Both studies suggest that timely, reliable, and efficient services are essential for boosting satisfaction and loyalty in urban public transport.

Responsiveness, as defined by Parasuraman et al. (1991), refers to the willingness of service providers to assist passengers promptly and address their needs. In urban bus systems, this can be seen in how bus operators provide accurate schedule information, respond swiftly to customer inquiries, and manage complaints effectively (Liu & Yen, 2016). A highly responsive transport system can reduce passenger anxiety and contribute to smoother journeys, positively influencing overall satisfaction. Therefore, enhancing

responsiveness, alongside improving operational factors, is critical for improving customer satisfaction in urban bus systems.

Assurance

Assurance, refers to the feeling of security, confidence, and reliance that passengers have in public transportation providers. It includes key sub-dimensions such as the competence, courtesy, and credibility of drivers and staff, as well as perceived safety during service usage (Smith, 1976). In bus transport, assurance is particularly crucial, as passengers expect drivers to maintain professionalism, adhere to traffic regulations, and ensure safe driving practices (Mirzaei et al., 2014). This sense of assurance directly influences customer satisfaction by making passengers feel confident in their journeys, contributing to a positive overall experience.

Amponsah & Adams (2016b) found that in Vancouver's Translink system, assurance-related factors, such as reliable and courteous service, significantly impacted customer satisfaction. While issues like overcrowding and late-hour services negatively influenced perceptions, the trust and confidence that passengers had in the system's reliability and safety were strong drivers of satisfaction. Similarly, Deneş & Grecu (2020) emphasize that the EN 13816 European norm highlights assurance as a critical factor in improving the quality of public transport services. Both studies, demonstrate that assurance—reflected in competence, safety, and reliability—plays a vital role in enhancing passenger satisfaction and fostering loyalty in public bus transportation.

Empathy

Empathy, as a key dimension of the SERVQUAL model, significantly influences customer satisfaction in public transportation by reflecting the ability of service providers to offer personalized attention and genuine care for passengers. Ojo et al. (2014) found that gaps in empathy, such as the lack of attention to individual passenger needs, contributed to customer dissatisfaction in intercity bus services on the Cape Coast-Accra route. Empathy is especially important in interactions like ticket purchases, assisting elderly passengers, and handling complaints, where personalized service can enhance the passenger experience. Demonstrating care during these interactions can improve the overall perception of service quality and foster a positive relationship between passengers and the service provider (A. Parasuraman et al., 1991).

Similarly, Belay (2019) found that a lack of empathy in urban public transport services in Ethiopia led to low customer satisfaction, with only 37% of passengers reporting a positive experience. Passengers who do not feel that their individual needs are being met, such as receiving assistance or attention during their journey, are less likely to be satisfied with the service. Empathy plays a crucial role in building long-term loyalty, as personalized attention creates a stronger connection between passengers and the service provider (Ojo et al., 2014). Therefore, improving empathy in public transport services can lead to better customer satisfaction and increased loyalty, making it an essential area for service quality improvement.

Safety, Cleanliness, and Comfort

Safety, cleanliness, and comfort play essential roles in determining customer satisfaction in public transportation. Van Lierop et al. (2018) point out that factors such as on-board cleanliness, comfort, and safety are key contributors to passenger satisfaction and loyalty. When passengers view a public transport service as clean, comfortable, and safe, they are more inclined to remain loyal, as these elements help alleviate anxiety and improve the overall travel experience. Technical University of Ostrava & Pawlasova (2015) also underscores the importance of cleanliness, proximity, and safety in shaping customer perceptions of service quality, highlighting that these aspects have a direct impact on passenger satisfaction with urban transport. Additionally, cleanliness and comfort, along with frequency and punctuality, rank among the most significant factors influencing customer loyalty in public transportation systems.

Eboli & Mazzulla (2015) emphasize the significance of safety, cleanliness, and comfort, showing that these elements, along with punctuality and frequency, greatly enhance the overall quality of service in public transport. Cleanliness plays a vital role in fostering a welcoming atmosphere, while safety ensures that passengers feel secure throughout their journey. Mokhtar et al. (2023) further support these conclusions by underscoring the essential role of cleanliness and safety in influencing customer satisfaction within Malaysia's rail transportation system. The study points out that a clean and safe environment, paired with comfortable amenities, leads to a positive travel experience and encourages passengers to keep using public transport services. These insights highlight the necessity of focusing on safety, cleanliness, and comfort to boost customer satisfaction in public transportation.

The SERVQUAL Model in Public Transportation

The SERVQUAL model provides a useful framework for assessing service quality in public transportation by focusing on gaps between expected and perceived service quality (A. Parasuraman et al., 1991). In the context of bus transport, researchers have adapted the model to measure dimensions such as safety, cleanliness, and comfort, which are particularly relevant for public transport users (Joewono & Kubota, 2006). Previous studies have demonstrated that focusing on these dimensions can improve passenger satisfaction and service efficiency (Eboli & Mazzulla, 2015; Guirao et al., 2016). By understanding the role of these factors, transportation authorities can design interventions to enhance service quality and increase passenger satisfaction (Hensher et al., 2003; Lai & Chen, 2011).

Service quality is what dictates passengers' satisfaction with regards to urban bus transportation. Reliability, responsiveness, assurance, empathy, safety, cleanliness, and comfort are some of the vital variables that shape service quality perception. Transportation authorities could use the SERVQUAL model to identify those important areas for improvement in order to assure that services meet or exceed passenger expectations. Being aware of these factors and understanding their role becomes an important part of upgrading urban bus systems to enhance long-term user satisfaction. Based on the critical literature review a conceptual framework (figure 1) and hypotheses was derived.

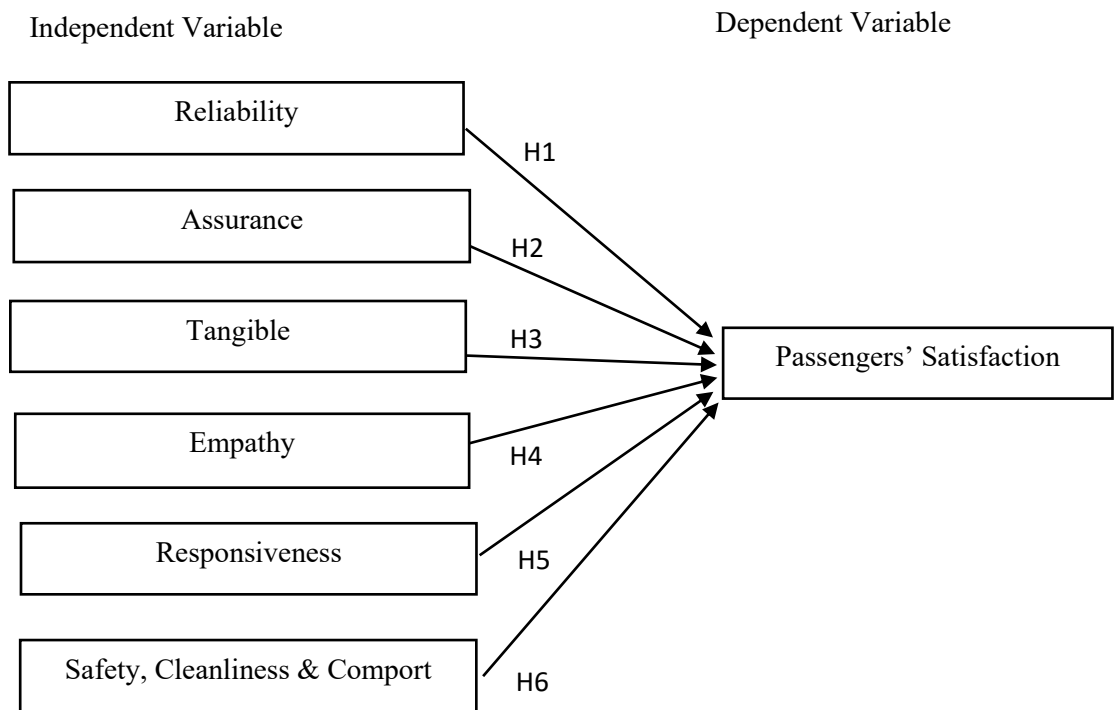


Figure 1: Conceptual Framework

Hypothesis 1: There is a significant impact of reliability on passenger satisfaction in urban bus transportation.

Hypothesis 2: There is a significant impact of assurance on passenger satisfaction in urban bus transportation.

Hypothesis 3: There is a significant impact of tangible on passenger satisfaction in urban bus transportation.

Hypothesis 4: There is a significant impact of empathy on passenger satisfaction in urban bus transportation.

Hypothesis 5: There is a significant impact of responsiveness on passenger satisfaction in urban bus transportation.

Hypothesis 6: There is a significant impact of safety, cleanliness & comfort on passenger satisfaction in urban bus transportation.

METHODOLOGY

This study employed a quantitative method to examine the factors influencing passenger satisfaction in Sri Lankan urban bus transportation. A survey was developed based on the SERVQUAL model, which evaluates service quality across several dimensions as reliability, responsiveness, assurance, empathy, tangibles, safety, cleanliness, and comfort. The study focused on understanding how these dimensions affect overall passenger satisfaction (Guirao et al., 2016; A. P. Parasuraman et al., 1988).

A structured questionnaire was developed based on the SERVQUAL model, with the features including each service quality dimension: reliability, responsiveness, assurance, empathy, safety, cleanliness, and comfort (A. P. Parasuraman et al., 1988). The questionnaire used a five-point Likert scale (ranging from "strongly disagree" to "strongly agree") for respondents to rate their satisfaction on these aspects (Joshi et al., 2015). A pilot test was conducted to ensure the clarity and reliability of the questions, as piloting is crucial in questionnaire-based research to enhance item reliability (Kothari, 1990). Data was collected from 385 frequent users of urban bus services in the Colombo District, Sri Lanka, representing a cross-section of daily commuters. Participants were selected to ensure diverse demographic representation, enhancing the generalizability of findings (Saunders et al., 2020). After data cleaning, 385 valid responses were retained for analysis.

The independent variables in this study are the seven dimensions of service quality, namely reliability, responsiveness, assurance, empathy, safety, cleanliness, and comfort. The dependent variable is passenger satisfaction, which reflects the overall satisfaction level of passengers with the urban bus services they use. Descriptive Statistics were used to summarize the central tendency, variability, and distribution of data. Cronbach's alpha was calculated to assess the internal consistency of the questionnaire items. Threshold of 0.7 considered acceptable for reliability (Nunnally & Bernstein, 1994).

Pearson correlation analysis was employed to examine the strength and direction of relationships between service quality dimensions and passenger satisfaction (Kotz & Johnson, 1992). Multiple regression analysis was conducted to evaluate the influence of the independent variables (service quality dimensions) on the dependent variable (Passenger satisfaction), and to determine which dimensions (reliability, responsiveness, assurance, empathy, tangibles, safety, cleanliness and comfort have the most significant impact on

passenger satisfaction. General equation for multiple linear regression analysis is mentioned below.

Passenger satisfaction

$$= \beta_0 + \beta_1 \text{reliability} + \beta_2 \text{responsiveness} + \beta_3 \text{assurance} \\ + \beta_4 \text{empathy} + \beta_5 \text{tangibles} \\ + \beta_6 (\text{safety, cleanliness, and comfort}) + \varepsilon$$

β_0 intercept represents the value of Passenger Satisfaction when all the independent variables are equal to zero. $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ are the respective coefficients of the each independent variables. All analyses were conducted using statistical software (SPSS), ensuring a thorough examination of the data.

DATA ANALYSIS

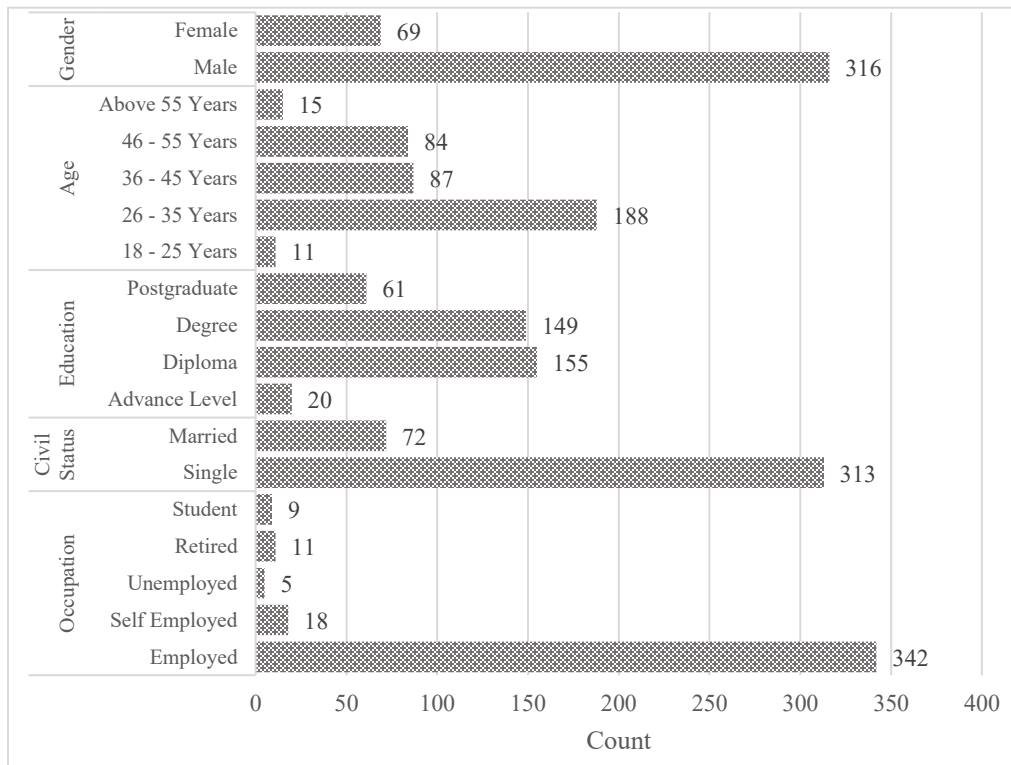


Figure 2: Demographic Details of the Respondents

The demographic details (Figure 01) of the study sample, comprising 385 respondents, reveal significant insights into various characteristics. In terms of age distribution, the majority of respondents (48.8%) fall within the 26-35 years' category, followed by 22.6% aged 36-45 years, and 21.8% aged 46-55 years. The gender composition indicates a predominance of males

(82.1%) compared to females (17.9%). Educationally, most respondents possess either a diploma (40.3%) or a degree (38.7%), while only 5.2% have completed their Advanced Level and 15.8% hold postgraduate qualifications. Regarding civil status, a significant majority are single (81.3%), with married individuals making up 18.7% of the sample. Finally, the occupational status shows that a large portion of the respondents are employed (88.8%), while smaller groups are self-employed (5.2%), unemployed (1.3%), retired (2.8%), or students (2.3%).

Table 01: Cronbach's Alpha Value -on Independent Variables

Variable	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted	Number of Question Items
Reliability	4.605	.732	.	.917	3 No's
Assurance	4.383	.792	.	.909	4 No's
Tangible	4.383	.792	.	.909	4 No's
Empathy	4.053	.798	.	.911	3 No's
Responsiveness	4.515	.860	.	.902	4 No's
Safety					
Cleanliness & Comfort	4.622	.755	.	.914	9 No's
Overall Cronbach's Alpha			0.924		

The table 01 presents the internal consistency reliability analysis for different service quality dimensions using Cronbach's Alpha. Reliability has a corrected item-total correlation of 0.732, and removing it would slightly reduce the Cronbach's Alpha to 0.917, indicating it is an important contributor to internal consistency. Assurance and Tangible both have the same corrected item-total correlation of 0.792. Removing either would also reduce Cronbach's Alpha to 0.909, suggesting these items contribute similarly to reliability. Empathy shows a higher corrected item-total correlation of 0.798. Removing it would result in an Alpha of 0.911. Responsiveness has the highest corrected item-total correlation at 0.860 and removing it would bring Cronbach's Alpha down to 0.902, signifying strong internal consistency. Safety, Cleanliness, and Comfort, with 9 question items, shows a Cronbach's Alpha of 0.755 and 0.914 if removed. The overall Cronbach's Alpha of 0.924 indicates excellent reliability, meaning the scale used to measure these dimensions has strong internal consistency across all items.

Table 02: Correlation Analysis

	Reliability	Assurance	Tangible	Empathy	Responsiveness	Safety Cleanliness Compart	Passengers Satisfaction
Reliability	1						
Assurance	.436**	1					
Tangible	.436**	1.000**	1				
Empathy	.836**	.591**	.591**	1			
Responsiveness	.628**	.883**	.883**	.649**	1		
Safety Cleanliness Compart	.836**	.514**	.514**	.780**	.618**	1	
Passengers Satisfaction	.722**	.774**	.774**	.755**	.896**	.758**	1

Note: **Correlation is significant at the 0.01 level (2-tailed).

Table 02 presents the correlation coefficients between the service quality dimensions (reliability, assurance, tangible aspects, empathy, responsiveness, and safety/cleanliness/compartment) and passenger satisfaction in Sri Lankan urban bus transportation. The analysis reveals significant positive relationships among most variables, with all coefficients marked with ** indicating statistical significance at the $p < 0.01$ level. The results show that passenger satisfaction is strongly correlated with multiple service quality dimensions, especially safety cleanliness compartments ($r = 0.758$), responsiveness ($r = 0.896$), empathy ($r = 0.755$), tangible ($r = 0.774$), and assurance ($r = 0.436$). These findings suggest that improvements in these areas may have a substantial impact on passenger satisfaction. Moreover, high correlations are observed between certain service dimensions, such as responsiveness ($r = 0.896$). Overall, the correlation analysis underscores the importance of safety, cleanliness, responsiveness, and empathy in shaping passenger satisfaction, guiding potential areas for service improvements in urban bus transportation. This matrix provides foundational insights for subsequent regression analysis to explore the predictive influence of these dimensions on passenger satisfaction.

Table 03: Descriptive Statistics for Independent and Dependent Variables

	Reliability	Assurance	Tangible	Empathy	Responsiveness	Safety Cleanliness Compartment	Passengers Satisfaction
N	385	385	385	385	385	385	385
Mean	4.03	4.05	4.05	3.97	4.01	4.07	4.00
Std. Error of Mean	.024	.025	.025	.030	.022	.023	.023
Median	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Mode	4	4	4	3	4	4	4
Std. Deviation	.465	.497	.497	.586	.432	.449	.449
Variance	.216	.247	.247	.344	.186	.201	.201
Skewness	.360	-.008	.130	.171	.210	.258	.360
Std. Error of Skewness	.124	.124	.124	.124	.124	.124	.124
Kurtosis	-.764	-.717	-.717	-1.019	-.529	-.479	-.613
Std. Error of Kurtosis	.248	.248	.248	.248	.248	.248	.248

Table 03 provides the descriptive statistics for the service quality dimensions and passenger satisfaction based on responses from 385 participants. Each variable's central tendency, dispersion, and distribution are summarized, offering insights into the data's characteristics.

The means for all variables range from 3.97 to 4.07, with medians consistently at 4.00, indicating generally high ratings across all service quality dimensions and passenger satisfaction. This suggests that respondents perceive these aspects positively. Standard deviations range from 0.432 (responsiveness) to 0.586 (empathy), reflecting some variability in perceptions, particularly for empathy. The relatively low standard deviations indicate moderate consensus among respondents on each dimension. Skewness values close to zero suggest that the data is relatively symmetrically distributed, with the exception of slight positive skewness in "reliability" (0.360) and "passenger satisfaction" (0.360), indicating a mild tendency toward higher ratings. Kurtosis values are all negative, ranging from -0.479 (safety cleanliness compartment) to -1.019 (empathy), indicating a flatter-than-normal distribution.

These statistics provide a foundation for understanding respondents' perceptions and suggest that service quality dimensions are generally well-regarded, with empathy showing slightly more variability. The relatively high means and minimal skewness in most variables imply a positive perception of

service quality and passenger satisfaction in urban bus transportation in the Colombo District, Sri Lanka.

Table 04: Regression Results

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.938 ^a	.879	.878	.157

Note: Predictors: (Constant), Safety Cleanliness and Comfort, Tangibles, Assurance, Empathy, Responsiveness, Reliability
Source: Author's calculation

Table 04 summarizes the results of the regression analysis conducted to examine the influence of various service quality on passenger satisfaction. R Square (.879) value shows that 87.9% of the variance in passenger satisfaction can be explained by the service quality dimensions included in the model. This high R Square value suggests that the model effectively captures the factors influencing passenger satisfaction in urban bus transportation. The Adjusted R Square (.878) adjusts for the number of predictors in the model and is slightly lower than the R Square value. This slight reduction indicates that the model remains robust even when accounting for the number of predictors, affirming the explanatory power of the selected service quality dimensions. These results demonstrate that service quality dimensions collectively have a substantial impact on passenger satisfaction, with the model providing a strong explanatory fit. The high R and R Square values suggest that focusing on these dimensions—particularly safety, cleanliness, comfort, and responsiveness—could meaningfully enhance passenger satisfaction levels in Sri Lankan urban bus transportation.

Table 05: ANOVA Results

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	68.035	5	13.607	553.093	<.001 ^b
Residual	9.324	379	.025		
Total	77.360	384			

Note: Dependent Variable: Passengers Satisfaction

Predictors: (Constant), Safety Cleanliness Compart, Tangible, Empathy, Reliability, Responsiveness

Table 05 presents the ANOVA (Analysis of Variance) results for the regression model. Mean squares are obtained by dividing the sum of squares by their respective degrees of freedom. The mean square for regression (13.607) is substantially higher than the mean square for residuals (0.025), indicating that the model explains a significant portion of the variance in passenger satisfaction. The F-statistic measures the overall significance of the model by comparing the explained variance to the unexplained variance. A high F-value, like 553.093, suggests that the model is statistically significant. The p-value

(Sig. < 0.001) indicates that the model is statistically significant at the 0.001 level. This means there is strong evidence that the service quality dimensions jointly have a significant impact on passenger satisfaction. These ANOVA results confirm that the regression model is statistically significant, implying that the predictors effectively explain a substantial portion of the variance in passenger satisfaction. This strengthens the case for focusing on these service quality dimensions to enhance satisfaction levels in Sri Lankan urban bus transportation.

Table 06: Coefficients Results

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	-.089	.087		-1.025	.306
Reliability	-.104	.044	-.108	-2.385	.018
Tangibles	-.100	.041	-.111	-2.449	.015
Empathy	.153	.029	.200	5.256	.000
Responsiveness	.788	.050	.758	15.762	.000
Safety, Cleanliness and Comfort	.282	.035	.281	8.148	.000

Table 06 displays the results of the multiple regression analysis. The table includes both unstandardized (B) and standardized (Beta) coefficients, t-values, and significance levels. Unstandardized Coefficients (B) show the actual change in passenger satisfaction for each unit increase in the predictor, holding other factors constant. For instance, a one-unit increase in responsiveness leads to a predicted increase of 0.788 in passenger satisfaction, while a one-unit increase in safety, cleanliness, and comfort results in a 0.282 increase. The standardized coefficients allow for comparison of the relative importance of each predictor. Responsiveness has the highest Beta value (0.758), suggesting it has the strongest positive influence on passenger satisfaction among all variables. This is followed by safety, cleanliness, and comfort (0.281) and empathy (0.200), both of which also positively impact satisfaction. The t-values and corresponding significance levels (p-values) indicate the statistical significance of each predictor. Predictors with p-values less than 0.05 are statistically significant. In this model, reliability ($p = 0.018$), tangibles ($p = 0.015$), empathy ($p < 0.001$), responsiveness ($p < 0.001$), and safety, cleanliness, and comfort ($p < 0.001$) are all significant predictors of passenger satisfaction, suggesting that each of these factors plays a meaningful role. The constant term, however, is not statistically significant ($p = 0.306$), meaning it does not significantly affect passenger satisfaction independently.

Overall, these results indicate that responsiveness, safety, cleanliness, and comfort are the strongest predictors of passenger satisfaction, while tangibles and reliability also contribute but to a lesser extent. Emphasizing these dimensions could effectively improve passenger satisfaction in Sri Lankan urban bus transportation.

DISCUSSION

This study investigated the impact of six service quality dimensions—reliability, responsiveness, assurance, empathy, safety/cleanliness, and tangibles—on passenger satisfaction in Sri Lankan urban bus transportation. The findings indicate that all six dimensions significantly influence passenger satisfaction, with responsiveness having the strongest positive impact.

Existing literature suggests that reliability, including factors like punctuality and adherence to schedules, is a critical determinant of satisfaction in public transportation (Chakrabarti, 2015). Studies indicate that when transit services consistently meet time schedules, passenger confidence and satisfaction improve, as reliability reduces uncertainty and frustration associated with delays (Soza-Parra et al., 2019).

Responsiveness emerged as the most influential factor in this study, which aligns with prior research showing that quick, efficient responses to passenger needs significantly enhance satisfaction. The role of responsive service in resolving issues promptly and attentively is especially emphasized in the transportation sector, where passengers value assistance in cases of delays or disruptions (Cebecauer et al., 2021; Guan et al., 2022).

Literature on public transportation highlights that passengers feel more satisfied when service providers display competence and instill confidence in safety and security. Assurance, demonstrated through knowledgeable and courteous staff, enhances passenger trust and satisfaction, which is particularly important in contexts where safety perceptions affect public transport usage (Friman & Gärling, 2001; Joewono & Kubota, 2006). Research shows that empathy, or personalized service, plays a significant role in customer satisfaction, particularly for individuals with special needs. In public transportation, understanding and accommodating the needs of elderly passengers or those with disabilities improves their travel experience and contributes to overall satisfaction (Zhang et al., 2020).

Safety and cleanliness are well-documented contributors to satisfaction in public transportation, as passengers prefer a secure and hygienic environment. Studies, especially those conducted post-pandemic, have shown that cleanliness in public spaces and transport facilities greatly influences passenger comfort and perceptions of safety (Li et al., 2020). Tangibles, including the physical aspects of buses and facilities, affect the comfort and appeal of the transportation experience. Prior studies indicate that factors such as vehicle appearance, seating comfort, and modern equipment positively impact passenger satisfaction, as these tangibles make the travel environment more pleasant and inviting (Fiorio et al., 2013).

CONCLUSION

This study confirms that responsiveness, safety, and cleanliness significantly influence passenger satisfaction in Sri Lankan urban bus transportation. Together, these service quality dimensions explain nearly 88% of the variation in satisfaction, highlighting the importance of customer-centric service improvements. To improve service quality, bus operators should prioritize responsiveness by training staff to handle passenger requests efficiently. Ensure cleanliness and safety through regular bus maintenance and safety protocols. Review operational reliability to meet passenger expectations for timely and dependable service. This study contributes to the broader understanding of service quality in public transportation by applying the SERVQUAL model in a Sri Lankan context, offering insights into the factors most critical to passenger satisfaction. Bus companies should implement strategies to improve responsiveness, cleanliness, and safety. These areas are crucial for increasing customer satisfaction and retention. Emphasizing customer service training for bus staff will help enhance empathy and responsiveness, improving the overall passenger experience. Innovative service quality enhancements, such as mobile apps for real-time updates and efficient complaint handling systems, can maintain competitiveness in urban transport and address evolving passenger needs. The study's sample was limited to 385 passengers in the Colombo District, which may restrict the generalizability of the findings to other regions. Future research should consider larger and more diverse samples. Future studies could explore the role of other transportation modes or include additional service quality dimensions. Research on age-specific satisfaction levels or longitudinal studies on service quality changes over time would offer deeper insights.

CONFLICT OF INTEREST

The authors declare no conflicts of interest regarding the publication of this paper. The research was conducted independently, and no external party had an influence on the study design, data collection, analysis, interpretation, or decision to publish the results. Furthermore, no financial, commercial, or personal relationships exist that could be viewed as a potential conflict of interest.

ACKNOWLEDGEMENT

The authors wish to acknowledge the use of AI language models, specifically OpenAI's ChatGPT, for improving the readability, coherence, and clarity of this manuscript. These tools assisted in refining language, enhancing grammar, and ensuring the precision of technical terminology.

REFERENCES

- Allen, J., Eboli, L., Mazzulla, G., & Ortúzar, J. (2018). Effect of critical incidents on public transport satisfaction and loyalty: An Ordinal Probit SEM-MIMIC approach. *Transportation*, 47, 827–863.
- Allen, J., Muñoz, J. C., & Ortúzar, J. D. D. (2019). Understanding public transport satisfaction: Using Maslow's hierarchy of (transit) needs. *Transport Policy*, 81, 75–94.
- Amponsah, C. T., & Adams, S. (2016a). Service quality and customer satisfaction in public transport operations. *International Journal of Services and Operations Management*, 25(4), 531–549.
- Amponsah, C. T., & Adams, S. (2016b). Service quality and customer satisfaction in public transport operations. *International Journal of Services and Operations Management*, 25(4), 531–549.
- Bagwell, T. (2023). *Factors Affecting Service Quality in Public Bus Transportation in Sri Lanka*. 67–89.
- Belay, D. G. (2019). Assessing Customers Satisfaction of Urban Public Transport Service Delivery in Selected Cities of SNNPRS, Ethiopia. *International Journal of African and Asian Studies*.

- Cats, O. (2014). Regularity-driven bus operation: Principles, implementation and business models. *Transport Policy*, 36, 223–230.
- Cats, O., & Gkioulou, Z. (2017). Modeling the impacts of public transport reliability and travel information on passengers' waiting-time uncertainty. *EURO Journal on Transportation and Logistics*, 6(3), 247–
- CBSL. (2022). *Central Bank Annual Report 2022*. https://www.cbsl.gov.lk/sites/default/files/cbslweb_documents/publications/annual_report/2022/en/Full_Text_Volume_I.pdf
- Cebecauer, M., Burghout, W., Jenelius, E., Babicheva, T., & Leffler, D. (2021). Integrating Demand Responsive Services in to Public Transport Disruption Management. *IEEE Open Journal of Intelligent Transportation Systems*, 2, 24–36.
- Chakrabarti, S. (2015). The demand for reliable transit service: New evidence using stop level data from the Los Angeles Metro bus system. *Journal of Transport Geography*, 48, 154–164.
- Deneş, C., & Grecu, V. (2020). Increasing Customer Satisfaction for Public Transportation Services. *Acta Universitatis Cibiniensis. Technical Series*.
- Dytckov, S., Persson, J. A., Lorig, F., & Davidsson, P. (2022). Potential Benefits of Demand Responsive Transport in Rural Areas: A Simulation Study in Lolland, Denmark. *Sustainability*, 14(6), 3252.
- Eboli, L., & Mazzulla, G. (2015). Relationships between rail passengers' satisfaction and service quality: A framework for identifying key service factors. *Public Transport*, 7(2), 185–201.
- Fiorio, C. V., Florio, M., & Perucca, G. (2013). User satisfaction and the organization of local public transport: Evidence from European cities. *Transport Policy*, 29, 209–218.

- Friman, M., & Gärling, T. (2001). Frequency of negative critical incidents and satisfaction with public transport services. II. *Journal of Retailing and Consumer Services*, 8(2), 105–114.
- Gaschi-Uciecha, A. (2023). The Problem of Reliability in Public Transport for the Metropolis GMZ Area-Pilots Studies. *Sustainability*, 15(4), 3199.
- Guan, D., Wu, X., Wang, K., & Zhao, J. (2022). Vehicle Dispatch and Route Optimization Algorithm for Demand-Responsive Transit. *Processes*, 10(12), 2651.
- Guirao, B., Garcia Pastor, A., & Lopez-Lambas, M. (2016). The importance of service quality attributes in public transportation: Narrowing the gap between scientific research and practitioners' needs. *Transport Policy*, 49, 68–77.
- Hensher, D. A., Stopher, P., & Bullock, P. (2003). Service quality—developing a service quality index in the provision of commercial bus contracts. *Transportation Research Part A: Policy and Practice*, 37(6), 499–517.
- Joewono, T. B., & Kubota, H. (2006). SAFETY AND SECURITY IMPROVEMENT IN PUBLIC TRANSPORTATION BASED ON PUBLIC PERCEPTION IN DEVELOPING COUNTRIES. *IATSS Research*, 30(1), 86–100.
- Joshi, A., Kale, S., Chandel, S., & Pal, D. (2015). Likert Scale: Explored and Explained. *British Journal of Applied Science & Technology*, 7, 396–403.
- Kothari, C. R. (1990). *Research Methodology* (2nd edition). New Age International (P) Limited.
- Kotz, S., & Johnson, N. L. (1992). Statistical Methods for Research Workers. In *Breakthroughs in Statistics*. Springer.
- Lai, W.-T., & Chen, C.-F. (2011). Behavioral intentions of public transit passengers—The roles of service quality, perceived value, satisfaction and involvement. *Transport Policy*, 18(2), 318–325.

- Li, X.-H., Huang, L., Li, Q., & Liu, H.-C. (2020). Passenger Satisfaction Evaluation of Public Transportation Using Pythagorean Fuzzy MULTIMOORA Method under Large Group Environment. *Sustainability*, 12(12),
- Liu, W.-K., & Yen, C.-C. (2016). Optimizing Bus Passenger Complaint Service through Big Data Analysis: Systematized Analysis for Improved Public Sector Management. *Sustainability*, 8, 1319.
- Mamcarz, P., Drożdziel, P., Gzik, A., Rybicka, I., & Drożdziel, P. (2023). Characteristics of urban transport users and their level of satisfaction with transport services. A longitudinal study of passengers in Lublin city in 2018 and 2020. *Transportation Research Procedia*, 74, 371–378.
- Mirzaei, R., Hafezi-Nejad, N., Sabagh, M. S., Ansari-Moghaddam, A., Lami, V., Fatemeh, R., & Rahimi-Movaghar, V. (2014). Dominant role of drivers' attitude in prevention of road traffic crashes: A study on knowledge, attitude, and practice of drivers in Iran. *Accident Analysis & Prevention*, 66, 36–42.
- Mokhtar, S., Azman Khamis, K., & Omar, R. (2023). ASSESSING CUSTOMER SATISFACTION IN RAIL TRANSPORTATION: A CASE STUDY OF MALAYSIA'S PUBLIC TRANSPORT SYSTEM. *Proceedings on Engineering Sciences*, 5(4), 701–708.
- Mouwen, A. (2015). Drivers of customer satisfaction with public transport services. *Transportation Research Part A: Policy and Practice*, 78, 1–20.
- NTC. (2017). *National Transport Statistics 2017*.
- NTC. (2021). *Annual Report 2021*.
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric Theory* (3rd Edition). McGraw Hill.

- Ojo, T., Mireku, D. O., Dauda, S., & Nutsogbodo, R. Y. (2014). Service Quality and Customer Satisfaction of Public Transport on Cape Coast-Accra Route, Ghana. *Developing Country Studies*.
- Parasuraman, A., Berry, L. L., & Zeithaml, V. A. (1991). Perceived service quality as a customer-based performance measure: An empirical examination of organizational barriers using an extended service quality model. *Human Resource Management*, 30(3), 335–364.
- Parasuraman, A. P., Zeithaml, V., & Berry, L. (1988). SERVQUAL: A multiple- Item Scale for measuring consumer perceptions of service quality. *Journal of Retailing*.
- Reimer, A., & Kuehn, R. (2005). The impact of servicescape on quality perception. *European Journal of Marketing*, 39(7–8), 785–808.
- Saunders, M. N. K., Lewis, P., & Thornhill, A. (2020). *Research Methods for Business Students* (8th edition). Pearson.
- Smith, F. C. (1976). SYSTEM ASSURANCE FOR CURRENT AND FUTURE GUIDEWAY TRANSPORTATION SYSTEMS. *Transportation Research Board Special Report*.
- Soza-Parra, J., Raveau, S., Muñoz, J. C., & Cats, O. (2019). The underlying effect of public transport reliability on users' satisfaction. *Transportation Research Part A: Policy and Practice*, 126, 83–93.
- Technical University of Ostrava, & Pawlasova, P. (2015). The Factors Influencing Satisfaction with Public City Transport: A Structural Equation Modelling Approach. *Journal of Competitiveness*, 7(4), 18–32.
- Van Lierop, D., Badami, M. G., & El-Geneidy, A. M. (2018). What influences satisfaction and loyalty in public transport? A review of the literature. *Transport Reviews*, 38(1), 52–72.
- Zeithaml, V. A., Berry, L. L., & Parasuraman, A. (1996). The Behavioral Consequences of Service Quality. *Journal of Marketing*, 60(2), 31–46.

Zhang, X., Liu, H., Xu, M., Mao, C., Shi, J., Meng, G., & Wu, J. (2020). Evaluation of passenger satisfaction of urban multi-mode public transport. *PLOS ONE*, 15, e0241004.