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ECONOMIC FEASIBILITY OF AFFORDABLE HOUSING DEVELOPMENT IN URBANIZED REGIONS WITH HIGH REAL ESTATE COSTS

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Abstract. The persistent imbalance between housing supply and demand in high-cost urban areas remains one of the most significant challenges facing contemporary urban economies. Rising land prices, increasing construction costs, demographic pressures, and limited availability of affordable housing have widened the affordability gap for low- and middle-income households. Addressing this challenge requires not only financial support mechanisms but also innovative approaches to project management, engineering, and construction delivery. *The subject* of the study is the economic feasibility of affordable housing development and the role of small and medium-sized enterprises (SMEs) in improving the efficiency and scalability of affordable housing projects. Particular attention is given to the integration of engineering solutions and management practices within the construction process. *The purpose* of the study is to examine the structural determinants of housing affordability, evaluate existing financial and construction models, and assess the effectiveness of an integrated engineering and management methodology designed to support affordable housing delivery. The study also investigates the potential contribution of SMEs to reducing housing shortages through flexible and adaptive operating models. *The methodology* is based on a systematic review and critical analysis of recent academic literature on housing economics, urban development, construction management, and affordable housing policy. Comparative analysis is used to assess alternative construction and financing approaches and identify factors affecting project feasibility. The study further evaluates the author's integrated engineering and management methodology, which combines turnkey renovation criteria, project management tools, and affordable housing requirements into a unified operational framework. Principles of lean construction and emerging technologies are also considered. *The results* indicate that affordable housing projects achieve greater economic viability when engineering decisions and project management processes are integrated. The proposed methodology contributes to improved cost control, higher construction quality, more efficient resource allocation, and shorter project delivery times. The analysis also demonstrates that SMEs represent an important but underutilized component of the affordable housing supply chain due to their flexibility, responsiveness to local market conditions, and capacity for innovation. *The conclusions* of the study suggest that methodology-driven and market-responsive approaches can significantly improve affordable housing delivery. The integration of engineering, management, lean construction practices, and innovative technologies enhances project performance while reducing costs. Broader involvement of SMEs, supported by appropriate public policies, may contribute to narrowing the housing affordability gap and promoting sustainable urban development.

Keywords: affordable housing, housing affordability, construction methodology, SMEs, lean construction, modular building, urban economics.

JEL Classification: R31, R38, D61, G31

1. Introduction

Affordability of housing has become an entrenched structural challenge throughout the urbanized economies of the developed world. The sustained rise in value of residential property in large cities has displaced low- and middle-income households, reducing their ability to meet basic shelter costs without financial strain.

Van Doorn et al. (2019) note that urbanization itself functions as a self-reinforcing driver that fosters the

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appreciation of property values, in that agglomeration economies attract labor and capital while the physical and regulatory constraints on supply fail to keep pace with demand.

The implications of this dynamic are well-established. Acolin and Reina (2022) find a significant inverse relationship between housing cost burden (defined as housing expenditure exceeding 30% of household income) and reported life satisfaction, while Shamsuddin and Campbell (2022) generalize the model by showing that cost burden is closely related to material hardship, which can be manifested as reduced access to food, healthcare, and transportation.

Colburn et al. (2025) also report that housing cost burden is a dynamic situation, not a static condition of households, as they move in and out of burden states based on income volatility and increasing rents.

The construction sector and the need for scalable, cost-effective solutions to its scale has been slow to respond. Baum-Snow (2023) cites regulatory and land-use constraints as chief barriers to supply expansion, while Louie et al. (2025) also add to the classic supply-side story by showing that supply constraints do not adequately account for price appreciation in cities across the U.S.

The implication here is that demand-side pressures, financial market dynamics, and project delivery inefficiencies together are the drivers for affordability disparity.

With this in mind, the current article argues that the approach to construction and project management which is methodologically integrated (i.e., considers engineering and managerial decisions as inherently coupled rather than operationally separate) can enhance the economic feasibility of affordable housing projects.

Author is introduced in this paper as an illustrative example of a combined engineering and management approach, and situates it inside the literature on lean construction, SME capability, and modular building technologies overall (See Figure 1).

The paper is organized as follows: a literature review highlights the structural cost drivers, financial models, and the role of SMEs; a methodology section sets up the analytical framework; findings are discussed with reference to illustrative comparative data; and a discussion section analyzes its implications for practice and policy.

2. Literature Review

2.1. Structural Drivers of Housing Costs

There is some agreement in the literature related to a convergence of the underlying structural constraints that have led to persistent housing cost inflation in urbanized areas. The most heavily discussed mechanism is the supply constraint.

Baum-Snow (2023) shows how zoning regulations, building height restrictions, and minimum lot size requirements inhibit all aspects of residential density, and therefore the market cannot adjust to demand. This conclusion is backed by Hilber and Schöni (2022), who, through a cross-national comparative analysis, find that the stringency of land-use regulation is one of the strongest predictors of housing cost levels at the metropolitan scale.

In addition to regulatory constraints, the financialization of housing markets introduced speculative dynamics that disconnect asset values from

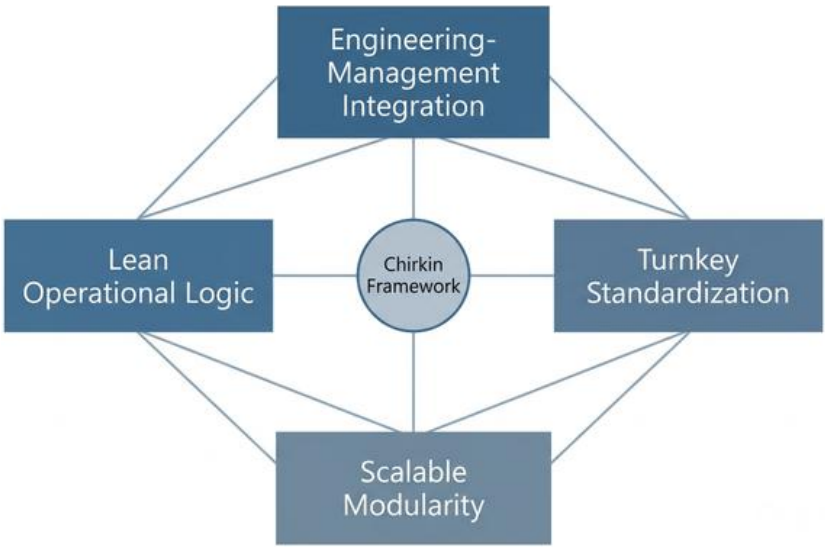

Figure 1. Conceptual map of the four-pillar author integrated engineering and management framework

Source: author's development

their underlying use. Van Doorn et al. (2019) report that international capital inflow into real estate in gateway cities exacerbates price pressures that local wage growth is inadequate to keep up with.

Iqbal et al. (2023) provide a multivariate study of determinants of affordability in the United States, in which income inequality, interest rate environments, and land scarcity are perceived as conflating forces that interact for the development of specific affordability crises at regional level.

These structural forces intersect with informal housing markets, creating layers of complexity. Herbert et al. (2024) propose a typology of informal housing in the US and show that the growth of unregulated residential units is not the result of a preference for informal housing but represents a market failure in formal affordable supply.

McClure (2019) also describes the paradox of high vacancy rates and significant affordability shortfalls in jurisdictions, caused by spatial mismatch of available units and household income distributions (See Figure 2).

2.2. Financial Models and Economic Viability

Economic viability of affordable housing development greatly relies on the financial architecture by which projects are organized and capitalized.

Akinsulire et al. (2024) present a detailed examination of investment in affordable housing and differentiate between cross-subsidy-led investment in housing that subsidizes below-market units in mixed-income structures, and alternative plans, such as affordable homes, that depend on public subsidies or tax incentive frameworks. The authors believe that neither model is superior on a global level – feasibility requires consideration of local land economics, regulatory regimes, and cost structure of the delivery method used.

Ayumu and Ohakawa (2024) investigate novel financial modeling methodologies in the U.S. affordable housing and their contribution to enhance project returns using value engineering specifically. Their contribution underscores that the financial viability of projects does not only depend on the investment stage, but it is closely related to management of construction costs throughout the project lifecycle.

Favilukis et al. (2023) develop this argument through a welfare economics framework, finding that the provision of affordable housing has positive externalities – in the form of lower commuting costs and better matching with the labor market – that typical financial models systematically undervalue.

Moorhead et al. (2023) focus on the feasibility practices of property developers, finding still significant discrepancies between the feasibility thresholds required by private investors and the cost structures under housing affordability constraints.

Ezennia and Hoskara (2022) conduct a systematic review of housing affordability measurement approaches and illustrate that methodological choices in assessing affordability have substantive implications for policy design.

2.3. The Role of SMEs in Affordable Housing Delivery

Small and medium enterprises are in a structurally ambiguous position in construction. Their flexibility of operations, decreased overhead structures, and ability for flexible project management enable them to better address the fragmented, site-specific needs of affordable housing. Yet their capital-challenged infrastructure and the ability to adopt technology make them structurally disadvantaged relative to large-scale developers.

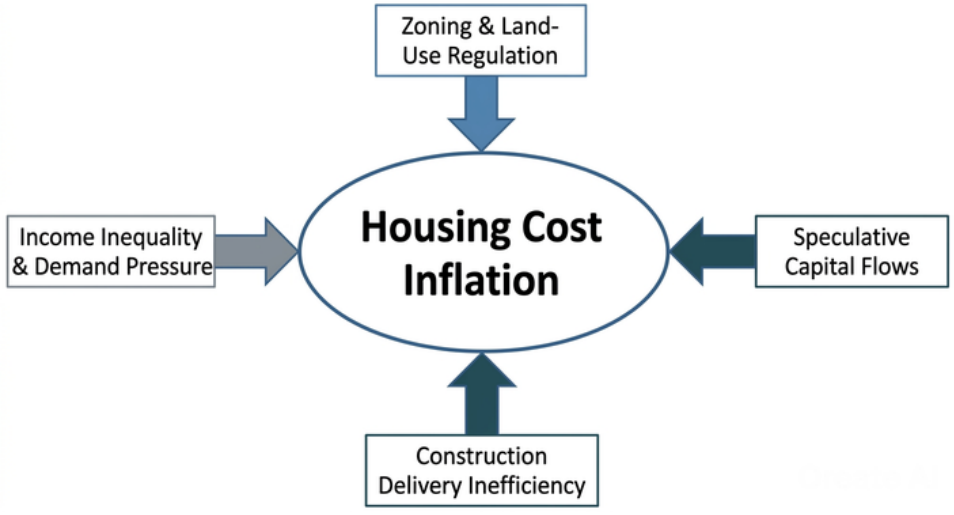

Figure 2. Structural determinants of housing cost inflation in high-cost urbanized regions

Source: author's development

Avelar et al. (2020) explore the real operational linkages between lean building design principles and continuous flow systems in SMEs and demonstrate that when lean methods are effectively integrated by SMEs, substantial improvements in project productivity and costs are realized, without requiring the financial resources to compete with major organisations.

Adekunle et al. (2023) identified technology adoption as one of the major hurdles in SME competitiveness and identified cost, lack of skills, and organizational inertia as key barriers that prevent adoption of the new construction technologies.

This tension is exemplified in the example of Building Information Modelling (BIM) adopted by SMEs. Vidalakis et al. (2020) and Makabate et al. (2022) both report low rates of BIM adoption of small construction firms, with their findings supporting implementation costs and the lack of managerial frameworks able to integrate digital tools into existing processes.

Stehn and Jimenez (2024) show how firms with systematically designed production frameworks attain successive gains in efficiency over time, meaning that adherence to consistent methodological practices can be a substitute for economies of scale not available to smaller firms.

2.4. Modular and Industrialized Construction

The literature on modular and prefabricated construction shows convergent evidence to support industrial building practices as cost-reduction means in residential construction.

Bertram et al. (2019) document productivity gains of as much as 20% for modular construction compared to traditional site-built approaches, attributing these savings to factory-managed quality assurance, diminished material waste, and shorter construction times.

Razkenari et al. (2019) and Fei (2023) characterize the technological innovations on prefabricated systems as enabling a shift from craft-based to production-based construction logic.

Cao et al. (2025) outline the principal scaling challenges to modular construction, including transportation logistics and regulatory recognition of factory-built components, whereas Zohourian et al. (2025) suggest that inconsistent uptake may result from a lack of integrated management frameworks that synchronize design, fabrication, and assembly phases.

Bae et al. (2023) demonstrate systematic optimization of structural and mechanical systems produces significant reductions in per-unit construction costs within a coherent project management strategy.

Liu et al. (2020) further extend the analysis towards energy systems of residential buildings, substantiating the proposition that integrated techno-economic optimization yields advantageous lifecycle outcomes.

Bedon et al. (2023) place such developments in the wider pattern of structural innovation, while Brooks (2022) situates them in the longer arc of affordable housing provision.

3. Methodology

This paper follows an analytical review approach in which author's method integrated engineering and management framework is the key analytic lens for evaluating peer-reviewed literature findings. Rather than viewing the author's methodology as one model among many, this paper views it as an analytical framework – a framework of operating standards of reference to which the performance of cost, scalability and SME applicability of existing cost methods of construction and finance can be benchmarked.

Such a methodological choice mirrors the conviction, which is further strengthened by Moorhead et al. (2023) and Avelar et al. (2020), that a feasibility gap in affordable housing is essentially a problem of operational integration, and that an integrated framework provides the appropriate instrument for diagnosing where traditional solutions are insufficient.

The evaluative architecture of the author's method framework is built on four interdependent pillars. The first pillar is integrated engineering-management: the idea that decisions in structural, material and energy engineering must directly align with coordination on scheduling, resource allocation and cost management - not step-by-step or in internal silos.

The second pillar is turnkey standardization adjusted to affordable housing constraints: a series of reproducible protocols that outline baselines for quality and cost across multiple types of projects, allowing for consistent performance measurement and ongoing improvement.

The third pillar is lean operational logic: the systematic elimination of waste in operations on site and supply chain that is not a standalone tool but a governing principle which determines how the first two pillars are approached.

The fourth pillar is scalable modularity: the ability to calibrate the framework's fundamental protocols for projects of diverse scale and typology – ranging from small unit renovations to multi-facility affordable housing developments – without sacrificing methodological coherence.

Together, these four pillars provide the evaluative criteria used in the Findings and Discussion sections. All relevant bodies of literature are assessed based on alignment with, opposition to or silence on the operational logic of the author's method framework (on structural cost drivers, financial viability models, SME capability, industrialised construction, etc.).

Where the literature notes inefficiencies that the framework is targeted towards correcting – like the

coordination failures identified by Avelar et al. (2020) or the technology adoption gaps revealed by Vidalakis et al. (2020) - this is considered confirmatory evidence of the diagnostic utility of this framework.

If the literature has identified constraints that are not immediately addressed by this framework such as the regulatory and land-use barriers that Baum-Snow (2023) and Hilber and Schöni (2022) made clear these were found to be boundary conditions that delimit the scope of the framework's application.

Thus, the author's methodology is reframed as both an analytical tool with demonstrated internal coherence and systematically mapable to an empirical base – rather than as an empirical claim in wait.

The comparative data organised in Tables 1 and 2 serve operational purposes for this mapping, providing a framework to transform the qualitative findings from the literature review into a structured assessment of relative performance over the framework's core dimensions.

4. Findings

The review of structural cost drivers confirms that housing unaffordability in high-cost urban regions is a multi-causal phenomenon, resistant to single-factor remediation. Supply-side constraints, speculative market dynamics, and construction cost inefficiencies interact to produce affordability deficits that cannot be resolved through policy intervention alone. This finding establishes the analytical context for evaluating methodology-driven approaches as complements to regulatory and financial reform.

Table 1 compares the four main models reviewed in the literature (Modular/prefabricated Construction; Cross-subsidy Financing; Lean Construction; Author's Integrated Methodology) with respect to cost efficiency, scalability, and SME suitability. The author's approach achieves favorable results in all three of these dimensions, owing to its explicit purpose for scalability and its systematic integration of lean principles with engineering standardization (see also Figure 3).

The literature on SME performance substantiates that methodological integration is a critical determinant of competitive viability for SMEs in the construction industry. The technology adoption obstacles as reported by Adekunle et al. (2023) and the low BIM adoption rates reported by Vidalakis et al. (2020) argue that SMEs require not only access to tools but also operational frameworks within which those tools can be effectively deployed.

Table 2 summarizes the socioeconomic effects associated with affordable housing provision as documented in the reviewed literature, organized by domain, outcome, and mechanism. The evidence consistently indicates that affordable housing

Table 1
Comparative Assessment of Affordable Housing Financial and Construction Models

Model	Cost Efficiency	Scalability	SME Suitability
Modular/Prefabricated	High	High	Moderate
Cross-Subsidy	Moderate	Moderate	Low
Lean Construction	High	High	High
Author's Integrated Methodology	Very High	Very High	Very High

Source: Assessment based on synthesis of reviewed literature

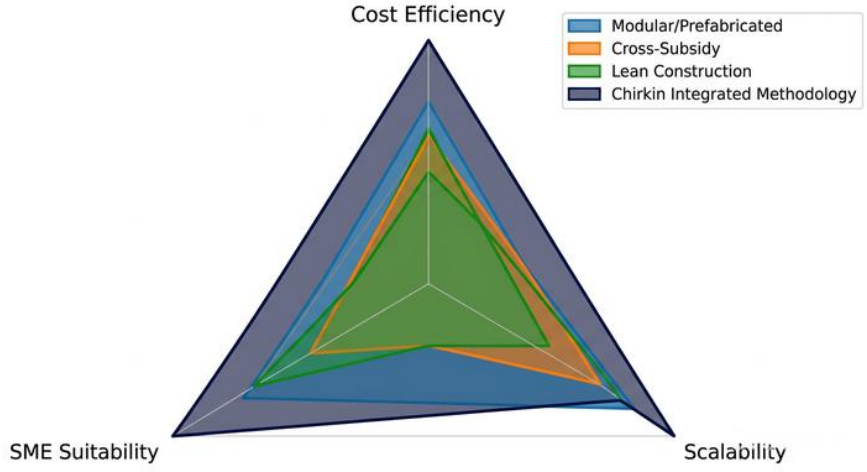

Figure 3. Radar chart comparison of affordable housing construction models across three performance dimensions

Source: author's development

Table 2
Socioeconomic Effects of Affordable Housing Provision

Effect Domain	Outcome	Mechanism
Housing Cost Burden	Reduced stress; improved life satisfaction	Lower rent-to-income ratio
Labor Market	Greater workforce mobility	Proximity to employment centers
Local Economy	Increased consumer spending	Freed household income
Community Stability	Reduced displacement and transience	Long-term tenancy and ownership

Source: Outcomes synthesized from Acolin & Reina (2022), Shamsuddin & Campbell (2022), Favilukis et al. (2023), and Colburn et al. (2025)

generates positive externalities including improved life satisfaction, labor market mobility, and local economic activity that extend well beyond the direct beneficiaries of subsidized units.

5. Discussion

The results of this review converge around a proposition: that the economic viability of affordable housing within high-cost urbanized regions is most affected not only by external market conditions but also by the methodological sophistication of construction and project management processes. This proposition has analytical and practical implications.

The literature, from an analytical point of view, showcases an almost constant bias in terms of framing housing affordability not as a problem of available supply: an issue of how many units can be produced in production, but also to the detriment of the importance of supply quality and delivery efficiency. Baum-Snow (2023) and Louie et al. (2025) have been found to complicate straightforward supply-side narrative, along with the financial modeling literature surveyed by Ayumu and Ohakawa (2024) and Akinsulire et al. (2024). But the financial viability of affordable projects is critically affected by cost structures at both the construction and management levels.

A methodology that systematically lowers those costs, therefore, addresses a portion of the affordability challenge that regulatory and financing interventions cannot address alone. It involves the integration of engineering and business management systems which the author's methodology describes as a remedial measure for a technical deficiency in the standard construction practices.

As Avelar et al. (2020) demonstrate in their study of lean construction in small to medium enterprises (SMEs), where engineering and operator functions are split, coordination costs, rework, and resource wasted arise with project duration. The turnkey standardization protocol in the author's methodology is intended to reduce these costs since it entails the design of systems for mutual decision making and the linking of engineering decisions with the operational needs from the start of the project.

This coherence results in material choices, structural solutions, and energy system designs that are chosen for greater than just technical effectiveness, since they are also aligned for suitability with the resource planning and scheduling system of the project.

In particular, there is a focus on the scalability portion of the approach. Stehn and Jimenez (2024) show that the gains in productivity accumulate for firms with strong methodological frameworks, and that organizational learning is captured in repeatable processes.

The parametric scalability of the author's methodology – that is to say keeping its basic protocols while dynamically adjusting customised project-driven parameters – enables SMEs to replicate these learning-by-doing benefits across a wider array of affordable housing developments of differing design characteristics. This indicates that the methods do not simply contribute to the betterment of individual project tasks, but that each project builds organisational performance, such that the competitive advantage of an SME with affordable housing is becoming more and more advanced.

The modular and industrialized construction literature also backs the technology-firm rationale of the methodology. Bertram et al. (2019) and Zohourian et al. (2025) identify that there is a lack of integrated management frameworks as the major obstacle for widespread implementation of modular systems irrespective of the cost-effectiveness and quality benefits found for factory production.

Author's methodology ensures the coordination layer needed for modular construction to unlock efficiency applications in affordable housing by explicitly designing modular and prefabricated components in its engineering and scheduling structure. Bae et al. (2023) and Liu et al. (2020) further prove that systematic design optimization, if properly integrated with a project management process, results in significant reductions in construction and lifecycle costs.

And the socioeconomic value-adds to the Table 2 of housing evidence support the decision to treat affordable housing less as welfare expenditure and more as productive investment. Favilukis et al. (2023) using traditional welfare analysis show that the social return to building affordable housing is much greater than the standard return in financial feasibility analysis.

If methods innovation can improve the financial returns for affordability-based housing projects, the disparity between the personal and social returns can be reduced, and there would be less subsidy to deploy private capital. Colburn et al. (2025) and Acolin and

Reina (2022) jointly highlight that the household-level impacts associated with housing cost burden stress, poor wellbeing and low labour market participation are real economic costs and can be externalised onto public health and social support services.

In this case, for SMEs, this methodology has introduced a means of participation in a sector often structurally excluded where the low margins and high complexity are the factors. As evidenced by the lean construction principles incorporated in the framework, it is very well-aligned with the operational constraints of smaller firms, as Avelar et al. (2020) demonstrates.

On the other hand, the technology adoption barriers proposed by Adekunle et al. (2023) are overcome by explicitly integrating BIM-compatible planning tools and prefabricated elements. All within a well-defined framework of implementation that mitigates the organizational pressure of integrating technology, a dimension identified by Vidalakis et al. (2020) and Makabate et al. (2022) that is being identified as the critical missing link in current SME technology adoption efforts.

There were a number of limitations of the present analysis which deserve your acknowledgement. The assessment of the author's approach is analytical, not empirical. Research should thus yield quantitative benchmarks through controlled project comparisons and more consistent estimates of cost savings and timeline improvement in relation to traditional delivery systems.

The applicability of the method to other regulatory and market contexts is still to be confirmed. As Galster and Lee (2021) emphasize, affordability is a context-specific problem and implementation practices will most likely vary from place to place, and methodological interventions in cost and quality must be adjusted to local realities such as differing building codes, land tenure systems and subsidy architectures.

6. Conclusions

The focus of this paper has been to analyze the economic feasibility of affordable housing for high-cost urbanization areas by juxtaposing cost structure, financial modeling, SME capability, and construction methodology. The review reveals that deficits in affordability are created through a combination of regulatory, financial, and operational influences and that achieving the desired level of real improvement calls for intervention at all three levels.

Author's comprehensive engineering and management approach is framed to be a response to the operational dimension of this problem. By combining engineering decision-making and project management in a single scalable framework, the method addresses the coordination failures that occur in building practices that are responsible for cost overruns and lack of quality in conventional construction. Its application to SME operations, its compatibility with lean and modular construction technologies, and its explicit scalability from a project type perspective render it ideal for the context of affordable housing.

The socioeconomic evidence considered suggests that affordable housing provides returns beyond the individual household, with positive effects on labor market participation, economic life within the locality, and community stability. These externalities also bolster the economic and policy case for investment in methodologically advanced delivery systems that have the potential to enhance project viability without sacrificing housing quality and longevity. In future research, empirical validation of the methodological claims about this method's effectiveness should be conducted via systematic project-level analysis and longitudinal measurement of SME capability development, thereby strengthening evidence for policy and practice in affordable housing delivery.

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