A RECSA APPROACH TO MEASURING INTERCITY BUS SERVICE QUALITY BRIDGING THE GAP BETWEEN EXPECTATIONS AND PERFORMANCE

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Abstract - This study evaluates the quality of intercity bus services in Hanoi, Vietnam, from passengers' perspectives using the RECSA framework to measure gaps between expectations and perceptions. A questionnaire survey was conducted at major intercity bus terminals, including Giap Bat, My Dinh, and Yen Nghia, to collect data on five core service dimensions: reliability, extent of services, comfort, safety, and affordability. From 240 collected responses, 199 valid samples were analyzed. Paired-sample t-tests identified significant differences between expectations and experiences, especially in reliability, affordability, and comfort. The results revealed significant differences between passengers' expectations and actual service experiences, particularly in the areas of reliability, affordability, and comfort. The findings suggest that a more consistent and comfortable service offering, alongside fair pricing, is crucial for meeting passenger expectations and improving overall service quality. The study offers practical insights for bus operators, policymakers, and planners to enhance intercity bus services and customer satisfaction.

Key words - Intercity bus; Service quality; RECSA; Expectations; Performance.

1. Introduction

In recent years, the demand for intercity passenger transport services in Vietnam has grown significantly, driven by urbanization, economic development, and increased mobility needs [1]. Among various transportation modes, intercity buses remain a popular and accessible choice for a large portion of the population due to their affordability, frequency, and coverage across provinces [2]. However, the rapid expansion of service providers, varying service standards, and increased customer expectations, customer migration to other services (i.e, limousine, unofficial bus route "dù") [3] have highlighted the need to evaluate and improve service quality in the intercity bus sector.

Service quality is a critical factor that directly influences passenger satisfaction, trust, and long-term loyalty [4]. In the context of intercity transportation, assessing service quality can support operators and policymakers in identifying performance gaps and implementing strategic improvements [5]. While numerous studies have applied the SERVQUAL model in transportation research [5]-[7], there is growing recognition that the model should be adapted to suit the specific characteristics of the service environment [8]-[10].

This study aims to evaluate the quality of intercity bus services in Hanoi from the passengers' perspective by measuring the service quality gap between expectations and perceptions using the RECSA model, and to provide recommendations for improving service delivery.

2. Literature review

The SERVQUAL model, initially developed by Parasuraman et al. [11], has become a widely accepted tool for measuring service quality across various industries, including public transportation. The model originally consists of five dimensions: Reliability, Assurance, Tangibles, Empathy, and Responsiveness (RATER). Over the years, scholars have modified the SERVQUAL framework to better reflect the unique nature of specific service settings such as RECSA [12]; extended SERVQUAL [13]; reformed SERVQUAL [6].

In the field of transportation, several studies have applied SERVQUAL to evaluate bus services. For example, research by Sam et al. [5] and Chang and Yeh [2] focused on customer satisfaction and service performance in public transport and intercity bus systems. These studies commonly used the RATER structure but noted that certain dimensions such as comfort and safety, which are crucial for intercity travel [14], were not adequately emphasized in the original model.

In the ASEAN region, several studies have applied and modified the SERVQUAL model to assess the quality of various transportation services. For instance, in the Philippines, the study by Ong et. al. [15] utilized the SERVQUAL dimensions alongside social exchange theory to examine customer satisfaction in motorcycle taxi services, emphasizing the importance of reliability, responsiveness, and empathy in the transportation experience. Similarly, Rosland et. al. [16] conducted a case study on the logistics sector in Iskandar Malaysia, adapting the SERVQUAL model to focus on the specific needs of service reliability, assurance, and empathy in the logistics service context. These studies highlight the flexibility of the SERVQUAL model, which can be tailored to address the unique aspects of different transportation and service sectors in Southeast Asia, particularly in regions with rapidly evolving service expectations and diverse customer needs.

To address limitations in the applicability of the SERVQUAL model to long-distance bus services, the RECSA model - standing for Reliability, Extent of Services, Comfort, Safety, and Affordability - has been developed. RECSA is grounded in the theoretical expansion of service quality dimensions to include factors

that are highly relevant in transportation contexts, particularly for intercity and long-distance travel. This model draws on foundational service quality theory [11] but extends it by incorporating both functional and outcome-related aspects specific to transportation [9]. For example, "Extent of Services" reflects operational breadth such as service frequency, geographic coverage, and route diversity. "Comfort" includes seat spacing, vehicle cleanliness, temperature control, and ride smoothness - factors often neglected in traditional SERVQUAL but critical for customer satisfaction during long trips. "Safety" encompasses both traffic safety (accident risk) and personal safety (theft or harassment concerns), while "Affordability" accounts for the perceived fairness of ticket pricing and fare transparency. These dimensions have been empirically validated as key determinants of service quality perception in intercity transport contexts [17], [18].

In this study, intercity bus refers to passenger services operating at major bus stations in Hanoi such as My Dinh, Giap Bat, and Yen Nghia, connecting the capital to more distant provinces such as Thai Binh, Nam Dinh, Hai Phong, Thai Nguyen, Bac Giang, and other provinces in the northern region. These are long-distance bus services used for travel between large cities and northern provinces, typically serving purposes such as business trips or tourism. The intercity bus is different from inter-provincial buses, which connect Hanoi to nearby provinces with a higher frequency of service. Intercity buses tend to offer more comfortable vehicles such as sleeper buses or spacious seating, with multiple departures per day, and are specifically designed for long-distance travel.

In the Vietnamese context, studies on service quality of intercity bus transport remain limited. Most existing research has focused on urban bus systems or general transportation infrastructure. A few papers [4], [19] explored aspects of customer satisfaction and service quality, but often lacked a structured SERVQUAL-based approach or did not adapt the model specifically for long-distance travel conditions. Bui [20] conducted a preliminary analysis of customers' expectations and perceptions regarding intercity coach services, with a particular focus on high-quality buses. Meanwhile, Tran et al. [21] analyzed passengers' satisfaction with services at long-distance bus stations; however, their study did not assess passengers' expectations. Both of these studies overlooked important factors such as ticket prices and fare changes. In contrast, Giao and Hiep [22] focused solely on passenger choice behavior for a single route, which may introduce bias when generalizing to the entire intercity coach system.

This study thus contributes to the literature by applying the RECSA model to evaluate the service quality of intercity buses in Vietnam - a sector with unique operational characteristics and growing strategic importance. The findings are expected to enrich the understanding of service performance from the passenger's perspective and support data-driven service enhancements.

3. Methodology

To evaluate the quality of intercity bus services from the passengers' perspective, a questionnaire survey was designed and conducted to gather data on service experiences and perceptions. The questionnaire is structured based on the RECSA framework, which encompasses five core dimensions: Reliability, Extent of Services, Comfort, Safety, and Affordability [9]. Each dimension is operationalized through a set of observable items or statements. The questionnaire was initially developed in English, with its content adapted from previous studies. It was then translated into Vietnamese for survey purposes. The translation process involved consultation with two transportation experts to ensure that the meanings were accurately and appropriately conveyed.

Hanoi was selected as the study location due to its role as a major transportation hub in northern Vietnam, with high demand for intercity bus services connecting it to multiple provinces. The city hosts several large bus terminals such as Giap Bat, My Dinh, Nuoc Ngam, Gia Lam and Yen Nghia serving diverse passenger demographics including students, workers, and tourists. Moreover, the intercity bus sector in Hanoi reflects a wide spectrum of service providers, ranging from traditional fixed-route operators to modern limousine services. This diversity makes Hanoi a representative and relevant context for assessing service quality using the RECSA model.

3.1. Measurement

This study aims to assess the service quality gap between passengers' expectations and their perceptions of the actual intercity bus services provided by operators in Hanoi. To achieve this, an adapted SERVQUAL model using five dimensions - Reliability, Extent of Services, Comfort, Safety, and Affordability - was employed to measure both the expected and perceived service quality levels.

Reliability: The ability to provide consistent, accurate, and dependable bus services, including adherence to schedules and service commitments.

Extent of Services: The breadth and accessibility of service offerings, such as route coverage, frequency of trips, and availability of connections.

Comfort: The degree of physical and emotional ease provided during the journey, including seating quality, cleanliness, temperature control, and onboard facilities.

Safety: Passengers' perceptions of protection and security during travel, encompassing driver behavior, vehicle condition, and adherence to safety regulations.

Affordability: The perceived fairness and reasonableness of ticket prices in relation to the quality and value of the service offered.

Based on a comprehensive review of relevant literature and contextual characteristics of intercity bus transport, a structured questionnaire was developed comprising 25 statements, with each of the five RECSA dimensions represented by five items. The questionnaire

was divided into three sections. The first section collected demographic information from respondents, including age, gender, occupation, travel frequency, and purpose of travel. The second section assessed passengers' expectations regarding service quality, while the third section measured their perceptions of the actual service they experienced.

A five-point Likert scale was used throughout the second and third sections to capture respondents' level of agreement with each statement, ranging from 1 (strongly disagree) to 5 (strongly agree). This measurement approach enables the identification of service quality gaps by comparing mean scores between expectations and perceptions for each service dimension, thereby providing insights into areas that require improvement.

3.2. Data Collection

Hanoi is home to several major intercity bus terminals, including Giap Bat, My Dinh, and Yen Nghia. These stations serve as key transportation hubs connecting the capital to a wide range of northern, central, and even southern provinces. Each terminal accommodates a high volume of daily passenger traffic and hosts a variety of service providers, from traditional fixed-route buses to higher-end limousine services. Despite differences in scale and infrastructure, these terminals share common features such as congested traffic at peak hours, limited passenger amenities, and varying levels of service quality, making them suitable locations for capturing a diverse range of passenger experiences in the intercity bus sector.

From March 1 to March 15, 2025, a face-to-face questionnaire survey was conducted with passengers at Giap Bat, My Dinh, and Yen Nghia intercity bus terminals in Hanoi. These locations were selected based on their high passenger volume and coverage of key interprovincial routes in the northern region. Using a convenience sampling approach, passengers were invited to participate immediately before or after their intercity journeys.

A total of 240 responses were collected, of which 199 were valid after screening for completeness and reliability, yielding a usable response rate of 82.9%. To ensure anonymity and reduce bias, no personal identifiers were recorded. Participants received a small monetary incentive to encourage full and honest participation.

3.3. Analysis Method

Data analysis was performed using R programming version 4.0.2. Both descriptive statistics (mean (M) and standard deviation (SD)) and inferential statistics (paired-samples t-test) were employed to assess passengers' expectations and perceptions of service quality. A larger gap between expectations and perceptions indicates lower service quality for that particular item, whereas a smaller gap reflects better service quality.

In addition to revealing differences between expectations and perceptions, the paired-samples t-test was instrumental in identifying which service quality items and dimensions were statistically significant to the surveyed passengers.

Understanding these differences is crucial for prioritizing service improvement initiatives and efficiently allocating resources to areas requiring the most attention.

4. Results and discussion

4.1. Descriptive statistics

Table 1 provides information on the background characteristics of the bus drivers surveyed. The sample was relatively balanced in terms of gender, with males (51.8%) slightly outnumbering females (48.2%). The majority of respondents were young adults, with 57.8% aged between 18 and 22 years, reflecting a predominantly youthful sample. Regarding marital status, most participants were single (68.3%), which is consistent with the large proportion of college students (56.2%) observed in the occupation distribution. In terms of income, over half of the respondents (55.3%) reported a monthly income of 10 million VND or less, suggesting a modest economic background. Furthermore, a significant proportion (76.9%) did not own a private car, implying a higher dependency on public and intercity transport services among the surveyed population.

Table 1. *The characteristics of the passenger sample*

Variables	Classification
Gender	Female=1 (48.2%), Male=2 (51.8%)
Age	Under 18=1 (5.5%), 18-22=2 (57.8%), 23-30=3 (6%), 31-40=4 (9%), 41-50=5 (13.1%), 51-60=6 (5.5%), 61-65=7 (1.5%), Over 65=8 (1.5%)
Marital status	Single=1 (68.3%), Married=2 (31.7%)
Occupation	State employees=1 (5%), Private employees=2 (19.6%), Business owners=3 (6.1%), College students=4 (56.2%), Unemployed=5 (3.1%), Other=6 (10%)
Income	<=10 million VND=1 (55.3%); 10.1-15=2 (9.2%); 15.1-20=3 (7.5%); 20.1-25=4 (4.1%); 25.1-30=5 (9.6%); 30.1-35=6 (7.1%); 35.1-40=7 (3.1%); >40=8 (4.1%)
Car owner	Yes=1 (23.1%), No=2 (76.9%)

4.2. Intercity bus service quality expectations and perception comparison

Table 2 presents the expectations and perceptions of participants for each service quality attribute included in the SERVQUAL scale. According to [23], analyzing each service quality attribute individually helps pinpoint and prioritize the most pressing areas for improvement in service quality, enabling more efficient allocation of resources and allowing for greater focus on the most crucial elements.

As indicated in Table 2, the participants in the study expressed substantial dissatisfaction with the service quality attributes of the city's transport providers. In general, their expectations for service quality were much greater than their evaluations of the actual services offered, resulting in noticeable gaps, as shown by the negative gap scores. As a result, there were significant statistical differences in the mean scores between the expected and perceived quality of public bus services across all 25 service quality items, with varying degrees of discrepancy.

Table 2. *Gap analysis between expectations and perceptions of intercity bus services*

Items		Perception		Expectation		Gap score	t - value	p-value (2-tailed)	95% C.I	
		M	SD	M	SD				Lower	Upper
Reliability	The intercity bus departs on time.	3.21	1.17	4.61	0.51	**-1.40**	-15.81	0.000	-1.571	-1.222
	The intercity bus is accessible to all types of passengers (children, the elderly, people with disabilities, etc.).	3.23	1.12	4.60	0.52	-1.37	-15.555	0.000	-1.545	-1.197
	Charging ports, wet tissues, drinking water, and other amenities are available for passengers.	3.69	0.85	4.65	0.52	-0.96	-14.374	0.000	-1.091	-0.828
	The intercity bus is fully equipped with modern conveniences such as wi-fi and air conditioning.	3.77	0.83	4.62	0.52	-0.85	-13.105	0.000	-0.977	-0.721
	The intercity bus is kept clean and well-maintained.	3.24	1.10	4.62	0.54	-1.38	-15.124	0.000	-1.562	-1.201
Extent of services	Full-service availability throughout the week.	3.68	0.89	4.61	0.54	-0.93	-14.753	0.000	-1.059	-0.809
	Transportation services are available in most cities and provinces.	3.87	0.84	4.66	0.53	**-0.79**	-12.999	0.000	-0.908	-0.669
	Pickup and drop-off locations are extremely flexible, not fixed, providing convenience without requiring passengers to gather at a specific point.	3.30	0.95	4.65	0.55	-1.35	-17.007	0.000	-1.502	-1.190
	Express delivery services are available upon request.	3.37	0.88	4.56	0.55	-1.19	-17.028	0.000	-1.328	-1.053
Comfort	Spacious and comfortable legroom.	3.22	1.11	4.58	0.53	-1.36	-15.708	0.000	-1.542	-1.198
	Comfortable (soft) seating.	3.26	1.07	4.62	0.54	-1.36	-15.608	0.000	-1.533	-1.189
	Pleasant and quiet atmosphere inside the vehicle.	3.43	1.05	4.66	0.52	-1.23	-15.116	0.000	-1.391	-1.07
	Clean and comfortable seating areas at the station.	3.56	0.99	4.61	0.53	-1.05	-13.8	0.000	-1.206	-0.904
	Smooth journey throughout the trip.	3.52	0.95	4.61	0.53	-1.09	-14.893	0.000	-1.240	-0.950
Safety	I feel safe from traffic accidents while riding in the intercity bus.	3.37	0.90	4.54	0.52	-1.17	-15.663	0.000	-1.318	-1.023
	I feel safe from crimes while on board.	3.39	0.91	4.61	0.52	-1.22	-16.185	0.000	-1.369	-1.072
	The driver is well-trained and safety measures are implemented, including emergency exits, seat belts, and surveillance cameras.	3.63	0.83	4.62	0.52	-0.99	-14.534	0.000	-1.118	-0.851
	I feel safe when riding during daytime.	3.47	0.89	4.60	0.51	-1.13	-15.846	0.000	-1.271	-0.989
	I feel safe when riding during nighttime.	3.27	1.04	4.62	0.51	-1.35	-15.405	0.000	-1.524	-1.178
	Passengers around me are polite, giving a sense of security.	3.46	0.87	4.60	0.51	-1.14	-16.38	0.000	-1.283	-1.007
	There are intercity bus staff members present on board.	3.69	0.78	4.58	0.52	**-0.89**	-13.296	0.000	-1.015	-0.753
Affordability	Ticket prices are affordable.	3.94	0.92	4.66	0.50	-0.72	-10.906	0.000	-0.842	-0.584
	Ticket prices are cheaper compared to other means of transportation.	3.78	0.98	4.60	0.54	**-0.82**	-11.512	0.000	-0.959	-0.678
	Ticket prices come with various promotions.	3.11	1.17	4.58	0.54	**-1.47**	-16.007	0.000	-1.659	-1.295
	Ticket prices remain stable during special occasions.	3.02	1.24	4.67	0.49	**-1.65**	-17.615	0.000	-1.838	-1.468

For example, there was a statistically significant difference between participants' expectations regarding the punctuality of intercity coach departures ("The intercity bus departs on time") ($M = 4.61$, $SD = 0.51$) and the actual situation at the time ($M = 3.21$, $SD = 1.17$), $t = -15.81$, $p < 0.05$. The mean difference was -1.40, with a 95% confidence interval (C.I.) ranging from -1.571 to -1.222. The η^2 value of 0.558 indicated a large effect size. Similarly, participants' expectations regarding ticket price promotions ("Ticket prices come with various promotions") ($M = 4.58$, $SD = 0.54$) were much higher than their perceptions of the actual situation ($M = 3.11$, $SD = 1.17$), $t = -16.007$, $p < 0.05$. The mean difference was -1.47, with a 95% confidence interval (C.I.) ranging from -1.659 to -1.295. The η^2 value of 0.564 indicated a large effect size. Additionally, the data revealed that participants expected ticket prices to remain stable during special occasions ($M = 4.67$, $SD = 0.49$) ("Ticket prices remain stable during special occasions") compared to their perceptions of the actual situation ($M = 3.02$, $SD = 1.24$), $t = -17.615$, $p < 0.05$. The mean difference was -1.65, with a 95% confidence interval (C.I.) ranging from -1.838 to -1.468, and the η^2 value of 0.61 indicated a large effect size.

Moreover, intercity bus users rated the availability of transportation services across cities and provinces very highly. This is reflected in the smallest negative gap score among all evaluated items, with the expectation score ($M = 4.66$, $SD = 0.53$) for the statement "Transportation

services are available in most cities and provinces" being higher than the perceived score (M = 3.87, SD = 0.84). The t-test result was significant (t = -12.999, p < 0.05), showing a mean difference of -0.79, with a 95% confidence interval ranging from -0.908 to -0.669. The η^2 statistic of 0.46 indicated a large effect size. Additionally, intercity bus users expressed a highly positive evaluation regarding the affordability of ticket prices compared to other modes of transportation. This is demonstrated by the second smallest negative gap score among all assessed items, with an expectation score of (M = 4.6, SD = 0.54) for the statement "Ticket prices are cheaper compared to other means of transportation," exceeding the perceived score (M = 3.78, SD = 0.98). The difference was statistically significant (t = -11.512, p < 0.05), with a mean difference of -0.82 and a 95% confidence interval ranging from -0.959 to -0.678. The η^2 value of 0.40 suggested a large effect size. Furthermore, intercity bus users gave a highly favorable assessment of the presence of staff members on board. This was reflected in the third smallest negative gap score among all evaluated items, where the expectation score for the statement "There are intercity bus staff members present on board" (M = 4.58, SD = 0.52) was higher than the perceived score (M = 3.69, SD = 0.78). The t-test indicated a statistically significant difference (t = -13.296, p < 0.05), with a mean difference of -0.89 and a 95% confidence interval from -1.015 to -0.753. The η^2 value of 0.471 indicated a large effect size.

Overall, the results demonstrated that while passengers highly value aspects such as widespread service availability, affordable pricing, and staff presence, substantial gaps still exist between their expectations and the actual service performance across all assessed dimensions. These findings underscore the need for intercity bus operators to prioritize improvements in operational reliability, fare stability, promotional offerings, and overall service delivery to better meet customer expectations and enhance satisfaction.

In summary, the service quality expectations of the participants were significantly higher than their perceptions, resulting in substantial differences (negative gap values) between the two. While this outcome is not unexpected, it provides valuable insight into the intercity bus services in the city. Fellesson & Friman [24] point out that negative gaps indicate high user expectations compared to their perceptions of the service, which they describe as the “quality paradox effect” [25]. Furthermore, Parasuraman et al. [11] emphasized that “it is common for consumer expectations to surpass the actual service perceived, highlighting the constant need for improvement.” Therefore, the study’s findings underline the necessity for enhancements in the intercity bus services offered in the city, particularly in the “priority areas” identified by the large negative gap scores.

While these findings contribute valuable insights into service quality perceptions, several limitations should be acknowledged. First, the use of convenience sampling may affect the representativeness of the results, limiting generalizability. Second, the exclusive reliance on quantitative data, without complementary qualitative feedback, may constrain the depth of interpretation regarding user dissatisfaction. Third, although the RECSA model based on SERVQUAL provides a structured framework, it may not fully capture all aspects of passengers’ experiences. Lastly, external situational factors (e.g., peak hours, weather) during the survey period might have influenced responses but were not explicitly controlled for.

5. Conclusion and implications

This study aimed to assess the perceived service quality of intercity bus services in Hanoi, Vietnam, using the RECSA framework, which encompasses reliability, extent of services, comfort, safety, and affordability. The findings revealed significant service quality gaps across all five dimensions, indicating that passengers’ expectations consistently exceeded their perceptions of the services provided. Notably, issues such as punctuality, price stability during special occasions, and the availability of promotional offers were identified as critical areas of dissatisfaction, while aspects like route availability and affordability relative to other modes of transportation received relatively better evaluations, though still below expectations.

The results highlight an urgent need for intercity bus operators and policymakers to prioritize service quality improvements to meet passenger expectations and retain customer loyalty. Several practical implications can be drawn from the specific findings of this study:

First, the analysis revealed that punctuality was one of the lowest-rated service attributes, indicating passengers’ strong dissatisfaction with delays. Therefore, operators must enhance schedule management, reduce travel time uncertainty, and improve operational reliability to restore passenger trust.

Second, our findings showed that ticket pricing fairness and transparency significantly influenced perceived value. This underscores the need for operators to implement clearer and more stable pricing strategies - especially during holidays and peak seasons - while also developing tailored promotional campaigns to attract and retain passengers.

Third, the study found that comfort-related aspects, such as seat space, cleanliness, and onboard temperature, had a notable impact on overall satisfaction. As a result, investing in upgraded seating, better ventilation systems, and routine cleaning protocols can greatly enhance the travel experience.

Fourth, safety was consistently ranked as a critical concern among passengers, reflecting their expectations for risk-free journeys. This calls for continuous investment in vehicle maintenance, strict adherence to safety standards, and comprehensive driver training programs.

Finally, our data indicated a growing demand for broader route coverage and higher service frequency, especially among passengers in rapidly urbanizing regions. Expanding intercity service networks and increasing trip frequency can better accommodate rising mobility needs.

From a broader perspective, the RECSA framework has demonstrated its applicability in evaluating intercity bus services in the Vietnamese context. Future research could expand the scope by applying this framework to different cities or transportation modes, or by investigating longitudinal changes in service quality perceptions. By systematically addressing service quality gaps, the intercity bus sector in Vietnam can enhance competitiveness, passenger satisfaction, and long-term sustainability.

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