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Comparative Study of User Perception of Metro vs BMTC Bus Services in Bengaluru City

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Abstract:
Efficient urban public transport is essential for managing congestion and supporting sustainable mobility in Bengaluru. This study investigates commuter perceptions of Metro and BMTC services, focusing on punctuality, comfort, safety, accessibility, and travel cost. A structured questionnaire gathered data from 80 participants across diverse age, gender, and income groups. Quantitative analysis using descriptive statistics, regression, and Spearman rank correlation examined how these factors influence overall satisfaction and usage frequency. Results indicate that timely services strongly affect satisfaction, comfortable travel enhances perceived safety, and fare considerations influence commuting frequency. Metro is preferred for reliability and cleanliness, while BMTC is valued for affordability and route coverage. Insights from this study can guide improvements in service quality and commuter experience.

Keywords: Metro, BMTC, User Perception, Commuter Satisfaction, Punctuality, Comfort, Safety, Public Transport

Introduction:
Urban public transport is essential for reducing traffic congestion and promoting sustainable mobility in cities. In Bangalore, commuters depend on both Metro trains and BMTC buses to meet the needs of a growing population. Users' perceptions and experiences significantly influence their choice of transport. Important factors include punctuality, comfort, safety, accessibility, and ease of ticketing. Cost and environmental considerations also shape travel decisions, especially for students and lower-income commuters. Metro services are often praised for their reliability and cleanliness, while BMTC buses are valued for their affordability and wider reach. Understanding what commuters prioritize helps authorities enhance service quality. Journey duration, waiting times, and route connectivity strongly affect mode selection. Passenger safety and comfort foster confidence in using public transport. Comparing satisfaction across different services enables assessment of operational effectiveness. Commuter feedback offers practical insights for targeted policy and infrastructure improvements. Hypotheses concerning punctuality, comfort, and cost allow quantitative analysis of their effect on satisfaction. This study focuses on regular Metro and BMTC users across diverse demographic groups. Findings can guide strategies to improve the efficiency, convenience, and appeal of urban transit systems.

Review of Literature:
Verma, M., & Das A. (2025), "Modeling satisfaction and loyalty of Metro commuters in Bengaluru, India using SEM". Using structural equation modeling, the authors examined factors affecting commuter satisfaction and loyalty on the Bengaluru Metro. They found that comfort, punctuality, and service reliability strongly influence repeated use of metro services.

Saxena, A., Choudhury, B. & Das Gupta P. (2024), "Travel satisfaction of Bus Rapid Transit users in a developing country: The case of Bhopal City, India". The research analysed BRT users in Bhopal, revealing

that service frequency, safety, and travel comfort significantly impact satisfaction, while affordable fares encourage consistent usage among lower-income passengers.

Meena, S., & Solanki, S. (2025), "Service quality and customer satisfaction of the Delhi Metro: An exploratory factor analysis". This study explored how service quality dimensions such as punctuality, staff behaviour, and cleanliness affect commuter satisfaction. High-quality service strongly contributes to positive perceptions and encourages continued metro use.

Rathor, S., Valad, V., & Vidani, J. (2024), "Passenger satisfaction in Ahmedabad Metro". The study found that safety, punctuality, and travel comfort were the main contributors to commuter satisfaction in Ahmedabad Metro. It also emphasized the importance of providing clear service information for better user experience.

Solanki, S., Meena, S., & Kumar, U. (2022), "Development of the travel satisfaction scale for assessment of commuters' satisfaction in public transport: Evidence from Delhi Metro". The study designed a satisfaction scale for public transport commuters, identifying comfort, punctuality, and convenience as primary factors. The tool can help authorities measure and enhance service performance effectively.

Manu Bharadwaj B. (2025), "Impact of Bengaluru Metro fare hike on passenger sentiment and travel behaviour: A survey-based study". The survey examined how fare increases affect commuter behaviour and sentiment. Results showed that some users shifted to alternate modes, while loyal passengers prioritized service quality and time savings over fare costs.

Research Gap:

While previous research has explored factors such as comfort, punctuality, cost, and service quality in Indian metro and bus systems, there is limited work directly comparing Metro and BMTC users in Bengaluru. Many studies concentrate on a single transport mode or city, often neglecting the role of demographics, travel frequency, and environmental considerations in shaping commuter choices. Furthermore, combined analysis examining how punctuality, comfort, and travel expenses affect overall satisfaction is rare. Filling these gaps can offer valuable insights into commuter priorities and support the development of strategies that make urban public transport more efficient, convenient, and attractive in fast-growing cities like Bengaluru.

Objectives:

1. To Identify Factors Shaping Commuter Preferences.
2. To Compare and Assess User Satisfaction Levels of Metro and BMTC Services.

Hypothesis:

Hypothesis 01:
H_{01}: Perceived punctuality has no significant effect on overall user satisfaction.
H_{11}: Perceived punctuality has a significant effect on overall user satisfaction.
Hypothesis 02:
H_{02}: Comfort during travel has no significant effect on perceived safety.
H_{12}: Comfort during travel has a significant effect on perceived safety.
Hypothesis 03:
H_{03}: Consideration of travel cost has no significant effect on frequency of using public transport.
H_{13}: Consideration of travel cost has a significant effect on frequency of using public transport.

Research Methodology:

The study adopts a quantitative descriptive research design to examine commuter behaviour in Bengaluru, focusing on Metro and BMTC users. Primary data was collected through structured questionnaires, capturing numerical responses on factors such as punctuality, comfort, travel cost, safety, and overall satisfaction. A total of 80 respondents participated, representing diverse age groups, genders, educational backgrounds, occupations, and income levels.

The collected data was analysed using descriptive statistics to summarize patterns, regression analysis to test the impact of punctuality and comfort on satisfaction and safety, and Spearman rank correlation to assess the relationship between travel cost and usage frequency. This methodology allows for a systematic examination of commuter preferences and provides statistical evidence to support or reject the proposed hypotheses.

Limitations:

1. The findings are based on self-reported responses, which may reflect personal opinions or recall bias.
2. With only 80 participants, the sample may not capture the full diversity of Bengaluru commuters.
3. The research examines only Metro and BMTC users, leaving out other transport modes like taxis or app-based services.
4. Data was collected at a single point in time, so changes in travel behaviour over time are not captured.

Data Analysis and Interpretation:

Table 1: Demographic Distribution of Respondents

Variable	Category	Frequency	Percentage
Age	Below 20	8	10%
	21–30	30	37.5%
	31–40	20	25%
	41–50	15	18.75%
	Above 50	7	8.75%
Gender	Male	50	62.5%
	Female	30	37.5%
Education	Below SSLC	0	0%
	SSLC	5	6.25%
	PUC	15	18.75%
	Diploma/ITI	6	7.5%

Variable	Category	Frequency	Percentage
	Graduate	40	50%
	Postgraduate	14	17.5%
	Doctorate	0	0%
Occupation	Student	25	31.25%
	Private Employee	20	25%
	Government Employee	10	12.5%
	Business	3	3.75%
	Homemaker	2	2.5%
	Retired	2	2.5%
	Other	18	22.5%
Monthly Income	No Income	10	12.5%
	₹10,000–₹30,000	30	37..5%
	₹31,000–₹50,000	25	31.25%
	₹51,000–₹70,000	10	12.5%
	Above ₹70,000	5	6.25%

Interpretation: Among the 80 respondents, most commuters are aged 21–30 (37.5%) and predominantly male (62.5%). Half hold graduate degrees, with smaller shares having postgraduate or Diploma/ITI qualifications. Students (31.25%) and private employees (25%) form the main occupational groups, while business, homemakers, and retirees are fewer. Most earn between ₹10,000–₹50,000, indicating that affordability likely influences their transport choices.

Table 02: Descriptive Statistics

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	SD
Travel time influences my choice of transport.	4	8	12	36	20	3.75	1.09
I consider the cost of travel while deciding which mode of transport to use.	6	10	14	30	20	3.60	1.20

I feel that safety and security are important when choosing public transport.	2	5	10	38	25	3.99	0.96
Comfort during travel affects my preference for a particular mode of transport.	3	6	12	35	24	3.89	1.04
Easy access to the transport service influences my travel decisions.	2	7	10	36	25	3.94	1.00
Environmental impact influences my choice of transport.	4	8	15	30	23	3.75	1.12
I consider the risk of accidents while choosing my mode of transport.	3	6	12	35	24	3.89	1.04
I prefer transport services that have shorter waiting times.	5	8	10	35	22	3.76	1.14
The Metro service I use is punctual and on time.	2	5	8	35	30	4.08	0.97
The BMTC service I use is punctual and on time.	3	6	10	30	31	4.00	1.07
The Metro trains are clean and hygienic.	1	4	8	36	31	4.15	0.88
The BMTC buses are clean and hygienic.	2	5	10	34	29	4.04	0.98
I feel safe while travelling in the Metro.	2	4	10	35	29	4.06	0.95
I feel safe while travelling in BMTC buses.	3	5	8	32	32	4.06	1.04
The ticketing process in the Metro is convenient.	2	3	7	38	30	4.14	0.90
The ticketing process in BMTC is convenient.	3	5	10	32	30	4.01	1.04
I am overall satisfied with Metro services.	2	3	8	35	32	4.15	0.92
I am overall satisfied with BMTC services.	3	4	10	33	30	4.04	1.02

Interpretation: The survey findings show that commuters give high priority to factors such as journey duration, travel comfort, personal safety, and convenient access when choosing public transport. While fare and environmental concerns influence decisions to a lesser degree, Metro services are generally rated higher than BMTC buses regarding timeliness, cleanliness, ease of ticketing, and overall satisfaction. Both modes are considered secure and reliable, with overall responses reflecting positive experiences and strong trust in the services provided.

Table 03: Regression Analysis Between Perceived Punctuality and Overall User Satisfaction

Transport Mode	**R**	**R^2**	**Adjusted R^2**	**F**	**Sig.**	**Beta (IV → DV)**	**Sig.**
Metro	0.78	0.61	0.60	148.83	0.001	0.78	0.001

BMTC	0.72	0.52	0.51	105.61	0.001	0.72	0.001

Interpretation: Perceived punctuality significantly impacts overall satisfaction for both Metro and BMTC users. R^2 indicates that punctuality explains 61% of satisfaction variance for Metro and 52% for BMTC, with $p < 0.001$, confirming the effect.

Table 04: Regression Analysis Between Travel Comfort and Perceived Safety

Transport Mode	R	R^2	Adjusted R^2	F	Sig.	Beta (IV → DV)	Sig.
Metro	0.74	0.55	0.54	97.45	0.001	0.74	0.001
BMTC	0.69	0.48	0.47	73.20	0.001	0.69	0.001

Interpretation: Comfort during travel significantly affects perceived safety for both Metro and BMTC users. R^2 indicates that comfort explains 55% of safety variance in Metro and 48% in BMTC, with $p < 0.001$, confirming the effect.

Table 05: Spearman Rank Correlation Between Consideration of Travel Cost and Frequency of Using Public Transport

Variable 1	Variable 2	Correlation Coefficient (Spearman's rho)	N	Sig. (2-tailed)
Travel Cost	Frequency of Using Public Transport	0.63	80	0.001

Interpretation: Consideration of travel cost significantly affects public transport usage frequency. A moderate positive correlation ($\rho = 0.63$, $p < 0.001$) shows commuters adjust travel frequency based on cost.

Findings

1. Commuters' perception of Metro and BMTC punctuality strongly influences their overall satisfaction.
2. Travel comfort positively affects perceived safety, making commuters feel more secure.
3. Consideration of travel cost significantly impacts how often commuters use public transport.
4. Metro users prioritize punctuality and cleanliness, while BMTC users value accessibility and affordability.
5. Environmental awareness and convenience, such as last-mile connectivity, also influence commuters' choices and satisfaction.

Suggestions

1. BMTC should improve punctuality through better scheduling and real-time tracking.
2. Transport authorities should enhance comfort and safety by upgrading seating, ventilation, and security measures.
3. Introducing affordable fare schemes, student passes, and loyalty programs can encourage frequent use and reduce cost-related barriers.

Conclusion:

The study demonstrates that multiple factors collectively shape commuter satisfaction and travel behaviour. Punctuality emerges as the main driver of overall satisfaction, while comfort significantly improves safety perception. Travel cost directly affects usage frequency, particularly for students and low-income commuters. Metro users prioritize timeliness and hygiene, whereas BMTC passengers value accessibility and cost-effectiveness. Targeted enhancements in scheduling, comfort, safety measures, and fare policies can encourage more frequent use and improve overall satisfaction. Implementing these strategies will make Bengaluru's public transport system more reliable, convenient, and appealing to diverse commuters.

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