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Commuter Expectation and Experience with Modernized Public Transport: Toward a Commuter Satisfaction Model

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1. Analysing Commuter Expectations and Experiences with Modernized Public Transport as a Basis for Developing a Commuter Satisfaction Model.
2.Commuter Expectations and Experiences in Modernized Public Transport: Toward a Commuter Satisfaction Model

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Abstract. This study examined commuter expectations and experiences of service quality relevant to the Philippine Public Transport Modernization Program, a nationwide initiative aimed at improving the levels of passenger comfort, safety, reliability, stakeholder welfare, and system efficiency in the transport system by utilizing modernized public transport. Employing the SERVQUAL model, the researcher focused on three service quality dimensions — tangibility, empathy, and reliability — to establish whether significant differences exist between commuter expectations and experiences. The adopted mixed-methods research design incorporated quantitative and qualitative approaches. A validated survey questionnaire was used to collect data from 200 commuter respondents with different age brackets who have experienced riding modernized public transport serving the Ifugao-Nueva Vizcaya route. Additionally, key informant interviews were conducted among passengers who have not yet utilized modernized public transport, and with drivers of modernized public units. Descriptive statistics and paired sample t-test with Cohen's d were employed to analyze and compare differences between expected and experienced service qualities. Key findings reveal that commuters reported high levels of expectation and satisfaction; however, there was a significant difference across the three dimensions, with the largest difference in tangibility and the least in reliability. The results highlight the need to enhance tangibility through improved vehicle aesthetics and accessibility, empathy through greater convenience, and reliability through increased operational dependability, efficient payment systems, and service availability.

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Keywords: Commuter expectation and experience; Modernized public transport; Commuter satisfaction

1. Introduction

In the Philippines, public utility jeepneys are still the most utilized mode of transport among passengers, particularly for daily commutes. However, public utility jeepneys have been pressured to modernize their outdated design and poor performance in terms of safety and the environment (Asia Pacific Foundation of Canada, 2023).

Although public utility jeepneys constitute the majority mode of public transport in the country, they have the distinction of having a non-binding age limit requirement. This contrasts with other public utility vehicles — such as buses, mini-buses, UV Express units, school services, taxis, and trucks — which adhere to a compulsory 15-year service life limit. Without a required age limit, coupled with inadequate maintenance practices and other issues, the public utility jeepneys have contributed to air pollution and safety concerns (Blacksmith Institute & Clean Air Asia, 2016, as cited by Pontawe & Napalang, 2018). Moreover, studies have documented health issues faced by drivers of outdated public utility jeepneys, particularly pain caused by excessive body vibration (Frisnedi & Angeles, 2021).

The Philippine government initiated the Public Utility Vehicle Modernization Program, imbued with the mission to reform and continuously enhance public transport since the early 1990s (Estrada, 2023). The program, renamed the Public Transport Modernization Program, strives to transform the public transport system into one at par with global standards, thereby realizing a safer, more efficient, and dignified ride (Tacderas, Ng, Tolentino, Tiglao, and Herrera, 2021; Cabrera, 2024). The program follows two department orders: ~~the~~The Department of Transportation Department Order 2017-011, or the Omnibus Franchising Guidelines, and Joint Memorandum Circular 2017-001, issued by the Department of Interior and Local Government and the Department of Transportation. Both directives establish comprehensive guidelines on acceptable modes of public transport, routes, and vehicle capacities (Tacderas et al., 2021). The program objectives include increasing public transportation safety, reliability, and comfort for commuters; promoting stakeholder welfare; and increasing the efficiency of the public transport system. This program phases out aging public utility

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jeepneys and replaces them with modernized ones, a process referred to as "fleet modernization" (Andalecio et al., 2020).

Existing literature on public transportation service qualities — particularly studies conducted before and during the COVID-19 pandemic — provides valuable insights into the key areas of passenger experience. Although safety was a key issue for passengers (Jou et.al, 2023; Ong et al., 2023), there were significant differences in focus across studies. Jou et al. (2023) identified a significant gap in tangibility, particularly regarding the extent of responsiveness, reliability, empathy, and COVID-19 procedure compliance. Conversely, Ong et al. (2023) highlighted the importance of value for money, driver attitude, information dissemination, and service adequacy in shaping passenger satisfaction. Interestingly, Chuenyindee et al. (2022) reported that responsiveness, reliability, and empathy were not significant.

While these studies are insightful, their focus is limited, largely addressing the effects of COVID-19 measures and differences in service qualities. Notably, the above-mentioned studies do not adequately examine the dimensions of commuter satisfaction within the theme of modernized public transport. This research gap highlights the need for a comprehensive investigation into commuter expectations and experiences in relation to modernized public transport. Moreover, the ongoing nationwide implementation of the Public Transport Modernization Program further highlights the relevance of this study, particularly in the rural sector, where limited research has been undertaken on sustainable rural transportation.

This study evaluated the implementation of the Public Transport Modernization Program by the Ifugao Transport Service Cooperative, in conjunction with the Land Transportation Franchising and Regulatory Board — Region 2. The initiative involved deploying ten modernized mini-bus units serving the Ifugao-Nueva Vizcaya route beginning in February 2022. A number of concerns were observed: primarily, the lack of further deployment of modernized public transport compared to ~~neiighboring~~neighboring provinces. Furthermore, commuters on the route have reported several service-related problems, including increased fare rates, limited accommodation for bulk items, malfunctioning of air-conditioning, overloading, and denial of rides at one of the terminals. These issues necessitate a deeper analysis for better understanding and potential improvement solutions.

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This study aimed to assess commuter expectations and experiences regarding the service qualities of modernized public transport operating along the Ifugao–Nueva Vizcaya route, focusing on the tangibility, empathy, and reliability dimensions. It further sought to determine whether a significant difference exists between commuter expectations and experiences.

2. Methodology

2.1. Research Design

A survey questionnaire adapted from the local research by Jou et. al. (2023) was used in undertaking descriptive research. The survey contained three sections: the respondents' profile, the commuter respondents' expectations of the modernized public transport service qualities, and their experiences with these service qualities. The questionnaire was carefully edited by five experts, namely: an academician, an English professor, the modernized public transport cooperative chairperson, a modernized public transport driver, and a commuter. The study conducted a reliability test of the questionnaire on 50 commuters, which returned an excellent internal reliability with its total Cronbach's alpha value of 0.954. Additionally, the study used key informant interviews with two groups of respondents: passengers who have not yet traveled using modernized public transport, and drivers of modernized public transport.

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2.2. Sampling Procedure

The research utilized purposive sampling to provide a balanced description of respondents who had experience riding modernized public transport on the Ifugao–Nueva Vizcaya route and who represent various age groups.

2.3. Respondents

Two hundred (200) commuter respondents were chosen at the Solano Terminal in Solano, Nueva Vizcaya, with their profile detailed in Table 1.

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Table 1. Profile of the respondents

Variables	Categories	Frequency	%
Age	18 – 27	69	34.5
	28 – 37	40	20.0
	38 – 47	35	17.5
	48 – 57	26	13.0
	58 – 67	21	10.5
	68 – 77	9	4.5

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Gender	Female	128	64.0
	Male	67	33.5
	LGBTQ++	5	2.5
Educational attainment	College under-graduate	94	47.0
	Professional	60	30.0
	Elementary graduate	14	7.0
	Senior high school/vocational graduate	11	5.5
	Senior high school/vocational under-graduate	8	4.0
	Junior high school under-graduate	6	3.0
	Junior high school graduate	2	1.0
	Other	5	2.5
Income level	No income	65	32.5
	Php 9,100 – 15,199	47	23.5
	Less than Php 9,100	35	17.5
	Php 15,200 – 36,399	30	15.0
	Php 36,400 – 63,700	17	8.5
	Above Php 63,700	6	3.0
Frequency of rides	Once a month	47	23.5
	Once a week	45	22.5
	2-3 times a week	44	22.0
	Daily	33	16.5
	Every 2 weeks	31	15.5
Residence	Lamut, Ifugao	60	30.0
	Lagawe, Ifugao	38	19.0
	Banaue, Ifugao	15	7.5
	Solano, Nueva Vizcaya	14	7.0
	Kiangan, Ifugao	13	6.5
	Bagabag, Nueva Vizcaya	7	3.5
	Hingyon, Ifugao	3	1.5
	Other	50	25.0

2.4. Data Gathering Procedure

Permission to conduct the research at the Solano transport terminal was obtained from the Municipal Mayor of Solano, Nueva Vizcaya. This authorization was then communicated to the Solano transport terminal management and to prospective respondents, who were purposely selected based on their experience with modernized public transport along the Ifugao–Nueva Vizcaya route and their willingness to participate in the survey. Direct key informant interviews with potential passengers and drivers of modernized public transport were also conducted to increase the reliability and rationality of the results.

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2.5. *Data Analysis*

Data on respondents' expectations and experiences regarding the service quality of modernized public transport were analyzed using descriptive statistics. ~~In addition~~Moreover, descriptive statistics using paired-samples t-test with Cohen's d were employed to assess whether the gap between expectations and experiences was significant. All data were checked for completeness, analyzed, and presented in tabular form.

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~~2.2. *Respondents*~~

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~~**Table 1** Number of frequencies in each sample~~

~~Frequency~~	~~Sample~~	~~Removed~~
~~1~~	~~50~~	~~28~~

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2	100	14
3	150	9
4	200	7
5	250	5

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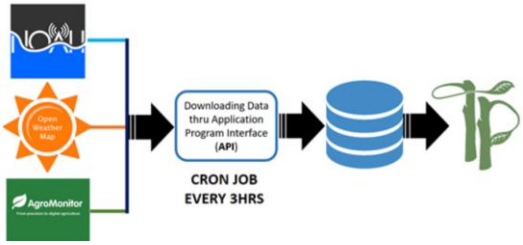

Figure 1 Collection of Weather Data from Providers.

3. Results and Discussion

Commuter Expectations

The commuter respondents' expectations concerning the service quality dimensions of modernized public transport: tangibility, empathy, and reliability, were presented and detailed, establishing their influence on overall satisfaction.

3.1. Commuter Expectations with Tangibility

Table 2 presents commuter expectations with the modernized public transport service quality of tangibility. It highlights ten key factors, each assessed in terms of their respective level of expectations.

Table 2. Commuter expectations with the modernized public transport service quality of tangibility

Factors	Mean	Standard Deviation (SD)	Qualitative Description
1. Security of belongings & safety during travel	4.59	0.72	Always Anticipated
2. The modernized public transport's appeal	4.51	0.67	Always
3. Good temperature & proper ventilation	4.45	0.84	Often
4. Terminal accessibility	4.40	0.81	Often
	4.37	0.97	Often

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5. Space designated for PWDs, elderly, & pregnant women	4.30	1.00	Often
6. Equipped with a dashboard camera	4.28	0.83	Often
7. Clean interior with no unpleasant odor	4.13	1.15	Often
8. Equipped with closed-circuit television (CCTV)	4.00	1.02	Often
9. Proper wearing of clean uniform & shoes by drivers & conductors	3.37	1.48	Sometimes
10. Equipped with an Automatic Fare Collection System (AFCS)	**4.24**	**0.95**	**Often**
Mean			

Note: Always Anticipated (4.50-5.00); Often Anticipated (3.50-4.49); Sometimes Anticipated (2.50-3.49); Seldom Anticipated (1.50-2.49); Never Anticipated (1.00-1.49)

Among all the factors of tangibility, safety of belongings and security in transit displayed the highest level of expectation (mean=4.59, SD=0.72). This indicates that passengers place great importance on the safety of their belongings and their security while in transit — factors that serve as key determinants of trust and satisfaction in transport services. This finding supports the findings of Hu et al. (2015), Wijerathna (2016), van Lierop et al. (2018), and Zhang et al. (2019), as cited by Atombo and Wemegah (2021), which highlight safety as a predominant factor influencing the mode of transport chosen by passengers. However, commuter respondents largely did not anticipate the presence of an Automatic Fare Collection System (mean=3.37, SD=1.48), suggesting a substantial need for action and attention in this regard. Overall, the tangibility service quality was rated highly (mean=4.24, SD=0.95), reflecting a consensus among commuter respondents that safety, appearance, controlled temperature, and accessibility are essential. However, certain elements — such as security features and cleanliness — displayed greater variability in responses. The high level of commuter expectations toward modernized public transport suggests strong anticipation for substantial improvements and innovations in service quality. This was anticipated, as Schiavone (1995), quoted by Atombo and Wemegah (2021), Roces (2023), Zulueta et al. (2024), and Land Transportation Office Portal.ph (n.d.) observed that material improvements in vehicle design and facilities — particularly improved safety features, comfortable seats, and better hygiene — matter in shaping passenger satisfaction.

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3.2. Commuter Expectations with Empathy

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Table 3 indicates commuter expectations with the modernized public transport service quality of empathy. Each of the five factors was rated as "always anticipated" or "often anticipated".

Table 3. Commuter expectations with the modernized public transport service quality of empathy

Factors	Mean	Standard Deviation (SD)	Qualitative Description
1. Trustworthy drivers for safe travel	4.61	0.71	Always Anticipated
2. A feeling of security during travel	4.54	0.74	Always
3. No loud noise from the engine during travel	4.38	0.79	Often
4. No disturbing vibrations when engine starts	4.32	0.82	Often
5. Adequate headroom and legroom.	4.26	0.94	Often
Mean	**4.42**	**0.80**	**Often**

Note: Always Anticipated (4.50–5.00); Often Anticipated (3.50–4.49); Sometimes Anticipated (2.50–3.49); Seldom Anticipated (1.50–2.49); Never Anticipated (1.00–1.49)

The highest-rated empathy expectation of modernized public transport was driver competence (mean=4.61, SD=0.71). This supports the importance that passengers attach to a sense of safety during travel (mean=4.54, SD=0.74), which underscores a general expectation to make the travel time calm and relaxing. These results further indicate that emotional comfort is equally important for commuters as physical safety in shaping commuter satisfaction. These results affirm the findings of Tahanisaz and Shokuhyar (2020) and Ong et al. (2021), as cited in Ong et al. (2023), on the crucial role of safety and employee attitude in influencing passenger satisfaction. Thus, commuters expect modernized public transport drivers to be professional, diligent, trustworthy, respectful, and tactful in ensuring a safety culture.

Moreover, high expectation levels for modernized public transport, including new devices to minimize travel disturbance (mean=4.38, 4.32; SD=0.79, 0.82), and adequate headroom and legroom (mean=4.26, SD=0.94), reflect passenger appreciation for comfort features —especially on long-distance routes. These elements have been noted by Chuenyindee et al. (2022) and Jou et al. (2023) to have considerable impacts on perceived service quality.

The expected quality of the empathy service ranked very highly (mean=4.42, SD=0.80). This supports the findings of Chuenyindee et al. (2022) and Ong et al. (2023), who have identified empathy as a significant factor in improving service experience and enhancing overall passenger satisfaction.

3.3. Commuter Expectations with Reliability

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Table 4 reveals commuter expectations of the modernized public transport service quality in terms of reliability. Of the eight factors considered, almost all were rated as "often anticipated".

Table 4. Commuter expectations with the modernized public transport service quality of reliability

Factors	Mean	Standard Deviation (SD)	Qualitative Description
1. Honesty of drivers in giving back fare change	4.54	0.84	Always Anticipated
2. Careful driving and following traffic rules	4.47	0.78	Often
3. Arrives at its destination on time	4.24	0.96	Often
4. Drivers charge the same fare rates	4.16	1.05	Often
5. Never encounters mechanical malfunctions during travel	4.10	1.13	Often
6. Fare is affordable	4.08	1.21	Often
7. Has available information on the route and schedule of travel time	3.77	1.10	Often
8. Readily available on every travel schedule	3.73	1.06	Often
Mean	**4.14**	**1.01**	**Often**

Note: Always Anticipated (4.50–5.00); Often Anticipated (3.50–4.49); Sometimes Anticipated (2.50–3.49); Seldom Anticipated (1.50–2.49); Never Anticipated (1.00–1.49)

Honesty in fare changes was listed as the most crucial factor (mean=4.54, SD=0.84), indicating that this is a precondition in building trust in the system. The second most valued was the assurance of safe driving and traffic rule compliance (mean=4.47, SD=0.78), indicating that these instill confidence and trust in the service. These findings align well with those of Zhang et al. (2019) and Zefreh (2020), as cited by Ong et al. (2023), as the former proposes the passenger-perceived dimensions of comfort, reliability, safety, operational service, and convenience as drivers of passenger expectations; and the latter demonstrates the positive impact of employee behavior on satisfaction. Furthermore, Zulueta et al. (2024) also linked respectful, courteous, and flexible driver behavior to enhanced service quality.

Though highly anticipated, the other factors considered in this dimension registered rather high standard deviation, highlighting differences in opinion, and signifying the need to improve to balance commuter expectations. However, the modernized public transport reliability dimension was discovered to be largely as expected among commuter respondents (mean=4.14, SD=1.01),

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having set a high benchmark for the service providers to sustain or outdo. Reliability is most evident when a commuter chooses public transport for daily use based on their trust and confidence in the system to provide regular, accessible, predictable, and reliable services. This is supported by research in Guzman (2020) and Zulueta et al. (2024), highlighting the importance of public transport service reliability in fulfilling passenger expectations.

Commuter Experiences

Key features in respondent experiences on the modernized public transport service qualities of tangibility, empathy, and reliability, were obtained from real exposure to the service that affected their net satisfaction level.

3.4. Commuter Experience with Tangibility

Commuter respondents reported fairly high levels of satisfaction with the modernized public transport service quality of tangibility factors, except for one factor rated at a moderate level, as exhibited in Table 5.

Table 5. Commuter experiences with the modernized public transport service quality of tangibility

Factors	Mean	Standard Deviation (SD)	Qualitative Description
1. Has designated space for PWDs, elderly, and pregnant women	4.40	0.93	Very Satisfied
2. Security of belongings and safety during travel.	4.38	0.76	Very Satisfied
3. The modernized public transport's appeal	4.29	0.90	Very Satisfied
4. Has a good temperature and proper ventilation	4.26	0.91	Very Satisfied
5. Terminal accessibility	4.24	0.93	Very Satisfied
6. Equipped with a dashboard camera	4.19	1.06	Very Satisfied
7. Equipped with a CCTV	4.12	1.17	Very Satisfied
8. Clean interior and has no unpleasant odor	4.10	0.89	Very Satisfied
9. Proper wearing of clean uniform and shoes by drivers and conductors	3.79	1.00	Very Satisfied
10. Equipped with an AFCS.	3.02	1.62	Satisfactory
Mean	**4.08**	**1.02**	**Very Satisfied**

Note: Excellent (4.50–5.00); Very Satisfied (3.50–4.49); Satisfactory (2.50–3.49); Fair (1.50–2.49); Needs Improvement (1.00–1.49)

Among the tangibility factors discussed, reserved seats for disabled, pregnant, and elderly persons are most appreciated (mean=4.40, SD=0.93). This finding is pertinent to increase commuter experience and to enact regulatory

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standards as R.A. 967, No. 344 obliges public transportation operators and enterprises to reserve seats for handicapped, pregnant, and senior citizens (The Philippine Star, 2018). It is therefore imperative that transport operators enhance the mobility of vulnerable persons by providing an effective link between transport, land usage, and future interaction; a finding supported by Tyrinopoulus and Antoniou (2008), Daniels and Mulley (2013), and Hu, Cao, and Yang (2020), as cited in Ismael and Duleba (2021). Additionally, exceeding the expectations of commuter respondents is similarly indicative of a high regard for modernized public transport operators and their drivers who execute regulatory standards, thereby optimizing the commuter experience.

The second most appreciated tangibility factor is the protection and safety of one's belongings while in transit (mean=4.38, SD=0.76). This finding indicates that commuters place great importance on their safety and their belongings, as commuter possessions are often kept out of reach due to their size. However, key informant modernized public transport drivers confirm that no incidences of lost or misplaced luggage were observed or reported, indicating a consensus and general trust in the reliability and security of modernized public transport.

These two previous results are most related to commuter satisfaction, as Zhang et al. (2019), whose study was referenced by Atombo and Wemegah (2021), established that security services, along with safety and comfort, are key performance characteristics of public transport. Moreover, these characteristics have the greatest impact on enhancing passengers' satisfaction and usage (Fellesson & Friman, 2012, referenced by Atombo & Wemegah, 2021). Therefore, the data validate the findings above.

Ranked third among the variables in tangibility is the modernized public transport appeal (mean=4.29, SD=0.90). A lower ranking from its expectation level indicates that experience is somewhat deficient in meeting respondents' expectations, which could be attributed to closed windows while traveling, durability, or other unanticipated factors. However, the high satisfaction rating entails that the design and aesthetic modification of modernized public transport is highly appreciated and that physical conditions have a strong impact on commuter sensitivity and satisfaction. According to Liu and Jang (2009), as quoted by Ong et al. (2023), this is most evident among new customers as physical conditions play a strong role in establishing first impressions. Furthermore, the state of the service environment plays a strong role in delivering

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operational competence and perceived quality (Kim & Moon, 2009; Horrevorts et al., n.d., quoted by Ong et al., 2023), with Zulueta et al. (2024) stressing that this is most evident when modernized public transport is well-maintained and visually appealing.

Next, well-controlled temperature and proper ventilation were rated as very satisfactory (mean=4.26, SD=0.91), implying a high level of satisfaction with climate control innovations in modernized public transport. However, the occasional failure of air-conditioning, which triggers the opening of windows and overhead vents for ventilation, was a nuisance to passengers on board, demonstrating that a faulty or inconsistent temperature control system on modernized public transport detracts from a pleasant experience. It is thus revealing that suitable temperature and efficient air conditioning in modernized public transport significantly contribute to commuter satisfaction, reducing the experience-expectation gap, improving passenger satisfaction, and increasing consistency in comfort while traveling. This is corroborated by Zhang et al. (2019) and Ong et al. (2023), highlighting tangible features as playing key roles in shaping passenger satisfaction, and Jomnonkwao and Ratanavaraha (2016), as cited in Ong et al. (2022), identifying functioning air-conditioning systems alongside cleanliness and well-kept facilities as key factors in creating a positive customer experience.

Terminal accessibility is another highly rated tangibility factor (mean=4.24, SD=0.93), indicating that convenient terminal access significantly influences service quality. Commuters find public transport terminals to be accessible as hubs of modernized public transport. However, the lower rank implies some differences, such as a lack of signage, congestion, or infrastructure, causing hindrances, with Atombo and Wemegah (2021) identifying inaccessibility as having a negative effect on passenger satisfaction with public bus transport.

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Use of dashboard cameras (mean=4.19, SD=1.06) and closed-circuit television cameras (mean=4.12, SD=1.17), for additional safety features, were also highly appreciated by commuters. While commuters in general appreciate such safety features, they are not necessarily aware of where and how such cameras function in modernized public transport. Surprisingly, during data collection, respondents would look for the presence of these features within modernized public transport before answering. This suggests that, despite closed-circuit television cameras performing better than expected, insofar as

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commuters may still feel comforted by their presence, they may have anticipated greater efficacy in such features if they were able to spot them easily. Furthermore, the positive reaction to closed-circuit television cameras signifies their symbolic role in creating a secure environment and reflects commuters' awareness of the features. Finally, these results, in conjunction with key informant modernized public transport drivers confirming that modernized public transports are perceived to be safer than traditional public utility vehicles, corroborate the positive impact of enhanced safety features on overall satisfaction, and the finding of Zulueta et al. (2024) that air-conditioned modernized public transport with closed-circuit television cameras enhances comfort and security.

The next tangible aspect that increases satisfaction is a clean and odor-free modernized public transport (mean=4.10, SD=0.89), which sets a more relaxed and suitable transit experience. Commuter respondents noted that about half of the modernized public transport units on the route were in good condition. There were new and clean floor mats and seat covers enhancing their appeal, while the remaining half had worn-out and smelly seat covers and no floor mats. Furthermore, some modernized public transport drivers were observed not wearing their uniforms until they were about to depart from the Solano Terminal. As this had the lowest very satisfactory rating (mean=3.79, SD=1.00), this indicates how cleanliness and the professional use of uniforms and shoes influence commuter satisfaction. This is evident in Henry and Litman (2006), Beirao and Sarsfield-Cabral (2007), Bailey et al. (2008), as cited by Atombo and Wemegah (2021), stating that improving safety and comfort on public buses via clean and comfortable seats, smaller numbers of passengers on board, and a clean interior, would prompt communities to reduce car use and combine trips. Conversely, Ong et al. (2023) reported that commuters of public utility vehicles do not expect high standards of cleanliness and comfort. Although Bezerra and Gomes (2020), as quoted by Ong et al. (2023), stated that these factors have little effect on passengers' satisfaction in public transport, Ponrahono et al. (2016), as cited by Ong et al. (2023), established cleanliness and comfort to be the primary determinants of satisfaction among public utility bus passengers. Similarly, Shen et al. (2016), as referenced by Ong et al. (2023), pinpointed tangible factors such as cleanliness and comfort to be amongst the greatest determinants of passenger fulfillment in railway services. These

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variabilities suggest that the significance of physical factors can differ greatly among various public transport modes.

The only tangibility factor scoring satisfactorily concerns the Automatic Fare Collection System (mean=3.02, SD=1.62), indicating high upgrading. Accordingly, passengers are curious about what an Automatic Fare Collection System is or should be, suggesting that there is a general desire for change. This could be the result of a lack of functional devices, as a key informant modernized public transport driver revealed that only half of the modernized public transport on the route have an Automatic Fare Collection System installed and that these were not operational. This operational problem is the center of major upgrading to satisfy the commuter experience, as the Public Transport Modernization Program requires modernized public transport to have advanced features that enhance safety, comfort, and operational efficiency. Among these features is the Automatic Fare Collection System, as it simplifies fare processing (Land Transportation Office Portal.ph, n.d.).

A generally very satisfactory rating of the modernized public transport tangibility dimension reflects the degree of satisfaction that respondents had with its physical attributes (mean=4.08, SD=1.02). These results substantiate those of other studies by Too (2010), Yaya, Fortià, Canals, and Marimon (2014), and Ueasangkomsate (2019), as quoted by Zulueta et al. (2024), thereby confirming the degree of impact that physical aspects (i.e., a clean, comfortable environment, appropriate temperature, ventilation, and appeal) have on influencing commuter comfort and experience on public transport.

3.5. Commuter Experience with Empathy

It is notable that of the five empathy factors of modernized public transport service quality, commuter respondents rated one factor as "excellent" and the other four as "very satisfied", as detailed in Table 6.

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Table 6. Commuter experiences with the modernized public transport service quality of empathy

Factors	Mean	Standard Deviation	Qualitative Description

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1. A feeling of security during travel	4.50	0.75	Excellent
2. Drivers are trustworthy for safe travel	4.42	0.78	Very Satisfied
3. No loud noise coming from the engine during travel	4.35	0.78	Very Satisfied
4. No disturbing vibrations when the engine starts	4.19	0.83	Very Satisfied
5. Has adequate headroom and legroom.	4.02	1.00	Very Satisfied
Mean	**4.29**	**0.83**	**Very Satisfied**

Note: Excellent (4.50–5.00); Very Satisfied (3.50–4.49); Satisfactory (2.50–3.49); Fair (1.50–2.49); Needs Improvement (1.00–1.49)

Feeling secure while traveling signifies how crucial feeling safe is to passengers (mean=4.50, SD=0.75). Ranked at a level of "excellent", security expands the ability of the service to instill confidence among passengers as they feel that they are in safe hands, and as a result, this creates long-term loyalty, credibility, and even ridership growth.

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The respondents were also highly content with the trustworthiness of drivers (mean=4.42, SD=0.78), revealing that the commuters appreciate a safe and convenient trip, and thus proving that trustworthiness and safety are their top priorities. This is corroborated by Tahanisaz and Shokuhyar (2020), as noted by Ong et al. (2023), highlighting the fact that stringent safety standards and respectable service personnel behavior, especially drivers, are the foundation of customer satisfaction; and Shaaban and Kim (2016), and Frinaldi et al. (2020), as indicated by Ong et al. (2023), stating that driver behavior influences passenger satisfaction with public transport.

Commuter respondents further reported high satisfaction with low noise levels (mean=4.35, SD=0.78), low vibration levels (mean=4.19, SD=0.83), and increased headroom and legroom (mean=4.02, SD=1.00) within the comfort facilities of modernized public transport. As these results are in line with expectations rankings, this indicates that the comfort factors of modernized public transport slightly meet commuter expectations, leading to rising levels of satisfaction. The fact that expectations were rated higher than experience indicates that commuters tend to be satisfied with modernized public transit vehicles. However, there is still some space for improvement to exceed expectations, with Roces (2023) advocating advanced engines to maximize operational efficiency, thereby increasing commuter demand for sustainable transport; and Zulueta et al. (2024) identifying ample space, seat configuration, and ergonomic grips being consistent with what this study found. However, the

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comparatively small differences in score indicate that modernized public transport conforms well in this respect.

The commuter respondents rated the empathy dimension of modernized transport very highly on satisfaction (mean=4.29, SD=0.83), denoting the significance of empathy-related factors in ascertaining commuter satisfaction. Jou et al. (2023) believe that empathy is vital in increasing the service quality and satisfaction of customers in public transport. Moreover, Roces (2023) identifies the need to focus on efficiency and environmental care within public transport, referencing how modernized public transport engines contribute to increased efficiency and reflect growing commuter pressure for sustainable transport.

3.6. Commuter Experience with Reliability

Commuter respondents rated all eight factors about the reliability of the modernized public transport service quality as being "very satisfactory", as listed in Table 7.

Table 7. Commuter experiences with the modernized public transport service quality of reliability

Factors	Mean	Standard Deviation (SD)	Qualitative Description
1. Careful driving and following of traffic rules	4.37	0.83	Very Satisfied
2. Drivers' honesty in giving back fare change	4.33	0.87	Very Satisfied
3. Arrives at its destination on time	4.19	0.86	Very Satisfied
4. Never encounters mechanical malfunctions during travel	4.11	0.98	Very Satisfied
5. Drivers charge the same fare rates	3.98	0.95	Very Satisfied
6. Fare is affordable	3.85	1.20	Very Satisfied
7. Has available information on the route and schedule of travel time	3.71	0.96	Very Satisfied
8. Readily available on every travel schedule.	3.67	0.97	Very Satisfied
Mean	**4.02**	**0.95**	**Very Satisfied**

Note: Excellent (4.50-5.00); Very Satisfied (3.50-4.49); Satisfactory (2.50-3.49); Fair (1.50-2.49); Needs Improvement (1.00-1.49)

There was strong satisfaction from commuters on careful driving and compliance with traffic regulations (mean=4.37, SD=0.83), indicating how much

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passengers care about safety and careful driving, and how critical these habits are in inspiring confidence and reliability in public transport services. Notably, key informant modernized public transport drivers reported that there were no incidents of traffic violations. This is highly relevant to this study as Van Lierop et al. (2018), cited by Zulueta et al. (2024), are of the opinion that reliability has a significant impact on enhancing passenger satisfaction.

The second highest ranked quality of service was the honesty accorded to drivers in terms of correct and punctual fare change (mean=4.33, SD=0.87). This signifies that there is a direct correlation between the ethical behavior of drivers and passengers trusting in the dependability of public transport services. In addition, it indicates that passengers place great value on the integrity of the drivers, which, if demonstrated, positively reinforces their overall perception of the reliability of the service. The findings of this research, therefore, corroborate the earlier works of Shaaban and Kim (2016) and Frinaldi et al. (2020), as referenced by Ong et al. (2023), which highlight the significance of driver behavior towards improving passenger satisfaction.

Commuters also found punctual arrival at the destination to be very satisfactory (mean=4.19, SD=0.86), highlighting the unique value given to punctuality as it directly contributes to commuters' ability to keep to their schedules. Observations supported by commuters and key informant modernized public transport drivers are that modernized public transport utilizes a point-to-point system in which passengers are transported directly to their destinations without avoidable interruptions. Moreover, key informant modernized public transport drivers state that they calculate their arrival times so that they have enough time to wait for passengers and prepare for their return trips. This is crucial to creating a sense of reliability, as Khan and Fasih (2014), as cited by Jou et al. (2023), observe that reliability refers to how service providers consistently meet their customers' needs. Furthermore, Randheer et al. (2011), as quoted by Zulueta et al. (2024), stress that prioritizing reliable services is key to enhancing the quality of public transport.

Respondents were highly satisfied with the lack of mechanical failures on trips (mean=4.11, SD=0.98), indicating that commuters appreciate the dependability of modernized public transport. This experience-expectation congruence is also an indicator of proper execution of vehicle maintenance standards, which adds to improved commuter satisfaction and trust in the

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service. As such, the findings of this study are related to those of Zulueta et al. (2024), who compared the transition time of traditional public utility vehicles with modernized public transport and recorded breakdowns of the latter as a cause of commuter discontent. This is corroborated by Sam et al. (2018), who also reported that mechanical breakdowns contributed to lower passenger satisfaction and negative behavioral intentions.

Commuter respondents have also rated the consistency of the fare rates (mean=3.98, SD=0.95), reflecting the high value they place on transparent and consistent fare structures. Although the minimum fare of modernized public transport is regulated by the Land Transportation Franchising and Regulatory Board at approximately fifteen percent higher than that of traditional public utility vehicles (Malonzo, 2024), differences do exist. Therefore, fare policies should be transparent, as the lack of visible fare rate matrices can lead to questions, with drivers rationalizing an approximately twenty percent higher fare on the specific route after being asked by passengers. Such inconsistency calls for a clear and logical fare matrix display to ensure fairness and reduce passenger confusion.

Affordability satisfaction was strikingly positive, indicating a high ranking by commuters (mean=3.85, SD=1.20). If this is the case, then passengers consider fares for modernized public transport to be reasonable. This is crucial as reasonable fares make the service more appealing compared to other forms of public transport. However, the above significant variations in passenger perceptions of price affordability require more competitive pricing and tactical display of fare matrix data. The fact that affordability is a key variable in this research is consistent with the study of Tsafarakis et al. (2018) and Jin et al. (2019), as referenced by Ong et al. (2023), where the former conclude that customer satisfaction increases when the fare is justifiable and adequate for the quality of service received; and the latter reiterated that the quality of service relates to the price one pays.

Commuter respondents also demonstrated a high level of satisfaction with having information available for routes and travel schedules (mean=3.71, SD=0.96). Yet, this remains an important area for improvement as commuters plan their trips based on comprehensive and precise information, thereby rating the experience more positively. The variability in experience with expectations indicates irregularities in communicating information. For instance, commuters travelling to Banaue frequently experience uncertainty as to whether their

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transport unit will terminate in Banaue or earlier in Lagawe, the predominant destination of passengers, as the driver's decision to continue to Banaue is influenced by the number of commuters going to Banaue or whether there will be commuters to be picked up along the way. Such uncertainty results in Banaue-bound commuters being unsure until they reach Lagawe. Thus, enhancing the consistency and accuracy of travel information will significantly improve the commuter experience. This finding aligns with that of Zefreh et al. (2020), as cited by Ong et al. (2023), as such information enables commuters to have the details needed for a relaxed journey, adding value to their experience.

The regular and predictable availability of modernized public transport is crucial for maintaining a reliable service. Although this factor was the lowest in the reliability dimension (mean=3.67, SD=0.97), it still implies a generally positive performance. However, the score suggests some inconsistencies in vehicle availability, as there are only a constrained number number of modernized public transport options on the route. This is evident in the aforementioned Banaue route, where the ten modernized public transport units operating out of a single terminal represent only forty-five percent of the necessary fleet size. Therefore, service operators should ensure the consistent availability of modernized public transport by increasing the number of transport units, as this enhances service reliability, increases commuter satisfaction, and addresses demand. This perspective agrees with Atombo and Wemegah (2021) and Zulueta et al. (2024). The former identifies the provision and cost of bus services as the most prominent factors affecting commuter satisfaction, and the latter notes that the number of modernized public transport vehicles is insufficient to accommodate mass transport demands effectively.

The relatively high satisfactory score (mean=4.02, SD=0.95) on the reliability of modernized public transport indicates that commuters largely experience the service as being reliable and effective, placing high confidence in the transport service. Upholding this study, Sam et al. (2018) and Zulueta et al. (2024) found reliability as a crucial factor that defines service quality. Conversely, Chuenyindee et al. (2022) found that reliability did not concern the public much during the COVID-19 period. Yet, Jou et al. (2023) debunked this by exposing that reliability had significantly impacted service quality during the same period.

3.7. Difference Between Commuter Expectations and Experiences

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The three service quality dimensions, when applied to expectation and experience, recorded notable differences, as enumerated in Table 8.

Table 8. Descriptive statistics of respondents' expectations and experiences with the modernized public transport service qualities in terms of tangibility, empathy, and reliability

Pair	Compared Service Qualities	Mean	Standard Deviation (SD)	Standard Error Mean
1	Expectation: Empathy	4.42	0.66	0.05
	Experience: Empathy	4.29	0.70	0.05
2	Expectation: Tangibility	4.24	0.60	0.04
	Experience: Tangibility	4.08	0.67	0.05
3	Expectation: Reliability	4.14	0.66	0.05
	Experience: Reliability	4.02	0.71	0.05
	Expectation: Overall	**4.26**	**0.56**	**0.04**
	Experience: Overall	**4.13**	**0.63**	**0.04**

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In all cases, expectations were marginally higher than experiences, indicating room for improvement in meeting commuter expectations. The somewhat greater variability of experience over expectation indicates variation in experiences among passengers. Concurrently, low standard error values across all pairs reinforce the reliability of the mean estimates, further increasing confidence in the recorded differences.

Although differences between expectations and experiences in all dimensions of service quality are slight, they indicate the need for targeted enhancement to synchronize the compatibility of modernized public transportation services with high commuter expectations.

The disparity between the expectation rating (mean=4.26, SD=0.56) and the experience rating (mean=4.13, SD=0.63) highlights a common trend in which idealized expectations surpass the reality of modernized public transport service qualities. As reiterated by Parasuraman et. al. (1988), as cited in Sam et al. (2018), "it is, however, common for consumer's expectation to exceed the actual service perceived and this signifies that there is always a need for improvement" (p. 30).

A paired-sample t-test with Cohen's d was used to examine whether there were significant differences between commuters' expectations and experiences along the key dimensions of tangibility, empathy, reliability, and overall service quality of modernized public transport services, as detailed in Table 9.

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Table 9. A paired sample t-test with Cohen's d of the difference between expectation and experience of the modernized public transport service qualities

Service Qualities	Statistic	df	P		Effect Size	Interpretation
Expectation – Experience: Tangibility	4.40	199	<.001	Cohen's d	0.311	Small to medium
Expectation – Experience: Empathy	3.36	199	<.001	Cohen's d	0.237	Small to medium
Expectation – Experience: Reliability	2.29	199	0.023	Cohen's d	0.162	Small effect
Expectation – Experience: Overall	**4.08**	**199**	**<.001**	Cohen's d	**0.289**	**Small to medium effect**

Note: H_a $\mu_{Measure\ 1\ -\ Measure\ 2} \neq 0$

The most significant gap was observed in tangibility (t=4.40, p<0.001, Cohen's d=0.311), suggesting a moderate practical difference between expectations and experiences. A modernized public transport system that is accessible, clean, well-maintained, and comfortable instills confidence in its reliability. This results in passengers feeling valued, knowing that their safety and comfort have been prioritized. Thus, prioritizing clean, well-ventilated, functionally safe, and convenient modernized public transport facilities can increase customer loyalty and revenue, benefitting passengers and operators alike (Yator, 2012, quoted by Jou et al., 2023).

Additionally, there was a significant gap in empathy (t=3.36, p<0.001, Cohen's d=0.237), a marked difference between commuter expectations and experiences. Research has shown that empathy significantly influences customer loyalty and service excellence (Al-Azzam, 2015; Pakurár et.al., 2019; as cited in Sikder, 2022).

Cohen's d suggested a small effect size in reliability (t=2.29, p=0.023, Cohen's d=0.162); hence, the practical difference between expectations and experiences is small but noticeable.

Studies by Jou et al. (2023) and Ong et al. (2023) found reliability to be significant; the latter explored this through attributes of specific service, such as driver behavior, service adequacy, informational materials, and value for money. Conversely, Chuenyindee et al. (2022) did not find reliability to be significant. However, Abd-El-Salam et al. (2013, as cited in Jou et al., 2023) argue that service reliability significantly influences perceptions of service quality because

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the impression left in a customer's mind after a service experience is pivotal for shaping their satisfaction, loyalty, and future behavior. The study by Zulueta et al. (2024) also determined reliability as an influential factor in service quality, although the least important, which coincides with this study.

The analysis revealed significant differences between expectations versus experiences for the service qualities of tangibility, empathy, and reliability, and their overall perceptions ($t=4.08$, $p<0.001$, Cohen's $d=0.289$). Results were statistically significant with a moderate effect size, indicating that the experiences did not fully meet commuter expectations for these service qualities and were overall below expectations. Effect sizes reveal that, while the differences are significant, they range from small to moderate in magnitude, pointing to a noticeable practical difference between overall expectations and experiences.

A study carried out in Russia by Mikhaylov et al. (2015) listed service dimensions that closely parallel the findings of the current study, in which tangibility had the highest gap between customer expectation and followed by empathy, whereas reliability had the smallest gap. In Sam et (2018) study, reliability was cited as the most critical element of service then empathy and tangibility. Atombo and Wemegah (2021) also found all elements: reliability, empathy, and tangibility, to be of importance. Zulueta et al. (2024) recognized empathy, tangibility, and reliability as dimensions under the SERVQUAL model that influence service quality and satisfaction.

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~~*System Performance Benchmark*~~

~~Results should be clear and concise. Show only the most significant or main findings of the research. Discussion must explore the significance of the results of the work. Adequate discussion or comparison of the current results to the previous similar published articles should be provided to shows the positioning of the present research (if available).~~

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~~3.1.1. Memory performance result~~

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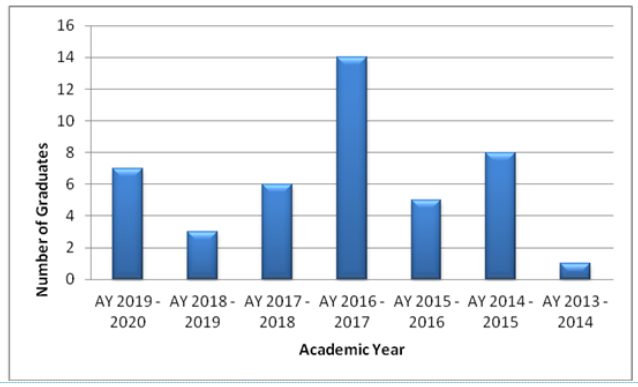

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~~**Figure 3** Number of Graduates~~

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~~4~~2.4. Conclusion~~s~~

Although public transport has greatly improved through fleet modernization to meet the expectations of commuters, the research results indicate deficiencies in tangibility and empathy. The mean of expectations regarding modernized transport was so high among commuters that continuous improvement is essential in these dimensions. Addressing the largest gap in tangibility regarding safety, appeal, and accessibility, the physical aspects of the service will satisfy commuter expectations. Similarly, the improvement of the empathy dimension, in relation to security and comfort, will lead to an enhanced passenger experience. Reliability obtained the smallest gap; however, timely operations, consistent service performance, and availability remain crucial in sustaining commuter confidence.

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To enhance the appeal of modernized public transport units, operators should regularly replace worn and odorous seat covers and curtains while continuously maintaining ventilation and temperature control systems. Dutifully implement set operational policies, with surprise inspections, and reminders to drivers of professional standards. Moreover, applying a stricter cleaning schedule would increase passenger comfort and satisfaction. Additionally, equipping all modernized public transport with a functioning Automatic Fare Collection System would increase efficiency and convenience.

Operators could enhance the empathic dimension of service quality by minimizing engine vibrations during idling periods when waiting for passengers or for departure time, and overcoming interior space limitations through retrofitting measures that improve legroom and headroom.

Moreover, operators could enhance dependability, fare efficiency, and availability through systematic interventions. Implementing periodic and frequent maintenance schedules ensures smoother and more reliable transport. Utilizing transparent fare structures and a functional Automatic Fare Collection System can minimize fare-related disputes and increase passenger confidence. Requiring operators to modernize their fleets fully would reduce waiting times and make modernized public transport more accessible to commuters. Similarly, providing transparent travel time, destinations, and fare charges would increase the dependability of the service. Finally, removing barriers to accessing modernized public transport services by operators greatly contributes to overall satisfaction. ~~The~~

~~main conclusion of the study may be presented in a short Conclusions section, which may stand-alone. It should not repeat the Results, instead provide significant findings and contribution of the study.~~

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