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Exploring the factors influencing commuters' satisfaction and the use of public utility buses in Quezon City, Philippines

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Abstract

This study examines the determinants of commuter satisfaction with public utility buses in Quezon City, Philippines, emphasizing service quality, travel duration, cost efficiency, and willingness to utilize the service. The study employed a quantitative research design, gathering data from public utility bus commuters in Quezon City using Slovin's formula. A validated 29-question Likert-scale survey was utilized, and data were analyzed with linear and multiple regression. The survey results show the significant influence of these factors on commuter satisfaction and their willingness to use bus services in Quezon City. The quality-of-service variable, exhibits significant results, highlighting safety concerns which are particularly relevant among women. This reflect subjective norms, travel duration and cost-efficiency were found to have a significant positive impact, as passengers value the advantages of time-saving and affordable prices. This research calls for regulatory changes aimed at improving service quality and safety to enhance operational standards of bus services in the Philippines.

Keywords: *bus transit, transportation, PCA, commuter satisfaction, Quezon City*

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1. Introduction

Public transportation is crucial for economic activities, enabling the movement of people and goods, which in turn affects productivity, equity, and accessibility (Abdallah, 2023). Mass transit systems like buses are essential for urban growth, significantly influencing commuter demand through factors such as convenience and service quality (Anderson et al., 2013). Buses are recognized globally for their cost-effectiveness, serving millions daily, even in cities with rail networks (Ingvardson & Nielsen, 2017). In the Middle East, cities like Abu Dhabi expand bus services to relieve congestion for expatriate workers (Qamhaieh et al., 2016), while São Paulo relies on buses for affordability (Facchini & Dias, 2019). Despite the benefits of public transportation, negative externalities like congestion and pollution can offset these gains (Miller et al., 2016). In the Philippines, transportation issues particularly affect lower-income individuals due to the reliance on buses and jeepneys, which contribute to traffic congestion (Boquet, 2017). Urban areas like Metro Manila face significant challenges, with inadequate infrastructure hindering bus operations (Boquet, 2019). Quezon City epitomizes these struggles, facing heavy traffic and low commuter satisfaction (Rotaris et al., 2015; Luz et al., 2015), lack of integrated planning in traffic and transportation, and its road systems being the most traversed passage ways in Metro Manila (Macusi, 2014). In relation to the global context, Quezon City would benefit deeply from an enhanced bus transportation system beyond that of its free bus services but applied at a larger scale to further alleviate commuter woes. As the nation recovers from COVID-19, evolving commuter behaviors add further complexity to the transportation landscape (Roquel et al., 2021; Jou et al., 2021).

As commuters return to pre-pandemic travel routines, they encounter challenges such as congestion, inconsistent loading areas, and driver difficulties, leading to negative experiences and stressful conditions. Service quality, particularly reliability and comfort, is vital for addressing these issues (Tuân et al., 2022; Guevara, 2024). Additionally, affordability is a major concern due to rising fuel prices (Peña, 2022). Economic pressures further stress commuters, highlighting the need for affordable options (Ha et al., 2020). Long commute times from traffic and inadequate public transport result in wasted time and frustration, compounded by prolonged waiting periods (Chowdhury et al., 2015). Subingbing (2020) stresses that these issues stem from urban planning, limited options, and poor infrastructure. Hence, this research examined commuter satisfaction within the context of Metro Manila's public transportation system.

This study examined the relationships between service quality, cost-effectiveness, journey time, and customer satisfaction, focusing on how satisfaction influences the willingness to use bus transit. It draws on the Theory of Planned Behavior (TPB), which suggests that attitudes, subjective norms, and perceived behavioral control shape intentions to use public transport. Service quality, cost, and journey time impact attitudes, while social pressures and beliefs about using transit also play a role. Additionally, the Theory of Social Exchange posits that passengers balance the benefits of convenience, affordability, and time savings against costs like discomfort and inconvenience. Cahigas et al. (2022) applied this theory to understand passenger decisions by examining the interactions among passengers, drivers, operators, and other stakeholders. This understanding can help enhance passenger satisfaction and increase public transit usage.

Recent research has highlighted the importance of bus commuter satisfaction, as it directly affects urban mobility and quality of life (Ching & Chian, 2024). Public transportation can foster economic activity and promote social equity (Litman, 2015). However, longer commutes have been shown to impact physical and mental health negatively, leading to increased stress and reduced productivity (Giménez-Nadal & Molina, 2019). Despite efforts to improve Metro Manila's transportation system, many initiatives have focused more on infrastructure rather than addressing local needs (Regidor & Aloc, 2017; Napalang & Regidor, 2015). Collaborative and inclusive policymaking is essential to tackle urban transportation challenges (Gatarin, 2023). Similar studies have aimed at enhancing public transport through technology and urban planning (Narboneta et al., 2014; Rith et al., 2019). By understanding the factors affecting commuter satisfaction, policymakers can develop strategies to create more efficient and sustainable urban transportation systems that enhance worker well-being and productivity. Further research into commuter satisfaction is crucial for advancing public transportation, particularly bus services. A study by St-Louis et al. (2014) conducted in Montreal, Canada, found that bus users are significantly impacted by external factors beyond their control, especially concerning trip characteristics and travel times, resulting in lower satisfaction levels. Conducting a study on bus commuters in Quezon City would help determine whether various circumstances influence their satisfaction.

2. Literature review

Transportation infrastructure, including both modes and networks, plays a significant role in economic development (Redding et al., 2015). This literature study examines five critical factors—service quality, journey duration, cost-effectiveness, and customer satisfaction—to elucidate how they are associated with commuters' willingness to use public transit. The focuses on the public transportation environment, where urbanization and increasing population density have led to considerable transit difficulties.

In the Philippines, public transportation remains the primary mode of transport, accounting for 59.48% of trips, while private vehicles account for 22.55% (Statista, 2024). However, Rith et al. (2018) found that households with higher socioeconomic status often prefer private transportation due to perceived convenience and accessibility. These households may have higher educational attainment and multiple working adults, making it difficult to rely on public transportation, especially during peak hours. Conversely, households residing near transit terminals are more likely to rely on public transportation.

To promote sustainable urban development, it is essential to create balanced and integrated transportation systems that incorporate private, public, and non-motorized modes. Poliak et al. (2017) emphasized the importance of complementarity between public and private transportation. However, public transportation ridership can decline due to factors such as longer travel times, frequent transfers, and long walking distances (Lunke et al., 2021).

2.1. Factors affecting Customer Satisfaction of Public Transportation

2.1.1. Service quality and customer satisfaction

Service quality refers to the consistent capacity to meet the demands and expectations of customers, highlighting technical and functional aspects (Ingaldi, 2018). The research of Gulhan et al. (2013) on transportation systems as public goods analyzed the importance of quality of service as an indicator of performance of transportation systems to facilitate economic activities. Service level agreements promote accessibility, but passengers have individual tastes, therefore this may affect transportation preferences.

Ha et al. (2020) found that Korean commuters are sensitive to transportation costs, with some being more cautious about switching modes, calling service quality a positive relationship for customer satisfaction. Additionally, younger commuters are more likely to resist public transportation hurdles. Ranosa et al. (2017) found that a certain group of workers,

mostly younger males, have different commuting behaviors and are more geographically dispersed due to their economic class, suggesting that they would rather travel for work than stay in one place if it meant a better quality of life. According to Bacero et al. (2018), the majority of student commuters in Manila are young adults in their teens and twenties, single, come from middle-class households, and have a high level of education who often travel five days a week, with walking being their primary mode of transportation, making age a significant question to add in the instrument.

Highly elastic commuters' perceived stress level as a significant variable. Evangelista et al. (2021) conducted a research study that found external influences to have a substantial effect on the job happiness of individuals who commute to work. Fallaria et al. (2019) stated that it is necessary to reduce burnout while traveling to work locations in order to manage fatigue and thus improve labor efficiency. The researchers proposed that high service quality is a contributing component to coping techniques that can be attributed to the inevitability of using public transportation, thereby leading individuals to continue using it claiming to a positive relationship between service quality and customer satisfaction.

While it is commonly believed that service quality has a positive impact on customer satisfaction and willingness to use, Mijares et al. (2016) highlighted another aspect of customer behavior called mental adaptation. This phenomenon can lead to increased satisfaction but also has the potential to lower expectations, creating complacency, and expose individuals to physiological harm. Consequently, mental adaptation may decrease customer satisfaction and their willingness to use a service. Furthermore, commuters could be responsive to poor quality service. Au and Tse (2019) found that participants exhibited a higher tendency to remember unpleasant occurrences compared to happy ones. Additionally, they displayed a greater willingness to communicate their negative experiences to their acquaintances. O'Donovan et al. (2015) discovered that improvement feedback is the most powerful part of evaluation cycles. Customers will exhibit their loyalty when they receive service excellence that fulfills their basic expectations (Arlen, 2023). Researchers argue that by focusing substantial emphasis on service quality attributes, can serve as a benchmark to establish customer and service relationships. Hence, this study argues that:

H1: There is a significant relationship between service quality and customer satisfaction on public transportation

2.1.2. Journey time and customer satisfaction

Journey time, measured by road or public transit journey time, can indicate service performance (Curl et al., 2015). Chowdhury et al. (2015) found that control beliefs, pertinent to Theory of Planned Behavior, influence public transportation riders' travel behavior despite time, money, and knowledge constraints. Hornsy and Love (2020) classify commuters as low-wage laborers, students, and leisure commuters. This supports the idea that aligning preferences with past choices may motivate people to engage in exploring different routes, giving journey time the possibility to have a positive relationship with customer satisfaction.

Researchers believe that individuals are inclined to use public transit, irrespective of the duration of travel, in order to mitigate uncertainty. This statement is based on the theory of Coherency Driven Choice (CDC) by Hornsy and Love (2020) which treats exploration and coherency maximization as separate and independent from each other, both in terms of theory and mechanism. Within the food and beverage industry, a recent examination of consumers' take-away purchases indicated that they were inclined to experiment with a new restaurant following a favorable experience, rather than repeating it. If a commuter desires to investigate alternative route possibilities, it indicates that their willingness to utilize and their happiness with the service has been fulfilled, as it negates the significance of the travel duration. Moreover, being exposed to various commuter behaviors can potentially impact one's choices (Durand et al., 2018).

Individuals adjust their reaction times in basic perceiving tasks dependent on reward and opportunity cost (Otto & Daw, 2019). In a survey conducted by Balita (2023) in June 2023, a Philippine mobility survey indicated that 28% of respondents commuted 15–29 minutes per day to employment, school, or university. Conversely, 27% of participants indicated that their daily journey typically lasted between 30 and 59 minutes. According to a headline by Monzon (2024), the instances of Metro Traffic being labeled as a "state of calamity" were not ignored from an individual's perspective. Traffic congestion costs the Philippine economy 3.5 billion pesos daily. Given the enormity of the destruction, immediate action is needed.

Given Manila's exceptionally high population density, as reported by Mapa (2021), the potential for competitiveness among those who travel often. Rivera (2018) stated that the distance of around 15 kilometers was unmanageable due to the large queues of people waiting for public transportation, based on commuter experience. The same study found out that bus operators are still unable to offer commuters convenient and direct transportation routes,

without the need to go through the difficulties of hailing rides or boarding jeeps or buses. As a result of this situation, public transit declines, and private vehicles become more popular. Similarly, Rith et al. (2019) found that homeowners with parking slots, married individuals, men, and women showed a preference for private car commuting. Age, employment, education, and purchasing power were found to be connected with car usage. In addition, the options for commuting did not include walking towards bus terminals, which eliminates the negative correlation between journey time on public transit. This results in a disparity between public and private transportation options. Van et al. (2014) uncovered local evidence that six Asian nations' car and public transit views greatly impact their behavior. The study suggests that policymakers should create educational initiatives to enhance the public transit image and mitigate social difficulties.

There is evidence suggesting that the duration of a journey is related to customer happiness and that this relationship may be influenced by the customer's gender. Women were found to prefer a structured system and advanced car technologies (Ranosa et al., 2017). A study conducted in Turkey examined the experiences of female domestic workers who commute significant distances between their own houses and the homes of their employers to do domestic tasks (Erman and Kara, 2018). Women experience a heightened sense of urgency due to their role as caretakers of the household within the patriarchal family structure, which demands shorter travel time. This makes journey time a factor that influences commuter satisfaction and willingness to avail of the service.

To meet the growing demand for efficient transportation in the Philippines, it is crucial to ensure that employment opportunities are accessible to all, regardless of geographic location. Urban commuters, in particular, require reliable and efficient transportation options that prioritize accessibility, mobility, and connectivity (Cheng and Chen, 2015). Given these arguments, this study posits that:

H2: There is a significant relationship between journey time and customer satisfaction on public transportation

2.1.3 Cost-effectiveness, customer satisfaction and willingness to use

Cost-effectiveness refers to the efficiency of a resource in relation to its cost (Thompson, 2023). Cost-efficient services can improve operational performance and enhance passenger satisfaction (Trang, 2022). Understanding the relationship between accessibility,

location preferences, and travel costs is crucial for developing effective transportation and land-use policies (Ponce-Lopez et al., 2019).

Stated choice experiments, such as the one conducted in the United States, provide valuable insights into how individuals weigh travel time, trip cost, and work-related factors. These experiments can help inform the development of cost-effective transportation solutions. Poudel and Singleton (2024) demonstrated the importance of considering both travel time and work time in transportation decision-making. Their study found that individuals value additional work time more than additional travel time. This highlights the significance of cost-effectiveness in enhancing customer satisfaction to public utility buses.

Assessing the cost-effectiveness of public transportation involves evaluating its efficiency in delivering services to travelers. To achieve cost-effectiveness, it is essential to consider the emotional well-being of passengers. As Friman et al. (2023) suggest, subjective well-being can be measured by assessing life satisfaction and willingness to use public transit. By facilitating engagement in important life activities, public transportation can contribute to overall well-being, aligning with the principles of planned behavior. If commuters perceive public transportation as essential for their daily routines and economic activities, their willingness to use the service can positively impact both individual well-being and economic outcomes.

A study by Gundersen et al. (2017) in Oslo, Sweden, emphasized the importance of diverse public transportation options for commercial centers. This highlights the interconnectedness of transportation infrastructure, land-use planning, and sustainable mobility strategies in addressing urban challenges and improving quality of life. Sustainable mobility practices align with the concept of a positive relationship between cost-effectiveness and customer satisfaction. Shifting towards public transportation can significantly reduce greenhouse gas emissions and improve environmental quality, making it a cost-effective solution for addressing climate change (Donald et al., 2014). Government intervention, such as subsidizing public transportation fares, can further incentivize the use of public transportation and reduce car usage, as demonstrated by Rotaris et al. (2015). Additionally, strategic urban planning, such as locating workplaces near transit hubs, can encourage the adoption of sustainable transportation modes (Chakrabarti, 2017) and could possibly make Quezon City commuters switch to public transportation.

While high-capacity transportation systems can increase overall capacity, they may also lead to inconveniences for individual travelers (Batarce, 2016). This study measures how likely are Quezon City passengers are satisfied despite having to experience the high-capacity set up. Perrota et al. (2016) suggested that targeted transportation subsidies could encourage public transit use, particularly among low-income workers. By implementing pre-tax deductions for transportation expenses, the Philippine government could potentially reduce the financial burden on commuters, making public transportation more cost-effective for both operators and passengers. Hence, this study argues that:

H3: There is a significant relationship between cost-effectiveness and customer satisfaction

2.2 Customer Satisfaction and Willingness to Use on Public Transportation

Customer satisfaction is a complex emotional response to the perceived gap between expectations and actual service delivery (Bilişik et al., 2013). To improve the long-term viability of public transportation, it is crucial to enhance its efficiency, attractiveness, and financial sustainability while minimizing negative social and environmental impacts. As urbanization continues, the demand for efficient and sustainable transportation solutions grows. To address this challenge, Kovvali and Ganji (2019) suggest focusing on improving public transportation systems in densely populated areas like Quezon City. By enhancing the overall satisfaction of public transit passengers (PTP), it is possible to create new travel behavior patterns and promote sustainable urban mobility.

Kovvali and Ganji (2019) outlined fundamental principles for urban transportation development in Indian cities, emphasizing the importance of prioritizing commuter well-being (Diener & Lyubchik, 2018) and promoting environmentally friendly solutions (Mittal et al., 2016). To gain deeper insights into the expectations and perceptions of public transportation users, conducting a survey can be a valuable tool to test how Quezon City commuters see customer satisfaction as a factor to willingly use public transportation. Previous research by Daniels et al. (2018) has demonstrated the distinction between core and non-core users, highlighting the need to tailor services to specific user groups. By understanding user preferences, service quality expectations, and cost-effectiveness concerns, transportation operators can allocate resources effectively and improve overall service delivery.

Liobikien and Poškus (2019) found that Lithuanian citizens, while not highly environmentally conscious, are willing to engage in pro-environmental behaviors, such as using public transportation. Environmental education plays a crucial role in promoting sustainable consumerism (Michelsen & Fischer, 2017). However, factors like urban planning and social strategies can influence customer satisfaction with public transportation services (Uddin et al., 2019). Given the importance of timeliness for commuters, it is essential to continuously update and improve public transportation systems to meet global standards (Sam et al., 2018).

Individual attitudes and cultural preferences affect public transit utilization. Mental aspects including societal views affect mode choice, according to Van et al. (2014). Cross-cultural differences also play a significant role in shaping transportation preferences (Heinen, 2016). For instance, Van et al. (2014) found that Asian university students often prefer private vehicles over public transit, while Gutiérrez et al. (2020) observed that individuals in Santiago, Chile, are more likely to use bicycles for shorter distances, but this preference decreases with increasing trip length and age. Meanwhile, Cahigas et al. (2022) applied Social Exchange Theory (SET) to understand that individuals weigh both tangible and intangible factors when making decisions. In the context of public transportation, the availability of sufficient buses can positively impact passenger trust in the system. However, even with adequate bus numbers, passenger satisfaction depends on factors like knowledge of peak and non-peak hours. This highlights the importance of considering both the quantity and quality of service, as well as providing clear information to passengers. By understanding these factors, there is better assessment of the relationship between perceived value, cost, and overall satisfaction with public transportation. Hence, this study posits that:

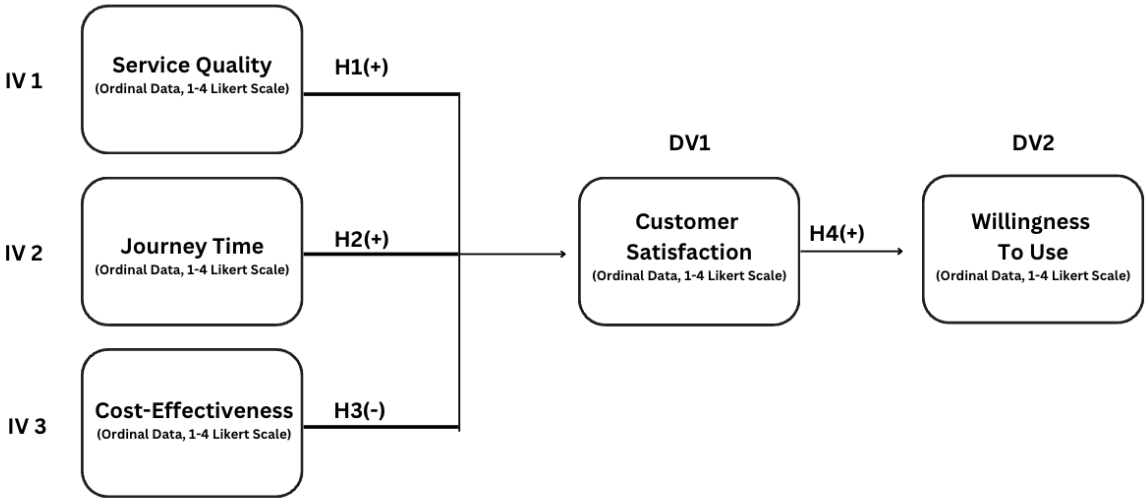
H4: There is a significant relationship between customer satisfaction and willingness to use on public transportation

2.3. Conceptual Framework

The research model in this study is based on the Expectancy Disconfirmation Theory. Its significance to this study is based on the perceived functions of customer satisfaction. Expectancy Disconfirmation Models suggest that satisfaction arises from a process where citizens make comparisons on their perceptions of the performance of public services in contrast to their initial expectations (Zhang et al., 2021).

Figure 1

Conceptual framework



3. Methodology

3.1. Research Method and Design

This study used quantitative research design performing both online and offline data collection methods as inspired by Bucu et al. (2023) on transportation improvements. Electronic surveys were distributed through social media platforms, and physical questionnaires were administered at bus terminals. The research instrument focused on assessing perceptions of service quality, cost-effectiveness, journey time, customer satisfaction, and willingness to use public transportation. The Theory of Planned Behavior guided the multiple regression model, while the Theory of Social Exchange informed the linear regression model.

Data analysis involved the use of linear and multiple regression analysis. The multiple regression equation used was:

$$CS = \alpha o + a1SQ + \alpha 2CE - a3JT + \epsilon$$

The linear regression equation was:

$$WTU = ao + \alpha 1CS + \epsilon$$

Where:

α0 is the Intercept or the value of customer satisfaction when independent variables are 0

α1 is the coefficient of service quality/ customer satisfaction

α2 is the coefficient of cost-effectiveness

α3 is the coefficient of journey time

ϵ is the error term

3.2. Population and Sampling

The study focused on public utility bus commuters and residents of Quezon City, surveying 400 respondents based on a population of 3,278,247 (World Population Review, 2024). Slovin's Formula was used to ensure a 5% margin of error. Table 1 shows the demographic characteristics of the participants.

Table 1

Descriptive characteristics of the participants (N = 405)

Characteristics	Category	F	%
Gender	Male	148	36.5%
	Female	258	63.5%
Age	18 - 29	348	85.7%
	30 - 39	26	6.4%
	40 - 49	18	4.4%
	50 - 69	13	3.2%
	70 and Over	1	0.2%
Current Educational Background	Elementary graduate	3	0.7%
	High school graduate	46	11.3%
	Senior high school graduate	196	48.3%
	Technical/Vocational graduate	11	2.7%
	Baccalaureate/College graduate	90	22.2%
	Post-baccalaureate graduate	12	3%
	Special education (undergraduate)	46	11.3%
	Special education (graduate)	0	0%
	Prefer not to say	2	0.5%

The survey sample was mostly female (63.5%) and young (85.7% 18-29). With only one response over 70, 30-39 (6.4%), 40-49 (4.4%), and 50-69 (3.2%) are smaller age

groupings. Senior high school graduates make up 48.3%, followed by baccalaureate/college graduates (22.2%) and high school graduates (11.3%). 11.3% are special education (undergraduate), 2.7% are technical/vocational, 3% are post-baccalaureate, and 0.7% are primary graduates. No responders from special education (graduate) and 0.5% decided to keep their background anonymously. The sample was young, mostly female, and educationally varied, with many respondents having recently graduated or are pursuing additional study.

3.3. Instrumentation

The research utilized a customer satisfaction survey approach (Hussain et al., 2018), with data collected from a 29-question questionnaire adapted from Jou et al. (2023) and a 4-point Likert scale was used to measure the perceptions of bus commuters, it must be noted that using this scale may vary in terms of reliability depending on the study and structure of the survey questions. Validity was established through pilot testing, and reliability was confirmed with a Cronbach alpha coefficient of 0.7 or higher (Valdez & Agustin, 2020). Principal Component Analysis (PCA) was employed to summarize data, retaining variables with Eigenvalues >1 and applying Kaiser's criterion for factors with eigenvalues over 0.7 (Suhr, 2023; Khanal et al., 2023).

Research relies on pilot testing to assess a study's feasibility and identify issues before launching it. This assured the study instrument's integrity, data collection methods' efficacy, and participant questions' clarity, offering clear directions for future researchers to improve research dependability (Wadood, 2021). Pasig City was chosen for the pilot test because it may mirror Quezon City, the study's principal proponent. After surveying 28 Pasig City citizens, an internal consistency of 0.942 indicated adequate reliability (Tavakol, 2011), allowing researchers to proceed with collecting data. The Cronbach Alpha results are shown in table 2.

Table 2

Cronbach Alpha results extracted from SPSS

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.942	.944	28

The sample had enough sampling adequacy, with a KMO (Kaiser-Meyer-Olkin) value between 0.778 and 0.912. This suggests that factor analysis of these three variables will reveal

their linkages. The extraction approach showed a low correlation between CE4 and SQ3, indicating instrument reduction and arrangement. SQ3 from the original survey instrument was eliminated and replaced with CE4 in the first PCA results. These changes and recent, acceptable results allowed this investigation to proceed with regression.

Table 3

Principal Component Analysis extracted from SPSS

	Component		
	1	**2**	**3**
SQ2	.853		
SQ1	.842		
SQ5	.812		
SQ4	.763		
SQ6	.688		
CE4/SQ3	.481		
JT2		.872	
JT5		.810	
JT4		.766	
JT3		.653	
JT1		.630	
JT6		.462	
CE3			.949
CE2			.890
CE1			.546
CE5			.529
Extraction Method: Principal Component Analysis			
Rotation Method: Promax with Kaiser Normalization			
Rotation converged in 5 iterations.			
KMO and Barlett's Test			
Kaiser-Meyer-Olkin Measure of Sampling Adequacy			.912
Barlett's Test of Sphericity		Approx. Chi-Square	2646.878
		df	120
		Sig,	.000

The survey questionnaire contains the demographic profile, educational background, route commute and past experience of the participants. Table 4 shows the survey question references.

Table 4

Sources of the survey questions

Statements	Source
Independent Variable: Service Quality (+)	
SQ1 Overall, bus transit provides me with a safe environment	Park et al. (2021) Jou et al. (2023)
SQ2 The bus transit follows all traffic laws	Park et al. (2021) Jou et al. (2023)
SQ3 Overall, the services offered by bus transit are worth their price	Suleman (2014) Jou et al. (2023)
SQ4 I am optimistic about the overall quality of service provided by the bus transit	Alabi et al. (2021) Jou et. al. (2023)
SQ5 Bus transit services exceed my expectations	Yu et al. (2014) Jou et al. (2023)
SQ6 I have lesser problems with the overall bus transit	Jou et al. (2023)
Independent Variable : Journey time (-)	
JT1 I prefer a faster travel time but more hassle	Lee et al. (2024)
JT2 I prefer to travel at night beyond working hours	Cook et al. (2016)
JT3 I prefer to go home as fast as possible	Cook et al. (2016)
JT4 I would rather wait for a newer bus unit than ride an older one	Zhang et al. (2024)
JT5 I ride buses because I can save time and allocate it to other things	Polydoropoulou et al. (2020)
JT6 When I ride the bus, I make more transfers to reach my destination	Polydoropoulou et al. (2020)
Independent Variable - Cost-Effectiveness (+)	
CE1 I am willing to pay for a higher price for a faster commute	Polydoropoulou et al. (2020)
CE2 The cost of public transportation puts a strain on my household budget.	Poudel et al. (2024)
CE3 Ticket price is reasonable	Park et al. (2021)
CE4 Public transportation vehicles are not overcrowded, allowing me to get my money's worth	Friman et al. (2017)

Statements	Source
CE5 The process of availing discounts for public transportation is hard and inconvenient.	Perrotta (2016)
Dependent Variable: Customer Satisfaction (+)	
CS1 Overall, I am satisfied with the bus transit service	Grujičić et al. (2014) Jou et al. (2023)
CS2 I will most likely utilize bus transit again	Yu et al. (2014) Jou et al. (2023)
CS3 I am willing to recommend the bus to my friends and relatives	Grujičić et al. (2014) Jou et al. (2023)
CS4 I feel comfortable riding the bus transit	Sumaedi et al. (2016) Jou et al. (2023)
CS5 I am satisfied with the bus transit system in Metro Manila	Sumaedi et al. (2016) Jou et al. (2023)
CS6 I have a positive mindset while riding in a bus transit	Jou et al. (2023)
Dependent Variable: Willingness To Use (+)	
WTU1 I am willing to use bus transit because it meets my preferences.	Del Chiappa et al. (2016)
WTU2 I am willing to use bus transit because I encounter few problems	Ranosa et al. (2017)
WTU3 I am willing to use bus transits because it is environmentally sustainable	Ranosa et al. (2017)
WTU4 Bus Transit is the most viable option for me because I'm satisfied with it	Sam et al. (2018)
WTU5 I am willing to recommend the bus to my friends and relatives	Yu et al. (2014) Sumaedi et al. (2016)

3.4. Ethical Considerations

The study emphasizes a commitment to ethical research practices, ensuring informed consent from all participants and guaranteeing the confidentiality and anonymity of their data, in adherence to the Data Privacy Act of 2012. Key ethical considerations include respect for individuals and marginalized groups, ensuring integrity in research through honesty and transparency, and prioritizing confidentiality and privacy. Researchers provide comprehensive information for informed consent, prioritize beneficence by maximizing benefits and minimizing harm, promote social justice by involving diverse communities, and are sensitive

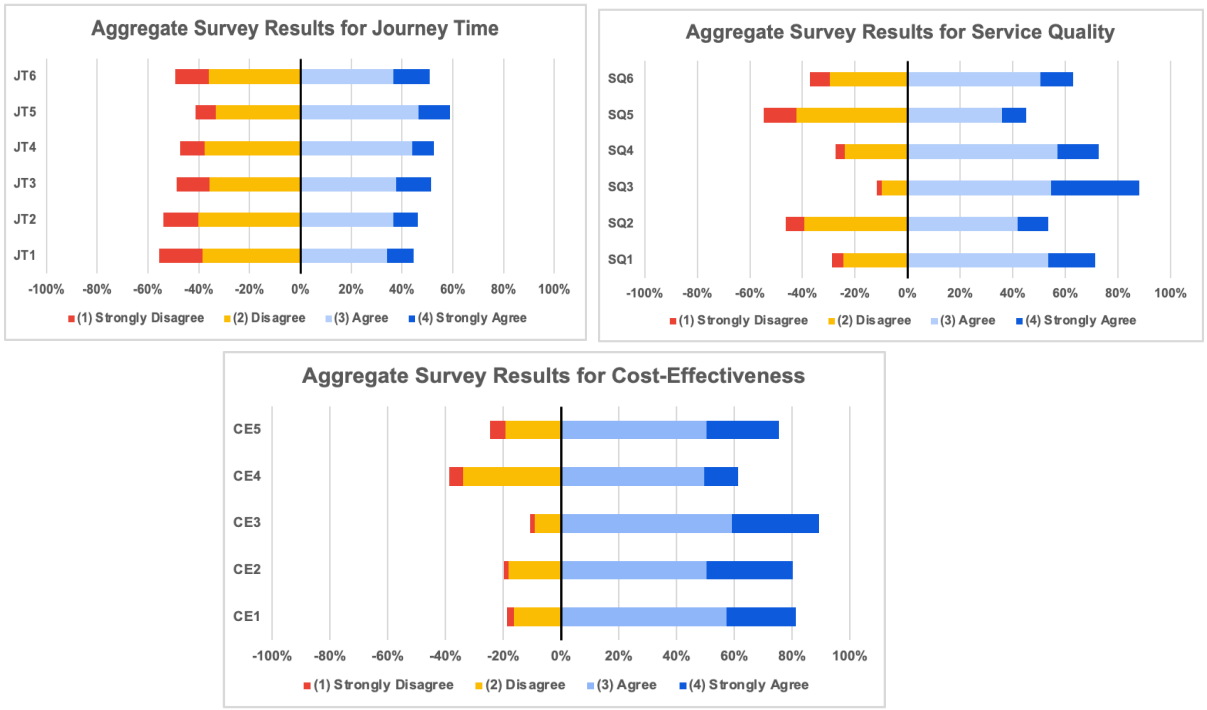
to cultural and gender differences. Additionally, special protections are implemented for vulnerable groups to prevent exploitation and harm.

4. Findings and Discussion

This descriptive research employed a survey instrument to systematically investigate the factors influencing the decision to use public utility buses. The survey instrument was reviewed and approved by the Social Science Ethics Review Board (SSERB) under the Philippine Social Science Council (PSSC). Suggestions from the board of reviewers were considered, particularly the open-ended question that could add evidential substance to the overall interpretation of the results.

Figure 2

4-point Likert scale chart of journey time, service quality, and cost-effectiveness as independent variables of Model 1

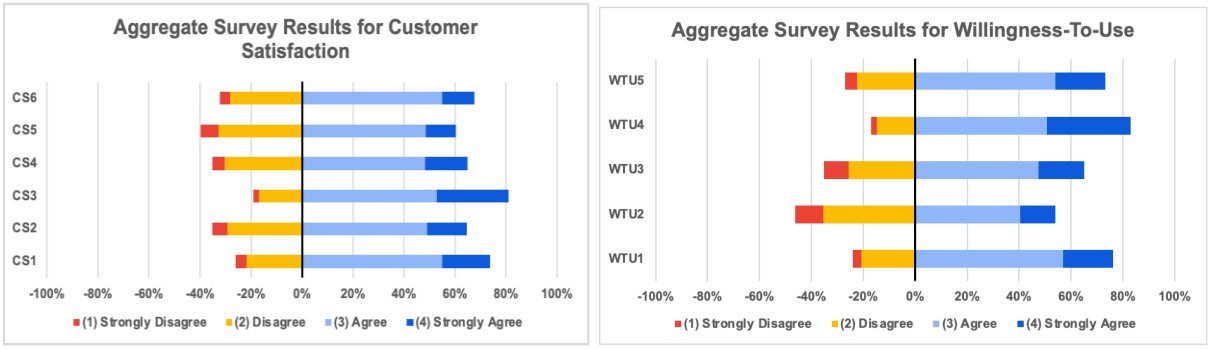


Surveys show male and female commuters interpret situations differently. SQ4 had the greatest service quality rankings; 231 passengers were positive. Despite hope, 171 travelers gave SQ5 the highest disapproval rating, claiming the bus service was disappointing. Given the 36.5% male responders, 58 of 148 saw bus transits breaking traffic laws. JT5 had the

highest agreement rate for journey time questions, with 188 passengers agreeing that one reason they ride buses is to save time and allocate it to other things, perceiving personal needs as a contributing factor and wanting to get to their destinations quickly regardless of inconvenience. JT2 had the highest disagree rate, with 40.25%.

Figure 3

4-point Likert Scale chart of customer satisfaction and willingness to use as independent variables of Model 1.



The highest cost-effectiveness rate was at CE3, when 239 passengers agreed that bus transportation prices are appropriate. But most respondents said overcrowding makes it unnecessary to spend their money to use the service. According to CE1, female commuters pay greater fares than men. In the aggregate customer satisfaction findings, CS1 and CS6 tied for the greatest agree response rate, while CS5 had the highest disagree rate. This showed that despite their discontent with bus transit, people continue to use it and stay happy. Male passengers are more likely to be optimistic while using bus transit, whereas female passengers are more likely to use it. WTU1 had the greatest agreed response rate for the final variable, willingness to use, showing that passengers favor the bus transit service. WTU2 has the highest disagree ratio, indicating that passengers are unwilling to use the service due to its potential to cause physical and emotional suffering.

Table 5

Multiple regression results

	Coefficients	Standard Error	t Stat	P-value
Intercept	-0.08591123266	0.1080913149	-0.7948023647	0.4271986257
Grand Mean of SQ	0.5619660454	0.04095624643	13.72113156	0
Grand Mean of JT	0.2131680733	0.03934905726	5.417361636	0.0000001045167139
Grand Mean of CE	0.2815151915	0.03890102656	7.236703408	0

Table 6

Linear regression results for IV (CS) and DV (WTU)

	Coefficients	Standard Error	t Stat	P-value
Intercept	0.987200506	0.092745	10.64426	1.75E-23
Grand Mean of CS	0.660371968	0.03216	20.53407	1.21E-64

The collective impact of three variables—service quality, journey time, and cost-effectiveness—were evaluated in the multiple regression in table 5. The coefficient of 0.561 indicates that service quality has the strongest positive impact on customer satisfaction. This means that as service quality improves, customer satisfaction increases significantly. The CS was also positively influenced by cost-effectiveness and journey time, however to a lesser extent, with coefficients of 0.213 and 0.282, respectively. The intercept in this case was not statistically significant, suggesting that the baseline effect is negligible in the absence of the first three independent variables (SQ, JT, CE). In contrast, the linear regression in table 6 assessed customer satisfaction in a manner that it was independent of willingness to use and identified an ample positive effect, with a coefficient of 0.660. This implies that a substantial increase in the willingness to use of buses was directly correlated with increased customer satisfaction. Service quality and customer satisfaction are critical determinants of the dependent variable's variation, as evidenced by the statistically significant relationships (p-values less than 0.05) between the predictors in both tables.

Table 7

Summary of hypotheses

	Hypotheses	Interpretation
H1	There is a significant relationship between service quality and customer satisfaction on public transportation	Significant
H2	There is a significant relationship between journey time and customer satisfaction on public transportation	Significant
H3	There is a significant relationship between cost-effectiveness and customer satisfaction on public transportation	Significant
H4	There is a significant relationship between customer satisfaction and willingness to use on public transportation	Significant

Table 8

Previous studies with similar findings

Title	Findings	Model	Parameters	Citation
An analysis of gender differences and perception of influential criteria for the quality of urban bus transportation: Evidence from Brazil.	Gender differences in service quality perceptions show that females prioritize safety, cleanliness, punctuality, and frequency, while males focus on cleanliness and traffic law compliance. Addressing these can enhance passenger satisfaction and urban transport systems	Importance-Performance Analysis - IPA	Safety, Time, Services, Ticket Price	Freitas, A. L. P., Silva Filho, M. T. S., & de Assis, D. A. (2023). An analysis of gender differences and perception of influential criteria for the quality of urban bus transportation: Evidence from Brazil. *Journal of Public Transportation*, 25, 100050.
The effects of travel time and cost savings on commuters' decision to travel on public transport routes involving transfers	Students are more sensitive to costs than time, and longer travel times are more accepting of transfers. Fare discounts should align with travel costs to promote transfer usage..	Weber's Law, Just Noticeable Difference (JND)	Travel Time, Travel Cost, Comfort at Interchange	Chowdhury, S., Ceder, A. A., & Schwalger, B. (2015). The effects of travel time and cost savings on commuters' decision to travel on public transport routes involving transfers. *Journal of Transport Geography*, 43, 151-159.
The quality of service desired by public transport users	User expectations are vital for reliable public transport. A study in Santander found that waiting time, cleanliness, and comfort significantly impact service quality. Cleanliness is especially valued by women, while older adults and occasional users prioritize comfort.	SWOT Matrix Analysis	Waiting time at the stop, Journey time on the bus, Vehicle occupancy, The cleanliness of the vehicle, The driver's kindness, The comfort of the buses	Dell'Olio, L., Ibeas, A., & Cecin, P. (2011). The quality of service desired by public transport users. *Transport Policy*, 18(1), 217-227.
Satisfaction with travel, ideal commuting, and accessibility to employment	Maximizing willingness-to-commute accessibility can improve commuter satisfaction by aligning expectations with job access. In areas with better job accessibility, longer commutes can enhance satisfaction. However, São Paulo still experiences high dissatisfaction due to lengthy travel times. Improving public infrastructure is essential for promoting sustainable commuting and enhancing urban mobility.	Generalized Linear Modelling	Actual Commute Times, Ideal Commute Times, Maximum Willingness-to-Commute	Pritchard, J. P., Slovic, A. D., Giannotti, M., Geurs, K., Nardocci, A., Hagen-Zanker, A., ... & Kumar, P. (2021). Satisfaction with travel, ideal commuting, and accessibility to employment. *Journal of Transport and Land Use*, 14(1), 995-1017.

Table 8 shows similar studies based on the results of this research. Though the models used vary in the respective outcome of the survey, their findings add validity to this study, specifically on the gender difference in responses between males and females, the sensitivity of young participants to cost and travel time, the crucial role of service quality, and the satisfaction with commuting being connected to travel time, comfort, and safety. The addition to the gender gap, the findings indicated that women pay more than males do. This suggests that women's travel requirements may differ from men's, which would explain the convenience premium. Furthermore, women may pay more because Quezon City's fee structures do not take into consideration the variety or frequency of their travels. These variations could explain policy improvements that enhance safety elements for all services, such as improved security presence and well-lit stations. Additionally, rules that are gender-neutral and do not base pricing on presumptions about gendered travel behavior are advised.

5. Conclusion

Identifying the key factors influencing commuter satisfaction is crucial for improving bus transportation services. This study found that journey time and cost-effectiveness were the most significant factors affecting commuter satisfaction. Commuters preferred shorter travel times, even if it meant reducing comfort. Despite potential drawbacks, commuters, particularly women, perceived the cost of bus services as reasonable and were willing to pay a premium for improved service. Customer satisfaction was also a significant factor, indicating that satisfied commuters are more likely to use and recommend bus services. The study confirmed the significant relationships between service quality, journey time, cost-effectiveness, and customer satisfaction, as hypothesized. However, inconsistencies between actual and perceived service quality highlight the need for further research to address this gap and improve service delivery.

The findings suggest that while service quality is a significant factor in customer satisfaction, there are inconsistencies in the results and the responses to the open-ended questions in the survey. Commuters expressed concerns about safety, particularly for women, even without negative experiences. This highlights the need for improved safety measures and a more secure environment on public transportation. To address these issues, policymakers should prioritize safety and reliability in public transportation, especially in high-traffic areas. Encouraging bus operators to undergo customer service training can help improve service

quality and meet performance standards. Such training should be incentivized for more sustainable service outcomes. According to Mcleod et al. (2017), demand-responsive transport plays a vital role in urban planning by combining different transport modes, like buses and trains, to tackle challenges and improve network coverage. Transit-Oriented Development (TOD) supports sustainable city growth through mixed-use developments. For successful changes, it's essential to have regional governance, collaboration among agencies, and input from stakeholders to create effective bus systems that serve varied urban mobility needs. Van Lierop et al. (2018) highlight the critical importance of commuter safety in shaping effective policy decisions. To achieve satisfaction, it is essential to enhance onboard safety and comfort, guarantee punctuality and reliability, train personnel for respectful interactions, upgrade waiting environments, advocate for public transport as a cornerstone of urban life, and improve accessibility for all. These vital recommendations are designed to elevate onboard safety, comfort, customer service, and the overall value of public transport. By proactively implementing these improvements we can significantly enhance commuter satisfaction and create a more enjoyable and efficient public transportation experience for everyone.

It is advised that future studies investigate the variables influencing private vehicle owners' choices to convert to public transit, paying special attention to the perceived advantages and difficulties of doing so. A comparison study of various bus routes could bring insight into route-specific elements like service quality, convenience, and travel duration that influence mode choice. Incorporating inquiries about commuters' willingness to pay for public transportation may also aid in determining how price-sensitive and affordable public transportation is. Gaining insight into commuters' travel habits by gathering information on their preferred travel times and the time they depart for work helps identify patterns of peak and off-peak demand. Additionally, by examining the effect of bus lanes on the effectiveness and appeal of bus services, a dummy variable might be introduced to determine whether or not commuter preferences are influenced by this feature, which could highlight policy implications for improving bus lane infrastructure.

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Declaration

The author declares the use of Artificial Intelligence (AI) in writing this paper. In particular, the author used QuillBot to ensure the proper and cohesive structure of paragraphs, summarizing, paraphrasing, and organizing the reference list. The author takes full responsibility in ensuring proper review and editing of contents generated using AI.

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