UITP ADVANCING PUBLIC TRANSPORT

→ Insights

Low Emission Zones in Indian Cities

Pathways to Cleaner Cities

Explore the feasibility of Low Emission Zones (LEZs) in Indian cities to reduce transport-related air pollution and improve public health. Through case studies of Bengaluru, Mysuru, and Kochi, this publication evaluates policy, institutional, infrastructure, enforcement, and public readiness. It proposes phased, city-specific LEZ models supported by clean mobility, parking reform, and digital enforcement, offering a roadmap for scalable implementation aligned with national climate and air quality goals.

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Introduction

Deteriorating air quality represents one of the most critical public health challenges globally. According to the World Health Organization (WHO) , in 2019 nearly 99% of the world's population was exposed to air quality levels exceeding WHO Air Quality Guidelines. Air pollution reduces average life expectancy by approximately 1.8 years and is responsible for an estimated 8.8 million premature deaths each year.

Road transport alone contributes around 27% of urban air pollution globally, underscoring its significant impact on public health[1]. In response, international frameworks such as the Global Roadmap of Action towards Sustainable Mobility (GRA) promote a comprehensive set of measures, including modal shift to public transport, walking and cycling, vehicle electrification, improved management of polluting vehicles, better traffic engineering, street design, and the introduction of regulatory instruments such as Low Emission Zones (LEZs).

India's rapid urbanisation continues to intensify air quality and public health challenges, with the transport sector remaining a major contributor to urban pollution. According to the Ministry of Environment, Forest and Climate Change (MoEFCC) and the Central Pollution Control Board (CPCB), road transport contributes 25 -30% of $PM_{2.5}$ emissions in large Indian cities, and is a dominant source of NOx and black carbon, particularly in dense urban areas[2]. This contribution is driven by ageing vehicle fleet, weak inspection and maintenance regimes, high dependence on petrol and diesel vehicles especially two-wheelers, heterogeneous traffic conditions that increase idling and stop-and-go emissions.

→ India's rapid urbanisation is intensifying air quality and public health challenges.

The CPCB analysis further indicates that older Bharat Stage (BS)-III equivalent to the Euro 3 emission standard and pre-BS vehicles, though a minority of the fleet, contribute a disproportionate share of particulate and NOx emissions, especially in city centres.

India adopted Bharat Stage (BS) emission standards based broadly on European EURO norms, with BS-VI aligned with EURO-6, skipping directly from BS-IV in 2020. The BS-VI norms improve emissions performance for new vehicles but do not address spatial concentration of emissions. National measures such as the Vehicle Scrappage Policy and the NCAP, which targets a 40% reduction in particulate matter (PM) concentrations by 2026, aim to accelerate fleet renewal to improve overall air quality.

→ National measures target a 40% cut in PM concentrations by 2026.

The scrappage policies rely on voluntary uptake and gradual fleet turnover to cleaner vehicles and NCAP primarily focuses on monitoring and sectoral action planning rather than enforceable, area-based restrictions. However, these instruments operate at a system-wide level and do not directly regulate where high-emission areas or zones within cities lie or deliver rapid air quality improvements in dense urban environments. As a result, exposure hotspots such as commercial cores, heritage areas, and high-footfall corridors remain vulnerable to concentrated vehicular pollution in cities.

In this context, Low Emission Zones (LEZs), successfully implemented across several European and other Asian cities, are increasingly recognised as a relevant and scalable instrument for Indian cities. LEZs enable local governments to restrict or discourage the entry of high-emitting vehicles into designated areas, thereby directly addressing pollution hotspots while supporting cleaner vehicle adoption, public transport use, and active mobility. When aligned with national policies such as BS-VI, scrappage and NCAP, LEZs can act as an effective city-level regulatory mechanism to accelerate emissions cuts and improve public health.

Against this backdrop, UITP's research project "Enabling Mechanisms for Development of Low Emission Zones (LEZ) in India", aims to:

→ The research draws from evidence-based learnings from three selected case cities.

→ Demonstrate the feasibility of LEZs within Indian urban contexts.

→ Assess institutional, technical, and operational readiness of cities towards LEZ concept.

→ Outline city-specific LEZ pathways for implementation and replication across Indian cities.

Recognising India's fragmented urban governance, heterogeneous traffic conditions, and prevalence of ageing and informal vehicle fleets, the initiative emphasises contextualised LEZ models aligned with municipal regulations, vehicle scrappage frameworks, and city climate action plans, while fostering public and political consensus.

→ LEZ National Workshop.

Methodology

The research project aimed to translate global LEZ experience into practical, India-specific guidance by addressing institutional fragmentation, mixed traffic conditions, and socio-economic sensitivities that characterise Indian urban transport systems.

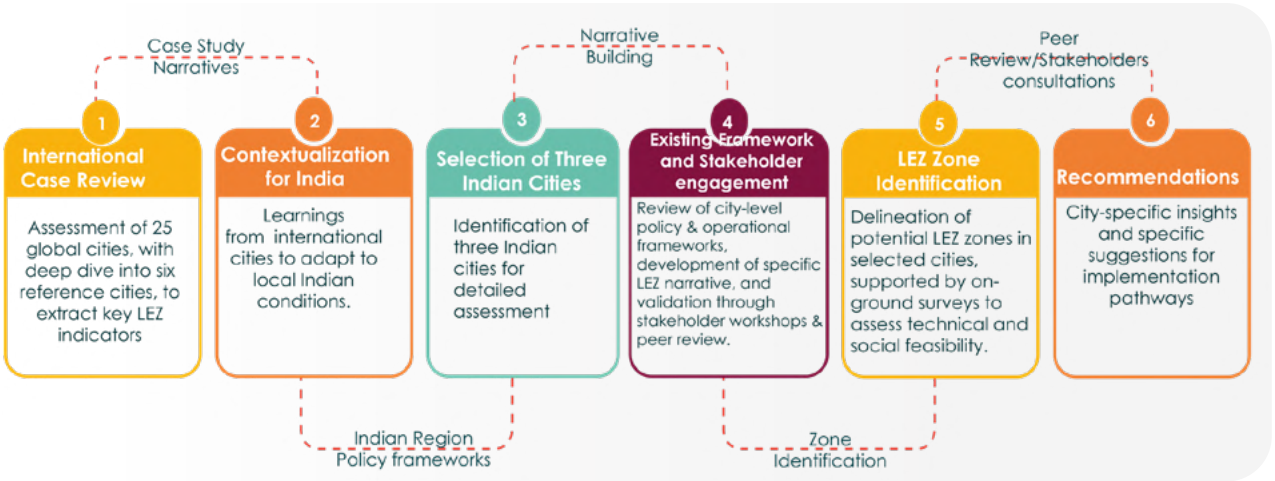
It follows a structured, multi-staged approach beginning with an extensive literature review of global LEZ practices across six early adopter cities like London, Berlin, Paris, Brussels, Barcelona, and Seoul.

Insights from these cities on phased implementation, enforcement mechanisms, public communication, exemptions, and supporting mobility measures paved the way for better understanding and developing tailored solutions for each of three Indian cities.

The project reviewed global LEZ practices across six early adopter cities like London, Berlin, Paris, Brussels, Barcelona, and Seoul.

Stakeholder consultations at various stages and data-driven technical assessment approach, helped UITP to identify the cities' local concerns and future opportunities for LEZ implementation.

Also, inputs from international experts as peer reviewers helped in the preparation of city-specific LEZ concepts and pilot strategies.



Case Cities

Three case cities of Bengaluru, Mysuru, and Kochi were selected for the study, based on a combination of factors like air quality concerns, traffic congestion and institutional capacity.

→ Bengaluru, Mysuru, and Kochi were selected for factors including air quality concerns and institutional capacity.

Within each city, selection of zones with potential of LEZ implementation were prioritised as core areas where exposure to vehicular emissions is highest. Additional criteria included dominance of personal vehicles, proximity to sensitive areas like heritage sites, markets, schools, hospitals, and tourist zones, availability of public transport, and access to air quality monitoring infrastructure.

→ In Bengaluru, the focus is on congested Central Business District (CBD) area with intense commuter inflows.

→ In Mysuru, on heritage-sensitive zone around the Mysuru Palace and historic core.

→ In Kochi, on commercial corridor of Mahatma Gandhi Road with significant pedestrian activity and multimodal connectivity.

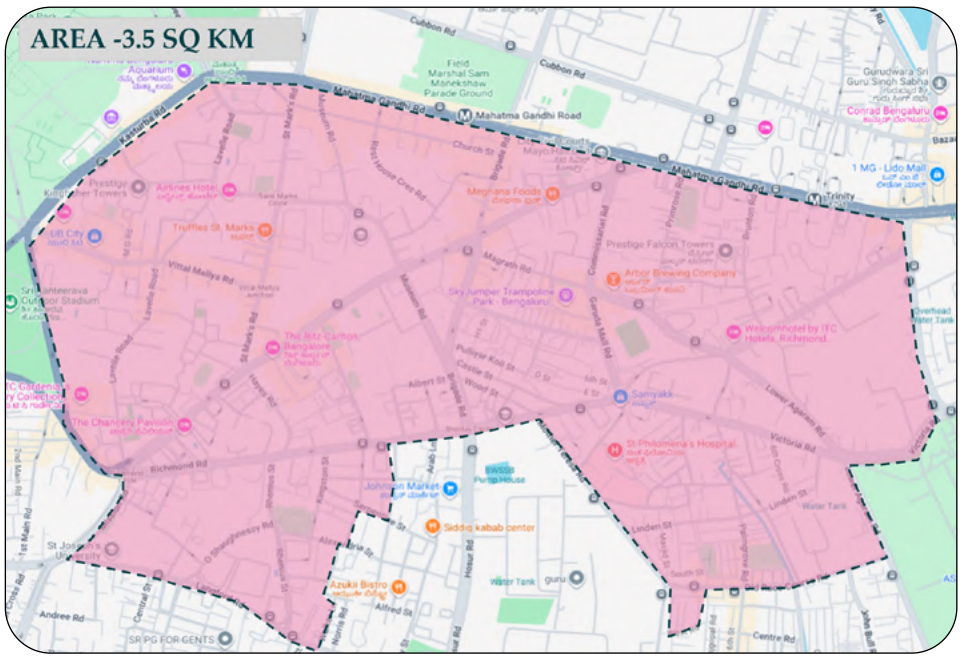
This targeted area selection along with the data-driven approach ensures that LEZ maximise environmental and public health benefits while remaining operationally feasible in the Indian context.

Bengaluru

Bengaluru, Karnataka's capital and India's 'Silicon Valley' (741km^2, 13.6 million population in 2023[3]), ranks as the world's sixth most congested city. Transport contributes ~40% of $PM_{2.5}$ pollution[4] underscoring the need for traffic- and vehicle-focused interventions. Bengaluru's engagement focused on identifying a feasible LEZ within a dense metropolitan setting. A weighted scoring framework based on several parameters like air quality, public transport connectivity, land use and population density was applied to prioritise LEZ location, resulting in the selection of Residency Road and the surrounding Shanthala Nagar administrative ward (approximately 3.5km^2) as an appropriate option. The area forms part of the CBD, encompassing major commercial, institutional, and recreational land uses, making it well-suited for sustainable mobility interventions. Defining the LEZ at ward level enables coordinated traffic management across agencies and supporting enforcement within a clearly delineated administrative boundary.

Baseline studies indicated frequent $PM_{2.5}$ and PM_{10} exceedances (based on WHO guidelines), peaking mornings/evenings with traffic, confirming vehicular emissions as the main source for pollution in the area. Traffic relies heavily on private vehicles (two-wheelers 53%, cars 28% petrol-fuelled); while other modes like buses comprise 2%, and non-motorised transport (NMT) is negligible. Despite BS-VI compliance post-2020, a small share of older BS-III vehicles disproportionately pollutes the area. High commercial density on Brigade Road and Residency Road worsens during peak hours and creates pressure on parking zones.

Bengaluru's potential LEZ implementation is suggested in a phased approach as majority of vehicles are currently complying with the existing BS IV and VI norms. A grace period from 2026 to 2029 is proposed to strengthen public transport, pedestrian infrastructure, parking management, governance via an inter-coordination agency Cell, Automatic Number Plate Reading (ANPR) enforcement, and awareness campaigns.



→ Bengaluru LEZ Site Area.

In 2030, municipal wards within Shanthala Nagar may pilot the LEZ and ban BS-III and older vehicles. The aim is to especially restrict BS-IV heavy goods vehicles, buses, and older light vehicles. There is also plan for introduction of congestion charging on major roads, with exemptions for special vehicles and buses. Long-term expansion goes city-wide that enforces stricter standards, promotes clean vehicles, and integrates demand management. Strong coordination, digital enforcement, and monitoring need to be created for a scalable model for reducing emissions, improving air quality, and enhancing liveability.

6th
most congested city in the world

40%
$PM_{2.5}$ pollution comes from transport

3.5km²
proposed LEZ

→ International experts at a site visit at Bengaluru during peer review.

The Bengaluru case illustrates how corridor-based LEZ planning in large metros must be grounded for understanding travel behaviour and vehicle composition. Baseline studies revealed a comparatively higher share of BS-VI compliant vehicles, significant peak-hour congestion, and strong spatial variation in traffic intensity across ward. These insights positioned proposing LEZ as a longer-term intervention (post-2030), allowing time for fleet transition while avoiding premature restrictions. Congestion pricing was proposed as a complementary demand-management measure, rather than relying solely on emission-based bans. A ward-level implementation approach was adopted to enable granular targeting of pollution hotspots, localised stakeholder engagement, and integration with parking management and public transport improvements.

→ The LEZ was proposed as a longer-term intervention with congestion pricing as a complementary measure.

Other Indian megacities can learn from Bengaluru's data-led, phased strategy that aligns LEZ timing with fleet maturity while using congestion management as a parallel policy lever.

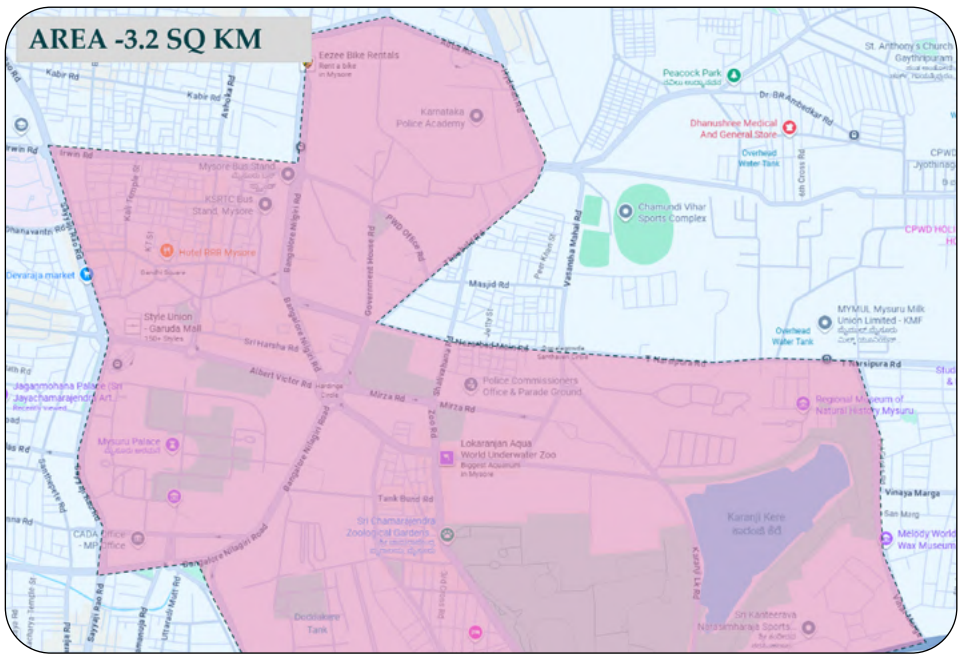
Mysuru

Mysuru is a historic city in Karnataka with about 1.3 million people. It was selected for its heritage significance, compact urban structure, and visible pollution hotspots in high-activity areas. The city draws millions of tourists annually to attractions like Mysuru Palace, Zoo, and Chamundi Hills, leading to a boost in the economy and infrastructure growth. Unlike larger metro cities, travel demand in Mysuru links closely to tourism and pedestrian movement around the CBD comprising the heritage area of the Mysuru Palace and nearby areas. Congestion and vehicular emissions peak during tourist seasons and festivals such as Dussehra and Diwali. These pose growing risks to public health, heritage structures, and pedestrian safety, making the city well suited for interventions that aim to improve air quality while preserving its historical importance.

Mysuru's proposed LEZ site selection targeted heritage protection and congestion/pollution mitigation in core areas. The chosen 3.2km^2 zone around Mysuru Palace which is the CBD and heritage hub, includes landmarks like the Mysuru Palace, Zoo, and Karanji Lake, along with other tourist sites, commercial places and ecologically sensitive areas. It offers strong public transport connectivity and air quality management stations.

Air quality assessments reveal $PM_{2.5}$ at 40-60 µg/m^3 (2-4x WHO 24-hr guideline) and PM_{10} at 80-120 µg/m^3 (3x guideline), spiking during Dussehra and peak hours of day due to vehicular surges in the heritage core. Cars/two-wheelers dominate (94% of fleet; buses <1%), with about 4% BS-III vehicles over-polluting despite rising BS-VI adoption. High private vehicle use, older diesel autorickshaws (11% diesel, 2% electric), unmanaged freight, and on-street parking worsen stop-go traffic and emissions.

This justifies a Palace precinct Green Zone with emission controls, traffic management, and clean mobility to safeguard health, heritage, and tourism. Mysuru's LEZ proposal adopts a heritage-sensitive approach. It targets the Palace area and its nearby areas for enforcing LEZ rules, also referred to as green zone. The restrictions include daytime bans on smoke-emitting heavy



→ Mysuru LEZ Site Area.

vehicles, levy of Green Cess on older diesel and BS-III vehicles entering or parking in the LEZ. Electric and Compressed Natural Gas (CNG) autorickshaws get priority at tourist/transit stands, while on-street parking is limited to short durations.

The medium-term plan aims to tighten restrictions on older light commercial vehicles and diesel autorickshaws and integrate the green cess into city traffic management systems. Public transport, particularly city buses serving tourist and CBD routes, is enhanced, promote pedestrianisation and no-honking zones, and establish institutional data-sharing. The long-term vision is to expand the LEZ to a city-wide level within the Outer Ring Road that would phase out BS-IV vehicles and boost electric vehicles (EVs) and CNG in public transport.

The Mysuru Palace zone serves as a low-emission benchmark. City-wide parking pricing, freight time restrictions, and demand management measures are proposed to support sustained emission reductions; while continuous air quality monitoring, health impact assessments, and mobility data monitoring would further refine policies and ensure predictable, socially acceptable, and sustainable enforcement.

1.3
million inhabitants of the historic city

94%
of vehicles are cars/two-wheelers

3.2km²
proposed LEZ

→ Meeting of international experts with Mysuru City Corporation team.

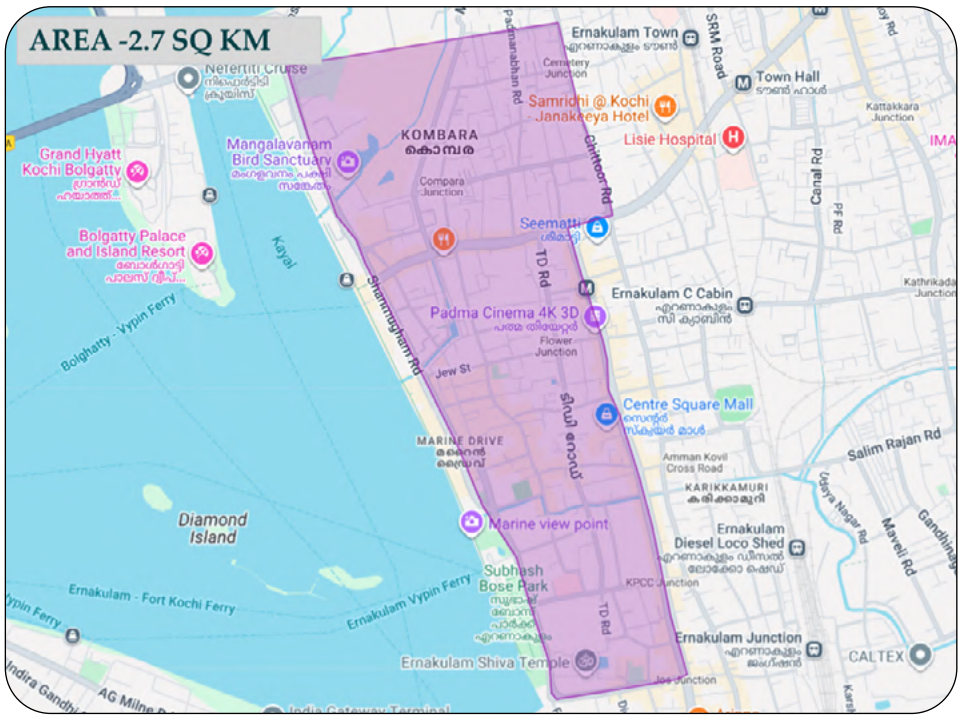
Mysuru exhibits concentrated pedestrian activity, pronounced tourism-driven traffic peaks, and heightened environmental sensitivity within the Mysuru Palace and surrounding heritage precinct, coupled with significant daily commuter pressure. These characteristics justified a precinct-based Low Emission Zone (LEZ) focused on the Palace area and adjacent heritage zones, rather than a city-wide intervention. The LEZ proposal prioritised the imposition of a green cess on tourist and outstation vehicles, integrated with existing parking fees, as a practical mechanism for both enforcement and revenue generation. This approach minimised disruption to residents while targeting high-impact, non-essential trips. Cities with historic cores can draw lessons from Mysuru's targeted, low-disruption model, which leverages parking and tourism management as practical entry points for LEZ implementation.

→ Proposed restrictions include daytime bans on certain vehicles, levies for entering and parking, notably on tourist and outstation vehicles, as well as priority for electric and CNG autorickshaws.

Kochi

Kochi is Kerala's commercial capital, known as the Queen of the Arabian Sea. Its metro region covers 95km^2 and houses about 3.4 million people[6]. While the city has made significant investments in advanced and sustainable transport infrastructure that includes the metro rail, water metro services, pedestrian redesign initiatives, and NMT networks, the core of the city continues to experience persistent traffic congestion and elevated levels of air pollution. Survey data shows heavy private vehicle usage, ageing fleets, unregulated freight, and poor parking. The $PM_{2.5}$ and PM_{10} levels often exceed WHO Guidelines with peak levels coinciding with periods of intensified traffic activity.

These concerns are consistent with the objectives of LEZ which aim to reduce emissions in high-traffic areas. Accordingly, a stakeholder-guided approach was adopted to inform the design of the LEZ and the selection of the implementation area. A strategic area spanning approximately 2.7km^2 along Mahatma Gandhi Road in Kochi was selected, extending from Subhash Park in the south to the High Court in the north. This corridor was chosen due to high vehicular and pedestrian activity, dense concentration of government offices, commercial establishments, markets, as well as its strong connectivity to key public transport nodes. This CBD represents both a critical pollution hotspot and an ideal testbed for sustainable urban mobility interventions.



→ Kochi LEZ Site Area.

Primary surveys confirmed congestion, emissions exposure risks in Kochi's proposed LEZ area. Traffic counts pinpointed Gandhi Bhavan and Jos Junctions as hotspots with 25% increase in air pollution during peak hours. The city's travel patterns reveal a strong dependence on private motorised modes with petrol powered fuel sources, with two-wheelers and cars accounting for 82% of trips. Although BS-VI vehicles represent 46% of registered vehicles, however about 8.4% includes proportion of BS-III and older vehicles which contribute disproportionately to urban emissions. Parking assessments indicate intense demand for on-street parking alongside substantial underutilisation of off-street facilities, particularly in the Marine Drive area.

Furthermore, 52% of all trips are shorter than 5km, highlighting considerable potential for a modal shift towards public transport and NMT.

Ambient $PM_{2.5}$ concentrations have been recorded as high as 120 µg/m^3 which is nearly eight times the WHO Guideline, correlating closely with peak traffic periods. Collectively, these factors provide a compelling rationale for the introduction of an LEZ.

The proposed LEZ plan for Kochi adopts a phased implementation strategy, wherein the initial phase prioritises public awareness and stakeholder engagement while introducing only limited regulatory restrictions. It bans BS-III and older diesel/petrol high-polluters plus smoky autorickshaws. The strategy advocates for pedestrianisation of Broadway Market, permitting freight movement only during early-morning hours, alongside stricter regulation of on-street parking and the introduction of differential parking pricing at the High Court and Marine Drive. Additionally, it prioritises the deployment of electric and CNG autorickshaws at designated stands to strengthen first- and last-mile connectivity.

In the medium-term phase, the LEZ is proposed to extend restrictions to all vehicles older than 10 years, introduce automated enforcement through ANPR, and significantly enhance public transport through the deployment of electric buses, increased service frequencies, and improved integration with metro and ferry networks. This phase also envisions the intermediate public transport (IPT) with at least 30% of the fleet transitioning to low-emission vehicles.

Long term, the plan recommends the establishment of a city-wide LEZ covering central urban zones, with restrictions on BS-IV vehicles subject to limited exemptions and supported by fully automated enforcement systems. Public transport and IPT fleets are expected to achieve 100% low-emission or electric status. Concurrently, off-street parking systems would be optimised through clean-vehicle pricing mechanisms, while electric charging infrastructure would be substantially expanded.

52%
of all trips are under 5km

8x
Ambient $PM_{2.5}$ levels are nearly 8x higher than recommended

2.7km²
proposed LEZ

→ Kochi Marine Drive Existing NMT and Parking Infrastructure.

Continuous monitoring of air quality and mobility patterns is envisaged to enable adaptive policy refinement and sustained environmental benefits. Kochi's phased proposal for LEZ implementation strategy, driven by strong data, and stakeholder-led approach demonstrates a practical and socially acceptable pathway for reducing urban air pollution while enhancing liveability. Its compact urban core, mix of transport modes, and ability to integrate enforcement, demand management, and public awareness makes it a replicable model for mid-sized, coastal Indian cities aiming for sustainable mobility and cleaner urban environments.

Other cities can adopt a similar combination of targeted high-footfall zone selection, phased implementation, and integrated mobility planning to maximise environmental and public health benefits. Kochi offers a replicable model for compact cities where LEZs can be integrated with multimodal mobility networks. Study indicated chronic congestion concentrated along MG Road, and spatial constraints arising from its coastal and island geography. But on the positive side, the data also indicated high public transport usage. These factors support a compact downtown LEZ approach that is complemented by pedestrianisation, park-and-ride facilities and integration with metro and water transport.

Given Kochi's climate vulnerability, the LEZ proposal was framed not only as an air-quality intervention but also as part of broader urban resilience and liveability objectives. Other Indian cities can learn from Kochi's approach of aligning LEZs with multimodal transport systems and climate-sensitive urban planning, demonstrating how corridor-level data and stakeholder readiness can enable faster and more socially acceptable implementation.

City's Readiness for LEZ Implementation

Each city was evaluated across six common dimensions as follows:

→ Policy and Regulatory Readiness – alignment with national policies, emission norms, and availability of regulatory tools.

→ Institutional Readiness – presence of empowered agencies, coordination mechanisms, and implementation capacity specially agencies like Directorate of Urban Land Transport (DULT) in Karnataka.

→ Physical and Mobility Infrastructure Readiness – quality of public transport, NMT, parking management.

→ Technology and Enforcement Readiness – availability of Intelligent Transport System (ITS), ANPR, monitoring systems, and enforcement integration.

→ Public Acceptance and Stakeholder Readiness – observed readiness for restrictions and availability of alternative mobility options.

→ Traffic characteristic and vehicles' composition - readiness in terms of newer vehicles' presence like BSVI and above.

Each dimension was ranked High/Medium/Low based on comparative evidence from the city assessments.

Dimension	Bengaluru	Mysuru	Kochi
Policy and Regulatory tools	High	High	High
Political and Institutional ownership	Medium	Medium	High
Physical and Mobility infrastructure	Medium	Medium	Medium
Technology and Enforcement	Medium	Low	Medium
Public acceptance	Medium	Medium	Medium
Traffic characteristic and vehicles' composition	High	Medium	Medium

Each of the six dimensions are explained in detail below:

#1 Policy and Regulatory Readiness

The readiness for LEZ implementation across Indian cities is shaped by a combination of enabling policy frameworks and persistent structural constraints. At the national level, the policy environment provides a strong enabling foundation despite the absence of a dedicated LEZ policy. Instruments such as the Vehicle Scrappage Policy, the Air (Prevention and Control of Pollution) Act, enable restriction of high-emission vehicles, demand management, and alignment of transport interventions with air quality objectives.

These frameworks act as primary enablers for pilot and phased LEZ deployment. At the state and municipal levels, existing statutes further strengthen regulatory readiness. For example, Kerala Motor Vehicles Rules, 1989 and Kerala Municipality Act, 1994 which empowers authorities to restrict unsafe or polluting vehicles and regulate heavy vehicle access, while the authorises urban local bodies (ULBs) to redesign streets, manage parking, implement pedestrianisation, and undertake street improvements. These provisions legally enable area-based controls, which are central to LEZ design.

At the city level, the proposed LEZ plans for Kochi and Mysuru reinforce this enabling environment through targeted mobility and NMT interventions, including public transport strengthening, developing pedestrian and cycling infrastructure, and creating structured parking near major transport hubs.

Together, these policies and provisions act as key enablers for pilot and phased LEZ implementation. However, the absence of explicit LEZ-specific regulations introduces ambiguity for city-wide scaling, making regulatory interpretation and inter-departmental coordination critical barriers to rapid expansion.

#2 Stakeholder Engagement

Stakeholder engagement acts largely as an enabler for LEZ implementation. Early and structured engagement with municipal agencies, traffic police, transport departments, public transport operators, freight and logistics stakeholders, traders' associations, resident welfare groups, and civil society organisations is considered an important medium to share understanding of LEZ objectives and design considerations. Workshops and consultations would enable co-creation of potential exemptions, transition timelines, and supporting measures, helping to identify operational risks and build institutional ownership. However, the diversity of stakeholder interests particularly among mobility operators, commercial establishments, and residents remains a barrier to rapid consensus building and requires sustained facilitation and coordination.

#3 Political and Institutional Ownership Readiness

Building on the policy foundation, political leadership and institutional ownership significantly strengthen LEZ readiness. Senior officials from the city and state, representing urban local bodies, transport departments, and traffic police leadership are actively engaged regularly through structured workshops and consultations.

Nodal agencies such as Bruhat Bengaluru Mahanagara Palike (BBMP) in Bengaluru, Mysuru Municipal Corporation (MCC in Mysuru, and Kochi Municipal Corporation (KMC) in Kochi, are considered pivotal to anchor planning and coordination of LEZ concepts and its implementation.

This is reflected in international best practices as well where sustained political leadership and strategic intervention by city-level government have been key determinants of successful LEZ implementation.

At the same time, LEZ delivery requires coordination across multiple agencies, including pollution control boards, regional transport authority, public transport authorities, and similar planning and executing agencies. The absence of formalised inter-departmental governance mechanisms remains a barrier, as fragmented institutional mandates slows decision-making despite demonstrated willingness to collaborate through task forces and coordination cells.

#4 Infrastructure and Technology Readiness

Infrastructure and technology readiness presents a mixed picture of progress and constraint. Cities are steadily expanding, enabling infrastructure through the deployment of CCTV networks, ITS, and pilot ANPR systems that can support vehicle identification and enforcement. Parallel investments in clean mobility, including the deployment of electric buses, expansion of the metro rail network, development of EV charging infrastructure, pedestrianisation initiatives, enhanced cycling facilities, and the provision of structured parking, further strengthen the operational feasibility and effectiveness of LEZs. Bengaluru's planned EV charging rollout, Kochi's integrated public transport system, and Mysuru's recent investments in cycling and parking infrastructure illustrate this momentum.

However, technological and enforcement capacity remains constrained by gaps in ANPR coverage, limited integration between vehicle databases (registration, pollution under control certificate scrappage), and the absence of standardised digital systems for fines, exemptions, and appeals. Continued reliance on manual enforcement reduces efficiency and limits scalability, resulting in only moderate readiness for city-wide LEZ implementation.

#5 Public Awareness and Acceptance

Public awareness presents both enabling and constraining conditions. Growing concern over air quality, congestion, and health impacts creates a favourable environment for introducing LEZ concepts and justifying regulatory interventions. This sensitivity to environmental and liveability issues supports acceptance of cleaner mobility measures.

At the same time, awareness of LEZs as a policy instrument to curb detrimental health impacts remain limited. Many users, including small traders, informal workers, and private vehicle owners, have limited understanding of LEZ objectives, compliance mechanisms, and benefits. Without targeted communication, this can translate into apprehension and resistance.Addressing this barrier will require sustained outreach, and transparent communication on phased implementation, and clear articulation of public benefits.

#6 Traffic Characteristics and Vehicle Composition

Local traffic conditions and vehicle composition continue to shape LEZ readiness. Indian cities are characterised by heterogeneous traffic, with two-wheelers forming a dominant modal share and IPT often relies on older technologies. Experience from this project, indicates that two-wheelers account for over half of traffic volumes in the project cities, with ageing diesel autorickshaws being prevalent in historic cores. These conditions constrain the feasibility of immediate blanket restrictions. At the same time, increasing adoption of BS-VI vehicles and the introduction of scrappage incentives act as key enablers, allowing cities to move towards phased, vehicle-category specific controls rather than abrupt bans.

Overall, LEZ readiness across the cities is high in terms of policy intent, moderate for political intent, infrastructure availability, enforcement, and institutional coordination, and evolving with respect to social acceptance and equity management.

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The convergence of national and state policy support with local leadership provides a strong starting point. However, sustained progress will depend on strengthening inter-agency coordination, improving digital enforcement systems, and managing social impacts through phased implementation and visible improvements in clean mobility alternatives.

It is contended that the holistic implementation of a comprehensive set of measures, in which LEZs supported by evidence from successful international applications constitute a central component, will be critical for achieving the intended environmental and mobility outcomes, including sustained improvements in air quality, effective climate action, and an enhanced quality of life for citizens across India.

Recommendations and the Way Forward

The stakeholder engagements conducted across project cities highlight that effective LEZ implementation must be locally tailored, data-driven, and supported by complementary mobility measures. The way forward therefore combines contextual planning, phased implementation, and strong institutional coordination to translate LEZ concepts into actionable urban development interventions. Some of the recommendations or way forward that cities should adopt for smooth LEZ implementation are as below:

#1 Design and Context

Effective LEZ implementation must be locally tailored to reflect each city's spatial structure, mobility patterns, and economic priorities. Bengaluru's dispersed form supports corridor-based LEZs combined with congestion management, Mysuru's heritage precinct requires focused vehicle restrictions and parking controls, while Kochi's compact core favours a concentrated downtown LEZ supported by park-and-ride systems. LEZ boundaries and control measures should explicitly align with dominant travel patterns, land-use intensity, and local economic activity, supported by phased and adaptive implementation beginning with pilot zones and progressive scale-up.

#2 Data and Evidence

Robust, localised data is foundational for credible LEZ design. Traffic volumes, vehicle composition, fuel usage, and air quality monitoring are critical in identifying pollution hotspots and high-impact corridors, particularly diesel-dominated routes. Cities should institutionalise regular data collection through expanded monitoring networks, standardised traffic and emissions datasets, and integration of evidence into planning processes. Transparent, evidence-based justification of LEZ boundaries and measures will also strengthen public and political acceptance.

#3 Supporting Measures

LEZ restrictions must be complemented by parallel investments in alternative mobility and transition incentives. Expansion of clean public transport, electrification of bus and IPT fleet, EV charging infrastructure, and improved walking and cycling facilities are essential enablers. Additional measures such as vehicle scrappage incentives, priority access for EVs, and pedestrian-friendly street redesigns should be embedded within LEZ strategies. Leveraging existing state policies, including EV incentives and scrappage frameworks, can accelerate implementation while reducing compliance burdens.

#4 Governance and Institutions

Strong institutional ownership and inter-agency coordination are critical for effective delivery. Empowered nodal agencies such as BBMP, MCC, and KMC should be supported through formal coordination mechanisms involving the traffic police, transport departments, pollution control boards, and state authorities. Clear definition of roles, enforcement responsibilities, and decision-making authority will enhance accountability and reduce delays. States may further strengthen implementation by issuing LEZ-specific guidelines or activating Unified Metropolitan Transport Authorities (UMTAs) to oversee cross-sector coordination.

#5 Engagement and Scale-Up

Sustained stakeholder engagement and public communication are essential throughout planning and implementation. Structured consultations with transport operators, freight associations, traders, and resident groups can help refine exemptions, transition timelines, and mitigation measures. Effective communication to spread awareness among the public should emphasise health benefits, improved liveability, and local co-benefits rather than framing LEZs as restrictive interventions. Following pilot implementation, cities should undertake systematic evaluation of air quality, traffic patterns, and compliance, documenting lessons learned to inform adaptive improvements. Successful pilots can then be scaled across additional corridors, vehicle categories, or city-wide applications, supporting replication in other Indian cities.

Conclusion

In summary, the way forward for LEZ implementation lies in combining locally grounded design, strong data foundations, complementary mobility investments, phased execution, and continuous stakeholder engagement. By following this integrated and adaptive pathway, cities can move from pilot initiatives to sustained, city-wide LEZ frameworks that deliver measurable air quality improvements, reduced congestion, and enhanced public health.

UITP played a central facilitative and technical role in advancing LEZ readiness across the project cities by providing structured knowledge support, capacity building, peer learning, and pilot design assistance. UITP contextualised global best practices on Low Emission Zones[7], translating international experiences into India-relevant guidance to inform city-specific LEZ frameworks.

Through targeted capacity-building engagements, UITP strengthened the technical understanding of municipal agencies and transport stakeholders on LEZ design, enforcement mechanisms, and integration with sustainable mobility measures. UITP also enabled peer learning by creating national platforms for cross-city exchange, allowing cities to share experiences, challenges, and implementation approaches. In addition, UITP supported pilot design by assisting cities with zone identification, baseline assessments, stakeholder consultations, and monitoring frameworks, helping translate strategic concepts into actionable pilots.

This integrated approach positioned UITP as a key knowledge partner, supporting cities in progressing from exploratory planning towards practical, phased LEZ implementation.

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