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DEVELOPER DIARIES
TARIQ AHMED
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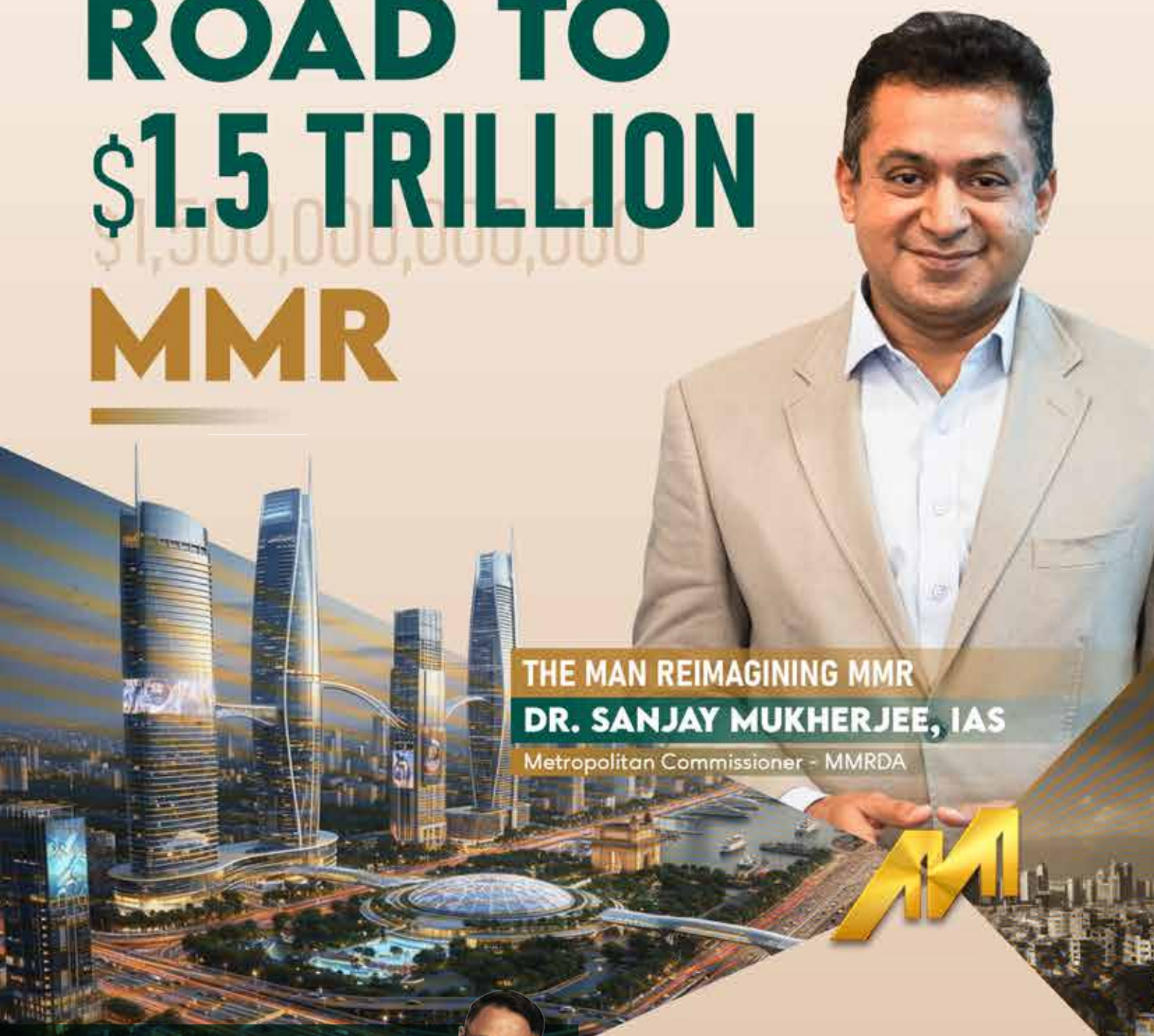
A systems-level analysis of waterproofing failure

ROAD TO $1.5 TRILLION MMR



THE MAN REIMAGINING MMR
DR. SANJAY MUKHERJEE, IAS
Metropolitan Commissioner - MMRDA

Architects' Diaries
QUTUB MANDVIWALA AND THE HUMAN LOGIC OF SUSTAINABLE URBANISM

THE MYTH OF 3RD MUMBAI
How expansion is masking Mumbai's urban failure

From Basement To Balance Sheet
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Humans Are No More Humans – We Are an Urban Species

That is the quiet revolution of our age. We have traded savannahs for skylines, evolved from hunters to commuters, and reshaped our own destiny into concrete and glass. Yet within this triumph lies a silent breakdown: Polycrisis. Climate collapse, housing scarcity, social isolation, geopolitics, and resource depletion—all converging on the cities we call home.

Consider the numbers. Buildings and construction account for nearly 40% of global CO_2 emissions. In India, urban population will hit 600 million by 2036—yet the housing shortage already exceeds 30 million units. Every year, 100,000 acres of farmland are swallowed by sprawl. Meanwhile, one in three urban Indians breathes air that shaves years off their life. Geopolitical shocks—a blocked strait, a trade war—send cement and steel prices soaring by 20-30% overnight, stalling thousands of sites.

Humanity stands at a crossroads. One path leads to segregated, unsustainable sprawl—already costing India $1 trillion annually in lost productivity and health damages. The other—still within reach—leads to just, regenerative, and humane cities.

The choice is not abstract. It falls on policy makers, developers, architects, town planners, manufacturers, and technology solution providers. They are the new alchemists. Planners must prioritise proximity over congestion—every 10% increase in walkability cuts emissions by 6%. Architects must design for nature, not against it—passive cooling alone can slash HVAC energy by 50%. Manufacturers must embrace circular materials—recycled aggregate can reduce embodied carbon by 30-40%. And technology must serve equity, not exclusion—smart grids could lift 200 million urban poor from energy poverty.

We at Urban Acres, through Homes and Buildings, refuse to stay silent. We are on the pursuit to prove that density can heal, that sustainability can be affordable, and that a just city is not a slogan—it is a blueprint.

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FOREWORD

For decades, we believed geopolitics belonged in chancelleries, not boardrooms. The Iran crisis has shattered that illusion—decisively and perhaps permanently.Today, a missile fired near the Strait of Hormuz lands on an Indian construction site within weeks—through crude volatility, supply chain drag, and capital flight. With 20% of global oil transiting that strait, India's energy import bill is no longer just a fiscal metric; it is the single largest variable in our project economics.

Let me be direct: this is not a passing storm. It is a structural shift in how the world will work for the next decade. And Indian real estate must respond as a leader, not a follower

The immediate mathematics are unforgiving. Every $10 rise in crude per barrel adds 30–40 basis points to our construction costs—steel, cement, logistics, and financing all move in lockstep. Inflationary pressures will test affordability in mid-income housing.

When capital flees uncertainty, it seeks three things: stability, scale, and rule of law. India offers all three. Our domestic consumption story, infrastructure push (from Gati Shakti to urban transit), and a regulatory regime that has matured through RERA and REITs make us one of the few large markets where long-term value is still visible.

My message to every developer, investor, and policymaker is this:

- Do not hoard land—accelerate execution. Speed is the new hedge. Faster project delivery lowers interest cost risk and locks in pricing before the next crude spike.
- Redesign for resilience. Diversify supply chains for materials. Adopt green construction to reduce energy dependence. Price in a $100–$120 oil scenario into your models, not today's rate.
- Defend the end-user. In past cycles, developers passed costs directly to buyers. That reflex will break trust now. Work with government on GST rationalisation for construction inputs and advocate for priority sector lending for affordable housing. A protected buyer is a stable revenue stream.

Let me be equally clear on what we will not do: panic, stall, or lobby for artificial bailouts. This industry spent a decade cleaning its balance sheet after 2013–2016. We are leaner, more transparent, and more disciplined than ever. That credibility is our true geopolitical hedge.

History will not remember how we complained about the Iran crisis. It will remember whether we used it to become more efficient, more self-reliant, and more trusted.

The coming 18 months will separate the speculative from the substantial. CREDAI stands ready to lead that transformation—not by predicting the next missile, but by building a real estate sector that no global shock can break.

India's story is being tested. Let us ensure it emerges strengthened.

BOMAN IRANI
Chairman, CREDAI National

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PREFACE

The rising geopolitical tensions around the Strait of Hormuz are a serious reminder of how interconnected global energy routes and domestic economic sectors have become. Nearly 20% of the world's oil trade passes through the Strait of Hormuz, making any disruption in the region immediately significant for energy-import-dependent economies such as India. For the real estate and construction sector, this has direct implications on input costs, logistics, manufacturing, and project execution timelines.

Construction is highly sensitive to fluctuations in energy and commodity prices. Escalation in crude oil prices impacts transportation and manufacturing costs across the value chain. We are already witnessing pressure on key construction materials such as steel, copper, aluminium, PVC products, and other energy-linked inputs. In several cases, raw material costs have seen increases of 10–12% in recent months amid supply-chain uncertainty and energy disruptions.

The impact extends beyond materials. Gas supply disruptions are affecting tile and ceramic manufacturing, leading to delays in deliveries and production cycles. Simultaneously, labour availability is becoming another area of concern as rising living costs and economic uncertainty trigger workforce migration pressures in certain regions. Together, these factors can affect construction timelines and overall project viability.

The affordable and mid-income housing segments remain the most vulnerable because pricing flexibility in these categories is limited. Developers cannot indefinitely absorb rising costs without affecting project economics.

In this environment, the industry must move towards greater resilience and efficiency. Strategic sourcing, long-term procurement partnerships, adoption of construction technologies, precast systems, and AI-led project management tools can improve productivity and reduce waste. Equally important is policy support through faster approvals, infrastructure expansion, and rationalisation of development-related costs.

India's long-term real estate fundamentals remain strong, driven by urbanisation, infrastructure investment, and rising housing aspirations. However, the current geopolitical climate reinforces an important lesson: future-ready real estate development will increasingly depend on operational resilience, supply-chain diversification, and disciplined execution alongside demand growth

DR. NIRANJAN HIRANANDANI
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War Shock & Realty: A Cost Crisis, Not a Demand Collapse

The ongoing Iran–Israel–U.S. conflict is a stark reminder that global wars don't stay confined to borders—they seep into economies. For India's real estate sector, the impact is not destruction, but disruption.

At the core lies a simple chain reaction: Oil ⟶ Inflation ⟶ Real Estate Costs.

With tensions threatening key energy routes, crude prices are rising—pushing up costs of cement, steel, transportation, and labour. The result is a 10–15% escalation in construction costs, forcing developers to pass on the burden.

This creates a critical shift:

> Demand remains steady, but affordability is tightening.

India's real estate market enters this phase from a position of strength—robust housing demand, steady sales, and disciplined supply. Yet, project feasibility is under pressure, and pricing is increasingly becoming cost-driven rather than demand-driven.

In the Mumbai Metropolitan Region (MMR), the impact is more pronounced. High-rise construction, premium materials, and tight margins amplify the shock. Luxury housing may absorb price hikes, but commercial real estate is already witnessing caution, with global occupiers slowing decisions.

Mumbai, however, remains resilient. Infrastructure momentum and end-user demand continue to support the market. But the city is entering a phase of recalibration—where launches become selective and financial discipline takes centre stage.

Amid the uncertainty, a silent opportunity emerges. Global instability often redirects capital, and India stands to benefit as NRIs increasingly view it as a safe real estate destination.

The takeaway is clear:

This is not a demand crisis. It is a cost-led correction cycle.

Indian real estate will not break under this pressure—it will adjust, reprice, and evolve.

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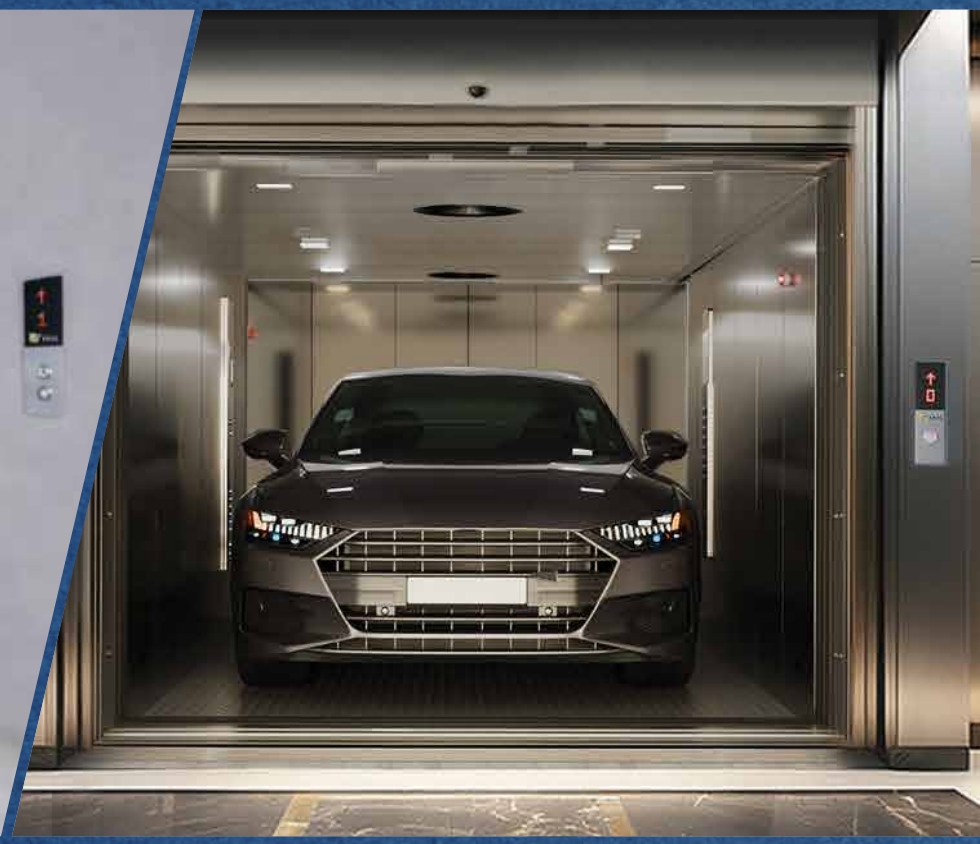

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MANAGING EDITOR'S NOTE

This edition is not designed to comfort—it is designed to provoke. Because the built environment today stands at a point where ambition is soaring, but reality is demanding answers.

We begin with scale—unprecedented, unapologetic scale. In an exclusive interaction with Dr. Sanjay Mukherjee, Commissioner, MMRDA, we unveil a $1.5 trillion roadmap for the Mumbai Metropolitan Region. It is a vision that signals massive capital flows, infrastructure acceleration, and a redefinition of Mumbai's economic geography. It is bold. It is necessary. And it is inevitable. But here's the uncomfortable question we must confront: are we expanding faster than we are fixing?

While the idea of a "Third Mumbai" captures imagination, the first Mumbai continues to struggle—with infrastructure fatigue, density stress, and a declining quality of everyday urban life. Roads, drainage, mobility, and civic systems remain under pressure. This edition doesn't just celebrate expansion—it challenges its timing, its priorities, and its preparedness. Because growth without correction is not transformation; it is displacement.

We then shift focus to the issues the market rarely headlines—but every user experiences. India's parking crisis is no longer incidental—it is systemic. Urban design has failed to keep pace with ownership patterns, creating friction between planning and reality. At the same time, one of the most silent yet destructive challenges in real estate continues to be ignored—water leakages. It may not sell homes, but it certainly erodes trust, asset value, and long-term credibility. And that is where the real opportunity lies. Because every unresolved problem in the built environment is a category waiting to be built.

The next generation of real estate leaders will not just be developers—they will be solution providers. Those who address inefficiencies in design, execution, and lifecycle performance will define the next phase of the industry. Adding depth to this narrative is our exclusive interview with Qutab Mandviwala, whose work pushes the conversation beyond construction and into responsibility. His approach reinforces a critical shift: sustainability is no longer an add-on—it is the baseline.

At Homes & Buildings, we are not here to mirror the market—we are here to question it, decode it, and at times, disrupt it. For advertisers and stakeholders, this is not just readership—it is influence. A platform where ideas shape decisions, and conversations shape direction. Because the future of Built Environment will not be defined by who builds the tallest and smartest. It will be defined by who understands the deepest.

RONITA D'SOUZA
Managing Editor, Homes & Buildings Magazine

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CONTENT

Mumbai BKC Adds Healthcare And Education Projects

Mumbai's primary business district is undergoing a strategic shift towards a more balanced urban ecosystem, with new investments directed at strengthening healthcare and education infrastructure. Authorities have advanced plans to develop key social amenities in the Bandra-Kurla Complex (BKC), signalling an effort to align commercial growth with essential public services in one of the city's most prominent economic zones.

The latest BKC social infrastructure investment involves the allocation of land parcels for a multi-speciality hospital and an education centre, with a combined project value exceeding ₹580 crore. The move reflects a growing recognition that high-density commercial districts require integrated civic services to support both daily users and surrounding communities.

Urban development experts note that BKC has long functioned as a financial and corporate hub, but has lacked adequate social infrastructure relative to its scale. The addition of healthcare and educational facilities is expected to reduce pressure on neighbouring areas while improving accessibility for workers, residents and visitors within the district. One of the proposed developments includes a large healthcare facility designed to provide tertiary medical services. Such infrastructure is considered critical in high-footfall zones, where access to emergency and specialised care can directly impact urban resilience. Alongside this, the planned education hub is expected to introduce academic programmes that could contribute to workforce development and skill-building in the region. The BKC social infrastructure investment has been facilitated through a competitive bidding process, indicating a continued reliance on public-private partnerships to deliver large-scale urban projects. Analysts suggest that this model allows cities to leverage private sector efficiency while retaining oversight on land use and planning objectives.

Beyond individual projects, the initiative reflects a broader transformation in how business districts are conceptualised. Rather than functioning solely as employment centres, areas like BKC are increasingly being reimagined as mixed-use environments where work, learning, healthcare and daily life coexist.

Mumbai Completes Over 2500 Slum Rehabilitation Projects

Mumbai has recorded the completion of 2,545 slum rehabilitation projects over nearly three decades, reflecting the city's ongoing efforts to provide formal housing to its urban poor. Notably, nearly 500 of these projects, or roughly 18 percent, were completed in the five years following the COVID-19 pandemic, indicating a post-pandemic acceleration in urban redevelopment initiatives, according to the Maharashtra Economic Survey 2025–26.

Since the establishment of the Slum Rehabilitation Authority (SRA) in 1995, the city has rehabilitated close to 2.84 lakh slum-dwelling families into formal housing units. Thane, as part of the Mumbai Metropolitan Region, has completed all 51 of its SRA projects, accommodating approximately 7,815 families. Experts suggest that such programmes are critical for ensuring equitable urban growth while mitigating the environmental pressures associated with informal settlements in high-density metropolitan areas.

to rehabilitate slum dwellers with free housing units while leveraging additional construction rights to recover costs through saleable apartments. While this model has facilitated large-scale formalisation of slum settlements, planners note that integrating these developments with local infrastructure, green spaces, and climate-resilient design remains a key challenge for sustainable urbanisation.

Beyond SRA, other agencies including the Maharashtra Housing and Area Development Authority (MHADA) and the City and Industrial Development Corporation (CIDCO) have contributed substantially to affordable housing in the state. MHADA has delivered 5.27 lakh units since its inception in 1977, while CIDCO has constructed 2.30 lakh units through planned township projects, according to the survey.

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Godrej Secures 11 Acre Gurugram Land With ₹4500 Crore Potential

Godrej Properties has strengthened its footprint in the National Capital Region with the acquisition of an 11.36-acre land parcel along Gurugram's Golf Course Extension Road, one of the city's fastest-growing residential corridors. The developer plans to build a mixed residential project on the site, combining low-rise and high-rise housing formats, with an estimated revenue potential exceeding ₹4,500 crore.

The newly acquired parcel lies within a high-demand micro-market that has evolved into a hub for premium residential, commercial, and retail projects. Urban planners note that the corridor's connectivity to Golf Course Road, Sohna Road, and National Highway 48 makes it strategically attractive for developers targeting affluent and upper-middle-class households. The area's infrastructure, access to social amenities, and proximity to key employment nodes have increasingly positioned it as a priority zone for sustainable urban residential expansion.

Industry analysts observe that large-format residential acquisitions in Gurugram are rare due to escalating land costs and fragmented ownership patterns. The 11.36-acre site offers scope for cluster-based planning, which could incorporate modern energy-efficient construction, open green spaces, and community-focused infrastructure. Experts emphasise that integrating sustainable design elements will be essential to balance density with liveability and long-term climate resilience. The Godrej Properties acquisition also signals continued confidence in Gurugram's residential demand trajectory.

The company's strategy reflects a dual objective: leveraging high-value land parcels to secure future revenue streams while contributing to the structured expansion of residential infrastructure in Gurugram. By prioritising strategic locations with connectivity and amenity advantages, the acquisition reinforces a long-term vision of creating residential communities that align with urban sustainability, equitable growth, and quality-of-life benchmarks.

Gopalan Township Adds Large Senior Living Cluster

Bengaluru's evolving housing market is witnessing a deeper shift towards age-focused residential communities, with a new senior living project planned within a large township development in the city. The proposed project, valued at nearly ₹450 crore, reflects rising demand for organised retirement housing as Indian cities confront demographic changes, healthcare pressures, and the need for more inclusive urban infrastructure.

The development, planned inside a mixed-use sports township in eastern Bengaluru, will include more than 300 homes intended for residents aged 55 years and above. The project is expected to feature apartment configurations designed for long-term accessibility, community interaction, and healthcare-linked living segments increasingly shaping urban real estate strategies in metropolitan India.

Industry analysts say the growth of senior living projects is no longer confined to niche retirement communities. Rising life expectancy, nuclear family structures, and migration-led urbanisation are creating demand for professionally managed housing environments that combine mobility-friendly design with social and medical support systems. Bengaluru, with its large professional workforce and expanding suburban corridors, has emerged as one of the country's fastest-growing markets for senior housing.

The senior living project forms part of a 16-acre township that includes sports and residential infrastructure, signalling how integrated developments are increasingly being positioned as self-contained urban ecosystems. However, specialists caution that these projects must avoid becoming isolated enclaves disconnected from public transit, civic amenities, and mixed-income neighbourhoods.

The senior living sector in India has gained momentum over the past few years, particularly in Bengaluru, Pune, Chennai, and Hyderabad, where healthcare access and climate conditions have supported retirement-oriented housing demand. According to market observers, developers are also seeing stronger investor interest in this segment because of stable long-term occupancy and growing demand from both domestic and non-resident Indian families.

Beyond market expansion, the emergence of senior housing is also linked to broader debates around sustainable urban development. Compact communities with healthcare access, shared amenities, and reduced commuting needs can potentially lower environmental stress while improving the quality of life for ageing residents. As Bengaluru continues to expand outward through large township projects, the rise of senior living communities may reshape how future neighbourhoods are planned not only as residential assets, but as long-term social infrastructure responding to changing urban demographics.

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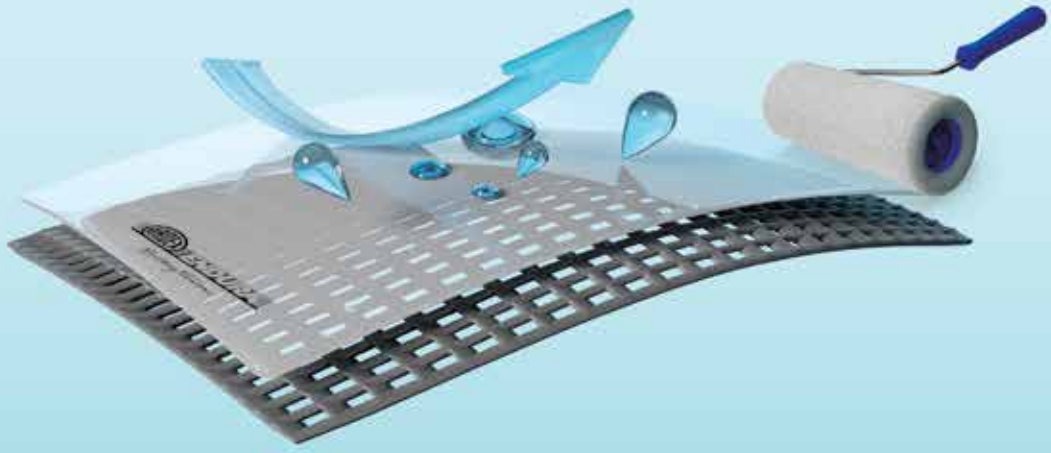

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BSE Requests MMRDA Land In BKC

India's oldest stock exchange is exploring expansion in Mumbai's prime financial district, signalling renewed demand for institutional space in one of the country's most valuable urban business corridors. The organisation has formally approached the regional planning authority seeking a land parcel in the Bandra–Kurla Complex to establish additional facilities, a move that could further consolidate the district's role as the centre of India's financial ecosystem.

The proposal involves identifying suitable land within the BKC commercial district where the exchange could develop new operational infrastructure. Officials from the exchange recently held discussions with senior representatives of the metropolitan planning authority to explore potential sites within the district's institutional and commercial zones. The request comes at a time when Mumbai's financial institutions are gradually expanding technology infrastructure, data facilities, and operational offices to support high-volume digital trading and regulatory oversight. Industry observers note that exchanges and financial institutions require specialised office infrastructure capable of housing secure data networks, trading operations and regulatory functions.

Urban planners say the move reflects the continuing transformation of Bandra–Kurla Complex from a planned commercial node into a strategic national financial hub. Over the past two decades, the district has attracted banks, stock exchanges, multinational financial firms and regulatory institutions, creating a concentrated ecosystem for financial services.

Bollywood Star Bobby Deol Acquires Five Commercial Offices

Mumbai actor Bobby Deol and his wife's investment firm has entered the city's growing commercial office market with the purchase of five office units in Andheri West, highlighting continued demand for strategically located business spaces in central Mumbai suburbs. The acquisitions, valued at approximately ₹15.05 crore, form part of an emerging trend of high-net-worth individuals and celebrities diversifying into commercial real estate.

The office units, spread across 3,400 sq ft on the second floor of Yura Business Park – Phase 2 on Link Road, were bought by Greenstone Investments Pvt Ltd, the Deols' corporate entity. The transaction, formalised in late February 2026, included five car parking slots and incurred stamp duty exceeding ₹90 lakh, alongside a registration fee of roughly ₹1.5 lakh. Possession is expected by December 2027, aligning with the building's construction timeline. This development places the Deols' offices in close proximity to the Roshan family's holdings, including Bollywood actor Hrithik Roshan's HRX Digitech LLP and Pramila Roshan's Filmkunj (Bombay) Pvt Ltd, which collectively own 10 units on the third and fourth floors of the same building.

Industry experts note that transactions like these are indicative of wider investor confidence in Mumbai's commercial property sector, particularly in mid-rise office parks that provide flexible floor plates, adequate parking, and proximity to key transit corridors. 'The Andheri West corridor continues to attract diversified buyers, balancing end-user needs with investment potential', said a senior real estate analyst. This trend also reflects a shift toward portfolio diversification by individuals traditionally associated with entertainment industries, moving into income-generating real estate assets.

County Group Expands NCR Housing Recovery Projects

A fresh round of acquisitions in Gurgaon's delayed housing market is set to revive long-pending residential developments and reopen nearly 2.6 million square feet of urban real estate inventory in the National Capital Region. The move is significant not only for hundreds of affected homebuyers but also for a region grappling with stalled projects, fragmented land use and mounting pressure on urban infrastructure.

NCR-based developer County Group has taken control of two partially built residential projects in Gurgaon, including one located along the Dwarka Expressway corridor, a rapidly urbanising belt linked to Delhi's expanding mobility network. The transactions are expected to unlock an estimated development value of around ₹4,000 crore over multiple phases. One of the projects was acquired through insolvency proceedings under the National Company Law Tribunal framework after construction delays left several families waiting for possession for more than a decade. Industry executives familiar with the matter said a section of the built structures will now be retrofitted and integrated into a larger redevelopment plan rather than being abandoned.

The second acquisition involved another incomplete housing site where existing structures were reportedly cleared to enable a redesigned layout with improved density planning and updated amenities. The Gurgaon housing revival comes at a time when the region is witnessing renewed investor interest driven by expressway-led connectivity, metro expansion proposals and the migration of corporate offices toward emerging business districts.

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Dharavi Redevelopment Expands Housing Eligibility

A revised framework governing rehabilitation eligibility in Mumbai's Dharavi redevelopment effort is reshaping how housing benefits will be distributed, particularly for residents living in multi-level informal structures. The updated criteria introduce a dependency between occupants on different floors, adding a new layer of complexity to one of India's largest urban renewal programmes.

Under the latest provisions, eligibility for upper-level occupants within the Dharavi redevelopment project is tied to the status of ground-floor residents in the same structure. Authorities have indicated that documentation submitted by households residing above ground level will only be considered valid if the primary unit below meets the prescribed criteria. This approach is expected to influence a significant number of families living in vertically expanded informal dwellings.

The revised guidelines also extend the eligibility window for certain residents who can establish occupancy prior to a specified cut-off date in late 2022. Those who qualify are expected to receive formal housing units measuring approximately 300 square feet, though many may be relocated outside Dharavi while remaining within the Mumbai Metropolitan Region. Urban policy experts say the changes reflect an attempt to bring greater structure to beneficiary identification in a densely populated settlement where property boundaries and ownership patterns are often unclear. Multi-storey informal housing has evolved organically in Dharavi over decades, making it difficult for authorities to verify claims without linking units within the same footprint. However, the dependency clause has raised concerns around fairness and inclusivity. Housing advocates argue that upper-floor residents, many of whom are tenants or extended family members, may face uncertainty if ground-floor occupants are deemed ineligible or lack documentation. This could potentially exclude vulnerable groups from formal rehabilitation benefits, despite long-term residence in the area.

The Dharavi redevelopment project is being positioned as a large-scale intervention aimed at improving living conditions, infrastructure access, and economic opportunities in one of Asia's most densely inhabited urban clusters. From an urban planning perspective, the initiative also highlights the challenges of formalising informal settlements in a city with limited land availability. Relocation outside the original site, even within the broader metropolitan region, may have implications for livelihoods, social networks, and access to employment.

Amaravati Land Pooling Model Reshapes Capital Planning

Andhra Pradesh's Chief Minister returned Amaravati to the centre of the state's capital debate, casting the voluntary land-assembly framework as the basis for how a greenfield city can still be built at scale. He said the project drew participation from 29,000 farmers who pooled 33,000 acres, a figure that has long made Amaravati a reference point in Indian urban planning, notably through the Amaravati land pooling model.

The significance of the Amaravati land pooling model lies in how it differs from conventional land acquisition. Under the state's 2015 rules, landowners transferred rights to the authority and, in return, were promised reconstituted plots, annuities and other development benefits. The framework was designed to reduce coercion, consolidate fragmented holdings and create a planned capital that could be served by roads, utilities and civic infrastructure rather than grow in a piecemeal way.

That design matters because land pooling is only as strong as the trust behind it. For farmers, the model depends on the timing of returned plots, the quality of surrounding infrastructure and the clarity of rehabilitation promises. For the state, it depends on whether the land assembled today can be turned into a liveable urban district tomorrow. In that sense, the Amaravati land pooling model is not just a land policy; it is a test of governance, delivery and long-term urban discipline.

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MMRDA Acquires Vast Land Bank Across MMR

The Mumbai Metropolitan Region Development Authority (MMRDA) has significantly expanded its land bank across the Mumbai Metropolitan Region, securing large tracts of government-owned land to support future infrastructure financing and urban development. The move is expected to reshape how large-scale projects are funded, with land monetization emerging as a central pillar of long-term financial strategy.

The MMRDA land monetisation strategy involves the transfer of nearly 34,000 hectares spread across districts including Thane, Raigad and Palghar. The parcels, covering over a thousand villages, are intended to be developed through a mix of urban formats, including logistics hubs, transit-oriented developments, integrated townships, and housing clusters. Officials indicate that the land has been transferred with ownership rights, allowing the authority greater flexibility in structuring projects and attracting private participation. By leveraging these assets, the agency aims to reduce dependence on debt financing and create sustainable revenue streams that can be reinvested into infrastructure.

Urban economists suggest that the MMRDA land monetisation strategy reflects a broader shift in how metropolitan regions are funding expansion. As infrastructure costs rise and borrowing constraints tighten, land-based financing is increasingly being used to unlock capital while aligning development with long-term planning goals. The geographic spread of the land bank also points to a deliberate attempt to decentralise growth beyond Mumbai's traditional core.

The strategy is closely linked to ongoing investments in transport and connectivity infrastructure, including metro expansions and multi-modal corridors. Planners highlight that integrating land use with transport networks will be critical to ensuring that development remains efficient, accessible and environmentally sustainable.

Pune Development Projects Review Highlights Urban Challenges

A high-level review of Pune development projects has brought renewed attention to the pace and direction of infrastructure expansion in one of India's fastest-growing urban centres. The inspection, carried out across multiple sites in the city, focused on transport upgrades, civic works, and large-scale urban initiatives that are expected to shape Pune's growth trajectory over the next decade, particularly in relation to Pune development projects.

The review comes at a time when Pune is experiencing rapid population growth driven by its expanding technology and manufacturing sectors. With increasing pressure on roads, housing, and public services, the progress of Pune development projects has direct implications for mobility, economic productivity, and overall quality of life.

Officials involved in the assessment highlighted ongoing works related to road widening, flyovers, and urban connectivity improvements. These projects aim to address long-standing congestion issues, particularly in high-density corridors that link residential zones with employment hubs. However, urban planners note that while such interventions can provide short-term relief, they must be integrated with broader public transport strategies to avoid reinforcing car-dependent growth.

The inspection also covered drainage, water supply, and flood mitigation infrastructure—areas that have gained urgency following recent instances of urban flooding in parts of the city. Experts suggest that climate-resilient planning must move beyond reactive measures, incorporating sustainable drainage systems, green cover, and better land-use regulation to reduce vulnerability. From a governance perspective, periodic reviews of Pune development projects are seen as essential to ensure accountability and timely execution. Delays in land acquisition, coordination challenges between agencies, and funding constraints have historically slowed urban infrastructure delivery in Indian cities. Industry observers argue that improving project management frameworks and adopting digital monitoring tools could enhance efficiency and transparency.

As Pune continues to evolve into a major metropolitan hub, the focus on monitoring and accelerating Pune development projects signals an effort to keep pace with growth while addressing structural gaps. The next phase will likely require deeper integration of mobility, housing, and environmental planning to ensure that expansion remains inclusive, efficient, and future-ready.

MMR TODAY

Watchdog of Mumbai Metropolitan Region

Coming Soon

MahaRERA Flags CIDCO Kharghar Project Over Amenity Changes And Size Discrepancies

Regulatory oversight has intensified around a Navi Mumbai housing development after concerns over project disclosures and design changes prompted intervention by the Maharashtra Real Estate Regulatory Authority. The directive calls for improved transparency in a project undertaken by City and Industrial Development Corporation in Kharghar, highlighting broader challenges in ensuring accountability in public housing delivery.

The issue emerged after a prospective homebuyer raised objections regarding variations between initial project representations and subsequent specifications. The concerns included a reduction in planned amenities, changes in vertical transport provisions, and differences in reported unit sizes. While the complaint did not meet the legal threshold for formal adjudication due to the absence of a registered sale agreement, it brought attention to inconsistencies in project communication. In its response, the City and Industrial Development Corporation attributed design revisions to regulatory constraints, particularly environmental safeguards governing coastal zones and construction norms under national building standards.

The authority clarified the discrepancy in unit sizing, explaining that marketing figures had included additional usable spaces such as enclosed balconies, whereas statutory definitions under the Real Estate (Regulation and Development) framework require a stricter measurement of carpet area.

Delhi Government Adds Thousands Of Flats

Delhi has taken another step in a large-scale transformation of government residential districts with the delivery of thousands of newly constructed flats and the launch of additional housing projects across several central neighbourhoods. The latest phase of the GPRA redevelopment programme introduces new residential units in Kasturba Nagar and Sarojini Nagar while initiating construction of thousands more across multiple government housing colonies.

The newly completed homes are part of the General Pool Residential Accommodation system, which provides

housing for central government employees posted in the national capital. Urban development officials confirmed that more than 2,700 apartments have now been completed and handed over, while construction has been initiated for over 6,600 additional units in Netaji Nagar, Sarojini Nagar, Kasturba Nagar and Sriniwaspuri. The broader GPRA redevelopment initiative is among the largest public housing modernisation projects undertaken in Delhi. When completed, the programme will deliver nearly 25,000 housing units, replacing around 13,000 ageing government residences that were originally built decades ago.

Urban planners say the redevelopment reflects a shift in how government housing is designed in dense metropolitan environments. The new projects involve mid- and high-rise apartment blocks integrated with improved civic infrastructure, including upgraded internal roads, utilities, green areas and community amenities. Higher residential density allows authorities to utilise valuable urban land more efficiently while modernising public housing. The initiative is being implemented through a self-financing model led by the Central Public Works Department, with commercial development playing a role in funding residential construction.

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DR SANJAY MUKHERJEE
IAS, Commissioner MMRDA

THE $1.5 TRILLION BLUEPRINT

THE MAN REIMAGINING MMR

*In an exclusive interaction with **TITTO EAPEN**, Founder and Chief Editor of Homes & Buildings Magazine and Urban Acres, **DR. SANJAY MUKHERJEE** offers a rare deep dive into the future of India's most powerful urban engine — the Mumbai Metropolitan Region.*

At a time when Mumbai is preparing for its most ambitious leap since its creation, the Metropolitan Commissioner of MMRDA opens up about the blueprint behind a $400-billion economy by 2030 and a $1.5 trillion regional vision over the coming decades. From the rise of Mumbai 3.0 to new financial districts, from transformative sea links and metro networks to inclusive housing and climate-resilient planning, Dr. Mukherjee shares the thinking, philosophy and precision that guide the city's next chapter.

This is not just a conversation about infrastructure. It is a conversation about identity, growth, sustainability, and the future of urban India — with the man reimagining Mumbai for the world.

Q Dr. Mukherjee, we know you as the force behind Navi Mumbai's transformation and today as the man building a 'Third Mumbai' through projects worth nearly ₹3 lakh crore — something no country in the world is doing at this scale. But before the visionary, there's a story — the child, the student, the young aspirant who chose public service. Take us back to the beginning. Where did your journey start, and what shaped the civil servant you eventually became?

I was born in the early '70s in Nagpur — the heart of India. I studied at Somalwar High School, a school we proudly joked was 'world-famous in Nagpur'. After 12th, I joined Government Medical College, but during my internship I decided to attempt the Civil Services. I cleared the IPS on my first try, and with some encouragement, appeared again and made it into the IAS the next year, fortunately in the Maharashtra cadre.

Along the way, I completed Level-1 of the CFA programme and a BA in History and Public Administration to strengthen my understanding of governance.

My first posting as a probationer was in Thane. I handled independent charge of several municipal councils — Mira Bhayander, Nalasopara, and others — and then served in Palghar, Dahanu, and rural Latur where the earthquake reconstruction was underway. Soon after, I became the country's youngest Collector in Jalgaon.

My entry into large-scale infrastructure came in Nagpur as Joint MD of the Maharashtra Airport Development Corporation, working on MIHAN. We raised ₹238 crore through land mortgage without a government guarantee. It was my first real lesson in project finance. I later served as Collector of Nagpur and Chairman of the Nagpur Improvement Trust.

Mumbai happened when I was posted to the State Excise Department — a role that still makes me smile. In four years, we grew excise revenue from ₹5,000 crore to ₹14,000 crore, a 30% annual growth rate that continues even today.

At BMC, as Additional Municipal Commissioner (Projects), I handled the Mumbai Coastal Road — redesigning it, securing approvals, and launching execution. Then came the Medical Education Department — and COVID. After the pandemic work, I moved to CIDCO for three years before being appointed to lead MMRDA.

And that's the journey — from Nagpur's school corridors to steering one of the world's largest urban transformation programmes in MMR today.

Q For the past decade, I've watched your work closely. And when we trace the evolution of MMR, your imprint is unmistakable. But one chapter that always stands out is CIDCO — a rare example of a city imagined on paper and built almost exactly as planned. With an international airport rising, JNPT reinventing itself, and global-scale infrastructure pouring in, Navi Mumbai is on the brink of becoming a world address. When you look back, does Navi Mumbai today reflect the blueprint you once envisioned? Or, as a planner and administrator, do you feel there are still pieces that could have been pushed further, done differently, done better?

Navi Mumbai is one of Maharashtra's proudest urban stories — a bold idea that actually worked. And its roots go back to a remarkable political decision in the 1970s. Leaders at that time understood that Mumbai, as India's financial capital, would keep swelling, and the only way to protect it was to build a satellite city with the same ambition, the same scale.

The land that eventually became Navi Mumbai was almost barren. But once it was notified as a new town, something unique in Maharashtra's legislation came into play — CIDCO received the authority to acquire all land within the notified boundary. The state initially acquired land on CIDCO's behalf, but as CIDCO strengthened financially, it took charge of land acquisition itself. With that, the organisation began crafting one of the most comprehensive master plans the country had ever seen.

What set Navi Mumbai apart, though, wasn't just its planning, it was the dignity with which CIDCO treated the people whose land built the city. The project-affected families were placed at the core of the development model: the famous 12.5% developed land formula, scholarships, employment

opportunities, and structured schemes that ensured they rose with the city, not despite it. This is why their economic progress today is so visible, and why entrepreneurship thrives in many of the nodes.

If something held back the Navi Mumbai story in its early years, it was connectivity. The north had Vashi and Airoli, but the southern belt remained isolated. With the completion of Atal Setu, that barrier has finally dissolved. The entire southern hinterland, for decades waiting for a direct link, is now open. And here again, proactive political leadership deserves credit; completing a project of that magnitude transforms not just traffic but destiny.

Could more have been done? Of course. Any administrator looking back honestly will say there's always room for improvement. But what excites me is the next chapter. Two massive new cities — KSC New Town, often called Mumbai 3.0, and CIDCO's NAINA — are now taking shape. Add the Navi Mumbai Integrated Industrial Area being developed by Reliance, and suddenly you are looking at nearly 650 square kilometres of land that will evolve into a true fourth-generation urban ecosystem.

And a modern city cannot be exclusive. It must echo Mumbai's own character — a place where the richest and the most modest dreamers can both build their futures. A place where diversity is not an outcome but the foundation. For any city to succeed, it needs that mix, that inclusivity, that sustainable balance.

That, to me, is the real promise of the Navi Mumbai story — a city built on vision, on fairness, on ambition, and now entering a phase where its scale could rival the world's most futuristic urban centres.

Q One of the most significant responsibilities you handled at CIDCO was the Navi Mumbai International Airport, a project that remained stuck for nearly 12 years. Under your tenure, the project finally began moving, and the pace at which it progressed over the last few years has been remarkable. How do you look at the airport's journey today? And once it becomes fully operational, what kind of impact do you foresee on MMR's overall growth trajectory?

When the Navi Mumbai Airport was initially conceived, a study had estimated that it had the potential to increase India's GDP by almost 1%. That gives a sense of how transformative this project is. Along with the Mumbai Trans Harbour Link, it is one of those rare developments that can fundamentally alter the region's economic landscape.

When I took charge of CIDCO in 2020, the project was facing several major challenges. The then concessionaire was unable to move the work forward, and CIDCO too was struggling to break the deadlock. Around the same time, there was a change of ownership at the parent company level. Adani Airports took over Mumbai International Airport Limited and became the controlling stakeholder in the Navi Mumbai Airport as well.

But even with a new concessionaire, the groundwork still had to be completed.

- Land acquisition was pending.
- The river diversion had not yet been executed.
- High-voltage transmission lines needed to be shifted.
- And around 11,000 people still had to be resettled.

What I am proud of is that all of this — land acquisition, resettlement, river diversion, hill cutting, and utility shifting — was completed within a year to a year and a half. And importantly, it happened without any confrontation. There was no forced eviction, no negative headlines. Every family moved voluntarily. Even the last person who had approached the High Court eventually asked to relocate on his own, and CIDCO gave him that opportunity.

CIDCO built new towns for the project-affected families, and their 12.5% developed land entitlement was allotted in the new Pushpak Nagar. When project-affected people are placed at the centre of the planning process, development becomes far smoother and more humane — and that is evident in this case.

Another crucial milestone was financial closure. Under SBI's leadership, a consortium of lenders extended the required credit line. This was followed by a Pragati meeting chaired by the Hon'ble Prime Minister, where clear timelines were laid down for both the government and the concessionaire. Once timelines are fixed, everyone knows exactly what needs to be done.

Today, the airport is essentially complete. And the impact on MMR will be immense — from economic expansion to new employment hubs, improved logistics, and the opening up of entirely new growth corridors. The airport will not just support Mumbai's growth; it will redefine it.

Q Today, you're leading MMRDA — an organisation handling an enormous scale of work: over 350 km of Metro corridors, more than 200 km of new road networks with sea links, tunnels, and expressways, along with plans to create future-ready growth hubs. How different is this challenge compared to CIDCO? And how prepared is MMRDA financially to deliver such a massive infrastructure push over the next five years?

The scale is completely different. CIDCO, although extremely important, is a more compact organisation with a defined project area — essentially Navi Mumbai, from Airoli to JNPT, and now the NAINA region. MMRDA, on the other hand, is spread across five districts, covering a far larger and more diverse geography. Our KSC New Town, what people call Mumbai 3.0, lies even beyond NAINA, extending to where the Atal Setu lands and further. Managing such a sprawling region is naturally a far bigger challenge.

The second major difference is the financial model. CIDCO has a substantial land bank, which gives it the advantage of land monetisation to support its projects. MMRDA's land bank, however, is primarily BKC, and most of that land has already been sold over the years. That means we must rely on stronger financial structuring and robust project appraisal, rather than land resources, to fund our infrastructure.

I'm happy to say that we have now achieved financial closure for all our major projects. Every significant project has been assessed and appraised by a top financial institution — and only after that appraisal has funding been sanctioned. We are working with the leading financial institutions of India and the world, including global lenders, domestic banks, and premier development finance institutions of the Government of India.

Very recently, the Hon'ble Chief Minister witnessed the signing of a MoU between MMRDA and these development financial institutions amounting to ₹4.07 lakh crore. That's the scale of credit line available for our future infrastructure programmes.

But it's important to be clear: this is not an open cheque for uncontrolled spending. Funds will only be drawn up for projects that have clear financial closure, meaning the project can eventually pay for itself. If a project is not financially viable, MMRDA does not have the cushion to take it up casually. Sustainability and accountability are essential factors for our funding model.

Understanding the MMRDA–CIDCO Difference

MMRDA	VS	CIDCO
Manages a sprawling region with limited land resources.		Manages a compact region with substantial land resources.

Q When people compare Delhi Metro with Mumbai Metro, the pace often becomes a point of discussion. Yes Mumbai's terrain is far more complex — underground water, rivers, heritage precincts, salt pans, and extremely dense neighbourhoods. At a fundamental level, what has really shaped the pace of the Metro in Mumbai? Is it financial constraints, or

are there deeper structural and environmental realities that explain why the timeline looks different from Delhi?
I would hesitate to compare Mumbai Metro with Delhi Metro. The two cities are built very differently, and the challenges are not comparable. Also, it's not entirely accurate to say that Mumbai's Metro has been moving slowly for 12 or 15 years. Line 1 was completed on time. After that came Line 3, one of the most complex underground corridors in the country, and today MMRDA is already operating four metro lines.

If you add the Navi Mumbai Metro, which we commissioned at CIDCO, Mumbai now has close to 100 kilometres of operational network. Most of these projects began only in the last few years, not a decade back, and they involve exceptionally difficult engineering.

Mumbai's biggest challenges are very specific to Mumbai. Much of the land falls under CRZ, salt pans or environmentally sensitive zones, so getting permissions takes time because compliance is essential. The city's density is unlike any other: you're building in the middle of continuous traffic, not in isolated corridors. That makes even routine construction far more complex.

Then there is the human element. Mumbai has a large number of project-affected families, and our responsibility is to resettle them properly. We do not move ahead unless resettlement is done in a dignified and complete way. It's the right approach, but naturally, it extends timelines.

Sustainability is another dimension. Every major project needs to pass through several environmental and safety approvals. For MMRDA — and for me personally — sustainability is not an afterthought; it is central to how we plan. And of course, financing is different too. The metro lines handled by MMRDA are not funded by the Government of India. They are funded by the Government of Maharashtra and by MMRDA itself, through debt raised only when a project can pay for itself. That financial discipline also shapes the pace.

What is important is that work has never stopped. If you visit any metro site, you will see activity everywhere. Trials are already underway on two lines. The Hon'ble Chief Minister has set a clear direction that most of the metro lines should be completed in the next two financial years, and we are firmly on track.

So, I would respectfully disagree that Mumbai is slow. Mumbai is complex. And against that complexity, the progress being made today is significant and steady.

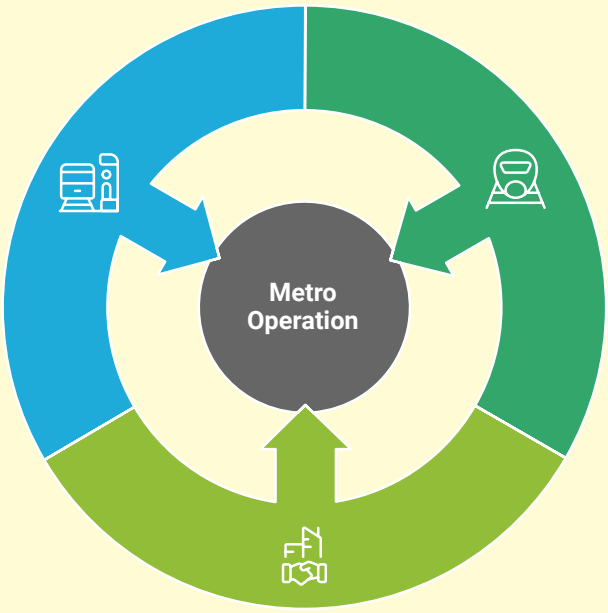
Q There was a plan at one stage for the government to take over Metro Line 1. You were also in a legal dispute with the private partner. What is the status of that situation?
The Government of Maharashtra has taken a clear decision on this — the cabinet has decided not to pursue the acquisition of Metro Line 1. So, as of now, there is no plan to take over that line or any other privately operated metro corridor.

Metro Line 1 continues to be operated by Reliance Infrastructure Limited through Mumbai Metro One Private Limited. MMRDA holds a 26% minority stake, but operational control lies entirely with the concessionaire. And that is how it should be. Mumbai is a city where the private sector has always played a strong role, and public–private partnerships work best when each side respects the other's space. The company runs the system independently, while regulatory approvals, where required, come to government bodies like BMC, MMRDA or the relevant state departments.

Interestingly, Mumbai now has all three models functioning together.

- One metro run by the private sector.
- One (Line 3) operated through an equal partnership between the Government of India and Government of

Models of Metro Operation in Mumbai



Public Sector Operation
Other metro lines operated by MMRDA

Private Sector Operation
Metro Line 1 operated through private ownership.

Public-Private Partnership
Metro Line 3 operated jointly by central and state government.

Maharashtra.

■ And the rest run entirely by MMRDA.

Despite these different models, the passenger experience is unified. The National Common Mobility Card is now active, so commuters can use a single card across all metro lines. That's the direction we want to move in — coordinated mobility, even with diverse operating structures.

Q In our conversations with major infrastructure stakeholders in Mumbai, a recurring theme is the complexity of approvals and clearances. Mumbai has multiple agencies — MMRDA, SRA, MHADA, heritage authorities, and the Urban Development Department — all operating within the same geography.

Does this decentralised structure create hurdles for large infrastructure projects? And do you believe Mumbai needs a more centralised mechanism, a common platform where all stakeholders align their priorities? Is there any such thinking or proposal within the Maharashtra government at this stage?

I am not aware of any formal proposal of that nature, although from time to time there has been discussion about having a 'CEO of Mumbai'. But in my view, the Chief Minister of Maharashtra is effectively the person who leads the state, and Mumbai is very much at the centre of that leadership.

MMRDA itself is designed as an overarching coordinating body. The Municipal Commissioner of Mumbai, the commissioners of other municipal corporations, elected representatives — all of them are part of our Authority. So, the structure already ensures that every major stakeholder has a seat at the table. This system has worked well in terms of coordination, decision-making, and resolving issues across agencies.

As far as approvals and clearances are concerned, they are part of planned and sustainable development. If a project needs permission, then that is simply an essential step in the process. Timelines must be factored in during planning; the key is to anticipate them rather than be surprised by them.

We also must recognise that specialised agencies exist for a reason. SRA focuses on slum redevelopment. MHADA looks after building redevelopment. The municipal corporations handle civic functions. MMRDA handles arterial roads and major infrastructure across the metropolitan region. Each organisation works within its mandate, and that division of responsibility is necessary in a city as large and layered as Mumbai.

The Government of Maharashtra keeps a very close watch on all major projects, and Mumbai receives continuous attention because of its importance to the state and the country. In my view, the current ecosystem functions well, and the leadership in place ensures that coordination happens when it is needed.

Q MMRDA's primary land bank has traditionally been BKC. One more concern is that Mumbai has not created any major new business district after BKC. Most other parts of the city are becoming increasingly residential.

As a result, we are beginning to see a kind of brain drain — high-value professionals from finance, IT and other knowledge sectors are moving to other states or countries, while the city continues attracting mostly unskilled or semi-skilled workers. This increases pressure on the urban core and reduces Mumbai's competitiveness.

In that context, what is your plan to create more BKC-like commercial hubs — places that offer affordable office spaces and lower establishment costs — so that Mumbai can retain and attract top talent? Is there a concrete roadmap for this?

On the point about brain drain, I believe it requires deeper study. Mumbai's defining strength has always been its inclusivity, and people across all categories — from highly skilled professionals to blue-collar workers — continue to see opportunity here. But since this is not my specific area of expertise, I will not comment beyond that.

As far as developing another BKC is concerned, it is important to remember what BKC was originally designed to be — an international financial hub. It was built with

MMR Economic Master Plan

What is the vision of the 50-year economic master plan for MMR?

To make the region a $1.5 trillion economy, achieving $400 billion by 2030.

How will this goal be reached?

Through eight policy shifts, seven growth drivers, and 30 major projects, including completing BKC, developing Wadala, and creating a special development zone in Aksa–Manori.

What is MMRDA's role?

MMRDA is now the planning authority for around 1,200 sq km in Thane district and 1,000 sq km in Raigad district.

a very clear purpose, and over time it has grown into exactly that. With similar long-term thinking, we worked with NITI Aayog to prepare a 50-year economic master plan for MMR, with the vision of making this region a $1.5 trillion economy, and achieving $400 billion by 2030.

To reach that goal, we have identified eight policy shifts, seven growth drivers and 30 major projects. Among these:

- Completing the remaining development of BKC
- Developing Wadala as a major commercial hub — an announcement you will hear very soon
- Creating a special development zone in the Aksa–Manori coastal belt, comprising about 265 hectares of government land, which is larger than the initial BKC land

These are already part of the roadmap.

Beyond that, the larger future lies in the KSC New Town — Mumbai 3.0. I am also pleased to share that the state government has decided to transfer 33,954.31 hectare land from the state revenue department to the MMRDA to create basic infrastructural facilities, as well as to monetise it so that it can fund key infrastructure projects. These land parcels are spread across Thane, Raigad and Palghar districts..

As we prepare the new Development Plan, we will identify multiple growth centres — each with a focused economic purpose. Some may specialise in logistics, some in specific industries, others in emerging service sectors. These centres will help create affordable, well-planned commercial ecosystems across the region, reducing pressure on the traditional city core.

People often ask when this will materialise. It's important to remember that area development is a long-term exercise. BKC began in 1975 and continues to evolve even today. Our goal is not speed alone, but sustainable, future-ready, balanced growth. The planning and financial groundwork for that future has already begun.

Q I'm very tempted to ask you something from the perspective of an observer, a layman and a journalist. We speak about a Third Mumbai, a New Mumbai — but when I look at the existing city, I often feel that barely 20% of Mumbai is truly developed. Nearly 30–40% of land is occupied by slums, another major share lies with old housing societies, and a significant portion consists of large institutional and industrial land holdings.

Just along the eastern waterfront, there's almost an entire alternate Mumbai sitting idle: 900 hectares with Mumbai Port Trust, over 600 hectares with ONGC, plus land with BARC, Tata Power, RCF, BPCL, and several private players. Add salt pan lands, and we are talking about 10,000 acres lying unused for decades. Alongside this, we are living in a time of sensitive geopolitics and serious climate challenges.

Many of these installations are legacy-era industries — some coal-based, some high-emission, some with radiation-related concerns — and naturally, they raise questions about urban suitability in today's context. So, my question is, within the larger planning vision for MMR, is there any discussion or thought around relocating such industries to more appropriate zones with modern emission standards, and freeing this land for newer forms of development? Is this conversation taking place at any level?

These are very loaded statements, and we need to approach them with caution. When we describe any installation as hazardous or polluting, we must remember that every facility you mentioned operates only after receiving all requisite permissions. These are not arbitrary operations. They are governed by strong regulatory frameworks, and the people running them are equally responsible citizens, as conscious of safety and environment as any of us.

Second, the idea of what is 'developed' or 'undeveloped' also needs nuance. A city does not become better simply by converting every parcel of land into a concrete cluster. Green spaces, open tracts, and

We are preparing a 50-year economic master plan for MMR, with the vision of making this region a $1.5 trillion economy

institutional buffers are equally important. Not every empty expanse is meant to be built upon, nor should urban planning be driven only by construction.

The issue of slums, however, is a very real and very important one. The Government of Maharashtra has already introduced a new policy on housing and slum redevelopment. MMRDA itself has taken up the redevelopment of the Ramabai Ambedkar Nagar slum, nearly 17 hectares, and the site has been fully vacated. Work will begin very soon. This is a priority because dignified housing is central to creating a humane city.

But when we talk about the broader vision, I believe cities must grow organically. Transformations happen in phases, over time, and in ways that balance economic needs, environmental responsibility, and social realities. Sudden or forced change is neither practical nor sustainable. The discussions you refer to — about long-term land use, about shifting certain activities, about future urban forms — are part of ongoing thinking across various levels of government. But they must be rooted in careful planning, environmental responsibility, and legal frameworks, not just broad assumptions.

Mumbai's evolution has always been gradual, layered, and resilient. That process must continue thoughtfully, not abruptly.

Q My earlier question wasn't about blaming or labelling any installation as polluting. It was more about the global compulsion to decarbonise cities. Mumbai, too, has long-term climate commitments — 2050, 2070. In that larger context, do you believe such large industrial plants and legacy-era facilities can realistically continue in the same form within the city?

In the larger climate conversation, it's important to acknowledge where India stands. Recently, it was recognised that India is the only country that has met its committed targets toward net-zero. No other nation has achieved that level of compliance. So, I think it's equally important to look at what has been accomplished, not just at what remains to be done.

There's a story that illustrates this. Imagine a room with beautiful tiling, and in one corner there's a single tile that doesn't match. Two people walk in. One says, 'What a beautiful room'. The other points only to the mismatched tile. Both observations are valid, but the question is: which one captures the true direction of the space?

My view is similar. While it is necessary to recognise areas that need improvement, it is equally important to appreciate the progress, the intent, and the direction we are moving in. And the direction — both in terms of emissions reduction and sustainable development — is very clear and very positive.

Q You've spoken about inclusive development, robust infrastructure, economic expansion and the geographical spread of the region. If you were to look at the year 2030, what is your ultimate vision for MMR? How do you envisage the Mumbai Metropolitan Region Five years from now?

We have put this vision down on paper. Together with NITI Aayog, we prepared the Economic Master Plan for MMR, which lays out a clear roadmap for the

region's future. This master plan has been approved by the Chief Minister, the Deputy Chief Minister, the Cabinet of Maharashtra, and has also been presented to and accepted by the Hon'ble Prime Minister of India. NITI Aayog has been a full partner in this entire process.

Economically, the goal is very clear:

MMR must grow from a $140 billion economy to a $400 billion economy by 2030.

That is the benchmark we have set, and every project we undertake aligns with that direction.

Within this framework, inclusive housing plays a central role. Slum redevelopment and improvement remain critical priorities. The development of the remaining parts of BKC, the transformation of Wadala, the Special Development Zone along the northern coast — all these initiatives are clearly identified in the master plan. The growth hubs you referred to earlier are also part of this long-term structure.

Two themes run through the entire document: sustainability and organic growth. The region must grow in a way that respects its ecology, its people, and its long-term resilience. And the growth must be designed for the citizens who live here — not for abstract projections, but for real communities.

That, in essence, is the vision for 2030: A region that is economically powerful, socially inclusive, environmentally responsible and physically well-connected — a metropolitan area that grows with its people, and for its people.

Q Now when we talk about the Third Mumbai or Mumbai 3.0, what is the planning philosophy behind it? Are we looking at a vertically dense city, or a more inclusive, mixed-use model with residential, commercial, industrial and IT ecosystems growing together? What is the thinking within the government, and how are you shaping that vision?

The government's guiding principle has always been inclusivity. India is a democracy, and every policy we draft is shaped not just by constitutional values but also by what Gandhiji called his talisman — to look at the poorest person and ask whether the decision helps improve his or her life. That ethos is deeply embedded in our planning.

Inclusivity is not just an ideal; it's something India has demonstrated in real terms. I was reading a recent study which mentioned that a decade ago, 24.4% of Indians could not afford two square meals a day. Today, according to World Bank figures, that number is around 4.2 or 4.3%. This is the largest poverty reduction in human history, simply because the scale of India makes the achievement extraordinary.

So, inclusivity is in our DNA as a nation, and naturally, it becomes the foundation of how the government plans new cities. Whether it is Mumbai 3.0, new townships, or large-scale regional planning, the goal is not to create exclusive enclaves but to build cities that bring everyone together — cities that allow people from all economic backgrounds to live, work, and grow in the same ecosystem.

The newer planning models, including the Third Mumbai, will therefore be mixed-use, integrated and inclusive. They will have residential areas, employment hubs, commercial centres, industry clusters, and social infrastructure coexisting within a balanced, sustainable urban fabric. That is not just a design choice; it's a reflection of who we are as a country and what we aspire to build.

Q We've spoken about 2030, but I want to look further ahead. Several global studies warn that by 2050, nearly 20–30% of Mumbai could be underwater due to sea-level rise and climate change. How seriously do you view these projections, and how is the government integrating climate risk into long-term planning for MMR?

These projections fall under the domain of the Government of Maharashtra's Environment Department, which

MMR Economic Masterplan 2030

is responsible for climate policy, and they study these issues very closely. Climate change is, without doubt, a very serious factor. But it is also an evolving science. I remember when I was in school in the 1970s, the concern then was a second Ice Age. Later it became global warming. Now we speak of climate change more broadly. Science continues to develop, and so does our understanding of it.

Within the government framework, every project must adhere to a very clear set of environmental approvals. Any building above 20,000 square metres requires an environmental clearance and any project falling under the Coastal Regulation Zone requires a CRZ clearance. Major infrastructure projects require multiple layers of environmental scrutiny. And all of these clearances involve public consultation, which is part of Indian law.

So, the mechanism is well established. Every organisation, including MMRDA, follows it rigorously. Climate considerations are not external to planning; they are embedded in how permissions are granted, how designs are approved, and how cities evolve. The Environment Department leads this effort, and we follow the framework they set.

Q The MTHL has unlocked entirely new land corridors and economic possibilities for Mumbai. A similar transformational potential is being spoken about for the proposed Uttan–Virar Sea Link. In the context of MMR's ambition to become a 1.5 trillion-dollar economy, how do you see this project reshaping the region?

Vadavan Port, which is coming up in Palghar, is central to this entire vision. It will be India's first true express port, with the deepest draft in the country. Its capacities are such that it can completely change the way global shipping connects with India. That is the scale we are talking about.

When you look at Mumbai, the city is fortunate to have multiple economic corridors radiating out of it — towards Pune, Ahmedabad, Nashik, and now Nagpur through the Samruddhi Expressway. With Vadavan emerging to the north, a new economic frontier opens up.

To support that, we are working on what is essentially a ring-road concept around Mumbai. Historically, Mumbai's growth has always been north–south, supported by the Western and Eastern corridors. What the city has lacked is strong east–west connectivity. That gap is now being systematically addressed.

Several key connectors are already in various stages of development:

- The ongoing link from Orange Gate (Eastern Freeway) to the Coastal Road, including the widening of Marine Drive into a 12-lane corridor.
- The Worli–Sewri Connector linked to MTHL.
- The Worli–Bandra Sea Link, followed by the Bandra–Versova Sea Link, which is under execution by MSRDC and should be completed around 2029.
- The upcoming road from Versova to Dahisar.
- Another corridor from Dahisar to Bhayander.

Beyond Bhayander begins the project you mentioned — the Uttan–Virar Sea Link, which will run all the way up to Virar. At Virar, it will integrate with the Baroda and Ahmedabad highways, both of which are six-lane corridors. From there, a new linkage is being created further north into Palghar.

JNPT has already declared a 145-metre right of way, and land acquisition has begun. This will connect directly to Vadavan Port. So, in effect, the entire Mumbai–Vadavan connectivity is fully mapped.

Regarding the Versova–Virar Sea Link specifically, the project has been submitted to the Government of Maharashtra for administrative approval. Once the state approves it, it will move to the Government of India, and foreign

Key Connectors in Development

Orange Gate (9.96 km)
Connects Eastern Express Highway to Marine Drive.

Thane Borivali Twin Tunnel (11.85 km)
Connects Thane to Borivali.

Uttan Virar Sea Link (55.12 km) Connects Mumbai to Wadhvan Port.

Airoli Katai Naka (12.71 km) Connects Thane to Airoli and Alibaugh Virar Corridor.

Anand Nagar - Saket - Amne (8.24 km)
Connects Thane to Eastern Express Highway and Samruddhi Mahamarga.

funding will be sought. The Hon'ble Chief Minister has already made a statement in the Assembly confirming that the project will be foreign-funded. Following funding approval, the execution phase will begin.

All of this together — the sea links, the tunnels, the new highways, and the port connectivity — will fundamentally rewire the northern growth engine of MMR. These are the kinds of networks that enable a trillion-dollar metropolitan economy to take shape.

Q Let me end with a hypothetical but important question. When you imagine Mumbai in 2030, what does that city look like to you? Moreover, what role do you see MMRDA playing in shaping that future? You also spoke of a $400-billion economy. In that journey, how significant will the circular or recyclable economy be for MMR?

Our net-zero goals are very clear. As I said earlier, India is the only country in the world that has achieved the targets it committed to. We were expected to reduce emissions by 50% by 2030 — and we have already met that milestone. So, the circular, or recyclable, economy will play a very substantial role in the coming years.

But we must also recognise something unique about India: recycling is not new to us. It is part of everyday life here. Every Indian home practices recycling long before the term became fashionable globally. The neighbourhood kabadiwala is one of the most efficient recyclers in the world. He takes glass bottles, newspapers, broken household items, metal, plastic — and every bit of it goes back into a second life. It may not appear in corporate balance sheets, but it strengthens local families and keeps waste out of landfills. It is decentralised, natural and deeply sustainable.

The same is true in construction. Materials discarded at one site find a second use for levelling ground somewhere else. It is done quietly, without fanfare, and in a very responsible manner. Even animal waste is not wasted — it goes back into farming and the soil. So, the circular economy is already embedded in the Indian way of living. What will grow now is the formal circular economy, and I believe it will become very large.

MMRDA will continue to be at the heart of the region's transformation

As for Mumbai in 2030 — I like to look at it the way we look at old cinema. If you watch a film from the 1950s, then one from the 60s, 70s, 80s, 90s and so on, you will see how the city has changed each decade. The growth is exponential, not linear. And that exponential curve will only rise further.

Q Where does MMRDA fit into this?

MMRDA will continue to be at the heart of the region's transformation — building the transport networks, the growth hubs, the new townships, the arterial roads, the mobility systems, and the urban backbone that holds a $400-billion economy together. Our job is to create the platforms on which the future city stands — sustainably, inclusively and ambitiously.

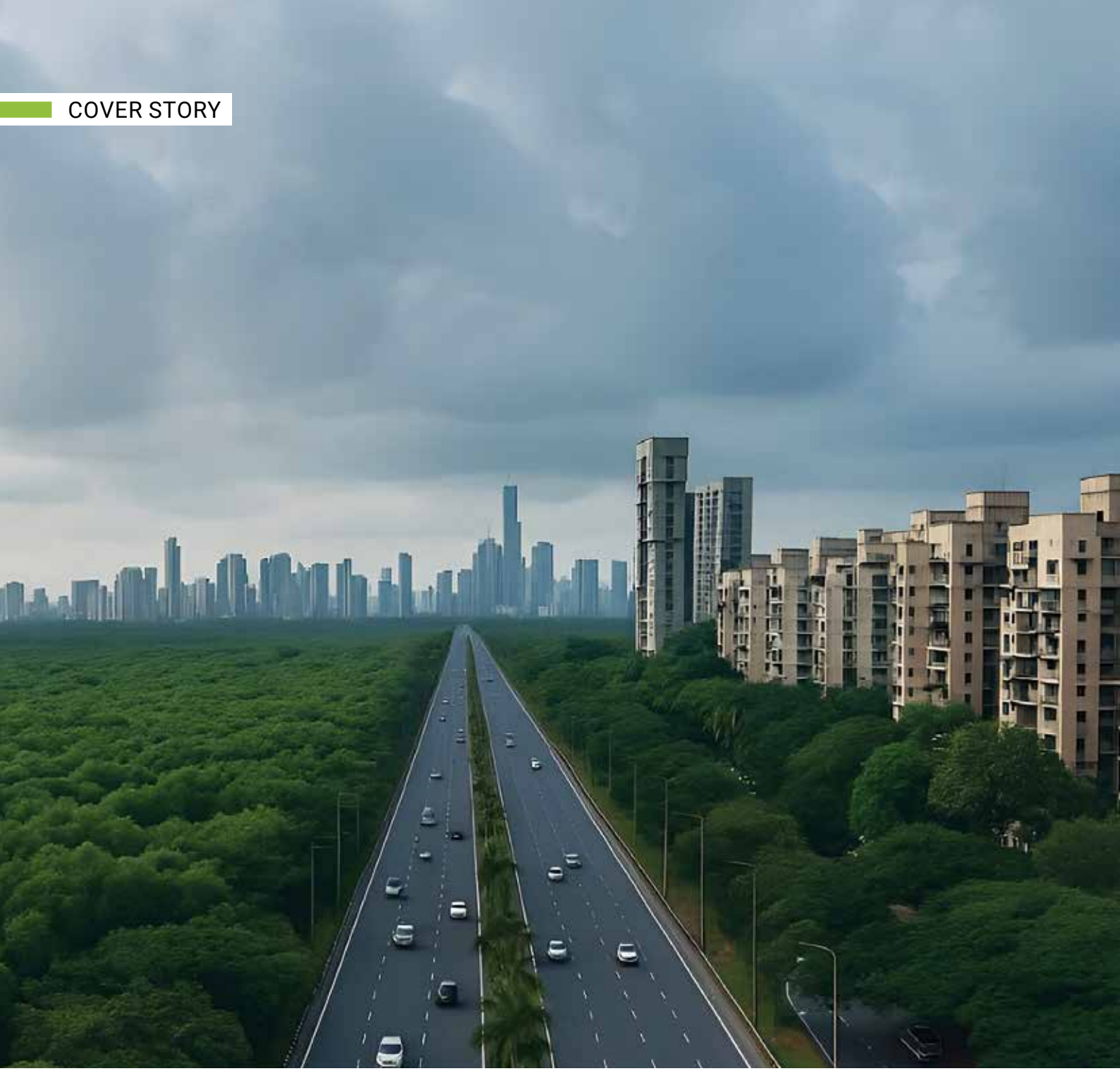
So I leave it to your imagination to visualise what exponential growth looks like. But I can assure you: the direction is clear, the momentum is strong, and the future of Mumbai-MMR will be far bigger than anything we have seen before.

COVER STORY

THE MYTH OF 3RD MUMBAI

HOW EXPANSION IS MASKING MUMBAI'S FAILURE

Land lies idle in the heart of the city, fenced off by institutions and inertia. Buildings decay quietly, carrying families in structures that were never meant to last this long. Pollution persists as a daily condition, embedded into neighbourhoods where industry and habitation collide. These are not hidden failures. They are visible, lived, and measurable. Yet each time the city is forced to confront its own neglect, the response is not reform but relocation. Another city is announced elsewhere, as if distance can substitute accountability. Expansion becomes the escape route, allowing Mumbai's unresolved crises to remain intact while attention shifts outward.



THE ANNOUNCEMENT FATIGUE

Mumbai is forever being promised an escape from itself. Every few years, like a ritual performed when the city becomes too loud, too crowded, too angry to ignore, a new idea is unveiled — 3rd Mumbai. 4th Mumbai. The Next Growth Corridor. The names change, the maps stretch outward, the colours on planning presentations become greener, bluer, cleaner. Hope is exported to the outskirts. Expansion is sold as salvation. As if congestion can be cured by distance.

As if inequality dissolves when pushed far enough away. As if cities, like cluttered rooms, simply need an extra wing. But Mumbai's real problem has never been the lack of space. It has been the refusal to confront what already exists.

Inside the city, time has stalled. Buildings grow old without being allowed to die or be reborn. Millions live suspended between legality and neglect. Prime land sleeps behind barbed wire and institutional indifference. The city gasps. It is not because it is full, but because it is unfinished.

And yet, instead of repair, we announce replacements. Instead of healing, we propose migration. The city's failures are not interrogated; they are outsourced. Each new Mumbai is not a vision of the future. It is an admission of surrender. A quiet confession that fixing the original city is politically inconvenient, administratively exhausting, and morally risky. So, we look away. We draw new lines on empty land. We call it progress. The question, then, is not why Mumbai needs another city. The question is far more disturbing: Why does Mumbai remain broken when the answers lie buried within its own geography — ignored, idle, and deliberately unseen?

This is not the story of a city growing.

It is the story of a city being abandoned while still alive.

THE EXPANSION PATTERN
WHEN REMEDIES BECAME REPETITIONS

Mumbai's response to its own congestion has never been sudden. It has unfolded in phases in which each was announced as a solution, only to be eventually absorbed into the same cycle of strain it was meant to escape.

The first formal remedy arrived not as an afterthought, but as a planned alternative. Navi Mumbai was conceived in the 1970s as India's most ambitious counter-magnet. Designed by CIDCO as a decentralised, self-sufficient city, it was meant to do what Mumbai could no longer do — distribute population, employment, and infrastructure in balance.

Industrial zones, residential nodes, transport corridors, and open spaces were plotted with intent. Navi Mumbai was not an accident of growth; it was a product of planning optimism.

Yet even this carefully imagined city became, over time, an extension rather than an alternative. Employment density lagged housing. Dependence on Mumbai persisted. Daily migration replaced decentralisation. The remedy worked, but only partially, and never at the scale required to relieve the original city.

When Navi Mumbai proved insufficient, the gaze shifted closer home. Thane, once dismissed as a peripheral district, was rebranded as the next urban frontier. Improved rail connectivity, large land parcels, and comparatively lower prices transformed it into Mumbai's pressure valve.

Residential towers rose rapidly, infrastructure followed unevenly, and employment remained selectively concentrated. Thane grew — fast, vertically, and profitably — but without a commensurate metropolitan plan integrating mobility, services, and civic capacity at scale.

What followed was not strategy, but spillover. As land prices climbed and planning discipline weakened, growth leaked outward into the suburbs. Not by design, but by inevitability.

Mira Bhayandar, Vasai Virar, Kalyan Dombivli absorbed population at a pace infrastructure could not match. What emerged were dense residential belts with limited employment bases, overburdened transport systems, and civic bodies constantly playing catch-up.

This phase of growth was neither formally planned nor officially acknowledged as a strategy. It happened because the city needed space, developers needed land, and governance looked the other way. Rail lines became lifelines. Roads turned into parking lots. Water, drainage, healthcare, and education infrastructure lagged behind sheer human volume.

What links these phases is not geography, but intent. Each expansion was reactive. Each treated congestion as a spatial problem, not a structural one. Instead of repairing Mumbai's internal dysfunctions — land lock-ins, stalled redevelopment, fragmented governance — the city repeatedly chose displacement. Pressure was pushed outward, never resolved inward.

Navi Mumbai was the plan.

Thane was the adjustment.

The extended suburbs were the consequence.

Together, they reveal a pattern that continues to define Mumbai's urban imagination: when fixing becomes difficult, expansion becomes doctrine.

THE FROZEN 30% MUMBAI LAND

Mumbai's most visible contradiction is also its most normalised one. Informal settlements occupy nearly a third of the city's land, yet they exist outside the moral urgency of crisis and outside the administrative speed of reform. They are spoken about endlessly, acted upon reluctantly, and resolved almost never.

This land is not hidden. It sits beside railway tracks, underneath flyovers, against glass towers, behind five-star hotels, and along the city's most valuable corridors. It is not marginal land. It is prime urban geography, frozen in a permanent state of postponement.

The idea of rehabilitation, on paper, was meant to be Mumbai's moral correction. The creation of it promised a mechanism where dignity and density could coexist — formal homes, legal tenure, infrastructure, and a city stitched back together. Instead, the process slowed into something more damaging than failure: inertia.

Projects move, but barely. Files circulate. Developers wait. Residents age. Entire neighbourhoods remain locked in negotiation for decades, caught between consent thresholds, legal disputes, political interference, and shifting policies. The slum, meanwhile, does not disappear. It consolidates. It grows taller, denser, and more complex. A vertical informal city inside the formal one.

What emerges is not housing scarcity, but housing limbo. Policy paralysis has ensured that no single stakeholder is fully accountable. The state blames developers. Developers blame feasibility. Bureaucracy blames litigation. Politicians blame public resistance. And residents are left navigating a system that promises upliftment while delivering uncertainty. In this paralysis, delay becomes profitable — for some — and devastating for most.

Overlaying this dysfunction is vote-bank urbanism, the most corrosive layer of all. Informality is not merely tolerated; it is strategically preserved. Slums become political capital — protected, promised, threatened, reassured — but rarely resolved. Rehabilitation becomes an election slogan rather than an execution mandate. The city learns to treat illegality not as a planning failure, but as an electoral asset.

The result is a cruel paradox. Mumbai is one of the densest cities in the world, yet it wastes land through underdevelopment. Millions live compressed into sub-human conditions on land that could accommodate dignified housing, open spaces, social infrastructure, and economic activity — if only redevelopment moved at the pace of human need rather than political convenience.

This is what density without dignity looks like. Children grow up without sunlight. Families live with permanent insecurity. Infrastructure is retrofitted where it should have been designed. Fire, health, and sanitation risks are not anomalies; they are structural features. And still, the city looks elsewhere for land — towards forests, wetlands, and agricultural belts — instead of confronting the injustice embedded within its own footprint.

Slum land is often described as 'complicated'. But complexity is not an excuse for abdication. Other global cities have resolved informal housing through scale, speed, and political clarity. Mumbai, by contrast, has chosen hesitation — allowing a third of itself to exist in a suspended state where legality, safety, and dignity are endlessly deferred.

The tragedy is not that slums exist.

The tragedy is that they are allowed to remain unresolved by design.

As long as this 30 per cent remains frozen, every new city announcement rings hollow. Because no amount of expansion can compensate for a city that refuses to fix the most visible fracture in its own body.

AGEING HOUSING STOCK – ANOTHER 30% OF LAND WAITING UNCERTAINTY

Mumbai's second great land paralysis does not arrive with sirens or headlines. It stands quietly — wrapped in peeling paint, corroded balconies, sagging beams, and walls softened by decades of monsoons. It is an ageing city within the city. Nearly 30 per cent of Mumbai's housing stock, largely constructed before 1991, dominates the island city and older central zones, surviving not on engineering strength but on habit, hope, and prolonged delay.

These buildings were never designed for the lives they now carry. They were built for fewer people, lower heights, lighter loads, and a climate that was less punishing. Today, they bear illegal extensions, vertical additions, water seepage, outdated services, and decades of deferred maintenance. Many are functionally obsolete and structurally fatigued, yet they remain inhabited because the machinery meant to replace them moves slower than gravity — and far slower than risk.

Redevelopment, in theory, should have been Mumbai's quiet revolution. A process that replaces danger with safety, inefficiency with optimisation, decay with dignity — all without displacement. In practice, it has mutated into an expensive approval ecosystem where complexity is monetised, delay is rewarded, and urgency quietly dies.

The first choke point is consent. What appears democratic on paper becomes paralytic in reality. Mandated thresholds demand years of persuasion, bargaining, and informal negotiation. Meetings stretch endlessly. Objections surface strategically late. Agreements are reopened after they are signed. In the absence of time-bound frameworks, consent ceases to be protection — it becomes a permanent veto.

Financing follows, reluctantly and unevenly. Redevelopment is capital-heavy, front-loaded, and exposed to regulatory unpredictability. Banks hesitate. Cash flows stretch thin. Smaller developers overpromise to win societies; larger ones overcalculate risk and slow down. Projects stall mid-stream, leaving residents in transit accommodation far beyond promised timelines. A two-year inconvenience quietly turns into five or seven years of dislocation.

Regulatory delays complete the triangle of dysfunction. Clearances move through departments that do not speak to one another. Height approvals, fire NOCs, environmental conditions, heritage restrictions — each layer adds cost and uncertainty, none adds speed. There is no synchronised clock, no single-point accountability, no penalty for delay and no reward for efficiency. The system does not fail dramatically; it coagulates.

Within this maze thrives a more corrosive pathology: corruption embedded within society management structures. Managing committees transform into power centres rather than facilitators. Decisions are influenced not by feasibility or safety, but by informal incentives — personal gains, future allotments, side agreements. Transparency evaporates. Trust fractures. Litigation becomes inevitable.

Into this chaos step developers, circling aggressively around every viable society. Redevelopment turns into

Instances of Infrastructural Negligence

PALI HILL
Small residential plots transformed into high-rise towers, but roads remain narrow and unprepared for increased traffic.

LOWER PAREL
Mills replaced by commercial towers, but roads remained unchanged, leading to traffic explosion and public transport buckling.

a bidding war of promises — larger homes, higher corpus, faster delivery, luxury finishes, zero cost. These promises are rarely grounded in financial reality. They are consent-weapons. Feasibility is postponed until after agreements are signed, and reality arrives only when cranes stop moving.

But even where redevelopment does move, it produces new failures.

Plush neighbourhoods attract an excess of developer interest, while less glamorous areas are starved of attention. Capital flows selectively. Safety becomes location-dependent. Risk is concentrated where returns are lower. The city ends up renewing privilege faster than necessity.

Worse, redevelopment often happens without urban context. Old bungalows and low-rise buildings are replaced by tall residential towers with little consideration for roads, drainage, parking, water supply, or emergency access. Density multiplies vertically while civic infrastructure remains stubbornly horizontal. The city grows heavier without growing wider.

In areas like Pali Hill, small residential plots have been transformed into high-rise towers — but the roads remain narrow, winding, and unprepared for increased traffic, service vehicles, and daily congestion. The building is new; the neighbourhood is not.

The same mistake was repeated on a far larger scale in former mill districts like Lower Parel. Mills were replaced by malls, offices, and commercial towers — symbols of Mumbai's economic transformation. But the roads remained unchanged. Traffic exploded. Public transport buckled. What was sold as urban renewal became a case study in infrastructural negligence.

This is redevelopment without responsibility — vertical growth without horizontal planning.

The cumulative effect is devastating. Redevelopment slows not because it is impossible, but because it has been reduced to speculative negotiation rather than treated as a public safety mission. Structural risk, ignored long enough, quietly mutates into humanitarian risk. Buildings collapse during monsoons. Families lose homes overnight. Emergency evacuations become routine news items instead of citywide alarms.

And yet, the city waits.

It waits while buildings weaken.

It waits while lives remain exposed.

It waits while new cities are announced elsewhere.

This is not urban renewal.

It is managed decay, a system so expensive, so contested, and so morally compromised that collapse becomes the path of least resistance. Mumbai does not lack land. It lacks a redevelopment ecosystem that values speed, safety, urban integration, and sincerity over spectacle, speculation, and selective profit.

Until that changes, another 30 per cent of the city will continue to stand — not because it is safe, but because it has been conveniently forgotten.

PRIVATE TRUSTS & INSTITUTIONAL LOCK-INS – THE SILENT 10%

There is a quieter form of land scarcity in Mumbai — one that does not arrive with the urgency of slums or the fragility of ageing buildings. It exists behind compound walls, locked gates, inherited titles, and moral exemptions. Roughly 10 per cent of the city's land lies with private trusts, religious institutions, and legacy corporate estates, forming an invisible geography of inaccessibility within one of the world's most land-starved cities.

This land is not illegal. That is precisely its strength. Charitable and religious trusts occupy vast parcels across the city — land granted generations ago under colonial or early post-Independence arrangements, often at nominal rates and with vaguely worded public-purpose clauses.

Over time, purpose blurred into possession. Hospitals became underutilised. Schools stopped expanding. Open land remained fenced off, neither developed nor surrendered. The moral shield of charity ensured minimal scrutiny, while the city continued to densify around it.

Accountability, in these cases, is neither clearly defined nor periodically reviewed. Trust deeds are rarely audited against contemporary urban needs. There is no statutory obligation to demonstrate land optimisation, social impact per square metre, or relevance to current demographics. Land, once justified as benevolence, is allowed to age into irrelevance.

Religious institutions mirror this pattern, often more visibly. Large temple, church, and mosque estates sit amid dense neighbourhoods, functioning as low-density enclaves in high-density zones. While spiritual and cultural roles are unquestionable, urban planning rarely interrogates the disproportion

between land consumed and public benefit delivered. Faith becomes a planning exemption, insulating large tracts from the pressures faced by ordinary citizens and housing societies.

Then there are legacy corporate estates — mill lands, factory campuses, staff colonies — remnants of an industrial Mumbai that no longer exists. Some have been redeveloped partially, others remain administratively intact but economically obsolete. Ownership structures are complex, litigation is common, and decision-making is slow. What remains is land that does not fully belong to the past nor serve the present.

What unites these holders is not intent, but insulation. They are shielded from market pressure, political urgency, and public questioning. Their land does not respond to housing demand, infrastructure needs, or environmental logic. It simply waits.

In a functioning city, land is periodically re-evaluated. Not confiscated, not vilified, but re-contextualised. In Mumbai, however, private institutional land enjoys permanence without performance. There is no city-wide mechanism asking whether these parcels still serve the purpose for which they were granted, or whether adaptive reuse could align them with today's urban realities.

The consequence is subtle but profound. While ordinary residents negotiate consent, approvals, and financing to redevelop dangerous buildings, vast low-density estates remain untouched. While forests and agricultural land are earmarked for 'future cities', prime urban land remains frozen out of civic responsibility.

This is not a call for expropriation. It is a call for accountability without exception. Mumbai's land crisis is not just about what is occupied illegally or collapsing structurally. It is also about what is legally idle, morally unquestioned, and strategically ignored.

Until private trusts and institutional land are brought into the same conversation as every other square metre of the city, Mumbai will continue to expand outward — not because it must, but because confronting privilege is harder than acquiring new land elsewhere.

CENTRAL GOVERNMENT LAND – UNLOCKING THE 'UNTOUCHABLE' 10%

If Mumbai's slums represent informality and its ageing buildings represent neglect, then central government–controlled land represents immunity.

Nearly 10 per cent of the city's land is held by defence establishments, public sector undertakings, and central agencies — vast, strategically located parcels embedded deep within the urban core. This land is neither invisible nor marginal. It sits along coastlines, transport corridors, and residential catchments, shaping the city's geography while remaining largely disconnected from its planning logic.

What distinguishes this land is not merely ownership, but detachment. Defence land occupies some of Mumbai's most valuable and well-connected zones, maintained at extremely low density in a city desperate for space. While national security considerations are non-negotiable, the absence of periodic spatial audits means that operational necessity is rarely separated from inherited sprawl. Large tracts remain frozen in configurations designed for another era, another threat landscape, another city size.

Public sector undertakings mirror this inertia. Agencies such as BPT Indian Oil, BPCL Bharat Fertilizer, and BARC control thousands of acres within Mumbai's most stressed urban zones. Much of this land was acquired when ports, refineries, and storage depots were central to the city's economy. That economic geography has since shifted, but the land has not.

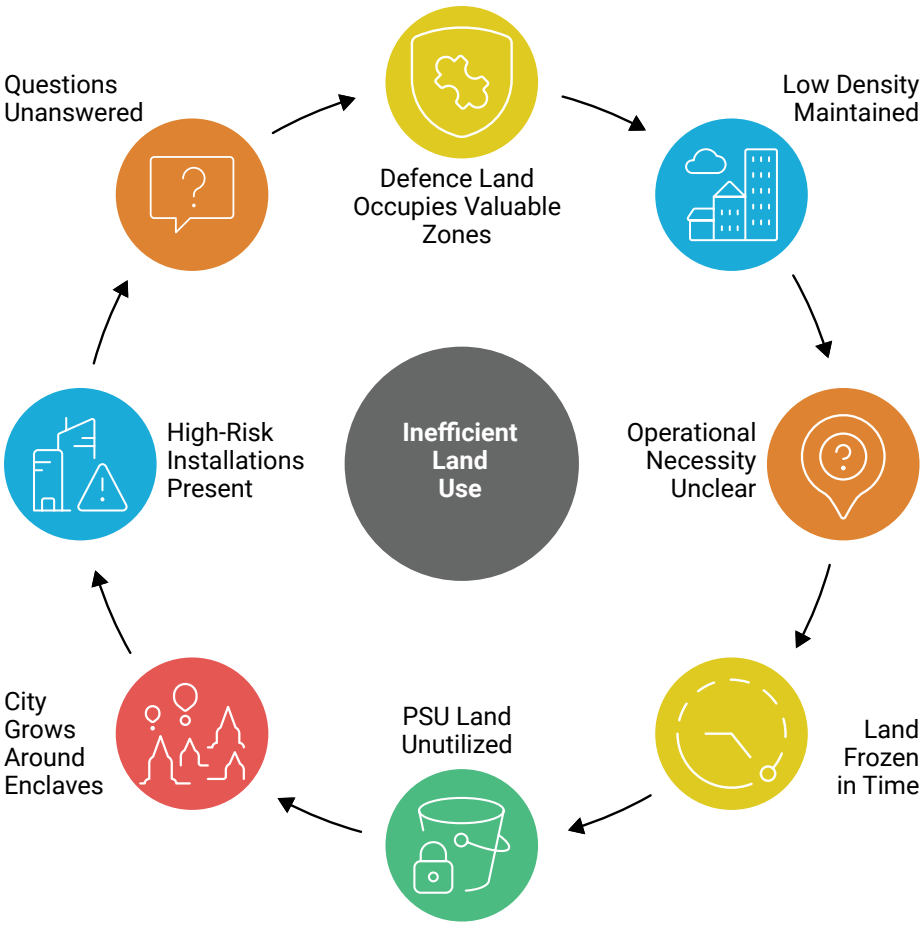
Utilisation remains low. Integration with surrounding neighbourhoods is minimal. Waterfronts are fenced off. Transport interfaces are underdeveloped. The city grows around these enclaves, bending infrastructure awkwardly to accommodate land that

does not respond, reciprocate, or adapt Then there are high-risk, high-sensitivity installations like BHABHA ATOMIC RESEARCH CENTRE , situated within one of the densest metropolitan regions in the world. Their presence raises uncomfortable questions — not only about land use efficiency, but about long-term urban safety, environmental exposure, and disaster preparedness. These are questions rarely asked in public, and never answered through an integrated planning framework.What is striking is not the legitimacy of central ownership, but the absence of coordination.

There is no unified city–centre land policy that aligns central holdings with metropolitan priorities. No institutional platform where the city, the state, and the Centre negotiate land optimisation, phased release, mixed-use integration, or risk relocation. Each parcel is governed vertically, through its own ministry, mandate, and internal logic — immune to the horizontal realities of the city around it. In effect, Mumbai is planned in fragments. While municipal bodies struggle to assemble small plots for affordable housing, transit-oriented development, or open spaces, massive centrally held lands remain untouched. Not because they are indispensable in their entirety, but because no mechanism exists to reimagine them collectively. The city adapts to these lands; these lands do not adapt to the city. This institutional siloing carries a cost. When land within the city is locked beyond negotiation, pressure inevitably shifts outward — towards wetlands, forests, and agricultural belts.

Expansion becomes the default response, not because it is efficient, but because the centre refuses to yield. Mumbai's tragedy is not that the Centre owns land. It is that this land is governed as if the city does not exist around it. Until central agencies are brought into a shared metropolitan vision — one that balances national interest with urban survival — Mumbai will remain a city that grows by avoidance, expanding endlessly at the edges while its most valuable land lies idle at the heart.

Cycle of Inefficient Land Use in Mumbai



EASTERN WATERFRONT

CASE STUDY 1: BOMBAY PORT TRUST

The Great Idle Land

Few stories capture Mumbai's planning failure as starkly as the fate of the Bombay Port Trust (BPT). Spread across approximately 2,000 acres, much of it lining the eastern waterfront, this land represents one of the largest contiguous public land banks in the heart of the city — and one of its greatest missed opportunities.

This was not marginal land. It was not peripheral. It sat at the intersection of trade, transport, employment, and housing — land that global cities would have transformed into mixed-use waterfront districts, logistics hubs, public promenades, and economic engines. In Mumbai, it slowly slipped into bureaucratic paralysis and physical decay.

From Strategic Asset to Administrative Orphan

BPT's land holdings date back to an era when ports were the primary drivers of Mumbai's economy. Over time, shipping patterns changed. Containerisation reduced spatial requirements. Port operations became more mechanised and less land-intensive. Large portions of docklands and storage yards lost their original operational relevance.

Yet the land was never reimagined.

Instead of a structured transition plan, BPT remained governed by a central mandate that prioritised legacy port operations over metropolitan integration. Decision-making stayed vertical — reporting to the Centre, not responding to the city. Mumbai grew around the port, while the port remained frozen in a different century.

What followed was a vacuum — and vacuums never stay empty.

Encroachment as a Symptom, Not the Disease

As land lay underutilised, encroachments crept in — informal housing, small-scale commercial activity, scrap yards, godowns, and unauthorised extensions. These were not sudden invasions but decades-long seepage, enabled by weak on-ground enforcement and the absence of a redevelopment roadmap.

Encroachment thrived precisely because the land had no future.

- No timeline.
- No project.
- No clarity.

In global planning terms, this is a known failure pattern: when public land remains idle, it becomes politically and socially difficult to reclaim. Each year of inaction hardens informal occupation into permanence. Rehabilitation costs rise. Legal complexity multiplies. What could have been proactive urban renewal becomes reactive damage control.

Underutilisation on a Global Waterfront

Even where land was not encroached upon, utilisation remained astonishingly low. Vast tracts sat behind rusting fences, disconnected from road networks, rail integration, or public access. The eastern waterfront, potentially Mumbai's answer to London Docklands or Hamburg HafenCity, remained largely invisible to the city it bordered.

There was no comprehensive land audit linking port requirements with surplus land. No phased release strategy. No mixed-use vision combining logistics, housing, commercial development, and public space. Each proposal that emerged over the years stalled between ministries, committees, and jurisdictional overlaps.

The land did not fail Mumbai.

Governance did.

Bureaucratic Inertia as Urban Policy

At the heart of the failure lay institutional misalignment. BPT land was central-government owned, city-adjacent, and city-critical — yet no single authority was empowered to replan it holistically. The port's mandate discouraged risk. The city lacked leverage. The state oscillated between ambition and accommodation.

Every redevelopment conversation became trapped in questions of control rather than outcomes. Who owns the land? Who approves of the change of use? Who benefits? Who compensates whom? Years passed debating structure while the city paid the price of inaction.

In the meantime, Mumbai pushed outward, towards wetlands, forests, and distant corridors, citing land scarcity.

The Opportunity That Was Lost — And Still Is

Had even a fraction of BPT's land been unlocked in a time-bound, integrated manner, Mumbai could have addressed multiple crises simultaneously:

- Inner-city housing supply
- Decongestion of central business districts
- Creation of public open spaces
- Waterfront access for citizens
- Transit-oriented redevelopment along the harbour edge

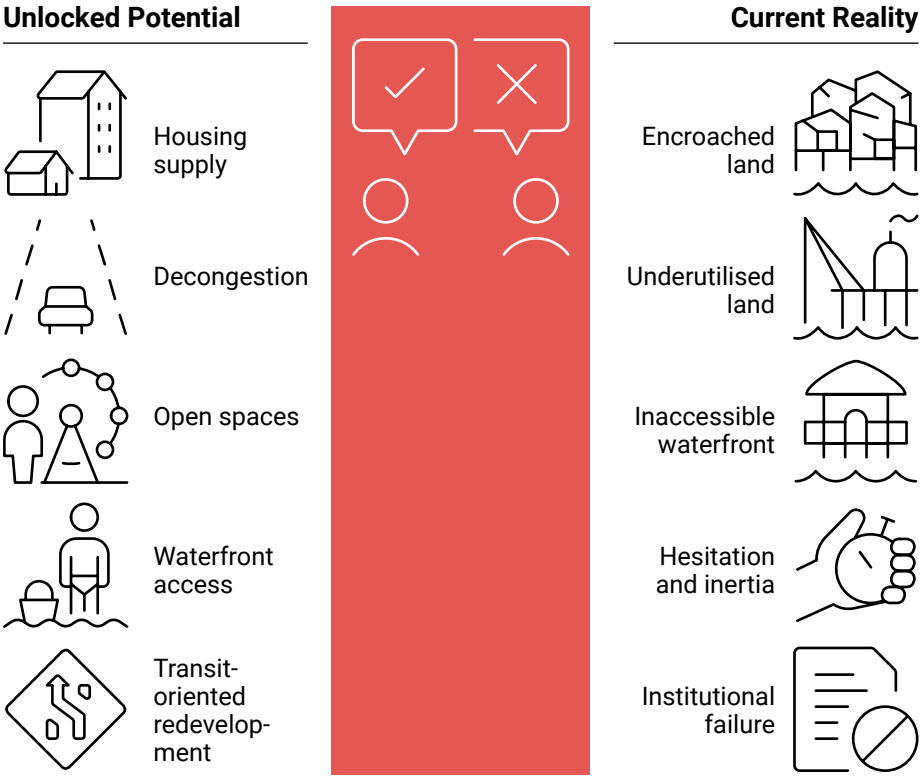
Instead, the city inherited the worst of all outcomes: encroached land that is politically sensitive, underutilised land that is economically wasteful, and a waterfront that remains largely inaccessible.

The lesson from BPT is not merely about ports or policy. It is about what happens when land is allowed to exist without a future.

Encroachment did not kill the opportunity. Underutilisation did. Encroachment was only the consequence. Mumbai did not lose 2,000 acres overnight. It lost them slowly — through hesitation, fragmentation, and the quiet acceptance of inertia.

And until this land is reclaimed not just physically, but institutionally and imaginatively, every new city announcement elsewhere will remain an admission that Mumbai failed to recognise the value of what it already had.

BPT Land Development



CASE STUDY 2: THE LAND TRAPPED IN A REFINERY PAST

There are cities that move forward by confronting their past, and there are cities that carry their past like an untreated wound. Mumbai belongs, tragically, to the latter.

In the heart of Mumbai's eastern suburbs lies a massive, overlooked contradiction: nearly 1,000 acres of land held by oil and gas PSUs. These vast industrial tracts, roughly 500 acres each held by major corporations, persist as relics of Mumbai's past as a heavy industrial port.

The uncomfortable question is not ideological. It is practical. Does Mumbai still need polluting refineries inside its urban core in 2026?

When Strategic Became Stubborn

These refineries were established when land was cheap, the city was smaller, and industrial proximity to ports made economic sense. At the time, they were symbols of national self-reliance — strategic assets critical to energy security.

But cities evolve. Economies shift. Risk profiles change. What was once strategic has now become stubborn geography — vast, low-density, high-risk land uses surrounded by residential neighbourhoods, rail corridors, highways, and informal settlements. The refineries did not move as the city enveloped them. They stayed put, protected by national importance and administrative immunity.

And so, Mumbai adjusted around them — dangerously.

Pollution as Collateral Damage

The environmental cost of this inertia is not abstract. It is lived daily in surrounding localities like Mahul, Chembur, Wadala where residents have long complained of toxic air, industrial emissions, health crises, and compromised quality of life. The city's poorest often live closest to its most hazardous land uses — a pattern repeated across urban India, but rarely acknowledged at scale.

In terms of planning, this is indefensible. Refineries are high-risk installations. They demand buffer zones, controlled access, and disaster mitigation planning. In Mumbai, these buffers have been quietly eroded by population pressure and institutional denial. The result is a city where hazard and habitation coexist, not by design, but by neglect.

Maharashtra as a state does not lack space elsewhere in the state — or even within regions like Raigad or Thane — to relocate such installations gradually, safely, and strategically and environmentally . What it lacks is the political will to challenge legacy land use in the name of urban safety.

Underutilised Land in a Starved City

Even setting pollution aside, the land economics are staggering. Thousands of acres lie locked into single-use industrial zoning in a city gasping for housing, open space, and employment diversification. This is not land working at peak efficiency; it is land frozen by mandate.

Globally, cities that once housed inner-city refineries, from London to Seoul, have relocated them, reclaiming waterfronts and industrial belts for mixed-use redevelopment, public access, and economic renewal. Mumbai, instead, continues to treat relocation as unthinkable, while simultaneously claiming land scarcity as justification for urban expansion into ecologically sensitive zones.

A Post-Industrial City in Denial

Mumbai calls itself a financial capital,

a services hub, a global city. Yet it continues to host a heavy polluting industry in the heart of its residential geography — a contradiction that no branding exercise can mask.

This land could have been reimagined decades ago:

- As mixed-use urban districts
- As employment hubs aligned to a modern economy
- As green buffers and public waterfronts
- As housing zones easing pressure elsewhere

Instead, it stands as proof that in Mumbai, legacy often outweighs logic.

The refineries did not fail Mumbai. Time changed, and policy refused to respond.

As long as oil and gas PSUs remain frozen inside the city — untouchable, under-questioned, and unintegrated — Mumbai's claim of land scarcity will remain hollow. Because a city that cannot renegotiate its past has no authority to redesign its future.

And every time a new Mumbai is announced elsewhere, the smoke rising silently from these refineries answers back. Reminding us that the city never ran out of land. It ran out of courage.

Greenwashing Expansion While Polluting the Core

Mumbai speaks the language of sustainability fluently — in conferences, policy notes, glossy presentations. It promises green corridors, carbon neutrality, and climate resilience. The vocabulary is polished. The intent is performative. The reality, however, remains stubbornly carbon-heavy, spatially unjust, and morally inverted.

At the heart of the city, coal still burns. Thermal infrastructure continues to power a metropolis that claims to be preparing for a cleaner future, even as its most vulnerable residents inhale the cost of that contradiction.

Chimneys rise quietly within city limits, their presence justified by reliability, legacy, and institutional inertia. Pollution is no longer seen as a crisis. It is treated as background noise, absorbed into the urban fabric like humidity or dust.

What makes this dependence particularly perverse is not the existence of thermal power, but where it exists.

Industrial emissions are embedded inside residential geographies, pressed up against informal settlements and lower-income neighbourhoods. Exposure is not accidental; it is structural. The city's poorest live closest to its most toxic decisions, while environmental rhetoric floats safely above them.

And yet, when expansion is discussed, it is framed as an environmental necessity. Forests at the edge of the metropolis are reclassified, fragmented, and sacrificed in the name of decongestion. While wetlands are described as 'underutilised', agricultural land is called 'non-productive'. The ecological cost of new cities is rationalised as inevitable — the price of progress.

What is rarely acknowledged is the asymmetry of this sacrifice. While forests are cleared and farms are flattened, vast swathes of prime urban land within Mumbai remain idle, underutilised, or locked behind institutional mandates. Pollution is tolerated in the core, while ecological assets are destroyed at the periphery. The city poisons what it inhabits and destroys what could have protected it.

This is greenwashing in its most sophisticated form — not the denial of environmental harm, but its careful relocation. Damage is shifted outward, made invisible, rebranded as development. The language of sustainability is used not to reduce harm, but to legitimise expansion without introspection.

The irony deepens when climate resilience is invoked. Mumbai's vulnerability to flooding, heat stress, and air pollution is well documented. Yet policy response favours land acquisition over land correction, sprawl over repair. Instead of reclaiming and remediating polluted industrial zones within the city, the planning imagination leaps beyond them — as if distance alone can undo ecological damage.

In this framework, environmentalism becomes selective. The city chooses which ecosystems to value and which populations to expose. It speaks of the future while refusing to clean up the present. It promises green cities while maintaining grey cores.

A truly sustainable Mumbai would not begin by cutting into forests or farmland. It would begin by confronting its own emissions, relocating its hazards, reclaiming its idle land, and redistributing environmental risk more justly. It would understand that sustainability is not an add-on to expansion — it is a discipline of restraint.

Until then, every green map will remain a contradiction layered over a polluted reality. And every new city announced in the name of the environment will quietly confirm what Mumbai has learned to do best — protect the rhetoric, not the ecology.

CASE STUDY 3: THE HIGH-RISK INDUSTRIAL–ATOMIC ZONE OF MUMBAI (TROMBAY BELT)

There are parts of Mumbai where planning does not fail loudly — it fails quietly, through silence, familiarity, and the slow erosion of logic. Trombay is one such place. What appears on a map as a cluster of institutional land is, in reality, a deeply layered contradiction — a dense residential city growing around infrastructure that was never meant to coexist with it.

Fertiliser production, thermal power generation, and atomic research — three fundamentally different, high-sensitivity activities — occupy contiguous land in a geography that is no longer industrial, no longer isolated, and no longer buffered. At the centre of this contradiction lies scale.

The Bhabha Atomic Research Centre (BARC) occupies roughly 1,200+ acres, forming the largest single landholding in the belt — a secured, low-density enclave within one of the most crowded urban regions in the world. Adjacent to it, Rashtriya Chemicals and Fertilizers (RCF) at Trombay spreads across approximately 700+ acres, while Tata Power's Trombay thermal station occupies another 250–300 acres along the coast.

Individually, each of these installations has a logic. Collectively, they represent a geography that has outlived its context.

These were decisions of another time — when Trombay sat at a distance from the city, when industrial adjacency did not mean residential exposure, when buffer zones were real, and when the idea of risk was spatially manageable.

But Mumbai does not respect historical boundaries. It expands, absorbs, compresses. Over decades, the city has folded itself around Trombay. Settlements have come closer, sometimes formally, often informally. Roads and rail lines have cut through what were once isolation buffers. The distance between hazard and habitation has narrowed — not through planning, but through inevitability.

And yet, the land use has remained unchanged. This is where the contradiction deepens. Not in the existence of these installations — but in the absence of any serious re-evaluation of their place within a transformed city. Planning, in theory, is an adaptive discipline. It responds to shifts in density, economy, ecology, and risk. In Trombay, planning has been replaced by continuity. The original logic has been preserved long after its assumptions have dissolved.

What emerges is a condition far more subtle than conflict — it is coexistence without reconciliation. The presence of atomic, chemical, and thermal infrastructure in such proximity to dense populations creates a layered exposure — environmental, operational, and hypothetical. It is not that the city is unaware of this. It is that the city has chosen not to articulate it.

Familiarity becomes a substitute for safety. Decades without visible catastrophe are read as evidence of stability. The absence of failure is mistaken for proof of adequacy. But risk, especially in urban systems, does not announce itself incrementally. It accumulates quietly and reveals itself suddenly. In a city like Mumbai, where evacuation itself is a logistical impossibility at scale, the margin for error is not thin — it is non-existent.

Yet the conversation does not happen. There is no metropolitan dialogue that asks whether this land — at this scale — should remain in its current form. No integrated assessment that weighs national importance against urban exposure. No phased roadmap that imagines reduction, relocation, or even partial reconfiguration.

Instead, the question is avoided entirely. And avoidance has consequences beyond safety. Because while this land remains locked in low-density, single-use, high-sensitivity activity, the city continues to argue that it has no land. The contradiction is almost architectural in its precision: high-value land remains frozen at the centre, while low-value land is consumed at the edges. This is not inefficiency. It is a hierarchy of convenience. It is easier to expand outward than to negotiate inward. Easier to acquire new land than to question existing power. Easier to relocate people than to relocate risk.

And so Trombay remains — not just as an industrial belt, but as a symbol of something deeper. A city that has learned to live with unresolved risk. A planning system that prefers silence over scrutiny. An urban imagination that expands faster than it reflects. The question, ultimately, is not whether these installations should exist.

The question is whether a city of Mumbai's density can afford to stop asking where they should exist.

Livability Index Failure

Why Does Mumbai Still Feels Underdeveloped?

Mumbai likes to count things. Kilometres of metro lines. Flyovers commissioned. Coastal roads inaugurated. The arithmetic is impressive, the announcements confident. And yet, for those who live in the city, livability remains an elusive promise. Something constantly spoken of, rarely experienced.

Failure lies not in ambition, but in proportion.

Infrastructure in Mumbai is built as if population density were an afterthought. Transit lines are laid down, but the neighbourhoods they serve remain congested, underserviced, and socially thin. Mobility improves in fragments, while daily life remains compressed into shrinking personal and civic spaces. Movement is prioritised; living is deferred.

Open space tells the story more brutally than any statistic. In a city that prides itself on scale, access to breathing room is a luxury rationed by pin codes. Parks are scarce, playgrounds vanish quietly, waterfronts remain fenced, and what little public space exists is overburdened beyond recovery. Livability is reduced to survival, recreation to endurance.

The imbalance becomes starker when transport upgrades race ahead of housing and social infrastructure. Metro stations rise where schools do not. Highways widen where clinics are absent. Transit-oriented development becomes transit-adjacent speculation, while hospitals, anganwadis, libraries, and community spaces fall behind or disappear altogether. The city moves faster, but it does not move better.

This skewed prioritisation creates a peculiar illusion of progress. Projects are completed, yet neighbourhoods feel unfinished. Commutes shorten for some, while quality of life deteriorates for many. Infrastructure becomes an event, not a system — inaugurated, photographed, and forgotten, even as its surrounding ecosystem collapses under pressure.

The deeper irony is spatial. Mumbai expands outward relentlessly, absorbing distant land to ease internal congestion, while its core quietly decays. Buildings age without replacement. Public spaces shrink without protest. Social infrastructure erodes invisibly. The city grows wider, but its heart weakens.

What emerges is a metropolis that looks modern in aerial photographs and feels underdeveloped at street level. A city where efficiency is engineered, but dignity is improvised. Where growth is measurable, but well-being is anecdotal.

Livability is not created by infrastructure alone. It is produced by balance — between density and space, mobility and access, speed and safety. Mumbai, however, has mastered imbalance. It builds movement faster than it builds care. It adds kilometres before adding capacity.

And so, despite its wealth, its scale, its ambition, Mumbai continues to feel incomplete — not because it has grown too fast, but because it has grown without learning how to live with itself.

Until livability is treated not as an index to be climbed, but as a condition to be experienced, Mumbai will remain trapped in a strange paradox — a global city that moves relentlessly forward, while quietly failing the simple act of making daily life humane.

The Missing Urban Governance Layer

Mumbai is not short of power. It is short of alignment. The city is governed not as a single organism, but as a loose assembly of authorities, each holding a fragment of control, none holding the whole responsibility. The state plans, the Centre and Private Players own, the local and statutory bodies administer — and between them, land waits. Decisions dissolve into correspondence. Urgency is lost in jurisdiction.

This fragmentation is not accidental; it is structural. State government agencies announce visions that require land they do not control. Central agencies and private players sit on assets they are not mandated to optimise for urban life. Local bodies and other statutory bodies like MMRDA, SRA, MHADA are left to manage consequences without the authority to reshape causes. The city becomes a negotiation table where everyone has a seat, but no one chairs the meeting.

What is missing is not expertise or intent, but a metropolitan conscience — a unified governance layer that sees land not as departmental property, but as a shared civic resource. Mumbai has transport authorities, development authorities, housing authorities. What it lacks is a Metropolitan Land Authority with the power to audit, coordinate, and time-bound land use across jurisdictions.

In the absence of such an institution, land policy drifts. Parcels remain frozen because releasing them requires consensus across ministries that do not share timelines or incentives. Redevelopment is discussed in principle, postponed in practice. Monetisation becomes episodic, triggered by fiscal stress rather than urban strategy.

Time, in this system, has no discipline. There is no city-wide redevelopment clock. No binding roadmap that sequences land release, rehabilitation, remediation, and reintegration. Projects move when conditions align, not when the city needs them. Delay carries no penalty. Inaction costs no one directly, while its impact is absorbed collectively by residents.

This vacuum breeds inconsistency. While one agency densifies without social infrastructure, another preserves land without purpose. Environmental risk, housing shortage, transport strain — all are treated as sectoral problems rather than symptoms of a single planning failure.

A city cannot function this way. Integration is not an administrative luxury; it is the minimum condition for urban survival at scale. Without it, planning becomes reactive, expansion becomes default, and governance becomes commentary rather than command.

Mumbai's crisis is not a lack of land, money, or ideas. It is the absence of a platform where these forces are aligned under a single, accountable vision. Until such a layer exists — empowered, transparent, and time-bound — the city will continue to grow by fragmentation.

And in a fragmented city, even the best intentions fail to add up. Mumbai does not need more plans. It needs one system that can make them speak to each other.

Developers as Vultures of Land Capitalism

Mumbai's transformation is often narrated as a story of ambition — towers rising, skylines stretching, cities multiplying. But beneath this narrative lies a more uncomfortable truth: the city is no longer being developed for people; people are being adjusted to suit real estate.

The irony is complete and unapologetic.The entire imagination of urban development has been surrendered to land value. In Mumbai, real estate does not follow the city. The city follows real estate.

Land is not unlocked to solve housing shortages or improve livability. It is hoarded first — quietly, strategically, legally — and infrastructure arrives later, like an apology. Roads, metros, water lines, and public services trail behind speculation, legitimising what has already been captured. Planning becomes a post-facto endorsement of private accumulation.

This is 'land capitalism' in its purest form. Developers are often framed as risk-takers, visionaries, nation-builders. In reality, the system rewards a different behaviour altogether — patience without responsibility. Those who can acquire land early, sit on it longest, and wait for public investment to inflate its value emerge as winners. Construction becomes secondary. Delivery becomes negotiable. What matters is control, not completion.

This is why expansion is irresistible. New cities are announced not because the old city has been repaired, but because fresh land offers a cleaner slate for accumulation — fewer disputes, weaker resistance, faster approvals. Agricultural land, forest edges, and peripheral villages are easier to convert than confronting entrenched interests inside Mumbai. It is simpler to buy silence at the edges than negotiate justice at the centre.

Land is not unlocked to solve housing shortages or improve livability. It is hoarded first — quietly, strategically, legally...

Infrastructure, in this model, is not a public good. It is a value amplifier. Metros are not built to decongest neighbourhoods; they are built to unlock floor space index. Highways do not serve communities; they serve inventory. Every new corridor is a speculative promise, every new announcement is an invitation to hoard. The city's circulatory system is redesigned to keep capital moving, not people comfortable.

What disappears in this process is time — human time. Residents wait years for redevelopment while land trades hands multiple times. Communities are displaced in the name of future housing that never quite arrives. Informality is tolerated until it becomes inconvenient, then erased without rehabilitation. The city moves fast for capital and painfully slow for citizens.

Land capitalism thrives on imbalance — scarcity manufactured through delay, urgency created through neglect. A city allowed to decay internally creates moral permission to expand externally. Each failure becomes justification for the next acquisition. Each broken promise becomes the preface to a larger project.

And so developers circle, not always maliciously, but predictably, responding to incentives that reward extraction over integration. They do not plan cities; they harvest them. What remains is not urban fabric, but urban residue — fragments of infrastructure, islands of luxury, oceans of compromise.

The tragedy is that this system does not even produce good cities. It produces profitable ones. Mumbai today is not underdeveloped by accident. It is underdeveloped by design — kept perpetually unfinished so that land always appears scarce, urgency always appears fresh, and expansion always appears inevitable.

Until land is treated not as a commodity to be cornered, but as a commons to be optimised, the city will remain trapped in this cycle. Infrastructure will keep chasing speculation. Development will keep arriving after displacement. And Mumbai will continue to grow — richer on paper, poorer in life.

What a Fixed Mumbai First Policy Would Look Like

A fixed Mumbai would not arrive with a launch date. It would not need a logo. It would not be announced from a podium with satellite maps and speculative numbers.

It would begin quietly, with restraint. The first principle would be almost radical in today's vocabulary: redevelop before you expand. The city would look inward before it looks outward. Ageing buildings would be treated as a safety emergency, not a consent puzzle. Slums would be addressed as land already owned by the city's future, not as political inconvenience. Expansion would become the last option, not the first reflex.

This would immediately change the moral geometry of planning. Forests and farms would stop being sacrificial buffers for urban failure. Peripheral land would no longer compensate for central neglect. The city would learn to finish what it started.

A fixed Mumbai would then confront its most uncomfortable truth — that vast amounts of land are already public, already serviced, already strategic — and yet locked away. Idle PSU land would be unlocked, not through backroom monetisation, but through public accountability. Every acre would be audited. Every use is justified. Every surplus explained.

> *A fixed Mumbai would not arrive with a launch date.*

This would not mean reckless selloffs or privatisation disguised as reform. It would mean transparent frameworks — phased release, mixed-use mandates, social infrastructure quotas, and public access as a non-negotiable condition. Land would stop being a fiscal emergency lever and start becoming an urban instrument.

Slum rehabilitation, long trapped between cruelty and paralysis, would finally move at the pace of dignity. Time-bound execution would replace endless eligibility debates. Rental housing models would acknowledge the city's mobile workforce, seasonal labour, and economic precarity — people who need stability without the burden of ownership traps.

Rehabilitation would no longer mean exile to the margins. It would mean integration — near livelihoods, transport, schools, and care. The slum would cease to be a bargaining chip and become what it always should have been: a failure the city takes responsibility for.

Environmental honesty would follow. A fixed Mumbai would stop pretending that risk can coexist indefinitely with density. Polluting and high-risk land uses would be relocated, not rationalised. This would be slow, phased, expensive — and unavoidable. Refineries, thermal plants, hazardous industries would be moved out of dense residential zones, not because catastrophe has struck, but because it eventually will.

This is what mature cities do: they act before the apology.

Most critically, a fixed Mumbai would repair its governance architecture. An integrated metropolitan land-use authority would replace the current patchwork of silos. This body would not replace existing institutions, but bind them into a single planning conscience — with shared timelines, enforceable roadmaps, and public accountability. Land would no longer answer only to ownership; it would answer to outcomes.

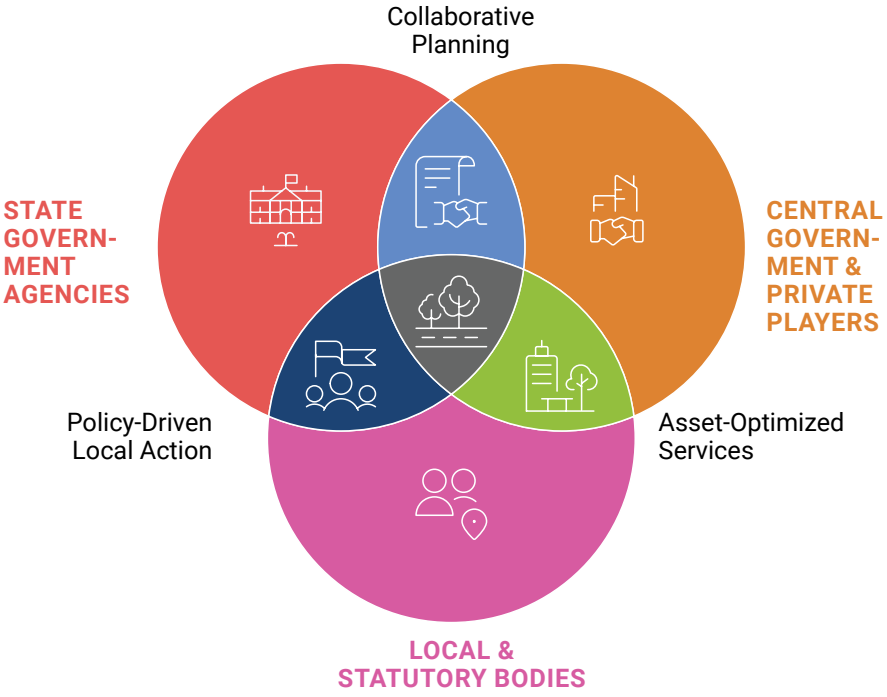
Time would finally matter. Delays would carry costs. Inaction would be visible. Every redevelopment, every rehabilitation, every land release would sit on a public clock — not drifting endlessly through committees, but moving because the city demands it. A "Fixed Mumbai First" policy would not promise perfection. It would promise completion.

It would recognise that cities do not fail because they grow too much, but because they refuse to resolve themselves. And that expansion, without resolution, is not vision. It is escape. Mumbai does not need another city yet. It needs the courage to finish becoming the one it already is.

Mumbai's Land Use Transformation

Characteristic	Idle PSU Land	Slum Rehabilitation	Polluting Land Uses	Land Use Authority
Action	Unlock through public accountability	Time-bound execution	Relocate, not rationalise	Integrated metropolitan body
Justification	Every acre audited	Pace of dignity	Risk cannot coexist with density	Shared timelines, enforceable roadmaps
Framework	Phased release, mixed-use mandates	Rental housing models	Slow, phased, expensive	Bind existing institutions
Outcome	Urban instrument	Integration near livelihoods	Environmental honesty	Land answers to outcomes

Power of Unified Land Governance in Mumbai



A CITY AT RISK OF PERMANENT INCOMPLETENESS

Mumbai does not suffer from a shortage of land. It suffers from a shortage of courage. Courage to confront what lies idle. Courage to dismantle legacy privilege. Courage to repair before replicating.

The city's crisis has never been spatial; it has always been institutional and moral. Land exists — in slums waiting for dignity, in buildings waiting for safety, in public estates waiting for purpose, in polluted zones waiting for remediation. What is missing is the will to engage these realities honestly, without detours or distractions.

> ***To fix Mumbai is not to dream bigger, but to look closer. To value repair over spectacle. To treat land not as a commodity to be escaped from, but as a responsibility to be completed.***

Instead, Mumbai has learned a dangerous habit: announcing futures to avoid fixing the present. Each new city proposed beyond its edges is not an act of ambition, but an act of abdication. It allows the original city to remain incomplete — structurally fragile, environmentally compromised, socially divided — while attention shifts elsewhere.

A 3rd Mumbai cannot compensate for a 1st Mumbai left unfinished. No amount of expansion can undo the damage of neglect. No new corridor can replace institutional reform.

Cities do not collapse only through disasters. They also collapse through permanent postponement, when every problem is acknowledged, debated, and then deferred. Mumbai is at risk not of stagnation, but of becoming endlessly unresolved: always growing, never healing. To fix Mumbai is not to dream bigger, but to look closer. To value repair over spectacle. To treat land not as a commodity to be escaped from, but as a responsibility to be completed.

Until that shift occurs, Mumbai will continue to expand outward, carrying its unfinished self into every new promise — a city forever in motion, and forever incomplete.

About The Author

Titto Eapen is the Founder of Urban Acres and Chief Editor of Homes and Buildings.
A Neo-Urbanist thinker, he bridges the gap between policy, design, and technology in the built environment. With over two decades of experience across architecture, real estate development, and urban systems, Titto champions density as a healing force, circular materials as standard practice, and just cities as the only viable future. Through Urban Acres' projects and the pages of Homes and Buildings, he refuses silent complicity—instead, he builds evidence, voices urgency, and calls his own profession to account.

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PRESTIGE GROUP'S MUMBAI STRATEGY DECODED

*In an exclusive conversation with **HOMES AND BUILDINGS NETWORK**, **TARIQ AHMED**, CEO – West India, Prestige Group, speaks candidly about why Mumbai defies standard real estate logic, how partnerships and financial discipline unlocked growth, what Marine Lines represents architecturally and emotionally, and why consolidation, sustainability and regional expansion will define the city's future.*

TARIQ AHMED
CEO – West India,
Prestige Group

Q Prestige entered Mumbai later than several national peers, yet scaled up at remarkable speed across multiple micro-markets. From your vantage point, what did Prestige understand about Mumbai that others may have misread?

I joined real estate only about five years ago, so it's important to acknowledge that this momentum is largely the result of a very deliberate strategy laid down by our chairman and the senior leadership. There was absolute clarity at the outset about what the western region could represent for Prestige, and how we needed to approach it. If I were to distil our success in Mumbai into a few fundamentals, two factors stand out clearly. The first was timing. Despite entering the market at a moment when the broader real estate ecosystem was under strain, Prestige had strong capital visibility due to our liquidity transaction with Blackstone. That balance-sheet strength allowed us to move decisively when opportunities presented themselves.

The second factor was discipline — applying the same core principles that have worked for us over four decades across other markets. We did not try to reinvent ourselves for Mumbai. Instead, we remained clear about what Prestige does exceptionally well: brand credibility, execution capability, customer trust, marketing strength, and delivery discipline. Many of our early Mumbai assets — including Marine Lines, Mahalakshmi, and Mulund — emerged from complex situations such as distressed transactions and NCLT cases. These were not opportunities everyone was willing or able to pursue. Our approach was to form partnerships where roles were clearly defined. Prestige brought capital strength, execution, and brand confidence, while our local partners contributed land access and deep familiarity with Mumbai's intricate approval environment. That collaboration proved extremely effective. Another important belief for us is that land should not sit idle. We are not in the business of creating passive land banks. Our focus is on quick conversion from land to development, and from development to sales so that capital is released and reinvested efficiently.

This approach has enabled us to

scale without over-leveraging. Finally, we invested early in building the right platform — strong local teams, experienced leadership, and systems that reflect the learning Prestige has accumulated over 40 years. We kept the strategy simple: stay true to our strengths, choose partners carefully, and execute with consistency. In a market as complex as Mumbai, that clarity made all the difference.

Q Mumbai is fundamentally different from markets such as Bengaluru — whether it is land economics, regulatory complexity, or the sheer number of authorities and premiums involved. How did Prestige navigate these early challenges, and what were the most important learnings from your first two to three years in the city?

Mumbai demands a very different mindset. The entry barriers are higher, the cost structures are heavier, and the approval ecosystem is far more layered than in most Indian cities. For anyone new to the market, the learning curve can be steep — and it certainly was for us in the initial phase. One of the first things we recognised was that Mumbai cannot be approached with a standardised playbook. What works in Bengaluru or other markets does not automatically translate here. We recognised that local knowledge is critical for navigating land history, regulatory pathways, and coordination across multiple approving authorities. That understanding shaped our decision to work closely with experienced local partners who could navigate these complexities far more efficiently.

At the same time, Prestige brought complementary strengths to the table — capital support, execution discipline, institutional processes, and brand credibility. This balance allowed us to absorb the initial friction without losing momentum. Once approvals are secured in Mumbai, speed of execution becomes crucial, and that is where our delivery capabilities came into play. The challenges here are undeniably higher than in other markets, but so is the scale of opportunity. If you respect the city's unique dynamics and work collaboratively within its ecosystem, Mumbai can reward you in ways very few markets can.

Q Compared to Bengaluru — where land, FSI and regulatory costs are far more predictable — how different has Mumbai been in terms of approvals, taxation and overall financial viability?

You've touched upon what is arguably the most defining difference between Mumbai and other Indian markets. When we first modelled our entry into the city, even with experienced advisors and strong local partners, the complexity of Mumbai's economics came as a learning in its own right. In markets like Bengaluru, you typically acquire land with a clearly defined FSI, and the cost structure beyond that is relatively straightforward. Hyderabad goes a step further, with virtually no FSI cap. Mumbai, however, operates on a completely different framework. Here, base FSI, premiums, TDR, fungible components and multiple statutory charges all stack up — pushing both costs and density significantly upward.

When you analyse the numbers closely, not every project in Mumbai automatically makes financial sense once all these elements are factored in. The margin for error is very thin. This means developers have to be exceptionally disciplined, both in underwriting deals and in managing approvals and cash flows.

Without getting into exact figures, in Mumbai–land cost, premiums, and approval-related expenses–together can account for nearly 35 to 45 percent of the total project cost for mid-segment housing, typically priced in the ₹20,000–30,000 per sq ft carpet range. In cities like Bengaluru or Hyderabad, this proportion is materially lower, which translates into stronger profitability and healthier cash flows.

As you move up the price curve into mid-luxury and luxury housing, the economics become more forgiving. The relative share of approval and land costs reduces, allowing more room for margins. That reality has played a key role in how we think about product mix in Mumbai.

For mid-segment projects in this city, scale and speed are absolutely critical. You need to execute large developments, secure approvals smartly, and sell through quickly. If a project gets delayed, interest costs alone can erode margins. Timing approvals alongside sales, using deferred payment structures, and avoiding front-loaded costs become essential tools rather than optional strategies.

Mumbai, therefore, demands far sharper financial discipline than most other markets. The rewards are real, but so are the risks. Success here is less about optimism and more about precision — in underwriting, execution, and capital management.

Q You mentioned about Marine Lines, which is not just another micro-market in Mumbai — it is an emotion, layered with heritage, memory and aspiration. As Prestige's first project in this iconic precinct, what architectural and lifestyle shift are you seeking to introduce here?

Marine Lines is one of those rare parts of Mumbai where real estate goes beyond economics. As you rightfully said, it carries memory, heritage and emotion. The Queen's Necklace, the Art Deco buildings, and the rhythm of the promenade— collectively, these define a precinct that demands restraint, not excess.

Our intent with Ocean Towers was to introduce a contemporary expression that respects this legacy rather than competing with it. Designed by Foster + Partners, the twin-tower development, with one tower rising close to 300 metres, is deliberately elegant and understated. It doesn't scream for attention. Instead, it rises calmly, creating a quiet dialogue with the surrounding Art Deco fabric.

We were conscious that at this scale, attempting to replicate historic styles would feel forced. So, we chose a modern, minimal design language that blends into the context while still adding a refined, global dimension to the skyline. There is perhaps a subtle Miami influence manifested in clean lines and ocean-facing homes, yet it is interpreted carefully for Marine Lines.

From a lifestyle standpoint, the project is intentionally boutique. With just 140–150 ocean-facing residences, the focus is on space, views and quality rather than density. The idea was to offer residents of an older neighbourhood the comforts of contemporary living — without overwhelming the precinct with scale or clutter.

Marine Lines is at an inflection point. As older buildings age, sensitive redevelopment can become a force for renewal. Our aspiration is simple: to contribute positively to this evolution, adding modernity without disturbing the emotion that makes Marine Lines so special.

Q How does this structural reality shape your approach to Mumbai? Additionally, how is Prestige positioning itself within redevelopment and slum rehabilitation, especially amid intense competition in core micro-markets?

Mumbai operates within very defined constraints. A significant portion of the city is occupied by slums, another large segment is under society redevelopment, and a substantial share of land is controlled by government and institutional bodies. Barely 5 to 10 percent of Mumbai offers any scope for true greenfield development. That single fact dictates how developers must think and operate here.

We entered Mumbai fully aware that redevelopment, whether society-led or SRA-driven, would be the primary growth engine. For a developer, land or development rights are the raw material, and in Mumbai those are largely accessed through redevelopment structures. Almost all our projects in the city reflect this reality. Slum Rehabilitation in Mulund and Jijamata Nagar, Integrated Transit Housing in BKC, and Society Redevelopments such as Daffodils and Nautilus.

This approach aligns closely with the government's broader vision of renewing Mumbai's ageing building stock while improving urban living conditions. Redevelopment allows the city to modernise itself and, at the same time, makes projects economically viable for developers — though the math has undoubtedly become tighter. Society expectations have risen significantly, and the margin for error has reduced.

That said, redevelopment is unavoidable in Mumbai. The key lies in managing it well. We are comfortable operating in this space because we collaborate closely with strong local partners who bring deep expertise in land clearances and approvals — areas where local knowledge is indispensable.

Q How different is the Mumbai homebuyer compared to buyers in market like Bengaluru, and how has that difference shaped Prestige's marketing and communication strategy in the city?

At its core, homebuying everywhere involves people putting their life savings behind one of the most emotionally charged decisions they will ever make. What changes from market to market is how that emotion is triggered and how trust is built.

In Bengaluru, marketing tends to be more project-centric. Buyers focus

heavily on specifications, layouts, and pricing, and brand familiarity often comes later. Mumbai is different. Here, especially in our early years, the challenge was not just to sell projects but to establish the Prestige brand itself.

We realised early on that trust had to lead the conversation. Mumbai buyers have seen their share of delayed projects and broken promises, so credibility matters more than glossy communication. Our messaging leaned strongly on emotion and reassurance, with 'Add Prestige to Your Life' serving as both anchor and demonstrable promise.

Execution and on-time delivery became our most powerful marketing tools. When we delivered three projects on schedule and secured occupation certificates earlier this year, that did more for brand confidence than any campaign could. It validated our claims.

As the portfolio has grown, our communication strategy has also become more nuanced. In the luxury segment, for instance, we did almost no mass advertising. Sales were driven largely by word-of-mouth and highly personalised engagement. Different products demand different conversations, and being flexible in how we communicate has been critical to building resonance with Mumbai's discerning buyers.

Q With redevelopment accelerating and long-stalled approvals now being unlocked, concerns around oversupply are growing in Mumbai. How do you see this impacting market sentiment and the competitive landscape?

Oversupply is often viewed as a risk, but in reality it tends to favour organised, well-capitalised developers. When consumers are presented with too many choices, behaviour becomes similar to other mature sectors — they gravitate towards brands they trust. In Mumbai, names like Lodha, Godrej, DLF or Prestige represent certainty: the confidence that projects will be executed, delivered on time and supported by strong balance sheets.

In that sense, oversupply leads to consolidation rather than chaos. Tier-one developers gain market share, while many smaller or under-capitalised players increasingly opt to monetise land instead of developing projects themselves. Regulatory reforms like RERA have further accelerated this shift by raising compliance and execution standards across the industry.There will inevitably be some friction in the system, given that real estate is cyclical, and periods of adjustment are natural. But structurally, this phase strengthens organised players and improves overall market discipline. For credible developers with execution capability, oversupply is less a threat and more an opportunity to deepen trust and expand responsibly.

Q Does this ongoing consolidation naturally push established brands like Prestige towards more joint ventures and partnerships with local developers or landowners?

Absolutely. Consolidation does encourage greater collaboration, and joint ventures are an increasingly important part of our growth strategy. They allow us to remain capital-light while expanding our footprint. However, for us, the quality of the partner is non-negotiable.

Counterparty diligence often matters more than the deal itself. We are comfortable exploring both outright acquisitions and partnership structures, but only where there is clear alignment on values, quality benchmarks and execution capability. In a market like Mumbai, partnerships work best when responsibilities are clearly defined and both sides bring complementary strengths to the table.

I see Mumbai evolving as a broader metropolitan ecosystem rather than a single, congested island.

Q As part of your western India strategy, how do you view markets like Pune and Ahmedabad in terms of growth potential and strategic fit?

Pune is a market we have evaluated far more closely at this stage. In many ways, it mirrors Bengaluru. This is evident in the similar buyer behaviour, IT-driven economic foundations, and price sensitivity found in both cities. That familiarity makes Pune a more immediate and natural extension of our portfolio. Ahmedabad is also a compelling market, but it requires deeper on-ground understanding. We have spent time studying the city and see strong long-term potential. It is vibrant, entrepreneurial and structurally very different from Mumbai or Pune, with a flatter development profile and lower vertical intensity.

Q As we look ahead to 2030, how do you see the Mumbai real estate market evolving — and where will Prestige stand within that future landscape?

Mumbai will continue to be one of India's most dynamic and complex real estate markets. The skyline has already undergone a dramatic transformation over the past decade, and I believe that pace will only accelerate. What we are witnessing is the emergence of a more global urban form, akin to a New York–style city, with a dense, high-rise core surrounded by lifestyle-driven residential and mixed-use zones. I see Mumbai evolving as a broader metropolitan ecosystem rather than a single, congested island. Navi Mumbai will play a far more prominent role, Alibaug will increasingly function as a lifestyle extension of the city, and destinations like Lonavala could emerge as primary or secondary residential hubs. As a result, improved connectivity will allow people to live across this wider geography while remaining closely linked to the city's economic core.

By 2030, Mumbai will be more spread out, better connected, and structurally more mature. Prestige intends to be present across this entire spectrum — from urban homes and commercial spaces to hospitality and lifestyle-led developments — shaping communities that reflect how the city itself is evolving.

BUILDING FOR THE MIDDLE INDIA

***SHAILESH PURANIK** on Scale, Cities and the Future of Affordable Aspirations, in an exclusive Interaction with Homes and Buildings Networks.*

SHAILESH PURANIK
MD
PURANIK BUILDERS

Q Puranik Group has completed over three decades in real estate — a period during which India's housing needs, regulations and consumer expectations have transformed dramatically. How do you reflect on this journey?

Our journey is deeply rooted in architecture and city-building. My father was an architect who worked with Dr. Homi Bhabha on the BARC projects, and that exposure to institution-led development shaped our thinking early on. After completing my architecture degree in the early 1990s, I joined the family business. Together with my cousins, I began developing small-format projects, focusing on single buildings in Thane and Nashik.

Over time, as cities expanded and housing demand became more structured, we evolved with them. Today, we develop large-scale townships and gated communities across Maharashtra—from Thane and Mumbai to Pune, Nashik and Karjat. What has remained constant, however, is our focus on the mid-income segment. That is our core strength. Middle India is aspirational, value-conscious and deeply invested in long-term stability—and we have built our organisation around understanding that psyche.

Q Your portfolio shows a clear progression from individual buildings to integrated townships. What prompted this shift in scale and thinking?

Scale is not a choice anymore. It is a necessity. As land availability shrinks and cities densify, the responsibility of developers increases. Townships allow us to think beyond building and focus on ecosystems: infrastructure, mobility, lifestyle, community and long-term sustainability.

Today, we are executing projects with 5,000 to 10,000 homes in locations like Karjat, Thane and Pune. Our ambition is to have a meaningful presence across every micro-market in the Mumbai Metropolitan Region (MMR) and Pune Metropolitan Region (PMR). These regions are not monolithic; each micro-market functions like an independent city with its own demand-supply dynamics. Scale gives us the ability to respond thoughtfully to these nuances.

Q Indian homebuyers today are globally exposed and culturally conscious. How has this influenced the way Puranik Group approaches design and product planning?

Housing is ultimately a social mirror. As society evolves, architecture must

respond. Today's homebuyer is informed, well-travelled and exposed to global design languages through travel and digital platforms. This is especially true even in the mid-income segment.

We were among the early developers introducing theme-based housing for this segment. Projects like LD Espanola in Pune and Ruma Bali in Thane weren't about superficial aesthetics; they were about storytelling and experience. Over time, expectations have become more functional too. Air conditioning, which was once a luxury, is now a necessity, even in kitchens. Homes must support comfort, efficiency and modern lifestyles without becoming unaffordable.

Q Did the COVID-19 pandemic permanently change what Indians seek in their homes?

Without a doubt. COVID fundamentally altered how people perceive their homes. The house is no longer just a place to sleep, it is a workspace, a wellness zone and a social refuge. Demand for larger apartments, dedicated workspaces and open balconies has risen sharply. We also see a renewed preference for gated communities—not only for security, but for holistic living. Amenities like jogging tracks, gyms and green spaces are no longer aspirational add-ons. They are actively used and valued. The pandemic accelerated trends that were already emerging, and I believe these shifts are here to stay.

Q The sector has undergone structural reforms through RERA, GST and demonetisation. How do you assess their long-term impact?

RERA has been transformational. It brought transparency, accountability and discipline into an industry that was often perceived as opaque. Today, real estate is no longer unorganised. It is regulated, monitored and far more credible in the eyes of consumers.

GST, while conceptually sound, still needs simplification. The absence of full input tax credit increases costs for both developers and homebuyers. If rationalised, GST can significantly improve affordability.

Demonetisation was disruptive in the short term, but it accelerated the shift towards formal capital, cleaner transactions and institutional participation in real estate.

Q From a policy standpoint, what is the one reform the sector urgently needs?

Industry status for real estate. It is long overdue. Real estate is capital-intensive, employment-generating and central to economic growth—yet access to institutional finance remains limited, particularly for land acquisition.

Schemes like SWAMIH have helped, but they are not enough. Industry status would lower borrowing costs, improve funding access and ultimately reduce home prices. It is a reform that would benefit developers, banks, the government and most importantly, the homebuyer.

Q In markets like Mumbai, premiums and approval costs significantly inflate housing prices. Is the current structure sustainable?

Approval-related costs in Mumbai are extremely high. Between premiums, development charges, cess, GST and stamp duty, nearly 30–40% of a project's cost goes to the exchequer. This leaves limited room for pricing flexibility.

What we've consistently communicated to policymakers is simple: reduce upfront costs, and economic activity will multiply. We saw this post-COVID—temporary reductions led to higher transaction volumes and increased overall revenue for the government. Affordability and revenue growth are not opposing goals; they are interconnected.

Thane sits at the geographic and infrastructural heart of MMR.

Q Sustainability is no longer optional. How is Puranik Group integrating environmental responsibility into large-scale housing?

Sustainability must be practical and scalable. Across our projects, we incorporate solar energy for common areas, sewage treatment and water reuse systems, composting and improved natural ventilation to reduce energy dependence.

We are also investing in better insulation and passive design to lower cooling requirements. With increasing government support and awareness, sustainability is moving from compliance to value creation. The objective is simple: homes that are healthier for residents and lighter on the planet.

Q There is often a perception that real estate is male-dominated. How does your organisation address gender inclusion?

That perception is outdated. In our organisation, women hold leadership roles across architecture, finance, engineering, design and even site operations. Gender is irrelevant. What matters is competence, education and commitment.

Real estate needs diversity of thought. Inclusive teams build better cities.

Q Finally, how do you view Thane and the broader MMR in the context of future urban growth?

Thane sits at the geographic and infrastructural heart of MMR. Its connectivity to Navi Mumbai, the central suburbs and western corridors, makes it uniquely positioned. Social infrastructure is already mature, and future transit investments will only strengthen its role.

Over time, I see MMR and PMR evolving into a continuous metropolitan region, especially with new airports and expressway networks. We are aligning our growth strategy with this reality. We believe in building not just homes, but resilient urban communities.

CHERAG RAMKRISHNAN
CMD—CR Realty & Infrastructure Pvt. Ltd

RIGHT-SIZED THINKING IN AN OVERBUILT CITY"

***CHERAG RAMKRISHNAN**, CMD—CR Realty on Mumbai's Real Estate Economics, Design Discipline, and the Future of Urban Living.*

Q CR Realty emerged during Mumbai's shift from promoter-led real estate to institutionalised development. How did this moment influence your approach to governance, transparency, and execution?

The transition was seamless for us because I came from a professionally governed environment. As Founder and CEO of Equinox Realty—part of the Ruia family's ESSAR Group—we already operated with independent governance structures, delegated authority frameworks, and ISO-certified systems. By the time CR Realty was founded, these systems were second nature. While Indian real estate remains largely promoter-driven, scale has forced change. Promoter-led firms today understand the value of professional leadership. That evolution has allowed companies like ours to replicate and strengthen governance rather than reinvent it.

Q In a city constrained by land scarcity and rising premiums, how does CR Realty evaluate land beyond short-term market sentiment?

Infrastructure direction is already defined for the next 15–20 years. Demographics and demand are also largely in place. What matters most to us is velocity—the speed and value of absorption. At our scale, we avoid immature markets where infrastructure or demand is still speculative. We focus on established micro-markets where fundamentals are proven and the risk is measurable.

Q DCPR 2034 is often described as complex. How do you view its impact on redevelopment and mixed-use projects?

For anyone with long experience in Mumbai real estate, DCPR 2034 is actually simpler than the past. Earlier regulations were restrictive and often forced informal workarounds. Today, the law is structured, transparent, and feasibility-oriented.

The new framework doesn't just allow redevelopment—it enables it. With professional consultants and support from bodies like CREDAI and NAREDCO, compliance today is far simpler than it was a decade ago. It can of course do much better and our developer bodies are constantly working with the regulators to ease the pain of the developers.

Q With metros, arterial roads, and transport-led development reshaping values, how do infrastructure upgrades factor into your pricing strategy?

Our pricing framework is largely defined at the time of site selection. We operate in city-centre locations where infrastructure is already operational or firmly committed. Infrastructure-led appreciation is more relevant for long-gestation township developments in peripheral markets like Panvel or Vasai / Virar for example. In core-city projects, the focus is

pricing correctly relative to existing absorption dynamics—not future speculation.

Q Sustainability is now both a regulatory and ethical mandate. How does CR Realty integrate ecological thinking without turning it into a marketing gimmick?

From a structural and architectural standpoint, many environmental considerations—wind behaviour, heat gain, water management—are already embedded in good design. Our projects incorporate rainwater harvesting, STP recycling, EV charging, solar integration, and high-performance glass. We are also moving towards IGBC Gold certification where feasible. The challenge is affordability. Sustainability should create real value, not inflate costs. In commercial projects, long-term ownership justifies higher capex. In residential developments, one must be mindful of what the buyer can afford to buy—and most importantly maintain.

Q Homebuyer preferences today span hybrid workers, retirees, and nuclear families. How do you design for such fluid demand?

We use the term "right-sized" intentionally. But development operates within time constraints. A project designed today will be delivered three to four years later—and preferences may shift again. Pre-COVID, demand favoured compact homes. Today, larger homes are back in demand. This volatility makes design development one of the most calculated and also mis-calculated risks in the business. The best mitigation is execution speed. Delayed projects often miss demand cycles entirely. Timely delivery is not just operational efficiency—it's market relevance.

Q Amenities are often driven by marketing ego rather than user reality. The real test comes post-occupation—can residents afford to maintain what's been promised?

Mature developers learn restraint In premium markets like Bandra and Juhu, we're seeing a shift towards fewer, more functional amenities—co-working spaces, gyms, multipurpose rooms,

private conference / meeting rooms—rather than excess. In markets like Goregaon and other suburbs, where affordability supports it, more comprehensive amenities make sense

The key is alignment: amenities must match the demographic, lifestyle, and long-term operating economics of the project.

Q Post-COVID has been challenging for many developers. How do you see CR Realty repositioning itself by 2030?

We've had execution challenges over the past few years, and there's nothing wrong in acknowledging that. Goregaon is a flagship project that will help reposition our brand.

Our focus is quality over scale. We are not chasing volume. We want to be known for what we deliver, not how much we build.

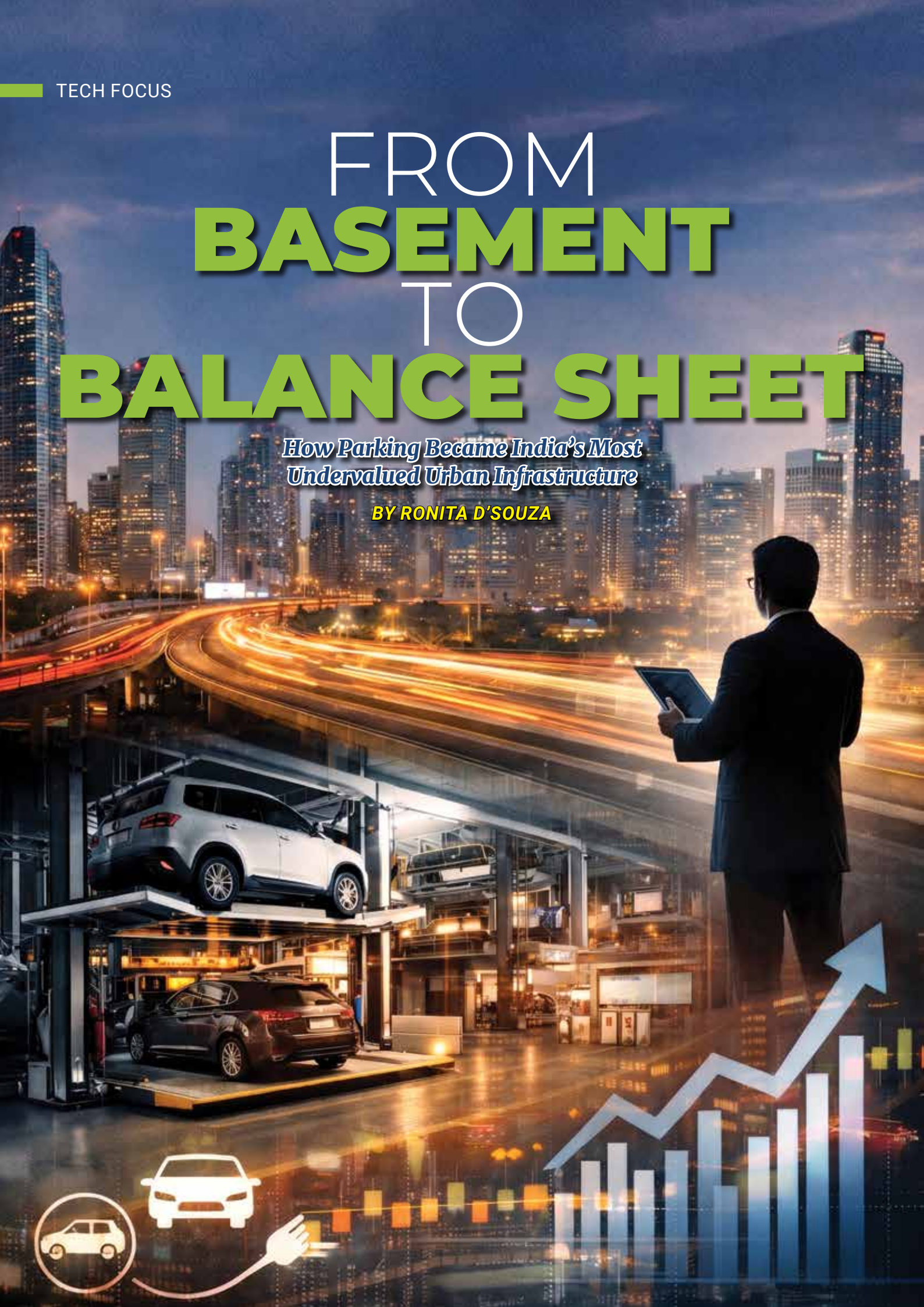
Design will remain current and flexible. Sustainability will be practical, not performative. We intend to stay Mumbai-centric, possibly expanding within the MMR, and monetise opportunities intelligently.

As a professional entrepreneur myself, we will professionalise further and deeper as we stabilise and start to grow in the near future. It's still early to over define the roadmap—but clarity of intent is firmly in place.

FROM BASEMENT TO BALANCE SHEET

How Parking Became India's Most Undervalued Urban Infrastructure

BY RONITA D'SOUZA



THE STRUCTURAL DEFICIT IN INDIA'S URBAN PARKING ECOSYSTEM

India's parking crisis is not a symptom of congestion—it is a manifestation of a deeper structural deficit within the country's urban development model. The imbalance is rooted in three converging forces: accelerated motorisation, static regulatory frameworks, and inefficient land utilisation practices. Together, they have created a systemic gap between demand and provision—one that is widening with every cycle of urban growth. The scale of motorisation alone illustrates the pressure.

India currently has over 300 million registered vehicles, as per the Ministry of Road Transport and Highways, with passenger vehicle ownership in urban centres growing at an annual rate of approximately 8–10 percent. More significantly, the composition of this growth has shifted. Data from Autocar Professional indicates that SUVs now account for over 50 percent of new vehicle sales, compared to nearly 30 percent just a few years ago. This transition has increased the average spatial footprint per vehicle by an estimated 20–25 percent, placing additional strain on urban parking infrastructure.

However, urban planning frameworks have not evolved in parallel. Development Control Regulations across most Indian cities continue to prescribe parking requirements based on built-up area ratios—a model that assumes linear correlations between space and demand. These norms rarely incorporate variables such as multi-vehicle ownership per household, visitor parking demand, commercial turnover rates, or changing vehicle dimensions. The result is a regulatory system that ensures compliance, but not adequacy.

> ***Parking is no longer a backend utility—it is becoming central to how urban infrastructure is planned, experienced, and monetised..***
>
> **Rajesh Dogra,**
> **COO, Eros Group**

This inadequacy is empirically visible across major metropolitan regions. In Mumbai, where developable land is among the most constrained globally, industry assessments suggest that parking demand exceeds formal supply by 30–50 percent in several residential micro-markets. Bengaluru presents a comparable case, where research by the Indian Institute for Human Settlements indicates that over 40 percent of carriageway space in key commercial districts is encroached

upon by parked vehicles, directly reducing road capacity. In Delhi NCR, the persistence of informal parking ecosystems reflects a structural inability of planned infrastructure to absorb demand, particularly in mixed-use developments.

These conditions point to a fundamental misclassification. Parking has historically been treated as a support function within real estate, rather than as a core component of urban infrastructure. This has resulted in underinvestment, fragmented planning, and limited integration with broader mobility systems.

"Parking is no longer a backend utility—it is becoming central to how urban infrastructure is planned, experienced, and monetised," notes **Rajesh Dogra**, highlighting a critical shift in industry perception. His observation underscores the transition from parking as a regulatory obligation to parking as a strategic determinant of asset performance and urban efficiency.

This transition is being accelerated by the economics of land. In high-density urban environments, particularly in cities like Mumbai, the cost of constructing parking infrastructure is substantial. Industry estimates indicate that the construction cost per parking slot ranges between ₹4 lakh and ₹8 lakh, depending on factors such as excavation depth, soil conditions, and structural design. At the same time, conventional parking layouts—primarily ramp-based basement systems—exhibit low efficiency ratios.

> ***Traditional parking consumes horizontal space. The real shift is in unlocking vertical potential and turning parking into a value multiplier.***
>
> **Ajay Raina, Director & CEO, Tedra Automotive Solutions**

Real estate design studies suggest that 30–40 percent of basement area is typically consumed by circulation spaces, including ramps, driveways, and turning radii. This results in a dual inefficiency: high capital expenditure combined with suboptimal space utilisation.

Ajay Raina contextualises this inefficiency within a broader engineering framework. "Traditional parking consumes horizontal space. Our systems unlock vertical potential. Whether it is stack systems that double capacity or tower systems that can accommodate over a hundred vehicles, the impact is not just on parking—it changes how developers utilise land and enhance the overall value of a project."

His assessment reframes parking as a space optimisation problem, rather than a space allocation problem. The distinction is critical. While conventional systems distribute vehicles across horizontal surfaces, engineered systems concentrate them vertically, thereby improving land-use

efficiency and project economics simultaneously.

Yet, spatial inefficiency is only one dimension of the problem.The evolving nature of vehicles introduces additional complexity. "The passenger vehicle landscape in India has evolved significantly, with a clear shift toward larger formats like SUVs," explains **Mayur Bhosale**. "This directly impacts parking design—requiring higher load capacities, larger dimensions, and more robust structural planning. At the same time, the rapid adoption of electric vehicles is reshaping parking infrastructure. EVs are heavier due to battery systems and require integrated charging provisions, making it essential for parking solutions to be structurally robust and future-ready."

> *The future of parking will be defined by connectivity—where systems talk to buildings, cities, and users seamlessly.*
>
> **Mayur Bhosale,**
> **National Sales Head, Wohr Parking Systems Pvt Ltd**

This dual shift—toward larger vehicles and electrification—has significant implications. Parking infrastructure must now accommodate increased load-bearing requirements, dimensional variability, and electrical integration, all within constrained urban footprints. Legacy systems, designed for smaller vehicles and static usage patterns, are increasingly misaligned with these demands. Operational inefficiency further compounds the issue.

Urban mobility research indicates that drivers in Indian metros spend 15 to 20 minutes on average searching for parking during peak hours, a figure consistent with findings from multiple city-level traffic studies. This search time contributes directly to fuel consumption, emissions, and congestion, creating a feedback loop that exacerbates urban inefficiency.

Ajay Raina highlights the scale of this impact, noting that even marginal fuel wastage per vehicle, when aggregated across millions of vehicles, results in a significant economic and environmental burden. This positions parking not merely as a spatial challenge, but as a contributor to urban productivity loss and environmental degradation.

Despite these implications, parking remains underrepresented in policy discourse. Urban regulations continue to focus on minimum provisioning rather than performance outcomes. Metrics such as utilisation efficiency, turnover rates, integration with mobility systems, and environmental impact are rarely incorporated into planning frameworks. This creates a structural lag between technological capability and regulatory adoption.

> *Urban density is rising, and conventional parking is no longer viable. The industry is at a decisive inflection point.*
>
> **Rajashree Shetty,**
> **Director, Keev International**

At the same time, emerging mobility trends are beginning to redefine the role of parking. "Parking can no longer be seen as a static provision," states **Rajashree Shetty**. "With EVs and evolving mobility patterns, every parking slot has the potential to become part of a larger system—connected, energy-enabled, and future-ready. The decisions we take today must account not just for current demand, but for how mobility itself is evolving."

Her perspective reflects a broader shift toward system integration. Parking is increasingly being viewed as a node within a larger urban ecosystem—interfacing with building management systems, energy networks, and digital platforms. This transformation moves parking from a passive function to an active infrastructure layer.

However, the transition is not uniform. India's urban parking landscape currently operates across two parallel paradigms. The first is defined by manual, space-intensive, and regulation-driven systems, characterised by low efficiency and high friction. The second is emerging through engineering-led, automated, and technology-integrated solutions, offering higher efficiency and improved user experience.

The gap between these paradigms represents the core of the crisis. Bridging this gap will require a shift from incremental adjustments to systemic transformation—one that redefines how parking is planned, designed, and integrated within urban development.

Because the challenge is no longer about providing more parking. It is about restructuring how space is utilised within increasingly constrained urban environments. And in that restructuring lies one of the most critical, yet under-addressed, opportunities in India's urban future.

FROM SPACE PROVISION TO SYSTEM ENGINEERING

If the first layer of India's parking crisis is defined by structural deficit, the second is defined by the industry's response—and that response is increasingly moving away from conventional construction toward engineered, system-driven infrastructure.

This transition is not cosmetic. It represents a fundamental shift in how parking is conceived—not as a physical allocation of space, but as an integrated system of movement, storage, and access.

Historically, parking design in India followed a linear logic: allocate basement area, design ramps, ensure turning radii, and distribute slots. The objective was compliance and basic usability. Efficiency was secondary. This model, while workable in low-density environments, begins to fail under conditions of high land cost and high vehicle density.

The limitations are now well understood.

What was once manual and fragmented is now becoming automated, connected, and data-driven.

Antony Parokaran,

Director - Sieger Parking Division

Conventional parking systems operate with low space efficiency ratios, often utilising only 60–70 percent of available area for actual vehicle storage. The remaining space is consumed by circulation—ramps, drive aisles, and manoeuvring zones. In high-value urban markets, this inefficiency translates into a direct economic cost.

The industry's response to this constraint has been to reframe parking as an engineering problem rather than a civil one.

Antony Parokaran, Director - Sieger Parking Division articulates this transition through the lens of system design. "At the core, parking is an engineering product—but today, it is equally a digital system. Whether it is stack parking, tower systems, or robotic solutions, the objective is to maximise capacity within the same footprint while ensuring reliability, safety, and user convenience. This fundamentally changes how developers approach space utilisation and project viability."

This shift toward engineered systems introduces a different set of design principles. Instead of horizontal distribution, these systems rely on vertical stacking, mechanical transfer, and automated positioning. Vehicles are no longer driven into individual slots; they are placed, moved, and retrieved through controlled systems. This eliminates the need for ramps and significantly reduces circulation space, thereby improving overall efficiency.

The impact is measurable. Stack parking systems can effectively double parking capacity within the same footprint, while tower-based solutions can accommodate 100 or more vehicles vertically, depending on configuration. Rotary and puzzle systems offer additional flexibility, allowing developers to adapt solutions based on site constraints and usage patterns.

However, capacity alone does not define the success of these systems. Reliability, safety, and lifecycle performance are critical—particularly in environments where parking is used continuously across residential and commercial applications.

This is where engineering discipline becomes central. **Rajashree Shetty** positions this emphasis clearly. "At KEEV, execution is not just about delivery—it is about predictability, reliability, and engineering confidence. Every system is designed, tested, and validated before deployment. Our focus is on ensuring that performance is consistent not just at installation, but across the

entire lifecycle of the system."

Her statement reflects an important evolution in industry standards. Parking systems are no longer evaluated only on installation metrics; they are assessed on uptime, maintenance cycles, and long-term durability—parameters more commonly associated with critical infrastructure such as elevators or transit systems.

This convergence with infrastructure-grade standards is further reinforced by advancements in manufacturing and design.

Tedra Automotive Solutions, for instance, has invested in robotic welding, CNC laser cutting, and precision fabrication technologies, enabling higher levels of structural accuracy and consistency. These capabilities are not merely technical upgrades; they are essential for ensuring load-bearing stability, alignment, and safety in high-density parking systems.

Ajay Raina elaborates on this integration of engineering and intelligence. "Most of our automated systems are equipped with diagnostic interfaces that identify faults in real time—whether sensor-related, mechanical, or software-driven. This allows immediate intervention, often before the user even experiences a disruption. In large-scale systems, we are also embedding centralised monitoring architectures to enable remote diagnostics and faster response."

This introduces a critical shift in operational philosophy—from reactive maintenance to predictive and preventive management.

The role of digital systems in enabling this shift is expanding rapidly.

Modern parking infrastructure is increasingly integrated with Building Management Systems (BMS), IoT platforms, and access control technologies. This integration allows parking to function as part of a larger ecosystem, rather than as an isolated component.

The best systems are the ones you don't notice—they work in the background, seamlessly and reliably.

Mohan Kumar

Managing Director, Parklayer Pvt.Ltd.

Mayur Bhosale highlights how this integration is shaping user expectations. "The current Indian scenario is changing the building structure. Building Management Systems are integrated from the entrance gate to access inside the office. Within this path, the user expects one seamless experience—from entry to parking to final access. Parking is a key link in this chain, and it is expected to align with the same level of automation and convenience."

This expectation of continuity is particularly relevant in commercial developments, where high volumes of vehicles must be managed within compressed timeframes.

In such environments, parking efficiency is not just about capacity—it is about throughput and flow management.

Large office complexes, malls, and mixed-use developments often experience peak-hour surges, where thousands of vehicles enter and exit within short intervals. Traditional systems struggle under such conditions, leading to congestion at entry points and delays within parking areas.

Engineered systems, combined with intelligent access control, address this challenge by reducing manual intervention and optimising movement.

Amit Lakhotia describes this transformation from a platform perspective. “What we have done is remove the manual layer entirely. The system reads RFID or FASTag, determines access automatically, and records every entry and exit. The barrier opens without stopping the vehicle. This reduces friction, improves security, and ensures that the entire process is seamless for the user.”

The scale at which such systems operate is indicative of their impact. With millions of daily transactions, automated access control is no longer an experimental feature—it is becoming a baseline expectation in urban developments. Beyond access, digital integration is also enabling new forms of operational efficiency.

Parking systems can now provide real-time availability data, usage analytics, and performance metrics, allowing developers and operators to optimise utilisation. In commercial environments, this data can be used to manage peak demand, allocate spaces dynamically, and improve overall throughput.

This idea of parking as an ecosystem is central to the next phase of transformation. It extends beyond individual buildings to include city-level integration.

Platforms such as Park+ are already enabling cross-location access, digital payments, and unified user interfaces, allowing parking to function across multiple environments—residential, commercial, and public.

What we have done is remove the manual layer entirely. The system reads RFID or FASTag, determines access automatically, and records every entry and exit.

Amit Lakhotia,
Founder, Park+

This creates a network effect, where the value of the system increases with scale.

At the same time, large-scale deployments are demonstrating the potential of engineered parking in real-world conditions. Projects such as high-density commercial hubs, airport-linked facilities, and mixed-use developments are increasingly adopting mechanised systems to address space constraints. Installations accommodating hundreds to thousands of vehicles within compact footprints are no longer exceptions—they are becoming reference models for future development.

Yet, despite these advancements, adoption remains uneven. Barriers persist—ranging from initial capital perception and user adaptability to regulatory ambiguity. While lifecycle economics often favour engineered systems, the upfront investment continues to influence decision-making, particularly in cost-sensitive segments.

However, as land costs rise and efficiency becomes critical, this equation is beginning to shift. Developers are increasingly evaluating parking not in terms of immediate cost, but in terms of long-term value creation—through increased saleable area, improved user experience, and enhanced project positioning.

This marks a transition from parking as a constraint to parking as a strategic asset. And it is within this transition that the industry’s response is taking shape—not as incremental improvement, but as systemic redesign.

Because the challenge is no longer to accommodate vehicles. It is to engineer space in a way that aligns with the realities of density, economics, and evolving urban mobility.

FROM INFRASTRUCTURE TO INTELLIGENCE: WHO OWNS THE FUTURE OF PARKING

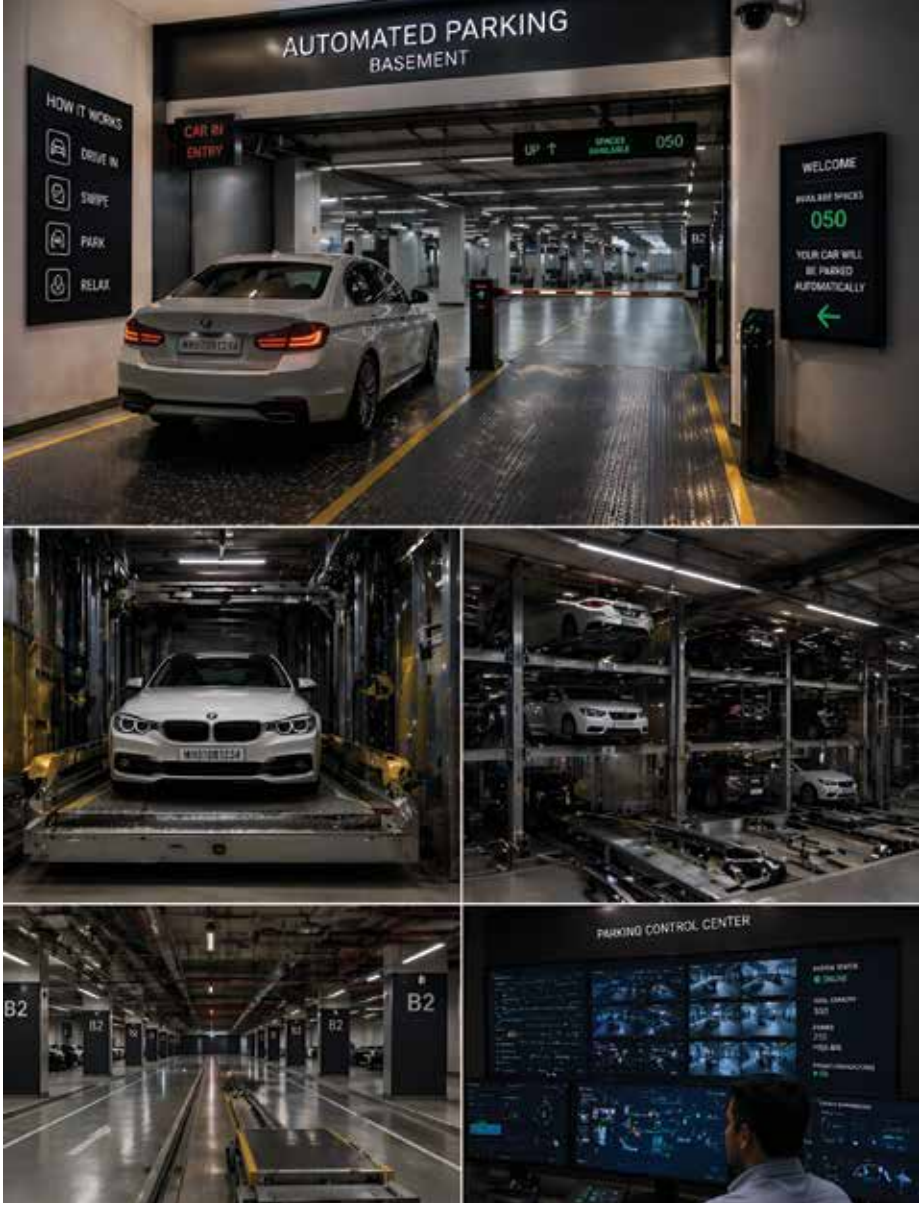
If the first phase of India's parking evolution was defined by shortage, and the second by engineering response, the third is now unfolding as something more complex—and far more consequential. Parking is no longer just infrastructure. It is becoming data, energy, access, and control—all converging into a single layer that sits at the intersection of real estate, mobility, and urban governance.

The early signals of this transition are already visible across Indian cities, though often in fragmented forms. A commercial building integrates parking with building management systems. A residential complex introduces app-based access. A mall deploys FASTag-enabled payments. A large office park monitors real-time parking availability. Individually, these are upgrades. Collectively, they point to a redefinition.

"Parking systems are evolving into intelligent infrastructure—integrated with IoT, real-time monitoring, and user interfaces that enhance both efficiency and experience," says **Sanjeev Nimkar**. "This is no longer about mechanical systems alone; it is about creating connected ecosystems."

What Nimkar describes is a shift from mechanisation to intelligence. The distinction is critical. Mechanised systems optimise space. Intelligent systems optimise time, movement, and decision-making. This shift is being accelerated by three converging forces—data, electrification, and platformisation.

The first is data. Every parking interaction—entry, exit, duration, occupancy—generates information. Until recently, this data remained largely unused. Today, it is becoming a central asset. Platforms are beginning to aggregate and interpret this data to create real-time visibility across locations. Users can identify available spaces before arrival. Operators can manage peak demand dynamically. Developers can analyse utilisation patterns to optimise design and pricing.



Amit Lakhotia explains how this transformation is already altering user experience at scale. "What has happened is that access has become completely digital. The system reads RFID or FASTag automatically, determines whether the car is authorised, and records every movement. You don't have to stop, you don't have to interact, and yet the system is more secure than before. Every entry and exit is logged, and that data becomes usable at any point of time."

The implication is profound. Parking is no longer just a physical interaction. It is a data-driven service layer.

The second force is electrification. Electric vehicles are not simply replacing internal combustion engines—they are redefining infrastructure requirements. Unlike conventional vehicles, EVs require time-bound charging, energy distribution, and load management.

This fundamentally changes the role of parking. It is no longer a passive storage space. It becomes an energy interface.

"The rapid adoption of electric vehicles is reshaping parking infrastructure," notes **Mayur Bhosale**. "EVs are heavier due to battery systems and require integrated charging provisions. Parking systems must now be structurally robust, electrically enabled, and future-ready."

What this introduces is a new layer of planning complexity. Charging infrastructure must be integrated without overloading systems. Electrical layouts must anticipate future demand. And perhaps most critically, energy consumption must be managed intelligently across multiple users and time cycles.

This is where parking begins to intersect not just with mobility, but with urban energy systems. The third force is platformisation.

Parking is increasingly moving from isolated systems to connected networks. Amit Lakhotia outlines this transition clearly. "The same tag can now work across multiple locations—society, office, mall, or hotel. You don't need different systems for different places. A single platform integrates everything. This improves convenience, but more importantly, it creates a network where parking becomes part of a larger mobility ecosystem."

This network effect is central to the future of parking. It shifts control from individual assets to integrated platforms. And that raises a more complex question—one that the industry has only begun to confront.

Who owns this ecosystem? Because as parking becomes connected, it begins to involve multiple stakeholders.

Parking systems are evolving into intelligent infrastructure—integrated with technology, mobility, and energy systems.

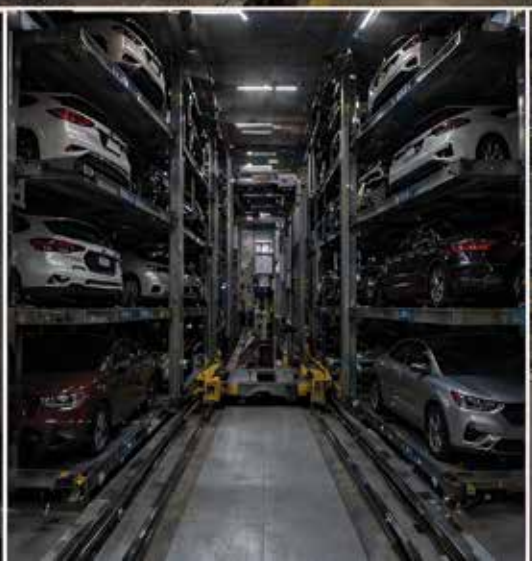
Sanjeev Nimkar,
CEO & President, RR Parkon

Developers own the physical infrastructure. Technology platforms control the interface and data. City authorities regulate usage and policy. Users generate the demand that drives the system. Each of these stakeholders has a different objective. For developers, parking must enhance project viability and asset value.

For technology platforms, scale and data aggregation are key.For city authorities, parking is a lever to manage congestion and mobility.For users, the expectation is simple—speed, convenience, and reliability. The challenge lies in aligning these interests.

"Parking will increasingly be defined by how well engineering, technology, and governance come together," observes **Rajashree Shetty**. "Each of these layers is evolving independently, but the real impact will be seen when they begin to function as a unified system." This alignment is particularly critical in the context of policy.

India's current parking regulations remain largely prescriptive. They define minimum requirements but rarely



address efficiency, integration, or performance. There is limited guidance on how parking should interact with emerging technologies, how it should support EV infrastructure, or how it can be used as a tool for urban mobility management.

This creates a structural gap between what is possible and what is implemented. In contrast, global cities have begun to approach parking as a strategic instrument. Tokyo, for instance, links vehicle ownership directly to proof of parking availability, effectively aligning demand with infrastructure capacity. Singapore integrates parking with transit-oriented development, using pricing and regulation to manage usage. In both cases, parking is not treated as an isolated function, but as part of a broader urban system.

India's context is more complex—larger, denser, and more diverse. But the direction is becoming clear. Parking will need to move from static provision to dynamic management. It will need to integrate with mobility platforms, energy systems, and urban policy frameworks.

And it will need to evolve from being a space problem to a system solution. At the same time, the implications for real estate are significant. Parking is emerging as one of the most critical determinants of project design and value. Efficient systems can unlock additional saleable area, improve user experience, and enhance long-term asset performance. Inefficient systems, by contrast, create friction, reduce usability, and erode value.

> *The challenge is not just space scarcity—it is inefficient utilisation. Engineering-led solutions are redefining how space works.*
>
> **Nakul Modani,**
> **Director, RR Parkon**

Ajay Raina captures this relationship succinctly when he notes that parking decisions now directly influence how land is utilised and how projects are positioned in the market. This is perhaps the most important shift of all. Parking is no longer a constraint to be managed. It is a lever to be optimised.

And in that optimisation lies a broader transformation—one that extends beyond basements and buildings into the very structure of cities. Because ultimately, the future of urban India will not be defined only by what is built above ground.

It will be defined by how intelligently we organise, integrate, and manage the invisible systems that support it. Parking, once overlooked, is now at the centre of that conversation.

Not as an afterthought.But as infrastructure that determines whether cities merely grow—or actually function.

ENGINEERING THE FUTURE OF URBAN PARKING

AJAY RAINA ON HOW TEDRA IS REIMAGINING MOBILITY INFRASTRUCTURE IN INDIA

AJAY RAINA
Director & CEO
Tedra Automotive Solutions
www.tedraauto.com

*In rapidly densifying Indian cities, where land is scarce and vehicle ownership is rising exponentially, parking is no longer a backend utility—it is critical urban infrastructure. At the forefront of this transformation is **AJAY RAINA,** Director & CEO of Tedra Automotive Solutions, a company that has evolved from a modest mechanical workshop into a technology-led mobility solutions provider.*

In this conversation with Homes & Buildings, Raina outlines how engineering precision, indigenous innovation, and digital intelligence are converging to redefine parking in India.

From Fabrication to Future-Ready Mobility Systems

Tedra's journey mirrors the evolution of India's urban challenges.

"Back in 2011, we started as a 6,000 sq. ft. workshop with a 10-member team," Raina recalls. "Today, we operate two large-scale manufacturing plants spanning over 2 lakh sq. ft., with a workforce exceeding 250 and a nationwide footprint."

But scale alone does not define Tedra's transformation. What distinguishes the company is its transition from a mechanical product manufacturer to a systems-driven mobility partner.

"Our approach has always been anchored in three non-negotiables—safety, affordability, and efficiency. Whether it's a basic stack parking system or a fully automated robotic solution, these principles govern every design and deployment."

This philosophy has enabled Tedra to build one of the most diverse portfolios in the Indian parking ecosystem—ranging from stackers and puzzle systems to high-density towers and robotic parking solutions.

Precision Engineering Meets Intelligent Systems

As parking systems become more complex, reliability hinges on engineering discipline and technological integration.

"At the core, parking is an engineering product—but today, it's equally a digital system," Raina explains.

Tedra has invested heavily in advanced manufacturing capabilities, including robotic welding, CNC laser cutting, and precision fabrication technologies. This ensures structural integrity, load consistency, and long-term durability across installations.

Equally critical is the integration of real-time diagnostics and control systems.

"Most of our automated systems are equipped with intelligent display interfaces. If there is a malfunction—whether sensor-related, motor-driven, or software-based—it is instantly identified through error codes. This allows immediate intervention, often even before the user escalates the issue."

For large-scale installations such as towers and robotic parking, Tedra is also embedding centralised monitoring architectures, enabling remote diagnostics and faster service response—bringing the operational philosophy closer to that of elevators and smart infrastructure systems.

Reclaiming Urban Space: Parking as a Value Multiplier

In cities like and , where land economics are unforgiving, parking solutions

directly influence project feasibility and profitability.

"Traditional parking consumes horizontal space. Our systems unlock vertical potential," says Raina.

The impact is transformative:

- **Stack systems** can instantly double parking capacity
- **Rotary systems** can accommodate up to 20 cars in the footprint of just 2
- **Tower parking** can scale vertically to accommodate 100+ vehicles

"This fundamentally changes how developers utilise FSI. Instead of allocating large land parcels for parking, they can optimise buildable area and enhance saleable value."

In an era where households increasingly own multiple vehicles, efficient parking is no longer a convenience—it is a critical value proposition for homebuyers.

The Sustainability Imperative: Reducing Invisible Urban Waste

One of the most overlooked contributors to urban emissions is the time spent searching for parking.

Raina quantifies this inefficiency with striking clarity:

"In cities like Mumbai, a vehicle can consume 2–3 litres of fuel per month just searching for parking. When you scale that across millions of vehicles, the environmental and economic cost is staggering."

Automated and organised parking systems address this inefficiency by:

- Reducing vehicle idling and circulation time
- Lowering fuel consumption and emissions
- Optimising land use through vertical development

However, Raina is quick to point out that technology alone is not enough.

"To truly unlock the benefits, we need integrated urban planning—public parking infrastructure, policy support, and eventually, real-time parking data integration."

Smart Systems, IoT & Predictive Maintenance

With the rise of smart cities, parking infrastructure is expected to function as part of a connected ecosystem.

Tedra is already embedding elements of this future.

"Our systems are equipped with diagnostic intelligence. Error detection, fault classification, and response protocols are built into the system architecture."

In high-capacity installations, the company is exploring microcontroller-based communication systems that can transmit performance data to central hubs—enabling:

- Remote monitoring
- Predictive maintenance
- Reduced downtime

"This is where parking infrastructure begins to behave like smart infrastructure—self-aware, responsive, and data-driven."

Make in India: Engineering Independence as a Competitive Edge

At a time when many infrastructure technologies rely on imports, Tedra has taken a firm stance on indigenous manufacturing.

"We are a 100% Made-in-India company—not just in assembly, but in engineering and sourcing as well."

This approach delivers three strategic advantages:

- **Cost efficiency** through localised supply chains
- **Customisation** aligned with Indian urban conditions
- **Quality control** through end-to-end manufacturing oversight

In a sector where safety and reliability are paramount, this control becomes a critical differentiator.

R&D and the Next Frontier: Robotics & AI Integration

Innovation at Tedra is not incremental—it is institutionalised.

"As a policy, we aim to launch at least two new products every year," Raina states.

Recent advancements include:

- Higher-capacity multi-configuration tower systems (2x2, 3x2 layouts)
- Enhanced high-rise rotary systems
- Dedicated two-wheeler automated parking solutions

The next leap, however, lies in robotics.

"We are working on fully robotic parking systems where vehicle handling will be completely automated—no human intervention. The system will park and retrieve vehicles autonomously."

Looking further ahead, Raina envisions the integration of AI-driven parking intelligence, where vehicles can interact with city-wide parking data systems—similar to advanced mobility ecosystems in global cities.

Lifecycle Value & Service as Differentiators

In infrastructure, performance is measured not at installation, but over decades.

"Our systems are designed for a lifecycle of 25 years," Raina notes.

To support this, Tedra has built one of the most robust after-sales ecosystems in the industry:

- A 110+ member dedicated maintenance team
- Integration with platforms like for service management
- Rapid-response protocols with real-time tracking and reporting

"This ensures not just uptime, but accountability. Every service call is logged, tracked, and resolved with complete visibility."

Vision 2030: From National Leader to Global Player

Looking ahead, Tedra's ambitions are both clear and aggressive.

"By 2030, we aim to be among the top three players in the automated parking industry."

While domestic demand remains the immediate focus—driven by rapid urbanisation—the company is preparing for global expansion.

"The future of parking will be defined by automation, AI, and user-centric design. Our goal is to stay ahead of that curve—technologically and strategically."

Closing Perspective

As cities grapple with congestion, emissions, and land scarcity, parking is emerging as a silent but critical lever of urban efficiency.

Through a combination of engineering rigour, digital intelligence, and indigenous innovation, Tedra Automotive Solutions is positioning itself not merely as a parking solutions provider—but as a key enabler of future-ready urban mobility.

THE ENGINEERING RACE TO SOLVE INDIA'S URBAN SPACE CRISIS"

ANTONY PAROKARAN
Director – Parking Division
at Sieger Global

*In this conversation, **ANTONY PAROKARAN**, Director – Parking Division at Sieger Global, discusses automation, engineering reliability, redevelopment challenges, EV integration, and the future of intelligent mobility ecosystems.*

Q Your journey into automated parking stems from a strong foundation in industrial automation. What strategic insight led you to identify parking as a high-potential urban infrastructure segment?

Our entry into parking came from observing a clear gap in urban infrastructure. Buildings were becoming more sophisticated, but parking was still being treated as an afterthought. With our background in automation, we saw an opportunity to apply engineering and process-driven thinking to a growing urban problem.

The validation came very early through developer interactions. Space constraints were becoming increasingly severe, particularly in dense urban markets where land economics directly impacted project viability. Developers were actively looking for structured and scalable parking solutions.

Over the last decade, that demand has only intensified. Today, with more than 15,000 car parking spaces installed across multiple cities, it is evident that parking is no longer a supporting function—it has become a core part of real estate planning and urban mobility infrastructure.

Q How has your legacy in precision engineering and process automation influenced the reliability of your parking systems?

Our automation background fundamentally shapes how we approach parking infrastructure. We do not design systems only for installation—we engineer them for long-term consistency, reliability, and operational stability.

Every system is developed with a process-driven mindset, ensuring predictable performance over its lifecycle. Today, we offer one of the widest parking solution portfolios in India, ranging from rotary systems to advanced tower parking technologies.

Reliability is especially critical in automated infrastructure. Our systems are engineered for average retrieval times below 120 seconds while minimizing downtime and maintenance dependency. For developers and facility managers, this translates into lower lifecycle costs, higher uptime, and a more dependable long-term asset.

Q How do you differentiate technologically while remaining cost competitive?

Our biggest differentiator is that our systems are built specifically for India.

Every project comes with unique structural and operational constraints, and our strength lies in designing solutions around those realities rather than offering standardised imports. All our systems are designed, manufactured, and tested in India for Indian urban conditions. We operate as a fully integrated manufacturer with complete in-house control over both hardware and software from our advanced manufacturing facility in Coimbatore. This gives us significant control over quality, cost efficiency, and delivery timelines.

At the same time, innovation remains central to our growth. Systems like our H-Cart Tower Parking technology, which received recognition under the "Excellence in Parking – 2026" category, reflect our focus on combining advanced engineering with practical usability.

Q Rotary systems are often considered entry-level automation. How are these systems evolving today?

Rotary systems are often the first interaction users have with parking automation, so reliability and simplicity become extremely important. We have focused heavily on improving cycle efficiency, operational smoothness, and safety mechanisms within these systems. Features like enhanced safety interlocks, better user controls, and optimized movement cycles ensure that even entry-level automation delivers a dependable and intuitive experience.

The goal is to make automation accessible while ensuring that users feel comfortable and confident interacting with the system every day.

Q How do you determine the right parking solution for a project?

Selecting the right parking system requires detailed understanding of the project itself. We evaluate several parameters including spatial constraints, traffic movement patterns, vehicle flow, user behaviour, and operational requirements before recommending a solution.

The timing of this integration is equally important. Parking decisions made during the early design stage create far greater optimization opportunities. When integrated correctly, automated systems can increase parking capacity by up to eight times within the same footprint.

Late-stage integration often limits efficiency and reduces the overall potential of the system.

Q How is IoT and predictive maintenance changing parking infrastructure?

Smart infrastructure is becoming increasingly important in parking. Through our Parking Management System platform, we integrate real-time monitoring, usage analytics, traffic visibility, and operational diagnostics into the system architecture. This allows us to move toward predictive maintenance rather than reactive servicing. The impact is significant. Predictive monitoring improves uptime, reduces operational interruptions, and gives developers and facility managers much better visibility into system performance and maintenance planning.

Q Safety remains one of the biggest concerns in automated parking. How do you address this?

Safety is embedded at every level of our engineering process. Our systems incorporate multiple sensors, fail-safe mechanisms, redundancy protocols, and safety interlocks to ensure controlled and secure operations at all times. We also continuously align our engineering standards with evolving regulations and global best practices.

Equally important is operational simplicity. Systems that are intuitive and easy to operate significantly reduce the possibility of user errors. Safety is not just about engineering—it is also about creating systems that users can interact with confidently.

Q In dense markets like Mumbai, how do automated systems impact project value?

In high-density markets, land efficiency directly influences project economics. Automated parking enables developers to substantially increase parking capacity within the same footprint, which improves space utilization and overall feasibility. In many cases, it also enhances the perception and premium positioning of the project.

Structured and efficient parking is no longer viewed as an optional amenity For modern urban buyers, especially in-.premium and redevelopment projects, it has become an expectation.

Q How are redevelopment projects influencing parking innovation?

Redevelopment projects require highly flexible and modular solutions because spatial limitations are often severe.

Our systems are designed to integrate into tight and complex layouts without requiring major structural modifications. Beyond engineering adaptability, we also focus heavily on user experience and operational simplicity because adoption becomes much smoother when the system feels intuitive and reliable.

In redevelopment, success is not just about fitting the technology—it is about ensuring that it becomes a seamless part of daily life.

Q How are your systems adapting to the rise of electric vehicles?

EV integration is no longer a future consideration—it is already becoming essential. Our systems are designed to support integrated EV charging infrastructure, and we have already implemented this capability within one of India's largest tower parking installations. The objective is to ensure that parking systems remain future-ready and adaptable as mobility evolves. We are also exploring partnerships within the broader mobility and energy ecosystem to strengthen this integration further.

Q Looking ahead, how do you see automated parking evolving over the next decade?

Parking is already evolving beyond a standalone utility. It is becoming part of a larger ecosystem that includes digital infrastructure, EV integration, smart city frameworks, and mobility platforms. The future will belong to systems that are intelligent, connected, and adaptable.

Our vision is very clear. We aim to remain among the leading players driving this transformation while continuing to build infrastructure that responds not only to current urban challenges, but also to the future needs of cities.

INDIA'S REAL ESTATE CAN'T AFFORD ANOTHER RAMP — HERE'S WHY

*In an exclusive interaction with **MOHAN KUMAR SOUNDARARAJ**, Managing Director of Parklayer Private Limited, he outlines how intelligent parking infrastructure is redefining urban real estate, why engineering adaptability matters in India's dense cities, and what it will take to make parking a seamless part of tomorrow's smart mobility ecosystem.*

Q Automated parking in India is moving beyond being a niche engineering solution and becoming part of mainstream urban infrastructure. At what point did you recognise this shift, and how did Parklayer position itself to capitalise on it early?

The shift became unmistakable to us around 2018–2020, though the groundwork was laid much earlier. When we founded Parklayer in 2012, automated parking was still seen as an interesting curiosity — a developer might visit an installation once, nod appreciatively, and then go right back to designing conventional ramp-based basements. But two parallel trends were building pressure that would change the calculus entirely: land prices in Mumbai — still our largest market — were crossing ₹1 lakh per square foot, while vehicle ownership was exploding across cities, not just the metros.

Bengaluru alone adds nearly 400,000 cars every year. Eventually the math just stopped working for the old approach. We recognised early that the inflection point wouldn't come from a sudden love of technology. It would come from hard economics — the moment when the cost of not adopting automation exceeded the cost of the investment itself. That's why our joint venture with Dong Yang PC of Korea — a partnership that brought over 30 years of global deployment experience to India — was such a deliberate move. Rather than waiting for the market to educate itself, we invested in building multi-technology capabilities across rotary, tower, puzzle, and stack systems. When the shift finally arrived, we weren't a single-product company scrambling to adapt; we were already positioned as a full-spectrum provider ready for the wide range of site conditions Indian cities throw at you. Today, that early conviction is reflected in our footprint.

MOHAN KUMAR SOUNDARARAJ
Managing Director of Parklayer Pvt. Ltd.

We've crossed the 10,000-plus car park installation mark, and our teams are present in over 42 cities across India — not just sales, but full service teams on the ground. Mumbai remains our single largest market, but if you look at our project map, you'll see us deeply embedded in Tier-2 and Tier-3 cities as well.

Q In India, parking is often viewed as a compliance requirement rather than a strategic asset. How difficult was it to change this mindset among developers, architects, and urban planners during your initial years?

Extremely difficult — and to be honest, it remains one of our most persistent challenges even today. In the early years, parking was almost always the last item on a developer's checklist: a regulatory box to tick under municipal norms, allocated the bare minimum of capital and creative attention. The prevailing mindset was, "Why would I sink money into something that generates zero revenue?"

So we stopped talking about parking as a cost. Instead, we started demonstrating it as a value lever. Here's the math we would walk developers through: take a 100-unit residential building requiring 150 parking spaces. A conventional ramp-based arrangement consumes roughly 50,000 square feet. In Mumbai, where land costs between ₹50,000 and ₹1 lakh per square foot, that's ₹25 to 50 crores of capital locked up — generating nothing. A tower parking system can deliver the same 150 slots in about 10,000–12,000 square feet. You've just freed 40,000 square feet for additional units, retail, or landscaped amenities — all of which do generate returns.

But changing a developer's mind isn't just about showing them a spreadsheet. They need to know the solution won't become a headache. That's where our complete turnkey promise made the difference. From the very first site inspection, we consult on exactly which car park typology suits the requirement, handle design and

manufacturing, manage transport and installation, and then stay on — service and maintenance for the entire life of the machine. Developers could see this wasn't an equipment sale with an uncertain future; it was a full-cycle guarantee that the system would perform. That credibility, built up project after project, is what slowly turned parking from an afterthought into a strategic conversation.

Q Many automated parking companies speak about technology, but operational reliability often becomes the real differentiator. How does Parklayer approach long-term system performance, maintenance, and lifecycle efficiency?

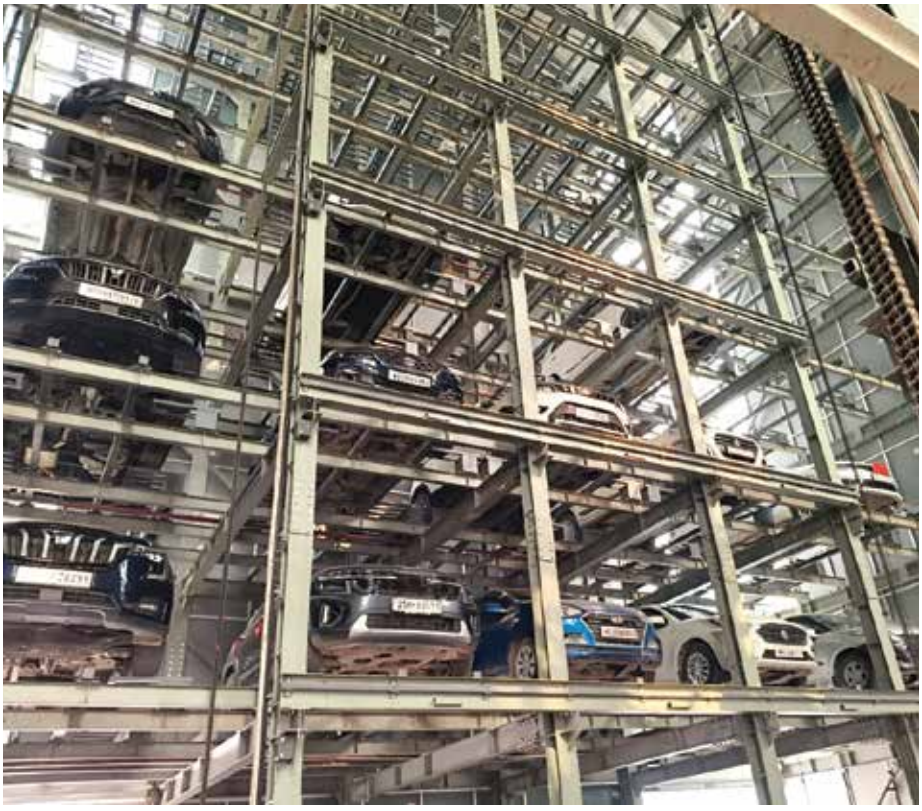
I've always believed the true test of an automated parking system isn't how it performs on day one — it's how it performs on day one thousand. The Indian market has unfortunately witnessed installations where impressive technology was deployed but operational reliability fell short, leading to user frustration, developer disappointment, and in some instances, system abandonment. I was determined that Parklayer would never be associated with that outcome.

Our approach to reliability begins at the engineering stage, not the maintenance stage. Through our joint venture with Dong Yang PC, we draw on over 30 years of global deployment experience and manufacturing precision. Modern tower parking systems operate on mechanical principles refined through decades of real-world operation. The reliability mirrors that of building elevators: technology so mature and refined that it becomes unremarkable in daily operation.

But engineering quality alone isn't sufficient. We've structured our operational philosophy around something that frankly separates us from most players: service is our core, not an after-sales obligation. Across those 42-plus cities where we are present, it's not just a marketing team — our full service teams are stationed there. In fact, I would go so far as to say our service team is bigger than our manufacturing team. More manpower is deployed onsite, keeping installations running, than at our factory building new systems. That's unusual, but it's deliberate.

Of the 10,000-plus car parks we've delivered, we hold the service contract for 99% of them. We take up after-sales service right through the machine's entire working life. That means preventive maintenance, not reactive repair. Our systems are equipped with sensors and monitoring capabilities that track component health continuously, enabling intervention before failures occur — increasingly shifting toward IoT-enabled predictive maintenance. But no amount of remote monitoring replaces a trained technician who can be at a site quickly when it matters. That's exactly what our city-level service presence ensures.

We also help clients understand lifecycle cost transparency. While automated systems may carry a higher upfront capital cost, the total cost of ownership is frequently lower when you account for eliminated basement excavation, significantly reduced energy consumption (tower systems draw power only during active operations — mere minutes daily rather than 24/7 ventilation and lighting), lower staffing requirements, and extended asset life. But none of those savings materialise if the system isn't reliably maintained. That is why we've built an organisation where service is larger than manufacturing, and why developers across India, in cities from Mumbai to smaller Tier-3 towns, trust us with the full lifecycle of their parking infrastructure.



Q The future of parking is increasingly linked with data, intelligence, and predictive systems. How do you see AI, IoT, and digital monitoring changing the way parking infrastructure operates over the next decade?

The next decade will transform parking from a mechanical utility into an intelligent, data-producing layer of urban infrastructure. We are already seeing the early contours of this transformation. Automated parking systems today are not merely mechanical structures — they are intelligent mobility solutions incorporating sensors, real-time monitoring, IoT dashboards, and predictive maintenance capabilities.

I see the evolution unfolding across three phases.

Phase one — what I'd call operational intelligence — is unfolding now through roughly 2028. This is about making parking systems self-aware. IoT sensors monitor every critical component — motor temperatures, chain tension, bearing vibration, hydraulic pressure — and feed data into dashboards that

enable operators to resolve issues faster and users to gain confidence through transparent performance visibility. For us, this digital layer amplifies what our on-ground service teams can already do: instead of scheduled visits based on calendar intervals, we will move toward condition-based interventions. Predictive maintenance algorithms, I expect, will reduce downtime by 40–60% compared to traditional models.

Phase two — demand intelligence — will likely characterise 2028 to 2032. Parking systems will connect to broader urban data ecosystems. For the first time, cities will be able to map when and where parking demand peaks, how patterns shift during festivals, what vehicle types are entering facilities, and how people move through different parts of the city. This data will help planners make vastly better decisions — from signal timing to space allocation for EV charging. AI will enable dynamic pricing, reservation systems, and real-time wayfinding that reduces the cruising-for-parking traffic that accounts for a significant share of congestion in dense urban cores.

Phase three — systemic intelligence — will take hold from 2032 onward. Parking infrastructure will integrate with smart-city platforms, traffic management systems, and mobility-as-a-service networks. The future of parking is digitally connected, data-driven, environmentally responsible, and designed for seamless user experience. But all of that still depends on physical infrastructure that works, which is why our foundation — 42-city service presence, 99% AMC coverage, 10,000-plus installations — is non-negotiable. Digital intelligence only matters if the machine lifts the car when the user arrives.

Q In high-density urban environments, user adoption is equally as important as engineering. How do you ensure that automated systems remain intuitive, user-friendly, and practical for everyday residential and commercial use?

I learned early on that a technically brilliant system that intimidates its users is a failed system. User adoption isn't a soft consideration — it is the determining factor in whether an installation becomes a lasting asset or a liability for the developer. In India, this challenge is compounded by extreme diversity: your user base ranges from tech-savvy young professionals to elderly residents who may never have encountered an automated system before.

Our design philosophy for user experience rests on simplicity, safety, resilient failure, and onboarding. The process must be intuitive: drive in, exit the vehicle, initiate parking via touchscreen or RFID card. Retrieval is typically within 90 seconds. In residential settings, RFID-based access means residents never need to touch a screen; they simply tap and go. We also build deliberate psychological safety — load-balance sensors, locking mechanisms, CCTV, and emergency backups. Even during a power outage, no user is stranded; our systems are designed for graceful degradation, and with service teams in 42 cities, any intervention required is prompt.

Once people experience the convenience — no more navigating tight ramps, no searching for slots, no anxiety about minor scratches in cramped spaces — adoption becomes self-reinforcing. At The Chennai Silks installation, one telling outcome was that the number of employed drivers dropped markedly because end users were comfortable parking themselves. When a system is backed by reliable service that keeps it running day after day, that confidence grows, and the machinery itself becomes invisible — simply a useful part of daily life.

Q As EV adoption accelerates, parking systems will eventually become part of a larger energy ecosystem. How is Parklayer preparing for this transition, particularly in terms of charging integration and future-ready infrastructure?

The convergence of automated parking and electric vehicle charging is not a distant future — it is a design imperative we are addressing right now. As EV adoption accelerates, parking infrastructure will inevitably become a critical node in the energy ecosystem: a place where vehicles don't merely park but charge, and eventually, through vehicle-to-grid technology, potentially contribute power back to the network.

Our preparation spans three horizons. Immediately, all new Parklayer systems are being designed with EV-ready infrastructure — dedicated power supply conduits, load-balancing capability, and slot-level charging integration pathways. Many of our facilities already integrate EV-ready slots, allowing vehicles to charge while parked.

In the medium term, we are engineering smart charging integration: parking management software that communicates with charging hardware via standardised APIs, enabling scheduled charging during off-peak tariff hours, dynamic load management across multiple simultaneous sessions, and integrated billing. Long-term, we are tracking bidirectional charging and grid-flexibility services — large commercial parking installations could become distributed energy resources, storing power during low-demand periods and feeding it back during peak hours.What makes this vision credible, however, is that we are already installed and deeply embedded across the country. With 10,000-plus car parks and service teams in 42 cities, we have a real, distributed base of infrastructure that can be progressively electrified. That combination of physical presence, service depth, and forward-looking engineering is what will make the transition real, not just rhetorical.

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FROM CONSTRAINT TO CAPABILITY IN INDIA'S VERTICAL CITIES

IN CONVERSATION WITH RAJESH DOGRA, GROUP COO FOR EROS & SKYZONE

*In this exclusive conversation, **RAJESH DOGRA** shares how Eros Group, through its automated parking brand Skyzone, is addressing structural urban challenges with engineered, intelligent, and future-ready solutions.*

RAJESH DOGRA
Chief Operating Officer - Group, Eros & Skyzone

Q Let's begin by sharing the origin of Eros Group's entry into automated parking, and how your journey has aligned with the evolution of India's urban infrastructure?

Eros Group's entry into automated parking was not just a business decision, it was a direct response to a structural urban challenge. As cities like Mumbai and other metros began facing acute land constraints, conventional parking was becoming increasingly inefficient and unsustainable.

We recognised early that urban India was moving vertically, and infrastructure had to evolve accordingly. Automated parking offered a natural solution optimising land use, improving user experience, and introducing engineering precision into what was largely an unorganised space. This led to the creation of Skyzone, our dedicated platform for automated parking. Over time, we've witnessed a clear shift from initial resistance to strong demand. Today, automated parking is no longer a luxury; it is becoming essential to smart urban development. At Eros, we are not just building parking systems, we are engineering the future of urban space.

Q What are the most critical gaps in current parking infrastructure, and how do automated systems change this equation?

The challenge is not just land scarcity, it is inefficient utilisation of available space and the absence of integrated planning. Parking is often treated as an afterthought, resulting in congestion, poor user experience, and loss of valuable real estate potential. The key gaps today are low space efficiency, manual dependency, and lack of system-driven operations.

Automated parking fundamentally changes this by increasing capacity within the same footprint, eliminating ramps and dead spaces, and delivering a safe, predictable, and seamless experience. Through Skyzone, we are driving a shift from unorganised parking to engineered infrastructure, thereby enabling better land monetisation for developers and more structured mobility for cities.

Q As urban density increases, how do automated parking systems contribute to space optimisation in high-density developments?

In cities like Mumbai and Bengaluru, space is the most valuable asset. Automated parking unlocks this value by building vertically rather than spreading horizontally.

By eliminating ramps and optimising layouts, we can increase parking capacity by two to three times within the same footprint. More importantly, this frees up usable space, whether for amenities or additional saleable area.

Through Skyzone, we see automated parking as a core enabler of efficient urban design.

Q With the growing preference for larger vehicles like SUVs, how has your engineering approach evolved?

Vehicle profiles have changed significantly, and our engineering has evolved in response. We have enhanced load-bearing capacities, redesigned system dimensions, and integrated advanced safety mechanisms. This includes stronger structural frameworks, upgraded drive systems, and multiple layers of safety interlocks and sensors.

The objective is to ensure stability, safety, and reliability while accommodating heavier and larger vehicles without compromising efficiency.

Q How are technologies like RFID, IoT, and ANPR enhancing efficiency?

User expectations today are shaped by digital ecosystems. Parking is expected to be seamless, intuitive, and contactless. Technologies such as RFID, IoT integration, ANPR, and mobile-based controls enable faster vehicle identification, real-time system monitoring, and reduced human intervention. This significantly improves both efficiency and user convenience. Through Skyzone, we are integrating these technologies to create a connected, frictionless parking experience.

> *In cities like Mumbai and Bengaluru, space is the most valuable asset. Automated parking unlocks this value by building vertically rather than spreading horizontally.*

Q From a developer's perspective, how do automated systems compare with conventional parking in terms of cost and value?

Automated parking is often perceived as a higher upfront cost, but in reality, it is a more efficient allocation of capital.

When you consider the cost of conventional parking, such as additional RCC, excavation, and loss of saleable area, the economics become comparable. The real advantage lies in unlocking value. Developers can maximise usable space, improve project viability, and accelerate sales. Even with long-term maintenance considerations, the overall return on investment remains significantly stronger. Through Skyzone, we position automated parking not as a cost, but as a revenue enabler.

Q Sustainability is becoming central to urban development. How do your solutions contribute?

Sustainability is closely linked to efficiency. A significant portion of urban emissions comes from vehicles circulating in search of parking. Automated systems eliminate this by enabling quick, system-driven parking and retrieval, reducing idle time, fuel consumption, and internal traffic movement. Additionally, vertical optimisation reduces the need for excessive construction and excavation, contributing to a lower environmental footprint. Through Skyzone, we see automated parking as a step toward cleaner and more efficient urban living.

Q What are the most common concerns developers have before adopting automated parking systems?

The most common concerns revolve around reliability, maintenance, user acceptance, and long-term costs. There is often a perception that automated systems are complex or difficult to manage. Our role is to address this through robust engineering, clear service structures, and dependable after-sales support. Once developers understand the operational reliability and value benefits, the mindset shifts quickly, moving from hesitation to confidence.

Q How do predictive maintenance and remote monitoring ensure performance?

Reliability is not reactive but engineered. Through Skyzone, we focus on preventive and predictive maintenance supported by IoT-enabled monitoring systems. This allows us to identify potential issues in advance and take corrective action proactively.Combined with strong after-sales support, this ensures minimal downtime and consistent performance across the system lifecycle.

Q With the rise of electric vehicles, how are you integrating EV infrastructure into your systems?

The transition to electric mobility is inevitable, and parking infrastructure must evolve alongside it. We are actively working on integrating EV charging within automated parking ecosystems. This involves both engineering integration and coordination with power infrastructure and regulatory frameworks. Our goal is to create systems that are not just storage solutions, but energy-enabled infrastructure which is aligned with the future of mobility.

Q Do you see adoption expanding beyond metro cities?

As urbanisation spreads, these cities are beginning to face similar constraints, including rising vehicle ownership, increasing land costs, and growing awareness of structured infrastructure. These factors will drive the adoption of automated parking beyond metros.

Q Looking ahead, how will AI and smart city frameworks reshape parking in India?

Parking will evolve from a static utility to a dynamic, intelligent component of urban mobility. With AI and smart city integration, systems will become more predictive, connected, and responsive, integrating with broader mobility platforms and user ecosystems. Contactless access, automated valet systems, and app-based reservations will redefine user convenience and experience. For developers and city planners, parking will shift from a cost center to a data-driven asset, unlocking new revenue streams and urban efficiency.

Q A landmark project that reflects Eros Group's capabilities?

We have delivered several landmark projects through Skyzone that reflect both engineering strength and real- world impact. One of our earliest projects is at Ruby Hall Clinic, a 150-car standalone tower commissioned in 2010, which continues to operate reliably today, demonstrating long-term durability. We have also executed high-rise installations, including 100 metre towers at Ashar Metro in Thane, showcasing our capability in vertical parking systems. More recently, the Jehangir Hospital project, a 300-car automated parking system, highlights the importance of reliability in critical environments such as healthcare. Across all these projects, the common thread is engineering precision, efficient space utilisation, and measurable impact in dense urban environments.

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#SPACEMULTIPLIER FROM LIMITATION TO LEVERAGE

*In this conversation, Mr. **MAYUR BHOSALE**, National Sales Head at Wohr Parking Systems Pvt Ltd., shares insights into how mechanised parking, integrated technologies, and forward-looking engineering are shaping the next phase of urban mobility in India*

Q Could you briefly share your company's journey in the Indian market and how your offerings have evolved to meet the rising demand for secure, efficient parking systems?

WOHR, backed by 120 years of proven German engineering, stands as a pioneer and undisputed leader in the car parking system industry. Since entering the Indian market, we have consistently delivered the most practical and cost-efficient parking solutions, proudly installing over 1,80,000 parking spaces across the country. We provide a complete mechanized car parking solution at the planning stage of a project. This helps architects and builders to accommodate the desired car parking numbers in a project.

Two decades ago, when we introduced multilevel parking to India, the concept was met with hesitation. Traditional parking was the norm, and change was resisted. But we stayed the course, confident in the future. Today, as users experience the unmatched convenience and driving comfort of mechanised, power-operated systems, the shift is undeniable.

The industry is now transforming from basic key-operated systems to intelligent, remote-operated solutions. At WOHR, technology has always been our backbone. Our products adhere to European (EN) standards and follow stringent safety norms. We continuously evolve with time, offering world-class systems designed for maximum efficiency, safety and seamless operation.

Q What are the key challenges you've faced in deploying intelligent access solutions in India, and how have you adapted your technologies or services to address them?

The current Indian scenario is changing the building structure. Building Management Systems (BMS) are integrated from the entrance gate to access inside the office. Within this path, the person driving the car goes to the parking area, parks the vehicle, accesses through elevators and reaches their desired office floor. The user expects one swipe at every hurdle and the parking system is one of the key links which is also expected to have BMS continuity.

Q What smart technologies such as RFID, ANPR, IoT, or cloud-based systems have you integrated into your parking solutions, and how are they enhancing user experience and operational efficiency?

Yes, we have integrated touchless technology in our systems. Post-Covid, we introduced RFID and remote operation, which omitted the use of conventional push button operating panels. WPS has also upgraded systems with new PLC software, allowing app-based integration for an enhanced customer experience.

Q How do your solutions improve convenience for residential gated communities, commercial complexes, malls, and high-traffic zones such as industrial parks and logistics hubs?

Every day, new challenges emerge due to increasing traffic. To overcome these challenges, we study traffic analysis, the requirement of accommodating maximum cars, and the footfall of vehicles with constraints of peak hours. This becomes necessary for the end user to park the vehicle effortlessly and safely within the parking area.

Q In what ways do your systems help reduce traffic congestion, waiting time at entry/exit points, and vehicle idling—thereby supporting lower carbon emissions?

WOHR systems integrated with BMS provide a dedicated parking spot within the parking area. This reduces the need for vehicles to circle while searching

for parking, which eventually lowers carbon emissions. For large projects, parking arrangements are planned during the project stage itself. This helps in organising the entire parking management in advance, where entry and exit points are predefined to avoid unnecessary vehicle movement.

Q How do the needs and expectations of residential projects differ from commercial or public infrastructure projects when it comes to smart access and parking automation?

In the residential segment, end users prioritise simplicity and low operating costs (OPEX). Since maintenance and running costs are borne directly by individual residents, there is a strong preference for parking solutions that are easy to operate, reliable, and cost-efficient over the long term.

In contrast, for commercial developments, the focus shifts toward efficiency and performance. While the end user does not directly bear the cost, building management aims to maximise parking capacity, ensure smooth traffic flow, and minimise waiting time for users.

Across both segments, the expectation is converging toward smart, dependable systems—solutions that deliver high uptime, minimal maintenance requirements, and a seamless user experience. Ultimately, whether residential or commercial, the emphasis is on optimising space while ensuring operational efficiency and user convenience.

Q What are the most requested features or functionalities today from developers, resident welfare associations (RWAs), and commercial property owners?

The passenger vehicle landscape in India has evolved significantly in recent years, with a clear shift from sedans to mid-size and high-end SUVs. This change has a direct impact on parking design, as larger vehicle dimensions demand wider platforms, higher load capacities, and greater manoeuvring space.

At the same time, the rapid adoption of electric vehicles is reshaping parking infrastructure. EVs are typically heavier due to battery systems and require integrated charging provisions, making it essential for parking solutions to be structurally robust and future-ready.

From a regulatory standpoint, frameworks like the Real Estate (Regulation and Development) Act, 2016 have brought greater transparency and accountability. Developers are now required to clearly define and disclose the parking space dimensions allocated to end users, ensuring usability and protecting consumer interests.

Together, these shifts are pushing the industry toward more adaptive, compliant, and future-oriented parking designs—capable of accommodating evolving vehicle types while aligning with regulatory and sustainability requirements.

Q Can you share a few notable case studies where your access or parking solutions have been deployed successfully—particularly in smart cities, airports, or high-density urban developments?

We have successfully delivered several large-scale parking and access solutions across high-density urban developments, airports, and premium commercial projects in India. At Aero Mall, Pune, which is directly connected to Pune International Airport via a foot overbridge, we implemented a puzzle parking system that enabled the creation of over 150 additional parking spaces alongside conventional parking. A similar deployment has also been executed at Chennai International Airport. In World Trade Center, Nauroji Nagar, Delhi, we delivered a large-scale installation of over 2,000 parking spaces for a high-profile government-backed commercial development.

The passenger vehicle landscape in India has evolved significantly in recent years, with a clear shift from sedans to mid-size and high-end SUVs

At Godrej Centre, Pune, our systems manage approximately 7,000 parking spaces through a combination of puzzle and stack parking, including integrated two-wheeler parking.

One of the most notable deployments is at One BKC in Mumbai, featuring one of India's largest and most sophisticated automated multi-level robotic parking systems. While the initial requirement was for 250 car spaces, our solution engineering enabled the delivery of 1,148 spaces within the same footprint—demonstrating the concept of space multiplication.

Q Looking ahead, what trends or innovations will define the future of parking and access management in India?

The future of parking and access management in India will be driven by a convergence of automation, data intelligence, and seamless user experience.

AI-led systems such as ANPR will become standard, enabling touchless entry and exit, enhanced security, and real-time monitoring. These systems will increasingly integrate predictive analytics to support smarter traffic flow and proactive decision-making.

Cloud-connected infrastructure will play a critical role, where parking systems will no longer operate in isolation. Remote diagnostics, preventive maintenance, and real-time system monitoring will significantly reduce downtime and improve efficiency.

Another major shift will be toward fully contactless ecosystems, including digital payments, mobile-based access, and app-driven user journeys.

Finally, integration with Mobility-as-a-Service platforms will redefine how parking fits into the broader urban mobility ecosystem. Parking will become a connected node linked with public transport, ride-sharing, and EV infrastructure.

While the pace of innovation is rapid, the direction is clear—smarter, connected, and user-centric parking solutions will define the future.

IN CONVERSATION

ENGINEERING SPACE EFFICIENCY IN INDIA'S VERTICAL CITIES

*In this evolving landscape, **RAJASHREE SHETTY**, Director at Keev International Parking Technology, shares how the company is addressing real-world parking challenges through engineering-led solutions, disciplined execution, and a deep understanding of urban realities.*

RAJASHREE SHETTY
Director, Keev International Parking Technology

Q Keev International has been working closely with developers on real, on-ground challenges. How did your journey into automated parking begin, and what gap were you solving?

"Hare Krishna"

Our journey began with a consistent pattern across projects—developers were struggling to accommodate increasing vehicle density within limited land. Conventional parking systems were inefficient and consumed valuable real estate without delivering long-term usability.

We identified this gap early and focused on engineered solutions that optimise space while ensuring safety and convenience. Our approach has always been rooted in real-world application—understanding site constraints, user behaviour, and project requirements before designing a system.

Q In dense cities like Mumbai, what structural issues do you see in current parking ecosystems?

The issue is not just scarcity of land, but the absence of structured planning. Parking is often treated as an afterthought, leading to inefficient layouts, internal congestion, and conflicts among users. There is also a consistent underestimation of parking demand. With rising vehicle ownership, especially multiple vehicles per household, this gap becomes more evident over time. As a result, parking turns into a daily operational challenge rather than a seamless experience.

Q Space is the biggest constraint today. How do your systems redefine space utilisation within tight project footprints?

In high-density environments, vertical optimisation is the only viable solution. Our systems eliminate ramps and redundant circulation areas, allowing us to significantly increase parking capacity within the same footprint. This not only enhances efficiency but also frees up valuable ground space for better planning, whether for amenities or additional saleable area. In essence, automated parking transforms parking from a space consumer into a space optimiser.

> ***The parking industry is at a decisive inflection point—urban density is rising, and conventional solutions are no longer viable. At Keev, we are focused on delivering systems that are efficient, reliable, and engineered for scale.***

Q Developers often hesitate before adopting automated parking. What are the underlying concerns?

The most common concerns revolve around reliability, maintenance, user adaptability, and initial investment. There is often a perception that automated systems are complex and difficult to manage. However, once developers see live installations and understand lifecycle performance, the perception changes. The decision becomes driven by efficiency, long-term value, and execution reliability.

Q How should developers evaluate automated parking in terms of cost and long-term value?

The evaluation must go beyond upfront

cost. Automated parking unlocks value by enabling better utilisation of space, improving project viability, and enhancing market positioning. In dense developments, parking directly impacts sales potential, making it a strategic investment rather than a cost.

Q With the rise of SUVs and larger vehicles, how has your engineering approach evolved?

Vehicle profiles have changed significantly, and our systems have evolved accordingly. We design for higher load capacities, larger dimensions, and stricter safety parameters. This includes structural reinforcement, advanced interlocks, load sensors, and controlled operations to ensure stability and reliability. Safety is not an added feature—it is the foundation of our engineering philosophy.

Q How is technology reshaping the parking experience for users?

User expectations today are driven by convenience and speed. We integrate automation, RFID-based access, and app-enabled interfaces to minimise human intervention and enhance efficiency. The goal is to create a seamless experience where the system operates efficiently in the background while the user experiences simplicity and control.

Q What are the key execution challenges in implementing automated parking systems?

Execution is where complexity truly emerges. Each project presents unique site constraints, coordination requirements with civil teams, and strict timelines. Our strength lies in anticipating these variables early and aligning engineering with execution discipline to ensure timely and efficient delivery.

Q How do you ensure long-term reliability and minimal downtime?

Reliability is built through process. We focus on preventive maintenance, trained service teams, and structured response mechanisms. Every system undergoes rigorous validation before deployment, ensuring consistent performance. Post-installation, quick response and disciplined servicing ensure minimal downtime and sustained efficiency.

Q How do automated parking systems contribute to sustainability?

Automated parking reduces unnecessary vehicle movement within developments, directly lowering fuel consumption and emissions. By optimising space vertically, it also reduces excessive construction and improves overall environmental efficiency. It is a practical step towards more sustainable urban development.

Q Are you seeing demand expand beyond metro cities?

Yes, demand is clearly expanding into Tier 2 and emerging cities. As urbanisation spreads and real estate becomes more structured, the need for efficient parking solutions is increasing across residential, healthcare, and commercial developments.

Q What can we expect from Keev International in terms of future innovation?

Our focus is on advancing automation, improving system intelligence, and integrating parking with broader building ecosystems.

We are also scaling manufacturing capacity and strengthening our R&D capabilities to meet the next phase of demand for efficient and reliable parking systems.

Keev Parking Tower with 64 Spaces at Kedar Darshan, Borivali.

KEEV (Ground plus 2 stackers) at Vasant Oasis by Sheth Developers and Turner House, Bandra West.

Q Can you share a project that reflects your capabilities and execution strength?

The Kedar Darshan Project in Borivali West is a strong example of our capabilities. It was a high-density mixed-use development with significant space constraints and a requirement to accommodate a large number of SUVs.

This was in close collaboration with Mr Rakesh Singh, Chief Promoter and Managing Director of Mumbai-based Kosmos Developers, who shared, 'We are glad to have chosen KEEV as our partner for providing a mechanized parking solution for our prestigious project, where timely completion was the biggest challenge. KEEV completed the parking tower with 64 spaces—most of them for SUVs—in a record time of 4 months after our machine room was ready. We truly appreciate the professional approach exhibited by the KEEV team. The system has shown almost zero breakdown in the last 8 months'.

Keev International operates on three defining pillars: Safety, Integrity, and Strong Process-Driven Execution. These principles guide every stage from design to delivery and ensure consistency across projects.

QUTUB MANDVIWALA AND THE HUMAN LOGIC OF SUSTAINABLE URBANISM

For over three decades, Mandviwala Qutub & Associates (MQA) has quietly shaped India's urban and residential landscape—eschewing signature styles in favour of spaces that respond, endure, and evolve with people. In this Architects' Diaries conversation with Meenakshi Singh, ***QUTUB MANDVIWALA*** *reflects on architecture as a behavioural force, the ethics of density, and why true sustainability begins—and ends—with human comfort.*

Space Before Style

From the outset, Mandviwala is unequivocal: what remains permanent is space.

'Architecture influences behaviour—this is something we are taught early on—but its real impact is felt in daily life', he says. Whether designing a compact 350 sq ft home or an expansive 3,500 sq ft residence, MQA begins with how people actually live, move, and interact.

Homes, he believes, are not products but environments of comfort and continuity. User-centric planning shapes not just lifestyle, but mindset and long-term wellbeing. 'When space is designed right', he notes, 'it quietly supports life without demanding attention'.

From Functions to Frameworks

While MQA is widely recognised today for its residential work in Mumbai, Mandviwala is quick to point out that the practice has always operated across complex typologies—hospitals, schools, hotels, campuses, and mixed-use developments—well before residential architecture became its most visible output.

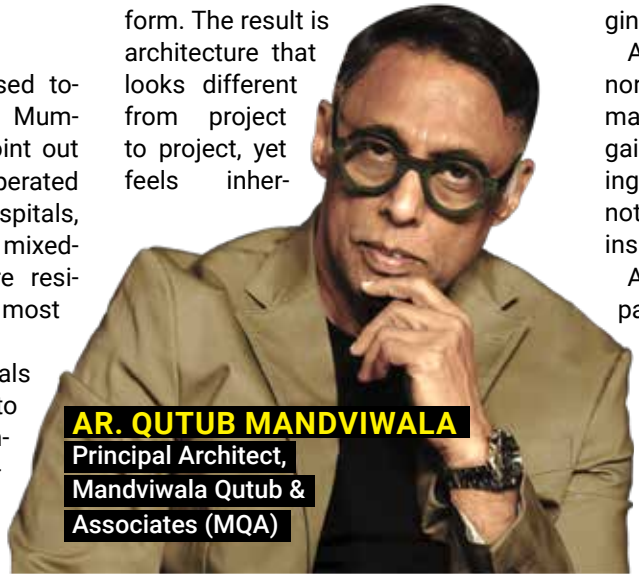
Projects ranging from hospitals in Mumbai (as early as 2000) to institutional campuses in Ahmedabad and schools in Bhopal informed a layered design sensibility. As Mumbai's residential boom accelerated post-2004, MQA's experience across sectors naturally fed into its housing work, bringing institutional rigour and urban sensitivity into the residential realm.

Why MQA Has No Signature Style

In an era where architectural branding often equals recognisable aesthetics, MQA's resistance to a fixed style is intentional.

'A signature style can limit contextual thinking', Mandviwala explains. 'Mumbai, Ahmedabad, Pune—each city has its own climate, culture, and expectations'.

Instead, climate, site conditions, sustainability, and user behaviour become the real drivers of form. The result is architecture that looks different from project to project, yet feels inherently appropriate—an approach that privileges relevance over recognition.



AR. QUTUB MANDVIWALA
Principal Architect,
Mandviwala Qutub &
Associates (MQA)

Designing Density with Dignity

As Indian cities build upward, Mandviwala emphasises that tall buildings need not sacrifice comfort. Orientation, not façade, is where performance begins.

At a building scale, MQA prioritises north and east-facing living spaces to maximise daylight while reducing heat gain, cutting energy loads and improving comfort. Glass is used judiciously, not decoratively, to maintain a strong inside–outside connection.

At a township scale, the logic expands. Bungalows, row houses, and apartment towers are strategically placed based on climate and orientation. Streets, open spaces, and building massing are treated as a single environmental system—an approach that sees sustainability not as an add-on, but as planning intelligence.

One Constant Across All Typologies

Whether it is a hospital, home, office, or campus, one principle remains non-negotiable: space planning.

Every project begins with the site—its contours, water bodies, views, or limitations. The function then defines the specifics, but the goal remains unchanged: architecture that is user-centric, climatically comfortable, and timeless.

For Mandviwala, this is the essence of sustainability—not technology alone, but architecture that continues to work, age gracefully, and remain valued decades later.

Rethinking Sustainability

'Sustainability is not a checklist', Mandviwala says plainly.

Drawing from the emotional comfort of ancestral homes and villages, he reframes sustainability as continuity—spaces that people want to return to.

A building that is uncomfortable, regardless of its green ratings, will ultimately fail. He points to small but critical details, such as glare on a classroom blackboard, as examples of how design can either support or sabotage usability. True sustainability, he argues, lies in enduring comfort and human connection.

Heritage, Height, and Sensitivity

In Mumbai's redevelopment-heavy context, MQA often works alongside existing heritage structures. Mandviwala advocates restraint rather than mimicry.

Tall buildings, he explains, should not overplay heritage aesthetics. Instead, they should respect scale at the lower levels, up to the eye line, by continuing the architectural language of their surroundings. Beyond that, a clean, contemporary expression allows the building to be honest about its time and function, without overwhelming its context.

Architecture Beyond Plots

For Mandviwala, the future of Indian cities depends on architects engaging beyond individual land parcels. Cities, he says, are experienced at ground level—through streets, pavements, plazas, and public spaces.

'When architects shape pedestrian environments and public realms, they create the memories people carry of a city', he reflects. Buildings may define skylines, but it is the quality of public space that defines urban life.

Looking Towards 2030

As population pressures intensify, Mandviwala sees two parallel responsibilities for architects. One is to design better, denser cities. The other is to strengthen rural and small-town development, reducing the compulsion for migration by improving infrastructure and habitability outside metros.

In the immediate future, architects must think holistically, by integrating tall buildings, landscapes, streetscapes, and open spaces into climate-resilient, people-first urban systems.

MQA's Vision 2030

MQA's vision extends beyond buildings to the urban fabric itself. Wherever possible, the firm engages with infrastructure and landscape, seeking to elevate the overall environment around its projects.

Sustainability, Mandviwala reiterates, is about how buildings function and feel over time. Equally central is emotional impact—architecture that brings comfort to a child in school, reassurance to a patient, or joy to a family entering a new home. This human-first lens defines MQA's journey towards 2030.

Projects as Philosophy

When asked to single out a project that best represents MQA's philosophy, Mandviwala resists naming just one. Child-centric schools, high-density inclusive developments like, and compact residential units all reflect the same underlying ethos: understand the user first.

Even in the smallest homes, MQA has challenged conventional layouts by studying real family dynamics and multi-generational living. Today, the practice is extending this philosophy into a health city project grounded in biophilic design—where healing is supported by architecture and nature together.

Closing Reflection

Across scales and typologies, Qutub Mandviwala's work argues for a quieter, more enduring form of architectural leadership—one rooted not in visual identity, but in lived experience. In an age of rapid urbanisation, his voice is a reminder that architecture's true legacy lies not in how it looks on day one, but in how it continues to serve people for generations.

WHEN WATER LEAK, **BRANDS LOSE TRUST**

A SYSTEMS-LEVEL ANALYSIS OF WATERPROOFING FAILURE

Water ingress is one of the most frequent, costly, and reputationally damaging failures in construction across buildings and infrastructure. Despite decades of material innovation, leakage continues to recur, indicating that the root cause is not product inadequacy but systemic failure in design integration, execution, and lifecycle thinking. This paper examines waterproofing as a construction engineering problem rather than a real-estate defect, analysing physical mechanisms of leakage, failure typologies, climate-driven risk escalation, and the evolution from product-based to system-based waterproofing design.

Drawing on industry practice, forensic logic, and expert insights from leading manufacturers and engineers, the paper argues that waterproofing must be repositioned as a core service-life determinant and governance function. It concludes with a technical and institutional framework for reducing leakage through system redundancy, interface engineering, execution tolerance, and accountability across the construction ecosystem.

LEAKAGE AS A CONSTRUCTION FAILURE, NOT A FINISHING DEFECT

In construction practice, water leakage is often discovered late and explained away early. It appears first as a cosmetic blemish—damp patches, seepage lines, staining—and is frequently categorised as a defect to be rectified during maintenance or defect liability periods. This framing is deeply misleading.

Water ingress is not a surface imperfection. It is a structural and systemic failure mode that reflects how a building or infrastructure asset was conceived, detailed, constructed, and governed over time. Once moisture enters a structure, it accelerates chemical, mechanical, and biological degradation processes that are difficult or impossible to reverse.

As **Tushar Munshi**, Director at Shubh Constrocare Products and Services, states from field experience:

'In waterproofing, the cost of repairs and maintenance is at least five times more than the waterproofing done during construction'.

This ratio captures the economic asymmetry of leakage: prevention is inexpensive relative to remediation, yet remediation is disproportionately common. The persistence of leakage therefore signals not a lack of technology, but a misalignment between construction intent and construction practice.

SCALE OF THE PROBLEM: WHY WATER INGRESS DOMINATES CONSTRUCTION FAILURES

Across global defect surveys, forensic investigations, and insurance claim data, moisture-related failures consistently rank among the most prevalent causes of post-construction intervention. In many building typologies—residential, commercial, industrial, and infrastructure—water ingress represents the largest single category of serviceability failure.

This dominance arises from three factors:

- Ubiquity of water exposure – rain, groundwater, humidity, condensation
- Porous nature of construction materials – concrete, masonry, mortar
- Complexity of modern construction interfaces – joints, penetrations, composite assemblies

While waterproofing typically represents a very small percentage of construction cost, its failure cascades into structural deterioration, asset devaluation, legal disputes, and reputational damage. In practical terms, leakage is a low-probability, high-impact risk that is systematically under-managed.

Moisture-Related Failures

Ubiquity of Water Exposure
Water exposure is common from rain, groundwater, humidity, and condensation

Porous Construction Materials
Concrete, masonry, and mortar are porous materials that allow water to penetrate.

Complex Construction Interfaces
Joints, penetrations, and composite assemblies in modern construction are complex and prone to leakage.

PHYSICAL MECHANISMS OF LEAKAGE: HOW WATER ENTERS STRUCTURES

All water ingress in construction can be traced to three physical transport mechanisms. Understanding these mechanisms is foundational to effective waterproofing engineering.

Capillary Transport

Concrete and masonry are porous materials. Even high-grade concrete contains interconnected capillary pores that draw water inward through surface tension forces. Capillary transport explains why moisture can rise against gravity, persist after rainfall ceases, and manifest far from visible cracks.

Crystalline admixtures and hydrophobic treatments aim to block or disrupt these capillaries, but their effectiveness depends on moisture availability, pore continuity, and curing conditions. Failures occur when capillary action is underestimated or when execution prevents the chemistry from fully developing.

Hydrostatic pressure-driven flow

In sub-grade construction, water ingress is dominated by hydrostatic pressure. Groundwater exerts continuous force on basement walls and slabs, exploiting the smallest discontinuities in concrete and waterproofing layers.

Barrier membranes often fail not because of inadequate tensile strength, but because water migrates laterally along interfaces created by:

- Poor bonding
- Tie-rod holes
- Construction joints
- Honeycombing

This is why fully bonded and integral waterproofing systems have gained prominence in basements and tunnels: they eliminate the interface where lateral migration occurs.

As Nikhil Bhatia, National Target Market Manager – Waterproofing & Roofing at Sika India Private Limited (Construction Chemicals), observes:

'Basement waterproofing today is carried out in confined spaces with rock anchors and complex detailing, where traditional methods are no longer fit'.

Vapour diffusion and condensation

Many failures are not caused by liquid water ingress, but by vapour diffusion. Warm, moisture-laden air migrates through assemblies and condenses on cooler internal surfaces, leading to corrosion, mold growth, and delamination.

Systems that block liquid water but trap vapour are especially vulnerable in tropical and humid climates. Breathability is therefore not an optional feature; it is a durability requirement.

CLIMATE VOLATILITY AND THE BREAKDOWN OF HISTORICAL DESIGN ASSUMPTIONS

Traditional waterproofing design was based on assumptions of predictable rainfall patterns, stable groundwater levels, and manageable wet–dry cycles. Climate change has invalidated these assumptions.

Unseasonal rainfall, intense cloudbursts, rising water tables, prolonged humidity, and extreme temperature fluctuations now subject waterproofing systems to:

- Increased saturation cycles
- Wider thermal crack movements
- Longer moisture retention periods
- More aggressive chemical exposure

Anubhav Saxena, Chief R&D Officer at Pidilite Industries Limited, highlights this shift:

'Climate change is causing floods even in traditionally low-rainfall cities. This demands updated waterproofing specifications and a move away from conventional practices'.

Waterproofing systems designed for peak rainfall but not for duration and frequency of exposure now fail prematurely. Climate volatility has transformed waterproofing from a seasonal consideration into a permanent design load.

STRUCTURAL MOVEMENT: WATERPROOFING IN DYNAMIC ASSEMBLIES

Modern structures are no longer static. High-rise sway, post-tensioned slabs, thermal expansion of podiums, and differential settlement introduce continuous movement.

Waterproofing materials must therefore satisfy two conflicting requirements:

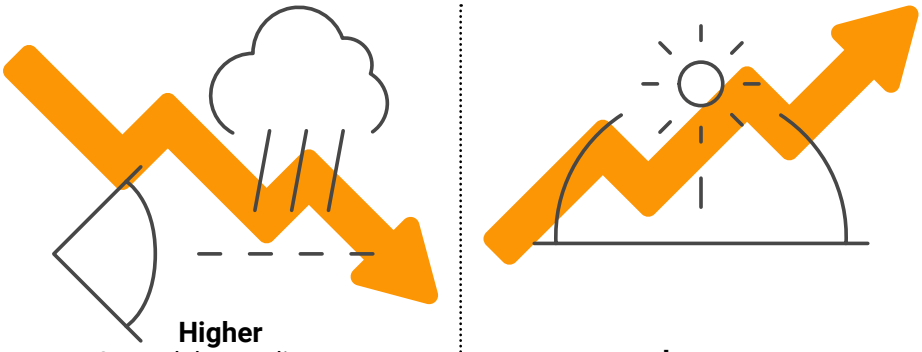
- Strong adhesion to the substrate
- High elasticity to accommodate movement

Rigid systems fail by cracking; highly elastic systems fail if adhesion is compromised. This has driven the adoption of elastomeric, polyurea, and hybrid membranes specified by strain capacity, not just thickness.

Bhatia explains the shift:

'Higher-grade concrete leads to more structural cracking, large podiums cause water stagnation, and post-tensioned slabs introduce movement. Traditional waterproofing methodologies cannot absorb this behaviour'.

Waterproofing System Stress



Higher
Caused due to climate volatility, leading to increased saturation and wider cracks.

Lower
In the case of Traditional Design based on predictable patterns, stable levels.

INTERFACES AS THE PRIMARY FAILURE ZONES

Forensic analysis consistently shows that most waterproofing failures originate at interfaces, not across uninterrupted surfaces. These include:

- Construction and expansion joints
- Pipe and service penetrations
- Tie-rod holes
- Parapet terminations
- Drain outlets

Interfaces combine geometric discontinuity, material incompatibility, and execution variability. Treating them as secondary "details" is a conceptual error; they are primary waterproofing components.

Dr Moulik Ranka, Managing Director, Zydex Industries, articulates the system logic:

'Waterproofing does not fail in the middle of the slab. It fails at joints, terminations, and interfaces. That is where the engineering effort must go'.

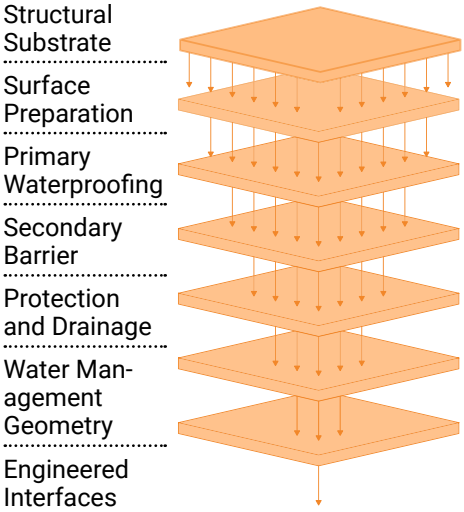
Modern practice therefore integrates factory-made waterstops, swellable profiles, compatible sealant chemistries, and redundant joint treatments into system design.

FROM PRODUCTS TO SYSTEMS: THE EVOLUTION OF WATERPROOFING ENGINEERING

The most significant transformation in waterproofing practice is philosophical rather than material. The industry is moving away from product-centric thinking toward system engineering.

A waterproofing system is a layered, functionally differentiated assembly comprising:

Waterproofing System Layers



- Structural substrate
- Surface preparation and repair
- Primary waterproofing layer
- Secondary or redundant barrier (where risk is high)
- Protection and drainage layers
- Water management geometry (slopes, outlets)
- Engineered interfaces

Each layer serves a distinct role. Expecting a single layer to perform all functions is the root cause of many failures.

Tushar B. Munshi explains their approach:

'We define the waterproofing design layer by layer—from the first application to the last line of defence. Redundancy is intentional'.

Redundancy transforms waterproofing from a barrier problem into a risk-management system.

EXECUTION TOLERANCE AND THE HUMAN FACTOR

Even the best-designed system fails if execution variability is ignored. Construction sites rarely offer controlled laboratory conditions. Moisture levels vary, substrates are imperfect, and timelines are compressed.

Zaheer Abbas, National Target Market Manager – Sealing & Bonding at Sika India, notes:

'Even the best products fail if they are not applied by trained specialist applicators'.

This reality has driven the development of execution-tolerant technologies:

- Pre-applied membranes
- Single-component systems
- Factory-controlled sheets
- Reduced-step chemistries

From an engineering standpoint, the goal is not to eliminate human error, but to limit its consequences.

LIFECYCLE DEGRADATION: WHY LEAKAGE ACCELERATES STRUCTURAL FAILURE

Water ingress is not a static defect; it is a trigger for degradation mechanisms:

- Carbonation lowers concrete alkalinity
- Chloride ingress initiates reinforcement corrosion
- Corrosion induces expansive stresses
- Cracking accelerates further ingress

Once corrosion begins, surface repairs are largely cosmetic. Structural deterioration becomes self-sustaining.

This is why infrastructure owners allocate disproportionate attention to waterproofing despite its small share of project cost. Waterproofing is not a finish. It is embedded durability engineering.

LEGAL, INSURANCE, AND REPUTATIONAL CONSEQUENCES

Leakage has migrated from a maintenance issue to a contractual and legal liability. Courts and tribunals increasingly treat water ingress as a deficiency of service or breach of performance guarantees.

Insurers, responding to rising water-damage claims, are tightening coverage, raising deductibles, and demanding evidence of system-based waterproofing design. Waterproofing is becoming an insurability parameter.

Reputational damage is often greater than legal cost. Leakage erodes occupant confidence, depresses asset value, and undermines brand credibility. Repairs rarely restore trust fully.

Munshi summarises the economic reality:

'Providing a good product at the right price is a win-win. Repairs later are never economical'.

PREDICTIVE SYSTEMS AND SELF-HEALING

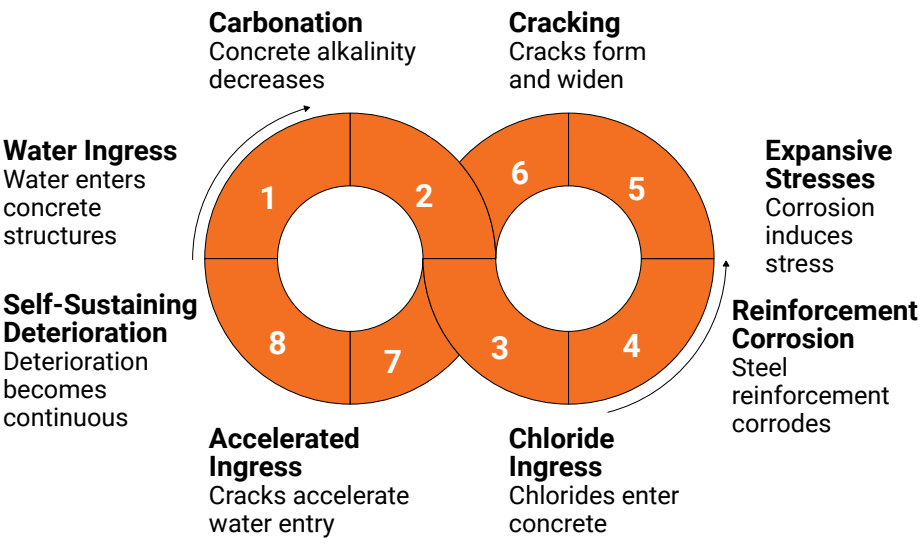
Sensors, IoT monitoring, and AI-driven analytics promise early detection of moisture ingress. Self-healing materials offer autonomous crack sealing. Both are valuable, but neither replaces fundamental resistance.

Saxena cautions:

'Self-healing and predictive systems work best as part of integral systems, not as standalone solutions'.

Detection without resilience merely documents failure. From an engineering perspective, prediction must complement, not substitute, robust system design.

Lifecycle Degradation Cycle



GOVERNANCE, SKILL, AND THE FUTURE OF WATERPROOFING

As systems become more complex, execution competence becomes decisive. Certified applicators, manufacturer-supervised installations, and system warranties tied to audits are becoming standard in high-risk construction.

The future waterproofing ecosystem will be defined by:

- System warranties over product warranties
- Interface engineering over generic detailing
- Design-stage integration over post-hoc fixes
- Lifecycle thinking over defect management

WATER AS THE ULTIMATE AUDITOR

Water is the most honest auditor in construction. It finds the weakest interface, the rushed detail, the compromised layer. It tests structures continuously, under changing conditions, without regard for intent or marketing narratives.

Leakage is therefore not merely a defect. It is a verdict on engineering judgement, execution discipline, and governance integrity.

In an era of climate uncertainty, legal scrutiny, and informed occupants, dry structures are not a premium—they are the baseline of trust. Waterproofing must move from the margins of drawings to the centre of construction engineering.

Because when water leaks, brands do not merely repair walls—they repair credibility.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THE SILENT GUARDIANS OF INDIA'S HIGH-RISE FUTURE

AN H&B EDITORIAL DIALOGUE WITH SIKA INDIA'S ZAHEER ABBAS & NIKHIL BHATIA

*As Indian cities like Mumbai stretch higher and denser, and climate variability compounds the challenge of building resilience, the unsung heroes of construction are not always the tallest cranes or the heaviest machinery — they are the invisible layers of protection that keep water, weather, and time at bay. Waterproofing and sealants, once considered ancillary, have emerged as critical enablers of longevity and sustainability in the built environment. Homes & Buildings Magazine sat down with **ZAHEER ABBAS**, National Target Market Manager – Flooring and Sealing & Bonding, **NIKHIL BHATIA**, National Target Market Manager – Waterproofing & Roofing, both from Sika India Private Ltd., to decode the evolving demand, innovation, and sustainability roadmap shaping these sectors.*

ZAHEER ABBAS
National Target Market Manager – Flooring, Sealing & Bonding, Sika India Pvt. Ltd.

NIKHIL BHATIA
National Target Market Manager – Waterproofing & Roofing, Sika India Pvt. Ltd.

Q Over the past 2–3 years, how has the demand for waterproofing and sealant systems changed, especially in dense and coastal cities like Mumbai?

Zaheer Abbas: 'In parallel, demand for sealants and adhesives has surged with the boom in high-rise and coastal development. Cities like Mumbai, where land constraints push vertical growth, are relying increasingly on silicone, polyurethane, and hybrid systems for façades, curtain walls, and expansion joints. Essentially, design innovation is inseparable from sealant innovation'.

Nikhil Bhatia: 'The waterproofing chemicals segment is expanding at over 13% CAGR (2023–2028). The growth is driven by residential, commercial, and infrastructure projects fuelled by developer's awareness, RERA guidelines, and the structural complexities of high-rises construction, government infrastructure boost etc.. New construction technologies also demand advanced waterproofing systems'.

Q Climate variability and urban flooding are rising concerns. What new challenges are developers facing?

Abbas: 'Coastal zones bring their own threats — humidity, salt-laden air, and heavy rainfall. These demand UV-resistant, marine-grade, elastomeric sealants. The push today is for longer lifecycle solutions that withstand aggressive environments without premature failures'.

Bhatia: 'Basement waterproofing is now a key battleground. Confined spaces, structural requirements like rock anchors and pressure release pipes, and terraces cluttered with services mean that traditional methods often fall short. Developers need new technologies designed to detail such complexities'.

Q Which sectors are leading demand for your solutions?

Abbas: 'In sealants, it's high-rise commercial and industrial sectors. Office parks, malls, hospitals, and airports are big demand drivers. In industries like pharma, food,

and automotive, hygiene and chemical resistance requirements further amplify the shift to high-performance, low-VOC sealants'.

Bhatia: 'Residential segment continues to dominate due to sheer scale. But the story lies in its complexities — from deep basements to podiums with dense plantation along with sway in high-rise buildings etc. The Regulatory frameworks and market awareness have accelerated adoption of chemical-based systems'.

Q What innovations are Sika bringing to market?

Abbas: 'Sealants are evolving through PurForm® Technology. Traditional 1K PU sealants release CO_2 during curing, causing bubbles and health hazards.

PurForm eliminates this, offering bubble-free curing, high thermal stability, low VOCs, and non-toxic, odourless application. This is sustainability meeting performance head-on'.

Bhatia: 'We've introduced Fully Bonded FPO Membranes with A+ Technology for raft foundations — high-performance, weldable, and superior to conventional membranes'.

'Our Wet Bonded SBS Membranes solve the challenge of moisture-laden retaining walls'.

'And with Under-Tile Waterproofing Membranes, speed meets performance — no plastering required, just direct adhesion'.

Q Could you share a case study where these technologies proved decisive?

Bhatia: 'Bridge deck waterproofing is a perfect example. Structures like Atal Setu and the Mumbai Coastal Road endure vehicle vibrations at 100 km/h.

Using our spray-applied polyurea membrane Sikalastic® M 800, we delivered solutions that bond with hot bitumen at 160°C while resisting dynamic crack movement. It's proof that waterproofing is not just protection — it's engineering resilience'.

Q How do your solutions align with green building benchmarks?

Abbas: 'We're already ahead of EU regulations with PurForm® Technology, which ensures safer chemistry and lower monomeric content.

In India, this aligns seamlessly with GRIHA, LEED, and IGBC norms, and supports the broader net-zero agenda. Our sealants are not just about performance, but about reducing hazards and environmental footprints'.

Bhatia: Many of our technologies are Singapore Green Labelled and also offer certified with EPD. EPD provides information to buyers about a product's impact on the environment, such as global warming potential, smog creation, ozone depletion and water pollution.

An EPD is a summary of the lifecycle assessment (LCA) for a product from material extraction to production, shipping, consumption and disposal.

Q In a price-sensitive market, how do you balance affordability and technical performance?

Abbas: 'Price is always a factor, but longevity, trust, and after-sales service build real value. Local production, strong R&D, and sustainable sourcing let us deliver justifiable premiums without compromising access'.

Q And what advice would you give to architects and developers?

Abbas: 'Treat product selection as performance-based, not feature-based. Environmental and lifecycle demands vary structure to structure. And remember — application is as critical as specification. Only certified specialist applicators can unlock the true potential of high-performance sealants. Joints are everywhere; managing them well is the foundation of durability'.

GREEN ROOFING WITH SUPERIOR WATER PROOFING FOR SUSTAINABLE CITIES

*A candid exchange with **MEHUL PARIKH**, President- Customer Service Group, Construction Chemicals, Pidilite, on Integrating Nature and Technology, and how Waterproofing enables the Rise of Resilient, Eco- friendly and Sustainable Rooftops.*

As cities continue to grow vertically, the concept of green roofs is taking root—literally and figuratively—across the world. Green roofs—also known as vegetative or living roofs—are roof surfaces that are partially or completely covered with vegetation, planted over a waterproofing membrane. Far from being just decorative, green roofs play a vital role in sustainable urban development.

With the 2024 update to the Energy Conservation and Sustainable Building Code (ECSBC) in India, green roofs are no longer just a sustainability buzzword but a strategic mandate for future-ready buildings. The new ECSBC code highlights the role of green roofs in reducing the Urban Heat Island (UHI) effect, improving thermal performance, and enhancing liveability in dense urban settings.

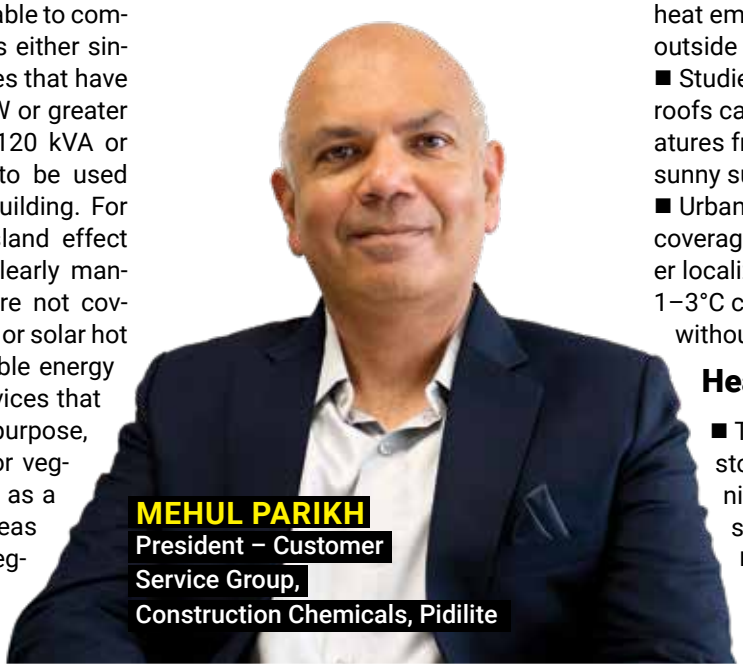
The new ECSBC is applicable to commercial and office buildings either single or for building complexes that have a connected load of 100 kW or greater or a contract demand of 120 kVA or greater and are intended to be used for commercial or office building. For reduction in urban heat island effect minimization the ECSBC clearly mandates that all roofs that are not covered by solar photovoltaics, or solar hot water, or any other renewable energy system, or utilities and services that render it unsuitable for the purpose, shall be either cool roofs or vegetated roofs. For qualifying as a vegetated roof, the roof areas shall be covered by living vegetation of >50 mm high.

One of the primary benefits of green roofs is their ability to mitigate the UHI effect. Conventional rooftops, made of concrete and asphalt, absorb and radiate heat, causing cities to become significantly warmer than surrounding rural areas. Green roofs, with their vegetation layers, act as natural insulators—absorbing less heat, reducing surface temperatures, and lowering ambient heat levels. This has a cascading impact on reducing energy consumption for cooling, thereby improving a building's energy efficiency.

Some of the known and proven benefits of Green Roofs in Urban high population density areas are :

Evapotranspiration

- Vegetation on green roofs releases water vapor through transpiration and evaporation.
- This process cools the surrounding air, lowering ambient temperatures, especially during hot days.



MEHUL PARIKH
President – Customer Service Group,
Construction Chemicals, Pidilite

Albedo Effect & Surface Temperature

- Conventional roofs (e.g., concrete, bitumen) absorb and retain heat due to low reflectivity.
- Green roofs have a higher albedo and lower thermal mass, meaning they absorb less heat and radiate less back into the environment.
- While green roofs may not have the highest albedo, they compensate by cooling through evapotranspiration, providing similar thermal comfort benefits.

Thermal Insulation

- The vegetation and growing medium provide insulation, reducing heat transfer to the building and limiting heat emissions from the roof to the outside air.
- Studies show that extensive green roofs can reduce roof surface temperatures from 60–80°C to 30–35°C on sunny summer days.
- Urban areas with high green roof coverage experience significantly lower localized air temperatures—often 1–3°C cooler than comparable areas without green roofs.

Heat Storage Reduction

- Traditional roofing materials store heat and release it at night, keeping cities warm after sunset.
- Green roofs reduce this nighttime heat release by limiting daytime heat absorption.

Enhancing Thermal Comfort

■ Indoor Temperature Regulation.
■ Green roofs can potentially reduce indoor temperatures by up to 2–5°C in summer.
■ This leads to more stable indoor climates, especially in upper-floor rooms directly beneath the roof.

Reduction in HVAC Load

■ Cooler indoor spaces reduce the need for air conditioning, cutting energy consumption and improving comfort.
■ Outdoor Microclimate Improvement.

Noise and Air Quality Benefits

■ Vegetation also improves acoustic insulation and traps airborne pollutants, contributing to a more comfortable, and healthier indoor and rooftop environment.

Global best practices offer valuable lessons. Singapore's government-led Green Roof policy mandates rooftop greenery for new buildings through its Landscaping for Urban Spaces and High-Rises (LUSH) initiative. It integrates greenery into urban planning to tackle climate challenges while making the city more liveable. Cities like Toronto and Copenhagen have also incorporated mandatory green roofing into building codes, encouraging biodiversity and better stormwater management. In Toronto, studies suggest that greening just 25% of city rooftops could reduce the UHI effect by 1 °C, while 50% coverage could achieve a 2 °C drop. Similarly, modelling in Seoul showed that greening 90% of rooftops could cool city air by up to 0.54 °C, reduce surface temperatures by 2.17 °C, and cut energy consumption by 7.7%.

From a human-centric perspective, green roofs improve the quality of life for occupants. Access to rooftop gardens has been linked to reduced stress levels, better mental well-being, and opportunities for urban farming and community interaction. For commercial spaces, green roofs create breakout zones, recreational spaces, and even co-working terraces—fostering healthier and happier environments.

However, the success of green roofs lies beneath the surface: in the robustness of their waterproofing systems. Unlike standard roofs, green roofs

Singapore's government-led Green Roof policy mandates rooftop greenery for new buildings through its Landscaping for Urban Spaces.

demand a robust, high-performance waterproofing layer that can withstand root penetration, resist constant moisture exposure and water immersion conditions , have high chemical resistance, and sustain temperature variations. A failure in waterproofing not only jeopardises the roof structure but also undermines the environmental benefits.

A comprehensive and effective Green Roof system necessarily includes multiple functional layers starting with a properly designed structural roof slab/ side walls , a robust waterproofing that resists permanent water immersion conditions, soil filter and drainage systems , root barriers in large planter / tree pit zones, and irrigation, followed by the horticultural layers and plantation depending on their complexity.

At Pidilite , with a vast experience of several decades and several successful Green Roofs done in India , we recommend a multi-layered waterproofing approach including a root-resistant liquid spray applied waterproofing membrane, a geotextile protective layer followed by slope making screed with a soil filter cum drainage layer as a minimum . Incorporating a spray applied PUF thermal insulation sandwiched between the primary waterproofing layer and with a waterproof sealer coat on the top , below the screed further enhances the overall system with heat insulation benefits and makes it compliant to new ECSBC guidelines. This ensures long term durability and leakproof performance across all weather cycles .

At Pidilite Industries we understand the challenges posed by the demanding conditions that a Green roof entails . With our extensive portfolio of high-performance waterproofing products under brands like Dr. Fixit, we offer tailored solutions for Green Roof systems—including root-barrier coatings, breathable membranes, and systems tested for durability and longevity.

Our Pidilite Professional Solutions team backed by our technical Product Specialist experts work closely with architects, structural engineers , developers and contractors, and project management consultants to recommend system-based waterproofing solutions that are compliant with relevant codes and best practices.

Few current promising Initiatives in India for Green Roofs

■ Delhi Development Authority (DDA) has explored green roof pilots.
■ IGBC & GRIHA Rating Systems award points for rooftop greening.
■ Private Sector Adoption: Some IT campuses, malls, and institutions have implemented extensive green roofs for energy savings and aesthetics.

Few Recommendations for India to consider for promoting Green Roofs are

■ **Policy Mandates:** Consider introducing city-level requirements for large or government buildings.
■ **Incentives:** FSI bonuses, stormwater credits, or property tax incentives to encourage adoption.
■ **Building Codes:** Integrate green roof provisions in National Building Code (NBC) or state bye-laws and develop relevant IS standards for green roof construction.
■ **Demonstration Projects:** Showcase pilot projects in smart cities or government constructed office buildings and mass housing projects to build confidence.
■ **Public-Private Partnerships:** Encourage corporate campuses and real estate developers to adopt green roofs via CSR or ESG incentives.

As GREEN buildings become the norm, green roofs are more than an aesthetic choice—they are a climate action tool, a wellness enabler, and a technical challenge worth mastering. With the right approach and solutions, India's rooftops can transform from barren slabs into thriving ecosystems.

WATERPROOFING IS THE BACKBONE OF A HEALTHY BUILDING

*With over 26 years of technical experience across construction chemicals, structural rehabilitation and waterproofing consultancy, **TUSHAR B. MUNSHI** brings deep insight into why waterproofing must be treated as a specialised discipline, and not as a last-minute site activity. In this candid interview, he explains the causes of leakage, evolving innovations, and why India urgently needs trained professionals in waterproofing.*

TUSHAR B. MUNSHI
B.Tech (Chem. Engg) ; MBA (Mktg)
Director of Shubh Constrocare Products and Services - Consultancy & Contracting in Waterproofing, Structural Strengthening & Epoxy Flooring.
Director of Tequasil Materials Pvt Ltd - Manufacturing of construction chemicals

Q How important is waterproofing for a structure?

Waterproofing goes far beyond preventing water from entering a building. It plays a decisive role in preventing reinforcement corrosion, maintaining the structural integrity of the building, preserving aesthetics, and avoiding health hazards caused by dampness and fungal growth. In the long run, it saves homeowners and developers from significant financial losses related to repairs and rehabilitation. In many ways, waterproofing is the foundation of a building's durability.

Q What causes leakages in buildings?

Most leakages stem from identifiable weaknesses within the structure. These include natural porosity in concrete, cracks of various sizes, construction or pour joints, tie-rod holes, honeycombing in concrete, gaps between pipes and core cuts, weak interfaces where two dissimilar materials meet—such as windows fixed against masonry or glass set in metal—and faulty plumbing joints. Each of these creates a potential path for water to enter and travel through the structure.

Q What does it take to deliver an effective waterproofing solution?

The golden rule is simple: treat the source. Once the origin of leakage is identified and addressed, a reliable waterproofing system can be designed. This begins with a detailed study of site conditions, which vary from project to project. Selecting the correct product is equally critical—since no single product fits all problems. Proper surface preparation, including grinding, cleaning, sealing cracks and rectifying concrete defects, is essential for any system to function. Finally, waterproofing must always be approached as a system—a combination of surface preparation, the right product, quality application, suitable overlays and efficient drainage. It is this integrated system that guarantees long-term success.

Q How is waterproofing evolving as construction technology becomes faster?

Speed is now central to construction economics. With precast systems, modular concrete sections, prefabricated elements, and aluminium formwork becoming common, waterproofing must evolve alongside these technologies. This has led to innovations such as mechanised

surface preparation, spray-applied coatings and high-performance products designed to cure faster without compromising quality. Modern methods also introduce new leakage risks—like precast joints, tie-rod holes and strip joints in aluminium formwork—which require specialised sealing solutions. Today, waterproofing must be both technologically advanced and aligned with the accelerated pace of modern construction.

Q How does a waterproofing consultant add value during construction?

A waterproofing consultant brings focussed technical oversight across design, specification and execution. They review drawings, recommend systems suited to site conditions, and align waterproofing with other services such as structural elements, plumbing and HVAC. In the rush to speed up construction, waterproofing often receives inadequate attention; a consultant ensures that doesn't happen. By monitoring product selection, system design and execution, they safeguard the project's long-term performance. Essentially, the consultant acts as the project's dedicated custodian for waterproofing excellence.

Q What makes basement waterproofing particularly challenging in urban areas?

Urban projects often require deep basements for parking, but redevelopment sites generally have very tight working spaces. These constraints make basement waterproofing complex. Over the last 23 years, we have developed solutions that allow positive-side waterproofing even in confined environments—avoiding the need for negative-side treatments, which can accelerate corrosion of the reinforcement. Because soil layers, water tables and urban site conditions vary dramatically from location to location, every basement requires a customised design, product specification and treatment strategy.

Q What latest innovations has your company introduced?

One major innovation is our specially developed gunnable cementitious waterproof mortar, designed to fill and seal tie holes and strip joints in aluminium formwork. These penetrations run through the entire concrete thickness, and conventional grouts often fail to seal them completely. Our ready-to-use mortar, which can be applied using a sealant gun, ensures full-depth sealing and has been thoroughly tested over the past two years by several leading construction companies. Additionally, we have upgraded our crystallisation systems, bonding agents and liquid-applied membranes to align with faster construction cycles and evolving environmental demands.

Q Is there a standard approach to maintenance waterproofing?

Currently, maintenance waterproofing in India remains largely unorganised. It is dominated by local plumbers, painters and small contractors who may not be fully trained in product selection, application techniques or standard operating procedures. While retail brands attempt to train labour, overall standardisation remains inadequate. As consultants, we are trying to bring structure into this space by introducing solution charts, promoting correct preparation methods, outlining proper application procedures and implementing checklists for each stage of work. We are also investing in predictive technologies—IoT, sensors, data analytics and AI—to make waterproofing measurable, trackable and proactive in the future.

Today, waterproofing must be both technologically advanced and aligned with the accelerated pace of modern construction.

Q How important is training in waterproofing, and what initiatives are you leading?

Training is absolutely essential. Waterproofing demands technical knowledge, hands-on skill and continuous upskilling, especially as products and technologies evolve. Both classroom sessions and on-site training are crucial to ensure consistent, durable results. As the Training Head of the Waterproofers Association of India (WAI), I oversee nationwide programmes aimed at professionalising the waterproofing community. At our office, we have a dedicated training facility where we educate stakeholders across the ecosystem. Our mission is clear: to build a technically strong, skilled community of waterproofing professionals and elevate the discipline to a respected and essential branch of construction.

REINVENTING WATERPROOFING WITH NANOTECHNOLOGY

THE ZYDEX WAY OF PROTECTING THE FUTURE OF CONSTRUCTION

In a country like India, where structures are exposed to intense heat, heavy monsoons, fluctuating humidity, and rising environmental stress, waterproofing is no longer just an optional finishing layer; it is a critical part of ensuring structural durability and long-term performance.

From residential homes and commercial buildings to large-scale infrastructure projects, water ingress remains one of the biggest causes of structural deterioration. What often begins as minor dampness or seepage can gradually evolve into cracks, corrosion, surface damage, and even structural instability.

At the same time, the construction industry is under growing pressure due to the rapid depletion of essential natural resources such as cement, sand, aggregates, soil, and bricks. Extending the life of buildings is therefore not only an economic necessity, but also an environmental responsibility.

This is where Zydex's nanotechnology-based waterproofing solutions are redefining the future of construction protection.

The Hidden Threat: Water Ingress and Structural Damage

Concrete may appear dense and solid, but microscopically it contains pores, capillaries, and nano-sized voids that allow water to penetrate over time. This moisture intrusion triggers damaging chemical reactions that lead to efflorescence, fungal and algae growth, carbonation, crack formation, corrosion of reinforcement steel, and a gradual loss of structural strength and durability. Structures exposed to high soil moisture, coastal conditions, or high-water tables are especially vulnerable, making effective waterproofing essential for long-term protection.

Why Conventional Waterproofing Systems Fall Short

Traditional waterproofing technologies primarily function by creating a superficial film or coating over the surface. While these systems may provide temporary protection, they often fail to address the root problem, the penetration of water through the micro and nano pores of concrete.

Over time, these surface films may crack, peel, or degrade due to UV exposure, weather fluctuations, and substrate movement.

The Zydex Approach: Penetrative & Reactive Waterproofing Technology

Recognizing the limitations of traditional systems, Zydex developed an advanced penetrative and reactive waterproofing technology powered by nanotechnology.

DR MOULIK RANKA
Managing Director,
Zydex Industries

Unlike conventional coatings, Zydex organosilane based waterproofing solutions are engineered at the nano level to deeply penetrate concrete and masonry substrates. Once inside, they chemically react within the pore structure to create long-lasting hydrophobic protection.

Rather than merely covering the surface, the technology becomes an integral part of the substrate itself.

This breakthrough approach offers multiple advantages:

- **Deep Penetration Protection**

Nano-sized molecules penetrate the micro and nano pores of concrete, creating a protective barrier from within rather than only on the surface.

- **Long Service Life**

The technology delivers exceptional UV stability and can provide protection for up to 20 years, significantly extending the lifespan of structures.

- **Easy Application**

Designed for practical site conditions, the system minimizes application errors and ensures consistent performance even across large-scale projects.

- **Cost-Effective for Mass Adoption**

By combining durability, efficiency, and affordability, the technology becomes viable not only for premium infrastructure but also for affordable and mass housing projects.

Building Sustainable Structures for the Future

As urbanization accelerates and infrastructure demands continue to rise, the construction industry must shift from short-term repair thinking to long-term durability planning.

Waterproofing is no longer just about preventing leaks; it is about preserving resources, reducing maintenance costs, enhancing structural safety, and increasing the service life of buildings and infrastructure.

Through nanotechnology-driven innovation, Zydex (www.zydexpaints.com) is enabling the next generation of smarter, more durable, and more sustainable construction practices.

The strongest structures are not just built well; they are protected intelligently.

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India Cement Sector Sees New Adani NAREDCO Alliance

A newly forged strategic alliance between Adani Cement and the National Real Estate Development Council (NAREDCO) signals a concerted effort to align the building materials sector with India's accelerating housing and infrastructure demand. The pact, announced this week, is positioned as a response to mounting construction requirements across urban and peri-urban India — and a nod to the government's long-term vision for inclusive infrastructure growth.

Under the collaboration, Adani Cement will integrate its broad building materials portfolio, research capabilities and technical knowledge with NAREDCO's nationwide network of industry stakeholders, which includes thousands of real estate developers, financiers and construction firms. In theory, the alliance aims to bridge supply-side gaps while promoting modern construction technologies and workforce skill development, industry stakeholders say. For urban planners and housing advocates, the tie-up comes at a critical moment. India's urban population continues to expand rapidly, with metropolitan clusters and tier-2 cities driving demand for both affordable and mid-segment housing.

Cement remains a foundational input for these projects, and reliable access to quality materials can simplify timelines and moderate costs for developers and municipal projects alike. Strengthening this supply chain through institutional partnerships could thus support more predictable project delivery. Analysts also note that enduring sector challenges — including volatile raw material prices and logistics bottlenecks — require coordinated responses, not isolated corporate initiatives.

Sustainability and workforce capacity are also flagged within the partnership's objectives. As India transitions toward lower-carbon construction methods, cement producers face pressure to reduce embodied emissions, enhance material efficiency and promote circular economy practices on urban job sites. NAREDCO, with its industry convening power, could play a role in diffusing best practices and technical standards across its member base. This is especially relevant as green building certifications and lifecycle carbon assessments become more mainstream in large-scale developments.

JK Cement Opens Buxar Facility To Push Local Supply

A significant industrial milestone unfolded this weekend as a major cement manufacturing facility was inaugurated in Buxar district, underscoring Bihar's escalating role in regional infrastructure and building materials production. The commissioning of the new unit, officiated by the state's Deputy Chief Minister at a high-profile 'Bhavya Lokarpan' ceremony, signals a strategic shift toward localised construction supply and economic diversification in eastern India.

Located along the Patna–Buxar corridor, the ₹500 crore facility spans about 100 acres and is designed to produce up to three million tonne of cement annually. This capacity addition will bring manufacturing closer to major construction and civic development sites across Bihar, reducing dependency on long-haul deliveries from plants in neighbouring states. The positioning of the plant reflects industry efforts to streamline logistics, improve service responsiveness, and better align production with rapid infrastructure de-

mand in urbanising regions.

Officials from the state government and company leadership highlighted the broader regional implications of the project. From employment creation to supply chain localisation, the new plant is being viewed as a catalyst for jobs both within the facility and across ancillary sectors such as transport, warehousing, and local materials supply. "Industrial investments like this are integral to Bihar's growth trajectory," a senior government official said, noting that such facilities can enhance regional competitiveness while nurturing skill development among the local workforces.

Urban planners and infrastructure analysts note that the cement sector plays a foundational role in shaping climate-resilient cities and enabling large-scale public works. A manufacturing base within the state's borders supports shorter delivery windows for construction projects, which can accelerate timelines for housing, roads, and civic utilities. While the primary focus remains on expanding capacity, industry observers also emphasise the need for environmental safeguards to balance industrial growth with sustainable development goals.

The plant's inauguration coincides with broader industrial momentum in Buxar, where another significant facility — a major bottling plant by a global beverages partner — was also launched. Together, these projects — amounting to over ₹1,700 crore in investment — form a diverse industrial foundation intended to extend economic opportunity beyond traditional agriculture-centric employment. Such an ecosystem aims to support Bihar's aspirations for long-term job creation and inclusive growth across districts.

Thyssenkrupp-Jindal talks pause amid steel crisis

A planned transaction between Thyssenkrupp AG and Jindal Steel International has been put on hold, underscoring mounting pressures on the global steel industry as energy costs and supply disruptions reshape industrial strategies. The German industrial group confirmed that discussions over the potential sale of its steel division have been paused, citing shifting economic assumptions and volatile operating conditions.

The halted talks come after months of negotiations triggered by Jindal Steel International's earlier bid to acquire a stake in Thyssenkrupp Steel Europe. However, both sides have now stepped back, acknowledging that the underlying conditions supporting the deal have changed significantly in recent months.

A key factor influencing the pause is the ongoing fuel and energy crisis affecting steelmakers globally. Rising input costs—driven in part by geopolitical tensions and disruptions in fuel supply—have increased production expenses and strained margins across the sector. In India, similar shortages have already forced some steel producers to scale down operations, highlighting the fragility of energy-dependent industries.

For urban economies, the implications are substantial. Steel is a foundational material for infrastructure, from transport networks and housing to industrial corridors. Any disruption in production or pricing directly affects construction timelines, project costs, and long-term urban planning. Industry analysts note that volatility in steel supply chains can ripple through real estate markets and public infrastructure investments, particularly in rapidly growing cities.

The pause also reflects deeper structural challenges. Negotiations had reportedly encountered hurdles around long-term liabilities, investment commitments, and the cost of transitioning to cleaner production methods.

Taj Cement expands into roofing solutions

A regional building materials manufacturer, Taj Cement, has signalled a strategic shift beyond core cement production by introducing roofing solutions at a large dealer engagement in Guwahati. The move, announced during an annual gathering of over 300 distributors, reflects a broader trend among construction material firms to diversify product portfolios in response to evolving housing and infrastructure needs.

The launch, under the "Taj Roofing" line, positions the company within a growing segment of prefabricated and metal roofing systems—an area gaining traction in India's northeastern states where climate resilience and rapid construction cycles are critical. The products are designed to offer durability, weather resistance, and corrosion protection, addressing challenges posed by high rainfall and humid conditions in the region.

For Taj Cement, which operates under Hills Cement Company Limited, the expansion signals a shift towards integrated building solutions. Traditionally focused on cement supply for residential and infrastructure projects, the company is now extending its role into structural components that directly influence building performance. Industry experts suggest this reflects changing demand patterns, where developers and homeowners increasingly prefer bundled material solutions to reduce construction time and complexity.

The timing of this diversification is significant. Urban and peri-urban areas in the Northeast are witnessing gradual but steady construction growth, driven by improved connectivity, institutional development, and housing demand. Roofing systems—particularly lightweight and prefabricated variants—are becoming central to this expansion, especially in regions where traditional construction methods face logistical constraints.

Beyond product expansion, the company also used the platform to highlight environmental and regional concerns, linking its operations to local ecological awareness campaigns. While such initiatives remain secondary to business operations, they point to an emerging expectation that construction-linked industries contribute to environmental stewardship in ecologically sensitive regions. Urban planners note that integrated material offerings, such as combining cement with roofing systems, can influence how smaller cities and towns develop.

Faster construction cycles and standardised materials may support more efficient housing delivery, particularly in areas where infrastructure gaps persist. However, they also emphasise the need for material choices to align with sustainability benchmarks, including energy efficiency and lifecycle durability.

Shalimar Paints Launches AI Campaign For Home Protection

Shalimar Paints, one of India's oldest paint manufacturers, has unveiled an AI-driven marketing campaign aimed at strengthening consumer understanding of long-lasting exterior protection products, underscoring the evolving role of technology in traditional building materials markets. The initiative, which centres on a creative narrative using artificial intelligence-enabled storytelling, reflects wider shifts in how legacy brands engage homeowners amid rising expectations for durable, resilient homes.

The campaign pivots around two flagship products — a weather-resistant exterior paint boasting up to 12 years of protection and a damp-proofing solution designed to tackle moisture ingress. By leveraging AI-enhanced creative executions, the company intends to demonstrate real-life performance differences in scenarios that resonate with modern urban and suburban consumers. For urban developers, construction planners and homeowners alike, the move signals a broader trend: building products are no longer commodities stripped of narrative. Instead, they are being positioned as integral components of resilient and low-maintenance urban infrastructure. In cities contending with monsoon-induced wear, heat stress and building degradation, durable exterior coatings contribute directly to lifecycle performance and maintenance cost-efficiency — outcomes increasingly prioritised in sustainability agendas.

India Concrete Pipe Market Set To Grow With Urban Renewal

India's urbanisation momentum and infrastructure renewal plans are propelling demand for reinforced concrete pipes (RCP), a foundational material in drainage, water management and civic utilities. Industry forecasts suggest that rising investments in road upgrades, stormwater systems and city-wide sewer networks could expand the market for RCP solutions substantially through 2035, reflecting the country's broad push for resilient, climate-adapted urban infrastructure.

Reinforced concrete pipes are critical in urban settings for directing stormwater, sewage and runoff, and their adoption is tightly linked to infrastructure scaling across both burgeoning metropolises and tier-II/III cities. Urban planners point out that durable pipe networks help contain flood risks — a growing concern as extreme weather events increase — while also underpinning long-term water and sanitation goals. This makes RCPs strategically central to state and municipal infrastructure planning. India's national and state governments have recently elevated investment in water resource management and drainage upgrades as part of urban renewal and climate resilience programmes.

Projects under the Smart Cities Mission, AMRUT (Atal Mission for Rejuvenation and Urban Transformation) and National Infrastructure Pipeline are increasingly factoring in durable linear infrastructure components, where reinforced concrete pipes are preferred for their load-bearing capacity and service life in high-traffic corridors. Urban affairs specialists note that aligning these investments with climate-adaptive design will be key to long-term effectiveness.

According to market analysts, India's RCP segment stands at a crossroads where traditional manufacturing methods are intersecting with technological upgrades such as mechanised batching, improved reinforcement techniques and quality assurance systems. "The shift towards standardised manufacturing and quality certification is enabling more consistent performance, especially under heavy load conditions in urban environments," said a senior manufacturing consultant.

These improvements are critical as cities expand sewerage networks and integrate underground utilities beneath dense road networks. Regional infrastructure projects — including elevated expressways, metro extensions and coastal protection schemes — also contribute to heightened demand for reinforced concrete pipes. In coastal zones, where groundwater tables are high and soil conditions challenging, RCP solutions offer reliability that can reduce long-term maintenance costs and disruption.

HIDRAL S. A. Joins Gilco Global For India Industrial Elevator Solutions

HIDRAL S.A. has entered the Indian market through a strategic collaboration with Gilco Global Pvt Ltd, signalling a focused push to strengthen industrial mobility systems across the country's fast-expanding manufacturing and logistics sectors.

The partnership aims to introduce a new generation of industrial freight elevators designed specifically for India's demanding operational environments. India's industrial landscape is undergoing rapid transformation, driven by growth in e-commerce, organised warehousing, and domestic manufacturing. This shift is increasing the need for reliable, high-capacity vertical transport systems within factories and logistics hubs. Industrial freight elevators, which are engineered to carry heavy goods and equipment across multiple levels, are emerging as a crucial infrastructure component in modern industrial facilities.

The HIDRAL–Gilco Global collaboration is centred on combining global engineering expertise with local execution capabilities. Industry observers note that such partnerships can help address long-standing challenges in the Indian market, including inconsistent safety standards, high maintenance requirements, and the need for equipment that can withstand intensive usage cycles. By aligning international design practices with India-specific conditions, the companies aim to deliver systems that are both durable and compliant with evolving regulatory frameworks. From a broader urban and economic perspective, the expansion of industrial freight elevators plays a significant role in improving operational efficiency within dense urban regions.

As land availability becomes constrained in major cities, vertical warehousing and multi-level industrial facilities are gaining traction. Efficient goods movement within these structures reduces dependency on manual handling, enhances productivity, and can indirectly ease pressure on external logistics networks by streamlining internal operations.

The collaboration is also expected to facilitate knowledge transfer and skill development within the domestic engineering ecosystem.

By deploying technical teams locally and working closely on project execution, both companies are likely to contribute to building specialised expertise in industrial elevator systems in India. As infrastructure investment continues across industrial corridors, logistics parks, and urban manufacturing clusters, the demand for robust and efficient industrial freight elevators is set to rise. The entry of global players through local partnerships indicates a shift towards more technology-driven, safety-oriented solutions that can support India's long-term industrial growth while aligning with sustainable urban development goals.

Kansai Nerolac solution cools public spaces

As rising temperatures intensify across Indian cities and towns, Kansai Nerolac Paints Limited is testing heat-mitigation solutions in public spaces by applying a specialised coating on temple pathways, reducing surface temperatures by up to 15°C. The initiative, carried out across high-footfall religious sites in southern India, reflects a growing intersection between climate-responsive materials and everyday urban infrastructure.The company deployed its heat-reflective coating, Perma NoHeat, on stone pathways commonly used by barefoot visitors. On-ground readings indicated a significant drop in surface heat, improving comfort for pedestrians navigating exposed areas during peak daytime hours. This is particularly relevant in India, where heatwaves are becoming more frequent and public spaces often lack adaptive cooling interventions.Unlike traditional product demonstrations, the application was integrated into real-world settings, allowing users to experience the benefits directly.

The intervention was carried out in coordination with local authorities to minimise disruption while targeting zones with maximum footfall and heat exposure. Urban planners view such experiments as early indicators of how material innovation could play a role in climate-resilient infrastructure. Heat-retaining surfaces such as concrete and stone contribute significantly to the urban heat island effect, where built environments register higher temperatures than surrounding rural areas.

Coatings that reflect solar radiation and reduce heat absorption are increasingly being explored as low-cost, scalable solutions.Perma NoHeat, an acrylic-based coating designed to reflect infrared radiation, has primarily been marketed for rooftops and building exteriors. Experiments like these suggest that materials innovation could become a key lever in shaping more climate-resilient, people-centric urban spaces.

INDIA'S GCC MOMENT

HOW GLOBAL CAPABILITY CENTERS ARE REDEFINING THE OFFICE MARKET AND POWERING EMERGING CITIES

*In discussion with **VS SRIDHAR**, Executive Managing Director- Tamil Nadu & Kerala and Head - GCC Advisory at Cushman & Wakefield on India's commercial real estate and global enterprise journey. Over the last few years, Global Capability Centers (GCCs) have transitioned from being peripheral back-office units to becoming central engines of innovation, decision-making, and value creation. This structural shift is now visibly reshaping India's office markets—across metros and increasingly, across emerging cities.*

VS SRIDHAR
Executive Managing Director – Tamil Nadu & Kerala and Head – GCC Advisory (Operations & Emerging Cities)

GCCs as a Dominant Office Demand Driver

GCCs have emerged as one of the most significant contributors to India's office leasing activity. Their share of total office leasing has risen sharply: from around 12 percent in 2022 to nearly 30 percent in YTD 2025 (Q1–Q3). This growth trajectory is not cyclical. It is structural and is expected to sustain over the medium term.

At the core of this momentum lies India's enduring 'cost plus value' proposition. Beyond competitive operating costs, India offers a rare convergence of a deep talent pool, scalable Grade A office infrastructure, robust digital ecosystems, and increasingly sophisticated urban environments. Notably, India today hosts the world's third-largest AI talent base, accounting for nearly 16 percent of the global AI workforce, significantly strengthening its appeal for high-value, future-ready GCC operations.

Crucially, the GCC ecosystem has matured well beyond traditional offshoring. India is now a global hub for research and development, product engineering, analytics, finance, healthcare innovation, and core business transformation functions. Sectoral participation has diversified meaningfully over the last decade, with engineering and manufacturing, BFSI, and healthcare gaining prominence alongside IT and technology services.

Policy as an Enabler: The Role of State Incentives

State-level policy frameworks have become decisive factors in GCC location strategies. Incentives play a vital role in reducing entry barriers, accelerating setup timelines, and improving long-term operational viability.

Several states—including Karnataka, Andhra Pradesh, Madhya Pradesh, Uttar Pradesh, and Gujarat—have already launched dedicated GCC policies. Haryana and Tamil Nadu have released draft frameworks, while Maharashtra and Telangana are actively developing theirs. Many more states are expected to follow.

These policies typically combine fiscal incentives—such as tax exemptions, subsidies, reimbursements, and innovation grants—with non-fiscal

measures including single-window clearances, digital approval systems, talent skilling support, incentives for local hiring, and plug-and-play infrastructure. A notable strategic shift is the targeted encouragement of GCC expansion into Tier-2 cities, aimed at decentralizing growth and catalyzing technology-led employment.

That said, while incentives are powerful enablers, the next phase of competition will be defined less by subsidies and more by talent depth, infrastructure quality, and scalability.

The Rise of Tier-2 Cities Across Asset Classes

India's Tier-2 cities are witnessing a multi-dimensional real estate upswing, driven by improved connectivity, infrastructure investments, policy support, and expanding talent ecosystems.

- Residential markets continue to be led by affordable and mid-income housing, but there is a visible rise in demand for premium and luxury homes, reflecting aspirational living and rising disposable incomes.
- Office leasing is gaining momentum, primarily supported by domestic enterprises and flexible workspace operators. Select Tier-2 cities are also beginning to attract multinational occupiers as Grade A supply improves.
- Retail real estate is emerging as a key growth segment, driven by evolving consumption patterns, lifestyle-oriented developments, and the entry of national developers, aided by lower land acquisition costs.
- Industrial and warehousing activity is expanding rapidly, propelled by infrastructure upgrades, e-commerce growth, and government-led industrial corridor and logistics hub initiatives.

Together, these trends are transforming Tier-2 cities from peripheral markets into strategic investment destinations.

Infrastructure: The Make-or-Break Factor for Tier-2 GCC Growth

While India's top six cities still account for over 95 percent of GCC leasing, the next growth wave is expected to come from Tier-2 cities such as Coimbatore, Kochi, Thiruvananthapuram, Visakhapatnam, Bhubaneswar, Indore, and Jaipur.

For this momentum to scale, targeted infrastructure upgrades will be critical. These include:

- Expanded airport capacity and improved regional connectivity
- Reliable public transport networks
- Strong digital and data infrastructure
- Enhanced higher education quality and technical skilling ecosystems

Equally important will be the availability of competitively priced land, consistent power supply, and a steady pipeline of Grade A and A+ office developments. Given current supply constraints, many occupiers are entering Tier-2 markets through managed and flexible office solutions—a trend expected to continue in the near to medium term.

Despite global macroeconomic uncertainties, the outlook for India's office market in 2026 remains robust.

Office Market Outlook for 2026: GCCs at the Core

Despite global macroeconomic uncertainties, the outlook for India's office market in 2026 remains robust. Gross leasing volumes are expected to exceed 80 million square feet for the third consecutive year, underscoring sustained occupier confidence.

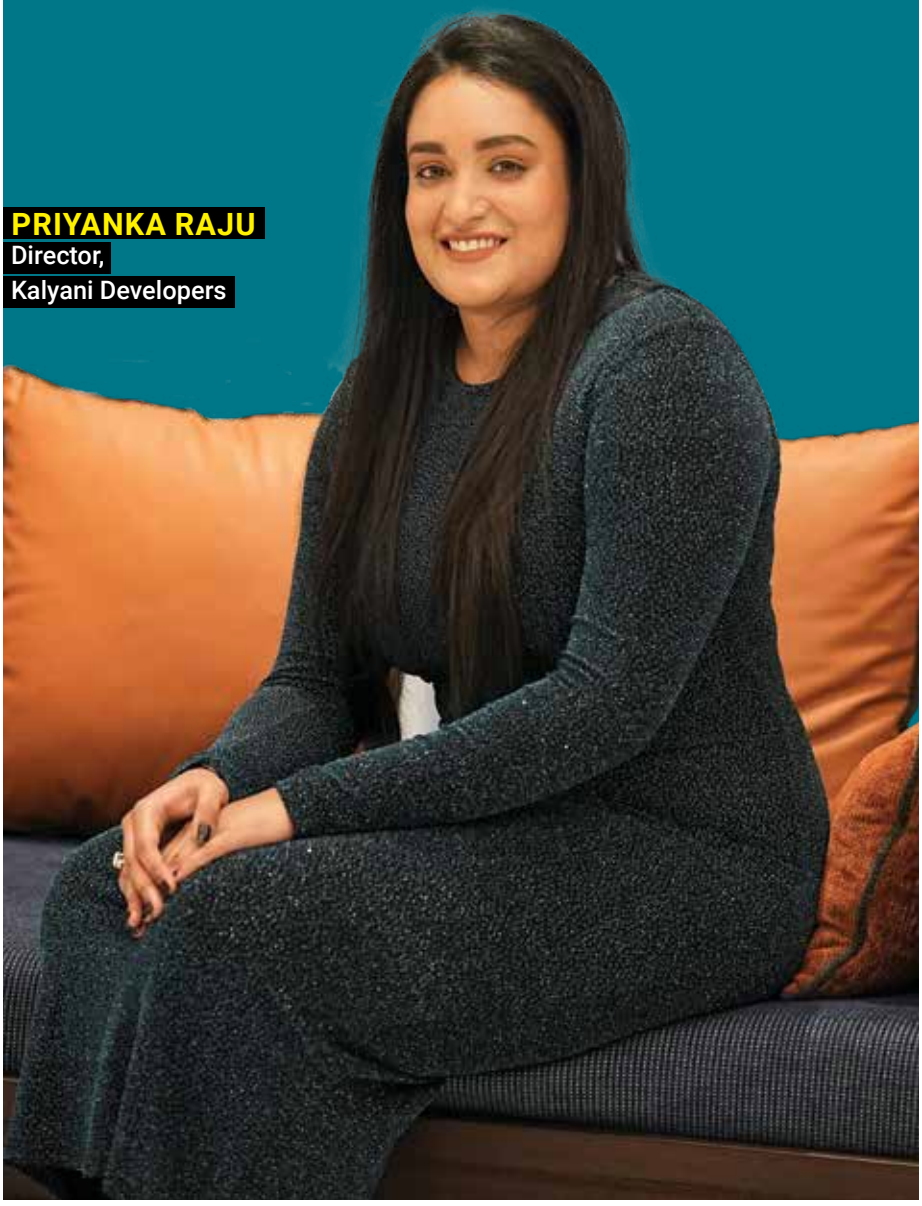
Developers are likely to accelerate supply additions, estimated at 60–62 million square feet, yet demand is expected to outpace supply, resulting in lower vacancy levels and steady rental growth.

GCCs will remain central to this growth narrative. As global enterprises deepen their reliance on India for digital transformation, innovation, and operational resilience, demand for high-quality, sustainable, technology-enabled office spaces will continue to rise.

An important emerging trend is the increasing preference for managed office solutions, driven by benefits such as flexible lease tenures, optimized upfront costs, customized delivery, and simplified payment structures. Collectively, these dynamics will not only sustain healthy office absorption but also reinforce India's position as the world's most compelling GCC destination.

STRENGTH IN SENSITIVITY: A WOMAN'S WAY OF BUILDING CITIES

***PRIYANKA RAJU**, Director Kalyani Developers on Architecture, Leadership and Redefining Real Estate from Within, in an exclusive conversation with Meenakshi Singh.*



PRIYANKA RAJU
Director,
Kalyani Developers

Q You trained as an architect before stepping into leadership at Kalyani Developers. How has that architectural grounding shaped the way you think about business, strategy and long-term value?

It has been about three years since I formally stepped into the business, and while I am actively involved across residential and hospitality ventures, every day continues to be a learning experience under the guidance of my father , whose vision and experience have been foundational to my professional growth. My architectural training has deeply influenced how I approach both design and strategy. Architecture teaches you to think holistically—about space, people, function and context. That mindset naturally extends beyond structures.

Whether it is planning a residential community or a hospitality project, I instinctively visualise how people will experience the space, how it integrates with its surroundings, and what kind of long-term value it creates. This sensitivity to user experience, combined with a growing understanding of business, is shaping a more thoughtful, design-led approach at Kalyani Developers—right from master planning to branding. I see this journey as a marathon, not a sprint, and I am grateful for the strong legacy backing me and the highly capable team that supports me.

Q Real estate remains a largely male-dominated industry. As a woman stepping into leadership, what challenges—and opportunities—have stood out most clearly to you?

Interestingly, when I first entered the business, I didn't carry the mindset that this was a male-dominated space. My focus was on learning, understanding how each vertical, whether commercial, hospitality or residential, actually functions. Over time, however, I did become aware that women are still underrepresented in leadership and decision-making roles. What made a significant difference for me was the unwavering support of my father. He never made me feel that gender was a limitation. He guided me with the same intensity and expectations that he would apply to anyone else, and that was incredibly empowering.

I do believe women bring a distinct sensitivity to this industry, especially in understanding how spaces are used daily and how design impacts lived experiences. That perspective has shaped my approach to projects like DoubleTree by Hilton and our first residential development, LivingTree in North Bengaluru. It is encouraging to see the sector evolving, and I hope to contribute to that change by building with intent and empathy.

Q Can you share how you've consciously used your leadership role to create space for other women within Kalyani Developers?

For me, empowering women has never been about a single moment; it has been about embedding a mindset into everyday decisions. One of the most fulfilling aspects of my journey has been helping create an environment where women feel confident to lead, contribute meaningfully and grow.

When we were building the core team for our residential vertical, we made a conscious effort to bring women into roles that directly shape how projects are designed, communicated and delivered. Today, women lead our Marketing and CRM teams and play critical roles in legal, liaising and design functions.

I strongly believe that diverse perspectives lead to more empathetic and thoughtful outcomes, especially in an industry that shapes how people live.

Q Research shows that representation matters, but bias often persists. From a leadership standpoint, what concrete actions are needed to bridge this gap sustainably?

Visibility is important, but real change happens through everyday leadership choices. It's not just about giving women a seat at the table. It's about ensuring their voices are genuinely heard, respected and acted upon. This means involving women early in decision-making, trusting them with ownership of key projects, and backing their ideas publicly. At Kalyani, we focus not only on qualifications, but also on potential and perspective.

When we see that spark, we make sure it is nurtured and supported. Leaders also need to stay open to feedback and reflection. Inclusion should feel natural, not forced. When the culture is right, empowerment follows organically.

Q In today's competitive real estate environment, what qualities do you believe define a strong brand leader—especially from a woman's leadership lens?

A brand leader today must be deeply connected to both the product and the people it serves. Vision is important, but so is listening—being willing to adapt without losing your core values.

Customers today are informed and value-driven. They prioritise trust, transparency and long-term value over flashy narratives. That means leaders must stay curious, observant and ready to course-correct when needed.

For me, consistency is the quiet strength behind brand building. It's not about one big campaign. It's about showing up the right way, every day, across every touchpoint. In real estate, trust is everything, and once lost, it is very difficult to rebuild.

> ***It's not just about giving women a seat at the table—it's about ensuring their voices are genuinely heard, respected and acted upon.***

Q As Kalyani Developers looks to expand across South India in the luxury and upscale segments, what leadership challenges come with scale?

We are approaching expansion with clarity and intention. After the success of LivingTree, our focus has been on building strategically, not expanding for the sake of scale. We are already working on our next Bengaluru launch while shaping a broader roadmap across South India. The key is understanding each market deeply and ensuring that the Kalyani brand experience remains consistent, relevant and authentic as we grow.

Our brand philosophy has always been rooted in long-term value, thoughtful design and trust—built over decades across commercial, hospitality and now residential real estate. Projects like LivingTree in Bengaluru were not reactions to policy announcements; they were outcomes of long-term urban growth thinking. The Greater Bengaluru Authority framework aligns well with how we plan, anticipating where cities are headed rather than chasing short-term signals.

Q In rapidly changing markets, how do you stay agile without diluting brand authenticity?

Authenticity comes from staying true to your core principles while being attentive to evolving needs. Agility does not mean reacting impulsively, it means responding thoughtfully. At LivingTree, for instance, we introduced Juliet balconies across most units, recognising a post-COVID preference for openness, light and ventilation. It was a small but meaningful decision that enhanced liveability without increasing cost. That is how we define agility—adapting early, but always in a way that feels natural to the brand and valuable to the customer.

Q What is your long-term vision for the Kalyani brand under your leadership, particularly in the context of ESG, digital transformation and evolving consumer expectations?

My vision is to build Kalyani into a people-first, design-forward and future-ready brand. Digital transformation, for us, goes beyond marketing—it's about enhancing the entire customer journey, from discovery to post-possession. On ESG, sustainability is not a narrative; it's a mindset. It already reflects in our planning, materials and community approach, and we intend to formalise this further by measuring and reporting impact. We aim to build quietly, consistently and with purpose—setting benchmarks rather than chasing trends.

> ***You don't have to be loud to be impactful. Influence comes from trust, empathy and logic. And resilience doesn't mean doing everything alone—it means building support systems...***

Q Finally, what advice would you offer aspiring women leaders looking to build influence, credibility and resilience in real estate?

Don't wait to be given space. Claim it with confidence and back it with consistency. Credibility is built by doing the work well, showing up every day and paying attention to detailYou don't have to be loud to be impactful. Influence comes from trust, empathy and logic. And resilience doesn't mean doing everything alone, it means building support systems, learning from setbacks and staying open to growth.

If we continue showing up for ourselves and for one another, we will create lasting space for women—not just in real estate, but across industries.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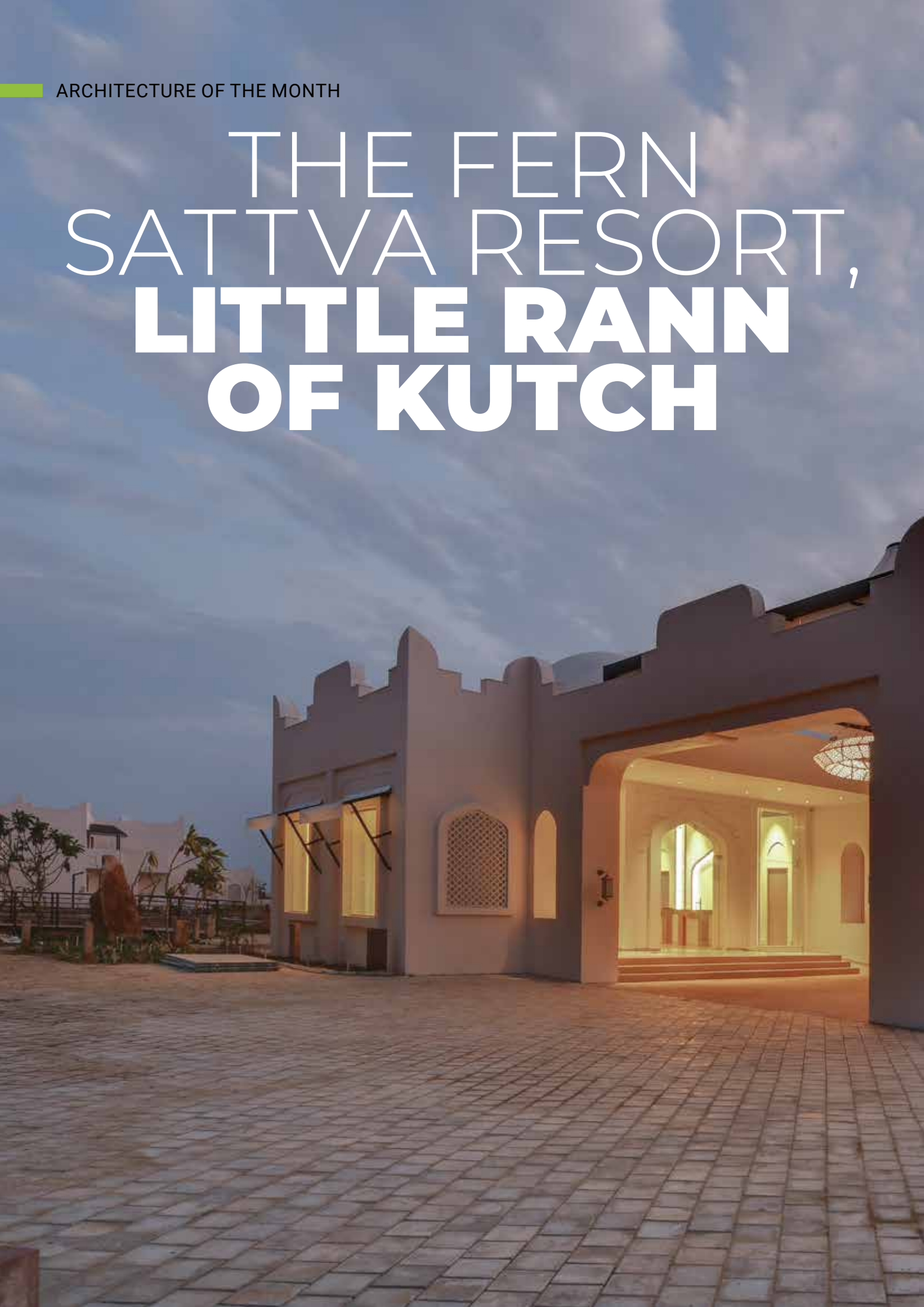

AR. REZA KABUL
Principal Architect
ARK Reza Kabul Architects

The Fern Sattva Resort, Little Rann of Kutch, is a boutique getaway featuring a stunning central waterbody and 47 elegantly designed rooms, including Winter Green Premium Rooms, Hazel Suites, Fern Club Suites, and Fern Club Villas. Each independent suite blends modern comfort with traditional elements, offering guests an authentic yet luxurious experience. The resort also houses a fine-dining restaurant, a versatile banquet hall, and thoughtfully designed outdoor spaces, making it ideal for both leisure and events. Nestled in the heart of Gujarat's wildlife haven, it perfectly balances serene landscapes, warm hospitality, and contemporary amenities, making it a true retreat for nature lovers and explorers.

Located amidst the captivating landscapes of the Little Rann of Kutch, The Fern Sattva Resort is a 47-key property designed for the Kotecha Group, with architecture, interiors, and planning by ARK. The completed resort spans 5.81 acres and is envisioned as an oasis that blends seamlessly into the desert terrain, reflecting both the raw beauty of its natural surroundings and the timeless elegance of Moroccan architecture. Drawing inspiration from the region's flora, fauna, and cultural essence, the design integrates traditional motifs with a young, contemporary aesthetic to create a warm and tranquil environment. Responding to extreme temperatures, clayey water-retentive soil, and saline conditions, a climate-resilient planting palette was adopted, featuring seasonal groves of Cassia, Tabebuia, Bauhinia, and Erythrina for shaded avenues, alongside native grasses such as Pennisetum and Vetiver to reinforce the site's natural grassland character.

A central lily pond, planted with Typha elephantina and saline-tolerant lilies, has been constructed using an HDPE liner instead of RCC to reduce carbon footprint and support local biodiversity, while also serving as an essential water source for birds during dry summers.

The architecture celebrates the intricate craftsmanship of Moroccan design—a refined fusion of North African, Mediterranean, and Islamic influences—expressed through a palette of neutral

desert tones such as sand, taupe, beige, and white. Arches form a defining architectural element throughout the project, with the elegant lancet arch used extensively across both interiors and exteriors, lending a sense of height, rhythm, and visual continuity. Moroccan influence is further articulated through intricate wall patterns, thoughtfully curated lighting, and perforated façade screens, complemented by antique gold finishes in lamps, mirrors, and furniture, adding warmth, depth, and authenticity to the overall spatial narrative. These soothing hues are enhanced by carved wooden elements, traditional trellises, and metal lamps in brass and copper shades, creating an ambiance that is both refined and rooted in place. The resort features 58 beautifully designed accommodations, including cottages, villas, and suites, each offering privacy and a close connection to nature. Amenities such as a multi-cuisine restaurant, banquet hall, spa, and swimming pool are thoughtfully positioned around an artificially created waterbody, transforming the property into a true oasis in the desert.

The design vision aimed to bring together two worlds—the rustic charm of the Kutch desert and the ornate elegance of Moroccan architecture—to create a resort that stands as a symbol of understated luxury. One of the key challenges was to design structures that maintained individual privacy while staying interconnected within the overall layout.

Sustainability was central to the project, with a focus on locally sourced materials, low-maintenance finishes, and cost-effective construction suited to the remote context. Local sandstone has been extensively used in walkways, seating, lighting elements, and landscape features for its durability, natural insulation, and contextual relevance.

Through a seamless blend of cultural sensitivity, environmental responsiveness, and refined design, The Fern Sattva Resort emerges as a tranquil sanctuary—capturing the spirit of its setting while offering a luxurious retreat in harmony with nature.

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H&B Media Networks is a diversified media and knowledge ecosystem focused on the urban built environment, real estate, infrastructure, architecture, construction technology, sustainability, and city development. The network functions as a multi-platform media, advisory, and thought leadership organization connecting developers, architects, policymakers, investors, channel partners, manufacturers, consultants, and urban stakeholders. At its core, H&B Magazine, which is designed to go beyond conventional B2B journalism by creating an integrated platform for industry dialogue, business interaction, policy advocacy, knowledge exchange, and urban transformation narratives.

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