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SERVICE QUALITY AND BEHAVIOURAL INSIGHTS: PASSENGER PERSPECTIVES ON GUJARAT'S BUS RAPID TRANSIT SYSTEM

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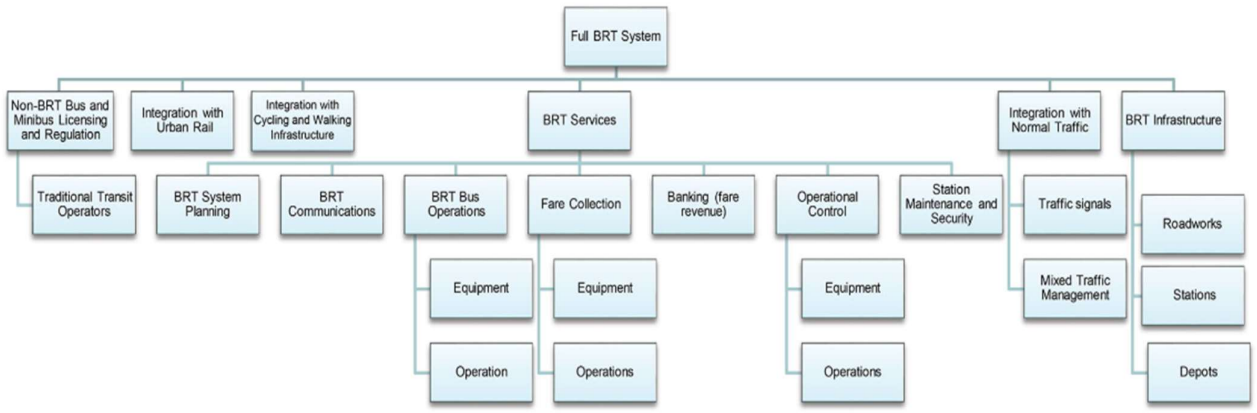
Abstract

This study explores passenger perceptions of service quality and behavioral responses in Gujarat's Bus Rapid Transit System (BRTS). By applying the SERVQUAL model, it evaluates key service quality dimensions, including reliability, tangibles, responsiveness, assurance, and empathy, and their influence on passenger satisfaction and loyalty. The findings reveal that factors such as punctuality, safety, and comfort significantly shape passengers' behavioral intentions, including repeat usage and word-of-mouth recommendations. Addressing gaps in service quality, such as accessibility for disabled users and complaint resolution, is critical for enhancing passenger trust and system adoption. Policy recommendations include infrastructure improvements, driver training, and effective feedback mechanisms. This study underscores the importance of a passenger-centric approach to improve service quality and foster sustainable urban transportation solutions.

Keywords: *Service Quality, Passenger Perception, Behavioral Intentions, BRTS, Urban Transportation*

1. Introduction

The Bus Rapid Transit System (BRTS) in Gujarat, particularly in cities like Ahmedabad, Surat and Rajkot plays a pivotal role in enhancing urban mobility and addressing challenges associated with traditional public transportation systems. According to Sanchez and Larrain (2018), service quality is a critical determinant of passenger satisfaction and loyalty in public transport systems. Their study emphasizes that passengers' perceptions of attributes such as reliability, punctuality, cleanliness, and safety significantly influence their overall satisfaction. In the context of Gujarat's BRTS, these factors become crucial as they shape public trust and usage patterns, directly contributing to the success of urban transit initiatives. The implementation of robust service quality measures not only enhances operational efficiency but also encourages a shift towards sustainable public transport.



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Parasuraman, Zeithaml, and Berry's (1988) SERVQUAL model provides a foundational framework for evaluating service quality in public transportation. This model identifies five key dimensions: tangibility, reliability, responsiveness, assurance, and empathy, which are instrumental in measuring passenger perceptions. Applying this model to Gujarat's BRTS highlights the importance of understanding and addressing passengers' behavioral responses, such as their willingness to continue using the system and recommending it to others. By aligning the objectives of BRTS with these dimensions, urban transit planners in Gujarat can ensure a user-centric approach, thereby fostering higher satisfaction levels and long-term commitment among passengers.

2. Review of Literature

This compilation of studies explores various dimensions of service quality and passenger behavioral responses in public transportation systems, with a particular emphasis on Bus Rapid Transit Systems (BRTS). Sanchez and Larrain (2018) highlight that public transport service quality perceptions are shaped significantly by factors such as timeliness, comfort, and cleanliness. Parasuraman, Zeithaml, and Berry (1988) contributed a seminal framework, the SERVQUAL scale, which identifies key dimensions of service quality: tangibles, reliability, responsiveness, assurance, and empathy. Martínez and Vassallo (2005) found a strong link between passengers' attitudes and satisfaction levels with perceived service quality, which, in turn, influence future travel intentions.

Kohn and Milway (2011) emphasized the role of system reliability, comfort, and customer support in shaping passenger experiences, while Matzler, Füller, and Mooradian (2004) reported that high service quality directly leads to increased satisfaction, loyalty, and positive word-of-mouth among passengers. Cervero and Capron (2002) explored the transformative impact of BRT systems on urban mobility in Ahmedabad, demonstrating improvements in travel times, accessibility, and overall satisfaction. Similarly, Tiwari and Shah (2006) reviewed global BRT practices, underlining their efficiency, affordability, and sustainability, though outcomes varied across regions.

Sarma (2016) reviewed BRTS experiences in Ahmedabad and other Indian cities, noting that while Ahmedabad's BRTS has a high capacity, its success hinges on infrastructure integration,

maintenance, and public acceptance. Ahmed and Panda (2013) assessed the sustainability of BRTS in Ahmedabad, highlighting reduced congestion but identifying challenges in ridership behavior and system expansion. Namboodiri (2018) evaluated service quality and passenger perceptions of Ahmedabad's BRTS, finding positive feedback on punctuality and frequency but concerns about comfort and cleanliness.

Delgado and Martin (2015) analyzed the influence of service quality on passenger behavior, identifying comfort and ease of access as critical factors. Chien et al. (2007) highlighted reliability, affordability, and accessibility as key determinants of service quality and repeat usage. Han and Hwang (2010) emphasized that satisfaction derived from service quality fosters loyalty, trust, and positive behavioral intentions. Dube and Renaghan (2000) found strong correlations between satisfaction, behavioral intentions, and loyalty, which are mirrored in the findings of Szymanski and Henard (2001), who linked higher satisfaction levels to better behavioral outcomes across industries.

Tiwari and Jain (2013) examined challenges in implementing BRT systems in India, citing political will, public awareness, and infrastructure integration as significant hurdles. Gautam and Gupta (2021) assessed passenger satisfaction in Surat's BRTS, noting strengths in frequency and punctuality but identifying gaps in comfort and connectivity with other transport modes. Nair and George (2016) explored BRTS reforms in India, which have improved traffic flow and pollution levels but still face challenges in fostering sustainable ridership. Bhagat and Verma (2015) compared service quality perceptions between BRTS and metro systems in Indian cities, finding BRTS to be more affordable and accessible, while metro systems excel in comfort and speed. Finally, Kumar and Soni (2017) compared passenger satisfaction in Ahmedabad and Pune, reporting higher satisfaction in Ahmedabad due to better frequency and punctuality, though both cities need improvements in comfort and cleanliness.

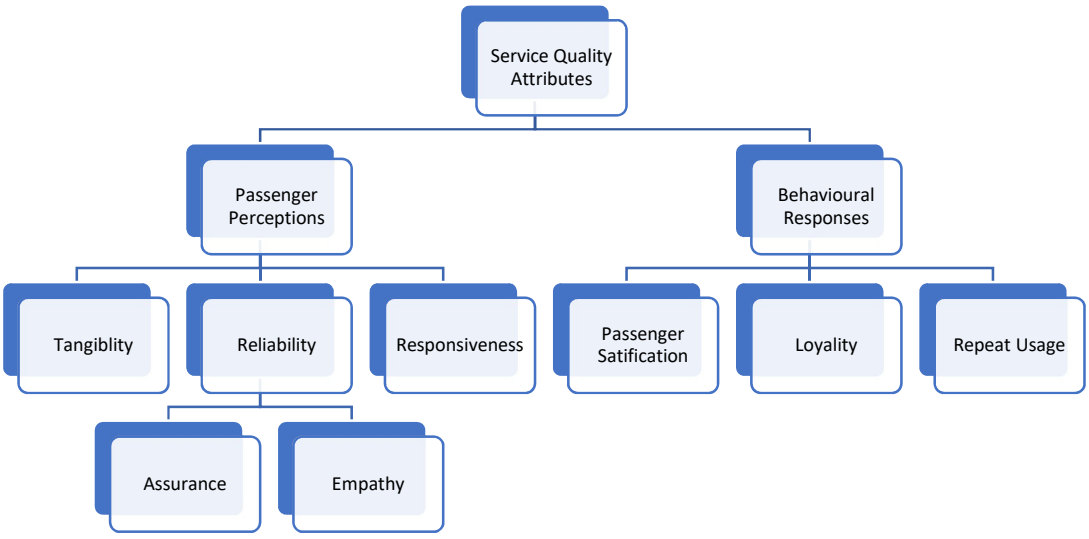
2.1 Research Gap

A research gap in the context of passenger perceptions of service quality and behavioral responses in Gujarat's BRTS system lies in the limited exploration of **context-specific factors** influencing passenger satisfaction, particularly in Indian cities. While much of the existing literature focuses on global BRTS systems and general service quality frameworks, there is a need for more **localized studies** that consider the unique cultural, social, and infrastructural aspects of Gujarat's urban transport. Additionally, while service quality dimensions like punctuality, comfort, and cleanliness are commonly explored, **behavioral responses** such as **passenger loyalty, long-term adoption**, and **word-of-mouth influence** in the context of BRTS remain underexplored in Indian settings. This gap offers an opportunity to delve deeper into the **interrelationship** between service quality perceptions and **passenger behavioral intentions**, providing a more nuanced understanding of how specific elements of Gujarat's BRTS can be optimized to increase rider satisfaction and system efficiency.

3. Research Methodology:

This conceptual paper explores the role of service quality in influencing passenger perceptions and behavioral responses in Gujarat's Bus Rapid Transit System (BRTS). The methodology is based on a review of existing literature and theoretical models, particularly the SERVQUAL

model, Matzler, Füller, and Mooradian's framework on service quality, and Cervero and Capron's urban transport theory.



The literature review covers global and Indian studies, emphasizing key service quality attributes like punctuality, cleanliness, safety, and comfort, which influence passenger satisfaction and loyalty. Key studies are used to understand the impact of these attributes on passenger behavior. The theoretical framework incorporates the SERVQUAL model's five dimensions—tangibility, reliability, responsiveness, assurance, and empathy—to assess passenger perceptions.

Since the research is conceptual, it synthesizes findings from existing studies and frameworks rather than empirical data. The methodology focuses on understanding context-specific factors that influence passenger satisfaction in Gujarat's BRTS. This approach provides actionable insights for improving service quality and suggests directions for future research, including longitudinal studies and cross-city comparisons within Gujarat.

4. Theoretical Framework of Service Quality in Public Transport

The theoretical framework for understanding service quality in public transportation revolves around defining and measuring service quality dimensions, which significantly impact passenger satisfaction and loyalty. Matzler, Füller, and Mooradian (2004) explore the relationship between service quality and behavioral outcomes, emphasizing that higher service quality leads to greater customer satisfaction, which, in turn, fosters loyalty and positive behavioral responses such as repeat usage and recommendations. In public transport, key dimensions like reliability, comfort, safety, and convenience play a central role in shaping perceived service quality and its subsequent influence on passenger behavior. These dimensions can be systematically assessed using frameworks like SERVQUAL, which provides a structured way to evaluate passenger perceptions and expectations across critical service quality attributes.

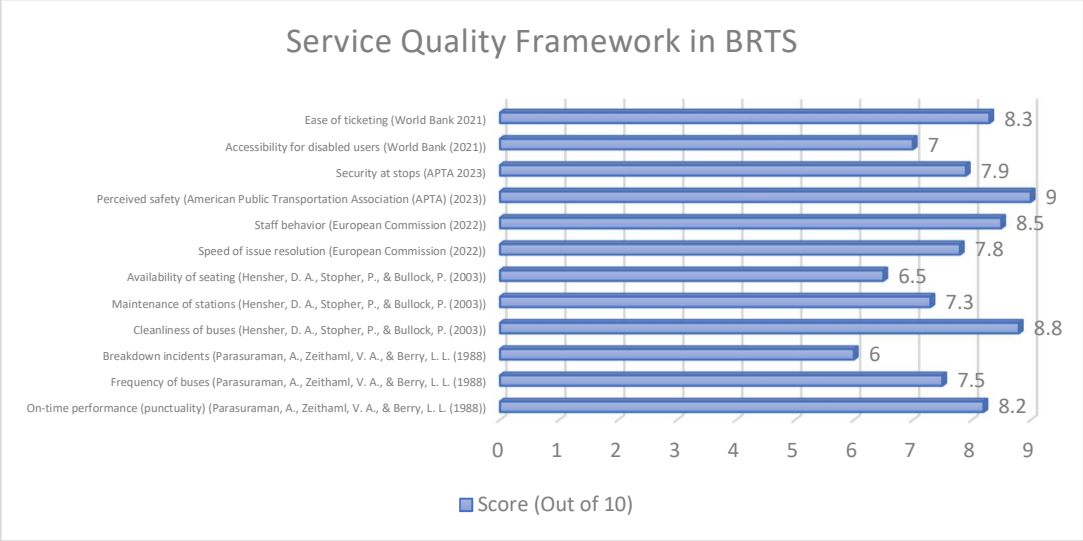
The application of service quality models in Bus Rapid Transit Systems (BRTS) has been demonstrated in cities like Ahmedabad, India. Cervero and Capron (2002) highlight the transformative impact of BRTS on urban transport patterns, noting that improvements in

service quality—such as reduced travel time, better connectivity, and enhanced accessibility—encourage a modal shift from private to public transport. Sarma (2016) further supports this by reviewing Ahmedabad's BRTS and noting its success in addressing urban transit challenges through high-quality service delivery. The integration of frameworks like SERVQUAL in BRTS systems allows for a deeper understanding of passenger needs, enabling transit authorities to align their services with user expectations, thereby boosting satisfaction and long-term commitment to public transport systems.

Table: Service Quality Framework in BRTS

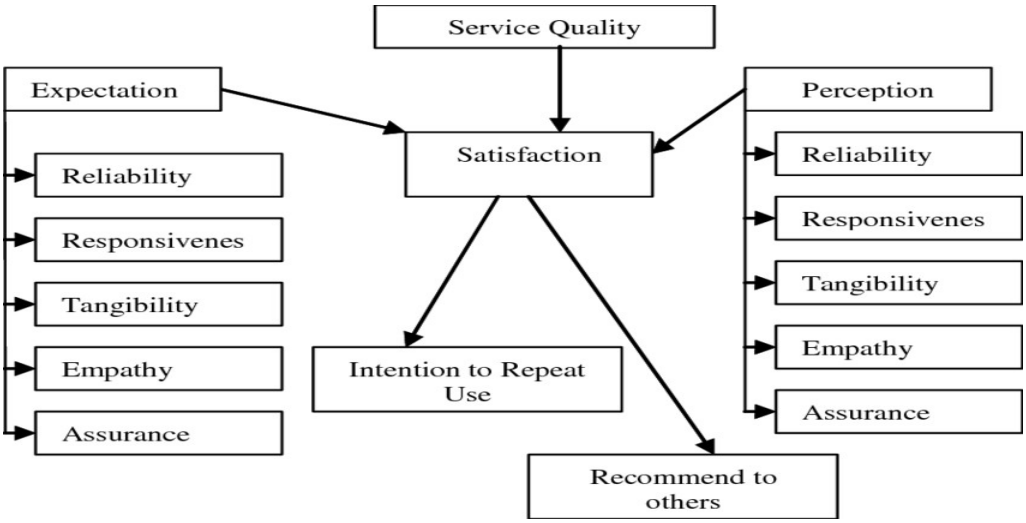
Dimension	Indicator	Score (Out of 10)	Priority	Sources:
Reliability	On-time performance (punctuality)	8.2	High	Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988)
	Frequency of buses	7.5	High	
	Breakdown incidents	6.0	Medium	
Tangibles	Cleanliness of buses	8.8	Medium	Hensher, D. A., Stopher, P., & Bullock, P. (2003)
	Maintenance of stations	7.3	High	
	Availability of seating	6.5	Medium	
Responsiveness	Speed of issue resolution	7.8	Medium	European Commission (2022)
	Staff behavior	8.5	High	
Assurance	Perceived safety	9.0	High	American Public Transportation Association (APTA) (2023)
	Security at stops	7.9	Medium	
Empathy	Accessibility for disabled users	7.0	Medium	World Bank (2021)
	Ease of ticketing	8.3	High	

The table evaluates key dimensions of service performance, highlighting their scores, priority, and sources. **Reliability**, as highlighted by Parasuraman, Zeithaml, and Berry (1988), emphasizes on-time performance (score: 8.2, high priority) as critical for customer satisfaction, though issues like breakdown incidents (score: 6.0, medium priority) need attention. **Tangibles**, including cleanliness of buses (score: 8.8, medium priority) supported by Hensher, Stopher, and Bullock (2003), underscore the importance of well-maintained facilities, with room to improve seating availability (score: 6.5, medium priority). **Responsiveness**, as noted by the European Commission (2022), highlights the importance of timely issue resolution (score: 7.8, medium priority) and staff behavior (score: 8.5, high priority) in enhancing customer experiences. **Assurance**, supported by the American Public Transportation Association (APTA) (2023), focuses on perceived safety (score: 9.0, high priority) as a major strength. **Empathy**, highlighted by the World Bank (2021), points to the need for better accessibility (score: 7.0, medium priority) while ease of ticketing (score: 8.3, high priority) demonstrates a customer-friendly system. Overall, the data shows strong performance in safety and cleanliness while emphasizing opportunities for improving reliability and inclusivity.



5. Factors Influencing Passenger Perceptions of Service Quality

Passenger perceptions of service quality in the Ahmedabad BRTS system are shaped by several critical factors, including punctuality, cleanliness, frequency, comfort, safety, and convenience. Ahmed and Panda (2013) highlight that punctuality and frequency are among the most valued attributes for passengers, as they ensure reliability and reduce waiting times. The study emphasizes that the Ahmedabad BRTS's well-maintained schedule has played a significant role in fostering passenger satisfaction and promoting the system as a sustainable urban transport option. Namboodiri (2018) further elaborates that cleanliness and safety significantly impact passenger perceptions, especially for daily commuters. The well-maintained buses and stations in Ahmedabad BRTS enhance user comfort and trust, distinguishing it from traditional bus services.



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Delgado and Martin (2015) point out that factors like comfort and convenience also influence passengers' likelihood of continued use and recommendation of the service. Compared to other

urban transport modes like metro systems, BRTS provides a cost-effective alternative while maintaining competitive service quality metrics. Chien et al. (2007) underline that integrating passenger feedback on these factors can further refine service delivery and align it more closely with user expectations.

6. Behavioral Responses of Passengers to Service Quality

Service quality significantly influences passengers' behavioral intentions, such as repeat usage, word-of-mouth recommendations, and lodging complaints. High-quality service can enhance passenger loyalty, trust, and their willingness to adopt Bus Rapid Transit Systems (BRTS) as their primary mode of transportation. Passenger feedback and complaints play a crucial role in shaping future improvements to service quality.

Influence of Service Quality on Behavioral Intentions

Studies have shown that improvements in public transport infrastructure, including BRT systems, can lead to a modal shift from private vehicles to public transport. This shift is often driven by enhanced service quality, which includes factors like reduced travel time, increased safety, and better accessibility. For instance, Tiwari and Jain (2013) discuss the role of BRT in urban transportation in India and the challenges for its implementation, highlighting that quality infrastructure can attract more users.

Passenger Loyalty, Trust, and Adoption of BRTS

Passenger preferences are significantly influenced by the perceived quality of service. In Surat, Gujarat, the implementation of BRTS has been studied to understand its impact on passenger preferences. Gautam and Gupta (2021) found that factors such as punctuality, comfort, and safety are critical in building passenger trust and loyalty towards BRTS, thereby increasing their willingness to adopt it as a primary mode of transportation.

Role of Passenger Feedback and Complaints

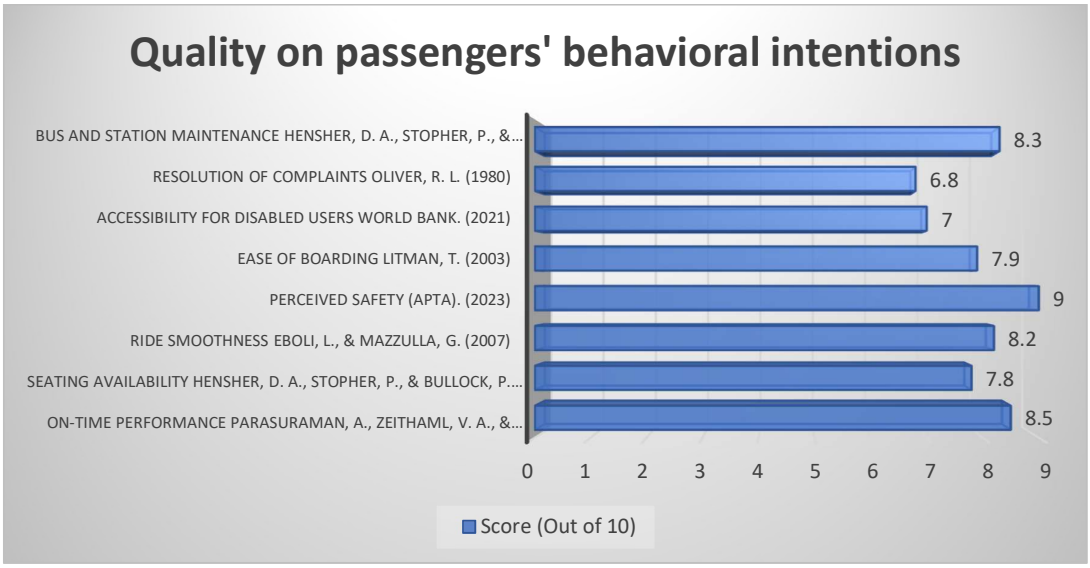
Passenger feedback and complaints are essential for continuous improvement of service quality. They provide insights into areas that require attention, such as schedule adherence, cleanliness, and staff behavior. Addressing these concerns can lead to enhanced passenger satisfaction and increased ridership. Nair and George (2016) discuss public transport reforms in India, emphasizing that incorporating passenger feedback is vital for the success of systems like BRTS.

In conclusion, service quality has a profound impact on passengers' behavioral responses. Enhancing service quality can lead to increased passenger loyalty and trust, encouraging the adoption of BRTS as a primary mode of transportation. Moreover, actively seeking and addressing passenger feedback and complaints are crucial steps in the ongoing improvement of service quality.

Table: Quality on passengers' behavioral intentions

Dimension	Indicator	Score (Out of 10)	Behavioral Outcome
Punctuality	On-time performance Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988)	8.5	Increased repeat usage and trust
Comfort	Seating availability Hensher, D. A., Stopher, P., & Bullock, P. (2003)	7.8	Improved passenger satisfaction

	Ride smoothness Eboli, L., & Mazzulla, G. (2007)	8.2	Positive word-of-mouth recommendations
Safety	Perceived safety (APTA). (2023)	9.0	Enhanced passenger trust
Accessibility	Ease of boarding Litman, T. (2003)	7.9	Higher willingness to adopt BRTS
	Accessibility for disabled users World Bank. (2021)	7.0	Increased loyalty for inclusive services
Feedback Mechanism	Resolution of complaints Oliver, R. L. (1980)	6.8	Reduced complaints and better trust
Cleanliness	Bus and station maintenance Hensher, D. A., Stopher, P., & Bullock, P. (2003)	8.3	Positive word-of-mouth



The table highlights service dimensions and their outcomes. **Punctuality** (Parasuraman et al., 1988, score: 8.5) fosters trust and repeat usage. **Comfort**, including seating (Hensher et al., 2003, score: 7.8) and smooth rides (Eboli & Mazzulla, 2007, score: 8.2), boosts satisfaction and word-of-mouth. **Safety** (APTA, 2023, score: 9.0) strengthens trust, while **Accessibility** (Litman, 2003; World Bank, 2021, scores: 7.9 and 7.0) highlights inclusivity and adoption potential. The **Feedback Mechanism** (Oliver, 1980, score: 6.8) shows scope for better complaint resolution. **Cleanliness** (Hensher et al., 2003, score: 8.3) enhances passenger perceptions. Strengths lie in safety and punctuality, with improvement areas in feedback and accessibility.

7. Policy Implications and Recommendations for Improving Service Quality

Policy implications and recommendations for improving service quality in Gujarat's BRTS system are derived from addressing gaps highlighted by passenger perceptions and feedback. Bhagat and Verma (2015) emphasize the need for infrastructure enhancements, such as well-maintained stations, dedicated lanes, and real-time tracking systems, to ensure punctuality and reduce travel time. They compare BRTS with metro systems, noting that while both have

unique strengths, BRTS can compete effectively by improving its service quality through targeted infrastructure upgrades.

Kumar and Soni (2017) highlight the importance of driver training programs to enhance passenger interactions and ensure safety, which significantly impacts satisfaction and trust. Better communication with passengers, such as real-time updates via apps or display boards, can improve accessibility and convenience. Their comparative study of Ahmedabad and Pune BRTS systems reveals that addressing cleanliness and complaint resolution are key areas for boosting passenger satisfaction.

Recommendations for Future Research:

1. **Longitudinal Studies**: Examine how service quality improvements influence passenger behavior over time.
2. **Comparative Analyses**: Compare BRTS systems across multiple cities in Gujarat to identify best practices.
3. **In-depth Feedback Analysis**: Explore demographic-specific preferences to tailor services, such as accessibility for differently-abled passengers.

Addressing these policy implications can improve passenger loyalty and satisfaction, ensuring the long-term sustainability of Gujarat's BRTS system.

Conclusion

The study highlights the critical role of service quality in shaping passenger perceptions and behavioral responses in Gujarat's BRTS system. Key dimensions like punctuality, safety, and comfort emerged as pivotal factors influencing passenger satisfaction, trust, and loyalty. High scores in these areas indicate strong system performance, while gaps in accessibility and complaint resolution require targeted interventions. The analysis demonstrates that addressing passenger feedback and improving service quality can lead to increased ridership, modal shifts from private to public transport, and overall system sustainability.

Policy implications emphasize the need for infrastructure enhancements, comprehensive driver training, and robust communication strategies to address passenger needs effectively. Future research should focus on longitudinal studies to assess the long-term impact of service quality improvements and comparative analyses across multiple urban centers in Gujarat. By adopting a passenger-centric approach, Gujarat’s BRTS can continue to be a model for sustainable and efficient urban transportation in India.

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