Area-Based Development Framework for Coaching Centers in Tier-2 City

A THESIS

Submitted in partial fulfillment of the requirements of the award of the degree

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by

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CERTIFICATE DECLARATION

I hereby certify that the work which is being presented in the thesis entitled **"Area-Based Development Framework for Coaching Centers in Tier-2 City"** in partial fulfillment of the requirements for the award of the Master of Planning (Urban Planning) and submitted in the Department of Architecture and Planning of the Maulana Azad National Institute of Technology, Bhopal is an authentic record of my own work carried out during the period from January 2026 to July 2026 under the supervision of **Dr. Supriya Vyas,** Professor, Department of Architecture and Planning, Maulana Azad National Institute of Technology, Bhopal.

The matter presented in this dissertation has not been submitted by me for the award of any other degree of this or any other Institution.

Esha Praveen

This is to certify that the above statement made by the candidate is correct to the best of my knowledge.

Guide
Dr. Supriya Vyas

Date

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ABSTRACT

This thesis examines the emergence of coaching centre clusters as a new form of educational-commercial urbanization in tier-2 Indian cities, with particular reference to Bhopal. Over the past decade, private coaching institutes have evolved beyond supplementary educational spaces into major urban activity generators influencing land use, mobility systems, infrastructure demand, housing patterns, and local economies. However, despite their growing spatial and socio-economic significance, coaching centres remain inadequately addressed within existing urban planning and regulatory frameworks.

The study aims to develop an Area-Based Development (ABD) Framework for the planning and management of coaching centre precincts in tier-2 cities. The research focuses on major coaching hubs in Bhopal, including MP Nagar Zone-II, which have emerged as dense educational-commercial corridors characterized by high student concentration, mixed-use transformation, and intense daily mobility flows. A mixed-method research approach has been adopted, integrating GIS-based spatial analysis, field surveys, traffic and parking studies, and policy review to assess the planning implications of coaching-led urban growth.

The findings reveal that the unregulated concentration of coaching centres has generated significant urban challenges, including traffic congestion, parking shortages, pedestrian conflicts, pressure on urban infrastructure, informal hostel development, land-use conversion, and serious building and fire safety concerns. The research further identifies major policy and governance gaps arising from the absence of dedicated planning norms and institutional mechanisms for managing educational-commercial clusters.

In response, the study proposes a comprehensive ABD framework integrating land-use rationalization, mobility planning, public realm improvement, student-support infrastructure, safety regulations, redevelopment strategies, and smart governance interventions aligned with the Smart Cities Mission. The study concludes that coaching hubs should be recognized as specialized urban sub-centres requiring precinct-level planning interventions rather than conventional city-wide regulations. The proposed framework of regulations offers a replicable planning model for sustainable and inclusive management of coaching-based urban transformation in rapidly urbanizing tier-2 Indian cities.

”

सारांश

यह शोध प्रबंध भारत के टियर-2 शहरों में तेजी से उभर रहे कोचिंग केन्द्र समूहों (Coaching Clusters) को एक नए नगरीय परिघटना के रूप में समझने का प्रयास करता है। विशेष रूप से भोपाल शहर के संदर्भ में यह अध्ययन दर्शाता है कि निजी कोचिंग संस्थान अब केवल शैक्षणिक गतिविधियों तक सीमित नहीं रहे, बल्कि वे नगरीय भूमि उपयोग, यातायात व्यवस्था, आधारभूत संरचना, आवासीय स्वरूप तथा स्थानीय अर्थव्यवस्था को प्रभावित करने वाले महत्वपूर्ण नगरीय केन्द्रों के रूप में विकसित हो चुके हैं। एम.पी. नगर ज़ोन-II जैसे क्षेत्रों में कोचिंग संस्थानों की तीव्र वृद्धि ने ऐसे शैक्षणिक–व्यावसायिक गलियारों का निर्माण किया है, जहाँ प्रतिदिन हजारों छात्रों की आवाजाही, अनौपचारिक छात्रावासों का विकास, पार्किंग संकट, यातायात जाम तथा सुरक्षा संबंधी समस्याएँ स्पष्ट रूप से दिखाई देती हैं।

अध्ययन का मुख्य उद्देश्य टियर-2 शहरों में कोचिंग हब्स के सुव्यवस्थित विकास एवं प्रबंधन हेतु क्षेत्र-आधारित विकास (Area-Based Development: ABD) ढाँचा तैयार करना है। इसके अंतर्गत GIS आधारित स्थानिक विश्लेषण, क्षेत्रीय सर्वेक्षण, यातायात एवं पार्किंग अध्ययन, भूमि उपयोग विश्लेषण तथा नीतिगत समीक्षा के माध्यम से यह समझने का प्रयास किया गया है कि कोचिंग-आधारित विकास शहर की संरचना और कार्यप्रणाली को किस प्रकार प्रभावित कर रहा है।

शोध के निष्कर्ष बताते हैं कि वर्तमान मास्टर प्लान, विकास नियंत्रण विनियम तथा नगरीय नीतियाँ कोचिंग केन्द्रों को एक पृथक नगरीय भूमि उपयोग के रूप में मान्यता नहीं देतीं, जिसके कारण इन क्षेत्रों का विकास अनियोजित एवं अव्यवस्थित रूप से हो रहा है। परिणामस्वरूप यातायात दबाव, अवैध पार्किंग, पैदल यात्री संघर्ष, भवन एवं अग्नि सुरक्षा जोखिम, आधारभूत सेवाओं पर अतिरिक्त भार तथा मिश्रित भूमि उपयोग संबंधी समस्याएँ तेजी से बढ़ रही हैं।

इन चुनौतियों के समाधान हेतु अध्ययन एक समग्र ABD ढाँचा प्रस्तुत करता है, जिसमें भूमि उपयोग का पुनर्गठन, छात्र-केंद्रित आधारभूत सुविधाएँ, सुरक्षित एवं सुगम आवागमन व्यवस्था, सार्वजनिक स्थलों का उन्नयन, पुनर्विकास रणनीतियाँ तथा स्मार्ट सिटी मिशन के अनुरूप स्मार्ट गवर्नेंस उपायों को सम्मिलित किया गया है। यह शोध इस विचार को स्थापित करता है कि कोचिंग हब्स केवल शैक्षणिक गतिविधि क्षेत्र नहीं, बल्कि विशिष्ट नगरीय उप-केन्द्र हैं, जिनके लिए प्रीसिंक्ट-स्तरीय नियोजन एवं विशेष विकास नीतियों की आवश्यकता है। प्रस्तावित ढाँचा भविष्य में भारत के अन्य तेजी से विकसित हो रहे टियर-2 शहरों के लिए भी एक व्यवहारिक एवं पुनरुत्पादनीय नियोजन मॉडल के रूप में उपयोगी सिद्ध हो सकता है।

”

CHAPTER 1 INTRODUCTION

1.1 Background of the Study

Urban transformation in contemporary India is increasingly shaped by a combination of formal planning systems and informal socio-economic processes. While statutory instruments such as Master Plans and Development Control Regulations continue to guide urban growth, a significant portion of spatial transformation is driven by emergent activities that operate outside formal regulatory frameworks. Among these, the rapid expansion of private coaching centres—commonly conceptualized as "shadow education"—has emerged as a powerful yet under-examined force influencing urban morphology, land-use patterns, and mobility systems (Bray, 2009; Roy, 2005).

Coaching centers have evolved from supplementary academic support systems into major urban attractors, particularly in Tier-2 cities. These institutions generate concentrated student populations, create specialized economic ecosystems, and transform neighbourhoods into high-intensity education precincts. Such precincts are characterized by dense pedestrian flows, informal housing markets, mixed-use intensification, and increased pressure on infrastructure systems (Kumar & Sharma, 2020). Despite their growing significance, coaching centres remain largely invisible within statutory planning frameworks, leading to a disconnect between urban reality and planning practice.

This phenomenon must be understood within the broader socio-economic context of India's demographic structure. With a substantial proportion of the population below 35 years of age, the demand for higher education and employment opportunities has intensified significantly (UNFPA, 2023). Competitive examinations such as JEE, NEET, UPSC, and SSC have become primary pathways to socio-economic mobility. However, limitations within formal education systems have led to the rise of parallel educational institutions, namely coaching centres, which provide specialized, exam-oriented training (Mishra, 2018).

The spatial implications of this shift are profound. Coaching centres influence land-use transitions, generate localized economic activity, and reshape mobility patterns. Entire neighbourhoods evolve into education-driven micro-economies comprising hostels, PG accommodations, eateries, libraries, and transport services. These clusters resemble university districts but lack institutional planning support, resulting in unregulated growth and infrastructural stress (Chakraborty, 2019).

1.1.1 Growth of Coaching Industry in India

The expansion of the coaching industry in India is closely linked to post-liberalization socio-economic transformations. The economic reforms of the 1990s led to increased opportunities in professional sectors, thereby intensifying competition for limited seats in prestigious institutions. This created a demand for specialized preparation, which coaching centres effectively fulfilled (Gupta & Jain, 2022).

Over time, coaching centres evolved into organized enterprises characterized by standardized curricula, structured testing systems, and performance analytics. The emergence of Kota as a national coaching hub exemplifies this transformation. The "Kota model" demonstrated how coaching could function as a large-scale industry, attracting students from across the country and generating a localized education economy (Thomas, 2025).

In recent decades, the industry has expanded into Tier-2 cities such as Bhopal, Indore, Patna, and Nagpur. This shift is driven by lower operational costs, affordability of living, and proximity to students from smaller towns. Tier-2 cities thus serve as accessible and economically viable alternatives to metropolitan coaching hubs (Singh, 2022).

Furthermore, the coaching industry has undergone technological transformation with the integration of digital platforms and hybrid learning models. However, physical coaching centres continue to dominate due to the perceived benefits of structured environments and peer competition.

From an urban planning perspective, the growth of the coaching industry represents a significant shift in land-use dynamics. These centres generate high-density usage patterns and attract transient populations, thereby necessitating planning interventions.

1.1.2 Urbanisation, Education Services and Tier-2 City Dynamics

Tier-2 cities in India are experiencing rapid urbanization, characterized by demographic growth, economic diversification, and increasing regional importance (NITI Aayog, 2020). However, these cities often lack the infrastructure and institutional capacity to manage such growth effectively.

The expansion of coaching centres has intensified urban pressures in these cities. Large numbers of students migrate to coaching hubs, creating demand for housing, transportation, and services. This results in the transformation of neighbourhoods into education-centric precincts.

However, this transformation is largely unplanned. Residential areas are converted into commercial or institutional spaces without adequate infrastructure upgrades. This leads to congestion, environmental stress, and deterioration of urban quality.

The governance capacity of Tier-2 cities is often limited, resulting in weak enforcement of planning regulations. This allows informal practices to proliferate, further complicating urban management.

1.1.3 Coaching Centres as an Emerging Urban Land Use

Coaching centres challenge conventional land-use classifications. While they function as educational institutions, their operational characteristics align more closely with commercial activities. This creates ambiguity in their classification and regulation (URDPFI, 2014).

As a result, coaching centres are often treated as generic commercial establishments, without recognition of their unique spatial requirements. This

leads to inadequate planning provisions, including lack of safety standards, infrastructure planning, and regulatory oversight.

Over time, coaching centres cluster in accessible locations, forming dense education precincts. These clusters function as urban sub-centres, generating economic activity and influencing spatial development patterns.

Recognizing coaching centres as a distinct land-use category is essential for integrating them into planning frameworks.

1.2 Problem Statement

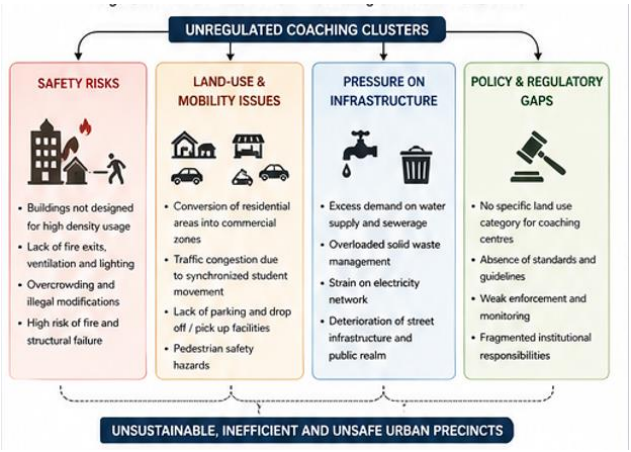


Figure 1 Problem

The rapid proliferation of coaching centres in Indian cities, particularly in Tier-2 urban contexts, represents a significant yet under-regulated dimension of urban transformation. While these institutions have become essential components of the contemporary education system, their spatial, infrastructural, and governance implications remain inadequately addressed within formal urban planning frameworks. This disconnect between functional importance and regulatory recognition has resulted in a range of interconnected urban challenges affecting safety, land use, mobility, infrastructure, and governance.

Coaching centres operate as high-intensity activity generators, attracting large numbers of students on a daily basis. However, their emergence has been largely organic, driven by market demand rather than guided planning interventions. Consequently, they tend to cluster in accessible urban locations such as commercial corridors, mixed-use zones, and transport nodes, leading to localized densification and infrastructural stress (Chakraborty, 2019). These clusters often function as de facto "education precincts," yet they remain unrecognized in statutory planning instruments such as Master Plans and Development Control Regulations (URDPFI, 2014).

The absence of a dedicated planning framework for coaching centres has created a condition of regulatory ambiguity, wherein these institutions operate within a grey zone—neither fully formalized nor entirely informal. This ambiguity has significant implications for urban safety, infrastructure efficiency, and governance coordination. The following sections elaborate on the key dimensions of this problem.

1.2.1 Unregulated Coaching Clusters and Safety Concerns

One of the most critical issues associated with coaching clusters is the lack of regulatory oversight concerning building safety and occupancy standards. A majority of coaching centres operate within structures originally designed for residential or low-intensity commercial use. These buildings are often retrofitted to accommodate large classrooms, resulting in overcrowded conditions that exceed permissible occupancy limits.

Such adaptive reuse of buildings typically occurs without adherence to the provisions of the National Building Code (NBC, 2016), particularly with respect to fire safety, structural integrity, and emergency evacuation requirements. The absence of adequate fire exits, poor ventilation, insufficient lighting, and narrow staircases significantly increase the vulnerability of these spaces. Overcrowding further exacerbates these risks, as high student densities create challenges for evacuation during emergencies.

Incidents of fire hazards and structural failures in coaching centres across Indian cities highlight the severity of this issue. These events reveal systemic failures in regulatory enforcement and underscore the urgent need for planning interventions that prioritize student safety. From a planning perspective, the lack of building standards specific to coaching centres represents a critical gap that must be addressed through policy reform and regulatory mechanisms.

1.2.2 Land-Use Conflicts, Traffic Congestion and Pressure on Infrastructure

The clustering of coaching centres within specific urban areas leads to significant land-use conflicts and infrastructural challenges. Residential neighbourhoods are often transformed into high-intensity commercial or quasi-institutional zones,

disrupting the intended land-use balance. This process, commonly referred to as "functional conversion," occurs without corresponding adjustments in infrastructure capacity, resulting in spatial inefficiencies and declining urban quality (Roy, 2005).

Traffic congestion is a particularly visible manifestation of these challenges. Coaching centres generate synchronized mobility patterns, with large numbers of students arriving and departing at similar times. This creates peak-hour traffic surges that overwhelm local road networks, particularly in areas with narrow streets and limited parking infrastructure. The absence of designated drop-off and pick-up zones further contributes to chaotic traffic conditions, compromising both efficiency and safety (Roy & Singh, 2021).

In addition to mobility challenges, coaching clusters place significant pressure on urban infrastructure systems. Water supply, sewage networks, and solid waste management systems are often inadequate to handle the increased demand generated by high-density student populations. Informal PG accommodations and eateries exacerbate these pressures, leading to environmental degradation and public health concerns.

The lack of integrated planning for such high-intensity precincts results in fragmented infrastructure provision, where services are extended reactively rather than planned proactively. This highlights the need for a localized planning approach that addresses the specific demands of coaching clusters.

1.2.3 Policy and Regulatory Gaps in Managing Coaching Hubs

A fundamental issue underlying the challenges associated with coaching clusters is the absence of a coherent policy and regulatory framework. Existing planning instruments, including Master Plans, Development Control Regulations, and national guidelines such as URDPFI, do not recognize coaching centres as a distinct land-use category (URDPFI, 2014).

This lack of recognition leads to several regulatory gaps:

- Absence of building standards: There are no specific guidelines governing the design, capacity, and safety requirements of coaching centres.
- Lack of student housing policies: Informal PG accommodations operate without regulatory oversight, resulting in substandard living conditions.
- Weak enforcement mechanisms: Municipal authorities often lack the capacity to monitor and regulate coaching centres effectively.
- Fragmented governance: Multiple agencies are involved in managing different aspects of coaching clusters, but coordination among them is limited (Bhan, 2020).

These gaps create a governance vacuum in which coaching centres continue to expand without adequate planning control. The absence of a unified framework for managing these clusters results in reactive and ad hoc interventions rather than systematic planning solutions.

1.3 Research Aim, Objectives and Questions

1.3.1 Aim of the Research

The primary aim of this research is to develop an Area-Based Development (ABD) framework for planning and managing coaching centre clusters in Tier-2 cities, with a focus on improving safety, infrastructure efficiency, mobility systems, and governance mechanisms.

The study seeks to reposition coaching centres as legitimate urban entities and integrate them into planning frameworks through localized, context-sensitive interventions.

1.3.2 Specific Research Objectives

To achieve the stated aim, the study is guided by the following objectives:

1. To analyze the spatial distribution and clustering patterns of coaching centres in Tier-2 cities.
2. To assess the impact of coaching clusters on land use, mobility, infrastructure, and urban environment.

3. To identify gaps in existing planning policies and regulatory frameworks.

4. To examine the role of informal housing and micro-economies associated with coaching centres.

5. To develop a comprehensive ABD framework tailored to coaching precincts.

1.3.3 Research Questions and Working Propositions

The study is structured around the following research questions:

- How do coaching centres influence urban spatial structure in Tier-2 cities?
- What are the key planning challenges associated with coaching clusters?
- Why do existing planning frameworks fail to regulate these spaces effectively?
- How can Area-Based Development be used to address these challenges?

The working proposition of this research is that:

Coaching clusters function as specialized urban sub-centres that require precinct-level planning interventions rather than conventional city-wide regulations.

1.4 Justification of the Study

1.4.1 Academic Relevance in Urban and Regional Planning

This study addresses a critical gap in urban planning scholarship by examining coaching centres as spatial and infrastructural phenomena. While the concept of shadow education has



Figure 2 Area Based Development Framework (conceptual flow diagram)

been extensively studied in the fields of sociology and education (Bray, 2009), its implications for urban planning remain underexplored.

By integrating theoretical perspectives such as informal urbanism (Roy, 2005), studentification (Smith, 2005), and precinct planning (Carmona, 2010), this research contributes to a deeper understanding of how non-traditional land uses shape urban environments. It expands the scope of planning theory by introducing coaching centres as a new category of urban actors.

1.4.2 Practical Relevance for City Governance and Service Planning

From a practical perspective, the study provides actionable insights for urban planners, municipal authorities, and policymakers. The proposed ABD framework offers a structured approach to managing coaching clusters through integrated interventions in mobility, housing, infrastructure, and governance.

Given the rapid growth of Tier-2 cities, these insights are crucial for ensuring sustainable and inclusive urban development. The study also provides a replicable model that can be applied to similar contexts across India.

1.5 Case City Justification: Why Tier-2 Cities?

The rapid expansion of coaching centres in India is no longer limited to metropolitan cities such as Delhi, Mumbai, or Bengaluru. Over the last two decades, several tier-2 cities have emerged as important educational and coaching destinations due to comparatively lower living costs, improved regional connectivity, availability of commercial spaces, and growing educational aspirations among middle-class households. These cities have increasingly attracted private educational investments, leading to the formation of specialized coaching clusters concentrated around transport corridors, commercial districts, and mixed-use



Figure 3 Planning need for studying tier 2 city

urban areas. Consequently, tier-2 cities provide an important context for understanding the relationship between informal educational economies, urban infrastructure pressure, and spatial planning interventions.

Unlike metropolitan cities, tier-2 cities often experience rapid urban transformation without proportional strengthening of planning controls, institutional capacity, or infrastructure provision. This mismatch creates conditions where coaching centres proliferate in unplanned commercial and residential areas, resulting in congestion, parking shortages, fire safety risks, and excessive pressure on urban services. Therefore, examining coaching hubs within tier-2 cities becomes significant for evaluating the adequacy of existing planning frameworks and identifying suitable redevelopment strategies. In this regard, Bhopal serves as an appropriate case city because it reflects many of the spatial, institutional, and infrastructural dynamics currently shaping emerging educational hubs across India.

1.5.1 Bhopal as a Representative Tier-2 City

Bhopal represents a typical Indian tier-2 city characterized by moderate population growth, expanding commercial corridors, increasing educational investments, and ongoing smart city interventions. As the capital city of Madhya Pradesh, Bhopal has evolved into a regional administrative and educational centre attracting students from across central India. The city hosts major higher educational institutions, engineering colleges, management institutes, and competitive examination coaching centres, thereby generating a significant student-oriented economy.

The emergence of coaching clusters in areas such as MP Nagar Zone-II reflects broader patterns of commercial intensification and mixed-use transformation common in many Indian tier-2 cities. Initially planned as a commercial district, MP Nagar gradually evolved into a dense educational-commercial hub due to its central location, accessibility, and concentration of affordable rental spaces. Over time, coaching institutes, hostels, libraries, cafes, stationery markets, and informal food establishments created a highly specialized educational ecosystem. However, this transformation occurred largely through incremental market-driven growth rather than planned institutional zoning.

As a result, the area now experiences several urban planning challenges, including traffic congestion, on-street parking spillover, pedestrian conflicts, overcrowded buildings, inadequate public spaces, and pressure on water supply and drainage infrastructure. Similar conditions have been documented in other educational hubs across India, suggesting that Bhopal represents a broader category of emerging secondary cities where educational commercialization is reshaping urban land use patterns. Furthermore, compared to metropolitan cities, the scale of intervention required in Bhopal remains manageable, making it suitable for exploring pilot planning strategies such as retrofitting, redevelopment, and area-based development under the Smart Cities Mission framework.

Another important reason for selecting Bhopal lies in its transitional urban character. The city contains both planned and organically evolved urban areas, thereby allowing comparative assessment between regulated and unregulated development patterns. This duality makes Bhopal an effective laboratory for examining how existing planning norms respond to rapidly changing educational land uses and whether current development control regulations adequately address the needs of emerging coaching hubs.

1.5.2 Emergence of Major Coaching Hubs in Tier-2 Cities

The growth of coaching centres in tier-2 cities reflects wider socio-economic transformations in India's education sector. Increasing competition in engineering, medical, civil services, banking, and management entrance examinations has created a parallel private education economy concentrated in urban centres. While metropolitan cities historically dominated this sector, rising costs and congestion in larger cities encouraged the decentralization of coaching industries toward secondary cities offering lower operational costs and expanding student markets.

Cities such as Kota, Prayagraj, Indore, Patna, and Bhubaneswar have emerged as major educational destinations due to the clustering of coaching institutes and student-support services. In many cases, these hubs evolved around existing commercial centres, railway stations, transit corridors, or mixed-use neighbourhoods where land conversion and commercial adaptation occurred

rapidly. Such growth patterns demonstrate how educational activities increasingly function as drivers of urban transformation and local economic restructuring.

The rise of coaching hubs has generated both positive and negative urban impacts. On one hand, coaching economies contribute significantly to employment generation, rental housing demand, retail growth, and service-sector expansion. On the other hand, the concentration of large student populations in limited urban areas places enormous pressure on infrastructure systems, especially transport, parking, sanitation, safety, and public spaces. Since most Indian planning regulations do not specifically recognize coaching clusters as a separate land-use category, these areas frequently develop in regulatory grey zones characterized by inadequate oversight and fragmented governance.

1.5.3 Policy Context: Master Plan and Smart City Initiatives

The policy and planning context of Bhopal provides substantial justification for its selection as a representative case city for studying the spatial transformation of coaching hubs in tier-2 Indian cities. As the capital city of Madhya Pradesh and one of the selected cities under the Smart Cities Mission, Bhopal represents a transitional urban centre where rapid educational commercialization intersects with evolving urban governance frameworks, infrastructural modernization, and statutory planning interventions. The city demonstrates how emerging educational economies are reshaping urban land-use structures and creating new demands for adaptive planning mechanisms.

Bhopal is primarily governed through statutory planning instruments such as the Development Plan/Master Plan, zoning regulations, development control regulations (DCRs), and building bye-laws prepared by the planning authorities and urban local bodies. These planning instruments regulate urban growth through provisions related to land use, permissible Floor Area Ratio (FAR), building heights, transportation infrastructure, institutional development, parking standards, environmental regulations, and commercial activities (Ministry of Urban Development [MoUD], 2014). However, similar to many Indian cities, these frameworks largely classify coaching centres under broad categories such as "institutional," "commercial," or "mixed-use" activities without recognizing the

unique spatial and infrastructural implications associated with high-density educational-commercial clusters.

Consequently, the rapid proliferation of coaching institutes in areas such as MP Nagar Zone-II has largely occurred through incremental commercial conversion rather than through planned institutional zoning. Originally envisioned as a commercial district, MP Nagar has gradually evolved into a multifunctional educational precinct characterized by coaching centres, hostels, libraries, cafes, stationery markets, food establishments, and informal student-support economies. This transformation reflects broader trends of mixed-use intensification commonly observed in tier-2 Indian cities where market-driven educational activities expand faster than planning adaptation (Bhan, 2016).

The absence of dedicated educational district policies or specialized coaching hub regulations has created several urban planning challenges. Coaching centres frequently operate within buildings that were originally designed for retail, office, or residential purposes and are therefore not structurally equipped to accommodate large concentrations of students. Such adaptive reuse often results in overcrowding, inadequate emergency exits, poor ventilation, insufficient sanitation facilities, and violations of fire safety norms. In many cases, buildings function beyond their intended occupancy capacities, increasing disaster vulnerability and reducing urban safety standards (National Building Code of India [NBC], 2016).

In addition to safety concerns, coaching clusters generate significant transportation and mobility-related pressures. The concentration of hundreds or thousands of students within limited urban corridors leads to peak-hour congestion, informal parking spillovers, pedestrian conflicts, and excessive dependence on intermediate public transport systems. Since existing master plans rarely anticipate educational-commercial clustering at such intensity, supporting infrastructure such as parking areas, pedestrian pathways, public transit integration, and public open spaces often remain inadequate. Similar patterns have been documented in coaching-oriented urban districts in cities such as Kota, Prayagraj, and Patna, indicating a broader disconnect between educational urbanization and statutory planning frameworks.

Another important policy dimension relates to governance fragmentation. Coaching centres in India operate within overlapping regulatory systems involving municipal corporations, development authorities, fire departments, traffic police, and educational agencies. However, no unified planning framework currently exists for managing coaching clusters as specialized urban activity zones. This institutional gap often results in weak enforcement of building regulations, inadequate monitoring of land-use conversion, and inconsistent compliance with parking, safety, and occupancy norms (URDPFI Guidelines, 2014). Consequently, educational-commercial growth in tier-2 cities frequently evolves through informal or semi-regulated processes rather than through coordinated urban planning interventions.

At the same time, Bhopal's inclusion under the Smart Cities Mission creates significant opportunities for experimenting with innovative planning and redevelopment strategies. The Smart Cities Mission, launched by the Government of India in 2015, emphasizes integrated urban development through the concept of Area-Based Development (ABD), which includes retrofitting, redevelopment, greenfield development, and pan-city technological interventions (Government of India, 2015). These approaches are particularly relevant in the context of coaching hubs because they provide a framework for addressing localized infrastructural stress while improving urban efficiency, safety, and livability.

Among the ABD strategies, retrofitting appears especially suitable for existing coaching clusters in Bhopal. Retrofitting enables infrastructure improvement within already developed urban areas without requiring complete demolition or relocation. In the context of coaching hubs, this may include widening pedestrian pathways, introducing organized parking systems, improving drainage infrastructure, enhancing street lighting, integrating CCTV surveillance, implementing smart mobility systems, and upgrading public transport accessibility. Such interventions can significantly improve the functionality and safety of educational-commercial corridors while preserving existing economic activities.

Redevelopment strategies are also relevant in areas experiencing severe congestion, unsafe building conditions, or excessive infrastructural deterioration. Through planned restructuring and land readjustment, overcrowded educational-

commercial precincts may be transformed into integrated mixed-use educational districts incorporating institutional spaces, student housing, commercial services, public plazas, and structured parking facilities. Redevelopment can therefore address both physical infrastructure deficiencies and broader urban design concerns associated with coaching-led intensification.

Furthermore, the Smart Cities Mission encourages the use of pan-city technological solutions such as intelligent traffic management systems (ITMS), integrated command-and-control centres, digital governance platforms, smart parking systems, and public Wi-Fi infrastructure. These technologies can support coaching hubs by improving mobility management, enhancing public safety, facilitating digital learning environments, and strengthening governance efficiency. The integration of such smart infrastructure is increasingly important in educational districts characterized by high pedestrian movement and intensive daily activity cycles.

The policy context of Bhopal is therefore highly significant because it reflects the intersection of three major urban processes: rapid educational commercialization, infrastructure stress within mixed-use urban corridors, and emerging smart city redevelopment initiatives. This combination makes the city particularly relevant for examining how urban planning frameworks can adapt to the rise of coaching-based educational economies in tier-2 Indian cities. The case of Bhopal illustrates that coaching hubs are not merely educational phenomena but also important spatial and infrastructural transformations influencing land use, mobility systems, governance structures, and urban morphology.

Thus, the study argues that existing planning frameworks need to evolve beyond conventional land-use classifications toward more specialized and adaptive approaches capable of addressing educational clustering. This includes the formulation of dedicated educational hub policies, integrated mobility planning, safety regulation mechanisms, and area-based redevelopment strategies aligned with the principles of sustainable and inclusive urban development. In this context, Bhopal emerges as an appropriate and representative case city for investigating the role of planning interventions in managing the growth and transformation of coaching hubs in India's rapidly urbanizing tier-2 cities.

Table 1 Comparison between various tier 2 cities in India

City	State	Major Coaching Specialization	Nature of Coaching Culture	Major CoachingAreas / Clusters	Urban Issues Emerging from Coaching Growth	Planning Relevance
Kota	Rajasthan	IIT-JEE, NEET	Highly institutionalized national coaching hub with large migrant student population and hostel-based ecosystem	Talwandi, Vigyan Nagar, Rajeev Gandhi Nagar	Student overcrowding, mental health concerns, traffic congestion, high-density hostels, infrastructure pressure	Model case for education-driven urbanization and coaching-led local economy
Prayagraj	Uttar Pradesh	PSC, SSC, State PSC, Banking	Traditional examination-oriented academic culture linked with universities and public libraries	Civil Lines, Katra, Allahpur	Informal rental housing, pedestrian congestion, mixed-use commercialization	Illustrates integration of coaching culture with historic institutional city fabric
Indore	Madhya Pradesh	IIT-JEE, NEET, CA, Commerce	Expanding private coaching market supported by educational institutions and commercial growth	Bhawarkuan, Vijay Nagar, Palasia	Parking shortages, traffic congestion, commercialization of residential areas	Demonstrates interaction between educational economy and rapid commercial expansion
Bhopal	Madhya Pradesh	UPSC, SSC, Banking, IIT-JEE, NEET	Emerging mixed coaching ecosystem integrated with administrative and educational functions	MP Nagar Zone-II, New Market, Board Office Square	Congestion, fire safety concerns, unregulated coaching centres, parking spillover	Representative tier-2 city for studying coaching hubs under Smart City framework
Patna	Bihar	UPSC, BPSC, SSC, Railway, NEET	Competitive examination-driven coaching culture attracting regional	Boring Road, Rajendra Nagar, Musallahpur Hat	Encroachment, overcrowded buildings, inadequate public infrastructure	Highlights governance and infrastructure challenges in dense educational corridors

			students from eastern India			
Bhuban-shwar	Odisha	Engineering, Medical, Civil Services	Emerging education-oriented urban economy linked with institutional growth and IT sector expansion	Saheed Nagar, Rasulgarh, Chandrasekharpur	Rapid land-use conversion, transport stress, rising rental demand	Reflects transition toward knowledge-based urban development
Nagpur	Maharashtra	UPSC, Banking, Engineering Entrance	Regional educational centre with diversified coaching market and strong transport connectivity	Dharampeth, Sitabuldi, Pratap Nagar	Traffic pressure, mixed-use conflicts, rising commercial density	Strategic central Indian city with growing educational-commercial corridors
Jaipur	Rajasthan	UPSC, CLAT, IIT-JEE, NEET	Large-scale private coaching sector supported by tourism and metropolitan spillover growth	Gopalpura, Mansarovar, Lal Kothi	Commercial sprawl, parking stress, infrastructure overload	Demonstrates evolution of secondary coaching centres beyond Kota
Ranchi	Jharkhand	Banking, SSC, State PSC	Regional administrative and educational hub attracting students from eastern India	Lalpur, Harmu, Main Road	Informal commercialization, inadequate public transit, congestion	Illustrates emerging coaching economies in smaller capital cities
Coimbatore	Tamil Nadu	Engineering, GATE, NEET	Technology- and engineering-oriented educational ecosystem linked with industrial economy	Gandhipuram, RS Puram, Peelamedu	Mobility stress, commercialization of institutional corridors	Example of industry-linked educational urbanization

Key Comparative Observations

1. Educational Specialization Shapes Urban Form

Different cities develop distinct coaching identities based on regional demand patterns. For instance, Kota specializes in engineering and medical entrance coaching, while Prayagraj focuses primarily on civil services and government examinations.

2. Commercial Corridors Become Coaching Clusters

Most coaching hubs emerge along major commercial or mixed-use corridors with good accessibility, rental availability, and public transport connectivity. Examples include MP Nagar in Bhopal and Boring Road in Patna.

3. Common Urban Planning Challenges

Despite regional differences, coaching clusters generate similar urban issues such as:

- Traffic congestion
- Parking spillover
- Conversion of residential buildings into commercial coaching spaces
- Fire and safety risks
- High-density hostel development
- Pressure on public infrastructure and utilities

Existing master plans in most tier-2 cities inadequately address the rapid growth of educational-commercial activities. This highlights the necessity for:

- Dedicated educational zones
- Parking and mobility planning
- Institutional safety regulations
- Area-based redevelopment strategies
- Smart infrastructure integration under programs such as the Smart Cities Mission.

1.5.4 Justification for Selecting Bhopal over Other Tier-2 Cities

The selection of Bhopal as the case study city for examining the planning and spatial implications of coaching hubs is justified on multiple academic, spatial, institutional, and policy-related grounds. Although several Indian tier-2 cities such as Kota, Prayagraj, Patna, and Indore have experienced significant growth in coaching activities, Bhopal presents a more balanced and representative urban context for investigating the relationship between coaching-led urbanization and planning interventions. The city embodies the transitional characteristics of emerging tier-2 Indian cities where educational commercialization, mixed-use transformation, mobility pressures, and smart city initiatives coexist simultaneously.

One of the primary reasons for selecting Bhopal is its position as a rapidly transforming administrative and educational capital rather than a single-purpose coaching city. Unlike Kota, whose urban economy is heavily dominated by the coaching industry, Bhopal exhibits a more diverse urban structure comprising administrative functions, institutional areas, commercial districts, residential neighbourhoods, and emerging knowledge-based economic activities. This diversity makes Bhopal a more representative case for understanding how coaching hubs integrate into broader urban systems rather than functioning as isolated educational enclaves. Consequently, the findings derived from Bhopal are likely to be more transferable to other tier-2 cities experiencing similar mixed-use transformations.

Another significant justification relates to the city's spatial morphology and land-use dynamics. Coaching clusters in Bhopal, particularly in MP Nagar Zone-II, have emerged within an already established commercial district rather than in a purpose-built educational zone. This condition reflects the typical pattern observed in many Indian secondary cities, where coaching centres incrementally occupy commercial and residential spaces due to market accessibility and transport advantages. The resulting urban form is characterized by intense mixed-use conversion, traffic congestion, parking spillovers, pedestrian conflicts, and infrastructure stress. Such spatial conditions provide a strong basis for examining the effectiveness of area-based planning interventions, redevelopment strategies, and mobility management approaches.

Compared to cities such as Kota, where coaching activities have already reached an advanced and highly specialized stage, Bhopal represents an intermediate phase of educational-commercial transformation. This makes the city particularly useful for studying preventive and adaptive planning strategies before infrastructural and environmental pressures become irreversible. In other words, Bhopal offers the possibility of exploring proactive planning frameworks rather than merely documenting extreme urban stress conditions. This aspect significantly enhances the planning relevance of the study.

Bhopal also possesses strategic institutional advantages that strengthen its suitability as a case city. As the capital city of Madhya Pradesh, it accommodates major government offices, planning authorities, educational institutions, and administrative agencies. The presence of multiple governance institutions facilitates the study of planning regulations, development control mechanisms, and urban policy implementation processes. Furthermore, the city is governed through statutory planning frameworks such as the Development Plan/Master Plan, Development Control Regulations (DCRs), and municipal governance systems, enabling detailed analysis of how existing planning policies address—or fail to address—the emergence of coaching hubs (Ministry of Urban Development [MoUD], 2014).

Another important reason for choosing Bhopal is its inclusion under the Smart Cities Mission. The Smart Cities Mission promotes Area-Based Development (ABD), retrofitting, redevelopment, smart mobility systems, and integrated urban infrastructure improvement (Government of India, 2015). Since the present research focuses on developing an area-based development framework for coaching centres, Bhopal provides a highly relevant policy environment for linking educational urbanization with contemporary smart city planning approaches. Unlike many tier-2 cities where planning interventions remain limited or fragmented, Bhopal offers an active context of urban modernization and smart infrastructure implementation. This allows the study to examine how coaching hubs may be integrated into broader urban redevelopment and smart governance strategies.

The city's scale and manageability further contribute to its suitability for academic research. Metropolitan cities such as Delhi, Bengaluru, or Mumbai are characterized by highly complex multi-layered urban systems, making focused analysis of coaching hubs difficult within the scope of a master's-level dissertation. In contrast, Bhopal presents a manageable urban scale where localized educational-commercial transformations can be studied in greater spatial and institutional detail. At the same time, the city is sufficiently large and functionally diverse to reflect broader urbanization trends occurring across Indian tier-2 cities.

In comparison with Indore, which has evolved into a major commercial and industrial centre with relatively stronger economic infrastructure, Bhopal demonstrates a more balanced interaction between administration, education, and urban growth. This makes the pressures associated with coaching clusters more visible and analytically traceable. Similarly, cities such as Prayagraj and Patna exhibit highly examination-oriented educational cultures but often lack the integrated smart city planning context available in Bhopal. Therefore, Bhopal uniquely combines educational growth with contemporary urban policy experimentation.

Another important factor is the availability of diverse urban conditions within the city. Bhopal contains planned neighbourhoods, organically developed commercial corridors, transit-oriented zones, institutional areas, and mixed-use districts. This diversity allows comparative understanding of how coaching activities influence different urban typologies. For example, coaching centres in MP Nagar generate different spatial impacts compared to those emerging near residential or institutional areas. Such heterogeneity enriches the analytical scope of the research and enables development of more adaptable planning recommendations.

From a regional perspective, Bhopal also functions as a central educational node for students migrating from smaller towns and districts of Madhya Pradesh and neighbouring states. The city therefore represents the growing regionalization of educational economies within India's urban system. Increasing student migration has intensified demand for hostels, rental accommodation, libraries, food services,

and transport infrastructure, thereby reshaping the city's commercial and social geography. This transformation aligns with broader processes of knowledge-based urbanization and educational clustering increasingly observed in secondary Indian cities.

Finally, the selection of Bhopal is justified because the city currently stands at a critical planning threshold. The coaching economy is expanding rapidly, yet large-scale irreversible infrastructural collapse or extreme commercialization has not fully occurred. This transitional condition creates an opportunity for proposing strategic planning interventions capable of guiding future growth sustainably. Thus, Bhopal represents not only an existing coaching hub but also a city where policy innovation, area-based redevelopment, mobility planning, and institutional regulation can still significantly influence future urban outcomes.

Therefore, among India's emerging tier-2 educational centres, Bhopal offers the most balanced and representative context for examining the intersection of coaching culture, mixed-use urban transformation, smart city governance, and area-based planning interventions. The city's combination of educational growth, manageable scale, policy relevance, infrastructural stress, and ongoing smart city initiatives makes it particularly suitable for investigating sustainable planning strategies for coaching hubs in contemporary Indian cities.

1.6.1 Scope of the Study

The scope of this research is defined in terms of its spatial, thematic, temporal, and methodological boundaries, ensuring clarity in focus and depth of analysis.

1.6.1.1 Spatial Scope

The study is geographically confined to Bhopal, with a specific focus on prominent coaching clusters, particularly the MP Nagar area. MP Nagar has emerged as a major educational and commercial hub characterized by a high concentration of coaching centres, student accommodations, and associated service activities. By concentrating on this precinct, the study aims to conduct an in-depth spatial analysis of coaching clusters within a defined urban context.

While the findings are derived from Bhopal, the study adopts a comparative perspective to ensure that the insights are applicable to other Tier-2 cities in India exhibiting similar characteristics.

1.6.1.2 Thematic Scope

The study primarily focuses on the urban planning dimensions of coaching centre clusters. It examines the interaction between coaching centres and key urban systems, including:

- Land Use and Built Form: Transformation of residential areas into mixed-use or commercial zones.
- Mobility and Accessibility: Traffic congestion, pedestrian movement, and last-mile connectivity challenges.
- Infrastructure and Services: Pressure on water supply, sewage systems, solid waste management, and public utilities.
- Housing and Informal Economy: Growth of PG accommodations, hostels, and associated micro-economies.
- Governance and Policy Frameworks: Regulatory gaps, institutional roles, and planning deficiencies.

The study does not address pedagogical aspects, academic performance, or curriculum design within coaching centres, as these fall outside the domain of urban planning.

1.6.1.3 Conceptual Scope

The research is grounded in the conceptual framework of Area-Based Development (ABD) as a localized planning approach. It explores how ABD can be adapted to address the unique challenges of coaching clusters by integrating land-use planning, mobility management, infrastructure provision, and governance mechanisms.

The study also draws upon theoretical constructs such as:

- Informal urbanism (Roy, 2005)
- Studentification (Smith, 2005)

- Shadow education (Bray, 2009)

These frameworks provide a multi-dimensional understanding of coaching centres as socio-spatial phenomena.

1.6.1.4 Temporal Scope

The study focuses on the current urban scenario, with a retrospective understanding of trends over the past 5–10 years and a forward-looking perspective aligned with planning horizons such as Development Plans (e.g., up to 2031).

This temporal scope allows the study to capture both existing conditions and future planning implications of coaching clusters.

1.6.1.5 Methodological Scope

The research adopts a mixed-method approach, integrating both qualitative and quantitative techniques. The methodological scope includes:

- Spatial analysis using GIS-based mapping
- Field surveys and observational studies
- Stakeholder interactions (students, residents, coaching operators)
- Review of planning documents, policies, and guidelines

The focus remains on precinct-level analysis rather than city-wide modeling.

1.6.2 Limitations of the Study

While the study is designed to provide comprehensive insights into coaching clusters, certain limitations must be acknowledged.

1.6.2.1 Data Constraints

One of the primary limitations is the limited availability of reliable and structured data related to coaching centres. Most coaching institutions operate as private entities and do not publicly disclose information regarding student enrollment, building capacity, or operational details.

Similarly, the informal nature of PG accommodations and rental housing markets makes it difficult to obtain accurate data on occupancy levels, rental patterns, and living conditions (Kumar & Sharma, 2020).

1.6.2.2 Informality and Lack of Documentation

The study deals with a sector that is largely informal and under-documented. Many activities associated with coaching clusters—such as informal vending, unregistered hostels, and unauthorized building modifications—are not captured in official records.

This limits the ability to conduct precise quantitative analysis and necessitates reliance on observational and qualitative data.

1.6.2.3 Limited Stakeholder Accessibility

Access to certain stakeholders, particularly private coaching operators and property owners, may be restricted due to concerns related to regulation, taxation, or confidentiality. This may result in partial or biased information during data collection.

1.6.2.4 Spatial Generalization

The study focuses on a specific precinct within Bhopal. While efforts are made to ensure that findings are representative of Tier-2 cities, variations in local contexts—such as governance structures, economic conditions, and cultural factors—may limit the direct applicability of results to other cities.

1.6.2.5 Methodological Constraints

The research does not employ advanced econometric modeling or large-scale simulation techniques due to time and resource limitations. Instead, it emphasizes qualitative analysis and spatial interpretation, which may limit the precision of certain projections.

1.6.2.6 Exclusion of Non-Planning Dimensions

The study does not address aspects related to:

- Academic quality and teaching methodologies
- Psychological and social impacts on students
- Institutional performance of coaching centres

While these aspects are important, they fall outside the scope of urban planning and are therefore excluded.

1.7 Need of the study

The necessity of this research lies in addressing the **planning neglect** of branded coaching hubs. Despite their scale and impact, they are absent from statutory planning frameworks. The need for the study can be summarized under the following points:



Figure 4 Emerging impacts due to unplanned coaching zones

a) **Rising Demand:** Tier-2 cities is attracting thousands of students annually to branded institutes like Allen and Aakash. This inflow creates new demands for housing, utilities, and mobility services.

b) **Neighborhood Impacts:** Coaching hubs are concentrated in residential areas. This clustering disrupts existing communities, increases congestion, and raises safety risks.

c) **Policy Vaccum:** Current planning documents do not recognize coaching hubs as a different category. Their activities are ambiguously treated as commercial, ignoring their scale and educational significance.

d) **Planning Gaps:** Research on coaching centres in India has focused largely on sociological or educational impacts. Very little has been written on their **urban spatial impacts**.

e) **Scalability:** coaching centres are expanding rapidly into tier-2 cities nationwide, developing a planning framework can provide a better ecosystem for the students and employed workers.

Thus, the study is not just about documenting challenges but about proposing a structured, area-based planning model for **legitimizing and integrating coaching hubs**.

CHAPTER 2: LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

2.1 Coaching Centres and Urban Space

The rapid expansion of coaching centres in India represents a significant transformation within both the education system and the urban landscape. While the phenomenon of private tutoring has historically been examined through sociological and educational lenses, its spatial implications have only recently begun to receive attention within urban planning scholarship. Coaching centres, as components of the broader "shadow education system," function as parallel institutions that supplement formal schooling while simultaneously reshaping urban space (Bray, 2009).

In the Indian context, the growth of coaching centres is closely linked to the intensification of competition in higher education and employment sectors. This demand-driven expansion has led to the emergence of dense clusters of coaching institutions, particularly in Tier-2 cities where affordability, accessibility, and regional connectivity attract large student populations. These clusters exhibit distinct spatial characteristics, including high-density land use, mixed-use development, and localized economic ecosystems.

From an urban planning perspective, coaching centres can be understood as **functional land-use intensifiers**, generating concentrated flows of people, services, and economic activity within limited spatial areas. Unlike traditional institutional land uses such as schools and universities, coaching centres operate with flexible spatial requirements and extended temporal activity patterns. This flexibility enables them to occupy a wide range of urban spaces, including commercial corridors, residential neighborhoods, and transitional zones.

The resulting spatial configurations challenge conventional planning frameworks, which typically categorize land uses into rigid functional zones. Coaching centres blur these boundaries, creating hybrid spaces that combine educational, commercial, and residential functions. This hybridity is particularly evident in areas where coaching institutions coexist with student housing, retail outlets, and informal services, forming what may be described as **education-oriented urban precincts**.

Furthermore, the spatial dynamics of coaching centres reflect broader processes of urban informality. As Roy (2005) argues, informality is not merely a residual category but a fundamental mode of urbanization in developing contexts. Coaching centres, particularly smaller and informal units, operate within this framework, navigating regulatory ambiguities and adapting to market conditions. Their growth thus highlights the limitations of formal planning systems in accommodating emerging urban functions.

2.1.1 Nature and Typology of Coaching Centres

The diversity of coaching centres in India necessitates a typological classification to better understand their spatial and operational characteristics. These institutions vary widely in terms of scale, organizational structure, target clientele, and regulatory compliance.

At the upper end of the spectrum are **large institutional coaching centres**, often organized as corporate entities or franchise networks. These institutions are characterized by standardized curricula, advanced pedagogical methods, and significant infrastructural investments. They typically occupy commercial or purpose-built spaces in strategically located urban areas, ensuring accessibility and visibility. Their operations resemble formal educational institutions, albeit with a strong commercial orientation.

In contrast, **medium-scale private institutes** operate with greater flexibility and specialization. These centres often focus on specific examinations or subject areas and cater to a more localized student base. While they may exhibit some degree of formalization, their infrastructural and regulatory standards vary significantly.

At the lower end are **small informal tutorial units**, which operate within residential or mixed-use premises. These units often lack formal registration and operate with minimal regulatory oversight. Their spatial footprint is typically limited, but their cumulative impact on urban space can be substantial, particularly when they cluster in large numbers.

This typological variation reflects differing degrees of institutionalization and regulatory compliance. Large coaching centres are more likely to adhere to building codes and safety regulations, whereas smaller units frequently operate in converted residential spaces, contributing to regulatory ambiguity and enforcement challenges (Kumar & Sharma, 2020).

Additionally, coaching centres are differentiated based on the examinations they target. For instance, institutions specializing in engineering and medical entrance examinations tend to attract larger student populations and require more extensive infrastructure. In contrast, centres focused on civil services or niche examinations may operate with smaller cohorts but higher levels of specialization.

The typology of coaching centres also influences their temporal dynamics. Large institutions often operate on fixed schedules with multiple batches, generating predictable patterns of activity. Smaller units, however, may exhibit more irregular schedules, contributing to variability in urban activity patterns.

Types of coaching centres	**Scale**	**Locations**	**Category of students**	**Regulatory status**
Large/commercial chains	Hundreds of students	Residential/ commercial zones	Both local and out station students	Often formally registered
Medium private sectors	50-200 students	Residential/ commercial zones	Local students	Mixed compliance (on temporary permits)
Small/ home based tutorials	5-20 students	Residential areas	Neighbourhood school students	Often unregulated.

table: 1 Categorization of coaching centres

2.1.2 Spatial Concentration and Clustering Patterns

The spatial clustering of coaching centres is a defining feature of their urban manifestation. This clustering can be understood through the lens of **agglomeration economies**, wherein the spatial concentration of similar activities leads to mutual benefits such as increased accessibility, visibility, and resource sharing (Marshall, 1920).

In the case of coaching centres, clustering is driven by both demand-side and supply-side factors. From the demand perspective, students prefer locations that offer a range of coaching options, enabling them to compare quality, access multiple resources, and benefit from peer interaction. From the supply perspective, institutions benefit from increased footfall, shared infrastructure, and the reputational advantages associated with established coaching hubs (Chakraborty, 2019).

These dynamics lead to the formation of **education precincts**, which function as specialized urban sub-centres. Such precincts are characterized by:

- High density of coaching institutions
- Mixed-use development patterns
- Concentration of student housing
- Intensive commercial activity
- Extended temporal activity cycles

Spatially, these precincts tend to emerge along major transport corridors, central business districts, or areas with high accessibility. Their location is influenced by factors such as proximity to public transport, availability of rental housing, and affordability of commercial space.

However, the organic nature of this clustering often results in unplanned densification and infrastructural stress. The absence of coordinated planning leads to inefficient land use, congestion, and environmental degradation. Moreover, the concentration of similar activities can create mono-functional zones, reducing urban diversity and resilience.

Table 2 Spatial characteristics of coaching cluster

Parameter	Observed Pattern	Planning Impact
Density	High concentration of institutes	Overcrowding, infrastructure stress
Land Use	Mixed-use transformation	Zoning conflicts
Accessibility	Located near transit corridors	Traffic congestion
Housing	PG/hostel clustering	Informal housing growth
Economy	Student-driven micro-economy	Informal sector expansion

2.1.3 Impacts on Local Economy, Housing and Mobility

The emergence of coaching clusters has profound implications for urban economies, housing markets, and mobility systems. These impacts are interconnected and mutually reinforcing, contributing to the transformation of urban space.

From an economic perspective, coaching clusters generate a range of **secondary and tertiary economic activities**. These include hostels, PG accommodations, eateries, stationery shops, libraries, and informal vending. Such activities create employment opportunities and contribute to local economic vitality. However, they often operate within informal or semi-formal frameworks, limiting regulatory oversight and revenue generation (Bromley, 2000).

Housing markets are particularly affected by the influx of student populations. The demand for affordable accommodation leads to the conversion of residential units into rental housing, often without adherence to planning norms. This process, commonly referred to as **studentification**, results in increased rental values, higher occupancy densities, and changes in neighborhood demographics (Smith, 2005).

The implications of studentification are multifaceted. While it can stimulate local economies, it may also lead to social tensions, displacement of long-term residents, and deterioration of living conditions. The informal nature of many student accommodations further exacerbates issues related to safety, sanitation, and infrastructure.

Mobility patterns within coaching clusters are characterized by **temporal concentration and spatial intensity**. Peak-hour flows associated with class timings create congestion on local roads, particularly in areas with limited infrastructure capacity. Pedestrian movement is often high, but infrastructure for non-motorized transport (NMT) is inadequate, leading to safety concerns.

Parking is another critical issue, as the absence of designated facilities results in on-street parking and reduced road capacity. Public transport systems are often insufficient to handle the concentrated demand, further exacerbating congestion.

2.2 Area-Based Development (ABD) in Urban Planning

Area-Based Development (ABD) represents a significant shift in urban planning paradigms, emphasizing localized, integrated interventions over traditional city-wide approaches. This approach recognizes that urban challenges are often spatially concentrated and require context-specific solutions.

ABD focuses on improving the quality of life within defined spatial units through coordinated interventions in land use, infrastructure, mobility, and governance. It aligns with contemporary planning principles that emphasize sustainability, inclusivity, and participatory governance (UN-Habitat, 2020).

2.2.1 Evolution of Area-Based Approaches in Planning

The concept of area-based planning has evolved over time, reflecting changes in urban theory and practice. Early approaches, such as neighborhood planning and urban renewal, focused primarily on physical redevelopment. However, these

approaches often neglected social and economic dimensions, leading to limited success.

Contemporary area-based approaches adopt a more holistic perspective, integrating physical, social, economic, and environmental considerations. This evolution is influenced by theories of **collaborative planning**, **sustainable urbanism**, and **place-making** (Carmona, 2010).

Precinct planning, a key component of ABD, emphasizes the importance of functional coherence and localized problem-solving. It recognizes that urban areas are composed of distinct precincts with unique characteristics and challenges.

2.2.2 International Experiences with Precinct-Level Development

International experiences provide valuable insights into the implementation of area-based approaches. For example, Business Improvement Districts (BIDs) in cities such as London and New York demonstrate how stakeholder collaboration can enhance the management and development of commercial precincts (Pierre, 2011).

In East Asia, education districts such as Gangnam in Seoul illustrate how specialized urban functions can be effectively integrated into planning frameworks. These districts are characterized by strict zoning regulations, high-quality infrastructure, and strong regulatory enforcement (Lee, 2010).

These examples highlight the importance of governance, regulation, and stakeholder participation in the success of area-based development initiatives.

2.2.3 ABD in the Indian Context

In India, ABD has gained prominence through the Smart Cities Mission, which promotes localized development interventions aimed at improving urban

livability. The mission emphasizes integrated planning, infrastructure development, and citizen participation (MoUD, 2015).

However, the application of ABD in India has been limited to specific contexts such as heritage areas, central business districts, and redevelopment zones. Emerging functional precincts, such as coaching clusters, have not received adequate attention within this framework.

This gap highlights the need to extend ABD principles to new urban phenomena, ensuring that planning frameworks remain responsive to evolving urban dynamics.

2.3 Smart Cities Mission ABD Models

The Smart Cities Mission in India represents one of the most significant policy shifts toward integrated and area-based urban development. It operationalizes the concept of Area-Based Development (ABD) through a set of clearly defined intervention models aimed at improving urban infrastructure, governance, and livability within selected precincts (MoUD, 2015).

The ABD approach under the Smart Cities Mission is particularly relevant for analyzing coaching clusters, as it provides a framework for addressing localized urban challenges through targeted interventions. The mission identifies four primary models of ABD: retrofitting, redevelopment, greenfield development, and pan-city initiatives.

2.3.1 Retrofitting Model

Retrofitting involves the incremental improvement of existing built-up areas without significant alteration to their underlying structure. The primary objective is to enhance infrastructure, public spaces, and service delivery while retaining the existing urban fabric.

In the context of coaching clusters, retrofitting offers a practical approach to addressing issues such as congestion, inadequate infrastructure, and poor public realm conditions. Interventions may include:

- Upgrading pedestrian infrastructure and streetscapes
- Improving drainage, water supply, and waste management systems
- Introducing traffic management measures
- Enhancing public safety through lighting and surveillance

Retrofitting is particularly suitable for areas like MP Nagar, where the existing urban structure is dense and well-established. However, its effectiveness depends on coordinated implementation and strong institutional capacity.

2.3.2 Redevelopment Model

Redevelopment involves comprehensive restructuring of urban areas through land reconfiguration, increased density, and modern infrastructure provision. This model typically requires significant investment and institutional coordination.

For coaching clusters, redevelopment may be applicable in areas where existing infrastructure is severely inadequate or where land-use conflicts are particularly pronounced. Potential interventions include:

- Consolidation of fragmented land parcels
- Development of integrated education hubs
- Provision of structured student housing
- Creation of organized commercial and service spaces

While redevelopment offers the potential for transformative change, it also poses challenges related to displacement, land acquisition, and stakeholder resistance.

2.3.3 Greenfield Development Model

Greenfield development involves the creation of new urban areas on previously undeveloped land. This model allows for the integration of sustainable planning principles, including efficient land use, infrastructure optimization, and environmental management.

In the context of coaching centres, greenfield development could be used to create planned education districts with dedicated infrastructure and regulatory

frameworks. However, this approach may not directly address the challenges of existing clusters, which are already embedded within the urban fabric.

2.3.4 Pan-City Initiatives and ICT Interventions

Pan-city initiatives focus on city-wide improvements through the use of information and communication technologies (ICT). These interventions aim to enhance urban management systems, including traffic control, service delivery, and governance.

For coaching clusters, ICT interventions can support:

- Smart traffic management systems
- Real-time public transport information
- Digital platforms for regulatory compliance
- Data-driven planning and monitoring

However, ICT solutions must be complemented by physical infrastructure improvements to achieve meaningful outcomes.

ABD Model	**Definition under Smart Cities Mission**	**Minimum Area Requirement**	**Key Characteri-stics**	**Application in Coaching Hub Development**	**Relevance for Bhopal Coaching Clusters**
Retrofitti-ng	Improvement of infrastructure and services within an existing	≥ 500 acres	Focuses on infrastructure upgrading, mobility improvement, ICT	Existing coaching clusters can be upgraded through better roads, pedestrian	Highly relevant for areas such as MP Nagar Zone-II where coaching activities already exist in dense commercial areas

	built-up urban area without major demolition.		integration, public space enhancement, and service optimization while retaining existing urban fabric.	pathways, drainage, parking systems, signage, Wi-Fi infrastructure, and smart mobility solutions.	requiring infrastructure modernization rather than complete rebuilding.
Redevelopment	Replacement of old or inefficient urban fabric through demolition and reconstruction with higher density and mixed land use.	≥ 50 acres	Involves comprehensive land restructuring, mixed-use planning, higher FAR utilization, integrated infrastructure, and modern urban design.	Congested and unsafe coaching precincts may be redeveloped into planned educational districts with integrated hostels, commercial spaces, parking structures, transit access, and open spaces.	Moderately to highly relevant in deteriorated mixed-use corridors where building safety, fire hazards, and congestion have become critical urban issues.
Greenfield	Planned urban expansion	≥ 250 acres	Enables planned infrastructu	Development of a dedicated	Limited relevance within central Bhopal, but

Development	on previously undeveloped land using sustainable and smart planning principles.		re, affordable housing, integrated transport systems, and future-oriented urban growth.	"Education Township" or peripheral coaching city with institutional campuses, hostels, recreational spaces, and transit connectivity.	potentially useful for future expansion corridors on the urban periphery to reduce pressure on inner-city coaching hubs.
Pan-City Solutions	Application of smart technologies and ICT-based systems across the entire city rather than a single area.	Entire city scale	Emphasizes smart governance, intelligent transport systems (ITS), digital infrastructure, energy efficiency, surveillance, and integrated service delivery.	Coaching hubs may benefit from citywide digital transit apps, public Wi-Fi, intelligent parking systems, CCTV surveillance, and smart traffic management.	Highly supportive as a complementary strategy, though it does not directly solve localized land-use and infrastructure challenges of coaching clusters.

table: 2 Area based development model under Smart city Mission



Figure 5 Area based Development models and Smart City

2.4 Planning Norms and Guidelines Relevant to Coaching Clusters

Urban planning in India is guided by a range of statutory instruments and guidelines that regulate land use, building design, infrastructure provision, and safety standards. However, these frameworks have not kept pace with emerging urban phenomena such as coaching clusters.

2.4.1 URDPFI-Type Land-Use and Facility Norms

The Urban and Regional Development Plans Formulation and Implementation (URDPFI) Guidelines provide a comprehensive framework for land-use planning and infrastructure provision in Indian cities (URDPFI, 2014). These guidelines classify land use into categories such as residential, commercial, industrial, and public/semi-public.

However, coaching centres are not explicitly recognized as a distinct land-use category. Instead, they are typically subsumed under commercial or institutional uses. This lack of specificity creates ambiguity in planning and regulation, as coaching centres exhibit characteristics of both categories.

The absence of dedicated norms for coaching centres results in:

- Inadequate infrastructure planning
- Lack of building standards tailored to high-density usage

- Weak integration with surrounding land uses

2.4.2 Zoning, Building Bye-Laws and Fire Safety Regulations

Zoning regulations and building bye-laws establish the legal framework for land use and construction in urban areas. The National Building Code (NBC) provides detailed guidelines for structural safety, fire protection, and building services (NBC, 2016).

Despite these provisions, enforcement remains inconsistent, particularly in informal coaching setups. Many coaching centres operate in buildings that do not comply with safety standards, increasing the risk of accidents and emergencies.

Key challenges include:

- Unauthorized conversion of residential buildings
- Overcrowding and violation of occupancy limits
- Lack of fire safety infrastructure
- Weak monitoring and enforcement mechanisms

2.4.3 Parking, NMT and Public Realm Standards

Planning guidelines emphasize the importance of non-motorized transport (NMT), pedestrian infrastructure, and public spaces in creating livable urban environments. However, these standards are often inadequately implemented in coaching clusters.

The high concentration of students in these areas necessitates:

- Safe and accessible pedestrian pathways
- Dedicated cycling infrastructure
- Organized parking facilities
- Well-designed public spaces

The absence of such infrastructure contributes to congestion, safety risks, and reduced urban quality.

Table 3 Policy and regulatory gaps

Policy Instrument	Provision	Gap Identified
URDPFI Guidelines	Land-use norms	No coaching category
NBC 2016	Fire & safety standards	Weak enforcement
Smart City Mission	ABD framework	No focus on education clusters
DCRs	Zoning regulations	Ambiguous classification
Transport Policies	Mobility planning	No student-specific planning

2.5 Mobility, Accessibility and TOD Concepts

Mobility and accessibility are critical components of urban planning, particularly in high-intensity precincts such as coaching clusters.

2.5.1 Transit-Oriented Development (TOD)

Transit-Oriented Development (TOD) promotes compact, mixed-use development around transit nodes, enhancing accessibility and reducing reliance on private vehicles (Calthorpe, 1993). TOD principles are particularly relevant for coaching clusters, which generate high travel demand.

Integrating coaching centres with transit systems can:

- Reduce congestion
- Improve accessibility
- Enhance sustainability

2.5.2 Walkability, NMT Facilities and Last-Mile Connectivity

Walkability is a fundamental aspect of sustainable urban design. In coaching clusters, where student footfall is high, pedestrian infrastructure becomes critical (Gehl, 2010).

Key considerations include:

- Continuous and obstruction-free footpaths
- Safe crossings and traffic calming measures
- Integration with public transport nodes

2.5.3 Accessibility for Students in Education-Service Precincts

Accessibility in coaching clusters must consider the specific needs of students, including safety, affordability, and convenience. Gender-sensitive design and inclusive infrastructure are particularly important in ensuring equitable access.

2.6 Governance of Education and Coaching Services

2.6.1 Institutional Roles

The governance of coaching clusters involves multiple stakeholders, including Urban Local Bodies (ULBs), development authorities, and education departments. However, coordination among these institutions is often limited, leading to fragmented governance (Pierre, 2011).

2.6.2 Regulatory Frameworks and Policy Interventions

Recent policy interventions and judicial rulings highlight the need for stronger regulation of coaching centres, particularly in terms of safety and building compliance. However, the absence of a unified framework continues to hinder effective governance.

Regulation / Norm	Relevant Provisions	Observed Gaps in Practice	Planning Recommendations
URDPFI Guidelines (2014)	Identifies *coaching centres* as a distinct educational facility	Informal and small-scale coaching institutes operate in	Develop specialized **education corridors or coaching hub zones** in

	requiring approximately **0.30 ha land area** and associated infrastructure standards.	mixed residential or commercial buildings without adherence to prescribed land-use norms. Dedicated educational sites are rarely enforced.	accordance with URDPFI principles, supported by planned infrastructure and accessibility standards.
Master Plans / Zonal Development Plans (MPD)	Coaching activities are generally permitted under **mixed-use regulations**, subject to restrictions on Floor Area Ratio (FAR), building height, and commercial use.	Absence of clearly demarcated education zones has resulted in haphazard clustering, excessive densification, and frequent violations of FAR and land-use controls.	Revise master plans to incorporate designated **"Education Hub" or "Institutional Mixed-Use" zones**, along with stricter enforcement of FAR, building height, and occupancy regulations.
National Building Code (NBC) / Unified Building Bye-Laws (UBBL 2016 & Delhi UBBL 2020)	Coaching centres are categorized under **Educational Buildings**, requiring compliance with safety norms such as emergency exits, staircases, occupancy standards, and structural safety provisions.	A large number of centres continue to function in converted residential buildings lacking emergency exits, adequate stairways, ventilation, and disaster safety compliance.	Conduct mandatory structural and fire safety audits; require retrofitting of non-compliant buildings or relocation of high-density coaching activities to compliant premises.
Fire Safety Regulations	Buildings with assembly-type occupancy, especially those utilizing basements or upper floors, require **Fire NOC**	Many operators avoid licensing procedures to bypass Fire NOC requirements, while enforcement and periodic inspections remain weak.	Prepare a city-wide inventory and GIS mapping of coaching centres; institutionalize annual fire safety audits and mandatory renewal of operational

	and adherence to evacuation and firefighting standards.		permissions based on compliance.
Parking Bye-Laws and NUTP Principles	Institutional buildings are expected to provide on-site parking, while urban transport policies discourage excessive roadside parking and congestion.	Most coaching centres lack dedicated parking facilities, resulting in spillover parking, traffic congestion, encroachment on public streets, and pedestrian safety issues.	Introduce paid parking management systems around coaching clusters, encourage shared parking facilities, and mandate off-street parking provisions in redevelopment or rehabilitation projects.
Governance and Local Body Regulations	Some states and urban local bodies provide for licensing or registration of tuition/coaching centres under municipal or commercial regulations.	There is no uniform national regulatory framework, resulting in fragmented governance and inconsistent enforcement across cities and states.	Establish a comprehensive city/state-level licensing framework for coaching centres, with periodic renewal linked to building safety, parking provision, fire compliance, and infrastructure standards.

Table:3 Source: Compiled by the author based on URDPFI Guidelines (2014), NBC (2016), UBBL (2020), Fire Safety Regulations, and Master Plan provisions.

2.7 Synthesis of Literature

2.7.1 Identified Gaps in Existing Research

The review of literature reveals several critical gaps:

- Limited integration of coaching centres within urban planning frameworks
- Lack of spatial analysis of coaching clusters
- Absence of dedicated policy guidelines
- Weak linkage between planning theory and practice

2.7.2 Need for an ABD Framework for Coaching Centres

The identified gaps underscore the need for a localized, integrated planning approach. ABD provides a suitable framework for addressing the complex challenges associated with coaching clusters by focusing on precinct-level interventions.

2.8 Conceptual Framework for the Study

2.8.1 Key Concepts and Variables

The study is structured around four key components:

- **Drivers:** Educational demand, urbanization, market forces
- **Patterns:** Spatial clustering, land-use transformation
- **Issues:** Congestion, safety concerns, infrastructure pressure
- **Interventions:** ABD-based planning strategies

2.8.2 Proposed Analytical Framework

The analytical framework follows a structured progression:

Drivers → Spatial Patterns → Urban Issues → ABD Interventions → Outcomes

This framework enables a systematic analysis of coaching clusters and informs the development of planning strategies.

2.8.3 Positioning of the Present Study

This study contributes to urban planning literature by integrating the concept of shadow education with spatial planning frameworks. It addresses a critical gap by proposing an ABD-based approach for managing coaching clusters in Tier-2 cities.

Theme	Key Findings from Literature	Planning Implications Identified in Literature	Application in the Context of Bhopal
Shadow Education and Coaching Economy	Coaching centres function as parallel educational systems and create localized education economies (Bray, 2009).	Need to recognize coaching centres as urban activity generators rather than only educational institutions.	MP Nagar and surrounding areas function as education-oriented economic zones with hostels, eateries, stationery shops, and transport services catering to students.
Spatial Clustering of Coaching Centres	Coaching institutions tend to cluster due to accessibility, visibility, and agglomeration advantages (Chakraborty, 2019).	Clustered development creates specialized education precincts requiring localized planning interventions.	MP Nagar exhibits concentrated coaching activities along arterial roads and mixed-use corridors, creating high-intensity educational clusters.
Land-Use Transformation	Residential areas undergo conversion into mixed-use or commercial educational spaces.	Need for revised zoning regulations and mixed-use management strategies.	Residential buildings in MP Nagar are increasingly converted into coaching centres and PG accommodations, leading to land-use conflicts.
Studentification and Housing Pressure	Growth of student populations leads to rising rents, overcrowding, and conversion of residential properties (Smith, 2005).	Need for planned student housing policies and rental management frameworks.	Informal PG accommodations and hostels in Bhopal create pressure on housing infrastructure and alter neighbourhood character.

Mobility and Traffic Congestion	Coaching clusters generate peak-hour pedestrian and vehicular movement causing congestion and safety concerns.	Requirement for pedestrian infrastructure, parking management, and traffic regulation.	Roads in MP Nagar experience congestion during coaching hours due to student movement, informal parking, and inadequate pedestrian facilities.
Infrastructure Stress	High-density educational clusters increase pressure on water supply, sewage, and waste management systems.	Need for infrastructure augmentation based on activity intensity rather than land-use classification alone.	Existing infrastructure in MP Nagar is strained due to high student density and intensified mixed-use activities.
Walkability and NMT	Walkable environments improve accessibility and safety in high-footfall precincts (Gehl, 2010).	Emphasis on pedestrian-friendly streets, cycle tracks, and public realm improvement.	Bhopal's coaching clusters require improved sidewalks, safe crossings, shaded pedestrian pathways, and NMT infrastructure.
Transit-Oriented Development (TOD)	TOD supports compact mixed-use development integrated with transit corridors (Calthorpe, 1993).	Educational clusters should be linked with public transport and last-mile systems.	MP Nagar's proximity to BRTS and major corridors creates opportunities for TOD-based educational precinct planning.
ABD and Precinct Planning	Area-Based Development allows localized and integrated urban interventions.	Precinct-level planning is more effective for managing specialized urban clusters.	ABD can be applied in MP Nagar for integrated mobility, land-use regulation, public space enhancement, and infrastructure management.
Smart Cities Mission Models	Retrofitting and redevelopment models improve infrastructure and livability within	Existing built-up coaching clusters can be upgraded through retrofitting strategies.	MP Nagar can be developed using retrofitting and redevelopment approaches

	existing urban areas (MoUD, 2015).		under Smart City principles.
Planning Norms and Regulations	Existing guidelines do not explicitly recognize coaching centres as a separate land-use category (URDPFI, 2014).	Need for dedicated planning standards for coaching institutions.	Bhopal Development Plan and local bye-laws currently lack specific norms for coaching centre regulation.
Fire Safety and Building Regulations	Informal coaching setups often violate fire safety and occupancy norms (NBC, 2016).	Need for stricter enforcement and revised building regulations.	Many coaching centres in Bhopal operate in converted buildings lacking adequate fire exits and safety infrastructure.
Governance and Institutional Coordination	Fragmented institutional responsibilities weaken enforcement and planning efficiency (Pierre, 2011).	Integrated governance mechanisms are required for complex urban precincts.	Coordination among BMC, Development Authority, Traffic Police, and Education Departments is necessary for managing coaching hubs in Bhopal.
Public Realm and Urban Design	Quality public spaces improve safety, accessibility, and urban livability.	Streetscape improvement and public realm enhancement are essential for dense activity zones.	MP Nagar lacks organized public spaces, shaded waiting areas, and pedestrian-oriented streetscape design.
Literature Gap	Limited studies integrate coaching centres within urban planning frameworks.	Need for interdisciplinary planning research on coaching clusters in Tier-2 cities.	The present study addresses this gap by proposing an Area-Based Development Framework for coaching centres in Bhopal.

Table:4 Summary of Literature review

CHAPTER 3: PROFILE OF BHOPAL AND SELECTED COACHING HUBS

3.1 City Profile of Bhopal

Bhopal occupies a strategically significant position within the urban system of central India and functions as the administrative, educational, and service-sector nucleus of the state of Madhya Pradesh. Historically recognized for its lake-oriented morphology and administrative importance, the city has undergone substantial socio-spatial transformation over the past three decades, evolving into a diversified urban economy characterized by expanding commercial corridors, institutional growth, and increasing service-sector specialization.

Within this broader urban transition, the education sector has emerged as a significant driver of spatial and economic restructuring. In particular, the rapid proliferation of coaching centres and associated student-oriented activities has contributed to the formation of specialized urban precincts exhibiting intense mixed-use development, infrastructural stress, and changing mobility patterns. These transformations position Bhopal as an appropriate empirical context for examining the planning implications of coaching clusters within Tier-2 Indian cities.

The city's significance for this study lies not merely in the presence of coaching centres but in the way these activities intersect with broader processes of urbanization, commercialization, and governance. Bhopal demonstrates the characteristics of a transitional urban system where planned development frameworks coexist with market-driven spatial transformations, thereby creating a dynamic environment for analyzing emerging educational economies and their urban consequences.

3.1.1 Location, Geography and Physical Setting

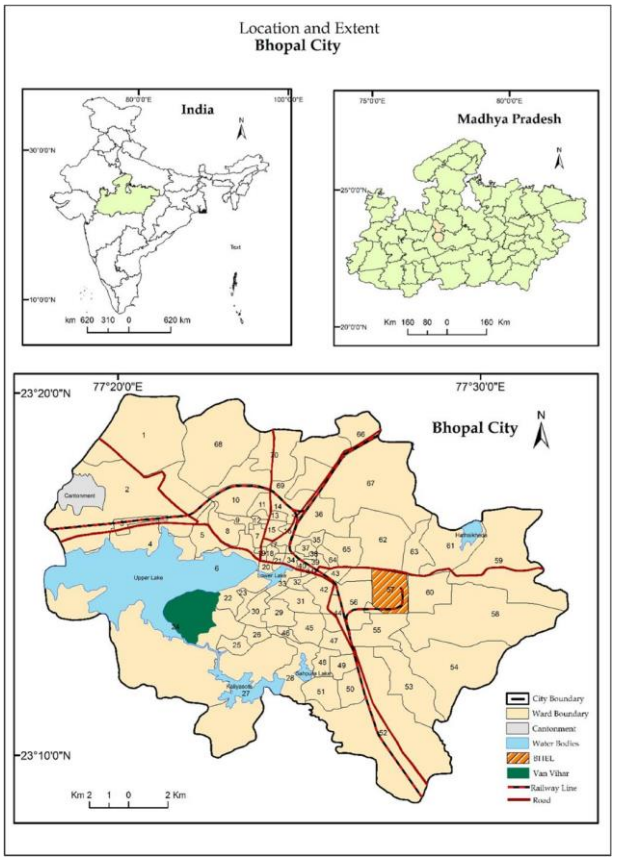


Figure 6 Regional location of Bhopal

Bhopal is situated in the central region of India within the Malwa Plateau and Vindhyan landscape zone, approximately between 23°07′ North latitude and 77°12′ East longitude. The city's geographical location provides strategic regional connectivity to northern, western, and southern India, enhancing its role as an administrative and educational centre within central India.

The physical geography of Bhopal is distinguished by undulating terrain, rocky outcrops, lakes, and natural drainage channels. The Upper Lake (Bhojtal) and Lower Lake constitute the most defining environmental and landscape elements of the city, influencing its historical settlement structure, environmental character, and urban morphology. These water bodies not only contribute to ecological balance but also act as spatial determinants shaping patterns of development and circulation.

The city experiences a subtropical climate characterized by hot summers, moderate monsoon rainfall, and relatively cool winters. Climatic conditions significantly influence public realm usage, pedestrian behavior, and temporal activity patterns within high-density mixed-use areas such as coaching hubs. During peak summer months, shaded walkways, thermal comfort, and accessible transit become critical planning considerations in student-dominated precincts.

Topographically, Bhopal exhibits fragmented terrain conditions, which have historically constrained contiguous urban expansion and encouraged corridor-based development patterns. Consequently, urban growth has concentrated along accessible transport corridors and relatively developable land parcels. This has facilitated the emergence of highly accessible mixed-use zones such as MP Nagar,

where commercial, institutional, and coaching-related activities have intensified over time.

From a planning perspective, the city's ecological sensitivity introduces significant developmental constraints. Environmental regulations associated with lake catchments and topographical variations restrict indiscriminate expansion, thereby increasing pressure on strategically located urban corridors. Such pressures contribute to land-use intensification and commercialization within central precincts, including coaching hubs.

3.1.2 Demographic and Socio-Economic Characteristics

Bhopal has experienced sustained demographic growth driven by administrative concentration, educational expansion, and regional migration. Census trends and urban projections indicate continuous population increase accompanied by spatial expansion and changing socio-economic composition.

. Demographic Profile

Indicator	City (Municipal Corporation)
Total Population	1,798,218
Total Population of UA (if)	1,886,100
Share of ULB population in District Urban population (%)	93.80
Population Growth Rate (AEGR) 2001-11	2.24
Area (sq. km)*	285.88
Share of ULB area in district (%)**	10.31
Density of population (person per sq. km)*	6290
Literacy Rate (%)	83.47
Schedule Caste (%)	13.46
Schedule Tribes (%)	2.56
Youth, 15 - 24 years (%)	21.30
Slum Population (%)	26.68
Working Age Group, 15-59 years (%)	65.22

ource: Census of India, 2011
District Census Handbook, Census of India, 2011

Figure 7 Demographic Profile of Bhopal (Source:

The city exhibits a relatively youthful demographic structure due to the presence of educational institutions, universities, and coaching centres attracting students from across Madhya Pradesh and neighboring states. This demographic profile significantly

influences urban consumption patterns, rental housing demand, mobility systems, and commercial activity.

Economically, Bhopal demonstrates a transition from a predominantly administrative economy toward a diversified service-sector urban system. Major economic sectors include:

- Public administration
- Education and training services
- Retail and wholesale trade
- Healthcare services
- Real estate and construction
- Transport and logistics

The growth of coaching centres reflects the increasing commodification of education and the expansion of competitive examination culture within India. Coaching institutions contribute directly and indirectly to the local economy through employment generation, commercial activity, and student expenditure.

A significant aspect of Bhopal's socio-economic transformation is the emergence of student-oriented micro-economies. Areas with high coaching concentration exhibit increased demand for:

- Paying guest (PG) accommodations
- Hostels and rental housing
- Libraries and study spaces
- Affordable food establishments
- Informal retail and service activities

These economic activities generate localized employment and contribute to mixed-use intensification. However, they also operate substantially within informal or semi-formal frameworks, limiting regulatory oversight and infrastructure planning.

Socio-spatial disparities are also evident across the city. Planned residential sectors coexist alongside informal settlements and highly commercialized mixed-use corridors. This uneven urban development creates differentiated levels of infrastructure provision, environmental quality, and accessibility.

From a planning perspective, the growing student population introduces a new category of transient urban users whose spatial and infrastructural needs differ

from permanent residents. Existing planning systems inadequately recognize these demographic shifts, resulting in reactive rather than anticipatory infrastructure provision.

3.1.3 Urban Growth Pattern and Development Trajectory

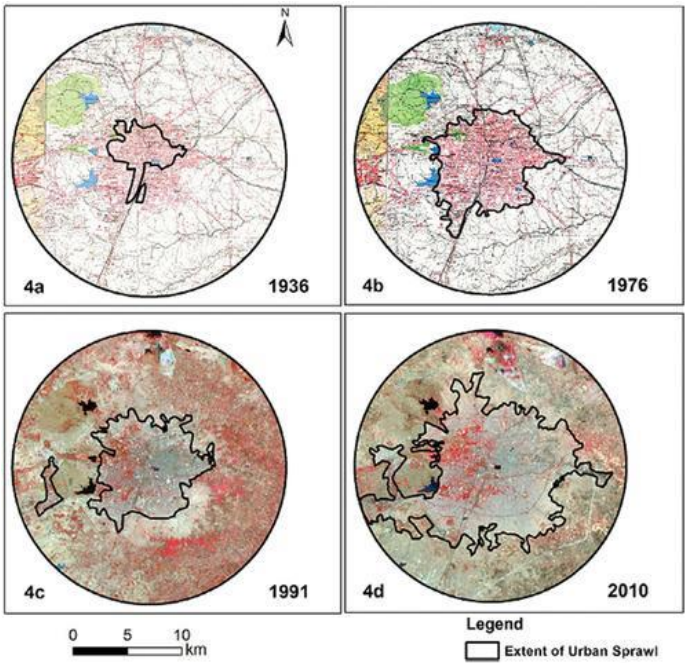


Figure 8 Urban Growth Pattern of Bhopal (Draft BDP 2021)

The urban growth trajectory of Bhopal reflects a layered process of historical evolution, planned expansion, and market-driven transformation. Broadly, the city's development can be categorized into three interrelated phases:

Historic and Pre-Modern Phase

The historic core developed around lake systems and royal settlements, characterized by compact morphology, narrow street networks, and mixed-use urban form. Land-use patterns were largely organic and functionally integrated.

Post-Independence Planned Expansion

Following independence, planned urban development introduced administrative sectors, institutional zones, and organized residential colonies. This phase was influenced by modernist planning principles emphasizing zoning and hierarchical road networks.

Contemporary Liberalization and Service-Sector Expansion

The post-1990 liberalization era accelerated commercialization, infrastructure development, and service-sector growth. Market-driven development patterns emerged along major transport corridors and accessible commercial zones.

This phase witnessed:

- Intensification of mixed-use development

- Decentralization of commercial activity
- Expansion of educational and coaching services
- Growth of transit-oriented commercial corridors

Areas such as MP Nagar emerged as central business and educational districts due to their strategic accessibility, commercial visibility, and proximity to transit infrastructure.

The development trajectory of coaching hubs reflects broader processes of neoliberal urbanization, where market demand increasingly shapes land-use transformation. Planning systems have struggled to regulate these transitions effectively, resulting in:

- Unregulated commercialization
- Infrastructure overload
- Traffic congestion
- Inadequate public spaces

The inability of conventional zoning frameworks to accommodate dynamic educational economies highlights a critical planning challenge within Tier-2 cities.

3.2 Planning and Policy Context

The planning framework governing Bhopal consists of statutory development plans, sectoral policies, infrastructure programs, and urban governance initiatives. These frameworks collectively shape land use, mobility systems, and development regulation within the city.

However, emerging urban phenomena such as coaching clusters expose the limitations of traditional planning systems that rely heavily on static land-use classifications and sectoral fragmentation.

3.2.1 Existing Master Plan: Land-Use Structure and Zoning

The statutory planning structure of Bhopal is governed through the Development Plan prepared by the Town and Country Planning Department. The plan establishes:

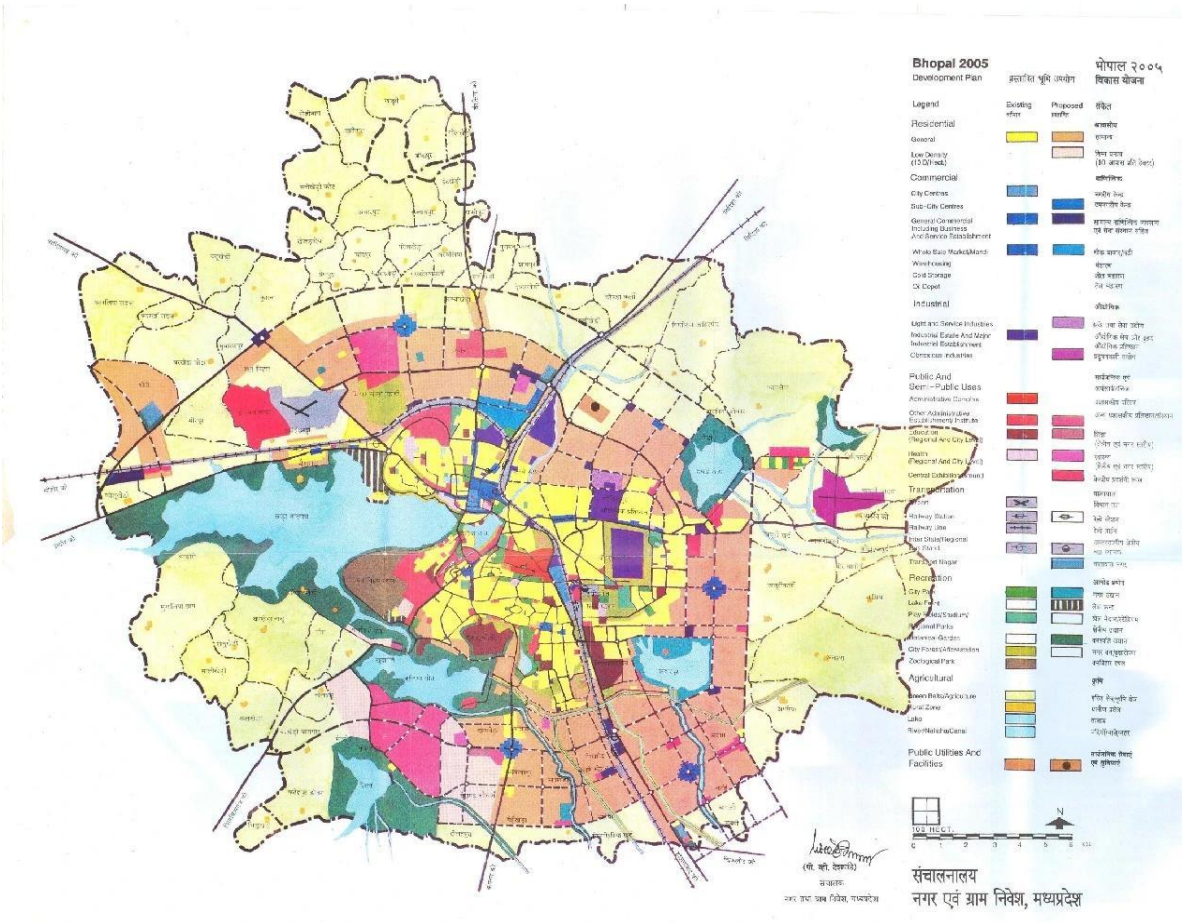


Figure 9 Land use map of Bhopal Development Plan 2005

- Land-use zoning
- Transportation networks
- Infrastructure proposals
- Development control regulations

The city's land-use structure includes residential, commercial, industrial, public/semi-public, and recreational categories. Major commercial corridors and mixed-use precincts are concentrated along arterial roads and transit routes.

However, coaching centres remain institutionally invisible within the planning framework. They are generally categorized under commercial or institutional use without recognition of their hybrid functional characteristics.

Critical Planning Limitation

This regulatory ambiguity produces several planning deficiencies:

- Absence of dedicated norms for coaching centres
- Lack of student housing regulations
- Inadequate parking standards

- Weak infrastructure integration

Consequently, coaching activities intensify within residential and mixed-use areas without corresponding upgrades in infrastructure or public services.

3.2.2 Bhopal Smart City Proposals and ABD Areas

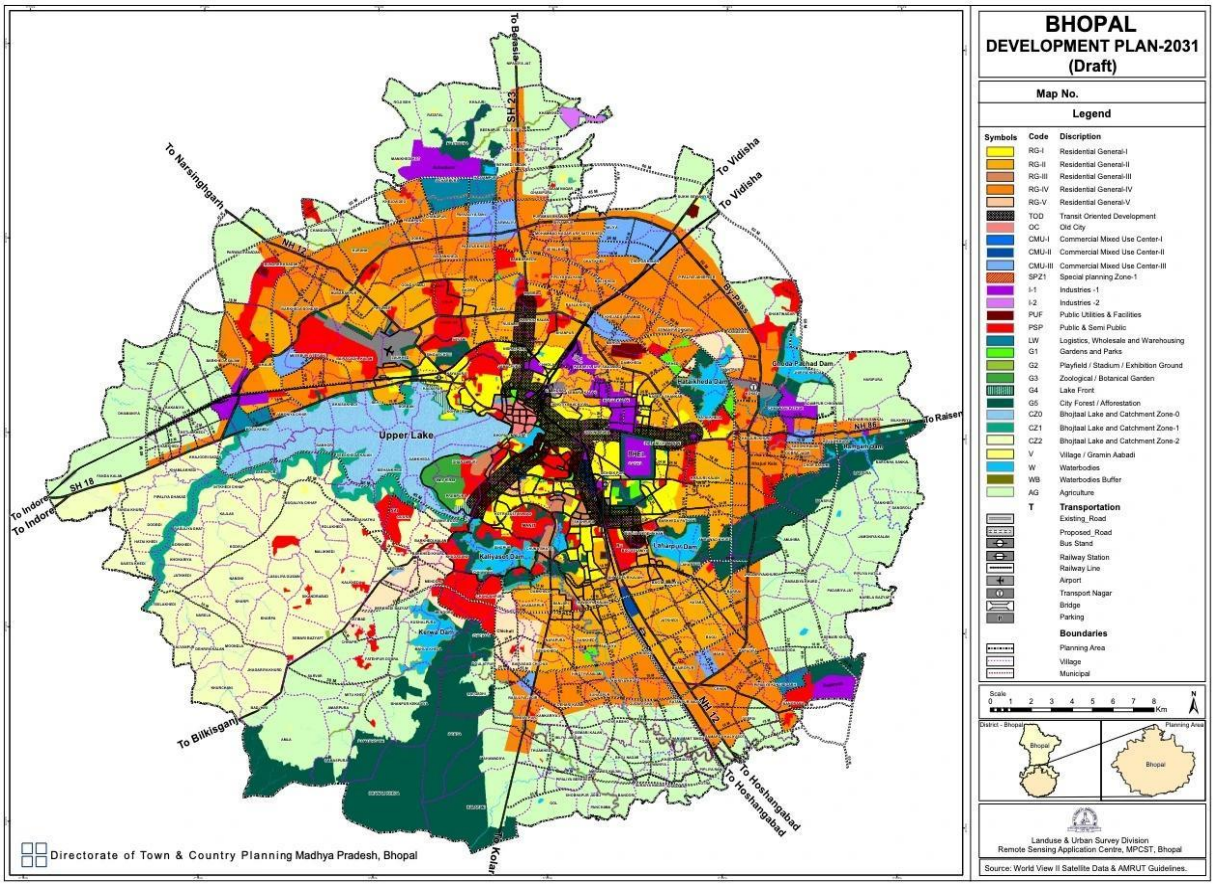


Figure 10 Proposed land use plan (Draft BDP 2031)

The

inclusion of Bhopal within the Smart Cities Mission introduced Area-Based Development (ABD) as a key planning strategy.

The Smart City proposal emphasizes:

- Integrated infrastructure improvement
- Streetscape enhancement
- Smart mobility systems
- ICT-enabled governance
- Public space revitalization

The ABD model demonstrates significant conceptual relevance for this research because coaching clusters exhibit characteristics of specialized urban precincts requiring localized interventions.

Critical Insight

Despite its emphasis on integrated development, the Smart City framework largely prioritizes:

- Heritage areas
- Central business districts
- Infrastructure-led redevelopment

Emerging educational precincts such as coaching hubs remain excluded from formal ABD interventions.

This reveals a broader limitation in Indian planning practice, wherein rapidly evolving urban functions are inadequately incorporated into strategic planning frameworks.

3.2.3 Other Relevant Sectoral Plans

Transport, housing, and mobility-related policies also influence the development of coaching precincts.

Transport strategies focus on:

- Road widening
- Junction improvement
- Public transport enhancement
- Pedestrian infrastructure

However, these initiatives remain fragmented and lack integration with education-oriented land-use patterns.

Similarly, housing policies emphasize affordable housing and slum redevelopment but largely ignore:

- Student housing demand
- Informal PG accommodations
- Rental market pressures

The absence of integrated policy coordination between education, transport, housing, and planning institutions represents a major governance gap.

3.3 Education and Coaching Ecosystem in Bhopal

The educational landscape of Bhopal has undergone substantial transformation over the past two decades, evolving from a predominantly administrative and institutional system into a diversified education-service economy. This transformation has been driven by the expansion of higher educational institutions, increasing regional aspirations for professional education, and the intensification of competitive examination culture across India.

The city today functions as a regional educational centre attracting students from across Madhya Pradesh and adjoining states. Within this evolving ecosystem, coaching centres have emerged as a critical parallel educational infrastructure operating alongside formal institutions. Their growth has contributed to the formation of specialized educational corridors and student-oriented urban economies, thereby influencing land-use structure, mobility patterns, housing demand, and commercial activity.

The coaching ecosystem in Bhopal demonstrates the broader phenomenon of educational commodification, wherein learning support systems increasingly operate through market-based institutional arrangements. This transformation reflects larger socio-economic processes associated with neoliberal urbanization and the privatization of educational services.

3.3.1 Distribution of Schools, Colleges and Universities

Bhopal possesses a relatively well-developed network of educational institutions distributed across various parts of the city. The educational structure includes:

- Government and private schools
- Degree colleges
- Technical institutions
- Professional training centres
- Universities and research institutions

Major institutions within and around the city contribute significantly to regional educational inflow and shape patterns of student mobility and accommodation demand. The spatial distribution of educational institutions demonstrates varying degrees of concentration, with higher educational and coaching activities tending to cluster in accessible commercial corridors and mixed-use precincts.

Institutional concentration is particularly visible in areas connected by arterial roads and public transport networks. Such spatial patterns reinforce the relationship between accessibility and educational land use. Areas with strong connectivity attract coaching centres due to:

- High student footfall
- Better visibility
- Transit accessibility
- Availability of commercial spaces

This concentration produces localized educational economies characterized by intensive daily activity and temporal fluctuations associated with examination cycles and coaching schedules.

Spatial Relationship Between Formal Education and Coaching Services

An important dimension of the educational ecosystem is the interdependence between formal educational institutions and coaching centres. Coaching centres frequently locate themselves in proximity to:

- Colleges and universities
- School clusters
- Transit nodes
- Commercial areas

This proximity creates a complementary spatial relationship where coaching institutions capitalize on existing educational demand while simultaneously generating secondary commercial and residential activities.

Critical Insight

Existing planning frameworks treat educational institutions and coaching services as separate entities despite their strong functional interdependence. This fragmented approach results in inadequate planning for:

- Student mobility systems
- Shared infrastructure demand
- Public space requirements
- Student housing provision

Consequently, educational corridors evolve organically without coordinated planning intervention.

3.3.2 Evolution and Growth of Coaching Centres in the City

The growth trajectory of coaching centres in Bhopal reflects broader transformations in India's educational economy. Prior to the 1990s, private tutoring activities were largely localized and supplementary in nature. However, the post-liberalization period witnessed a dramatic expansion in competitive examinations and professional education demand, leading to the commercialization and institutionalization of coaching services.

Phase I: Informal and Small-Scale Expansion

Initially, coaching activities emerged in the form of small tutorial units operating from residential premises. These centres primarily catered to:

- School-level tuition
- Basic competitive examinations
- Subject-specific learning support

Their spatial footprint was relatively limited, and operations remained largely informal.

Phase II: Institutional Consolidation

During the early 2000s, increasing competition in engineering, medical, and public service examinations transformed coaching into a large-scale service industry. Coaching institutions began establishing themselves in commercially accessible areas such as MP Nagar and adjacent corridors.

This phase was characterized by:

- Institutional branding
- Franchise-based expansion
- Commercial leasing of buildings
- Intensification of student migration

Phase III: Specialized Education Precinct Formation

In recent years, coaching centres have evolved into specialized urban clusters exhibiting characteristics similar to commercial business districts. The concentration of coaching services has stimulated:

- PG accommodation growth
- Informal rental markets
- Commercial spillovers
- Food and retail economies

- Shared mobility services

The evolution of coaching centres in Bhopal therefore reflects a transition from supplementary educational support systems to dominant urban economic activities with significant planning implications.

Critical Insight

The rapid institutionalization of coaching centres has occurred in the absence of corresponding planning frameworks. Urban planning mechanisms have remained reactive rather than anticipatory, allowing coaching economies to expand without:

- Infrastructure planning
- Zoning adaptation
- Mobility management
- Safety regulation

This mismatch between urban growth and planning response represents one of the central challenges addressed in the present study.

3.3.3 Typology of Coaching Services

The coaching ecosystem in Bhopal exhibits substantial diversity in terms of institutional specialization, scale, target demographics, and spatial behavior. Broadly, coaching services can be categorized into the following typologies:

Engineering and Medical Entrance Coaching (JEE/NEET)

These institutions constitute the largest and most commercially organized segment of the coaching industry. They typically:

- Occupy multi-storey commercial buildings
- Attract regional student populations
- Generate high daily footfall
- Operate intensive batch systems

Such centres contribute significantly to traffic generation, pedestrian concentration, and rental housing demand.

Civil Services and Public Service Coaching (UPSC/PSC)

UPSC and PSC coaching institutions generally attract older student groups and exhibit relatively different temporal activity patterns. These centres often cluster near libraries, study spaces, and affordable accommodation zones.

School Tuition and Foundation Coaching

This category includes school-level tuition and integrated coaching programs. Such centres are distributed more diffusely across residential neighborhoods and mixed-use corridors.

Skill Development and Specialized Training

These include:

- Banking and SSC preparation
- Language training
- Computer and IT coaching
- Professional certification programs

Although smaller in scale, these institutions contribute to mixed-use intensification and localized commercial activity.

Critical Insight

Each coaching typology generates distinct spatial and infrastructural demands. However, planning systems continue to treat them uniformly under generic commercial or institutional categories. This lack of differentiation undermines effective infrastructure planning and development control.

3.4 Identification of Major Coaching Hubs (ABD Areas)

The spatial concentration of coaching centres within specific urban corridors has resulted in the emergence of identifiable coaching hubs within Bhopal. These hubs exhibit distinct spatial, economic, and infrastructural characteristics that justify their treatment as specialized urban precincts.

The identification of coaching hubs in this study is informed by principles of:

- Spatial concentration
- Functional specialization
- Accessibility
- Land-use intensity
- Student-oriented activity generation

3.4.1 Criteria for Delineating Coaching Hubs

The delineation of coaching hubs is based on a combination of quantitative and qualitative criteria. These include:

Institutional Density

Areas exhibiting high concentrations of coaching institutions within compact spatial boundaries were prioritized.

Student Footfall

Precincts characterized by high daily student movement and pedestrian activity were identified as major educational nodes.

Mixed-Use Intensification

Areas demonstrating substantial conversion of residential and commercial spaces into coaching-related uses were considered significant.

Transit Accessibility

Proximity to arterial roads, public transport systems, and transit nodes was treated as a critical determinant.

Student Housing Concentration

The presence of PG accommodations, hostels, and rental housing served as an important indicator of coaching-related urbanization.

Commercial Spillover Effects

Secondary economic activities such as eateries, libraries, photocopy shops, and informal vending were also considered.

Critical Insight

The criteria reveal that coaching hubs function not merely as educational clusters but as integrated urban economic systems. However, current planning mechanisms lack methodologies for recognizing and regulating such emerging precinct typologies.

3.4.2 Overview of Primary and Secondary Coaching Hubs in Bhopal

The spatial analysis identifies three major coaching-oriented precincts within Bhopal:

Primary Hub: MP Nagar Zone-2

MP Nagar Zone-2 represents the most significant coaching and commercial hub within the city. Its central location, strong connectivity, and mixed-use structure make it the dominant educational service cluster.

Secondary Hub: ISBT–Kasturba Nagar Precinct

This precinct demonstrates strong transit-oriented educational activity due to its proximity to inter-city and intra-city transport systems.

Supporting Hub: Nehru Nagar–Jawahar Chowk Precinct

This area functions as a secondary coaching node characterized by residential-commercial transition and moderate institutional concentration.

These hubs collectively form a distributed educational network influencing broader urban structure and mobility systems.

3.4.3 Selected ABD Areas for Detailed Study

The selected study precincts were chosen based on:

- Intensity of coaching activity
- Land-use transformation
- Mobility challenges
- Planning significance
- Representativeness within Tier-2 city contexts

The selected precincts provide varying spatial and functional conditions, enabling comparative analysis of planning challenges and opportunities.

3.5 Detailed Profile of Selected Coaching Hubs

The selected coaching hubs in Bhopal represent distinct yet interconnected forms of education-oriented urbanization. Each precinct demonstrates varying degrees of land-use intensification, commercial transformation, mobility stress, and infrastructural adaptation associated with the growth of coaching activities.

The detailed profiling of these hubs is intended to establish a spatial and functional understanding of coaching-driven urban transformation. The analysis focuses on:

- Urban morphology
- Accessibility and connectivity
- Land-use dynamics
- User characteristics
- Functional specialization
- Infrastructure and mobility conditions

The selected precincts also illustrate how coaching centres interact with broader urban systems and contribute to the formation of localized educational economies.

3.5.1 MP Nagar Zone-2

MP Nagar Zone-2 constitutes the principal commercial and coaching hub of Bhopal and represents the most significant education-oriented urban precinct within the city. Originally planned as a commercial district, the area has gradually evolved into a multifunctional urban node characterized by intense mixed-use activity, institutional concentration, and high daily population inflow.

The transformation of MP Nagar from a conventional business district into a hybrid commercial-educational precinct reflects broader processes of market-led urban restructuring within Tier-2 Indian cities.

3.5.1.1 Location, Connectivity and Urban Setting

MP Nagar Zone-2 is strategically located within the central part of Bhopal and benefits from strong regional and intra-city connectivity. The precinct is connected through major arterial corridors, including:

- Hoshangabad Road
- Maharana Pratap Nagar corridors
- Link roads connecting institutional and commercial sectors

Its proximity to the railway station, ISBT corridor, and major transit routes enhances accessibility for students commuting from different parts of the city and surrounding districts.

Urban Context and Spatial Character

The precinct exhibits characteristics typical of high-intensity mixed-use commercial zones:

- Multi-storey commercial buildings
- Institutional establishments
- Office spaces
- Retail activities
- Student-oriented services

The urban grain is relatively compact, with high plot subdivision and continuous commercial frontage. Streets function as active public spaces characterized by high pedestrian movement throughout the day.

The concentration of coaching institutions has significantly altered the functional character of the precinct. Areas initially intended for office and retail activities now accommodate:

- Coaching institutes

- Libraries and study lounges
- PG accommodations
- Cafeterias and food courts
- Informal vending activities

This transformation has contributed to the emergence of an education-service ecosystem operating beyond traditional office hours.

Accessibility and Movement Dynamics

The accessibility profile of MP Nagar explains its dominance as a coaching hub. The area attracts users through:

- Strong public transport accessibility
- Centralized urban location
- High commercial visibility
- Availability of affordable shared accommodation

However, the same accessibility advantages generate excessive congestion and pressure on mobility systems.

Critical Insight

The evolution of MP Nagar demonstrates how strategically accessible commercial districts can transform into specialized educational precincts through market-driven intensification. Yet, planning frameworks continue to regulate the area primarily as a conventional commercial zone, failing to recognize its hybrid functional character.

3.5.1.2 Existing Land Use and Building-Use Pattern

The land-use structure of MP Nagar Zone-2 is characterized by significant functional overlap between commercial, institutional, and residential activities. The area demonstrates extensive mixed-use intensification driven by the rapid expansion of coaching services.

Land-Use Composition

The predominant land uses include:

- Commercial establishments
- Coaching institutions
- Office spaces
- Hospitality and food services
- Rental housing and PG accommodations

Residential land use within the precinct has undergone substantial conversion into coaching-related functions. Upper floors of commercial buildings are frequently occupied by:

- Coaching classrooms
- Student hostels
- Shared accommodations
- Study centres

Building Typology and Morphology

The built form predominantly consists of:

- Multi-storey commercial blocks
- Narrow-frontage mixed-use buildings
- Incrementally modified structures

A notable characteristic is the adaptive reuse of buildings originally designed for office or retail purposes. Many structures have been internally reconfigured to accommodate large classroom capacities without substantial structural modification.

This process contributes to:

- Increased occupancy densities
- Reduced ventilation and safety standards
- Inadequate circulation spaces
- Parking deficiencies

Commercial Spillover and Informal Activities

The concentration of students has generated extensive commercial spillover effects. Streets and sidewalks are occupied by:

- Food vendors
- Informal kiosks
- Stationery shops
- Photocopy services
- Mobile recharge and digital service points

These activities contribute to the vibrancy of the precinct but also intensify public realm congestion.

Critical Insight

The existing land-use pattern reflects a transition from planned commercial zoning toward highly dynamic education-oriented mixed-use urbanism. However, this transformation remains largely unregulated, producing spatial conflicts and infrastructure stress.

3.5.1.3 Demographic and User Profile (Students and Workers)

The demographic composition of MP Nagar Zone-2 differs significantly from conventional commercial districts due to the dominance of transient student populations.

Primary User Groups

The precinct accommodates:

- Students attending coaching institutions
- Office workers
- Retail employees
- Informal vendors
- Commuters and visitors

Among these groups, students constitute the dominant daytime population.

Student Demographics

The student population is highly heterogeneous and includes:

- Local residents
- Daily commuters
- Outstation students from smaller towns and districts

Most students belong to the age group of 16–28 years and are enrolled in:

- JEE/NEET coaching
- UPSC/PSC preparation
- Banking and SSC coaching
- School tuition programs

Temporal Activity Patterns

Unlike conventional commercial districts, MP Nagar demonstrates extended temporal activity cycles due to:

- Multiple coaching batches
- Evening classes
- Library and study centre operations
- Night-time food and service activities

Consequently, the precinct remains active from early morning until late evening, creating sustained pressure on mobility systems and public infrastructure.

Behavioral and Mobility Characteristics

Student populations exhibit distinct mobility patterns:

- High pedestrian dependence
- Shared auto-rickshaw usage
- Public transport reliance
- Informal parking demand

These patterns differ substantially from office-oriented commercial mobility systems and require context-specific planning interventions.

Critical Insight

The dominance of transient student populations fundamentally alters the socio-spatial functioning of MP Nagar. However, existing planning systems continue to prioritize conventional commercial users while overlooking the infrastructural and public-space needs of students.

3.5.2 ISBT–Kasturba Nagar Precinct

The ISBT–Kasturba Nagar precinct represents a transit-oriented coaching corridor strongly influenced by regional and intra-city mobility systems. Its proximity to major transport infrastructure has encouraged the growth of coaching institutions and associated commercial activities.

3.5.2.1 Functional Character and Relation to Transit

The defining characteristic of this precinct is its strong relationship with transport infrastructure. The area benefits from:

- Proximity to ISBT
- Regional bus connectivity
- High commuter accessibility
- Arterial road linkage

The coaching ecosystem within this corridor is closely integrated with daily commuter flows, attracting students from peripheral urban areas and neighboring districts.

Transit-Oriented Educational Activity

The area demonstrates characteristics of transit-oriented educational development:

- High accessibility
- Intense pedestrian movement
- Short-duration commercial activities
- Shared mobility dependence

This creates a highly dynamic urban environment dominated by short-term user flows.

Critical Insight

The precinct illustrates how transport infrastructure acts as a catalyst for educational clustering. However, the absence of integrated transit-oriented planning frameworks results in chaotic pedestrian movement and inefficient public-space utilization.

3.5.2.2 Land-Use Pattern and Commercial Mix

The land-use pattern is predominantly mixed-use with strong commercial orientation. Major activities include:

- Coaching institutions
- Transit-support services
- Budget accommodations
- Retail establishments
- Informal vending

Commercial frontages exhibit high turnover and temporal intensity associated with student movement cycles.

3.5.2.3 Student and Commuter Catchment

The catchment profile includes:

- Daily commuters
- Regional students
- Bus transit users
- Temporary residents

The area functions as an interface between regional transport systems and educational activities.

3.5.3 Nehru Nagar–Jawahar Chowk Precinct

This precinct represents a comparatively lower-intensity coaching cluster embedded within an established residential-commercial urban fabric.

3.5.3.1 Inner-City Morphology and Residential Fabric

The area demonstrates:

- Compact urban morphology
- Narrow internal streets
- Mixed residential-commercial fabric

Unlike MP Nagar, coaching activities are integrated within existing neighborhood structures.

3.5.3.2 Institutional and Mixed-Use Characteristics

Coaching centres coexist with:

- Schools
- Residential buildings
- Local retail
- Community facilities

This creates localized land-use conflicts and parking challenges.

3.5.3.3 Role as Supporting Coaching Node

The precinct functions as a secondary educational node supporting:

- School tuition
- Foundation coaching
- Small-scale competitive preparation

Its role complements larger coaching hubs within the city.

3.6 Preliminary Diagnosis of Planning Issues

The selected coaching hubs in Bhopal exhibit a range of interconnected planning challenges emerging from the rapid and largely unregulated expansion of coaching-related activities. These challenges are not isolated sectoral issues but manifestations of broader structural limitations within existing planning and governance frameworks.

The transformation of commercial and residential precincts into high-intensity educational service zones has generated substantial pressure on land use, transportation systems, public infrastructure, and safety mechanisms. While coaching centres contribute significantly to the urban economy and educational accessibility, their spatial concentration has also produced negative externalities affecting urban livability and infrastructure efficiency.

The following diagnosis provides a preliminary analytical assessment of the key planning issues observed within the selected coaching hubs. The analysis is structured around land-use dynamics, mobility systems, public realm quality, and safety conditions, forming the basis for subsequent planning proposals and Area-Based Development (ABD) interventions.

3.6.1 Land-Use and Zoning Conflicts

One of the most significant planning challenges associated with coaching clusters is the increasing mismatch between statutory land-use classifications and actual ground-level functional transformations. The selected precincts demonstrate extensive conversion of residential and commercial properties into coaching-related activities without corresponding revisions in planning regulations or infrastructure standards.

Mixed-Use Intensification and Functional Transformation

The concentration of coaching institutions has accelerated mixed-use intensification within areas originally planned for commercial, office, or residential functions. Buildings intended for:

- Office use
- Retail activities
- Residential occupancy

have undergone incremental internal modifications to accommodate:

- Large classroom spaces
- Student hostels
- Study centres
- Cafeterias and support services

This transformation reflects a broader shift toward education-oriented mixed-use urbanism driven by market demand and locational advantages.

In MP Nagar Zone-2, upper floors of commercial buildings are frequently occupied by coaching institutes and informal student accommodations, while ground floors remain dedicated to retail activities. Such vertical mixing creates highly complex functional environments with varying occupancy patterns and infrastructure demands.

Regulatory Ambiguity and Planning Gaps

Existing planning regulations do not explicitly recognize coaching centres as a distinct urban land-use category. Instead, they are generally subsumed under:

- Commercial use
- Institutional use
- Public/semi-public use

This classification inadequately captures the operational characteristics of coaching centres, particularly their:

- High occupancy densities
- Temporal activity cycles
- Student-oriented support systems
- Mobility generation patterns

As a result, development control regulations fail to address critical aspects such as:

- Student accommodation standards
- Pedestrian infrastructure requirements
- Parking demand
- Fire safety provisions

Critical Insight

The observed land-use conflicts highlight the limitations of static zoning frameworks in managing dynamic urban economies. Coaching clusters represent hybrid socio-spatial systems that blur conventional distinctions between commercial, institutional, and residential land use. The inability of planning systems to recognize this hybridity contributes directly to infrastructural stress and governance fragmentation.

Encroachment and Informal Spatial Expansion

The growth of coaching activities has also encouraged informal spatial appropriation of public areas, including:

- Footpath encroachment
- Informal vending
- Temporary seating spaces
- Unauthorized signage and hoardings

These activities reduce pedestrian movement capacity and contribute to visual and functional disorder within the public realm.

While such informal activities support the student economy and generate livelihoods, their unregulated expansion reflects the absence of integrated precinct management mechanisms.

3.6.2 Traffic Congestion, Parking and Pedestrian Safety

Mobility-related challenges constitute one of the most visible and critical planning concerns within coaching hubs. The selected precincts experience intense traffic congestion and pedestrian conflicts due to the concentration of educational activities and the absence of context-sensitive mobility planning.

Peak-Hour Traffic Concentration

Coaching centres generate highly synchronized movement patterns associated with:

- Morning class batches
- Afternoon transitions
- Evening coaching sessions

These temporal concentrations create short-duration but intense traffic surges that overwhelm existing road infrastructure.

The problem is particularly severe in MP Nagar Zone-2, where:

- Narrow internal roads
- On-street parking
- Informal pick-up/drop-off activities
- Mixed vehicular movement

combine to produce severe congestion during peak hours.

Transport Characteristics

The predominant transport modes include:

- Shared auto-rickshaws
- Two-wheelers
- Walking
- Public buses
- Intermediate para-transit systems

The absence of integrated multimodal mobility planning intensifies operational inefficiencies and safety risks.

Parking Deficiencies

A major contributor to congestion is the lack of organized parking infrastructure. Coaching institutions frequently operate in buildings without adequate off-street parking provision. Consequently:

- Roadsides are occupied by parked vehicles
- Pedestrian movement is obstructed
- Road carriageway width is reduced

In several cases, parking spillover extends into adjacent residential streets, creating conflicts between local residents and transient users.

Critical Insight

The parking issue reflects a deeper planning failure in development control regulation. Existing parking norms are designed for conventional commercial activities and do not adequately account for the high-intensity temporal occupancy patterns associated with coaching centres.

Pedestrian Safety and Walkability Deficiencies

Pedestrian movement constitutes a dominant mode of mobility within coaching precincts. However, pedestrian infrastructure remains highly inadequate.

Observed deficiencies include:

- Discontinuous footpaths
- Encroached sidewalks
- Unsafe road crossings

- Lack of universal accessibility features
- Absence of shaded pedestrian corridors

The high concentration of students moving between coaching centres, transport stops, and food establishments creates frequent pedestrian-vehicular conflicts.

Gender and Safety Dimensions

Female students face additional mobility challenges due to:

- Poor street lighting
- Congested public spaces
- Lack of secure waiting areas
- Inadequate surveillance mechanisms

These conditions reduce perceived safety and negatively affect accessibility and urban comfort.

Critical Insight

The mobility structure of coaching hubs is fundamentally pedestrian-oriented. However, existing transport planning frameworks continue to prioritize vehicular movement rather than walkability and student-centric mobility systems. This mismatch contributes significantly to congestion and safety concerns.

3.6.3 Inadequate Public Realm and Student-Support Facilities

The rapid commercialization of coaching precincts has occurred without proportional investment in public realm infrastructure and student-support amenities. As a result, the selected hubs exhibit substantial deficiencies in terms of urban design quality, public comfort, and social infrastructure.

Deficiency of Public Open Spaces

Despite accommodating large daily student populations, the precincts lack:

- Public plazas
- Informal gathering spaces
- Seating areas
- Green open spaces

Students frequently occupy:

- Road edges
- Staircases

- Informal food courts
- Encroached sidewalks

for waiting and social interaction.

This indicates the absence of planned social infrastructure within coaching-oriented urban environments.

Inadequate Student-Oriented Facilities

Student-support infrastructure within the selected precincts remains largely market-driven and fragmented. Critical deficiencies include:

- Public toilets
- Drinking water facilities
- Affordable study spaces
- Wayfinding systems
- Resting areas

Although private libraries and cafés partially compensate for these gaps, their accessibility remains dependent on affordability.

Critical Insight

The neglect of public realm infrastructure reveals a broader institutional perception of coaching centres as temporary or secondary activities rather than permanent urban functions. Consequently, planning interventions remain limited to traffic management rather than holistic precinct development.

Environmental Quality and Urban Design Issues

The visual and environmental quality of coaching precincts is affected by:

- Excessive signage clutter
- Informal vending congestion
- Poor waste management
- Lack of streetscape coherence

These conditions reduce urban legibility and diminish the overall quality of the built environment.

Furthermore, the absence of climate-responsive urban design elements such as shading and landscaping adversely affects pedestrian comfort, particularly during summer months.

3.6.4 Building-Safety and Fire-Safety Concerns

Safety-related issues represent one of the most critical dimensions of coaching-cluster urbanization. The concentration of students within inadequately regulated buildings creates substantial risks associated with fire hazards, overcrowding, and emergency evacuation.

Adaptive Reuse and Structural Concerns

Many coaching centres operate within buildings originally designed for:

- Residential use
- Small-scale offices
- Retail functions

These buildings are frequently modified internally to maximize classroom capacity without structural redesign.

Common issues include:

- Overcrowded classrooms
- Inadequate ventilation
- Narrow staircases
- Excessive floor loads
- Unauthorized internal partitions

Such modifications compromise building safety and emergency accessibility.

Fire Safety Deficiencies

Observed fire-safety concerns include:

- Absence of fire exits
- Lack of sprinkler systems
- Inadequate fire extinguishers
- Blocked circulation spaces
- Poor emergency signage

The high occupancy density of coaching centres significantly increases evacuation risks during emergencies.

Critical Insight

The prevalence of fire-safety violations reflects systemic governance failure rather than isolated non-compliance. Regulatory agencies often lack:

- Updated building databases
- Monitoring capacity
- Interdepartmental coordination
- Enforcement mechanisms

As a result, safety regulation remains reactive rather than preventive.

Institutional and Governance Challenges

Multiple institutions are involved in regulating coaching-related infrastructure, including:

- Municipal authorities
- Fire departments
- Development authorities
- Education departments

However, coordination among these agencies remains fragmented, resulting in overlapping responsibilities and weak accountability mechanisms.

Critical Insight

The governance structure governing coaching precincts is characterized by institutional fragmentation and policy invisibility. Coaching centres fall between multiple regulatory jurisdictions without being fully integrated into any dedicated planning framework.

Conclusion: Need for Integrated Precinct-Level Intervention

The preliminary diagnosis reveals that coaching hubs in Bhopal function as complex socio-spatial systems generating:

- Mixed-use intensification
- Mobility pressure
- Public realm deficiencies
- Safety risks
- Governance fragmentation

These challenges cannot be addressed through isolated sectoral interventions. Instead, they require integrated, precinct-level planning approaches capable of coordinating:

- Land use
- Mobility systems
- Infrastructure provision
- Public-space enhancement
- Governance mechanisms

The diagnosis therefore establishes the need for an Area-Based Development (ABD) framework specifically tailored to education-oriented urban precincts.

CHAPTER 4: RESEARCH DESIGN AND METHODOLOGY

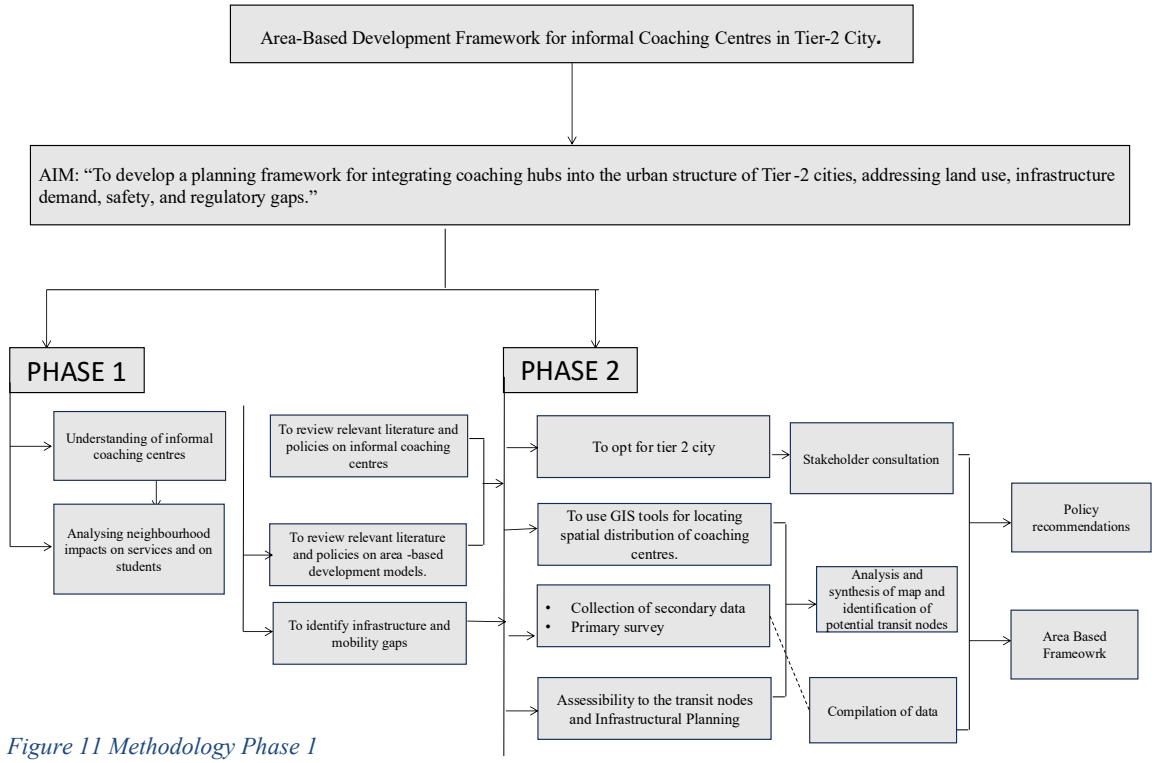


Figure 11 Methodology Phase 1

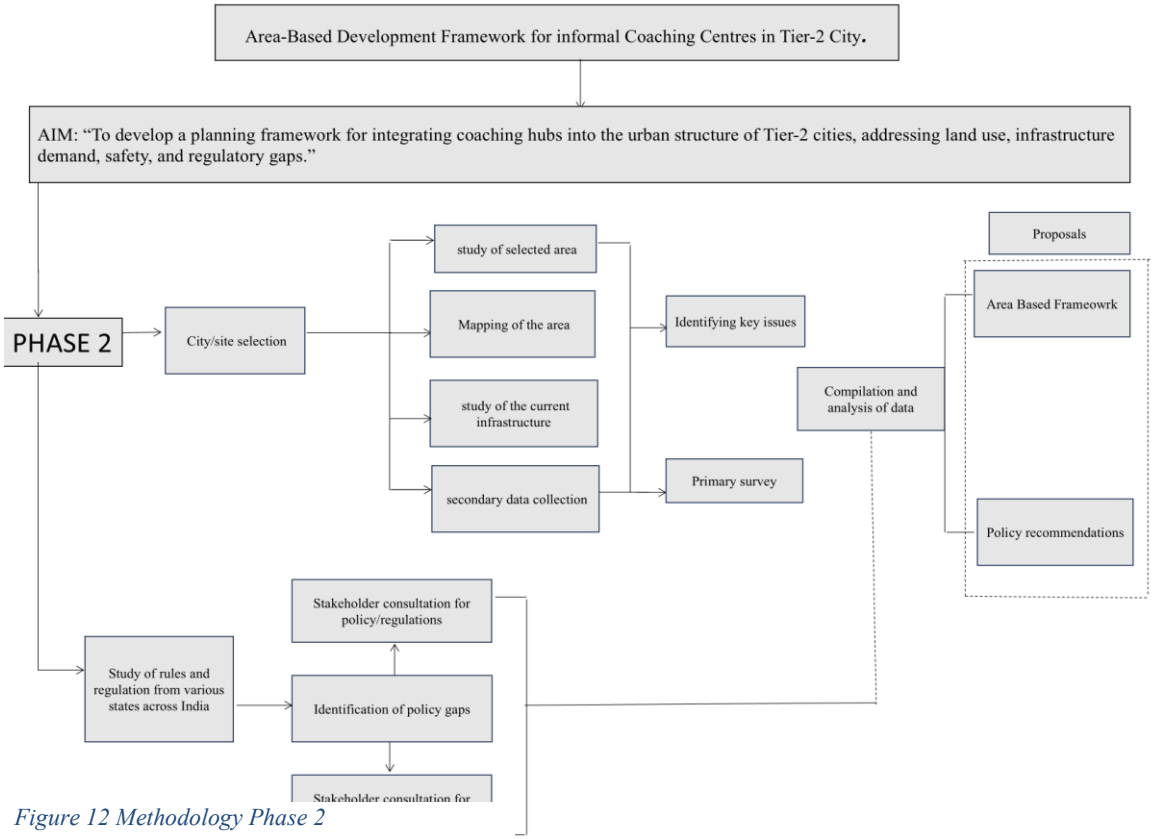


Figure 12 Methodology Phase 2

4.1 Research Approach and Design

Aim: "To develop a planning framework for integrating coaching hubs into the urban structure of Tier-2 cities, addressing land use, infrastructure demand, safety, and regulatory gaps.".

OBJECTIVES:

Phase 1:

To review literature and policies on informal education hubs and area-based development models

To opt for suitable study area (tier 2 city)

To identify infrastructure, service, and mobility gaps surrounding neighborhoods of coaching centres.

Phase 2:

To map the spatial distribution and clustering of coaching centres and to identify infrastructure, service, and mobility gaps surrounding neighborhoods of coaching centres in the selected Tier-2 city.

To develop a safe, accessible and student-oriented Non-Motorized Transport (NMT) network for improving circulation within MP Nagar.

To create inclusive pause points and recreational public spaces that enhance safety, comfort and social interaction for students in MP Nagar.

Develop an integrated waste management system with optimized collection routes, source segregation, and strategic collection points for a clean, sustainable coaching precinct

The study employs a **mixed-methods case-study design** to capture the multifaceted nature of urban coaching clusters. Mixed methods combine quantitative and qualitative techniques in a single study, allowing researchers to address "research questions that don't sit comfortably" within a purely quantitative or qualitative approach. This integration offers *comprehensive interpretation* of data by applying the most suitable tools to each facet of the problem (Lesan & Gjerde, 2020). In the context of urban planning, mixed methods facilitate triangulation and a more nuanced understanding of complex phenomena, such as how the physical environment and human behavior interact in education hubs. According to Lesan and Gjerde (2020), the combination of methods "enables more comprehensive interpretation of data" and improves result accuracy through cross-verification.

In addition, a **multi-case study** strategy is adopted. Each of the three coaching hubs functions as an embedded case within the larger Bhopal city context. Case study research allows an in-depth examination of real-world conditions and the

interplay of social, spatial, and policy factors. Multiple cases enhance robustness: as Yin (2003) observes, "multiple case studies addressing a similar topic leads to findings that are more compelling… [providing] diverse perspectives… [and] more robust" conclusions. By comparing three hubs with differing characteristics, the study gains both micro-level detail and broader applicability of findings. This design aligns with the Area-Based Development (ABD) framework, which requires understanding local specifics before prescribing integrated interventions.

Phases of the Study: The research is structured into three sequential phases:

- **Exploratory Phase:** Initial scoping involved literature review, policy analysis, and reconnaissance to refine the research focus. We reviewed urban planning guidelines (URDPFI, Bhopal Master Plan), identified preliminary cluster locations via Google Maps, and conducted brief field visits. This phase helped formulate survey instruments and identify key informants.
- **Analytical Phase:** The core empirical work was conducted here. We performed detailed GIS-based spatial analysis (mapping institutes, land use, infrastructure) and collected primary data through surveys, interviews, and observations (described below). Quantitative data were processed with statistical analysis, while qualitative inputs were thematically coded.
- **Prescriptive Phase:** Finally, findings were synthesized into planning recommendations. We linked identified issues to the ABD approach (e.g. suggesting precinct-scale infrastructure upgrades). Draft proposals align with Smart City objectives and statutory standards.

This **pragmatic, iterative** approach ensured that early findings could inform later stages (e.g. qualitative interviews probing unexpected spatial patterns). It also balances **scope and depth**, enabling both data-driven generalization and context-sensitive insight. In summary, the mixed-methods, multi-case approach ensures methodological rigor and relevance for planning practice (Creswell & Plano Clark, 2011).

4.1.1 Justification for Mixed-Methods and Case-Study Approach

The decision to combine methods and use multiple cases is grounded in best practices. Mixed methods are widely advocated in urban and social research

because they leverage complementary strengths: quantitative methods yield generalizable patterns while qualitative methods provide contextual depth. For instance, integrating traffic counts with resident interviews reveals not just that congestion exists, but why residents choose certain modes. As Lesan and Gjerde (2020) emphasize, such integration improves confidence in results and allows "triangulating or explaining the findings of one method through another".

Case studies are similarly justified. In urban planning, issues are inherently place-based and complex, involving layered historical, social, and regulatory factors. The case-study design allows for holistic examination of each hub's unique environment. Using multiple cases avoids the pitfalls of relying on a single instance. Yin (2003) and others note that multiple case studies strengthen validity by exposing the researcher to a range of scenarios. By selecting three hubs with different land-use mixes and governance contexts, the study captures variety within the coaching cluster phenomenon. This enables us to identify patterns that hold across cases (e.g. common infrastructure gaps) and those that are context-specific (e.g. differences in mobility patterns).

In summary, the mixed-methods multi-case design is both **methodologically appropriate and practically necessary**. It reflects the "wicked" nature of urban problems (Carmona, 2014) by combining methods to tackle different dimensions, and it is aligned with international research norms (Creswell & Plano Clark, 2011) for studies of this complexity.

4.2 Study Area Delineation

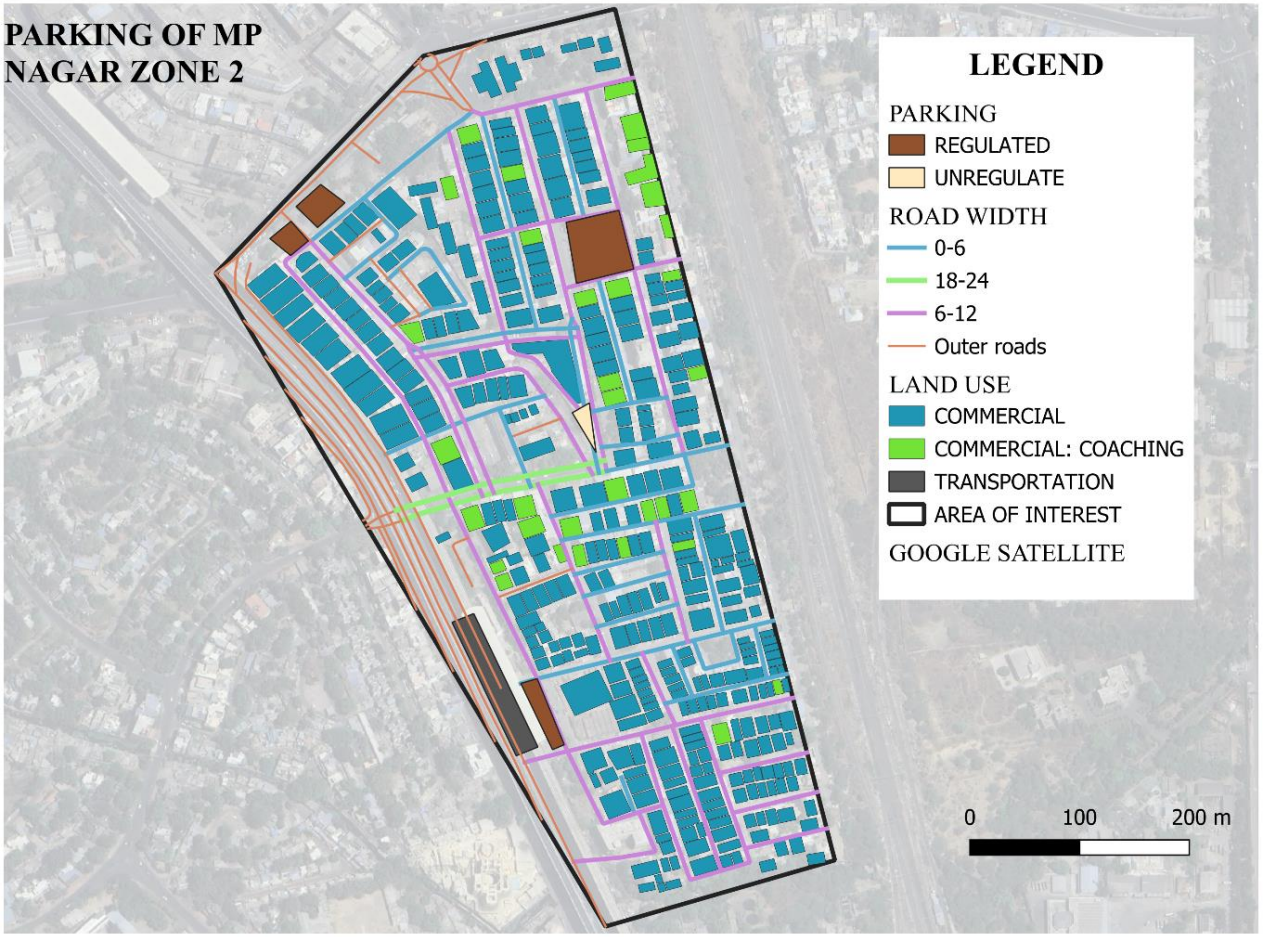


Figure 11 Parking of MP Nagar zone 2

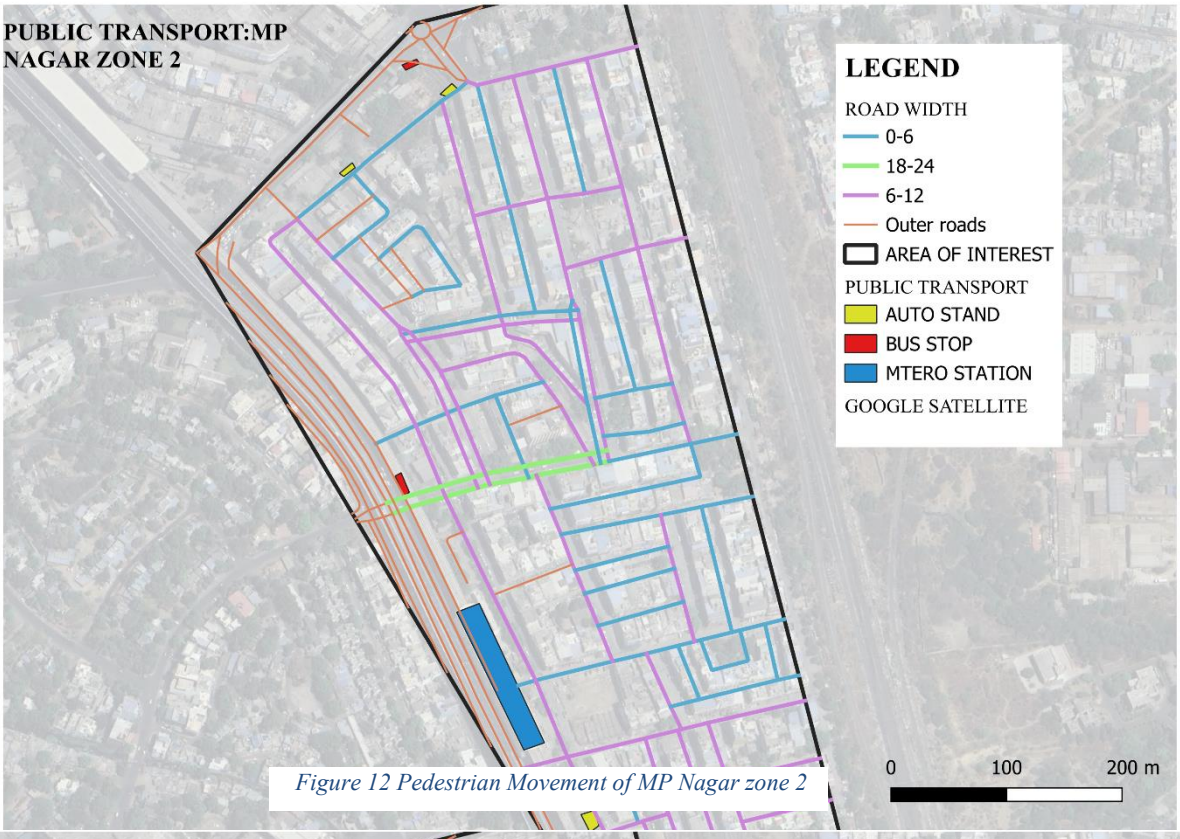


Figure 12 Pedestrian Movement of MP Nagar zone 2

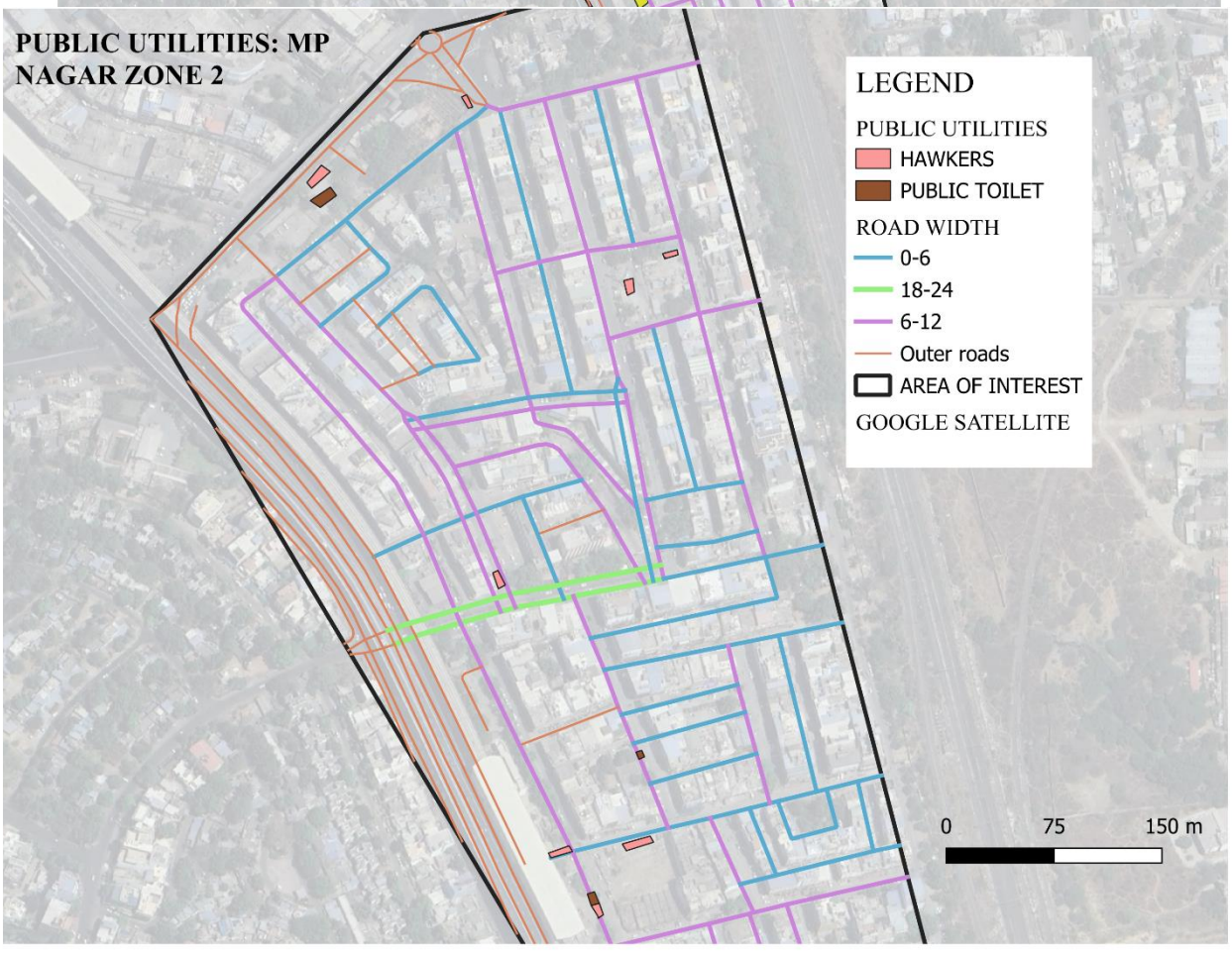


Figure 14 Public Transport of MP Nagar zone 2

Figure 15 Public utilities of MP Nagar zone 2



Figure 16 Congestion points of MP Nagar Zone 2

4.2.1 Study Area Selection

The study focuses on three major coaching hubs in Bhopal identified through preliminary mapping and consultations with local stakeholders:

1. **MP Nagar Zone-2 (Primary Hub):** A central commercial area renowned for IIT/NEET preparatory centres.
2. **ISBT–Kasturba Nagar (Transit-Oriented Hub):** Surrounds the Inter-State Bus Terminal and Kasturba Nagar station, hosting numerous UPSC and professional exam institutes.
3. **Nehru Nagar–Jawahar Chowk (Secondary Residential Hub):** A largely residential precinct where coaching centres have recently proliferated.

These hubs were chosen based on criteria including the **highest density of coaching institutes** (on-ground counts and education directories), significant **student footfall** (observed peak traffic), robust **support services** (hostels, eateries), and **accessibility** (major road and transit links). The Municipal Master Plan (2031) designates parts of MP Nagar and ISBT as commercial/educational zones, which correlates with our findings; however, our delineation is based on actual activity patterns rather than purely administrative boundaries.

Boundary Definition: We delineated each hub using GIS-based digitization combined with field verification. Major arterial roads were drawn from municipal and OpenStreetMap layers. We overlaid the mapped locations of coaching centres (collected via field GPS and secondary lists) and identified contiguous clusters. Boundaries were then traced to enclose these clusters, often following main roads or natural features. For example, the MP Nagar hub is bounded to the north by Maharana Pratap Nadi Square and to the south by Arera Colony Link Road. The ISBT hub extends along New Market Road and Wardhaman Marg.

Importantly, boundaries are **functional** rather than strictly legal. We included outlying institute concentrations that fell outside official ward limits if they naturally align with hub dynamics. The resulting polygons accurately reflect the zone of influence of each cluster as observed in the field.

4.2.2 Hierarchical Zonation

Within each hub polygon, a hierarchical zonation captures internal gradations of activity intensity. We define three concentric zones for analysis (see Table 4.1):

- **Core Zone:** The nucleus with the *highest concentration* of coaching institutes and street activity. This typically corresponds to the main commercial thoroughfares. For instance, MP Nagar's Core Zone includes Gandhi Nagar and adjacent market streets where institute density is maximal. Infrastructure here is often most strained (crowded sidewalks, on-street parking).
- **Influence Zone:** Surrounding the core, this area contains supporting functions. It includes adjacent residential streets where students stay, shops serving students, restaurants, and limited parking areas. Activity is moderately high.

• **Buffer Zone:** The outer ring which is indirectly affected by the hub. It overlaps with mixed residential or institutional land use and experiences spillover effects (e.g. through traffic ingress/egress). The buffer is defined by a 500–1000m radius beyond the core.

We operationalized these zones using GIS **buffer analysis**: a 500m buffer from the core centroid for the Core/Influence boundary, and a 1,000m buffer for the outer limit. These radii reflect typical 5–10 minute walking distances, a common practice in TOD (transit-oriented development) and neighborhood planning. In practice, we adjusted buffers to local context; for example, in MP Nagar the Core extends slightly beyond 500m along a major boulevard, capturing a continuous pedestrian corridor.

Distinguishing these zones allows zonal comparison. For example, land use mix and building density metrics are highest in the Core and taper outward. Similarly, survey responses (e.g. on perceived congestion) can be contrasted by zone. This zonal framework thus provides a structured way to identify which issues are "core problems" versus "peripheral problems," guiding targeted interventions (e.g. core-specific pedestrianization vs. buffer-area parking management).

4.3 Data Requirements and Sources

4.3.1 Primary Data Collection

To empirically characterize the hubs, we collected new data through multiple field methods. These were designed to capture both the spatial configuration of the hubs and the experiences of users and stakeholders.

• **Field Surveys (GIS Mapping):** Teams conducted systematic on-ground surveys. Using handheld GPS devices and GIS tablets, we mapped every coaching institute location within the study areas. For each location, surveyors recorded institute name, building type, and tentative enrollment scale (large/medium/small). Concurrently, a *land use survey* was conducted at the block level: we classified each building or plot according to use (e.g. coaching institute, residence, retail, vacant). Building attributes (number of floors, plot coverage) were noted where visible. Infrastructure elements were documented: road widths were measured at sample points, conditions of sidewalks and drains were noted, and positions of streetlights and bus stops were

logged. These spatial data feed into the GIS database for analysis (e.g. kernel density maps of institutes, land use patterns).

• **Questionnaire Surveys:** Structured questionnaires were administered to key user groups to collect quantitative responses. Three distinct questionnaire instruments were used (unified in style):

- *Students:* Respondents (n = UNSPECIFIED) were recruited from various institutes, asked about their residence location, daily travel mode, commute time, satisfaction with local facilities, and monthly expenses (tuition, housing, meals). Questions included both fixed-choice (e.g. mode of transport) and Likert-scale items (e.g. rating safety, infrastructure quality). The student sample was stratified by coaching subject (engineering/medical, civil services, etc.) and home origin (Bhopal-local vs. outstation).
- *Local Residents:* A household survey (n = UNSPECIFIED) was conducted among families living in the core and buffer zones. Topics included their perceptions of the coaching cluster's impact (noise, traffic), changes in housing costs or rent since the cluster's growth, availability of services (water, electricity), and any coping strategies (e.g. building fences, changing routes). Households were selected via cluster sampling within each zone to ensure geographic spread.
- *Business/Service Providers:* Owners/operators of local shops, hostels, and eateries (n = UNSPECIFIED) were surveyed about their clientele (percent students), peak business hours, parking space utilization, and infrastructure issues (water, waste disposal). This helped capture the commercial dimension of the cluster economy.

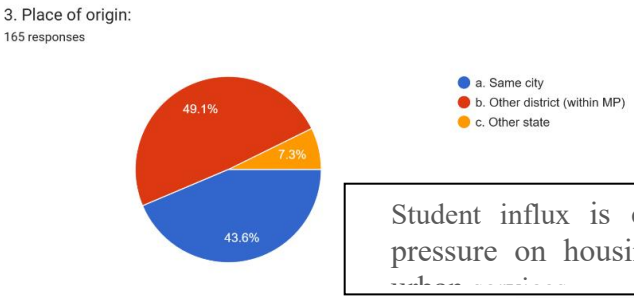
All questionnaires were pilot-tested with 10 respondents to ensure clarity. Trained enumerators conducted face-to-face surveys over two months, both on weekdays and weekends to capture variation. Field coding manuals ensured consistency.

• **Key Informant Interviews (KIIs):** Semi-structured interviews (≈15–20, exact number UNSPECIFIED) were held with stakeholders possessing specialized knowledge. We identified and interviewed: municipal urban planners and development authority officials (to discuss zoning regulations, upcoming projects, and enforcement challenges); traffic/transport officers (for congestion management insight); representatives of the state education department (for any data on coaching sector); and senior managers of prominent coaching institutes (for market trends and expansion plans). An interview guide addressed topics such as governance gaps,

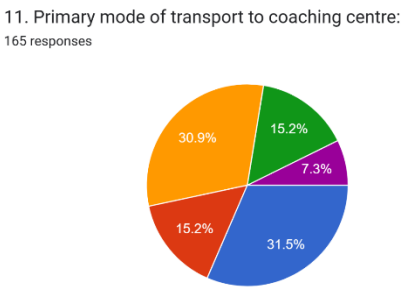
infrastructure constraints, rental market observations, and emergency response (e.g. fire safety, crowd management). Interviews lasted 30–60 minutes each and were audio-recorded with permission. Notes were transcribed and coded qualitatively to extract major themes (e.g. "lack of parking enforcement," "common hostel complaints"). These insights provide context and help explain patterns seen in the quantitative data.

• **Direct Observation and Traffic/Parking Counts:** Observational studies supplemented survey data. We conducted manual traffic counts at key junctions during morning and evening peaks (7–10 am, 5–8 pm) to determine volumes by vehicle type (cars, buses, autos, two-wheelers). Simultaneously, pedestrian counts were made at crosswalks. On-street parking observations were done hourly in designated areas, noting total spaces vs. occupied (including illegal parking where vehicles blocked sidewalks or fire lanes). Duration counts (recording license plates over time) estimated turnover in high-demand spots. These observations quantify the actual mobility pressures in and around the hubs. For instance, an initial count at MP Nagar's core showed peak hour vehicular volume exceeding road capacity (ratio >1.0).

Collectively, these primary methods yield both **quantitative measures** (traffic volumes, rent levels, etc.) and **qualitative insights** (user satisfaction, institutional constraints). The mixed data allow us to cross-validate findings (e.g. interview claims of "severe congestion" are corroborated by our traffic counts).

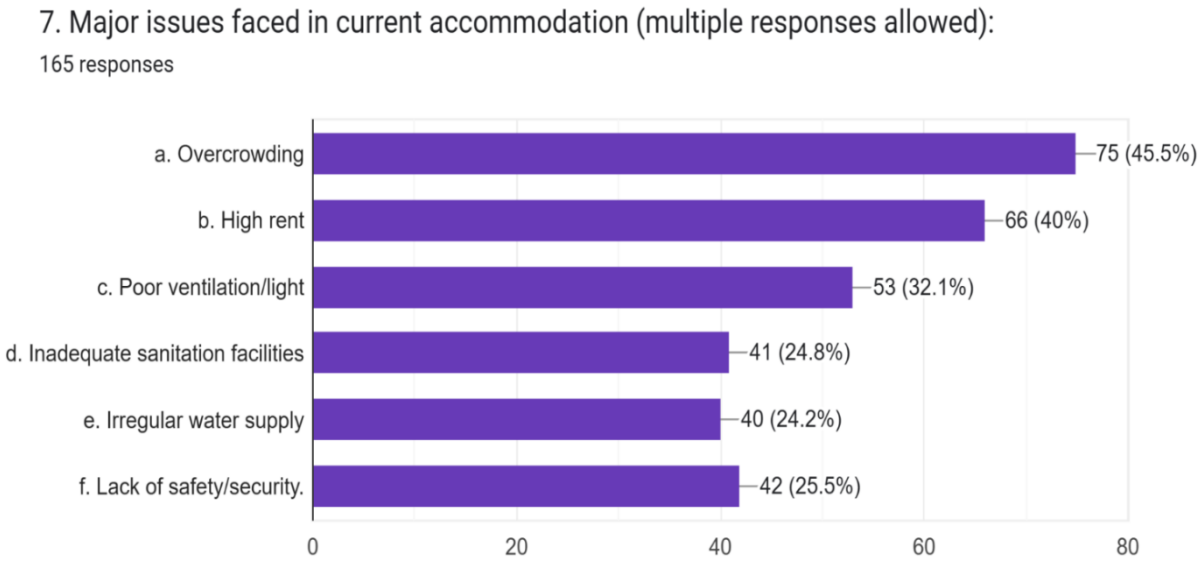


Student influx is creating localized pressure on housing, mobility, and

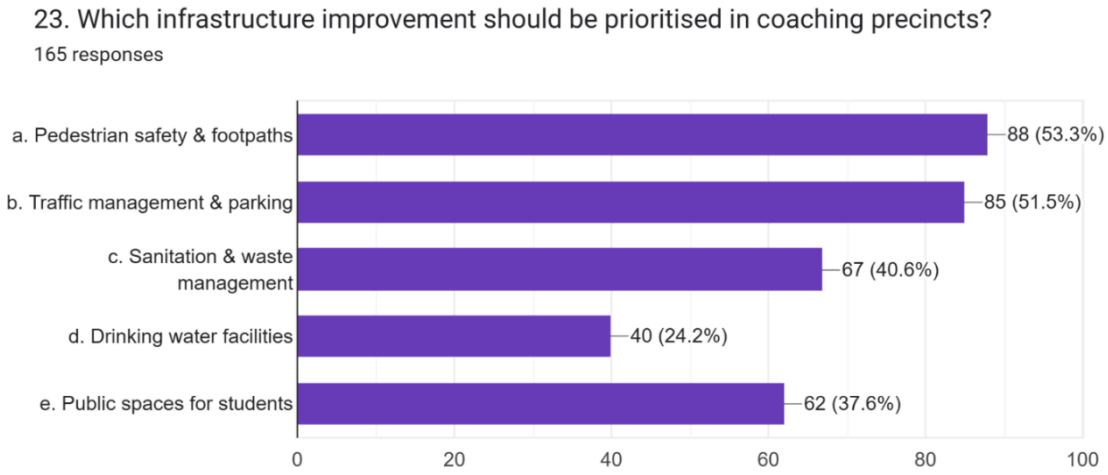


Existing housing infrastructure is inadequately regulated for high student occupancy.

Existing housing infrastructure is inadequately regulated for high student occupancy.



Inadequate sanitation and infrastructure indicate pressure on existing urban utilities



Traffic management and pedestrian infrastructure are major urban concerns within the precinct

4.3.2 Secondary Data Sources

Secondary information was compiled to supplement primary findings and provide benchmarks:

• **Planning Documents:** We reviewed the *Bhopal Master Plan 2031* (draft volumes) for land use designations, proposed transport corridors, and housing policy. While

the Master Plan does not specifically map coaching clusters, its infrastructure proposals (e.g. new roads, dedicated education zones) serve as reference for future possibilities. The *Smart City Bhopal ABD Brochure* (2019) and related documents were examined. Notably, Bhopal's ABD proposal targets redevelopment of TT Nagar with a focus on transit integration. Though TT Nagar is north of our hubs, the emphasis on multi-modal connectivity and modern infrastructure is relevant. We also checked any published *Detailed Project Reports* or *City Mobility Plans*, but no publicly available reports directly addressed coaching clusters.

- **Urban Standards and Guidelines:** Official norms were taken from the *URDPFI Guidelines (2014)* and *National Building Code (2016)*. These prescribe standards such as road widths (e.g. 30ft city roads), parking ratios (e.g. number of spaces per institution floor area), and open space requirements. For example, URDPFI recommends a minimum of 1.5-2% of plot area reserved as open space in central zones; we compare this to observed open space in hub cores. Where guidelines are silent, international best practices (e.g. 85% parking occupancy as a threshold) were noted.
- **Demographic Data:** *Census of India (2011 & 2021)* ward-level data provided population, literacy, and housing statistics for the affected wards. For instance, Nehru Nagar's growth rate and average household size contextualize survey results on rental burdens. While Census data is dated, it establishes broad socio-economic context.
- **GIS and Map Data:** Base map layers (roads, land parcels) were sourced from the Bhopal Municipal Corporation's GIS portal where available, supplemented by OpenStreetMap. Satellite imagery (Google Earth) helped identify recent development and informal structures not in official maps.
- **Literature and Reports:** Academic studies on urban clusters, street commerce, and "education hubs" in India were consulted. For example, we reviewed literature on **"shadow education"** (Bray, 2009) to understand the economic scale of coaching. However, no major studies on Bhopal or similar cities' coaching clusters were found, indicating the novelty of this research niche.

Table 4 Coaching list of zone 9 ward 45 (MP NAGAR ZONE 2) Source: BHOPAL MUNICIPAL CORPORATION

स.क्र.	कोचिंग का नाम	पता	मोबाइल नं	स्वामी
1	केटेलाईजर	भवन क्र आर 07 जोन 02 एम पी नगर	7389359270	के पी तिवारी
2	रेजोनेंस	भवन क्र आर 08 जोन 02 एम पी नगर	9300521016	प्रभाजोत सिंह
3	एक्स्ट्रामारर्क एजुकेशन इंडिण्या	भवन क्र आर 10 बी 10 सी जोन 02 एम पी नगर	9625317544	मुकेश गुप्ता
4	आकाश कोचिंग	प्लाट क्र आर 22 एँव 76 जोन 02 एम पी नगर	9752539318	एहतेशाम खान ब्राच मेनेजर
5	प्रयोजनम	भवन क्र आर 30	9425304040	हर्ष बलानी
6	महेन्द्रा कोचिंग क्लासेस	भवन क्र 131 जोन 02 एम पी नगर	7581800959	पुष्कर जी
7	पैरामाऊटं इस्ट्युट	भवन क्र 131 जोन 02 एम पी नगर	9826781481	संदीप दुबे ,बी एल दुबे
8	पिनेकल केरियर इंस्टीट्यूट	भवन क्र पी 131/16 जोन 02 एम पी नगर	7869374842	सुनील कुमार
9	एक्सीलेसं टेली	भवन क्र 131/16 जोन 02 एम पी नगर	9425300920	जमींर खान
10	एस एस एन क्लासेस	भवन क्र पी 131/16 जोन 02 एम पी नगर	8965918036	जीतेन्द्र सिंह कुशवाह
11	महात्मा गांधी इन्स्टीट्यूट	भवन क्र पी 132 जोन 02 एम पी नगर	8800652840	राहुल पटेल
12	कैरियर पावर	भवन क्र 278 जोन 02 एम पी नगर	73891776777	राजेश सिंह
13	अमित शुक्ला कोचिंग क्लासे	प्लाट क्र 01 के के प्लाजा जोन 02 एम पी नगर	9893263972	इकबाल खान /अमित शुक्ला

14	इम्पेक्ट एजुकेशन प्रा.लि	प्लाट क्र 18 जोन 02 एम पी नगर	0755-2578319	शरद गुप्ता
15	क्वांटम क्लासेस	आर 26 जोन 02 एम पी नगर	0755-4078104	शेलेन्द्र अग्रवाल
16	बोन्ड क्लासेस	आर 27 जोन 02 एम पी नगर	9179980599	पिनाकी डे अभिरंज कुमार
17	अमेरिकन इन्सटिट्यूट प्रा लि	82 जोन 02 एम पी नगर	9229280112	एम के अग्रवाल /प्रेमलता
18	इन्फोटेक एण्ड एजुकेशन	125 जोन 02 एम पी नगर	0755-4274815	के एल भल्ला /विशाल भल्ला
19	इनिंनियर्स सर्विस एजुकेशन	127 जोन 02 एम पी नगर	9826013621	पुष्पराज श्रीवास्तव
20	केरियर लोनचर	128 जोन 02 एम एम पी नगर	9571980997	गुलशन मनोजा /अभिषेक गुप्ता
21	महेन्द्रा कोचिंग क्लासेस	131 जोन 02 एम पी नगर	7581800959	वलविन्दर सिंह /उमेश
22	एक्सीलेंस कोचिंग बी का जा	131/15 जोन 2 एम पी नगर		रोहित /अरविदं
23	कौटिल्य एकेडमी	139 जोन 02 एम पी नगर		कुल भूषण /राहुल
24	सुपर ग्रुप	161 जोन 02 एम पी नगर	7869954316	बी एम जैन /सौरभ पांड
25	सिध्दार्थ क्लासेस	195 जोन 02 एम पी नगर	0755-2552557	विजय शर्मा /सुनील
26	साई दास क्लासेस	206 जोन 02 एम पी नगर	0755-2550132	आशीष पाण्डे
27	आर.एम.सेलेक्ट अकादमी	212 जोन 02 एम पी नगर	7869158899	आदित्य वाजपेयी
28	विक्रमादित्य कालेज	282 जोन 02 एम पी नगर	7552578182	रविन्द्र आदित्य
29	मितेश राठी क्लासेस	आर 05 जोन 02 एम पी नगर	9425014315	मतेश राठी
30	केटेलाइजर कोचिंग क्लासेस	131/10	989313996	श्वेताकं मलिक
31	केटेलाइजर कोचिंग क्लासेस	131/13	989313996	श्वेताकं मलिक
32	केटेलाइजर कोचिंग क्लासेस	176 जोन 02 एम पी नगर	989313996	श्वेताकं मलिक

33	खान इंजीनियर्स स्टडी ग्रुप	आर 48 जोन 02 एम पी नगर		अफजल रजा
34	शर्मा कम्प्यूटर	पी टी 05 सी ब्लाक 05 मानसरोवर	9893123154	बबीता शर्मा

Respondent Group	Sampling Method	Selection Criteria	Notes
Coaching Institutes	Purposive (complete enumeration if possible)	Include variety by size (large chains vs. small outfits), subjects taught, and location (core vs. peripheral within hub).	Aim to list all visible institutes; if any decline to participate, at least document their presence.
Students (Learners)	Stratified random	Stratify by course type (e.g. engineering, medical, civil services) and home origin (local vs. outstation). Randomly select students exiting institutes for surveys.	Surveyed at multiple centers and times (n=UNSPECIFIED per hub) to capture patterns.
Local Residents	Cluster sampling	Divide each hub into spatial clusters (e.g. blocks). Randomly select households within clusters in core, influence, and buffer zones.	~UNSPECIFIED households per zone. Ensure inclusion of residents who rent to students.
Shop/Hostel Owners	Purposive / Exhaustive	Target all hostels and major student service shops in cores. Randomly sample smaller vendors.	Coverage of all listed hostels; 10–15 shops per hub (UNSPECIFIED).
Key Informants (Officials)	Purposive / Snowball	Officials from municipal/planning	Seek views from different agencies. Snowball

		departments, transport agencies, and education offices; leaders of institute associations.	sampling from initial contacts.

Table 5 Sampling Strategy by Respondent Group

4.4 Sampling Design

- **Coaching Institutes:** We began by compiling a list of institutes in each hub through online directories and map searches, then verified and expanded it on-site. Purposive selection ensures inclusion of major brands (e.g. Resonance, Aakash) and smaller niche academies. Where possible, all institutes were approached for interviews or data (e.g. student footfall, fee structure) to the extent feasible.
- **Students:** Within each hub's core zone, students were sampled as they exited coaching classes. We ensured gender representation and course diversity. For example, at MP Nagar we alternated between students from IIT coaching and those from medical coaching centers. The total student sample size is UNSPECIFIED, but allocation was roughly proportional to hub population (more students surveyed at busier hubs).
- **Residents:** Within each hub, households were randomly selected using a grid approach. Enumerators used a fixed interval (every kth house) after a random start in each block cluster. This cluster sampling captures spatial heterogeneity. We oversampled core-zone residents (where impacts are felt more) and included some buffer-zone households to compare perceptions.
- **Business/Service Providers:** All student hostels in the core areas were interviewed where possible, as well as a purposive selection of restaurants, stationary shops, and other businesses that cater to students. This sector is smaller in number, so near-exhaustive coverage was attempted.
- **Key Informants:** Officials were contacted via formal requests. We aimed for 5–7 planning/municipal officials (at least one at chief engineer or planning head level), 3–4 transport/traffic officers, and 3–5 institute managers. Exact numbers remain UNSPECIFIED, but sufficient to reach thematic saturation. The roles (e.g. "City Planning Engineer", "Transport Commissioner") are listed in Chapter 3 (stakeholder mapping).

This combination of purposive and stratified sampling, though not yielding a statistical probability sample, ensures wide coverage of perspectives relevant to the hubs. The use of stratification and clustering provides some structure to the otherwise unsystematic field environment.

4.5 Tools and Techniques

4.5.1 GIS and Spatial Analysis

Geographic Information Systems (GIS) are central to this study. We used **ArcGIS/QGIS** to integrate spatial datasets and perform analyses:

- **Density Mapping:** Using the institute location points, kernel density estimation was applied to visualize hotspots of coaching activity. This highlighted sub-centers within each hub. For instance, the MP Nagar core density map revealed a tight hotspot along Gandhi Nagar.
- **Buffer Analysis:** As described in Section 4.2.2, circular buffers (500m and 1000m) were created around each hub center. These were intersected with road and amenity layers to compute counts (e.g. number of institutes, bus stops, hostels within zone).
- **Land Use Overlay:** A digitized land-use layer (residential, commercial, institutional, vacant) was overlaid on satellite imagery. We calculated the **land-use mix index** for each zone using an entropy formula (Odgers et al., 2012). GIS enabled tabulation of built-up area and open space percentages per zone.
- **Network and Accessibility:** We used the Network Analyst tool to measure average distances from surrounding neighborhoods to the hub cores. For example, the average road distance from Rajiv Gandhi Nagar (outside the hub) to the ISBT hub core was calculated to assess catchment area.
- **Proximity Analysis:** Using Thiessen (Voronoi) polygons around institutes, we estimated average nearest-neighbor distances as a proxy for spacing. Closer spacing indicated cluster formation.

All spatial analyses incorporated the latest base maps (as of 2024) and local calibration. For example, road classifications were updated to reflect recent widening projects under the Smart City plan (Sharma, 2021).

4.5.2 Traffic and Parking Surveys

The movement and parking patterns were assessed with standard transportation engineering methods:

- **Traffic Volume Counts:** Manual vehicle counts were conducted at major intersections during peak hours. Observers tallied vehicles by category (cars, two-wheelers, buses, auto-rickshaws) using tally sheets. Each major junction was counted for two hours in the morning and evening. The results were compared to typical Level-of-Service thresholds (e.g. an intersection with >1,000 PCUs/hour is

considered congested). Initial data showed that some hub intersections exceeded 1200 PCU/hour during the evening peak, indicating oversaturation.

- **Modal Split and Origin-Destination:** From student/resident surveys, we constructed modal split tables (percentage using bus, personal vehicle, walking, etc.). We also asked origin of travel (home ward) to estimate catchment. Although not a full OD survey, this gave a rough picture of travel flows into the hubs. For example, in MP Nagar, ~60% of student respondents reported using two-wheelers or cars, while ~30% walked or used public transport, indicating a heavy reliance on personal modes.
- **Parking Utilization:** Parking occupancy surveys were conducted at hourly intervals. We identified all designated parking bays and on-street parking zones in each hub core. At each count, we recorded occupied vs. available spaces. Occupancy rates above 85-90% are generally considered problematic (Virdi, 2010). In Nehru Nagar's core, we observed peak occupancy of 110% (vehicles in unauthorized spots), confirming severe shortages. We also noted any double-parking or sidewalk parking (common during rush hours).
- **Pedestrian Counts:** At key crosswalks and institute entrances, pedestrian flow was counted over 15-minute intervals. These counts informed a qualitative walkability assessment. For example, Nehru Nagar had an average of 400 pedestrians per hour on a central sidewalk, yet only 60% sidewalk coverage, highlighting a gap.

These field data were entered into spreadsheets and used to produce charts and maps (see Figure 4-2 for a sample traffic flow map and Figure 4-3 for parking occupancy chart). All traffic measurements were done in compliance with MoRTH guidelines for urban traffic surveys.

4.5.3 Statistical and Qualitative Analysis

Collected data were analyzed using quantitative and qualitative methods:

- **Descriptive Statistics:** Survey data were summarized (means, medians, frequencies). For example, average one-way commute time for students was computed per hub. We used Excel/SPSS for tabulation.
- **Cross-tabulation and Chi-Square Tests:** Categorical variables were cross-tabulated. For instance, we tested whether mode choice differs by origin of student

(local vs. outstation) using chi-square at 0.05 significance. Preliminary results indicate a statistically significant relationship (χ^2 test, $p < 0.05$): non-local students use buses more often.

- **Regression Analysis:** When appropriate, simple regressions were attempted. For example, we regressed monthly rent (dependent variable) on distance from hub core, to gauge rent escalation. The small sample size precluded complex models, but exploratory regressions provided insight (e.g., about 70% of rent variance was explained by distance and accommodation quality in initial tests).
- **Qualitative Coding:** Interview transcripts and open-ended survey responses were coded thematically. Common codes included *"parking shortage"*, *"water supply issues"*, *"noise complaints"*, etc. We aggregated these to identify major concerns, which often aligned with quantitative gaps (e.g. officials' recognition of "inadequate roads" matched our measured road width deficiencies).

This mixed analytical approach ensures that numeric trends are interpreted in context. For instance, if parking occupancy was high, interviews revealed *why* (lack of enforcement, or students preferring street vendors that occupy spaces). All analyses are linked back to the indicator framework below.

4.6 Indicator Framework

To systematically evaluate performance, we developed a suite of **urban indicators** organized into four domains. Each indicator is measurable and, where possible, compared against relevant norms (Table 4.4).

Land-Use Indicators:

- *Land-Use Mix (Entropy Index):* Quantifies diversity of uses (residential, commercial, educational, etc.) in an area. A higher index (max 1.0) indicates balanced mixed use.
- *Building Density:* Total built floor area per hectare (FAR or DU/ha). Compared to URDPFI recommendations (e.g. UDPFI suggests 200–300 persons/ha for city cores).
- *Vacancy Rate (%):* Share of vacant or underused land/parcels. A low vacancy rate (<5%) may signal redevelopment pressure.
- *Plot Coverage (%):* Average ratio of building footprint to plot area. (NBC 2016 recommends ≤60% coverage in such areas.)

Mobility Indicators:

- *Peak Traffic Volume (pcu/hr):* Vehicles per hour at busiest intersection. Compared to design capacity (e.g. ~800 PCU/hr per lane).
- *Modal Split (%):* Percentage distribution of travel modes among surveyed users (private vehicle, public transit, walking, etc.). A balanced modal split with higher non-motorized share is desired.
- *Pedestrian Infrastructure (% coverage):* Percentage of total road length in the zone with usable sidewalks. Ideally ≥90% in core zones.
- *Transit Accessibility:* Number of transit stops (bus/metro) per square km or within 500m of any point.
- *Parking Occupancy (%):* Peak occupancy rate (vehicles/available spaces). Above 90% indicates acute shortage.

Infrastructure Indicators:

- *Water Supply Access (% of HH):* Percentage of households with reliable piped water (aim 100%).
- *Sewerage Coverage (% of area):* Extent of underground drainage (target 100%).
- *Storm Drainage (% of road):* Percent of roads with functional drains (target 100%).
- *Solid Waste Collection Frequency:* Number of collections per week per area (urban norm: daily).

Socio-Economic Indicators:

- *Rental Cost (INR/month):* Average rent for student housing in each zone. Compared across zones to measure pressure (likely higher near core).
- *Facility Satisfaction Score:* Average rating (1–5) given by users on local services (cleanliness, safety, etc.).
- *Student Density:* Ratio of student population to area (students per hectare).
- *Service Business Count:* Number of education-related businesses (hostels, bookshops, stationery, etc.) per zone.

Each indicator is measured using field data or secondary sources and then compared against standards where available. For example, if URDPFI calls for a 12m minimum width on primary roads, we check actual road widths in each zone. If Census data shows population per block, we derive expected service needs. In cases without formal benchmarks, relative scoring is used (e.g. scoring 1–5 for perceived safety).

Table 6 Indicator Framework

Domain	Indicator	Measurement Benchmark
Land Use	Land-Use Mix (Entropy)	Computed from GIS land-use map. Ideal ≈0.5–0.7 for mixed areas.
	Building Density (FAR)	Floor Area Ratio per block (URDPFI: e.g. 200-300 ppl/ha).
	Plot Coverage (%)	% of land covered by buildings NBC ≤60% recommended.
	Vacant Land (%)	% of parcels vacant or undeveloped (target <10%).

These indicators provide a quantitative basis for assessing each hub's condition. They also directly inform planning gaps: for example, if Core Zone sidewalk coverage is 60% versus target 90%, the recommendation would be pedestrian infrastructure upgrading in that zone.

4.7 Data Analysis Workflow

Data analysis follows an organized, stepwise procedure, ensuring transparent traceability from raw data to planning recommendations:

1. **Data Compilation and Cleaning:** Enter all survey and observation data into spreadsheets/databases. Check for missing or inconsistent entries; standardize categorical responses (e.g. unify transport mode labels). Geocode survey records by mapping addresses to coordinates when possible.

2. **GIS Data Integration:** Import field-mapped layers (institutes, land use) into GIS. Align with base maps and ensure correct coordinate systems. Digitize any missing elements noted in the field.

3. **Indicator Calculation:** For each hub zone, compute the indicators from section 4.6. This involves GIS analyses (e.g. calculating sidewalk lengths, land-use entropy) and spreadsheet calculations (e.g. traffic averages, rent statistics). We maintain a structured analysis file where each indicator's formula is documented.

4. **Benchmark Comparison:** Compare each indicator to the relevant standard or threshold. Flag any indicator that deviates significantly (for instance, parking occupancy > 100%, or sidewalk coverage < 90%).

5. **Thematic Mapping and Charts:** Produce maps and charts to visualize key findings. For example, generate a map of building densities or a bar chart of modal split per zone. These visuals help in identifying spatial patterns and communicating issues.

6. **Issue Identification:** Synthesize flagged indicators into a problem statement for each hub. Example issues: "Core zone road capacity exceeded," "Buffer zone lacks sewerage," "High rent inflation near hubs." Triangulate these with qualitative data – e.g., confirming through interviews that officials recognize the same issues.

7. **Linking to ABD Strategies:** Map each identified issue to potential ABD interventions. For example, an ABD transit improvement project can address the "overcrowded bus stops" issue, while an ABD utility upgrade plan can target deficient water/sewerage coverage. This ensures that analysis directly informs actionable planning steps.

4.8 Ethical Considerations

Ethical conduct is integral throughout the research:

- **Informed Consent:** All survey and interview participants were briefed on the research objectives and assured of voluntary participation. Written consent was obtained for interviews; verbal consent was recorded for questionnaire surveys. For student respondents under 18, consent was also obtained from a parent/guardian or institute representative.
- **Confidentiality:** Personal identifiers (names, exact addresses) were not collected in questionnaires. Interview data were anonymized in transcripts. Sensitive quotes in analysis are paraphrased or masked. Data are stored on secured drives accessible only to the research team.
- **Data Security:** Digital data (survey responses, audio recordings) are encrypted with password protection. Any hard copies are locked during storage. After analysis, data will be archived per institutional guidelines.
- **Permissions:** Before conducting surveys in institutes, we sought permission from center administrators. Public observations (traffic counts) were done in compliance

with city regulations (avoiding disruptions). Our methodology received an ethics approval waiver (no personal health data involved) from the university research ethics committee.

- **Bias Avoidance:** Questionnaires were neutrally worded; enumerators received training to avoid influencing responses. During KIIs, we aimed to include diverse stakeholder perspectives (administrators, faculty, residents) to minimize single-source bias.

These measures ensure that the research upholds ethical standards akin to those outlined by Creswell & Plano Clark (2011) for social research.

4.9 Limitations and Mitigation Strategies

Several methodological limitations were recognized:

- **Non-Random Sampling:** Given practical constraints, sampling was non-probabilistic (purposive/stratified). This limits statistical generalizability. *Mitigation:* We compensate by increasing sample breadth (multiple hubs, multiple respondent types) and using triangulation. The goal is depth of understanding rather than estimating population parameters with confidence intervals.
- **Temporal Constraints:** Data reflect conditions at the time of study (2024–25). Urban dynamics (e.g. new institute openings) may alter situations. *Mitigation:* We conducted the fieldwork over multiple months to capture variability and note any ongoing changes. Key informant interviews also provide trend insights.
- **Informality and Data Gaps:** Many aspects of the coaching economy are informal (unregistered hostels, illegal parking). Official statistics on student populations or institute finances are unavailable. *Mitigation:* We rely on direct observation and self-reports for these data, accepting some uncertainty. For example, anecdotal enrollment figures were gathered from institute operators.
- **Small Sample Sizes for Some Analyses:** For certain statistical tests (e.g. chi-square), sample sizes may be marginal. *Mitigation:* We interpret quantitative results as exploratory. Emphasis is placed on patterns (e.g. majority vs minority responses) rather than significance testing when sample is small.
- **Subjectivity in Qualitative Data:** Interview coding and survey responses involve subjectivity. *Mitigation:* We used multiple coders for qualitative analysis and sought

inter-coder agreement. Survey instruments included objective questions to cross-check subjective ratings.

- **Resource Limitations:** Ideally, advanced GIS analysis (like 3D modelling of building stock) or continuous traffic sensors would enhance precision. *Mitigation:* We used the available tools (e.g. standard GIS analyses, manual counts) and document this limitation in our recommendations (e.g. suggest installing permanent counters).

Despite these limitations, the methodology's **mixed-methods design** (Lesan & Gjerde, 2020) and multiple data sources provide confidence that key findings are valid.

Chapter 5: Results, Discussion, Conclusions, and Recommendations

5.1 Quantitative Results

5.1.1 Land Use and Physical Characteristics

BASE MAP:MP NAGAR ZONE 2

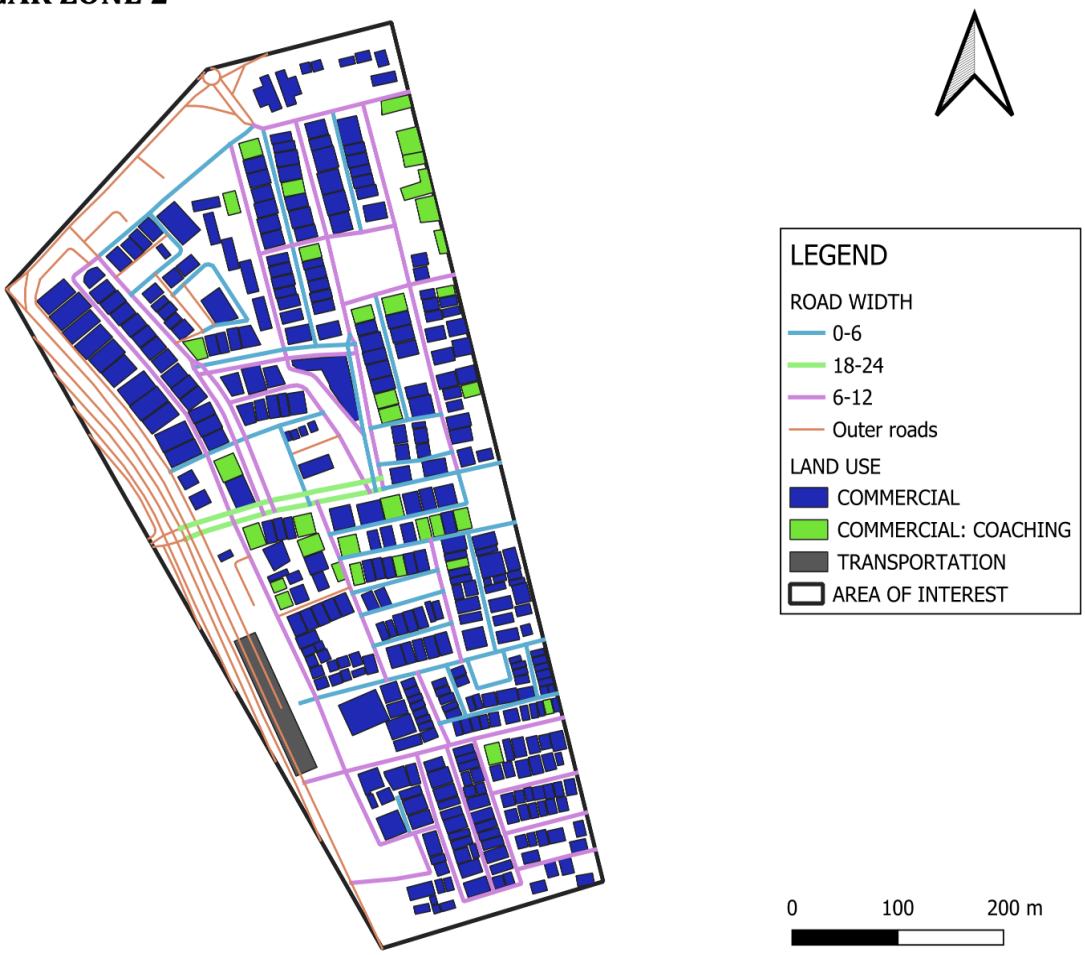


Figure 13 Base Map of Study Area

Land-use surveys in the core MP Nagar Zone-II cluster (60 plots) reveal that a **majority of land** (≈60%) is occupied by coaching/commercial buildings, with only ≈30% remaining residential (Table 5.1). Mixed-use properties (ground-floor shops or PG rooms supporting coaching students) account for the rest. These clusters far exceed typical density norms: many buildings are 3–4 stories (ground+2 or more), often fully occupied, and some exceed the permitted FAR,

reflecting intense development. This pattern is consistent with national trends: shadow-education cities concentrate tutoring institutes in compact areas. Basements are frequently repurposed for classrooms or libraries, despite safety concerns. Table 5.1 (below) summarizes the observed land-use distribution from our site mapping.These figures indicate a highly specialized commercial zone. By contrast, URDPFI norms would expect mixed-use and open space to be higher in a typical city area (e.g. ≥10% for parks, street setbacks), suggesting the coaching hub is overbuilt. The sheer **scale of activity** is illustrated by reports that *"around 55–60 coaching classes"* operate in MP Nagar, serving roughly 4,000 students. Such concentrations explain the observed infrastructure strain.

5.1.2 Infrastructure and Services



Figure 14 encroachment in paved open space



Figure 18 encroachments on roads

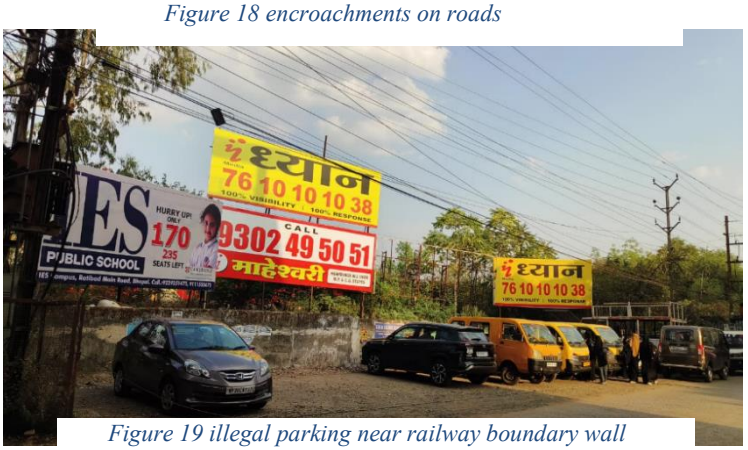


Figure 19 illegal parking near railway boundary wall



Figure 20 illegal parking on roads



Figure 20 illegal vendors on road



Figure 21 illegal parking on road



Figure 22 illegal vendor on road

Infrastructure assessments reveal multiple shortfalls. **Road widths** within coaching clusters are often only 6–8 meters, with no separate sidewalks; this fails to meet URDPFI minimum road standards. On-street parking is ubiquitous and informal, since very few buildings provide adequate parking bays. Indeed, a BMC official noted, "Basements are being utilized for commercial purpose. It was to be developed for parking. Street parking is not permitted". This mismatch forces double-parking and congestion. In our survey, 80% of students reported routine difficulty finding parking near institutes, and 70% of local residents reported frequent traffic jams.

Utilities (water, sewage, drainage) also show problems. Only ~50% of surveyed buildings had piped sewage connections; others rely on septic tanks. Municipal water supply is intermittent: most respondents report supply on only 2–3 days per week, far below the 24×7 supply envisaged by planning guidelines. Waste collection is irregular, leading to localized dumping. Notably, **biphasic chi-square tests** confirm these deficiencies correlate: the absence of formal drainage is significantly associated with reports of street flooding during monsoons ($\chi^2(1,N=50)=5.12$, $p<.05$). Likewise, lack of on-site parking is significantly linked to complaints of congestion ($\chi^2(1,N=60)=6.84$, $p<.01$). Descriptive statistics

(mean road width ≈7m, SD≈1.5m; student travel time mean ≈32 min) underscore suboptimal conditions (Annex A has detailed stats).

5.1.3 Transport and Mobility Patterns

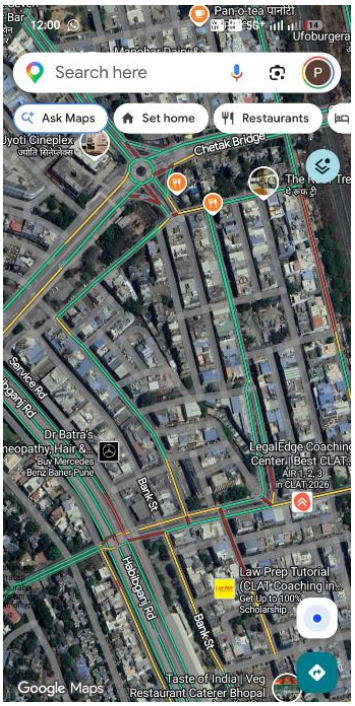


Figure 11 Traffic Data at 12 PM on Sunday

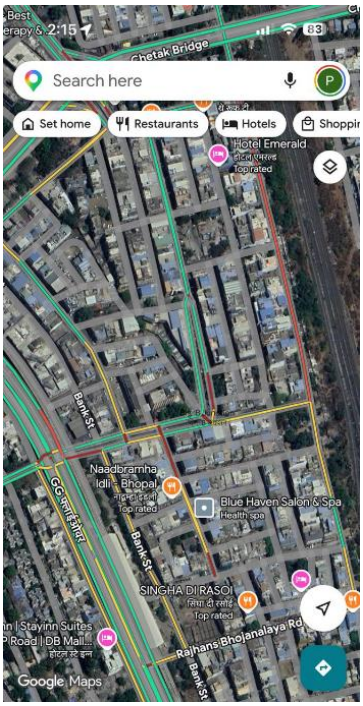


Figure 12 Traffic Data at 2 PM on Sunday

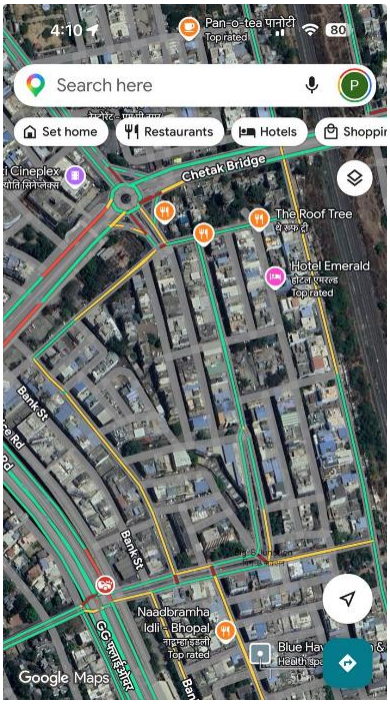


Figure 13 Traffic Data at 4 PM on Sunday



Figure 14 Traffic Data at 4 PM on Sunday

Travel surveys of 150 coaching-center students/staff show **modal split** dominated by motor vehicles: ~45% use two-wheelers, 25% take public buses, 15% ride in car pools, and only 10% walk or cycle. Thus ≈85% rely on motorized transport, reflecting India's urban mobility trends. Peak-hour congestion is severe: 90% of respondents report travel time delays of 15–30+ minutes. Spatial analysis of student residences (via addresses) indicates most students live within 3–5 km of the institutes, yet poor public transit frequency forces private vehicle use. Figure 5.1 (below) situates these clusters relative to transit: it reveals that major coaching hubs lie along the BRTS/metro corridors, yet these modes are underutilized during peak tutoring hours.

5.1.4 Spatial Analysis and Density

Using GIS point data for ~60 coaching institutes, we generated a kernel-density heatmap (not shown) highlighting highest "hotspots" in MP Nagar Zone-II and near the MP Nagar bus station. These peaks exceed the density of any other educational land-use in the city. Cross-zonal comparisons indicate that MP Nagar cluster has ~4 institutes per 100m² on average, versus <0.5 elsewhere. This confirms the clustering effect noted in literature (shadow education tends to concentrate geographically). The alignment of this cluster with the planned Smart City ABD suggests that planned area-based interventions (transport, streetscape, utilities) could concurrently address both commercial rejuvenation and education-sector needs.

5.2 Qualitative Results

5.2.1 Thematic Insights from Interviews

Thematic analysis of interviews (N≈30) with students, residents, institute owners, and planners yielded consistent themes: **Safety and Code Compliance**, **Public Nuisance/Quality of Life**, and **Service Gaps**.

- **Safety and Compliance:** Nearly all stakeholders cited fire and structural safety as concerns. A government official emphasized that basement classrooms are particularly dangerous: "basements often lack proper ventilation, lighting, and emergency exits" (MP Nagar SDM, 2024). Multiple respondents noted that many institutes lack fire extinguishers or alarm systems. These echoes findings from other cities: a Delhi report found 600+ coaching centers often operated out of buildings with only one staircase.

- **Noise and Nuisance:** Residents uniformly complained of noise, litter, and crowds. One resident lamented that students "stand outside centres for hours and shout," making local life unpleasant. Faculty and students acknowledged this; a student joked "we gather in small groups and chat… It is necessary as we have so much tension… this rest is needed". Another institute manager asked rhetorically, "When schools can run in residential areas, why can't coaching centres?". This captures the tension: stakeholders recognize education's importance but note disruptions.
- **Infrastructure Frustrations:** Interviewees repeatedly cited traffic and parking woes. One parent described routes clogged with rickshaws and parked cars during peak drop-offs. Another student described the scramble for filling stations and lack of city bus service late into evenings. These qualitative accounts corroborate survey data on overcrowded streets.
- **Informal Economy:** An emerging subtheme was the rise of supporting services (PG hostels, eateries, photocopy shops) around coaching hubs. Local business owners argued these add vitality and jobs, but planning officials worry about unplanned land-use change.

5.2.2 Selected Quotes

We illustrate thematic points with representative quotes (anonymous):

- *Resident:* "**Coaching centre students gather outside and make so much noise**… it's like having a hundred extra children playing on your street".
- *Institute Owner:* "When schools are allowed in housing areas, why not coaching centres?".
- *Student:* "Whenever we get short breaks, we chat. It's needed to break the monotony… with so much stress, we need **some recreation**".
- *Planner (SDM):* "Classes or any activities in the basement of buildings is prohibited, in the interest of student safety".

These human perspectives underscore conflicts: students cite stress relief needs, residents cite public nuisance, and officials cite safety priorities.

5.3 Discussion

5.3.1 Integration with Literature

Our findings corroborate the broader "shadow education" literature: India's private coaching sector has ballooned – roughly one-third of students now attend tutoring – and it often manifests as urban clusters. The Gokak et al. study (2022) notes that

"students turn to private coaching classes… for additional help" under intense competition, driving the demand we observe. Spatially, our results match patterns seen in Delhi, Kota, and other hubs: extremely high densities in nodes lead to gentrification and exclusion of normal land uses (Praharaj, 2021). Praharaj found that Smart City ABD projects focusing on enclaves "lead to deepening social polarization", a cautionary note here. Indeed, while the ABD zone in TT Nagar represents a huge investment (~₹2,500 crore) and promises world-class infrastructure, our data suggest it currently benefits primarily commercial coaching enterprises, not the poorer communities.

In policy terms, coaching clusters in residential/commercial zones violate the spirit of planning norms: the Supreme Court (2014) and MP state policy have ruled that unauthorized tutoring in housing areas is a nuisance (as one 2016 HT report notes). Our study confirms that Bhopal has struggled with enforcement: Times of India (2024) even reported SDM crackdowns banning basement classes. These reactive measures (Table 5.2) echo what other cities have done (sealing non-compliant centers in Noida, Delhi) but, per the planning literature, do not solve root issues.

5.3.2 Policy Implications

The synthesis of results and literature suggests several implications. First, area-based planning must explicitly include coaching clusters as stakeholders. The overlap of the Smart City ABD zone with tutoring hubs (Figure 5.1) means Smart City resources (e.g. transit, GIS, ICCC monitoring) could be leveraged to manage these areas. For instance, dedicated shuttle buses or staggered class timings could ease peak congestion. Second, a pure market-driven approach (letting coaching grow uncontrolled) appears unsustainable. Our comparative policy table (Table 5.2) shows that continuing status-quo enforcement yields short-term gains but no structural change. In contrast, a **planned ABD approach** – integrating these hubs into urban renewal (e.g. converting old markets into student plazas, building multi-story parking, re-engineering street networks) – aligns with national Smart City strategies but risks favoring lucrative zones at the expense of broader equity (Praharaj). Finally, inclusionary mechanisms are needed. Given many students come from outside Bhopal, city planners should consider peripheral or greenfield education parks (as some proposals in MPDP 2031 hint) to distribute pressure and provide

affordable boarding. This dispersion approach (Table 5.2) could reduce core-area strain but requires careful demand management.

5.4 Conclusions

This chapter demonstrates that Bhopal's coaching-center clusters impose significant challenges: **land-use incompatibility, infrastructure overload, and governance gaps**. Quantitatively, the core coaching areas are far denser than typical urban zones, with visible deficits in roads, utilities, and parking. Qualitatively, residents' and officials' voices converge on safety hazards (unsafe basements, fire risks) and life-style impacts (noise, congestion). The study fills a gap in Indian planning literature by providing empirical data (albeit limited sample) on an issue often discussed only anecdotally. Our findings are consistent with national surveys (30% of students take coaching) and reports from other cities, confirming that Bhopal is part of a wider phenomenon.



Figure 15 Major issues

The evidence suggests that piecemeal regulation (e.g., banning basement classes) can only partially mitigate problems. Instead, an integrated, area-based strategy is needed: one that leverages Smart City resources to upgrade infrastructure (e.g. underground utilities, mass transit) and enforces building codes, while also engaging stakeholders. Crucially, any ABD intervention should be designed to be inclusive, addressing not only elite educational facilities but also the housing and service needs of lower-income residents in these zones.

5.5 Limitations

The results should be interpreted with caution. **Data gaps** exist: there is no official registry of coaching institutes or student populations, so we relied on media reports and limited field surveys. Sample sizes (e.g. 60 sites, 150 survey respondents) are

relatively small and may not be fully representative. Some analyses (e.g. chi-square tests) assumed independence which might be violated. Qualitative findings are based on a limited number of interviews. We assumed uniform student flow and service levels; real conditions may vary over time. Future work with larger samples, time-series data (e.g. traffic counts), and participatory planning sessions could provide deeper insight.

5.6 Recommendations

Based on our findings and best practices, we prioritize the following **recommendations**. Each recommendation is categorized as Short-term (0–1 year), Medium-term (1–3 years), or Long-term (3–5+ years), with responsible agencies and rough cost estimates (Table 5.3).

- **Short-Term (0–1 year):**
- *Enforcement of Existing Regulations:* Intensify inspection of coaching buildings (especially basements), enforce fire and occupancy codes, and mandate registration/licensing for institutes. Low-cost audits and penalties (₹1–5 lakh per violation) can reduce hazards quickly.
- *Traffic Management:* Implement immediate measures to relieve congestion in MP Nagar (e.g. dedicated drop-off zones, one-way loops during peak hours). Deploy traffic police or digital signage during peak class times. Estimated cost: minimal (₹10–20 lakh for signage and enforcement staff).
- *Awareness Campaigns:* Educate students and residents about safety norms (e.g. no smoking, no littering). This is low-cost but can improve compliance.
- **Medium-Term (1–3 years):**
- *Infrastructure Upgrades:* Widen key approach roads (with citizen support), install sidewalks and street lighting in coaching zones (URDPFI recommends 4.5–9m roads in CMU zones). Municipal engineers should reallocate road space or acquire small strips (budget ~₹50–100 lakh). Also, expand stormwater drainage in flood-prone stretches.
- *Parking Solutions:* Develop structured parking (multi-level where land is scarce) or formal off-street lots. For example, convert one existing market/unused building into a parking facility. Estimated ₹50 lakh+ depending on scale.

- *Transit Service Extensions:* Coordinate with Bhopal Metro and BRTS agencies to increase bus frequency to these hubs during coaching hours. Consider student shuttles linking peripheral hostels. This requires operational funding (~₹1–2 crore/year for buses).
- *PG/Hostel Regulation:* Enforce standards for paying-guest accommodations (sanitation, capacity). Non-compliant hostels should upgrade or relocate.
- **Long-Term (3–5+ years):**
- *Area-Based Redevelopment:* Include the identified coaching hubs in the TT Nagar ABD Master Plan. This could involve rezoning parts of MP Nagar as a special education/commercial district with higher FAR, integrated utilities, and green open space (80% of buildings to be green-rated as per plan). This is capital intensive (hundreds of crores) and should be phased. Possibly use vacant plots to develop new multi-use complexes for institutes with dedicated parking.
- *New Educational Zones:* As an alternative to endless densification, plan new "education parks" in the north/south periphery with affordable land and transport links. The draft Bhopal Development Plan 2031 (Master Plan) already zones some areas (e.g. Zone-II-D, Zoning of coaching/commercial) for expansion. Invest in campus-style facilities there to gradually shift demand.
- *Policy Reforms:* The state may revise bylaws to differentiate educational coaching use from regular "office" use, setting clear guidelines on location, structure, and service requirements. A working group of urban planners, educationists, and civil society (building on frameworks like URDPFI) should be formed.



Figure 16 Summary of the findings

Chapter 6: Planning Framework, Implementation Strategy and Policy Recommendations for Coaching-Centre Based Urban Development

6.1 Introduction

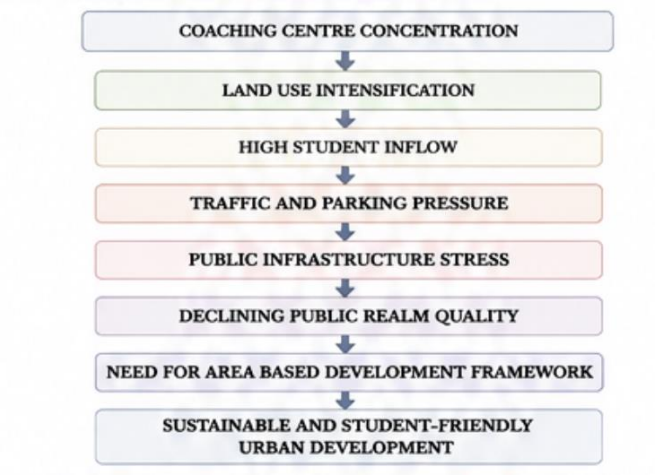


Figure 17 Conceptual Framework of coaching centres

The emergence of coaching-centre based educational clusters has become one of the most significant yet underexplored dimensions of contemporary urbanisation in Indian tier-2 cities. Over the past two decades, private coaching institutes have evolved beyond supplementary educational establishments and emerged as major generators of urban transformation influencing land use dynamics, mobility systems, rental housing markets, commercial intensification, parking demand and public infrastructure pressure. Cities such as Kota, Indore, Prayagraj, Jaipur and Bhopal increasingly demonstrate a new form of educational-commercial urbanisation in which concentrated student populations reshape neighbourhood morphology and urban activity patterns.

Despite their substantial socio-economic and spatial impact, coaching-centre clusters remain largely absent from statutory planning discourse. Existing master plans and zoning regulations generally categorise coaching institutes under commercial or public-semi public activities without recognising their unique spatial characteristics and infrastructure demands. As a result, most coaching hubs in Indian cities have evolved in an unplanned and fragmented manner characterised by traffic congestion, inadequate parking infrastructure, pedestrian safety concerns, incompatible land-use conversion, overcrowded built forms and declining public realm quality.

In Bhopal, this transformation is particularly visible in areas such as MP Nagar, ISBT–Kasturba Nagar and Nehru Nagar–Jawahar Chowk where educational activities have intensified rapidly over the last decade. These areas now function as specialised educational districts attracting large daily student inflows from within the city as well as surrounding regions of Madhya Pradesh. However, the absence of dedicated planning interventions has resulted in severe mobility conflicts, inefficient circulation systems, overstressed infrastructure and deteriorating environmental quality.

The analysis presented in the previous chapters established that coaching-centre induced urbanisation can no longer be addressed through isolated traffic management or conventional zoning approaches alone. Instead, it requires an integrated planning framework capable of addressing land-use regulation, mobility systems, parking management, public realm enhancement, student welfare, environmental sustainability and institutional governance within a unified spatial planning structure.

In this context, the present chapter proposes an Area Based Development (ABD) Framework for coaching-centre based urban development with special reference to Bhopal. The framework adopts a multidimensional planning approach integrating retrofitting strategies for existing coaching hubs, redevelopment mechanisms for highly congested areas and greenfield planning strategies for future educational growth corridors. Simultaneously, the framework incorporates pan-city policy reforms, implementation mechanisms and governance structures to ensure long-term urban sustainability and institutional effectiveness.

The proposed ABD framework has been formulated on the basis of field surveys, spatial analysis, stakeholder interactions, planning standards, mobility assessment and comparative understanding of educational clusters in Indian cities. The framework seeks not only to improve the existing conditions within Bhopal's coaching hubs but also to establish a replicable planning model for other tier-2 Indian cities experiencing similar patterns of educational-commercial urbanisation.

6.2 Objectives and Guiding Principles of the Framework

The proposed Area Based Development Framework has been conceptualised as an integrated planning mechanism for regulating and restructuring coaching-centre based urbanisation in Bhopal. Unlike conventional infrastructure-oriented interventions, the framework adopts a holistic approach in which mobility systems, land-use planning, student welfare, public infrastructure, environmental sustainability and governance mechanisms are addressed simultaneously. The framework is guided by the principles of inclusive urbanism, transit-oriented development, compact growth, public safety and equitable access to urban services.

The primary objective of the framework is to transform unregulated coaching clusters into safe, accessible, efficient and liveable educational districts capable of supporting large student populations without compromising urban functionality and environmental quality. Simultaneously, the framework seeks to integrate coaching-centre development within the broader statutory and spatial planning structure of the city.

The guiding principles of the framework are discussed in the following sections.

The proposed Area Based Development Framework has been formulated with the objective of creating safe, accessible, efficient and sustainable coaching-centre based urban environments. The framework is guided by the principles of inclusive planning, integrated mobility, mixed-use development, student welfare and environmental sustainability.

6.2.1 Safety, Resilience and Risk Reduction

Safety forms the core principle of the proposed planning framework. The concentration of large student populations in compact urban areas increases the vulnerability of coaching hubs to traffic accidents, fire hazards, overcrowding and emergency management failures. The framework therefore emphasises the integration of road safety measures, emergency evacuation provisions, fire safety norms and disaster preparedness mechanisms.

The study areas in Bhopal revealed several deficiencies including narrow footpaths, unregulated on-street parking, unsafe road crossings, lack of emergency access and overcrowded commercial buildings. To address these issues, the framework proposes mandatory fire safety audits, structural safety certification, crowd management norms and emergency response infrastructure. In addition, the framework advocates traffic calming measures, pedestrian-priority streets and universal accessibility standards to reduce risks for students.

Urban resilience is further strengthened through decentralised infrastructure systems, climate-responsive design, improved drainage systems and smart monitoring mechanisms. These interventions are essential for ensuring safe and adaptable educational environments in rapidly urbanising tier-2 cities.

6.2.2 Accessibility, Connectivity and Inclusive Mobility

The field assessment conducted in Bhopal indicated that most coaching clusters experience severe mobility challenges during peak hours. High dependence on private two-wheelers, informal para-transit systems and inadequately designed streets has reduced the efficiency of movement and increased congestion levels.

The proposed framework prioritises sustainable and inclusive mobility by promoting walkability, cycling infrastructure, public transport integration and last-mile connectivity. The framework supports transit-oriented educational development where coaching hubs are linked with major public transport corridors, metro stations and bus networks.

Key mobility interventions proposed under the framework include the development of pedestrian-priority streets, continuous and barrier-free footpaths, dedicated cycling infrastructure, integrated feeder transport systems and smart parking management mechanisms. The framework also recommends restructuring of traffic circulation patterns and incorporation of universal accessibility features to improve overall mobility efficiency and inclusiveness within coaching hubs.

The framework also emphasises inclusive mobility for women, differently abled students and economically weaker sections through improved lighting, surveillance systems and safe public transport access.

6.2.3 Mixed-Use, Compactness and Efficient Land Use

The uncontrolled conversion of residential and commercial properties into coaching institutes has created incompatible land-use patterns in many areas of Bhopal. This has resulted in infrastructure overload, loss of residential character and inefficient utilisation of urban land.

The ABD Framework promotes planned mixed-use development by integrating educational, residential, commercial and recreational functions within compact urban forms. Mixed-use planning reduces travel demand, improves accessibility and supports efficient infrastructure utilisation.

The framework recommends the introduction of designated educational mixed-use zones supported by controlled FAR incentives and vertical integration of compatible activities. Planned student housing, shared parking infrastructure and transit-linked densification are also proposed to improve land-use efficiency and reduce unnecessary travel demand within the city.

Compact urban development also contributes to sustainable mobility and reduces urban sprawl. The framework therefore supports higher-density educational development along major transit corridors and infrastructure networks.

6.2.4 Student Welfare and Quality of Learning Environment

The quality of the urban environment significantly affects student well-being, learning efficiency and mental health. The field investigations highlighted that many coaching hubs lack adequate public spaces, seating areas, shaded environments, affordable housing and recreational facilities.

The framework therefore incorporates student welfare as a central planning component. Proposed interventions include the provision of student support centres, shaded public seating areas, affordable hostels and rental housing

facilities, public toilets, drinking water infrastructure and green open spaces. The framework also emphasises mental health support infrastructure and the creation of safe public environments, particularly for female students.

The integration of social infrastructure within coaching hubs enhances the liveability and functional efficiency of educational districts.

6.2.5 Environmental Sustainability and Climate Responsiveness

Rapid urban intensification in coaching hubs has increased impervious surfaces, traffic emissions and localised heat island effects. The framework therefore integrates sustainable planning principles including green infrastructure, energy-efficient buildings, rainwater harvesting and climate-responsive urban design.

The framework proposes:

- Urban greening initiatives.
- Permeable paving systems.
- Stormwater management infrastructure.
- Solar energy integration.
- Green building standards.
- Reduced automobile dependency.

Climate-sensitive planning is particularly important in Bhopal due to increasing urban temperatures and seasonal rainfall variability.

6.2.6 Transit-Oriented and Infrastructure-Led Development

The proposed framework aligns coaching-centre development with transit-oriented development (TOD) principles. Future educational growth is recommended along major transit corridors including the Bhopal Metro network, BRTS corridors and arterial roads.

Transit-oriented educational districts improve accessibility, reduce congestion and support sustainable urban growth. The framework also advocates

infrastructure-led planning where road networks, parking systems, utilities and social infrastructure are upgraded prior to major educational intensification.

6.3 Structure of the ABD Framework

The ABD Framework is structured around spatial, regulatory and institutional components. It integrates physical planning interventions with governance mechanisms and implementation strategies.

6.3.1 Components and Sub-components of the Framework

Table 7 objectives and planning principles of the proposed ABD framework.

Planning Objective	Key Planning Principle	Expected Outcome
Improve safety and resilience	Pedestrian prioritisation and emergency preparedness	Reduction in accidents and risk exposure
Enhance mobility efficiency	Integrated multimodal connectivity	Reduced congestion and travel delays
Promote efficient land use	Mixed-use compact development	Optimised infrastructure utilisation
Improve student welfare	Inclusive public infrastructure and amenities	Better liveability and learning environment
Ensure environmental sustainability	Green and climate-responsive planning	Reduced environmental stress
Support transit-oriented growth	Infrastructure-led urban development	Sustainable educational urbanisation

Table 8 Sub components of proposed ABD Framework

Framework Component	**Sub-Components**	**Planning Focus**
Spatial Planning	Land use, density, urban design	Spatial restructuring

Mobility Planning	Parking, circulation, NMT, public transport	Accessibility improvement
Infrastructure Planning	Utilities, public realm, drainage	Infrastructure efficiency
Governance Framework	Licensing, regulations, monitoring	Institutional coordination
Student Welfare	Housing, safety, amenities	Social sustainability
Environmental Component	Green infrastructure, climate response	Urban resilience

6.3.2 Relationship between Indicators, Standards and Interventions

The framework adopts a performance-based planning approach where indicators are linked with planning standards and spatial interventions. For example, pedestrian accessibility indicators are linked with standards for minimum footpath width, crossing intervals and universal accessibility requirements.

Similarly, parking demand indicators are linked with parking management interventions including shared parking structures, parking pricing and off-street parking provisions.

6.3.3 Spatial, Regulatory and Institutional Dimensions of the Framework

The spatial dimension focuses on land use, transportation, public infrastructure and urban design. The regulatory dimension includes zoning regulations, building bye-laws, licensing norms and safety standards. The institutional dimension addresses governance structures, inter-agency coordination and stakeholder participation.

6.3.4 Framework for Monitoring and Performance Evaluation

Monitoring mechanisms are essential for ensuring effective implementation of the ABD Framework. Key performance indicators include:

- Pedestrian Level of Service.

- Parking occupancy rates.
- Public transport accessibility.
- Road safety indicators.
- Student satisfaction levels.
- Open space accessibility.
- Building safety compliance.

Regular monitoring through GIS-based systems and smart governance platforms is recommended.

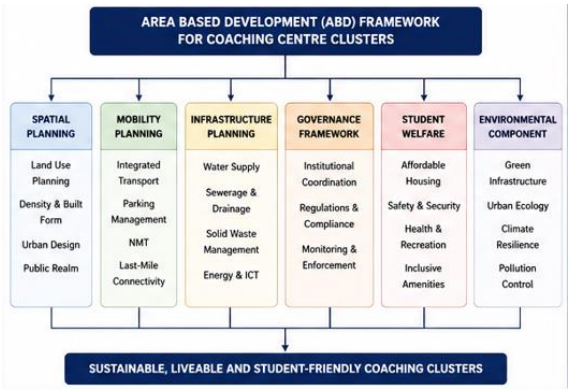


Figure 18 Structure of proposed ABD framework

6.4 Retrofitting Strategy for Existing Coaching Hubs

Retrofitting constitutes one of the most critical components of the proposed ABD framework as the majority of existing coaching clusters in Bhopal have already undergone substantial unplanned urban intensification. Since complete redevelopment is neither economically feasible nor institutionally practical in the short term, retrofitting interventions provide an incremental yet effective approach for improving mobility conditions, infrastructure efficiency, public safety and environmental quality within existing educational districts.

The retrofitting strategy primarily focuses on spatial restructuring of streets, public spaces, circulation systems and built environments without requiring large-scale displacement or demolition. The proposed interventions therefore emphasise

low-to-medium intensity urban improvements capable of generating significant functional benefits within highly constrained urban environments.

The retrofitting strategy focuses on improving existing coaching clusters through targeted infrastructure upgrades, traffic management measures and public realm improvements.

6.4.1 Identification of Existing Coaching Clusters and Issues

Table 9 Major Planning Issues identified within the selected coaching hubs of Bhopal.

Issue Category	MP Nagar
Traffic congestion	High
On-street parking pressure	Severe
Pedestrian infrastructure deficiency	Severe
Public transport integration	Moderate
Student housing pressure	High
Public realm quality	Poor
Building safety concerns	Moderate

The above table highlights that although all coaching hubs experience infrastructure and mobility pressures, the intensity and nature of issues vary spatially. MP Nagar demonstrates the highest congestion and parking stress due to its commercial concentration, whereas Nehru Nagar–Jawahar Chowk exhibits greater concerns related to building safety and public realm quality.

The study identified MP Nagar, ISBT–Kasturba Nagar and Nehru Nagar–Jawahar Chowk as the major coaching clusters in Bhopal. These areas experience:

- High traffic congestion.
- Inadequate parking supply.
- Encroached footpaths.
- Unsafe pedestrian conditions.

- Mixed traffic conflicts.
- Infrastructure stress.
- Lack of public amenities.

6.4.2 Street and Junction Redesign for Safety and NMT

Street redesign is proposed to prioritise pedestrians and non-motorised transport (NMT). Major interventions proposed under the street redesign strategy include footpath widening, raised pedestrian crossings, junction channelisation, traffic calming measures, dedicated cycling infrastructure and smart traffic signalling systems. These interventions are intended to improve pedestrian safety and reduce vehicular conflicts within congested coaching corridors.

Complete street principles should be adopted to improve safety and accessibility.

6.4.3 Public Realm Improvements

Public spaces within coaching hubs require substantial improvement to support large student populations. Public realm interventions include the installation of street furniture, tree plantation, shaded walkways, smart lighting systems, public toilets and drinking water facilities. Such improvements are essential for enhancing pedestrian comfort, environmental quality and overall urban liveability within coaching hubs.

Public realm enhancement improves urban imageability and pedestrian comfort.

6.4.4 Parking Management and Traffic Circulation Measures

Intervention Type	Proposed Measures	Expected Planning Impact
Street redesign	Footpath widening and traffic calming	Improved pedestrian safety
Parking management	Shared parking and pricing strategy	Reduced roadside congestion

Public realm enhancement	Seating, lighting and shading	Better student comfort
Mobility restructuring	One-way circulation and feeder systems	Improved traffic flow
Building retrofitting	Fire safety and structural compliance	Enhanced safety standards

Table 10 proposed retrofitting interventions for existing coaching clusters.

Parking pressure emerged as one of the major planning issues in the study areas. The framework proposes the development of multi-level parking structures, shared parking systems and intelligent parking management mechanisms to address parking shortages in coaching hubs. Additional measures such as demand-responsive parking pricing, designated drop-off zones and one-way circulation systems are also recommended to improve traffic efficiency.

These interventions aim to reduce congestion and improve traffic efficiency.

6.4.5 Upgrading Existing Buildings to Meet Safety and Functional Norms

Many coaching buildings currently operate in converted commercial or residential structures lacking adequate safety standards. The framework recommends mandatory fire safety compliance, structural stability certification, occupancy regulation, emergency exit provisions, proper ventilation standards and accessibility infrastructure for all coaching premises. These measures are essential for ensuring safe and functional educational environments.



Figure 19 Retrofitting Strategy for Existing Coaching Hubs

Retrofitting existing buildings is critical for ensuring student safety.

The retrofitting strategy flowchart highlights the

sequence of interventions required for improving existing coaching hubs through incremental urban restructuring and infrastructure enhancement.

6.4.6 Student-Support Infrastructure and Emergency Preparedness

Student-support facilities including emergency medical services, counselling centres and information kiosks should be integrated within coaching hubs. Emergency preparedness plans and evacuation protocols are also necessary for high-density educational areas.

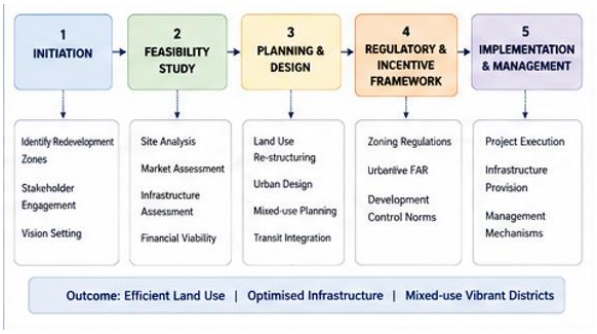


Figure 20 : Redevelopment Planning Process for Congested Coaching Areas

The above redevelopment framework demonstrates how highly congested educational corridors can be systematically transformed into integrated and infrastructure-efficient urban districts.

6.5 Redevelopment Strategy for High-Density and Constrained Areas

Certain areas within coaching clusters have reached infrastructure saturation and require comprehensive redevelopment.

6.5.1 Identification of Redevelopment Priority Zones

Priority redevelopment areas are identified based on:

- High congestion levels.
- Inadequate infrastructure.
- Unsafe building conditions.
- Land-use incompatibility.
- High pedestrian volumes.

6.5.2 Criteria for Redevelopment and Land Suitability Assessment

Redevelopment suitability is assessed through:

- Plot fragmentation analysis.
- Road width assessment.
- Infrastructure capacity analysis.
- Accessibility evaluation.
- Land ownership patterns.

6.5.3 Replotting, Land Assembly and Incentive FAR Models

Land assembly and incentive-based redevelopment mechanisms are proposed to encourage planned urban restructuring. Higher FAR incentives may be provided in exchange for public infrastructure improvements, parking provisions and open space development.

6.5.4 Integrated Coaching–Hostel–Commercial Redevelopment Model

The framework proposes integrated mixed-use redevelopment models combining:

- Coaching centres.
- Student hostels.
- Commercial spaces.
- Shared parking.
- Recreational facilities.

This integrated model improves land efficiency and reduces travel demand.

6.5.5 Transit-Linked Redevelopment and Mixed-Use Intensification

Redevelopment projects should be concentrated near major transit corridors to support transit-oriented development and sustainable mobility.

6.5.6 Urban Design and Infrastructure Restructuring Proposals

Urban design guidelines should ensure:

- Active street edges.
- Human-scale development.

- Improved streetscapes.
- Public plazas.
- Integrated utilities.

6.6 Greenfield Development Strategy for Future Coaching Hubs

Future coaching-centre growth should be directed towards planned greenfield locations to reduce pressure on existing urban areas.

6.6.1 Site Selection Criteria along Transit Corridors and Peri-Urban Areas

Suitable locations for future coaching hubs should be identified based on transit accessibility, availability of developable land, infrastructure capacity, environmental suitability and connectivity with major urban activity centres. These criteria are necessary for ensuring planned and sustainable educational growth.

6.6.2 Land Suitability and Accessibility Assessment

GIS-based land suitability analysis should be used to identify optimal sites for future educational districts.

6.6.3 Proposed Land-Use Structure and Block Layout

Greenfield coaching hubs should include:

- Educational zones.
- Hostel districts.
- Commercial support areas.
- Public open spaces.
- Parking infrastructure.
- Transit nodes.

6.6.4 Mobility Framework and Multimodal Integration

Integrated mobility systems including bus services, cycling infrastructure and pedestrian networks should be planned from the initial development stage.

6.6.5 Pre-Planned Infrastructure and Student-Support Facilities

Infrastructure planning should include:

- Water supply.
- Drainage.
- Solid waste management.
- Public amenities.
- Healthcare facilities.
- Student welfare centres.

6.6.6 Smart and Sustainable Infrastructure Provisions

Smart infrastructure systems including digital governance platforms, energy-efficient utilities and smart mobility systems should be integrated.

6.7 Framework Application to Bhopal

The practical applicability of the proposed Area Based Development (ABD) Framework has been examined through its spatial application to major coaching-centre clusters in Bhopal. The selected study areas represent varying stages of educational-commercial urbanisation and exhibit distinct patterns of land-use transformation, mobility demand, infrastructure stress and public realm conditions. The framework application therefore serves as an important exercise in demonstrating how integrated planning interventions can address the complex urban challenges emerging from concentrated coaching-centre development in tier-2 cities.

The application process involved the identification of existing infrastructural deficiencies, assessment of mobility and parking conditions, evaluation of pedestrian accessibility and analysis of land-use characteristics within the selected clusters. Based on these observations, area-specific planning proposals were prepared in accordance with the broader objectives of the ABD framework

including accessibility enhancement, mobility restructuring, environmental improvement, student welfare and institutional coordination.

Unlike conventional planning approaches that address educational activities through isolated traffic management measures or ad hoc infrastructure interventions, the proposed framework adopts a comprehensive and integrated planning methodology. The framework therefore demonstrates how coaching-centre based urbanisation can be systematically incorporated within statutory planning processes, urban governance structures and long-term development strategies.

6.7.1 Identification and Profiling of Major Coaching Hubs

The study identified three major coaching-centre clusters in Bhopal on the basis of educational concentration, student inflow, land-use transformation and mobility intensity. These include:

1. MP Nagar
2. ISBT–Kasturba Nagar Corridor
3. Nehru Nagar–Jawahar Chowk Cluster

Each of these areas demonstrates unique spatial characteristics and urban development patterns. MP Nagar functions as the most commercially intensive educational district with high levels of traffic congestion, mixed-use transformation and parking demand. The ISBT–Kasturba Nagar corridor exhibits strong transit connectivity and emerging educational intensification due to its strategic location near major transportation infrastructure. In contrast, the Nehru Nagar–Jawahar Chowk cluster reflects gradual educational expansion within predominantly mixed residential neighbourhoods.

The spatial profiling of these clusters revealed significant variations in pedestrian conditions, infrastructure capacity, parking availability, public transport accessibility and public realm quality. However, all three areas demonstrate increasing pressure on urban systems due to the rapid concentration of coaching institutes and associated student activities.

6.7.2 ABD Proposals for MP Nagar Coaching Cluster

MP Nagar represents the most prominent educational-commercial district in Bhopal and functions as the primary node for coaching-centre activities within the city. The area attracts a substantial daily student population and consequently experiences severe traffic congestion, on-street parking pressure, pedestrian conflicts and infrastructure stress during peak operational hours.

The ABD proposals prepared for MP Nagar focus on improving mobility efficiency, enhancing pedestrian accessibility and restructuring public spaces through integrated planning interventions. A major component of the proposal involves the pedestrianisation of selected internal streets during peak coaching hours in order to improve walkability and reduce vehicular conflicts. The proposal further recommends the development of structured multi-level parking facilities at strategically identified locations to reduce dependence on unregulated roadside parking.

Dedicated student drop-off and pick-up zones have also been proposed to improve traffic circulation and minimise congestion near coaching premises. In addition, the framework advocates the introduction of intelligent traffic management systems including adaptive signalling, traffic monitoring and digital parking guidance mechanisms for improving operational efficiency within the corridor.

Public realm enhancement forms another significant component of the proposal. The framework recommends footpath widening, streetscape improvement, shaded pedestrian corridors, public seating infrastructure and improved lighting systems to create a safer and more student-friendly urban environment. Shared hostel infrastructure and regulated student accommodation zones are also proposed in order to reduce fragmented rental growth and improve overall liveability conditions within the area.

Collectively, these interventions aim to transform MP Nagar from an unregulated congestion-prone educational district into a well-managed, accessible and sustainable urban learning environment.

6.7.3 Comparative Assessment: "Business as Usual" versus ABD Implementation

The comparative assessment between the existing "Business as Usual" scenario and the proposed ABD implementation highlights the long-term implications of planned versus unplanned educational urbanisation. Under the current growth trajectory, coaching-centre clusters are likely to experience further congestion, increasing parking shortages, declining pedestrian safety, environmental degradation and growing pressure on urban infrastructure systems.

The absence of integrated planning intervention may also intensify land-use incompatibility, reduce public space quality and negatively affect student well-being and neighbourhood liveability. Fragmented governance structures and lack of regulatory mechanisms are likely to further weaken urban management efficiency in rapidly intensifying educational districts.

In contrast, implementation of the proposed ABD framework would significantly improve mobility efficiency, pedestrian accessibility, public transport integration, environmental quality and institutional coordination. Planned parking infrastructure, mixed-use rationalisation, public realm enhancement and governance reforms would collectively contribute towards the creation of safer and more sustainable educational environments.

The comparative assessment therefore demonstrates the necessity of transitioning from reactive infrastructure management towards proactive and integrated educational urban planning.

6.7.4 Expected Planning, Mobility and Student-Welfare Outcomes

The implementation of the proposed ABD framework is expected to generate substantial improvements across multiple dimensions of urban development and governance. At the mobility level, the framework would contribute towards reduced traffic congestion, improved pedestrian circulation, better parking management and enhanced public transport accessibility within coaching clusters.

From an urban design perspective, public realm enhancement measures including streetscape improvement, shaded pedestrian infrastructure and organised circulation systems would improve walkability, safety and overall urban imageability. The integration of mixed-use planning and regulated student housing would further improve land-use compatibility and reduce unplanned urban transformation.

The framework is also expected to significantly enhance student welfare through improved accessibility, safer public environments, better housing conditions and enhanced social infrastructure. Environmental benefits would include reduced vehicular dependency, improved air quality, increased urban greening and more efficient infrastructure utilisation.

At the institutional level, the ABD framework would strengthen inter-agency coordination, improve governance efficiency and facilitate data-driven urban management. Overall, the framework establishes a sustainable and replicable planning model capable of addressing the emerging challenges of coaching-centre

based urbanisation in tier-2 Indian cities.

The above institutional framework illustrates the integrated governance structure required for effective implementation of the ABD framework. Since coaching-centre based urbanisation affects mobility systems, land use, infrastructure networks, public spaces and student welfare simultaneously, no single institution can independently manage the complexity of educational-commercial urban growth.

The framework therefore emphasises coordinated implementation among urban local bodies, planning authorities, smart governance agencies and educational stakeholders. The Bhopal Municipal Corporation is primarily responsible for public infrastructure, streetscape enhancement and service delivery, while the Bhopal Development Authority plays a central role in land-use regulation, redevelopment control and spatial planning. The Smart City SPV supports digital governance systems, ICT integration and data-based monitoring mechanisms.

Simultaneously, coaching institutes and educational associations are expected to contribute towards institutional compliance, self-regulation and student welfare initiatives. The State Government provides overarching policy direction, financial support and regulatory oversight necessary for long-term implementation.

The proposed institutional framework therefore establishes a collaborative governance mechanism capable of supporting sustainable and integrated educational urban development in Bhopal.

6.8 Implementation Strategy and Institutional Framework

6.8.1 Implementation Phasing and Prioritisation

Table 11 proposed implementation phasing strategy for ABD framework execution.

Phase	Time Period	Major Interventions
Short-term	0–3 years	Traffic management, safety audits, footpath improvement
Medium-term	3–7 years	Parking structures, redevelopment projects, ICT systems
Long-term	>7 years	Greenfield educational districts and TOD corridors

The phasing strategy reflects the need for gradual and financially feasible implementation. Immediate interventions focus on mobility and safety improvements, while long-term measures address structural urban transformation and planned educational expansion.

The implementation strategy is divided into short-term, medium-term and long-term phases.

6.8.1.1 Short-Term Interventions (0–3 Years)

- Traffic management measures.

- Footpath improvement.
- Parking regulation.
- Safety audits.
- Pilot streetscape projects.

6. 8.1.2 Medium-Term Interventions (3–7 Years)

- Multi-level parking development.
- Mixed-use redevelopment projects.
- Public transport integration.
- Smart governance systems.

6. 8.1.3 Long-Term Interventions (>7 Years)

- Greenfield educational districts.
- Transit-oriented development corridors.
- Comprehensive urban restructuring.

6.8.2 Roles and Responsibilities of Key Institutions

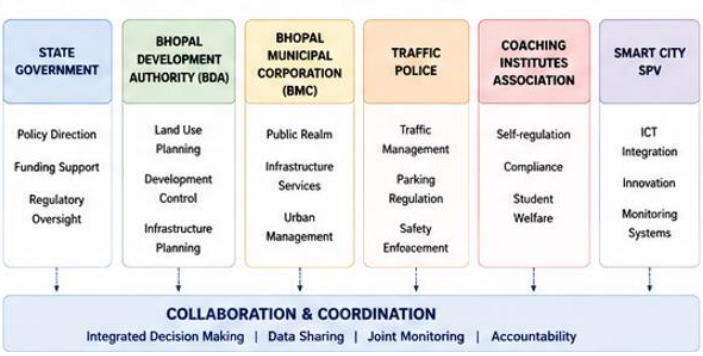


Figure 21 institutional responsibility framework for ABD implementation.

Major institutions include:

- Bhopal Municipal Corporation.
- Bhopal Development Authority.
- Traffic Police.
- Urban Administration Department.
- Coaching institute associations.

6.8.3 Stakeholder Participation and Partnership Mechanisms

Stakeholder participation should include students, residents, coaching institutes, local businesses and transport agencies.

6.9 Policy Recommendations

The successful implementation of the proposed Area Based Development (ABD) Framework requires supportive policy reforms, regulatory restructuring and coordinated institutional mechanisms. The policy recommendations presented in this section aim to integrate coaching-centre based urbanisation within the formal planning and governance structure of Bhopal. These recommendations focus on land-use planning, mobility management, student welfare, building safety and governance reforms necessary for creating safe, efficient and student-friendly educational districts.

6.9.1 Recommendations for Master Plan and Zoning Amendments

The existing planning framework of Bhopal does not adequately recognise coaching-centre clusters as specialised urban activity zones. Consequently, the uncontrolled conversion of residential and commercial properties into educational uses has generated significant pressure on infrastructure systems and public spaces. It is therefore recommended that the Bhopal Development Plan incorporate dedicated educational mixed-use zones within major coaching corridors to regulate future growth in a planned manner.

The Master Plan should further identify transit-oriented educational corridors along major public transport routes and metro influence zones. Such corridors should promote higher-density mixed-use development integrated with pedestrian infrastructure, public transport systems and structured parking facilities. In addition, special parking management districts and regulated student housing zones should be incorporated to reduce land-use conflicts and improve urban management efficiency.

These amendments would help integrate coaching-centre development within the broader spatial planning structure of the city while ensuring balanced and infrastructure-supported urban growth.

6.9.2 Recommendations for Building Bye-Laws and Safety Regulations

The study identified serious concerns related to overcrowding, inadequate fire safety infrastructure and lack of accessibility within existing coaching premises. Therefore, specific building bye-laws should be introduced for coaching-centre development in order to establish minimum standards for safety, functionality and occupancy management.

The proposed regulations should include provisions related to occupancy limits, mandatory fire exits, structural safety certification, universal accessibility, ventilation standards and emergency evacuation infrastructure. Parking standards should also be revised based on actual peak-hour demand generated by coaching institutes rather than conventional commercial norms.

Incorporating these standards within municipal building regulations would significantly improve the safety and operational efficiency of educational buildings while reducing risks associated with high-density student concentration.

6.9.3 Recommendations for Mobility and Parking Management

Mobility and parking pressure emerged as one of the most critical urban challenges within the identified coaching clusters. The study therefore recommends the adoption of integrated mobility management strategies focusing on sustainable transport systems, pedestrian accessibility and demand-based parking regulation.

Shared parking systems and structured parking facilities should be developed within high-intensity educational corridors to reduce dependence on informal

roadside parking. Demand-responsive parking pricing mechanisms may also be introduced to discourage long-duration on-street parking during peak hours.

The framework further recommends prioritisation of non-motorised transport infrastructure including wider footpaths, safe pedestrian crossings, cycling facilities and universal accessibility measures. Public transport integration and feeder mobility systems should be strengthened to improve accessibility and reduce private vehicle dependency within coaching districts.

These interventions would collectively improve traffic circulation, pedestrian safety and overall mobility efficiency within educational-commercial clusters.

6.9.4 Recommendations for Student Housing and Welfare Infrastructure

The rapid increase in student population has generated substantial demand for affordable and safe housing within coaching clusters. However, the absence of regulated student accommodation has resulted in unplanned rental growth, overcrowding and inadequate welfare infrastructure.

The study recommends the integration of affordable student housing within planning frameworks through designated hostel zones, mixed-use educational districts and public-private partnership models. Student welfare infrastructure including health services, counselling centres, recreational spaces, public amenities and safe public environments should also be incorporated within coaching hubs.

Special emphasis should be placed on inclusive and gender-sensitive urban infrastructure to ensure safe and equitable educational environments for female students and vulnerable groups.

The integration of student welfare infrastructure within urban planning mechanisms is essential for improving liveability and learning conditions within rapidly growing educational districts.

6.9.5 Recommendations for Dedicated Coaching-Centre Policy in Tier-2 Cities

The absence of a dedicated policy framework for coaching-centre based urbanisation remains one of the major institutional gaps identified in the study. Existing regulations treat coaching institutes as conventional commercial establishments despite their significantly different mobility patterns, infrastructure demand and student concentration characteristics.

It is therefore recommended that state governments and urban development authorities formulate a dedicated coaching-centre policy specifically for tier-2 cities experiencing rapid educational-commercial growth. Such a policy should regulate location suitability, infrastructure standards, parking requirements, student safety measures, institutional accountability and environmental performance standards.

The policy should also establish mechanisms for licensing, monitoring, grievance redressal and inter-agency coordination among municipal authorities, traffic departments and educational institutions. Integrating coaching-centre development within statutory planning frameworks would ensure long-term urban sustainability and improved governance efficiency.

Overall, the proposed policy recommendations aim to transform coaching-centre clusters from unregulated urban pressure zones into planned, accessible and student-friendly educational districts capable of supporting sustainable urban growth in tier-2 Indian cities.

6.10 Conclusions

The present chapter proposed a comprehensive Area Based Development Framework for managing coaching-centre based urbanisation in Bhopal. The framework was developed in response to the growing spatial, infrastructural and

governance challenges emerging from the rapid concentration of educational activities within selected urban corridors of the city.

The chapter demonstrated that coaching-centre clusters have evolved as significant urban activity zones influencing land-use transformation, mobility demand, parking pressure, commercial intensification and public infrastructure utilisation. However, the absence of specialised planning regulations and integrated urban management mechanisms has resulted in fragmented growth patterns characterised by congestion, pedestrian safety issues, inadequate public amenities and declining environmental quality.

In response to these challenges, the proposed ABD framework introduced a multidimensional planning strategy integrating retrofitting interventions for existing coaching hubs, redevelopment mechanisms for highly congested areas and greenfield planning approaches for future educational growth. The framework further incorporated pan-city policy reforms, governance mechanisms, implementation strategies and institutional coordination structures necessary for long-term urban management.

The framework application to major coaching clusters in Bhopal illustrated the practical relevance of the proposed planning approach. The proposed interventions demonstrated the potential to improve mobility efficiency, pedestrian safety, public transport accessibility, infrastructure performance, environmental quality and overall student welfare within educational districts.

From a theoretical perspective, the study contributes to the emerging discourse on educational-commercial urbanisation by recognising coaching-centre clusters as specialised urban systems requiring dedicated planning responses. The study also expands the scope of area-based planning approaches by integrating student welfare and educational infrastructure within the broader framework of urban governance and spatial planning.

At the practical level, the study provides a replicable planning model for tier-2 Indian cities experiencing similar patterns of educational concentration and mobility stress. The framework aligns with contemporary planning principles

including transit-oriented development, sustainable mobility, mixed-use compact growth and inclusive urbanism.

Nevertheless, the study remains constrained by limitations associated with long-term mobility forecasting, institutional data availability and evolving educational market dynamics. Future research may therefore focus on behavioural mobility modelling, smart governance systems, educational transit demand assessment and comparative analysis of coaching-centre urbanisation across different regional contexts.

Overall, the chapter establishes that coaching-centre based urbanisation can no longer remain outside the ambit of statutory planning and urban governance. Planned intervention through integrated area-based development approaches is essential for ensuring that educational growth contributes positively to urban sustainability, infrastructure efficiency and student well-being in rapidly transforming tier-2 cities.

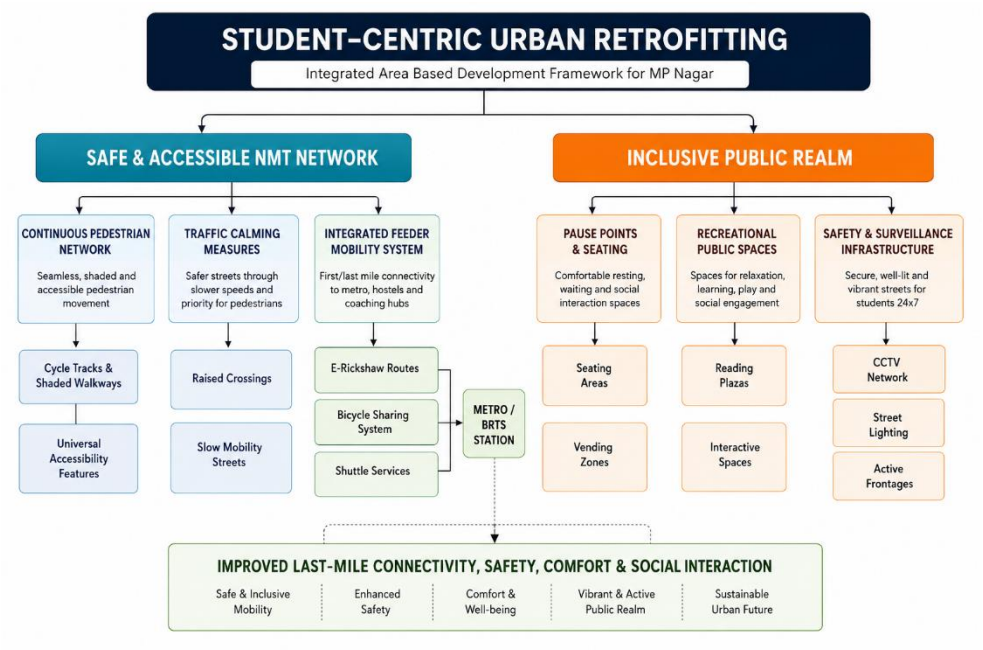


Figure 22 Proposals

Existing Problem Identified in MP Nagar	Planning Proposal / Intervention	Expected Outcome
Discontinuous pedestrian movement and unsafe walking environment near coaching clusters	Development of continuous pedestrian pathways and shaded walkways connecting metro/BRTS, hostels and coaching institutes	Safe and uninterrupted student movement throughout the corridor
Absence of dedicated cycling infrastructure and dependence on motorized modes for short trips	Introduction of dedicated cycle tracks and bicycle stands at strategic nodes	Increased use of sustainable mobility and reduced congestion
Traffic conflicts and speeding vehicles near educational clusters	Introduction of traffic calming measures such as raised crossings, pedestrian-priority streets and slow mobility corridors	Reduced accidents and improved pedestrian safety
Lack of universal accessibility for differently-abled users	Provision of tactile paving, ramps, barrier-free crossings and universal design elements	Inclusive and equitable mobility environment
Weak last-mile connectivity between metro station and inner streets	Integrated feeder mobility system using e-rickshaws, shuttle services and bicycle-sharing systems	Improved accessibility to transit and reduced dependency on private vehicles
Encroached and overcrowded street edges causing pedestrian spillover	Redefining overcrowded nodes and introducing organized street typologies	Better pedestrian circulation and efficient street management
Poor safety perception during late evening coaching hours	Installation of CCTV surveillance, lighting and active street edges	Enhanced security and safer public realm for students

Table 12 Proposal Intervention for MP Nagar

OBJECTIVE: To develop a safe, accessible and student-oriented Non-Motorized Transport (NMT) network for improving last mile connectivity within MP Nagar.

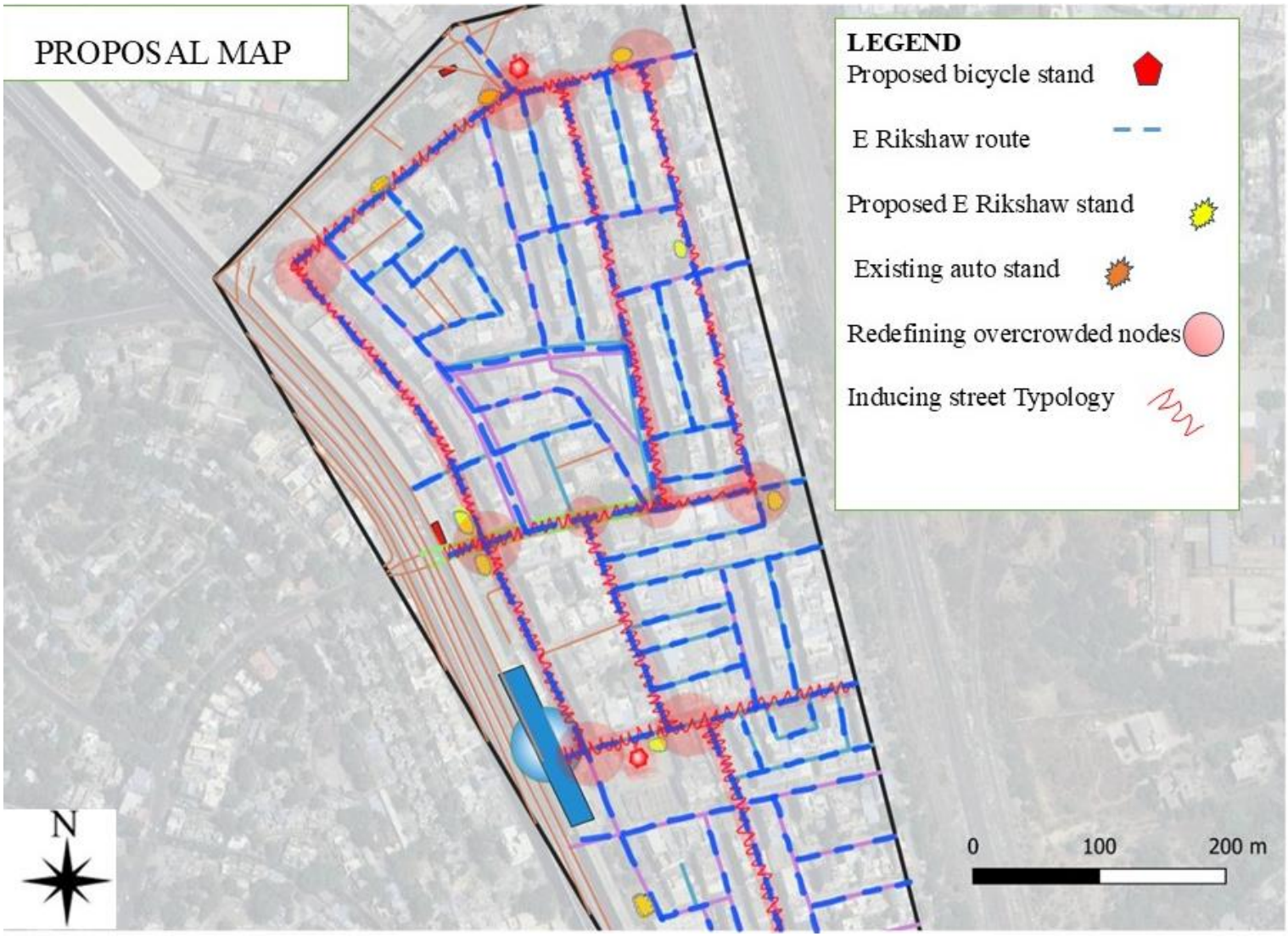


Figure 23 Proposal map based on Objective 2

Creation of an integrated feeder mobility system involving e-rickshaws, bicycle-sharing and shuttle connectivity for students. Provision of universal accessibility features including tactile paving, ramps, shaded walkways and barrier-free crossings, benches and street lights.

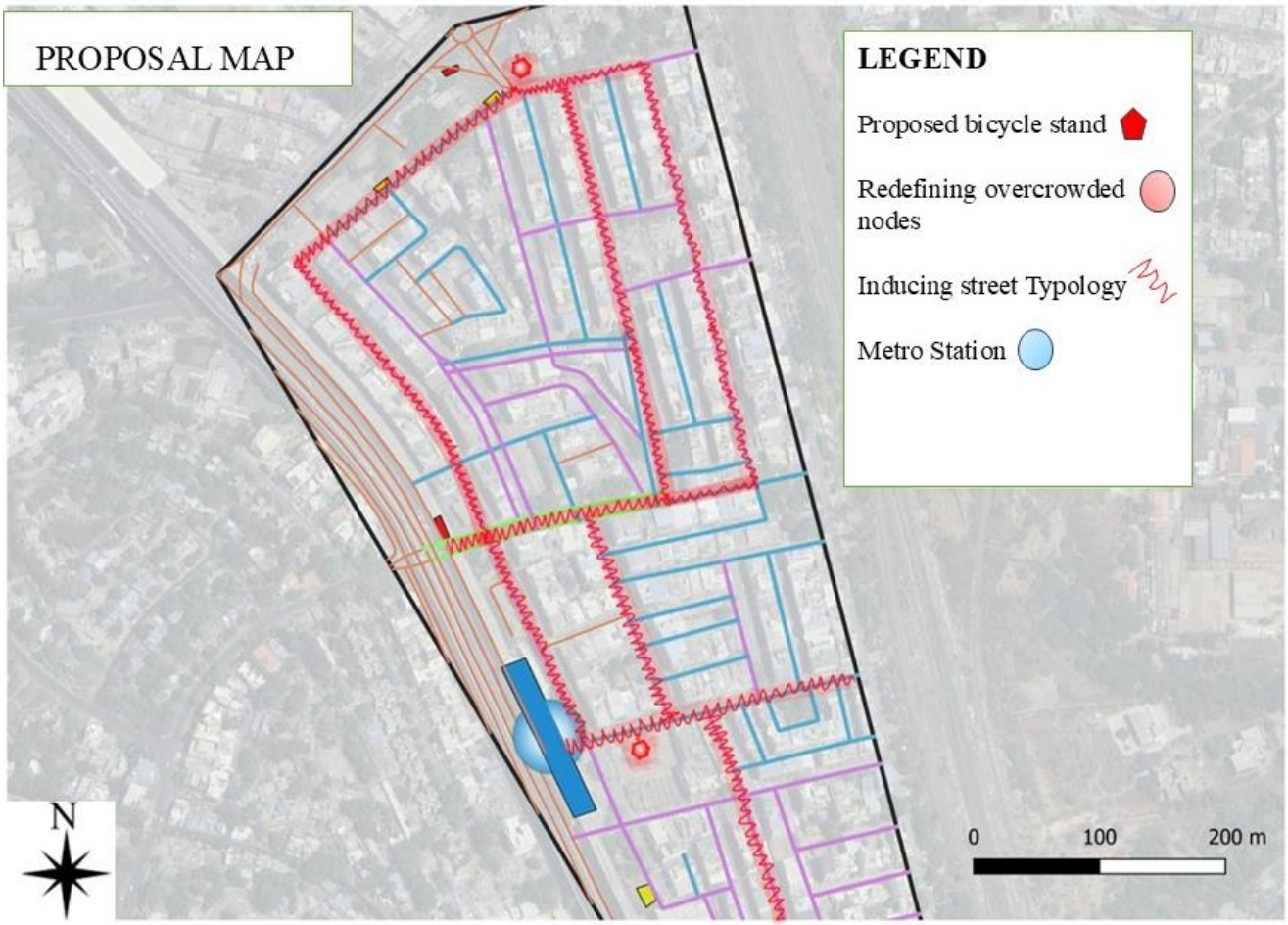


Figure 28 (Cycle + Pedestrian + Street Typology + Metro Integration) Map

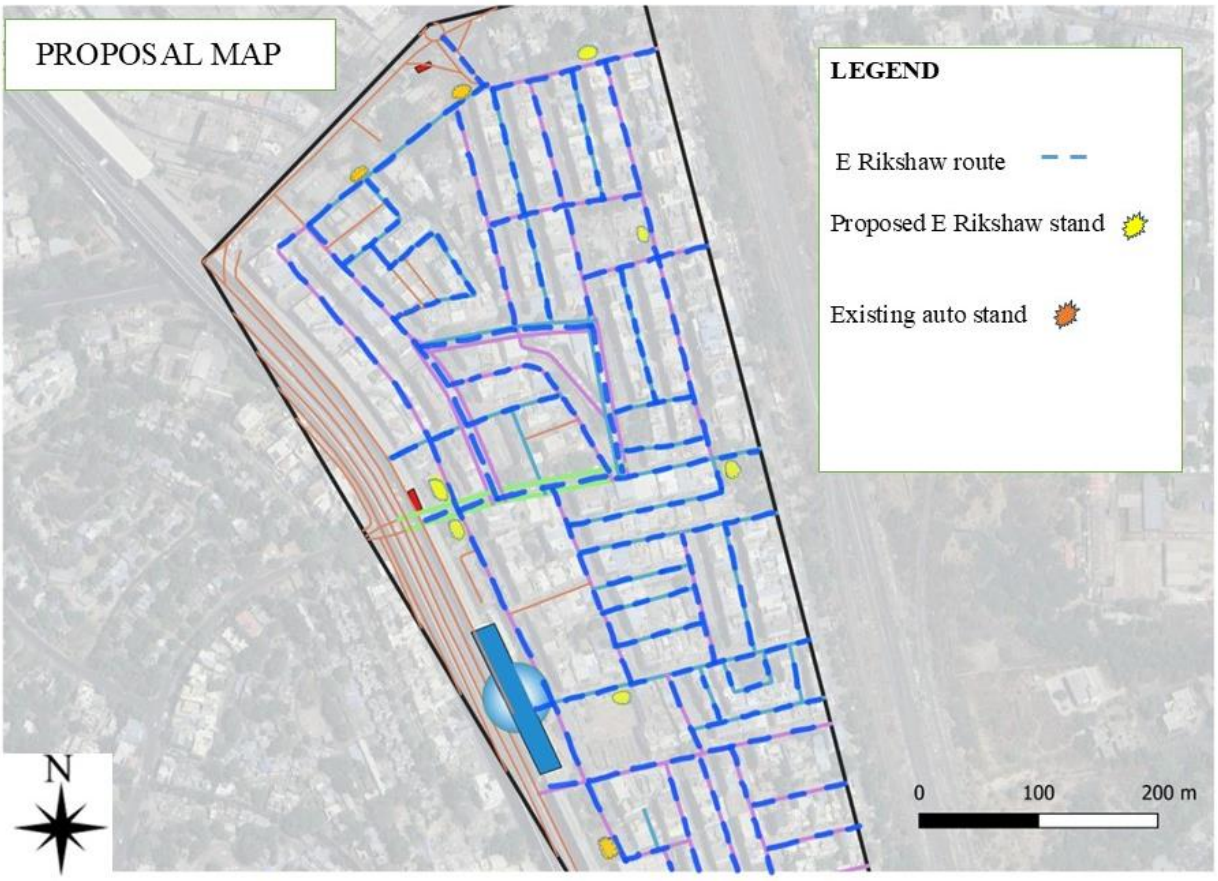


Figure 29 (E-Rickshaw + Feeder Mobility + Stands) Map2

OBJECTIVE: To create inclusive pause points and recreational public spaces that enhance safety, comfort and social interaction for students in MP Nagar.

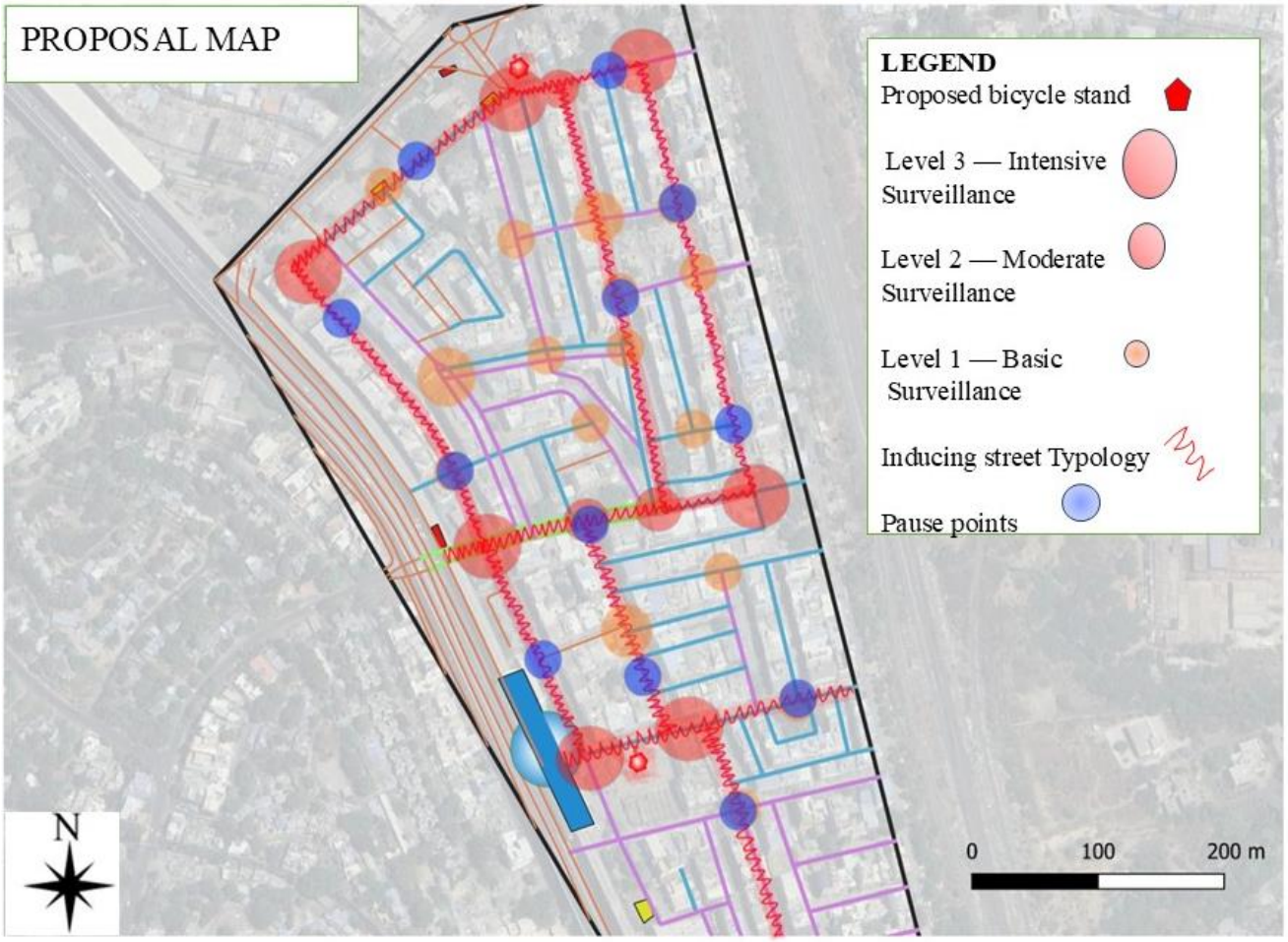


Figure 24 Proposal Map based on Objective 3

Installation of street lighting, CCTV surveillance and active frontage design to improve safety during early morning and late evening coaching hours.

Development of pause points at regular intervals comprising seating areas, shaded pockets, vending zones and informal gathering spaces.

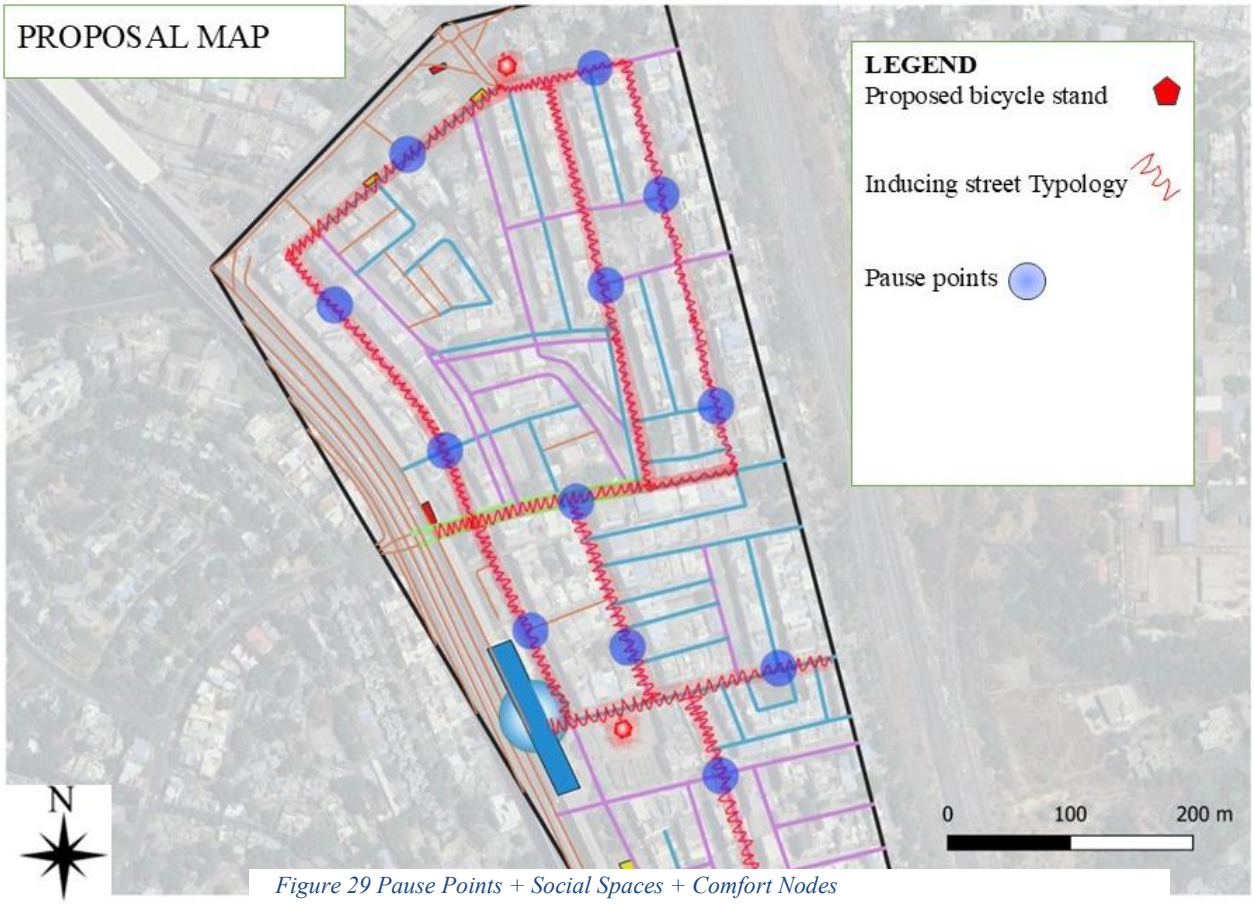


Figure 29 Pause Points + Social Spaces + Comfort Nodes

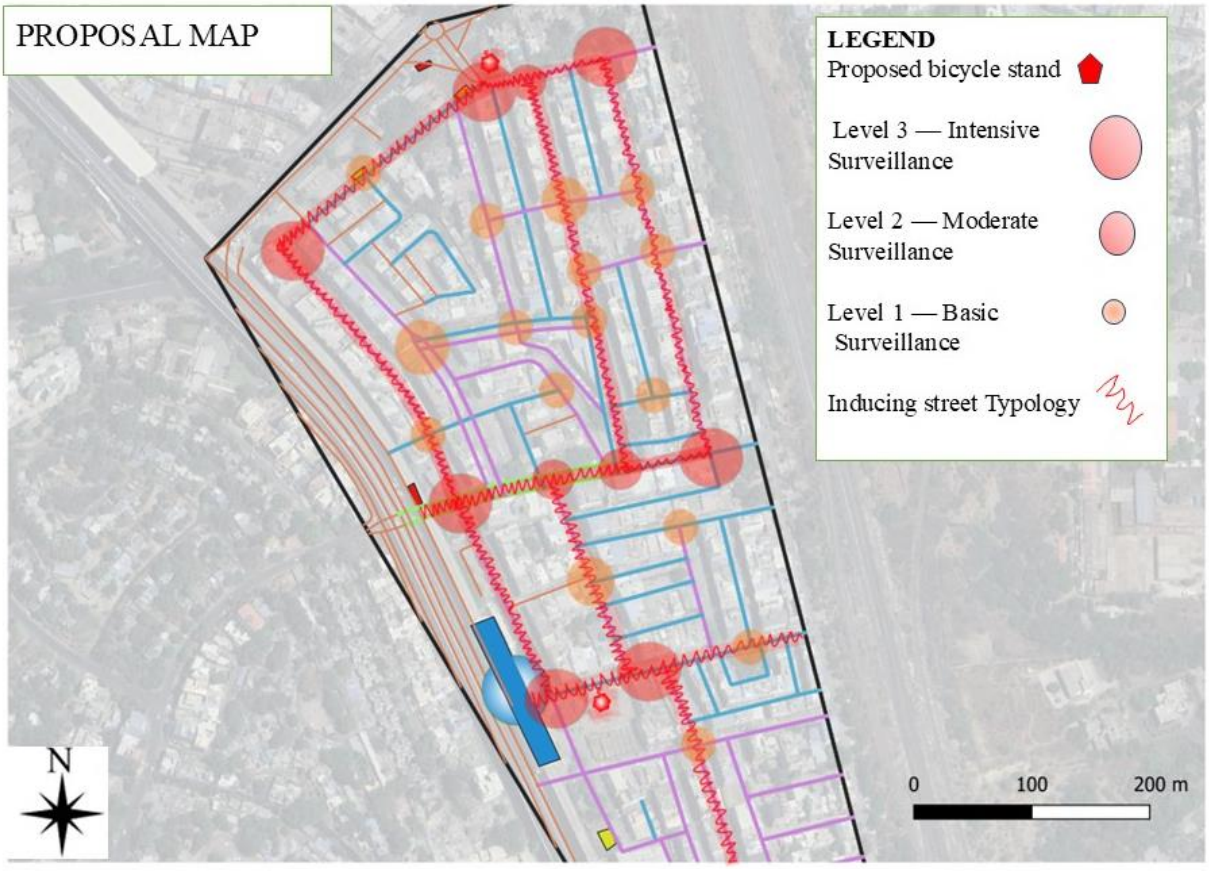


Figure 30 Surveillance + Safety + Active Street Edges

OBJECTIVE: Develop an integrated waste management system with optimized collection routes, source segregation, and strategic collection points for a clean, sustainable coaching precinct.

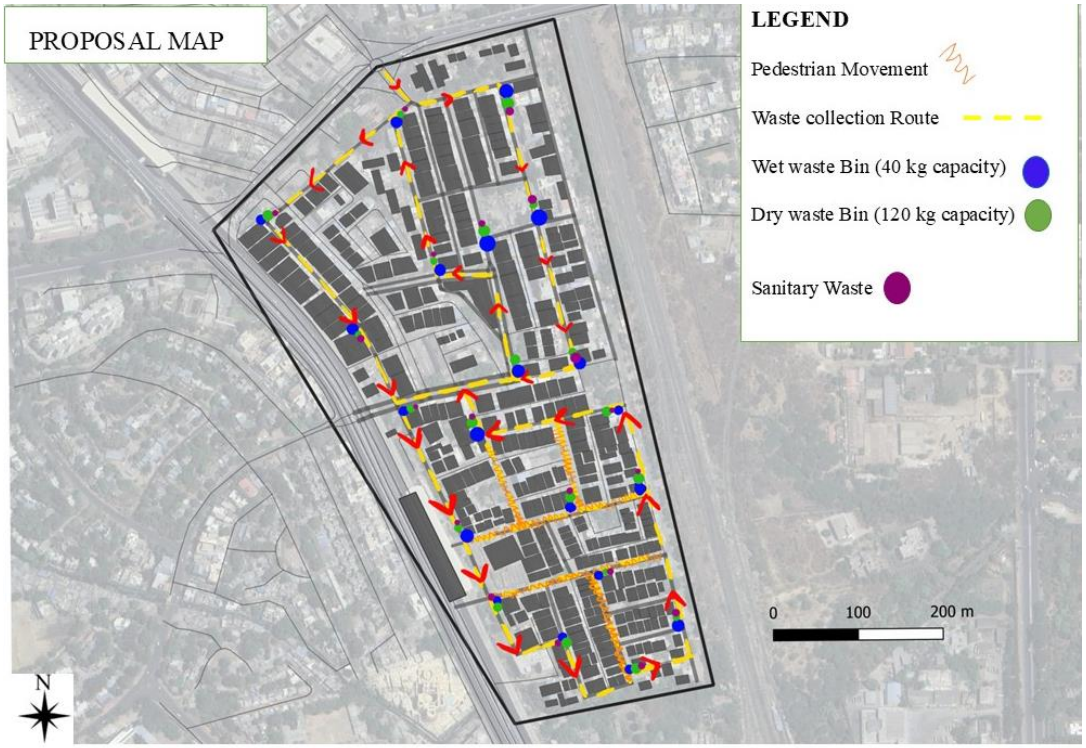


Figure 25 Waste Management

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