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From Policy Authorization to Practical Execution: A Decision-Support Framework for Implementing Housing Supply Strategies in the United States

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Abstract: Accessory Dwelling Units (ADUs) have been widely promoted across the United States as a policy mechanism to address housing shortages by expanding housing supply within existing residential neighborhoods. Despite broad legislative support, the actual implementation of ADU policies remains inconsistent and limited across jurisdictions. This paper examines the structural factors contributing to the gap between policy authorization and real-world execution, with particular attention to early-stage uncertainty, fragmented zoning and permitting frameworks, and the absence of systematic feasibility assessment mechanisms. Drawing on policy analysis and observed implementation patterns in high-density urban contexts, the study argues that ADU underperformance is primarily an execution challenge rather than a limitation of design capability or construction technology. By reframing ADU deployment as a housing policy execution problem, this research highlights the need for upstream decision infrastructure to improve predictability, reduce administrative friction, and enable more equitable access to small-scale housing supply expansion. This decision-support approach operates prior to architectural design, engineering documentation, and formal permitting submissions, and does not replace licensed professional services or governmental review.

Keywords: Housing Policy Implementation; Implementation Gap; Decision Support Framework; Administrative Friction

1. Introduction

In the context of a long-term imbalance between housing demand and supply, how to promote the expansion of housing supply under the existing urban space and institutional constraints has become a practical problem in the housing governance of the United States. In recent years, accessory dwelling units (ADUs), as an incremental supply method based on existing communities, have received extensive policy authorization at the state and local levels [1]. However, the relaxation of policies has not been simultaneously translated into a significant increase in the scale of housing supply [2]. The disconnection between policy texts and actual implementation is relatively common. A large number of projects encounter obstacles after entering the zoning interpretation, permit approval, and preliminary feasibility judgment stages. The approval cycle is prolonged, the implementation cost rises, and some projects even have to be halted before entering the construction phase. Compared with discussions at the policy target level, existing research pays insufficient attention to the institutional frictions, process uncertainties, and internal mechanisms of the housing supply strategies during the implementation stage. In particular, there is a lack of systematic analysis of "how policy authorization is transformed into executable actions" [3]. To address this issue, starting from the implementation chain, identifying key constraints and converting them into

operational decision support tools is of great significance for enhancing the predictability and implementation stability of housing policies. Based on this, this paper focuses on the actual operation process of the housing supply strategy in the United States, and builds a decision support framework for the implementation stage around the transformation path of policy authorization to implementation.

2. Mechanism diagnosis of implementation gap: From "policy effectiveness" to "implementation obstruction"

2.1. Breakdown chain from authorization to execution: Legislation - Zoning - Permitting - Feasibility - Construction - Occupancy

From the perspective of the implementation process, the housing supply strategy does not naturally transform into construction behavior after the policy is issued. Instead, it relies on multiple consecutive links such as legislative authorization, zoning rules, permit approval, project feasibility assessment, construction implementation, and final occupancy to form an execution chain [4]. Policy adjustments often focus on legislative and zoning levels, but their actual effectiveness needs to be continuously transmitted through subsequent links. In specific operations, this transmission process is often affected by differences in rule interpretation, poor program coordination, and insufficient initial information, resulting in a significant weakening of policy effects at the permit approval and feasibility assessment stages [5]. Some projects, although having legal basis at the institutional level, are difficult to continue due to insufficient initial judgment or exceeding expected implementation costs, and thus the construction process cannot be initiated. It can be seen that the relationship between policy authorization and housing supply results is not a direct correspondence. The degree of transformation largely depends on whether the execution chain has stable and continuous operating conditions.

2.2. Decomposition of key blocking factors

During the transformation of policy authorization to actual execution, the obstacles faced by the housing supply strategy are not caused by a single factor, but are the result of multiple constraints superimposed at different execution nodes [6]. From the operational mechanism perspective, these blocking factors mainly focus on uncertainty, fragmented rules, process friction, and insufficient initial feasibility judgment [7]. Uncertainty is manifested as inconsistent interpretation of policy terms and unclear expectations for rule adjustments, which weakens the decision-making stability of the participating entities; fragmented rules are reflected in the lack of consistency between zoning regulations and permit requirements, increasing the cost of cross-departmental coordination; administrative friction at the process level leads to repeated corrections in the approval process, prolonging the project cycle; and the lack of systematic feasibility assessment makes some projects reveal difficult-to-overcome constraints only after entering the execution stage [8]. These factors interact with each other, gradually dissipating the policy effect in the execution chain, becoming the key reason for the difficulty in implementing housing supply. See Table 1.

Table 1. Key blocking factors of implementation gap and their functional links.

Blocking factors categories	Key stages of occurrence	Typical manifestations	Observable signals	Impact on the execution outcome	Intervention direction
Uncertainty	Zoning, licensing	Inconsistent interpretation of terms, frequent rule adjustments	Large fluctuations in approval cycle	Decision delay, project hesitation	Unified interpretation guidelines, rule change assessment

Fragmentation of rules	Zoning - licensing connection	Conflicts in standards among different departments	Increased number of cross-departmental round trips	Increased coordination costs	Clause mapping, minimum consistency standard
Administrative friction	Licensing approval Pre-evaluation	Repeated corrections of materials	High number of corrections and rejection rates	Extended execution period	Parallel review, one-time notification
Insufficient feasibility judgment	The entire process	Exposure of costs or compliance obstacles later on	Project termination rate	Construction phase unable to commence	Preceding feasibility screening
Constraints on fairness and accessibility	Key stages of occurrence	Implicitly high participation threshold	Uneven distribution of opportunities	Concentration of policy benefits	Targeted support and trigger mechanism

2.3. Diagnostic Output: Forming the "List of Interactable Bottlenecks"

Based on the decomposition of the key obstructive factors of the execution gap, problems scattered across different links can be further transformed into bottleneck nodes with clear intervention directions [9]. Different from the general description of execution obstacles, the bottleneck list emphasizes the specific position of the problem in the execution chain and its adjustable attributes [10]. From the perspective of operational logic, these bottlenecks mainly concentrate on aspects such as uncertain rule interpretation, poor connection between zoning and licensing standards, repetitive approval processes, absence of preliminary feasibility judgment, and implicit bias in participation thresholds. These bottlenecks are not immutable structural constraints but operational issues that can be intervened through institutional integration, process optimization, or tool support. By compressing the complex execution gap into a set of identifiable, comparable, and intervenable bottleneck nodes, it not only helps to clarify the key links of policy execution failure but also provides clear input for the subsequent construction of a decision support framework for the implementation stage [11].

3. Decision Support Framework Construction: From "Rule Text" to "Executable System"

3.1. Framework Goals and Principles

Facing the institutional frictions and operational instability issues exposed during the implementation stage of the housing supply strategy, the construction of the decision support framework aims to bridge the gap between policy authorization and actual execution. Its core goal is not to replace the existing institutional arrangements but to enhance the predictability and operability of the execution process within the existing rule system through systematic organization and pre-judgment. The framework does not generate binding determinations, nor does it substitute for regulatory approval, professional judgment, or site-specific technical verification. In terms of specific orientation, the framework emphasizes integrating information scattered in the legislative text, zoning provisions, licensing requirements, land conditions, and cost elements, enabling the participating entities to clearly understand the key constraints and path choices before entering the execution. Around this goal, the framework follows several basic principles: First, the pre-emptiveness principle, reducing the cost of trial and error through early identification of execution bottlenecks; second, the consistency principle,

reducing conflicts and uncertainties between different rule standards; third, the operability principle, ensuring that the output results can directly serve the execution decisions; fourth, the adjustability principle, leaving room for flexibility for subsequent rule updates and process optimizations.

3.2. Overall Framework Architecture

The decision support framework, as shown in Figure 1, adopts a systematic architecture of "input - processing - output - feedback" to ensure that policy authorization information can be stably transformed into executable actions. At the input layer, the framework integrates scattered information such as legislative texts, zoning rules, licensing requirements, land conditions, and cost elements, forming a unified set of rules and conditions; at the processing layer, through rule mapping, constraint identification, and path combination, it conducts pre-analysis of uncertainties and conflicts that may occur during the execution process, and generates feasibility judgments and execution plans; at the output layer, the framework provides direct usable decision-making basis in the form of clear licensing paths, key constraint prompts, and operation lists. At the same time, the framework sets up a feedback mechanism, returning execution results and process data to the system for correction of rule interpretation and update of judgment logic. Through the above structure, the decision support framework no longer remains at the level of policy interpretation but forms an executable system that runs through the entire process of authorization, execution, and adjustment.
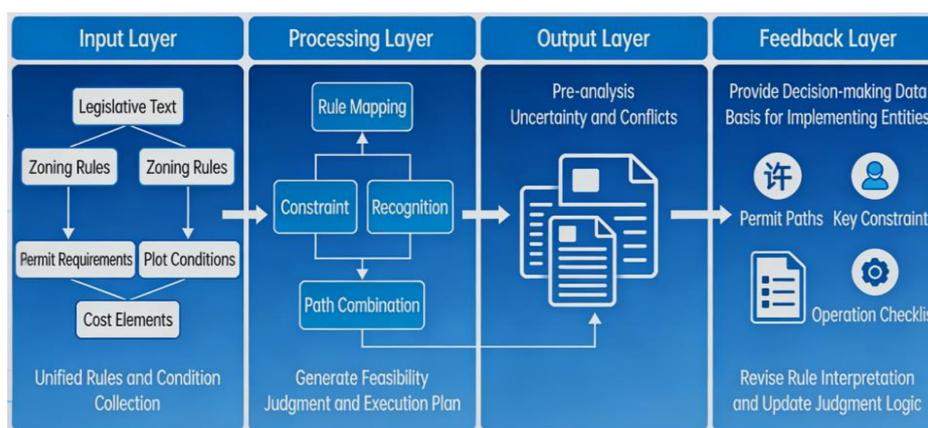

Figure 1. Overall Architecture of the Decision Support Framework.

3.3. Core Modules

3.3.1. Uncertainty Governance Module: Guidance Explanation, Impact Assessment of Changes, Unified Release

During the implementation of the housing supply strategy, uncertainty is an important source leading to the attenuation of policy effectiveness. Differences in the understanding of rules and regulations by different departments, as well as unclear time and scope of policy adjustments, all weaken the decision-making confidence of the implementing entities. The core function of the uncertainty governance module lies in converting scattered explanations and implicit expectations into identifiable and communicable information content. Specifically, this module forms stable guidance explanations for key provisions, clearly stating the applicable boundaries and determination criteria for these provisions; before and after rule adjustments, it introduces change impact assessment to systematically alert on the potential affected execution links; and through a unified release mechanism, it ensures consistency of information among different implementing entities. Through these methods, the uncertainty governance

module provides a relatively stable rule environment for subsequent process decisions, reducing the execution risks caused by unclear expectations.

3.3.2. Rule Integration Module: Clause Mapping, Conflict Detection, Minimum Consistency Standard

One of the prominent problems faced by the housing supply strategy during its implementation is the lack of unified connection between zoning regulations, licensing requirements, and related technical standards, resulting in the coexistence of rule fragmentation and applicable conflicts. The goal of the rule integration module is to systematically sort out scattered rules, enabling them to form usable rule combinations in specific execution scenarios. This module first performs clause mapping to correspond different sources of rule provisions to specific execution links, clearly stating their applicable scope and constraints; on this basis, it introduces a conflict detection mechanism to identify and label conflicting or duplicate requirements; further, it sets minimum consistency standards to provide operational compliance baselines for the implementing entities. Through these processes, the rule integration module converts complex institutional texts into clear execution guidelines, reducing cross-departmental coordination costs, and laying the foundation for subsequent license path generation and process optimization.

3.3.3. Feasibility Assessment Module: Four-Dimensional Screening of Land, Regulations, Costs, and Benefits

During the implementation of the housing supply strategy, project failures often do not occur during the construction phase but are instead forced to be halted due to a lack of systematic judgment in the early stage. The feasibility assessment module aims to conduct a comprehensive screening of project conditions at the initial stage of implementation to reduce subsequent trial-and-error costs. This module uses four basic dimensions - land conditions, regulatory constraints, implementation costs, and potential benefits - to conduct a pre-assessment of project feasibility. The land dimension focuses on spatial conditions and physical limitations, the regulatory dimension focuses on applicable provisions and compliance boundaries, the cost dimension assesses construction and approval-related expenditures, and the benefit dimension measures the feasibility of the project under existing conditions. Through the joint analysis of these four dimensions, the module can identify key constraints and risk levels before entering the licensing process, providing decision-making basis for the implementing entities on whether to proceed and how to adjust the plan.

3.3.4. Administrative Friction Reduction Module: One-time Notification, Parallel Review, Closed-loop Correction

During the implementation of the housing supply strategy, administrative friction mainly manifests as lengthy approval processes, repeated submission of materials, and poor coordination among departments. The goal of the administrative friction reduction module is to reduce unnecessary time and communication costs through process optimization. This module first introduces the one-time notification mechanism, clearly stating the required material list and review priorities at the project initiation stage, reducing information asymmetry; next, it adopts the parallel review method to integrate the originally sequential approval links, shortening the overall processing cycle; finally, it builds a correction closed-loop, providing centralized feedback and tracking for correction opinions, avoiding repeated submissions and additional consumption caused by standard changes. Through the above arrangements, the administrative friction reduction module, without changing the institutional framework, improves the coherence and controllability of the execution process, creating conditions for the project to smoothly enter the construction stage.

3.3.5. Fair Accessibility Module: Opportunity Distribution Assessment, Threshold Identification, Triggered Support

In the actual implementation of the housing supply strategy, policy authorization does not necessarily mean that different entities have the same participation opportunities. The role of the fair accessibility module lies in identifying the implicit entry barriers that may form during the execution process, preventing the policy benefits from being overly concentrated in specific groups or regions. This module first conducts an opportunity distribution assessment to analyze the accessibility conditions of different land use types and participating entities; on this basis, it identifies the entry obstacles at the institutional, process, or cost levels, clarifying their formation location and impact scope; further, it introduces a triggered support mechanism. When the assessment shows that the execution opportunities are significantly restricted, it automatically matches corresponding adjustments or auxiliary measures. By embedding the fair accessibility into the execution judgment process, this module enables policy implementation to not only focus on the quantitative results but also on the accessibility and stability of the execution path.

4. Framework Operation and Verification: From "Framework Proposal" to "Measurable Outcomes"

4.1. Operating Mechanism and Process

The operation of the decision support framework follows an execution chain as the main thread. Through modular collaboration, it achieves a stable transformation from policy authorization to actual actions. In the operating mechanism, the framework takes policy and rule information as the initial input, integrates legislative texts, zoning regulations, and licensing requirements uniformly, and simultaneously introduces land block conditions and basic cost information at the project front end to form a complete decision input set. Subsequently, each core module operates in a predetermined sequence in coordination: the uncertainty governance module first clarifies the boundaries of rule application, the rule integration module maps and verifies relevant clauses and conflicts, the feasibility assessment module completes multi-dimensional screening, the administrative friction reduction module generates the optimized process path, and the fairness accessibility module verifies the distribution of execution opportunities. In the process design, the framework emphasizes the combination of pre-judgment and parallel processing to avoid the concentration of problems in the later execution stage. During the execution process, approval results, time costs, and correction records are continuously returned and used to correct rule interpretation and judgment logic. Through the closed-loop operation of "input - processing - output - feedback", the framework converts abstract policy requirements into repeatable and traceable execution processes, providing a stable foundation for subsequent effectiveness evaluation.

4.2. Data Governance: Rule Version Management, Case Library Iteration, and Indicator Consistency

To ensure the stable operation of the decision support framework in different times and situations, data governance is the key support for its continuous effectiveness. In terms of rule version management, the framework systematically records the updates of legislative texts, zoning provisions, and licensing standards, by clearly defining version numbers, effective times, and applicable scopes, to avoid understanding deviations in the execution entities during rule transitions. For the adjustment contents of the same rule in different stages, the framework retains historical versions and differences explanations, providing a traceable basis for execution judgments. In terms of case library iteration, the framework structures the execution process, key nodes, and result information of completed or terminated projects, continuously supplements typical scenarios and handling paths, enabling subsequent decisions to refer to existing experience rather than

starting from scratch. At the same time, indicator consistency is the basis for achieving effectiveness verification. Through the clear definition of statistical indicators such as approval cycle, correction times, and conversion rate, the framework ensures the comparability of data from different stages and regions. Through the collaborative data governance of rules, case libraries, and indicators, the decision support framework can maintain consistency and interpretability in a dynamic environment.

4.3. Evaluation Index System

To test whether the decision support framework achieves the transformation from "proposal" to "actual effectiveness", an evaluation index system corresponding to the execution process needs to be constructed. This system analyzes the execution chain as the object, focusing on four dimensions: predictability, administrative friction, implementation performance, and fairness accessibility. It pays attention to changes in the execution process rather than a single result. The predictability indicator is used to measure the stability of rule interpretation and process paths, reflecting whether the decision environment has a consistent expectation; the administrative friction indicator focuses on the time and communication costs in the approval and correction processes, testing the effect of process optimization; the implementation performance indicator pays attention to the transformation relationship between licensing, commencement, and completion, used to evaluate the conversion efficiency from policy authorization to actual supply; the fairness accessibility indicator is used to identify the differences in execution opportunities among different entities and regions. By correlating indicators with specific process nodes and framework modules, the evaluation system not only measures results but also can reverse-locate execution bottlenecks, providing a basis for the continuous adjustment and optimization of the framework. See Table 2.

Table 2. Evaluation Index System and Corresponding Relationship of the Decision Support Framework.

Evaluation dimension	Indicator Name	Indicator definitions and statistical standards	Corresponding process nodes	Corresponding framework modules
Predictability Administrative friction	Average approval cycle	Average time from submission to approval completion for a single project	Permission approval	Uncertainty governance, rule integration
	Approval cycle volatility	Degree of dispersion of approval cycles for different projects	Permission approval	Uncertainty governance
Performance implementation	Number of corrections	Average number of correction rounds for a single project	Correction of approval	Reduction of administrative friction
Accessibility of fairness	Pass rate on first attempt	Proportion of projects that complete approval upon first submission	Permission approval	Reduction of administrative friction
Evaluation dimension Predictability	Conversion rate from permit to start	Proportion of approved projects that enter the construction stage	Construction start	Feasibility assessment
	Conversion rate from start to completion	Proportion of projects that are finally completed among	Construction implementation The entire process	Feasibility assessment

		those that have started		Accessibility of fairness
Administrative friction	Difference in execution opportunity distribution	Differences in approval proportions among different regions/entities	Pre-evaluation	Accessibility of fairness
	Proportion of triggering support	Proportion of projects that activate auxiliary or adjustment mechanisms	Corresponding process nodes	Corresponding framework modules

5. Conclusion

The implementation effect of the housing supply strategy not only depends on the strength of policy authorization, but also on the stable operation of the system and procedures during the execution stage. Regarding the gap issues in the process of transforming policy authorization into actual execution, this paper identifies the key blocking factors from the perspective of the execution chain and converts them into controllable bottleneck nodes. On this basis, a decision support framework for the implementation stage is constructed. Through modular design and indicator-based verification, the framework provides a structured path for improving the predictability and execution stability of the housing supply strategy. Relevant analysis shows that embedding decision support at the front end of execution helps reduce institutional friction and enhance the controllability of policy implementation, providing a sustainable improvement direction for housing supply governance. While this study focuses on accessory dwelling units, the analytical framework is applicable to other small-scale residential policy instruments facing similar execution-stage constraints across U.S. jurisdictions.

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