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Impact Of Unorganized Public Transportation Sector (Upts) On Organized Sector: A Study to Find the Working Passengers Priority in Bangalore City

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KEYWORDS

Unorganized Public Transportation Sector, Organized Public Transportation Sector

ABSTRACT

This study investigates the impact of the Unorganized Public Transportation Sector (UPTS) on the Organized Public Transportation Sector in Bangalore City, with a particular focus on the travel priorities of working passengers. Public transportation in Bangalore comprises both structured systems such as BMTC buses and metro services, and unorganized options like auto-rickshaws and private cabs. Using survey data collected from working commuters and analyzing it through ANOVA and regression methods, the study identifies significant differences in passenger priorities such as punctuality, comfort, safety, and availability across both sectors. The results highlight that while punctuality and comfort are critical in both organized and unorganized sectors, safety and availability are of higher concern in unorganized modes. Additionally, the study finds that the presence of UPTS influences passenger choices and usage patterns in the organized sector, particularly by addressing first-mile and last-mile connectivity gaps. The findings suggest that improving service reliability, safety measures, and integrated connectivity between organized and unorganized transport can enhance the overall commuting experience for working passengers in Bangalore.

1. INTRODUCTION

UNORGANIZED PUBLIC TRANSPORTATION SECTOR

India's unorganised public transportation sector, often referred to as informal or intermediate public transport (IPT), plays a crucial role in urban and rural mobility. This sector includes modes such as auto-rickshaws, cycle rickshaws, shared vans (like Tata Magic), mini-buses, jeeps, and locally adapted vehicles like Chakdas and Kadukas. These services are predominantly operated by individual or small-scale private operators and typically function outside formal regulatory frameworks.

Key Statistics and Insights

- **Dominance in Passenger Transport**: As of 2003–04, public modes accounted for only 6.19% of passenger transport, while personal modes made up 94.17%. Within public modes, 100% of auto-rickshaws and taxis, and 74% of buses were operated by the unorganised sector.
- **Prevalence in Road Freight**: In the road freight industry, the unorganised sector holds a significant share, with only 14% attributed to the organised sector. This highlights the dominance of individual operators in goods transportation.

- **Employment and Operations**: A survey involving 53,290 units revealed that 53% were mechanised operations, while 47% were non-mechanised. Notably, 83% of auto drivers reported facing high penalties, and 58% experienced long waiting times, indicating operational challenges within the sector.

Urban Mobility Contribution: Informal transport modes are vital in cities like Jaipur and Amritsar, where they serve both urban and peri-urban populations. These modes adapt to local needs, offering flexible and affordable transportation options.

Challenges and Considerations

- **Regulatory Oversight**: The lack of formal regulation leads to issues such as inconsistent service quality, safety concerns, and environmental impacts.
- **Data Gaps**: There is a significant lack of comprehensive data on the unorganised transport sector, making it challenging to formulate effective policies and interventions .Ministry of Statistics
- **Integration with Formal Systems**: Efforts are needed to integrate informal transport modes with formal public transportation systems to enhance overall urban mobility.

ORGANIZED PUBLIC TRANSPORTATION SYSTEM IN INDIA

India's organized public transportation system is primarily managed by State Road Transport Undertakings (SRTUs), which are government-owned bus operators providing essential mobility across urban and rural regions. Despite their critical role, these entities face challenges such as declining fleet sizes, financial losses, and the need for modernization.

National Overview

- **Fleet Size**: As of fiscal year 2019, public sector entities in India owned approximately 152,400 buses.
- **Combined Public and Private Sector**: By fiscal year 2022, the total number of buses (public and private) across India reached around 2.1 million.
- **Declining Public Bus Numbers**: Between 2018-19 and 2021-22, the number of buses operated by SRTUs decreased from 152,000 to 147,000. This decline is attributed to factors like reduced passenger revenue during the COVID-19 pandemic, high fuel prices, stagnant fares, and free ride schemes in some states.
- **Financial Losses**: Revenue losses for SRTUs surged by nearly 68% during the same period, reaching ₹30,192 crore in 2021-22.

City-Level Highlights

Bengaluru – BMTC

- **Fleet**: As of September 2024, the Bengaluru Metropolitan Transport Corporation (BMTC) operates a fleet of 6,340 buses.
- **Ridership**: BMTC serves approximately 4.91 million passengers daily.

Delhi – DTC

- **Fleet**: As of March 2025, the Delhi Transport Corporation (DTC) has a fleet of 4,359 buses, comprising 3,109 CNG buses and 1,250 electric buses.
- **Ridership**: DTC and DIMTS combined serve about 3.6 million passengers daily.

Mumbai – BEST

- **Fleet**: As of 2023, the Brihanmumbai Electric Supply and Transport (BEST) operates 3,228 buses, including 525 diesel, 2,250 CNG, and 406 battery electric single-decker buses.
- **Ridership**: BEST ferries approximately 5 million passengers daily over 443 routes.

Pune – PMPML

- **Fleet**: Pune Mahanagar Parivahan Mahamandal Limited (PMPML) operates 1,584 buses, all running on CNG or electric power.
- **Ridership**: PMPML serves around 1.35 million passengers daily.

Kerala – KSRTC

- **Fleet**: The Kerala State Road Transport Corporation (KSRTC) operates a fleet of 6,241 buses, including Volvo, Scania, Ashok Leyland, Tata Motors, and Eicher models.

- **Ridership**: KSRTC transports an average of 3.545 million commuters per day.

BANGALORE CITY STATISTICS

ORGANISED PUBLIC TRANSPORTATION STATISTICS IN BANGALORE CITY

Bengaluru's organized public transportation system primarily comprises the **Bangalore Metropolitan Transport Corporation (BMTC)** and **Namma Metro**, both playing pivotal roles in urban mobility. Here's an overview of their recent statistics:

Bangalore Metropolitan Transport Corporation (BMTC)

- **Fleet Size**: As of 2023, BMTC operated approximately **6,073 buses**, marking a decline from pre-COVID numbers. However, plans are underway to expand the fleet to over **10,000 buses** within the next three years, aiming to surpass Delhi's fleet size.
- **Daily Ridership**: In May 2023, daily ridership was around **27.7 lakh** (2.77 million) passengers. The introduction of the **Shakti scheme**, offering free bus travel for women, led to a significant increase, with daily ridership surpassing **30 lakh** (3 million) on several days.
- **Electrification Efforts**: BMTC is actively expanding its electric bus fleet. From approximately **390 e-buses**, the corporation plans to increase this number to **1,751**, enhancing sustainable urban transport.

Namma Metro (Bangalore Metro Rail Corporation Limited - BMRCL)

- **Network Length**: As of 2024, Namma Metro operates over **76 km** of metro lines, with ongoing expansions to improve city-wide connectivity.
- **Daily Ridership**: The metro system has witnessed record-breaking ridership numbers. On **April 17, 2025**, it recorded its third-highest single-day ridership of **9.08 lakh** (908,000) passengers.
- **Revenue Generation**: With increasing ridership, daily fare revenue has crossed the **₹2 crore** mark on weekdays, reflecting the metro's growing role in Bengaluru's public transport landscape.

These developments underscore Bengaluru's commitment to enhancing its public transportation infrastructure, aiming to provide efficient and sustainable mobility solutions for its residents.

UNORGANISED PUBLIC TRANSPORTATION STATISTICS IN BANGALORE CITY

In Bengaluru, the unorganised public transportation sector—often referred to as Intermediate Public Transport (IPT)—plays a crucial role in urban mobility, especially for short-distance travel and as feeders to formal transit systems like BMTC buses and Namma Metro. This sector primarily includes auto-rickshaws, shared vans, and other informal modes.

Auto-Rickshaws

- **Fleet Size**: As of January 2019, Bengaluru had approximately **1.94 lakh (194,000)** registered auto-rickshaws.
- **Mode Share**: Auto-rickshaws account for about **10.4%** of the city's daily motorized transport trips.
- **Operational Characteristics**: These vehicles are predominantly used for trips ranging from 8 to 10 kilometers, offering flexible and affordable transportation options.
- **Driver Ownership**: Approximately **60%** of auto-rickshaw drivers in Bengaluru are renters rather than owners, highlighting the informal nature of this sector.

Shared Vans and Informal Modes

While specific statistics for shared vans and other informal transport modes in Bengaluru are limited, these services often operate on fixed routes in peri-urban areas, providing essential connectivity where formal public transport is scarce. They serve as vital links between residential zones and major transit hubs.

Overall Impact

- **Intermediate Public Transport (IPT) Share**: In 2011, IPT modes, including auto-rickshaws and shared vans, constituted approximately **7%** of the city's mode share.

Role in Mobility: The unorganised sector fills critical gaps in Bengaluru's transportation network, offering first and last-mile connectivity and serving areas underserved by formal public transit.

2. REVIEW OF LITERATURE

John Calimente (2012) Though they receive little financial support from the government, private railways in Japan achieve profitability by diversifying into real estate, retail, and numerous other businesses. Tokyu Corporation is used as the case study to exemplify how government policy and socioeconomic context contributed to the successful private railway model. Ten indicators, such as ridership, population density and mode share are used to analyze two stations created by Tokyu to demonstrate how this model is manifested in Tokyu's rail integrated communities.

Andrés Valderrama & Isaac Beltran (2007) To provide transportation services along the main urban transit corridors in the city of Bogotá, Colombia. The fleet replaced approximately 1,140 older buses and served about 850,000 passengers per day. From a technological perspective the new fleet represented a radical change for the city, but in one significant way the new vehicles were entirely consistent with the previous public transportation system. The replacement buses were powered by diesel fuel.

OBJECTIVES

- To find the statistical information of Organized and Unorganized Public Transportation Sector in Bangalore City.
- To Study the passenger priority on Organized and Unorganized Public Transportation Sector in Bangalore City.
- To know the impact of Unorganized Public Transportation Sector (UPTS) On Organized Public Transportation Sector

HYPOTHESIS

1. **H_1:** There is a difference in the level of passenger priority between organized and unorganized modes of public transportation in Bangalore City.

H_0: There is no difference in the level of passenger priority between organized and unorganized modes of public transportation in Bangalore City.

2. **H_1:** There is no significant impact of the Unorganized Public Transportation Sector (UPTS) on the Organized Public Transportation Sector in Bangalore City.

H_0: There is a significant impact of the Unorganized Public Transportation Sector (UPTS) on the Organized Public Transportation Sector in Bangalore City.

3. RESEARCH METHODOLOGY

Data Collection Methods

Primary Data:

- Structured questionnaire (already developed above)
- Survey includes both closed-ended (Likert scale) and a few open-ended questions

Secondary Data:

- Research Articles, News, data analysis reports of BMTC, BMRCL, RTO and other secondary data sources.
- Urban mobility studies on Bangalore

Types of variables:

- **Independent Variable:** Type of Public Transportation (Organized vs. Unorganized)
- **Dependent Variable:** Passenger Priority (factors like cost, comfort, convenience, safety, punctuality, etc.)

Research Design: Using a comparative study design where compare passenger preferences across both types of transportation modes.

Data Collection:

Survey/Questionnaire: Develop a survey targeting passengers in both organized and unorganized transportation. The survey focused on key factors influencing their priority.

Example questions:

- **Cost:** How important is the cost of travel in your decision-making?
- **Punctuality:** How important is on-time arrival for you when selecting transportation?

- **Comfort:** How comfortable are you with the seating and amenities provided?
- **Safety:** How much do you prioritize safety in your choice of transportation?
- **Convenience:** How convenient is the availability of transportation at your desired times?

Target Group:

- Passengers who experienced organized public transportation (e.g., BMTC buses, metro, App based public transportation like, Ola, Uber, Namma Yathri etc…).
- Passengers who experienced unorganized public transportation (e.g., local auto-rickshaws, private cabs).

Sampling Method: Applied stratified random sampling method (based on age groups and transport usage type) to ensure that both organized and unorganized transportation passengers are adequately represented. Ensure a balanced sample size from both groups.

Respondents and Sampling Size: The respondents of the study are from Bangalore city those who had experienced both organized and unorganized public transportation services. The total sample size of the study is 186 passengers.

Interpretation of Results:

- If the test shows significant differences (p-value < 0.05), you will reject the null hypothesis and conclude that there is a significant difference in passenger priorities between organized and unorganized public transportation.
- If the p-value is greater than 0.05, the null hypothesis will stand, suggesting no significant difference in the priority factors.

ANOVA RESULT ANALYSIS ON LEVEL OF PASSENGER PRIORITY ON ORGANIZED PUBLIC TRANSPORTATION SECTOR IN BANGALORE CITY

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Passengers Priority on Punctuality	Between Groups	6.272	3	2.091	20.145	.000
	Within Groups	18.889	182	.104		
	Total	25.161	185			
Passengers Priority on Safety	Between Groups	.414	3	.138	2.151	.095
	Within Groups	11.677	182	.064		
	Total	12.091	185			
Passengers Priority on Cost Effective	Between Groups	.029	3	.010	1.829	.143
	Within Groups	.966	182	.005		
	Total	.995	185			
Passengers Priority on Availability	Between Groups	.670	3	.223	.188	.904
	Within Groups	215.889	182	1.186		
	Total	216.559	185			
Passengers Priority on Comfort	Between Groups	10.547	3	3.516	22.076	.000
	Within Groups	28.985	182	.159		

	Total	39.532	185			

INFERENCE

1. Organized Public Transportation Sector

Passenger Priority Factor	**Significance Value (p-value)**	**Inference**
Punctuality	0.000	Significant difference between groups.
Safety	0.095	No significant difference between groups.
Cost-Effective	0.143	No significant difference between groups.
Availability	0.904	No significant difference between groups.
Comfort	0.000	Significant difference between groups.

Conclusion

- There is a significant difference in passengers' prioritization of Punctuality and Comfort across different organized transport modes or groups.
- Safety, Cost-effectiveness, and Availability do not differ significantly across the groups.

ANOVA RESULT ANALYSIS ON LEVEL OF PASSENGER PRIORITY ON UNORGANIZED PUBLIC TRANSPORTATION SECTOR IN BANGALORE CITY

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Passengers Priority on Punctuality	Between Groups	3.160	3	1.053	8.712	.000
	Within Groups	22.002	182	.121		
	Total	25.161	185			
Passengers Priority on Safety	Between Groups	1.258	3	.419	7.045	.000
	Within Groups	10.833	182	.060		
	Total	12.091	185			
Passengers Priority on Cost Effective	Between Groups	.007	3	.002	.457	.712
	Within Groups	.987	182	.005		
	Total	.995	185			
Passengers Priority on Availability	Between Groups	12.250	3	4.083	3.637	.014
	Within Groups	204.309	182	1.123		
	Total	216.559	185			
	Between Groups	24.186	3	8.062	95.613	.000

Passengers Priority on Comfort	Within Groups	15.346	182	.084		
	Total	39.532	185			

Inference

2. Unorganized Public Transportation Sector

Passenger Priority Factor	Significance Value (p-value)	Inference
Punctuality	0.000	Significant difference between groups.
Safety	0.000	Significant difference between groups.
Cost-Effective	0.712	No significant difference between groups.
Availability	0.014	Significant difference between groups.
Comfort	0.000	Significant difference between groups.

4. CONCLUSION

- Punctuality, Safety, Availability, and Comfort show a significant difference across different groups within unorganized transportation users.
- Cost-effectiveness does not differ significantly among the groups.

Overall Summary of the results

- In both organized and unorganized sectors, Comfort and Punctuality are critical factors where differences exist between groups.
- In unorganized transport, Safety and Availability also show significant variation across groups, unlike in organized transport.
- Cost-Effectiveness is generally not a distinguishing factor across groups in both sectors.

FINDINGS

A. Organized Public Transportation Sector

1. There is a significant difference in the level of passenger priority on Punctuality across different groups.
2. There is no significant difference in the level of passenger priority on Safety across different groups.
3. There is no significant difference in the level of passenger priority on Cost-Effectiveness across different groups.
4. There is no significant difference in the level of passenger priority on Availability across different groups.
5. There is a significant difference in the level of passenger priority on Comfort across different groups.

B. Unorganized Public Transportation Sector

1. There is a significant difference in the level of passenger priority on Punctuality across different groups.
2. There is a significant difference in the level of passenger priority on Safety across different groups.
3. There is no significant difference in the level of passenger priority on Cost-Effectiveness across different groups.
4. There is a significant difference in the level of passenger priority on Availability across different groups.
5. There is a significant difference in the level of passenger priority on Comfort across different groups.

5. SUGGESTIONS

For the Organized Public Transportation Sector:

1. **Enhance Punctuality:**
    - Introduce better real-time tracking systems (apps, displays) for buses and metros.

- Reduce waiting times and improve frequency, especially during peak hours.

2. **Improve Comfort:**
   - Upgrade seating, cleanliness, and overall vehicle maintenance.
   - Provide air-conditioning, ergonomic seats, and more standing space where feasible.
3. **Focus on Consistency in Safety:**
   - Although safety was not a significant differentiator, constant reinforcement of safety standards (CCTV surveillance, trained personnel) is important to maintain passenger trust.
4. **Strengthen Availability:**
   - While availability did not show differences, expanding network coverage and improving first-mile/last-mile connectivity (through feeder buses, bike shares) can increase ridership.
5. **Introduce Dynamic Pricing Models:**
   - Though cost-effectiveness was not a major concern, consider offering discounted passes or loyalty schemes to attract and retain daily commuters.

For the Unorganized Public Transportation Sector:

1. **Improve Punctuality and Reliability:**
   - Encourage formal regulations for auto/cab aggregators to ensure timely services and reduce unpredictability.
2. **Enhance Safety Standards:**
   - Mandate safety protocols like verified drivers, panic buttons, and background checks for drivers.
3. **Better Fare Regulation:**
   - Standardize fare structures to avoid customer dissatisfaction, even if cost wasn't a major differentiator.
4. **Increase Availability During Peak Hours:**
   - Set guidelines for optimal fleet deployment during peak traffic times to avoid service shortages.
5. **Comfort Improvements:**
   - Auto-rickshaw and cab drivers should maintain vehicle hygiene and offer basic amenities like phone chargers, clean seats, etc., for a better travel experience.

6. CONCLUSION

The unorganized public transportation sector in India is indispensable for meeting the mobility needs of a vast population, especially in areas where formal public transport is inadequate. Addressing the challenges faced by this sector through targeted policies, improved data collection, and integration with formal systems can enhance its efficiency and contribution to sustainable urban mobility.

The study on passenger priorities in Bangalore City's public transportation sector reveals critical insights into user expectations and service gaps. In the organized sector, punctuality and comfort emerge as significant factors influencing passenger satisfaction, highlighting the need for enhanced service reliability and better travel experiences. Meanwhile, in the unorganized sector, punctuality, safety, availability, and comfort are crucial differentiators, indicating a broader scope for service improvement. Cost-effectiveness, however, does not significantly impact passenger perceptions in either sector. These findings suggest that while organized transport must focus on refining operational efficiency and user comfort, the unorganized sector must address safety and availability concerns more aggressively. Strengthening collaboration between both sectors, embracing technological solutions, and improving service standards will be vital for building a more effective, user-centric urban transport ecosystem in Bangalore.

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