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The Post-Pandemic Shift: An Economic Analysis of User Preferences and Willingness-to-Pay for Public Transport Safety and Hygiene Measures in Uzbekistan

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Abstract: This paper investigates post-pandemic changes in public transport user preferences and willingness-to-pay (WTP) for safety and hygiene measures in Uzbekistan. The study responds to the COVID-19 pandemic, which changed passenger perceptions of health risk and weakened confidence in shared mobility systems. Using survey evidence from Tashkent and Samarkand, the paper examines how commuters value regular sanitization, improved ventilation, hand sanitizer availability, mask enforcement, and crowd management. The results show that passengers now place safety and hygiene among the central attributes of public transport service quality. Mean WTP for improved safety and hygiene is positive but moderate, with ventilation and sanitization receiving the highest valuations. Regression results indicate that income, education, perceived health risk, travel frequency, and age significantly influence WTP. The findings suggest that safety improvements can support passen ger confidence, but fare-based financing must be balanced with affordability and equity concerns.

Keywords: Public transport, willingness-to-pay, safety measures, hygiene, Uzbekistan.

1. Introduction

The outbreak of COVID-19 radically challenged mobility systems and changed how passengers evaluate health, safety, and hygiene in public transport environments [1, 2]. Public transport was among the most affected sectors because vehicles and stations often involve shared enclosed spaces, high passenger volumes, and close contact among users [3]. These conditions increased perceived infection risk and contributed to a substantial decline in passenger trust [4].

In Uzbekistan, where public transport remains a central part of urban mobility, the pandemic exposed weaknesses in vehicle quality, informal operation, and the enforcement of hygiene standards [6, 7]. As society moved into the post-pandemic period, cleanliness, ventilation, crowd control, and visible disinfection became important service attributes rather than secondary concerns [8, 9]. This study therefore examines how public transport users in Uzbekistan value safety and hygiene improvements and whether they are willing to pay for those improvements.

The study focuses on public transport users in Tashkent and Samarkand. It analyzes post-pandemic changes in user preferences, estimates willingness-to-pay (WTP) for safety and hygiene measures, identifies socioeconomic and behavioral determinants of WTP, and assesses the policy implications of using WTP evidence in transport planning and pricing.

2. Literature Review

Global evidence shows that public transport ridership fell sharply during and after the COVID-19 pandemic. Even after restrictions were lifted, recovery remained incomplete in many cities because perceived infection risk continued to affect passenger choices [4, 9]. The shift from public transport to private or individualized modes created economic, environmental, and equity concerns, especially in developing and transition economies where low-income groups depend heavily on buses and minibuses.

Safety and hygiene concerns now have a stronger influence on transport choice than before the pandemic. Empirical studies identify cleanliness, ventilation, crowding, hand sanitizer availability, and the visible enforcement of health guidelines as important determinants of passenger confidence [10, 13]. In this context, WTP provides an economic measure of the value that users attach to non-market service attributes such as health protection, perceived safety, and improved hygiene [11, 12].

The literature also indicates that WTP differs by income, education, travel frequency, perceived risk, and trust in operators. These differences are important for Uzbekistan because a uniform fare increase could improve service quality but may also reduce affordability for frequent and low-income users. The research gap addressed in this paper is the lack of Uzbekistan-specific evidence on post-pandemic WTP for public transport safety and hygiene measures.

3. Theoretical and Conceptual Framework

The study is grounded in Random Utility Theory and the Contingent Valuation Method. Random Utility Theory assumes that passengers choose among transport options by comparing the utility obtained from cost, time, comfort, safety, and perceived risk. After the pandemic, perceived health protection becomes part of the utility calculation because passengers attach value to reduced exposure, cleaner vehicles, and better ventilation.

The Contingent Valuation Method is used to estimate the monetary value users assign to safety and hygiene improvements. Respondents are asked whether they would accept a fare increase if specific improvements, such as regular sanitization or improved ventilation, were provided. The conceptual framework links socioeconomic characteristics, travel behavior, and health risk perception to

WTP. Income and education are expected to increase WTP, while frequent travel may reduce WTP because repeated fares create a larger cumulative burden.

4. Research Methodology

The study used a quantitative survey design. Data were collected from public transport users in Tashkent and Samarkand through a stratified random sampling approach designed to represent differences in gender, age, education, employment status, travel frequency, transport mode, and trip purpose. The final sample consisted of 420 respondents.

The questionnaire measured demographic characteristics, travel behavior, perceived importance of safety and hygiene measures, and WTP for fare increases linked to specific public transport improvements. Descriptive statistics were used to summarize the sample and preference patterns. A binary logit regression model was then used to identify determinants of WTP. The model included socioeconomic variables, behavioral variables, and perceived health risk as explanatory factors.

5. Data Analysis and Results

The descriptive results show that the sample includes a broad range of public transport users. Men accounted for 53.8% of respondents and women for 46.2%. Most respondents were economically active, and daily public transport use was common. Buses and minibuses were the dominant transport modes, confirming the practical importance of road-based public transport in the selected cities.

Users rated regular vehicle sanitization and improved ventilation as the most important safety and hygiene measures. The mean importance score for sanitization was 4.46 and the mean score for ventilation was 4.38, indicating that visible and technically meaningful measures are central to passenger confidence. Crowd management and mask enforcement were also valued, but their mean scores were lower.

The WTP results show a positive but moderate willingness to pay for improved safety and hygiene. The mean fare premium was 7.6%. Approximately 22.9% of respondents reported zero WTP, while the remaining respondents accepted low, moderate, or high fare increases. Ventilation and sanitization received the highest mean WTP values, at 9.2% and 8.7% respectively. These results suggest that passengers distinguish among safety measures and value those perceived as more effective.

The logit regression confirms that WTP is influenced by income, education, perceived health risk, travel frequency, and age. Income level and perceived health risk have the strongest positive effects, while travel frequency has a negative effect. This means that users who feel more exposed to health risk are more willing to pay, but frequent users are more price-sensitive because fare increases accumulate across repeated trips.

Table 1. Demographic characteristics of respondents

Variable	Category	Frequency	Percentage (%)
Gender	Male	226	53.8
	Female	194	46.2
Age Group	18–25	98	23.3
	26–35	124	29.5
	36–45	112	26.7
	Above 45	86	20.5
Education	Secondary or below	142	33.8
	Tertiary	278	66.2
Employment Status	Employed	246	58.6
	Student	104	24.8
	Unemployed	70	16.6
Monthly Income (USD)	Below 300	168	40.0
	300–600	162	38.6
	Above 600	90	21.4

Table 2. Travel behavior of respondents

Variable	Category	Frequency	Percentage (%)
Trip Frequency	Daily	238	56.7
	3–4 times/week	114	27.1
	1–2 times/week	68	16.2
Primary Trip Purpose	Work	206	49.0
	Education	118	28.1
	Shopping/Other	96	22.9
Main Transport Mode	Bus	232	55.2
	Minibus	148	35.2
	Metro	40	9.6
Average Trip Duration	<30 minutes	174	41.4
	30–60 minutes	186	44.3
	>60 minutes	60	14.3

Table 3. Perceived importance of safety and hygiene measures

Measure	Mean	Std. Dev.
Regular Vehicle Sanitization	4.46	0.71
Improved Ventilation	4.38	0.76
Hand Sanitiser Availability	4.12	0.82
Mandatory Mask Use	3.94	0.89
Crowd Management	3.88	0.91

Table 4. Overall willingness-to-pay distribution

WTP Category	Frequency	Percentage (%)
Zero WTP	96	22.9
Low WTP (≤5%)	138	32.9
Moderate WTP (6–10%)	118	28.1
High WTP (>10%)	68	16.1
Mean WTP Increase	7.6	—

Table 5. Willingness-to-pay for specific measures

Measure	Mean WTP (%)	Std. Dev.
Improved Ventilation	9.2	3.4
Regular Sanitization	8.7	3.1
Crowd Management	6.5	2.8
Hand Sanitiser Provision	5.9	2.6
Mask Enforcement	5.4	2.9

Table 6. Logit regression results for willingness-to-pay

Variable	Coefficient (β)	Std. Error	z-value	p-value
Income Level	0.624	0.142	4.39	<0.001
Education Level	0.382	0.118	3.24	0.001
Perceived Health Risk	0.711	0.156	4.56	<0.001
Travel Frequency	−0.295	0.121	−2.44	0.015
Age	0.214	0.097	2.21	0.027
Constant	−1.862	0.384	−4.85	<0.001

Table 7. Marginal effects of determinants of willingness-to-pay

Variable	Marginal Effect	Std. Error	p-value
Income Level	0.142	0.031	<0.001
Perceived Health Risk	0.161	0.036	<0.001
Education Level	0.088	0.028	0.002
Travel Frequency	−0.067	0.029	0.021
Age	0.051	0.024	0.033

Table 8. Summary of key findings

Analytical Dimension	Key Result
Demographics	Majority low- to middle-income, economically active users
Travel Behavior	High daily dependence on buses and minibuses
Safety Perception	Hygiene and ventilation rated highly important
Overall WTP	Mean fare premium of 7.6%
Highest Valued Measures	Ventilation and sanitization
Key WTP Determinants	Income, perceived risk, education
Equity Concern	Frequent users less willing to pay
Policy Implication	Need for targeted subsidies and selective pricing

6. Discussion

The findings show that the pandemic changed the meaning of public transport service quality. Before COVID-19, passengers usually evaluated public transport through cost, time, accessibility, and comfort. In the post-pandemic period, hygiene and safety have become part of the core service package. This result is consistent with studies showing that visible cleaning, ventilation, and crowd management affect passenger trust and mode choice [13-16].

The WTP results should be interpreted carefully. A positive average WTP does not mean that all costs should be transferred to passengers. Public transport safety and hygiene generate public health benefits beyond the individual passenger, so exclusive reliance on fare increases may be economically inefficient and socially unequal. The negative effect of travel frequency highlights an equity issue: the users most dependent on public transport are also the most exposed to the cumulative burden of fare increases.

The study therefore supports a balanced policy approach. Core hygiene and safety standards should be treated as baseline public service obligations, while selective service improvements may be supported through carefully designed fare mechanisms. Subsidies, performance-based operator support, and transparent communication are necessary to ensure that safety improvements do not reduce access for low-income users.

7. Conclusions and Recommendations

This study analyzed post-pandemic public transport user preferences and WTP for safety and hygiene measures in Uzbekistan. The results show that safety and hygiene are now important determinants of perceived service quality and public transport confidence. Users place the highest value on improved ventilation and regular sanitization, and the average acceptable fare premium is moderate rather than high.

The findings indicate that WTP is shaped by both economic capacity and psychological perception. Higher income, higher education, and stronger perceived health risk increase the probability of WTP, while frequent travel reduces it. These results confirm that pricing decisions should not be based on WTP alone; they must also consider affordability, equity, and the public health value of safe public transport.

For government, the main recommendation is to establish and enforce minimum safety and hygiene standards across formal and informal transport services. Public investment should prioritize ventilation, cleaning systems, and compliance monitoring. For transport operators, the key recommendation is to make hygiene measures visible, reliable, and clearly communicated to passengers. Future research should use longitudinal and mixed-method approaches to track how WTP and passenger trust evolve as post-pandemic mobility patterns stabilize.

References

[1] Habib, M. A., & Anik, M. A. H. (2023). Impacts of COVID-19 on transport modes and mobility behavior: Analysis of public discourse in Twitter. Transportation Research Record, 2677(4), 65–78. https://doi.org/10.1177/03611981231162978

[2] Olayode, I. O., Severino, A. G., Campisi, T., & Tartibu, L. K. (2022). Comprehensive literature review on the impacts of COVID-19 pandemic on public road transportation system: Challenges and solutions. Sustainability, 14(15), 9586. https://doi.org/10.3390/su14159586

[3] Burdzik, R., Chema, W., & Celinski, I. (2023). A study on passenger flow model and simulation in aspect of COVID-19 spreading on public transport bus stops. Journal of Public Transportation, 25, 100063. https://doi.org/10.1016/j.jpubtr.2023.100063

[4] Nikolaidou, A., Kopsacheilis, A., Georgiadis, G., Noutsias, T., Politis, I., & Fyrogenis, I. (2023). Factors affecting public transport performance due to the COVID-19 outbreak: A worldwide analysis. Cities, 134, 104206. https://doi.org/10.1016/j.cities.2022.104206

[5] Przybylowski, A., Stelmak, S., & Suchanek, M. (2021). Mobility behavior in view of the impact of the COVID-19 pandemic: Public transport users in Gdansk case study. Sustainability, 13(1), 364. https://doi.org/10.3390/su13010364

[6] Berdiyorov, A., Berdiyorov, T., Nasritdinov, J., Qarshiboev, S., & Ergashkxodjaeva, S. (2021). A sustainable model of urban public mobility in Uzbekistan. IOP Conference Series: Earth and Environmental Science, 822(1), 012008. https://doi.org/10.1088/1755-1315/822/1/012008

[7] Mukhiddinov, M., & Vogel, C. (2025). Integrating human-scale mobility solutions in car-centric cities of Uzbekistan. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.5086721

[8] Dzisi, E. K. J., & Dei, O. A. (2020). Adherence to social distancing and wearing of masks within public transportation during the COVID-19 pandemic. Transportation Research Interdisciplinary Perspectives, 7, 100191. https://doi.org/10.1016/j.trip.2020.100191

[9] Tirachini, A., & Cats, O. (2020). COVID-19 and public transportation: Current assessment, prospects, and research needs. Journal of Public Transportation, 22(1), 1–21. https://doi.org/10.5038/2375-0901.22.1.1

[10] Bwambale, A., Uzondu, C., Islam, M., Rahman, F., Batool, Z., Mukwaya, P. I., & Wadud, Z. (2023). Willingness to pay for COVID-19 mitigation measures in public transport and paratransit in low-income countries. Transportation Research Part A: Policy and Practice, 167, 103561. https://doi.org/10.1016/j.tra.2022.103561

[11] Kumar, S., & Sinha, S. (2021). Willingness to pay for improvement in service quality of intermediate public transport modes. Civil Engineering Journal, 7(5), 866–879. https://doi.org/10.28991/cej-2021-03091173

[12] Nyamaliza, H. A. (2020). Valuing willingness to pay for improved public transport: A case of commuter buses in Dodoma City, Tanzania. The Open University of Tanzania.

[13] Aghajanzadeh, M., Aghabayk, K., Esmailpour, J., & De Gruyter, C. (2022). Importance-performance analysis of metro service attributes during the COVID-19 pandemic. Case Studies on Transport Policy, 10(3), 1661–1672. https://doi.org/10.1016/j.cstp.2022.07.011

[14] Florido-Benitez, L. (2023). Cleaning and hygiene in the air transport industry after the COVID-19 pandemic. Hygiene, 3(4), 383–395. https://doi.org/10.3390/hygiene3040029

[15] Dong, H., Ma, S., Jia, N., & Tian, J. (2021). Understanding public transport satisfaction in post COVID-19 pandemic. Transport Policy, 101, 81–88. https://doi.org/10.1016/j.tranpol.2020.12.004

[16] Helfers, A., Schneider, N., Koch, J., Fouckhardt, L., & Sommer, C. (2024). Visualizing ventilation in the bus: Addressing risk perception in public transport passengers. Transportation Research Part F: Traffic Psychology and Behaviour, 101, 236–249. https://doi.org/10.1016/j.trf.2024.01.011

[17] Litman, T. M. (2022). Evaluating transportation equity: Guidance for incorporating distributional impacts in transport planning. ITE Journal, 92(4), 43–49.

[18] Eboli, L., Bellizzi, M. G., & Mazzulla, G. (2022). A literature review of studies analysing air transport service quality from the passengers point of view. Promet-Traffic & Transportation, 34(2), 253–269. https://doi.org/10.7307/ptt.2022.02.11