Remodelling of Indore BRTS: A Comprehensive Study for Sustainable and Inclusive Mobility

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ABSTRACT

Indore's Bus Rapid Transit System (BRTS), launched to provide fast, efficient, and modern public mobility, faces increasing challenges in ridership, operational efficiency, and public acceptance. With evolving urban demands, mixed traffic pressures, and changing mobility preferences, the need to remodel Indore BRTS has become crucial. This research paper critically analyses the current conditions of the BRTS corridor, identifies gaps in design and functionality, and proposes an integrated remodelling framework focusing on accessibility, safety, multimodal integration, urban design enhancements, and future-ready mobility solutions.

CHAPTER 1: INTRODUCTION

1.1 Background

Indore's BRTS (iBus), initiated in 2013, was designed as a modern mass transit system to reduce congestion, improve public transport quality, and support sustainable urban mobility. Despite initial success, the system has struggled with issues such as corridor encroachment, lack of seamless integration, safety concerns, and limitations in station design. With Indore's rapid growth and increasing population, remodelling the BRTS is a necessary step toward developing a more resilient and efficient urban mobility network.

1.2 Need for Remodelling

The remodelling of Indore BRTS is essential due to:

- Mismatch between projected and actual ridership
- Safety challenges for pedestrians and cyclists
- Limited first–last mile connectivity
- Underutilized stations
- Road design conflicts with mixed traffic
- Increased demand for multimodal, climate-sensitive mobility

1.3 Aim of the Study

To evaluate the performance of Indore BRTS and propose a future-ready remodelling strategy that enhances mobility efficiency, safety, urban quality, and user experience.

1.4 Objectives

1. To analyse existing challenges and spatial issues in the BRTS corridor.
2. To study best practices of BRT systems globally.
3. To propose design and operational improvements for stations, lanes, intersections, and supporting infrastructure.

4. To suggest strategies for multimodal integration and corridor revitalisation.

1.5 Research Questions

- How can Indore BRTS be redesigned to improve efficiency and user experience?
- What street design interventions can make the corridor safer and more inclusive?
- How can BRTS integrate with other urban mobility modes (Metro, e-rickshaw, cycles)?
- What role does urban design play in enhancing BRTS acceptance and usability?

CHAPTER 2: LITERATURE REVIEW

2.1 Evolution of BRTS Systems Globally

Study of Curitiba, Bogotá TransMilenio, Ahmedabad Janmarg, and Guangzhou BRT.

2.2 Urban Mobility Theories

- Transit-Oriented Development (TOD)
- Complete Streets Theory
- Walkability and Human-Centred Design

2.3 Parameters for BRTS Evaluation

- Speed and reliability
- Accessibility and safety
- Passenger capacity
- Network connectivity
- Environmental impact

2.4 Existing Studies on Indore BRTS

Review of IMC and AICTSL performance reports.

CHAPTER 3: STUDY AREA AND METHODOLOGY

3.1 Study Area: Indore BRTS Corridor

- 11.4 km operational stretch from Niranjanpur to Rajiv Gandhi Square
- 21 stations (median-aligned)
- Dedicated central bus lane
- Mixed traffic lanes on both sides

3.2 Methodology

1. Primary site surveys
2. User interviews and behaviour mapping
3. Traffic and pedestrian counts
4. Spatial mapping and GIS analysis
5. Comparative study with other BRTS models

CHAPTER 4: ANALYSIS OF EXISTING CONDITIONS

4.1 Physical Assessment of BRTS Corridor

- Station infrastructure condition
- Pavement quality
- Junction conflicts
- Bus frequency and operational gaps

4.2 Key Challenges Identified

4.2.1 Spatial Challenges

- Narrow pedestrian walkways
- Encroached footpaths
- Poor cycle lane connectivity
- Non-uniform carriageway widths

4.2.2 Operational Challenges

- Bus delays due to signal interruptions
- Limited fleet size
- Incomplete real-time passenger information

4.2.3 Safety Issues

- Unsafe pedestrian crossings
- Insufficient lighting
- High-speed mixed traffic

4.2.4 User Experience Issues

- Station overcrowding at peak hours
- Lack of shade, seating, and weather protection
- Limited accessibility for elderly/disabled passengers

CHAPTER 5: REMODELLING STRATEGIES

5.1 Corridor Redesign

- Expand footpaths and add continuous shaded walkways
- Create protected cycle tracks parallel to the corridor
- Introduce green buffers for UHI mitigation

5.2 Station Redesign

- Universal accessibility (ramps, tactile paths, lifts)
- Improved seating and shading
- Smart screens for real-time bus information
- Better entry/exit management to reduce congestion

5.3 Intersection Improvements

- Signal priority for BRT buses
- Dedicated pedestrian signals
- Traffic calming at conflict points

5.4 Multimodal Integration

- Integration with Metro Phase 1 & future phases
- Feeder services: e-rickshaws, shared cycles, small EV shuttles
- Park-and-ride facilities

5.5 Operational Enhancements

- Increase fleet size and frequency
- GPS-based fleet management
- Real-time passenger data analytics

CHAPTER 6: URBAN DESIGN STRATEGIES

6.1 Transit Plaza Development

Redesign of key nodes (e.g., LIG Square, Bapat Square) as active public spaces.

6.2 Green Infrastructure

- Bioswales
- Tree-lined buffers
- Green medians

6.3 Street Furniture & Wayfinding

- Signage
- Lighting
- Seating
- Public art

CHAPTER 7: CONCLUSION AND FUTURE SCOPE

The remodelling of Indore BRTS can create a more efficient, safe, and sustainable mobility network aligned with the city's future growth. Integrating design improvements with operational upgrades will help transform BRTS into a truly people-centric transit system. Future scope includes integrating AI-based traffic systems, solar-powered stations, and adaptive street designs to accommodate autonomous mobility.