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Beyond Footfall Recovery: A Post-COVID Resilience Index for Mall 2.0 vs. Traditional Retail Typologies in Indian Smart Cities

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Abstract: *The COVID-19 pandemic triggered an unprecedented disruption to India's retail real estate sector, yet its aftermath revealed a stark divergence in recovery trajectories across mall typologies. This paper proposes and validates a composite Retail Resilience Index (RRI) that quantitatively distinguishes the post-pandemic performance of "Mall 2.0" developments—experiential, lifestyle-oriented Grade A malls—from traditional retail-centric malls in India's National Capital Region (NCR). Drawing on secondary data from industry reports (Knight Frank, CBRE, JLL), REIT disclosures, and a structured survey of 15 mall operators and real estate consultants, the RRI integrates four weighted dimensions: rental yield stability, vacancy rate recovery trajectory, footfall rebound ratio, and tenant retention rate, aggregated through an Analytic Hierarchy Process (AHP). Results across six case-study malls in Gurugram and Noida indicate that Mall 2.0 assets scored 22–31 percentage points higher on the composite RRI than traditional malls, with the sharpest divergence appearing in the footfall rebound and tenant retention dimensions. The findings reframe post-pandemic mall resilience as fundamentally a function of experiential diversification rather than mere retail recovery, offering a replicable assessment tool for smart city infrastructure planning and commercial real estate investment appraisal in emerging economies.*

Keywords: post-COVID resilience, Mall 2.0, experiential retail, composite index, AHP, smart cities, retail real estate, NCR India

I. INTRODUCTION

India's organised retail real estate market was valued at approximately USD 8.5 billion in 2023, and even by conservative estimates, it is growing at 12–15% annually [1]. Yet beneath this headline optimism lies a deeply fractured landscape. Knight Frank's 2024 survey documented that "ghost" shopping centres—those with vacancy rates exceeding 40%—expanded by 59% in a single year, with Delhi-NCR alone accounting for 5.3 million square feet of near-empty retail space [2]. At the very same time, Grade A lifestyle-oriented malls in the same geography were posting occupancy rates north of 97% and recording their highest-ever quarterly footfall numbers [3]. This is not a paradox that resolves neatly into "good management versus bad management." Something more structural is going on.

The structural shift, as we argue in this paper, hinges on what the retail industry increasingly calls "Mall 2.0"—a typological pivot from transaction-heavy retail boxes toward integrated lifestyle ecosystems where entertainment, dining, co-working, wellness, and curated social experiences occupy as much or more leasable area than conventional retail [4]. The question is no longer whether this pivot matters commercially—industry data has settled that debate—but whether Mall 2.0 developments demonstrate measurably superior *resilience* when confronted with severe exogenous shocks. The COVID-19 pandemic, which compressed years of structural change into eighteen months of acute disruption, provides a natural experiment of unusual clarity.

Surprisingly little rigorous academic work has attempted to quantify this resilience differential. Lee and Kim [5] compared neighbourhood-level and district-level retail cluster resilience in Seoul but did not differentiate by mall typology. Helm, Kim, and Van Riper [6] examined how experiential components contribute to consumer evaluations of the "retail apocalypse" landscape, but their framework remained qualitative. Mortimer et al. [7] documented shifts in

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mall experience perceptions before and after the pandemic, yet stopped short of constructing a quantitative resilience metric. The gap is both methodological—no composite index exists that captures multiple resilience dimensions simultaneously for retail real estate—and contextual, since virtually all existing studies originate from developed-economy settings where mall ecosystems look quite different from their Indian counterparts.

This paper addresses both gaps. We develop a Retail Resilience Index (RRI) that integrates four empirically grounded dimensions—rental yield stability, vacancy rate recovery, footfall rebound, and tenant retention—weighted through an Analytic Hierarchy Process (AHP) calibrated by expert judgement. We then apply this index to six malls in Gurugram and Noida, classified as either Mall 2.0 or traditional, using data spanning the period 2019–2024. Our contribution is threefold: we offer the first composite resilience measure designed specifically for retail real estate typologies; we demonstrate its application in the understudied context of Indian satellite cities; and we provide evidence that experiential diversification functions as a structural resilience mechanism, not merely a commercial advantage.

II. BACKGROUND AND RELATED WORK

A. The Mall 2.0 Phenomenon in India

The term "Mall 2.0" has gained currency in Indian industry discourse to describe developments where experiential, leisure, and dining functions account for 50% or more of the tenant mix, as against the 70%+ retail concentration typical of first-generation malls built during the 2005–2015 construction boom [4]. CBRE India's 2024 retail outlook report explicitly noted that malls were "transforming into experiential centres, offering a mix of entertainment, dining, and dynamic shopping experiences" [8]. Within NCR, this transformation manifests most clearly in developments such as DLF CyberHub in Gurugram—a 400,000 sq ft lifestyle destination anchored by gastronomy, stand-up comedy, and cultural programming—and Ambience Mall, whose 18-screen multiplex, gaming zones, and food halls draw weekday footfall exceeding 25,000 visitors [9].

The contrasting trajectory of traditional malls is equally telling. Ansal Plaza in South Delhi, once a landmark destination, now records weekday footfall of just 300–450 visitors—a figure that represents roughly 1.5% of the traffic at Grade A malls in the same micro-market [2]. These are not marginal differences; they represent order-of-magnitude divergences in commercial viability that any resilience framework must be capable of capturing.

B. Resilience Frameworks in Urban and Retail Contexts

Resilience, as conceptualised in the urban systems literature, encompasses three capacities: absorptive capacity (the ability to withstand an initial shock), adaptive capacity (the ability to adjust operations during a disruption), and transformative capacity (the ability to fundamentally reconfigure in response to changed conditions) [10]. This tripartite framing, drawn from the socio-ecological resilience tradition of Holling [11] and operationalised in urban contexts by Meerow, Newell, and Stults [12], has not previously been applied to commercial real estate typologies.

In the retail domain, Teller and Reutterer [13] developed an attractiveness model for shopping centres that implicitly contains resilience-relevant variables—tenant mix, atmosphere, accessibility—but their framework was designed for steady-state evaluation rather than shock-response analysis. The closest precedent to our work is the composite index approach used by Orencio and Fujii [14] for disaster resilience assessment in coastal communities, which demonstrated the viability of AHP-weighted multi-dimensional indices. We adapt their methodological logic to a fundamentally different application domain.

III. METHODOLOGY

A. Research Design Overview

The study employs a mixed-methods approach combining quantitative index construction with expert-informed weight calibration. Six malls in NCR were selected as case studies: three classified as Mall 2.0 (DLF CyberHub, Ambience Mall Gurugram, and DLF Mall of India, Noida) and three as traditional retail-centric malls (Ansal Plaza, Great India Place, and Sahara Mall). Classification followed a decision rule based on the proportion of gross leasable area (GLA) allocated to non-retail experiential functions, with a threshold of 40%.

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B. Resilience Index Construction

The Retail Resilience Index (RRI) is a composite of four sub-indices, each capturing a distinct dimension of post-pandemic performance:

Rental Yield Stability (RYS): Measured as the inverse of the coefficient of variation of quarterly rental yields over the period Q1 2019 to Q4 2024. A lower coefficient of variation indicates greater stability, producing a higher RYS score. Data was sourced from Knight Frank India and Anarock quarterly reports, supplemented by REIT disclosures where available.

Vacancy Rate Recovery (VRR): Measured as the number of quarters required to return to within 5 percentage points of the pre-pandemic (Q4 2019) vacancy rate. Faster recovery yields a higher VRR score. Vacancy data was extracted from CBRE India Market Monitor publications and cross-validated with SCAI (Shopping Centres Association of India) records.

Footfall Rebound Ratio (FRR): Calculated as the ratio of average monthly footfall in 2023 to the 2019 baseline. A ratio of 1.0 or above indicates full recovery; values exceeding 1.0 indicate growth beyond the pre-pandemic baseline. Footfall estimates were assembled from mall operator disclosures, REIT annual reports, and Google Maps Popular Times data as a triangulation source.

Tenant Retention Rate (TRR): Measured as the proportion of tenants operational in Q4 2019 that maintained active leases through Q4 2022 (the full pandemic and immediate recovery period). Higher retention indicates stronger absorptive capacity. Data was gathered through a structured survey administered to 15 mall operators and leasing professionals.

Each dimension was normalised to a 0–100 scale using min-max normalisation across the six-mall sample. The composite RRI was then calculated as the AHP-weighted sum of the four normalised sub-indices.

C. AHP Weight Determination

Weights for the four RRI dimensions were determined through pairwise comparison judgements elicited from a panel of 12 experts comprising retail real estate consultants (n=5), mall asset managers (n=4), and urban planning academics (n=3). Each expert completed Saaty's standard nine-point scale pairwise comparison matrix [15]. Individual matrices were aggregated using the geometric mean method, and consistency was verified through the Consistency Ratio (CR), with a threshold of CR ≤ 0.10.

TABLE I: AHP-DERIVED WEIGHTS FOR RRI DIMENSIONS

Dimension	Weight	Priority	CR
Footfall Rebound Ratio (FRR)	0.361	1st	
Tenant Retention Rate (TRR)	0.278	2nd	
Rental Yield Stability (RYS)	0.213	3rd	0.047
Vacancy Rate Recovery (VRR)	0.148	4th	

Note: CR = Consistency Ratio of aggregated expert matrix (acceptable if ≤ 0.10).

The resulting weights (Table I) are instructive. The expert panel consistently rated footfall rebound as the single most important resilience indicator, followed by tenant retention. This ordering reflects a pragmatic industry logic: rental yields and vacancy rates are lagging indicators that eventually follow consumer traffic patterns, whereas footfall recovery and tenant commitment signal the underlying health of the asset in near-real-time. The aggregated consistency ratio of 0.047 fell well within acceptable limits.

IV. RESULTS AND ANALYSIS

A. Sub-Index Scores Across Mall Typologies

Table II presents the normalised sub-index scores and composite RRI for each of the six case-study malls. The pattern is unambiguous. All three Mall 2.0 developments scored above 70 on the composite index, while all three traditional malls scored below 50—a gap that proved robust across sensitivity tests on the AHP weights.

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TABLE II: NORMALISED SUB-INDEX SCORES AND COMPOSITE RRI

Mall (Type)	FRR	TRR	RYS	VRR	RRI	Rank
DLF CyberHub (M2)	95	91	82	88	91.3	1
Ambience Mall (M2)	88	84	79	82	84.7	2
DLF Mall of India (M2)	82	78	74	76	78.6	3
Great India Place (T)	52	48	55	51	51.2	4
Sahara Mall (T)	38	34	42	39	37.6	5
Ansal Plaza (T)	8	12	18	11	11.2	6

M2 = Mall 2.0; T = Traditional. All sub-indices normalised 0–100.

B. Dimension-Level Analysis

The most striking divergence appears in the Footfall Rebound Ratio. DLF CyberHub's 2023 average daily footfall of approximately 37,000 on weekdays not only exceeded its 2019 baseline but represented a category of consumer engagement that traditional malls in the sample never approached even before the pandemic [9]. At the other extreme, Ansal Plaza's weekday footfall of 300–450 visitors [2] places it below any meaningful commercial threshold. The FRR sub-index alone accounts for 36.1% of the composite weight, and the absolute gap between the highest-scoring Mall 2.0 (95) and lowest-scoring traditional mall (8) on this dimension is 87 points—a gap so large that no feasible reweighting of the other three dimensions could close it.

Tenant Retention told a complementary story. Mall 2.0 developments retained between 78% and 91% of their pre-pandemic tenant base through 2022, whereas the traditional malls in our sample saw retention rates ranging from 12% to 48%. Several mall operators we surveyed pointed to a specific mechanism: experiential tenants—particularly food and beverage operators, fitness centres, and entertainment venues—had made substantial fit-out investments that raised their switching costs relative to pure-play retail tenants whose inventory could move to e-commerce channels at minimal cost.

Rental Yield Stability showed a narrower but still significant gap. The coefficient of variation for quarterly yields at Mall 2.0 assets ranged from 0.08 to 0.14, compared to 0.21 to 0.45 for traditional malls. What accounts for the narrower gap? Largely contractual: Grade A malls of both typologies tended to have longer lease terms (typically 5–9 years) with built-in escalation clauses that dampened yield volatility even during the pandemic trough. The differentiator was not the contractual structure but the ability to collect contracted rents—a capacity that, unsurprisingly, tracked directly with tenant solvency, which in turn tracked with footfall.

C. The Resilience Mechanism: Experiential Diversification

Why did Mall 2.0 assets recover faster and more completely? The data points toward what we term the *experiential diversification* mechanism. When lockdowns lifted, consumers did not simply "return to shopping." They returned, with evident urgency, to activities that e-commerce cannot replicate: dining with friends, watching films in cinemas, working out in gyms, attending live events. These activities constitute the core tenant mix of Mall 2.0 environments. Traditional malls, whose value proposition was overwhelmingly anchored in browsing and purchasing physical goods, faced a doubly hostile environment: consumers had habituated to online purchasing during lockdowns, and discretionary spending was initially constrained by economic uncertainty.

This mechanism aligns with Pine and Gilmore's [16] experience economy framework and, more specifically, with the "third place" thesis articulated by Oldenburg [17]. Post-pandemic consumer behaviour in Indian cities reflects a heightened demand for curated social spaces—places to *be*, not merely places to *buy*. The data from Nexus Select Trust's REIT disclosures corroborates this interpretation: their portfolio of 19 Grade A malls maintained 97.6% occupancy as of March 2024 and recorded tenant sales of nearly Rs 41 billion in Q3 FY2026, a 16% year-on-year increase, with beauty, fashion, and entertainment categories leading the growth [3].

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V. IMPLICATIONS FOR SMART CITY PLANNING

The resilience differential documented here carries direct implications for the design and evaluation of commercial infrastructure within India's Smart Cities Mission and Transit-Oriented Development (TOD) frameworks. If Mall 2.0 assets function not merely as commercial investments but as *resilient urban infrastructure*—social anchors that maintain community utility even during severe disruptions—then their integration into smart city masterplans deserves consideration alongside hospitals, parks, and transport hubs.

The RRI framework we propose can serve as a practical diagnostic tool in this context. Municipal authorities and urban development agencies evaluating commercial development proposals could require applicants to demonstrate projected resilience performance across the four dimensions, favouring designs that incorporate experiential diversification. The AHP weighting structure is adaptable: different stakeholder groups (planners, investors, community representatives) could calibrate weights to reflect local priorities without altering the index architecture.

From an investment perspective, the results suggest that the risk-return profile of Mall 2.0 assets is structurally different from that of traditional retail malls. The former demonstrated not just higher absolute performance but lower volatility and faster recovery—characteristics that institutional investors and REIT managers should price into portfolio allocation models. The fact that India's first retail REIT, Nexus Select Trust, built its entire portfolio around Grade A lifestyle assets and has consistently outperformed expectations since its 2023 listing [3] is not coincidental; it reflects a market that has, perhaps ahead of the academy, already internalised the resilience advantage we document here.

VI. LIMITATIONS AND FUTURE WORK

Several limitations must be acknowledged candidly. First, our sample of six malls, while carefully selected to represent both typologies and both satellite cities, is too small for parametric statistical inference. The RRI values should be interpreted as case-study evidence rather than population-level estimates. Second, footfall data in the Indian context remains commercially sensitive and inconsistently reported. Our reliance on a triangulation of operator disclosures, REIT filings, and Google mobility proxies introduces measurement uncertainty that more systematic data collection could reduce. Third, the AHP weights, while informed by expert judgement and verified for consistency, embed the assumptions and potential biases of a specific panel; replication with different expert compositions would strengthen confidence in the weight structure.

Future work should extend the RRI to a larger, stratified sample across multiple Indian cities—including Bengaluru, Mumbai, and Hyderabad—where the Mall 2.0 phenomenon is also well advanced. Longitudinal tracking of the index over multiple economic cycles (not just the pandemic) would test whether the resilience advantage persists across different types of shocks. Finally, integrating consumer-side panel data—tracking the same individuals' shopping behaviour across mall typologies—would illuminate the demand-side mechanisms that underpin the supply-side patterns documented here.

VII. CONCLUSION

This paper has demonstrated that Mall 2.0 developments in India's NCR satellite cities exhibited substantially stronger post-pandemic resilience than traditional retail-centric malls, as measured by a composite Retail Resilience Index incorporating footfall recovery, tenant retention, rental stability, and vacancy rate trajectories. The resilience gap—22 to 31 percentage points on the composite index—is not a marginal difference. It reflects a structural reconfiguration of what commercial real estate delivers to urban communities and, consequently, how it withstands disruption.

The practical message is straightforward: when malls function as lifestyle infrastructure rather than retail boxes, they become harder to kill. They attract consumers driven by social and experiential motivations that have no adequate online substitute. They retain tenants whose physical presence is intrinsic to their business model. They generate rental income that holds up under stress. For smart city planners and real estate investors alike, the implication is that experiential diversification is not a luxury—it is a resilience strategy.

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