



Exploring Innovative Pathways for Property Management in Old Residential Communities from a Collaborative Governance Perspective

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Abstract. With the deepening of urbanization in China, property management challenges in old residential communities have become a critical barrier to the modernization of urban governance. This study systematically analyzes the core contradictions in old residential communities, including aging infrastructure, weak resident autonomy, structural funding shortages, and inadequate legal-policy alignment, based on nationwide surveys and case studies from Yunnan and other regions. A collaborative governance framework is proposed, integrating "government guidance, market operation, technological empowerment, and resident participation" to break the "low-efficiency equilibrium lock-in" (i.e., the vicious cycle of low fees, poor services, and fee defaults). By combining fiscal investment with social capital, promoting smart renovations, cultivating autonomous organizations, and refining legal systems, this research provides theoretical and practical paradigms for transforming property management in old residential communities toward sustainability. The findings aim to inform the modernization of grassroots social governance.

Keywords: Old residential communities; Collaborative governance; Structural funding shortages; Smart transformation.

1 Introduction

The dilemma of property management in old residential communities represents both the "last mile" of urban renewal and a litmus test for modernizing grassroots governance. Most old residential communities in China, built during the 1980s–1990s, face common challenges such as outdated infrastructure, lagging management mechanisms, and diverse resident demands. By 2024, over 200,000 old residential communities nationwide require renovation, affecting more than 100 million residents^[1]. These communities are trapped in a "low-efficiency equilibrium lock-in"—a cycle of low fees, poor services, and fee defaults—that undermines residents' quality of life and urban sustainability. Despite increased government investment in recent years, fragmented governance and ambiguous responsibilities persist.

This study proposes a systematic solution integrating institutional design, technological innovation, and multi-stakeholder collaboration. Drawing on domestic practices (e.g., cases from Shanghai, Qingdao, and Kunming) and international experiences (e.g., Singapore's Town Council model, Germany's housing cooperatives, and Japan's self-management associations), the research addresses three core questions:

- 1) How are the core contradictions in property management formed in old residential communities?
- 2) How can multi-stakeholder collaboration resolve funding, technological, and governance challenges?
- 3) How can international experiences be adapted to empower property management in China's context?

2 Current Status and Core Contradictions in Property Management for Aging Residential Communities

2.1 Basic Functions and Challenges

The core responsibilities of property management in aging residential communities encompass infrastructure maintenance, environmental sanitation, safety management, public facility operations, and community service coordination. Specific tasks include:

Facility Maintenance: Ensuring the normal operation of water, electricity, heating, and elevator systems.

Environmental Management: Waste disposal, green space upkeep, and public area cleaning.

Safety Oversight: Access control system maintenance, firefighting equipment inspections, and security patrols.

Conflict Mediation: Resolving disputes between homeowners and property management companies to foster community co-governance.

However, due to historical legacies and resource shortages, property management services in these communities are often underperforming. Additionally, China's property management industry, which emerged late under the planned economy's welfare housing system, faces low resident acceptance of paid services.

2.2 Infrastructure Aging and Planning Lag Contradictions

Aged residential communities commonly face challenges of outdated facilities, aging water and electricity supply systems, and original planning designs that no longer meet contemporary residential demands.

Dual Challenges of Parking Shortages and Management Deficiencies

The proliferation of private vehicles accompanying improved living standards has created an inevitable parking crisis in older neighborhoods. Retrofitting efforts are significantly constrained by insufficient expansion space reserved during initial construction phases. Typical issues include inadequate parking provisions electrical ca-

capacity limitations hindering charging pile installations, and deficient electric bicycle charging infrastructure.

Empirical evidence from Kunming's Wuhua District reveals critical manifestations

A 1990s-built community maintains a parking ratio of merely 0.3:1, forcing residents to occupy fire lanes and pedestrian pathways

The 2023 Yunnan Provincial Housing Department Survey documents frequent unauthorized wiring for charging, with two electric bicycle combustion-induced fires causing substantial economic losses^[2]

Management malpractice exacerbates risks, exemplified by the 2016 Yunnan Image Community case: an unstructured "first-come" parking system intensified congestion, resulting in emergency vehicle access blockage during fire incidents and subsequent casualty escalation

Systemic absence of dedicated electric bicycle parking/charging zones necessitates hazardous practices like roadway occupation and indoor battery charging. This multi-faceted crisis stems from compounding factors: antiquated infrastructure frameworks, shortsighted urban planning, and inadequate property management protocols. The situation demands comprehensive policy interventions addressing both physical infrastructure upgrades and managerial capacity building.

2) **Obsolete Facilities and Neglected Greenery:** Aging infrastructure, such as water pipelines with 30% leakage rates in Kunming's Panlong District, reduces service satisfaction. Retrofitting elevators in multi-story buildings faces funding and coordination challenges. Unmaintained green spaces degrade into weed-filled areas, requiring significant investment that developers often avoid.

3) **Historical Liabilities:** Mismanagement by previous property companies—such as embezzlement of maintenance funds in Qujing City—has left unresolved issues like prolonged elevator breakdowns and public revenue disputes.

2.3 Dual Deficiencies in Resident Autonomy Awareness and Capability

Most aging communities originated from welfare housing programs, where temporary staff handled basic maintenance. Post-commercialization, renovation efforts prioritize urgent facility upgrades over long-term management. Residents transitioning from subsidized housing to fee-based services exhibit low acceptance of paid management. Surveys reveal widespread misconceptions:

1) **Blurred Service Boundaries:** 40% of residents conflate property management responsibilities with governmental duties (e.g., public security and firefighting) and lack awareness of contractual obligations.

2) **Cost-Value Disconnect:** Stagnant fees (e.g., <¥1/m²/month) perpetuate a "low fee → low service" cycle, despite rising operational costs.

3) **Low Participation:** Elderly and low-income residents dominate these communities, resulting in <30% attendance at homeowner meetings and resistance to decision-making processes.

2.4 Low Fee Collection Rates

Fee collection rates in aging communities average below 60%, with annual revenues insufficient to cover basic costs. For example, a 100-household community in Taiyuan generates only ¥80,000 annually, creating a structural funding gap that undermines service quality.

2.5 Intertwined Challenges of Legacy and Emerging Issues

Persistent problems—such as outdated elevators, leaking pipes, and misused maintenance funds—coexist with emerging demands like EV charging stations and smart infrastructure. These multifaceted challenges overwhelm single-entity property management solutions.

3 Systemic Solutions and Innovative Pathways for Aged Residential Communities

3.1 Government-Led Multi-Source Financing and Facility Modernization

1) Fiscal Investment and Financing Innovation: Prioritizing aged community renovation within national livelihood projects, with focused upgrades on hydraulic, electrical, heating, and elevator systems. Case analysis: Qingdao's PPP model successfully mobilized social capital to renovate 433 communities by 2024, benefiting 130,000 households [3]. This governance model clarifies construction-maintenance responsibilities through diversified funding mechanisms, establishing sustainable property management foundations.

2) Streamlined Approval Processes for Efficient Management: Critical infrastructure failures (elevators, water systems, security installations) require urgent resolution mechanisms. Kunming's 2024 policy innovation demonstrates effectiveness - enabling direct emergency fund access for elevator repairs through homeowner associations, reducing approval timelines by 60%.

3.2 Market-Oriented Operations and Smart Transformation

1) Integrated Property Management Model: Regional resource consolidation through professional management companies achieves economies of scale. Implementation in Lijiang's ancient district increased fee collection rates to 85% while reducing per-unit operational costs by 30%.

2) Technology-Enhanced Management Efficiency: Intelligent parking systems and EV charging monitoring (Yuxi's "One-Vehicle-One-Code" system reduced fire incidents by 70%)IoT-enabled pipeline leakage detection (40% maintenance cost reduction)

Strategic recommendations for cost-effective smart retrofitting: Wireless sensor adoption (NB-IoT) minimizing structural modifications Legacy equipment optimiza-

tion through AI augmentation (e.g., CCTV repurposing) Modular platform architecture supporting future expansions (e.g., elderly care integration) (see Figure 1).

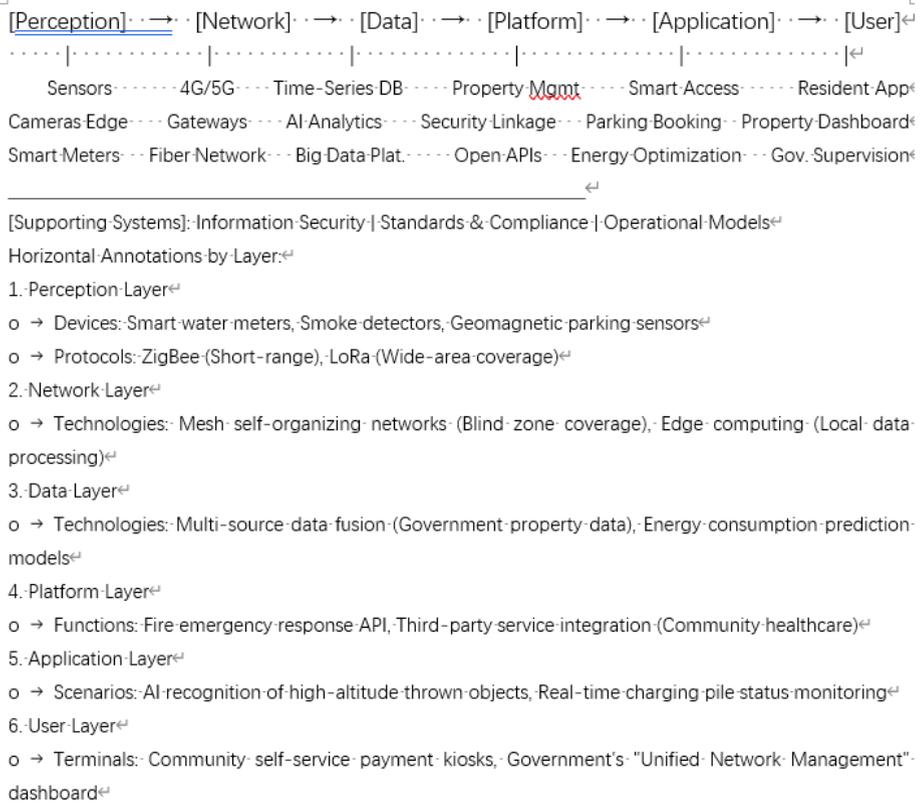


Fig. 1. Technical Framework Schematic

3.3 Tripartite Governance Mechanism: Party Leadership, Resident Autonomy, and Community Co-Management

1) Party-Led Autonomous Organization Development: Taiyuan's "Five-Level Organizational System" enhances owner committee functionality through financial transparency and service accountability mechanisms.

2) Transparent Deliberative Platforms: Shanghai's digital negotiation system achieved 82% resident approval for fee adjustments through participatory decision-making processes.

3.4 Adjustment Standards Recommendation for Economic-Technical Indicators in Community Renovation Approval

The renovation of old communities requires balancing historical planning constraints with modern standards. It is recommended to prioritize ensuring safety and comfort

while appropriately relaxing green space ratio requirements to alleviate parking shortages in Table 1.

Table 1. Compares key indicators between old and new residential design standards.

Indicator	Old Standard (GB50180-93)	New Standard (GB50180-2018)	Impact Analysis
Floor Area Ratio (FAR)	No national standard; Significant regional variations	Graded control (Class I areas ≤ 1.2)	FAR in Shenzhen reduced from 4.0 to 3.0
Greening Rate	$\geq 30\%$, rooftop greening counted at 50%	$\geq 35\%$, rooftop greening counted at 30%	Shanghai's greening rate increased from 32% to 38%
Building Density	General $\leq 30\%$, High-rise $\leq 35\%$	Graded control (High-rise $\leq 25\%$)	Land costs in Hangzhou increased by 8%
Sunshine Standard	Significant north-south disparities	Unified national standard of ≥ 2 hours (winter solstice)	Building spacing in Guangzhou expanded to 36m

The comparison shows that new regulations feature reduced maximum values for FAR (floor area ratio) and building density, indicating lower land development intensity. Meanwhile, increased minimum requirements for greening ratio and green space rate enhance effective green areas, suggesting improved environmental quality in new developments. However, existing communities face spatial constraints for optimization due to limited land availability and inherent parking deficiencies. These three factors - spatial limitations, parking shortages, and strict new standards - form an interlocked dilemma. The author proposes prioritizing fundamental safety and comfort needs. Given that parking shortages severely impact resident safety and convenience in older communities, appropriately relaxing greening ratio requirements could help address essential living requirements while accommodating existing spatial constraints.

4 International Best Practices and Localization Strategies

4.1 Singapore's Town Council Model

Integrated governance through mandatory Central Provident Fund contributions (85% maintenance fund coverage rate^[4]). Proposed adaptation: Hybrid financing combining maintenance funds, government matching, and housing provident funds.

4.2 German Housing Cooperative System

Owner cooperatives with fiscal incentives (25% tax rebates for participatory communities^[5]). Implementation strategy: Gradual piloting in mature communities with party-building integration and decision-making empowerment.

4.3 Japanese Maintenance Consortiums

Legally mandated maintenance and community-based elderly care offer lessons. China should balance technology with human-centric approaches and clarify repair obligations via legislation ^[6].

5 Conclusion

A collaborative "governance ecosystem" is essential. Recommendations include legal frameworks for resident responsibilities, "community governance credit systems," and smart-market integration. Future efforts should leverage big data for resource optimization, transforming old communities into resilient, sustainable spaces.

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