International Journal of Research in Engineering and Science (IJRES)
ISSN (Online): 2320-9364, ISSN (Print): 2320-9356
www.ijres.org Volume 13 Issue 12 ǁ December 2025 ǁ PP. 120-125

PUBLIC TRANSPORT AVAILABILITY IN JAIPUR

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Abstract
This Report presents a comprehensive assessment of the public transit system in Jaipur City, analysing availability (network coverage, capacity, and frequency). Jaipur, with a population of 3.046 million (2019 census) and projected growth to meet national urbanization targets, faces critical challenges in providing efficient and inclusive public transportation. The study May be used to evaluate current conditions in context of the future scenarios.
Key findings reveal significant disparities between central and peripheral zones, with central areas maintaining higher stop densities (4-6 per sq km) and service frequencies (10-15 minutes), while peripheral zones show minimal provision (1-2 stops per sq km, frequencies up to 30 minutes). The Jaipur Metro Rail Phase 1 (18 km, 11 stations operational since June 2015) and City Bus network (400 low-floor buses on 32 routes, 143 stops) together provide limited mode share (20-30% of total trips), with private two-wheelers dominating urban mobility.

Date of Submission: 07-12-2025 Date of acceptance: 19-12-2025

ACRONYMS AND ABBREVIATIONS

PTAL	Public Transport Accessibility Levels
JCTSL	Jaipur City Transport Services Limited
Sq.	Square Kilometres
IT	Information Technology
RSRTC	Rajasthan State Road Transport Corporation
CBD	Central Business District
BRTS	Bus Rapid Transit System
TOD	Transit Oriented Development
GIS	Geographic information system
JIMA	Jaipur Integrated Mobility Authority
JMRCL	Jaipur Metro Rail Corporation Limited
JDA	Jaipur Development Authority

I. Introduction

1.1. Background and Context

Urban transportation systems are fundamental to modern city functioning, directly influencing economic productivity, social equity, environmental quality, and liveability. The United Nations' Sustainable Development Goal 11 emphasizes the need for "safe, affordable and sustainable transport systems" accessible to all residents. However, Indian cities, despite rapid urbanization, have been unable to keep pace with growing transportation demand, leading to congestion, pollution, and reduced public transit mode share.

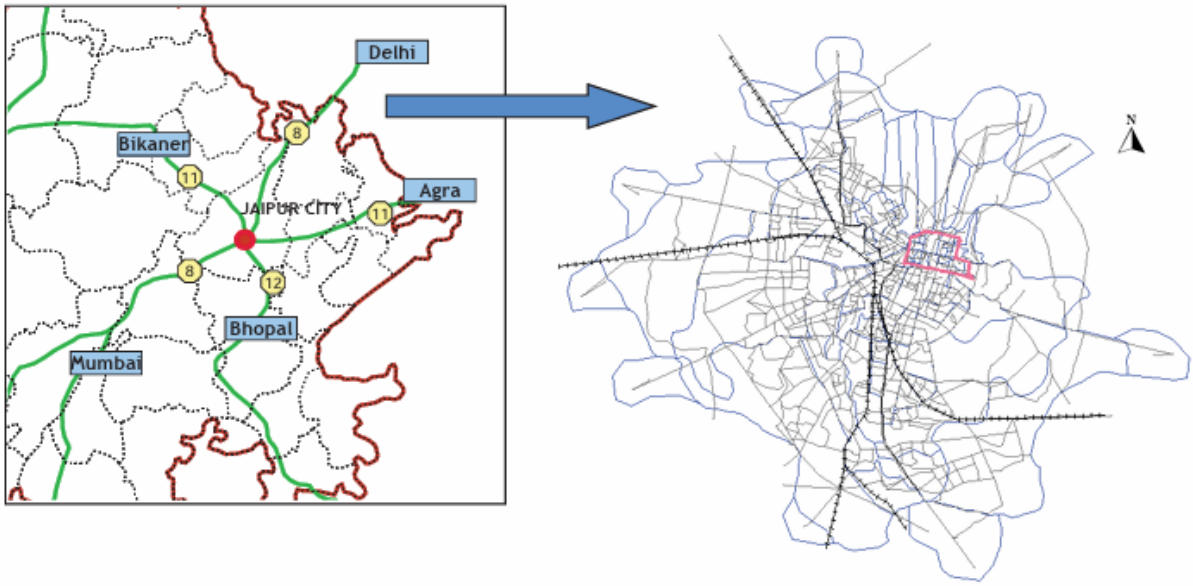

Figure 1: Jaipur City

Jaipur, the capital city of Rajasthan, exemplifies this challenge. With a metropolitan population exceeding 3 million and annual growth rates of 2.8-3.2%, the city has experienced unprecedented expansion, particularly in peripheral areas. Traditional urban planning frameworks have not adequately addressed this growth, resulting in spatial mismatches between residential areas and employment/service centres, inadequate public transit provision, and heavy reliance on personal motorized vehicles.

The rapid motorization of Jaipur's transport system reflects broader Indian trends: two- and three-wheelers constitute 80% of registered vehicles, yet carry only 35% of trips, while public transit, despite serving only 20-30% of trips in Jaipur, remains underfunded and underutilized. This modal shift toward private vehicles creates negative externalities: air pollution ranking among India's worst, traffic congestion (average speeds declining from 25 km/h in 2010 to 18 km/h in 2020), and increased carbon emissions.

1.2. Problem Statement

Despite the operational launch of Jaipur Metro Rail Phase 1 (2015) and ongoing expansion of bus services through JCTSL, accessibility to public transit remains highly uneven across the city. Key issues include:

1. **Spatial Coverage Gaps**: Bus routes concentrate on main arterial corridors; 40% of peripheral residential zones lack transit access within 800-meter walking distance
2. **Last-Mile Connectivity Deficiency**: Poor pedestrian infrastructure (80% of roads lack continuous footpaths) prevents effective access to transit nodes from residential areas
3. **Service Frequency Disparities**: Central zones receive service every 10-15 minutes; peripheral areas experience 20-30 minute frequencies, creating unreliable travel patterns
4. **Underserved Populations**: Low-income residents in peripheral settlements, persons with disabilities, elderly users, and women commuters face particular access barriers
5. **Modal Competition**: Private two-wheeler adoption (12% annual growth) outpaces transit expansion, undermining system efficiency and sustainability
6. **Infrastructure Quality**: Overcrowding during peak hours, inadequate bus shelters, poor signage, and safety concerns reduce ridership and user satisfaction

1.3. Research Objectives

This Report aims to:

1. Assess spatial availability of Jaipur's public transit network using GIS-based capacity and frequency indices
2. To Provide basic Data to study and develop future accessibility scenarios aligned with population growth projections to 2035

II. Current Transit Network Inventory and Characteristics of Jaipur City

2.1 Jaipur City Bus Network (JCTSL)

The Jaipur City Transport Services Limited operates the primary intra-city public transit service:

Fleet and Operations:

- 400 low-floor air-conditioned and non-AC buses

- 32 designated routes covering main arterials
- 143 bus stops distributed across city and satellite towns
- 10 routes designated as heavy-traffic corridors
- Service hours: 05:30 - 23:30 (typical span 18 hours daily)

Route Characteristics:

- **High-frequency corridors**: Tonk Road (8-10 min headway), Ajmer Road (10-12 min), Station Road (10-15 min)
- **Medium-frequency routes**: MI Road, JLN Road, SMS Road (15-20 min)
- **Low-frequency routes**: Peripheral areas, satellite towns (25-40 min)
- **Peak hour capacity**: 1.2-1.5 million person-trips daily (current); designed for 1.8 million capacity
- **Depot Locations**: 4 main depots (Tonk Road, Sindhi Camp, Vidhyadhar Nagar, Bani Park); storage capacity: 500 buses; maintenance facilities adequate for current fleet but insufficient for proposed expansion.

Figure 2: Jaipur City Bus Route Map

2.2 Jaipur Metro Rail System

Jaipur Metro Rail Phase 1 commenced operations June 3, 2015:

Operational Characteristics (Phase 1A completed; Phase 1B extended):

- **Line extent**: 18 km total (Phase 1A: 9.44 km with 6 stations; Phase 1B: 8.56 km with 5 stations)
- **Stations**: 11 operational stations:

- Phase 1A (underground): Mansarovar, New Atish Market, Vivek Vihar, Shyam Nagar, Ram Nagar, Civil Lines, Railway Station, Sindhi Camp, Chandpole (8 Elevated stations, 1 underground)
- Phase 1B: Choti Choupar, Badi Chaupar (2 Underground stations)
- Extension connections: Integration with Ajmer Road interchange (proposed Phase 1D)

- **Capacity**: 3,000 passengers per train; frequency: 5-minute headways during peak hours
- **Daily ridership**: 180,000-220,000 passengers (2023-2024 data), representing 15-18% of transit trips

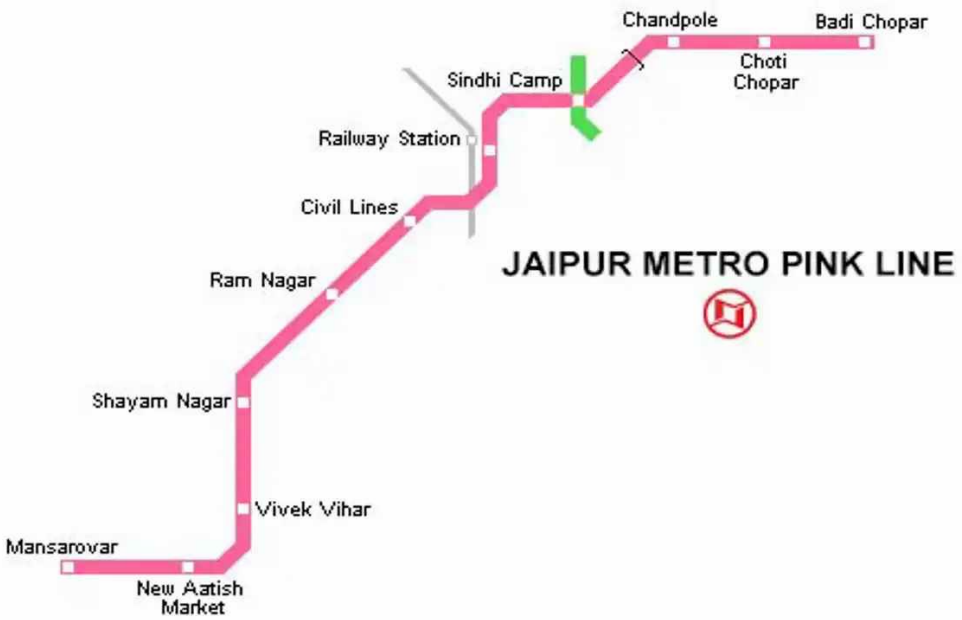

Figure 3: Jaipur Metro Phase -1 Route

Accessibility Features and Gaps:

- Universal design in accessible stations: elevators, accessible seating, tactile guideways
- Underground station limitations: 3 underground stations with emergency stairwells lacking elevators in 2 locations; accessibility audits underway (scheduled 2024-2025)
- Integration with bus network: Limited feeder bus routes to metro stations; pedestrian access challenging in 40% of surroundings

2.3 Rajasthan State Road Transport (RSRTC)

RSRTC provides inter-city connectivity:

Network Coverage:

- 600-bus fleet for regional services
- Major routes: Jaipur-Delhi (6 hours), Jaipur-Udaipur (4 hours), Jaipur-Ajmer (2 hours), Jaipur-Bikaner (5 hours)
- Frequency: 4-8 hourly departures on major routes; daily-weekly on secondary routes
- Hub: Sindhi Camp bus stand (centrally located, 8 km from CBD)

Role in Urban Accessibility: While primarily inter-city, RSRTC buses serve satellite towns and peripheral settlements; integration with city bus network remains limited, creating modal mismatch and transfer penalties

2.4 Bus Rapid Transit (BRTS) Initiative

A 6.6 km BRTS pilot project between Sikar Road and Pani Petch was implemented but subsequently abandoned due to policy shifts and insufficient political support. Lessons learned:

- Dedicated bus lane feasibility demonstrated but required consistent right-of-way maintenance
- Segregated infrastructure can increase speed 15-20% and reduce travel time variability
- Public perception of bus priority remains low without complementary pedestrian and cycling infrastructure

References

[1]. Gahlot, V., Swami, B.L., Parida, M., & Kalla, P. (2013). Availability and Accessibility Assessment of Public Transit System in Jaipur City. International Journal for Transportation Engineering, 1, 81-91.

[2]. Shrivastava, P. (2025). Assessing public transport accessibility: A case of Jaipur. M. Plan Thesis, SPA Bhopal. PTAL analysis integrating GIS, density mapping, and user satisfaction.

[3]. Asian Development Bank. (2017). Jaipur Metro Rail Line 1-Phase B Project. Project Report 46417-001. Accessibility standards and feeder network requirements.

[4]. Rajasthan Transport Department. (2023). Comprehensive Mobility Plan for Jaipur. Government of Rajasthan, Department of Transport. Strategic planning and fleet projections.

[5]. Jaipur City Transport Services Limited. (2024). Annual Operations Report and Fleet Data. Bus network, ridership, financial sustainability analysis.

[6]. World Bank. (2019). Urban India: Status of Indian Metropolitan Regions. Urban growth projections and transportation challenges for million-plus cities.

[7]. Ministry of Housing and Urban Affairs. (2023). Pradhan Mantri Awas Yojana - Urban (PMAY-U) Transit Integration Guidelines. TOD policy framework and financing mechanisms.

[8]. United Nations Habitat. (2024). Sustainable City Strategy: Jaipur. UN-Habitat India, accessibility targets and SDG alignment.

[9]. Indian Institute of Public Health. (2022). Air Quality and Transportation Health Impacts in Indian Cities. Emission reduction benefits from transit mode shift.

[10]. Cervero, R., & Dai, D. (2014). BRT TOD: Leveraging transit-oriented development with bus rapid transit investments. Transport Policy, 58, 133-147. International case studies and implementation lessons.