



ASSESSMENT OF THE QUALITY OF PASSENGER TRANSPORTATION SERVICES: ANALYSIS BASED ON PASSENGER FEEDBACK

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ABSTRACT: The growing demand for comfortable, reliable, and safe passenger transportation has intensified scholarly interest in service-quality assessment tools that can capture the experience of actual riders. Using a 27-item structured questionnaire grounded in the SERVQUAL conceptual framework, we surveyed 1 262 passengers and conducted twenty in-depth interviews to corroborate and nuance the quantitative results. Statistical processing relied on exploratory factor analysis, multiple linear regression, and Cohen's d effect-size calculation. The study reveals five latent quality dimensions—comfort, punctuality, information transparency, staff courtesy, and perceived safety—that jointly explain 71.4 % of the variance in overall satisfaction. Policy implications include the integration of real-time digital feedback channels into national quality-of-service standards and the introduction of incentive schemes for operators that outperform benchmarks.

Keywords: Passenger transportation; service quality; SERVQUAL; passenger feedback; Uzbekistan; factor analysis; customer satisfaction; public transport policy.

INTRODUCTION

High-quality passenger transportation services underpin urban liveability, regional integration, and socioeconomic development. Over the last decade, Uzbekistan has invested heavily in rail, road, and bus infrastructure; nevertheless, anecdotal reports and periodic ministerial audits indicate persistent passenger dissatisfaction regarding comfort conditions, reliability, and safety. Since classical operational indicators such as vehicle mileage or on-time performance fail to fully capture user perceptions, contemporary transportation research emphasises the importance of voice-of-customer data. Drawing on marketing science, many scholars employ multi-attribute scales—most prominently Parasuraman's SERVQUAL model—to quantify the subjective service experience. Yet empirical studies focusing on Central Asia remain scarce, and official performance reports seldom exploit systematic passenger feedback. Against this backdrop, the present article aims to generate actionable insights by addressing two interrelated research questions: which latent factors shape passengers' overall satisfaction with transportation services in Uzbekistan, and to what extent do these factors differ across transport modes and demographic subgroups? By answering these questions, we expect to enrich the regional evidence base and provide a blueprint for data-driven service improvements.

The study used a sequential explanatory design. In the quantitative phase we administered a 27-item survey instrument adapted from the SERVQUAL scale. Items were translated into Uzbek and Russian and validated through a two-step back-translation procedure to ensure semantic equivalence. Five academic experts in transportation management confirmed content



validity. Responses were recorded on a seven-point Likert continuum from “strongly disagree” to “strongly agree”. A pilot test with 48 passengers yielded Cronbach’s alpha values above 0.80 for all preliminary dimensions, indicating internal consistency.

Sampling followed a stratified multistage approach. Primary strata reflected transport modes—city bus, trolleybus, metro, suburban rail, and long-distance rail—while secondary strata captured departure time bands to mitigate peak-hour bias. Data collection took place between 3 March and 27 April 2025 at 24 high-traffic nodes. Field investigators approached every third passenger exiting a vehicle, achieving a response rate of 78 %. After eliminating incomplete questionnaires, the final dataset comprised 1 262 valid cases. Socio-demographic variables included age, gender, education, income proxy, and trip purpose.

Ethical approval was granted by the Academic Council of Tashkent Institute of Transport Engineers (protocol No. -34/2025). Participants gave informed consent, and anonymity was safeguarded.

Factor analysis converged on a five-factor solution that cumulatively explained 71.4 % of the variance in the response matrix. Factor 1, labelled Comfort, encompassed seat ergonomics, ambient temperature, noise level, and cleanliness. Factor 2, Punctuality, captured schedule adherence and travel-time predictability. Factor 3, Information Transparency, referred to clarity of timetables, fare information, and real-time delay updates. Factor 4, Staff Courtesy, aggregated behavioural indicators concerning drivers’ and conductors’ politeness and competence. Factor 5, Perceived Safety, combined items on personal security, vehicle maintenance, and driving style. All factor loadings exceeded 0.62, and composite reliabilities ranged from 0.82 to 0.91.

Regression analysis demonstrated that Comfort ($\beta = 0.31$; $p < 0.001$) and Punctuality ($\beta = 0.29$; $p < 0.001$) were the strongest predictors of overall satisfaction, followed by Staff Courtesy ($\beta = 0.18$; $p < 0.01$) and Information Transparency ($\beta = 0.14$; $p < 0.05$). Perceived Safety showed a smaller direct coefficient ($\beta = 0.09$; $p = 0.07$) but exerted a significant moderating effect: satisfaction among female passengers exhibited high sensitivity to safety perceptions (interaction term $\beta = 0.22$; $p < 0.01$), whereas male passengers prioritised punctuality. Agewise segmentation revealed that students placed higher relative importance on information transparency, especially availability of mobile-friendly applications.

Robustness checks using bootstrapped confidence intervals (5 000 resamples) confirmed parameter stability. Effect-size analysis indicated a large Cohen’s d (0.81) between high- and low-satisfaction groups on the comfort scale, underlining its practical salience.

Qualitative interviews enriched these findings. Passengers frequently associated comfort with “dignity” and “respect”, suggesting socio-psychological layers beyond physical amenities. Interviewees cited overcrowding during peak periods as emblematic of systemic neglect, resonating with survey evidence linking seat availability to satisfaction. Regarding punctuality, respondents described train delays as eroding trust in institutional competence; this symbolic dimension explains the disproportionate regression weight of punctuality despite moderate mean score differences.

The prominence of comfort and punctuality corroborates international observations that tangible service attributes remain central to user appraisal even in technologically advanced contexts. However, the emergence of information transparency as a standalone factor reflects the digitalisation trajectory of Uzbekistan’s transport sector. Real-time data integration into

passenger information systems appears to mitigate the negative impact of inevitable disruptions, echoing findings from European metropolitan research.

The gender-specific safety sensitivity aligns with criminological theories of perceived vulnerability in public spaces. While overall crime statistics on Uzbek public transport are comparatively low, the heightened awareness among female commuters demands targeted interventions such as panic-button installation and dedicated helplines.

Interestingly, staff courtesy, though statistically significant, played a subsidiary role compared to physical attributes. This may stem from historically limited service-culture exposure under state-run monopolies. Yet the qualitative evidence reveals that courteous behaviour functions as a reputational amplifier, indicating potential for multiplier effects if combined with visible infrastructure upgrades.

From a managerial vantage point, the multidimensional scorecard developed in this study enables operators to track longitudinal performance and to benchmark against peer systems. Furthermore, regression coefficients can be translated into marginal utility estimates, guiding cost-benefit analyses for proposed service enhancements. Policymakers can embed these empirically derived weightings into contractual key-performance indicators, thereby aligning provider incentives with passenger priorities.

A holistic evaluation of passenger transportation quality must begin and end with the passengers themselves. By triangulating survey data and qualitative insights, this study identifies comfort, punctuality, information transparency, staff courtesy, and perceived safety as mutually reinforcing determinants of satisfaction. Investments that improve cabin ergonomics and timetable reliability yield the highest immediate returns in public approval; nevertheless, sustained legitimacy hinges on transparent communication and a safety culture attuned to gendered perceptions. Embedding continuous digital feedback loops into regulatory frameworks will institutionalise user-centred performance management and accelerate progress towards an integrated, high-quality transport ecosystem.

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