

Evaluating the Performance of Master Plans in India's Tier-1 Cities: Implementation Gaps, Spatial Outcomes

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ABSTRACT

India's urban cover is expanding at an remarkable pace, with urban population predicted to reach 50% of the total country's population by 2050. However, even today, only less than 40% of Indian cities have active statutory plans, and where plans exist, severe implementation gaps are observed. This study examines the performance of statutory master plans in India's Tier-1 cities, such as Delhi, Bengaluru, Mumbai, to understand how these statutory plans shape urban land use and urban fabric, and to understand what underlying factors explain the divergence between planned intentions and on-ground outcomes. The study reveals that institutional weaknesses, legal constraints, political and economic pressures, lack of integration with key infrastructure and climate considerations are key barriers to effective plan implementation. While Tier-1 cities prove major centres of growth, they simultaneously exhibit severe ecological degradation and uncontrolled peri-urban expansion. The report concludes with recommendations for institutional and legislative reforms to enhance master plan performance in these Indian cities.

1. INTRODUCTION

India's current urban landscape is undergoing extraordinary transformation. India's urban population has grown from approximately 29 crores to over 55 crores, between 2000 and 2025, representing a 90% increase in just 25 years (Chadchan & Shankar, 2012). This growth is driven by various factors such as rural-to-urban migration, natural population increase, and economic opportunities in metropolitan centres. Tier 1 cities are expanding at rates of 2–5% annually, substantially outpacing the creation of formal housing, infrastructure, and basic services (*ASICS 2023 – Janaagraha*, n.d.) . This rapid urbanization creates extensive pressure on land resources, even in ecologically sensitive regions. India's urbanization is increasingly shaping up in areas classified as biodiversity hotspots or forest ecosystem hotspots, leading to loss of forest cover, water-body and biodiversity (Singh et al., 2024).

Statutory master plans exist, however, it is observed that plan performance is weak: significant variations exist between planned land-use allocations and actual development patterns, with widespread encroachment, unauthorized construction, ecological degradation, and infrastructure deficits (Pethe et al., 2014a).

The key objectives of this study are to:

1. To analyze how statutory master plans in Tier-1 Indian cities (Delhi, Bengaluru, Mumbai) shape land use and urban fabric over time.
2. To identify the common implementation gaps between these statutory plans and on-ground reality.
3. To identify the institutional, legal, and political economy factors explaining these failures.
4. To provide with recommendations to uplift the performance of urban planning in India.

2. MASTER PLANS IN INDIA

2.1 Historical Evolution

Master planning in India's Tier-1 cities dates back to Delhi's 1962 Master Plan under the Delhi Development Authority (DDA), prepared by Albert Mayer. These plans have been prepared in India under state-level Town and Country Planning Acts (TCPA), intended to guide urban land use, infrastructure development, and sustainable urban growth. These plans specify land-use, building densities, infrastructure, and development goals for an intended period of 20-30 years. The 74th Constitutional Amendment Act (1992) mandated all states for preparation of master plans for all statutory towns, establishing a constitutional obligation for comprehensive urban planning (Datta & Jha, 1983).

Key legislative frameworks include Town and Country Planning Acts defining plan preparation methodology; zoning regulations, and municipal bylaws for implementation. However, the abovementioned legal framework has significant limitations (Routra, 1993a). Master plans in India are largely restricted to land-use allocation, zoning regulation, and development control. Environmental, climate, public health, and gender considerations, while increasingly included in draft plans (Delhi MPD-2041, Bengaluru draft Master Plan 2041), are often not enforceable under existing law, reducing their practical impact and accountability.

2.2 Typology of Tier-1 Master Plans

Traditional Zoning Plans: Major masterplans such as Delhi MPD-2021, Mumbai DP-2034, follow mid-20th-century British planning practice, specifying land-use zones (residential, commercial, industrial, agricultural, conservation) with permitted floor-area ratios (FAR), building heights, and setbacks (Sharma et al., 2023)

Strategic Spatial Development Plans SDPs: Some states mandate three-tier hierarchical SDPs to coordinate planning across administrative boundaries and ensure spatial integration. Only seven states (Andhra Pradesh, Bihar, Delhi, Haryana, Jharkhand, Telangana, Uttar Pradesh) mandate this hierarchical planning, with inconsistent implementation (“Annual Survey of India’s City-Systems - Janaagraha,” n.d.)

Sectoral Plans: Few Indian cities have integrated sectoral plans for sanitation, mobility, and climate resilience alongside master plans, with limited coordination across domains (“Annual Survey of India’s City-Systems - Janaagraha,” n.d.)

2.3 Current Scenario

Critical gaps have been observed in the spatial planning of India’s Tier-1 cities. All Tier-1 cities have a formal master or development plan, still many of them operate with severely outdated documents (Guo et al., 2020). Long delays in plan preparation and revision are observed, with weak enforcement, effectively creating a planning vacuum (“Annual Survey of India’s City-Systems - Janaagraha,” n.d.). Master Plan for Delhi 2041 (MPD-2041) was drafted in June 2021 but remains pending for approval, forcing the region to continue under MPD-2021 (notified in 2007), serving much beyond its intended horizon. Other Tier-1 cities such as Bengaluru, Mumbai, Chennai, Kolkata, Hyderabad, Ahmedabad and Pune also show evidence of lagged or partially implemented plans, implying that Tier-1 status does not guarantee timely, effective, or up-to-date master planning.

3. CASE STUDIES

3.1 Delhi: The MPD-2041

Delhi, the capital of India, has a population of approximately 3 crores, making it one of the world's largest city by population. The city has been governed under multiple master plans: the first (1962), revised versions (1982, 2001), and currently the MPD-2021 (notified in 2007).

The Master Plan for Delhi 2041 was envisioned for making Delhi a "24-hour city" with integrated land use, transportation, environment, and social infrastructure. The draft was released in June 2021 but the approval is still pending at the disposal of Ministry of Housing and Urban Affairs (MoHUA) since February 2023. This results in Delhi operating without an updated master plan for over 16 years, having severe consequences:

- **Unauthorized colonies:** An estimated 1,000+ unauthorized colonies have developed in Delhi's periphery, housing approximately 2 million residents, many lacking basic services (Snehanshu Mukherjee Bachelor et al., 1988).
- **Water body encroachment:** Numerous water bodies and natural drainage channels have been encroached, causing the severe flooding and heat-related mortalities seen in 2024, with (Delhi Supreme Court statement: "The whole city is in utter mess" (*Rethinking Master Plans for India's Growing Cities*, n.d.)
- **Loss of agricultural land:** The Aravalli Hills and surrounding agricultural areas have been subjected to unplanned conversion and degradation.

Apart from the delays, even the existing MPD-2021 suffers from poor implementation:

- **Land pooling policy:** A major land-pooling scheme, intended to consolidate fragmented land ownership and enable coordinated development, was poorly implemented due to objections, delays, and lack of political will (*Rethinking Master Plans for India's Growing Cities*, n.d.). Only a handful of land-pooling projects have been completed.
- **Zoning compliance:** Many developments have taken place outside designated zones or with variations, compromising the plan's spatial layout.

3.2 Bengaluru: LULC Transformation and Slipping Master Plan

Bengaluru, also known as India's "Silicon Valley," has experienced explosive growth since the 1980s, driven by booming IT sector, migration of skilled workers, and real estate speculation. The population of metropolitan area has grown from approximately 0.4 crores (1990) to 1.5 crores (2023). The development Bengaluru is currently guided by the Revised Master Plan (RMP) 2015, drafted in 2006–07, originally intended to be valid until 2015. A draft Master Plan 2031 was scrapped in 2020 due to state government policy shifts. In December 2021, tenders were issued for a Master Plan 2041, but progress has stalled (Bindajam et al., 2025).

A recent study (T. L. et al., 2025) using multi-temporal satellite imagery analyzed LULC change in Bengaluru Metropolitan Region (BMR) from 1990 to 2023, revealing dramatic land-use transformation:

Built-up area expansion (the most significant change):

- 1990: 28,009 hectares (9.3% of BMR)
- 2023: 202,521 hectares (67.1% of BMR)
- **Sevenfold increase over 33 years**, representing an average expansion of 5,300 hectares annually (T. L. et al., 2025).

Ecological collapse indicators:

- Flooded vegetation (wetlands) nearly eliminated: from 290,756 hectares (1990) to 1,423 hectares (2023), a **99% loss**.

- Natural vegetation (forests, grasslands) declined by 24.3%, fragmented by urban sprawl and infrastructure corridors.
- Barren land near-complete utilization: from 212,109 hectares (1990) to just 488 hectares (2023), indicating virtually all developable non-agricultural land has been converted (T. L. et al., 2025).

Consequences: Loss of vegetation and increased impermeable surfaces have elevated urban temperatures by 3–5°C compared to surrounding areas, creating urban heat island effect. The near-total loss of wetlands and unplanned groundwater extraction have depleted aquifers; Bengaluru's water tables have dropped 3–5 meters over the past 20 years (T. L. et al., 2025)).

3.3 Mumbai Development Plan

Mumbai is the India's financial capital, with a metropolitan population of approximately 2 crores (Sarkar & Bardhan, 2020). The city's development is governed under the Development Plan 2034, with following implementation gaps:

- **Slum and informal settlement dominance:** An estimated 40–50% of Mumbai's population lives in informal settlements and slums. Many of these remain unrecognized in the development plan (Zhang, n.d.). These settlements occupy valuable land in prime locations but generate limited revenue for the municipal corporation.
- **Coastal encroachment:** Despite regulations protecting the coastal zone, numerous developments have proceeded in restricted areas, degrading marine ecosystems (Darshan et al., 2023)
- **Infrastructure-land use mismatch:** Mumbai's transport infrastructure (metro expansion, Mumbai local-rail network) has proceeded with limited coordination with land-use planning, limiting transit-oriented development outcomes (Dawda, Nandan H. Comprehensive Mobility Planning in Indian Cities : Challenges, Gaps, and the Way Forward, 2025).

4. KEY IMPLEMENTATION GAPS

4.1 Institutional Weaknesses and Fragmentation

Multiple authorities: Implementation of master plans typically involves numerous agencies, such as Development Authorities (DDA in Delhi), municipal corporations, state departments (housing, water, power), and semi-autonomous bodies (transit authorities) This "multiplicity of authorities" creates coordination failures, unclear accountability, and delays (Routra, 1993b).

Monitoring Failures: It has been observed that there are no robust rules to monitor ongoing projects for possible violations (*ASICS 2023 – Janaagraha*, n.d.). Thus, even where violations occur, enforcement action is irregular and often politically mediated.

Weak technical capacity: Many municipal corporations and development authorities lack trained planners, GIS tools, and monitoring systems.

4.2 Legal and Regulatory Limitations

Narrow legislative scope: Current legislation restricts master plans to land-use zoning and development control. Broader objectives like environment, climate resilience, public health, are often included in plans as aspirations but lack legal enforceability (Pethe et al., 2014b).

Absence of sectoral plan mandates: Only 7 states mandate three-tier SDPs while most Indian states lack integrated sectoral plans for sanitation, mobility, and sustainability, preventing coordinated development(*ASICS 2023 – Janaagraha*, n.d.).

4.3 Political Economy and Revenue Dependency

Revenue-driven decisions: Municipalities often financially rely heavily on development-related revenues (building permits, property taxes). This creates incentives to approve development contrasting plan parameters to maximize short-term revenue (*ASICS 2023 – Janaagraha*, n.d.).

Private Developer influence: Real estate developers, often connected to political parties, often pressurize for zoning changes, land-pooling exemptions, which weakens adherence to planning regulations (Mongabay India, 2024).

4.4 Delays in Plan Preparation and Revision

Lengthy approval timelines: Master plans often take 5–7 years to prepare and 2–4 years to approve, meaning that by the time approval is granted, the plan is already partially outdated. Delhi's MPD-2041 delay of over 3 years exemplifies this challenge (Pethe et al., 2014c).

Procedural complexity: Public participation and democratic decision making processes, often extend timelines substantially.

4.5 Lack of Integration with Infrastructure and Climate Planning

Siloed sector planning: Land-use planning operates separately from transport, water, energy, and climate planning. This fragmentation prevents coordinated development and misses opportunities for transit-oriented development, integrated water management, and climate-resilient urban design (Dawda, Nandan H. *Comprehensive Mobility Planning in Indian Cities : Challenges, Gaps, and the Way Forward*, 2025).

4.6 Informal Settlement Challenge

Informal urban growth: In major Indian Tier-1 cities, approximately 30–50% of population growth occurs through informal settlement expansion and unauthorized construction, largely outside the formal master plan system (Bardhan et al., 2015).

5. LIMITATIONS

1. **Reliance on secondary data:** The Analysis depends on satellite-derived land use data taken from existing research (T. L. et al., 2025) rather than ground-truthing reality.
2. **Study area bias:** The findings of this study are biased towards cities Delhi, Bengaluru, Mumbai. reducing generalizability across all Tier-1 cities.
3. **Subjectivity in Implementation Gap:** The identification and analysis of implementation gaps are influenced by the subjective interpretation, which may introduce bias and variability in the findings.
4. **Political and Economic Context:** The study acknowledges the influence of political and economic factors but may not fully capture the complex interplay of local politics, developer interests, and revenue dependency, which can vary significantly across cities and over time.
5. **Limited Longitudinal Data:** The study uses limited longitudinal data, which may not capture the full dynamics of urbanization over large periods. Long-term trends and cyclical patterns may be underrepresented.

6. RECOMMENDATIONS

6.1 Institutional Reforms

1. Consolidating multiple planning and development authorities under a single planning organization with clear accountability and adequate technical capacity.
2. Mandating development authorities and municipal corporations to employ trained planners, GIS specialists, and monitoring systems.
3. Establishing public, web-based systems for tracking compliance, development permits, and violations.

6.2 Legal and Regulatory Reforms

1. Amending Town and Country Planning Acts to integrate environmental, climate, and social factors.
2. Mandating all major cities to prepare integrated sectoral plans for mobility, water management, energy, and climate adaptation, coordinated with master plans.
3. Imposing maximum timelines for plan preparation (3 years) and approval (1 year) to reduce delays.
4. Strengthening 74th CAA implementation by empowering municipal corporations to prepare detailed plans and building bylaws aligned with master plans.

6.3 Political Economy Reforms

1. Implementing property-tax based revenue systems that promote plan adherence., while providing alternate financing mechanisms to reduce municipal dependence on development-related revenues.
2. Requiring public disclosure of land development decisions and zoning changes.
3. Establishing mechanisms for citizen monitoring of plan compliance, including community inspectorates and whistleblower protections.

6.4 Sectoral Integration Reforms

1. To Prepare city-specific TOD guidelines that promote higher-density, mixed-use development around transit nodes.
2. Integrating climate hazard mapping (flood risk, heat vulnerability) into zoning codes to restrict development in high-risk areas.

6.5 Informal Settlement Inclusion

1. Adopting planning approaches that include informal settlements in spatial plans, mapping informal communities and integrating them into broader city visions.
2. Developing streamlined processes for informal settlement land regularization, with clear titling and integrating into municipal revenue systems.

7. CONCLUSION

Master plans remain essential for guiding Tier-1 cities' rapid urbanization, yet performance suffers from institutional fragmentation, legal constraints limiting plans to zoning, political economy pressures favouring revenue over compliance, and siloed sectoral planning. Study of Delhi, Bengaluru, and Mumbai highlights

common failures: outdated plans (MPD-2021 from 2007, RMP-2015), approval delays (MPD-2041 pending since 2021), poor implementation (land pooling, zoning violations), multi-agency coordination gaps, and informal growth bypassing formal systems. India's master planning comprises of democratic processes, private land fragmentation, and informal populations, demanding for context-specific reforms. Recommendations include: (1) unified metropolitan planning bodies; (2) expanding legislative scope to encompass environment, climate, and social equity; (3) accelerating plan revision and approval timelines; (4) isolating municipal revenues from development approval; (5) integrating land-use planning with sectoral plans for mobility, water, energy, and climate; (6) informal settlement inclusion; and (7) implementing holistic sustainability metrics. Implementation of these reforms will require sustained political commitment, central government support and public participation. Tier-1 cities' planning crises threaten national urban sustainability, climate resilience and equity.

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