

Toward Cross-Regional Governance: Innovations in Territorial Spatial Planning for Metropolitan Regions

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Abstract: The fundamental role of territorial spatial planning in cross-regional spatial governance for metropolitan regions is indispensable to China's strategies of coordinated regional development and new urbanization. However, the positioning of planning, its core tasks, implementation and transmission pathway, and its relationship with development planning still require clarification. Drawing on territorial spatial planning practices in the Greater Shanghai Metropolitan Region, this paper examines the core value and key tasks of metropolitan territorial spatial planning oriented to cross-regional governance. The value and function of such planning are reflected in five aspects: providing a spatial foundation for regional coordination, building institutional arrangements for equal consultation, preparing action plans for planning implementation, establishing a legal basis for cross-boundary control, and creating common opportunities for policy innovation. The key tasks of metropolitan territorial spatial planning are to highlight administrative logic and construct multi-scale spatial governance units; build stratified regional coordination strategies around the leading role of the core city; adhere to bounded planning and focus on key cross-regional strategic issues; concentrate on boundary areas and establish a penetrating model of spatial control; and design multi-field policy mechanisms oriented to implementation needs. The paper further proposes future research directions concerning planning-system articulation and governance-efficiency improvement, with the aim of informing metropolitan territorial spatial planning theory with Chinese characteristics and innovative cross-regional spatial governance practice.

Keywords: cross-regional governance; metropolitan region; territorial spatial planning; planning innovation; new planning

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Regional coordinated development is a major pillar of China's national strategic system. In this context, metropolitan regions have been assigned a central role in leading the new urbanization process. This role has been established through policy documents such as the National New Urbanization Plan, and has been further strengthened in the Outline of the Fourteenth Five-Year Plan and Long-Range Objectives for 2035, the report of the 20th National Congress of the Communist Party of China, and the 2024 Decision of the Third Plenary Session of the 20th CPC Central Committee. The Central Urban Work Conference held in 2025 also made metropolitan-region development a key task of urban work. As the carrier connecting core cities with surrounding areas, metropolitan regions have become an important strategic platform for alleviating metropolitan problems, uneven regional and urban-rural development, and the barriers of administrative-district economies, while promoting coordinated regional development and new urbanization [1].

In recent years, many local governments have intensified the preparation of metropolitan-region plans in order to strengthen the guiding role of planning. Yet the basic function and main tasks of metropolitan territorial spatial planning remain insufficiently clarified. The 2024 Decision explicitly requires the improvement of a national strategic planning system guided by national development

planning, grounded in spatial planning, and supported by regional and sectoral planning. According to the 2019 Guiding Opinions on Cultivating and Developing Modern Metropolitan Regions issued by the National Development and Reform Commission, a metropolitan region is an urbanized spatial form within an urban agglomeration that is centered on a megacity, super-large city, or large city with strong radiating capacity and is organized around a one-hour commuting circle. Metropolitan regions therefore have evident regional spatial characteristics across municipal administrative boundaries. As provincial, municipal, and county territorial spatial plans have gradually been approved and a spatial control system centered on the "three zones and three lines" has basically been established, the position of metropolitan territorial spatial planning as cross-regional planning has become a focus of debate.

Although the Ministry of Natural Resources issued the Technical Regulation for the Preparation of Metropolitan Territorial Spatial Plans in 2024, practical work still needs to define more precisely what such planning should do. Metropolitan territorial spatial planning is not a repetition of spatial elements within a planning scope. Its value lies in focusing on cross-regional spatial coordination problems that local plans cannot solve alone, thereby functioning as a higher-level spatial governance platform [2]. This paper takes the Greater Shanghai Metropolitan Region, under the broader integration of the Yangtze River Delta, as the practical context for analyzing this issue. It aims to clarify the basic positioning and main tasks of metropolitan territorial spatial planning and to provide references for improving metropolitan planning theory with Chinese characteristics and enhancing regional spatial governance capacity.

1 Cross-Regional Governance and Metropolitan Territorial Spatial Planning

1.1 Theoretical Foundations of Regional Governance and Sino-Western Differences

Regional governance theory took shape in the second half of the twentieth century. Its conceptual construction was strongly influenced by Western intellectual currents and developed through frameworks such as new regionalism, polycentric governance, and synergetic governance [3-4]. Early governance practice abroad often emphasized market-oriented coordination, broad participation by multiple actors, and relatively loose governance structures. This model was also criticized for ambiguous goals, low decision efficiency, and limited capacity to respond to complex cross-regional coordination challenges. Jessop offered a systematic diagnosis of these limitations through the concept of governance failure [5]. Subsequent theories of multi-level governance [6-7] and rescaling [8-9] placed greater emphasis on the core position and initiative of governmental power in coordinating relationships among multiple actors. Multi-level governance explains the governance structures and interactive relationships formed by governments at different levels and non-governmental actors within specific territories, while rescaling focuses on the reorganization of power and institutional mechanisms through which particular territorial scales pursue governance objectives [10].

Compared with Western governance paths based on decentralization and market logic, regional governance in China is deeply embedded in a political-economic environment structured by strong governmental steering. It has formed a governance logic with Chinese characteristics, in which spatial governance is the main instrument, administrative coordination is an important operational means, and

public action is organized through planning. With the rapid urbanization process, China's regional spatial governance has moved from earlier reliance on rigid instruments, such as administrative boundary adjustment and mandatory spatial control, toward more flexible and coordinated governance tools, including metropolitan coordination and urban agglomeration integration [11]. Sun Shiwen further argues that spatial governance has become a specialized field within cross-regional governance, whose core tasks are to guide and regulate concrete spatial elements, including land, ecology, and infrastructure, and to coordinate and manage the integrated processes of spatial-resource development, protection, and utilization within specific territories [12].

1.2 Evolution of the Metropolitan Concept and the Value of Cross-Regional Spatial Governance

Scholars generally recognize the radiating and driving role of core cities within metropolitan regions, and recent work has further emphasized metropolitan development, regional integration, and spatial governance as mutually connected research themes [13], [14], [15]. With technological progress, especially advances in transportation technology and changes in economic organization, the concept, connotation, and organizational form of metropolitan regions have evolved dynamically across development stages [24]. Early research, influenced by growth-pole theory and central-place theory, emphasized the advantage of the core city. Metropolitan areas were regarded as "core-periphery" structures characterized by hierarchical diffusion under the influence of administrative rank and industrial gradient transfer [16-17]. As globalization deepened, Castells' theory of the space of flows [18] and Scott's global city-region concept [19] provided new theoretical support for metropolitan research. Empirical studies by Xie Shouhong and Zhang Jingxiang on the Pearl River Delta and the Yangtze River Delta further showed that functional linkages were gradually replacing administrative relations as the leading force in shaping metropolitan spatial organization [20-21].

The improvement of specialized node-city network capacities promoted the evolution of metropolitan regions from monocentric to polycentric and networked structures. In recent years, global deindustrialization and industrial restructuring have catalyzed layered networks in which core-specialized nodes coexist [22]. A metropolitan region has therefore become an appropriate spatial unit for reorganizing intercity industrial chains, supply chains, innovation chains, and talent chains [23]. These shifts show that the metropolitan region is no longer only a functional extension of the core city. It is also an important instrument for overcoming the fixed barriers of administrative-district economies through regional spatial governance [25]. In China's institutional context, this gives metropolitan-region construction particular significance: it is both a vehicle for coordinated regional development and an arena in which territorial spatial planning can translate regional governance objectives into spatial organization, control rules, and implementation mechanisms.

1.3 Practical Innovation Requirements for Metropolitan Territorial Spatial Planning Oriented to Cross-Regional Governance

Local governments have increasingly begun to recognize the distinctive role of metropolitan regions in regional spatial governance and to promote the preparation and implementation of metropolitan territorial spatial plans. In 2019, under the guidance of the Ministry of Natural Resources, the Shanghai Municipal Planning and Natural Resources Bureau and the Shanghai Municipal Development and Reform

Commission jointly led more than thirty local departments in preparing the Territorial Spatial Coordination Plan for the Greater Shanghai Metropolitan Region. It was jointly issued by Shanghai, Jiangsu, and Zhejiang in January 2022. The plan established a working mechanism of joint organization, joint preparation, joint recognition, and joint implementation. It also adopted the Yangtze River Delta Eco-Green Integrated Development Demonstration Zone as an important cross-regional coordination pilot, offering valuable experience for metropolitan planning practice elsewhere [28]. In 2024, the Chengdu Metropolitan Territorial Spatial Plan (2021-2035) became the first national-level metropolitan territorial spatial plan approved by a provincial government. It established a model of unified preparation, joint approval, and joint implementation through mechanisms such as a leading group, provincial-level departmental guidance, coordination by the Tongchenghua Office, and member-city participation. This experience has important implications for breaking administrative barriers, promoting the balance of territorial development within a province, and exploring institutional innovation in cross-regional planning [29]. In October 2023, the Overall Territorial Spatial Plan for the Greater Shanghai Metropolitan Region was launched, establishing a platform for member cities to jointly conduct spatial planning under the mechanism of joint preparation [30]. Inspired by these initiatives, Nanjing, Hangzhou, Ningbo, Hefei, and other cities in the Yangtze River Delta have also carried out research or preparation for metropolitan territorial spatial planning.

Although each metropolitan plan differs in spatial scope, substantive content, and governance logic, these practices share a basic consensus: metropolitan territorial spatial planning has the dual attributes of spatial planning and spatial governance. It functions as an intermediary between national strategies and local development and provides a policy instrument for cross-regional spatial governance [31]. Current practice also faces several constraints. First, metropolitan territorial spatial planning and development planning remain insufficiently connected. Some metropolitan development plans strictly define the one-hour commuting circle, while territorial spatial plans must pay greater attention to functionally integrated areas with more complex governance needs and equal consultation among peer administrative actors [32]. Second, the formal position and transmission pathway of metropolitan territorial spatial planning within the existing planning system remain unclear, weakening its binding force [26]. Third, unequal power among governance actors persists; higher-level governments still have stronger resource allocation capacity, while member cities differ substantially in administrative rank and bargaining capacity, making effective and equal dialogue difficult [33]. Fourth, institutional design remains unstable. Compared with Japan, where multiple supporting laws such as the National Land Use Planning Act and the Metropolitan Area Development Act provide a legal framework [34], metropolitan planning implementation in China still depends heavily on ad hoc coordination. It lacks sufficient legal support, policy continuity, and mechanisms for balancing obligations and benefits [27].

2 Core Values of Metropolitan Territorial Spatial Planning

Metropolitan regions are important governance units in China's strategies for coordinated regional development and new urbanization. Drawing on the planning practices of Shanghai, Hangzhou, Ningbo, and other metropolitan regions, this paper argues that metropolitan territorial spatial planning is a comprehensive task in the territorial spatial planning system. It is not limited to drawing a blueprint for cross-regional spatial coordination. It also has important value in implementing national and regional

strategies, promoting planning implementation, and innovating institutional mechanisms. Its value can be understood through five dimensions.

2.1 Spatial Foundation for Regional Coordination

Regional coordinated development within a metropolitan region depends on the effective allocation and integrated management of spatial resources. Territorial spatial planning, as a core tool, provides the basic spatial foundation for cross-regional coordination. With the gradual completion of provincial, municipal, and county territorial spatial plans, China has initially built an integrated spatial planning map centered on "three zones and three lines" data and covering the whole territory. This provides data support for cross-regional spatial governance. Metropolitan territorial spatial planning offers member cities a platform for sharing regional spatial information. On this basis, it can further integrate and optimize highways, rail transit, facilities, and other spatial elements, form accurate, reliable, and visualized spatial data, support the precise identification, systemic simulation, and coordinated decision-making of spatial resources across administrative boundaries, and thereby move metropolitan cooperation from strategic consensus toward substantive spatial integration and institutional collaboration.

2.2 Institutional Arrangements for Equal Consultation

Under the current administrative structure, the absence of regularized cross-administrative consultation mechanisms means that intercity spatial coordination often relies on irregular case-by-case negotiation. Such non-institutionalized coordination has clear limitations. It is slow to respond and often involves long negotiation cycles, making it difficult to meet the time requirements of regional development. It also lacks stable institutional support and authoritative backing, so negotiated results often have limited binding force and uncertain implementation effects. In addition, many regional conflicts involve multiple functional departments and broader spatial ranges. Temporary and fragmented consultation is insufficient for systematic governance.

Metropolitan territorial spatial planning has an important institutional significance. During preparation, it can organize the participation of core cities, member cities, and relevant departments, create a technical platform for multi-party collaboration, and consolidate consensus while maintaining the equal status of regional actors. During implementation, it can be transformed into a management platform with binding and operational value, offering an institutional arrangement for resolving structural contradictions and conflicting interests in cross-boundary spatial governance. In this sense, the metropolitan plan is not only a technical platform. It is also an institutional platform for reshaping cross-regional spatial governance relationships.

2.3 Action Plans for Planning Implementation

Within the current territorial spatial planning system, provincial, municipal, and county plans have initially coordinated key spatial elements within their own administrative jurisdictions, yet coordination across regions remains a weak point. Problems are especially evident in the disconnection of intercity road systems, inconsistent land-use and line-position standards, and mismatched construction timing on either side of administrative boundaries. Even when planning content is consistent, asynchronous implementation can make projects difficult to deliver. Metropolitan territorial spatial planning should

therefore offer systematic solutions at the action level [35]. Three kinds of coordination are particularly important: spatial layout coordination to ensure seamless alignment of major spatial arrangements; planning-standard coordination to unify technical standards for infrastructure and ecological protection; and implementation-schedule coordination to formulate common construction plans and project lists so that major projects can proceed in a coordinated manner.

At the same time, the planning process can build a strategic-spatial-action framework. It can respond upward to national and provincial strategies, guide downward the preparation of municipal and county territorial spatial master plans, town master plans, and transport, ecology, industry, and other special plans, and thereby transmit macro strategies into concrete implementation. On this basis, action consensus can be incorporated into each city's five-year plan and annual key project database. By clarifying the spatial layout, construction bodies, funding arrangements, and timing nodes of cross-regional projects, hierarchical transmission and supervisory implementation can ensure that metropolitan spatial coordination moves from blueprint to reality.

2.4 Legal Basis for Cross-Boundary Control

Under the current administrative system, spatial governance in provincial and municipal boundary areas faces structural contradictions. On the one hand, spatial control authority must strictly avoid exceeding administrative boundaries and has clear jurisdictional limits. On the other hand, the mobility of capital, people, technology, and other factors, as well as the networked development of functional layouts, increasingly breaks through administrative barriers and moves toward integration. In metropolitan-region boundary areas, this contradiction is particularly evident. Core cities attract industries, residential, and service functions to adjacent areas through strong economic radiation and functional spillovers, but these surrounding areas often continue to perform important agricultural production, ecological conservation, or security functions. Development and protection demands therefore generate boundary-area spatial conflicts and increase governance difficulty.

Metropolitan territorial spatial planning, as a key platform for cross-regional spatial governance, can provide explicit spatial control requirements for boundary areas. Its statutory position within the spatial planning system can make it an upper-level basis for guiding key-coordination-area special plans and detailed plans within the metropolitan region. The effective promotion of cross-regional spatial governance requires two conditions: the administrative integrity of governance units and the administrative equality of participating actors [36]. Metropolitan planning should distinguish spatial planning objects from governance objects. Spatial objects may be defined according to a one-hour commuting circle, while planning objects must be aligned with the boundaries of governance objectives. In the Greater Shanghai Metropolitan Region, the practice has used complete county-level administrative units as the basic units for constructing the overall metropolitan framework, thereby establishing a basis for equal consultation and dialogue among member cities. Different types of units can then be defined according to governance goals and key issues: the Shanghai-oriented core coordinated unit, the secondary metropolitan units such as Hangzhou, Ningbo, and Suzhou-Wuxi-Changzhou, the strategic function units such as the Yangtze River Estuary, Taihu Lake rim, and Hangzhou Bay, and the cross-boundary spatial coordination units based on counties, cities, or districts. Together, these units form a multi-scale and networked metropolitan spatial governance framework, as shown in Fig. 1.

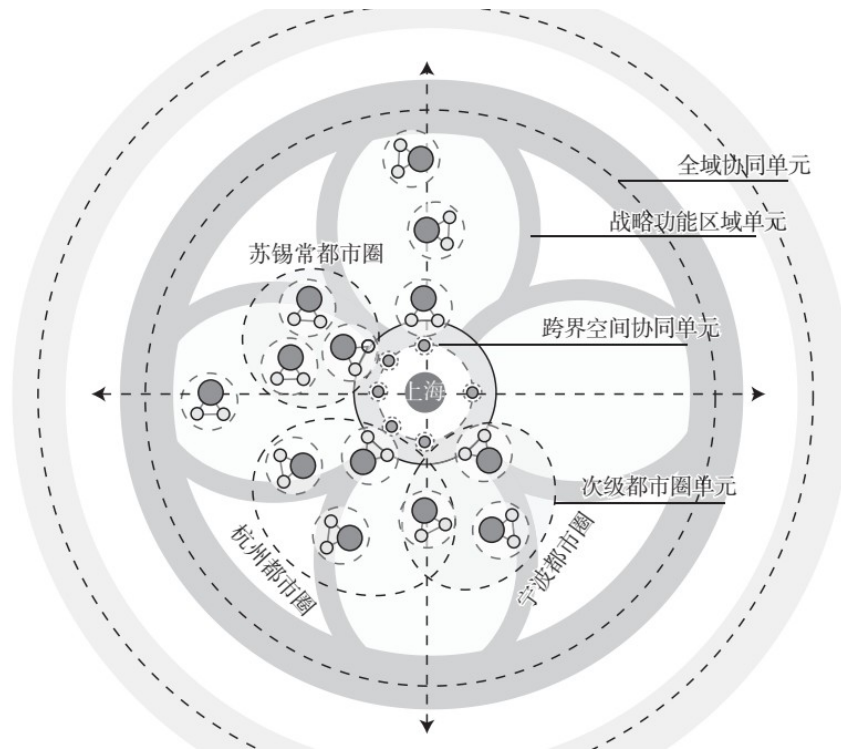


Fig. 1 Diagram of multi-scale spatial governance units

2.5 Shared Opportunities for Policy Innovation

With the establishment of the territorial spatial planning system, the ways in which spatial policy innovation can raise the efficiency and value of spatial-resource allocation have become central to cross-regional governance. Metropolitan territorial spatial planning is not only a technical tool for spatial arrangement. It is also an opportunity to promote institutional renewal and policy coordination through an integrated planning process. Member cities can share policy innovation experience in territorial remediation, land supply, ecological compensation, and cross-regional cooperation-zone development, and can develop common policy claims and jointly seek policy pilots from higher-level governments. This creates a more favorable institutional environment for regional integrated development.

As regional integration deepens, cross-administrative problems such as land quota coordination, ecological compensation, and cost and benefit sharing will become increasingly prominent. These problems require policy instruments that can respond to both spatial arrangement and governance incentives. Through metropolitan territorial spatial planning, a policy toolbox can be developed, including cross-regional transfer of construction land quotas, land-index trading, ecological compensation, public-construction cost sharing, and revenue-sharing arrangements. These instruments can provide institutional support for sustainable cooperation. In the Greater Shanghai Metropolitan Region, the plan has proposed policy recommendations concerning multi-level consultation platforms, coordination mechanisms with neighboring provinces, and experimental forms of "enclave economy" cooperation. By innovating policy tools, the plan can break administrative barriers and stimulate cross-regional cooperation.

3 Key Tasks of Metropolitan Territorial Spatial Planning

The vitality of metropolitan territorial spatial planning lies in governance orientation. Based on the understanding of the value of such planning, its preparation should respond to actual cross-regional spatial governance problems and inter-administrative coordination needs. It should take the improvement of planning implementation effectiveness as a fundamental objective, focus on key strategic spatial issues, and develop targeted institutional design and action arrangements.

3.1 Highlighting Administrative Logic and Constructing Multi-Scale Spatial Governance Units

Metropolitan territorial spatial planning oriented to cross-regional governance should be compatible with the existing administrative structure. Lu Qingqiang argues that effective promotion of cross-regional spatial governance in China requires two key conditions: the administrative integrity of governance units and the administrative equality of participating actors [36]. These are the foundations of equal consultation. In planning practice, the planning object should be distinguished from the governance object. The spatial phenomenon can be understood through the one-hour commuting circle, yet the planning object should be defined according to the boundaries of governance targets.

In the Greater Shanghai Metropolitan Region, county-level administrative units with complete jurisdictions have been used as the basic units for constructing the metropolitan framework. This arrangement creates a practical basis for equal consultation and dialogue among member cities. Given differences in governance goals and spatial priorities, four types of spatial governance units can be identified. The first is the Shanghai-oriented core coordination unit, emphasizing integrated coordination between Shanghai and cities in southern Jiangsu and northern Zhejiang in industrial innovation, ecological structure, and infrastructure. The second is the secondary metropolitan unit, including Hangzhou, Ningbo, Suzhou-Wuxi-Changzhou, and other metropolitan areas within the broader Shanghai metropolitan space, each with relatively independent metropolitan structures. The third is the strategic function unit, such as the Yangtze River Estuary, Taihu Lake rim, and Hangzhou Bay, where coordination is needed for functions and spatial organization across administrative boundaries. The fourth is the cross-boundary spatial coordination unit, mainly based on counties, cities, or districts, designed to facilitate concrete cross-boundary project alignment and cooperation and to solve the problem of implementation being blocked by adjacent planning jurisdictions. These four units together constitute a multi-scale, networked metropolitan spatial governance framework, as shown in Fig. 1.

3.2 Building Stratified Regional Coordination Strategies Around Core-City Leadership

A major objective of metropolitan construction is to amplify the radiating and driving role of the metropolitan core city [38]. Yet the intensity of this radiating effect differs across spatial distance. Spatial distance also affects the choice of transportation modes. Traditional point-axis structures formed by key cities and trunk transport corridors are no longer sufficient for the flow-based and networked spatial structure of metropolitan regions [39]. Metropolitan spatial structure should therefore be organized according to spatial distance and functional-linkage intensity, forming a layered structure in coordination mode and strategic focus.

Taking the Greater Shanghai Metropolitan Region as an example, three spatial circles can be defined by distance and transport accessibility, as shown in Fig. 2. The first circle is defined mainly by municipal railways and urban rail transit. It covers counties around Shanghai's main urban rail hub that can be reached within about thirty minutes, with an approximate radius of 60-80 km. It represents an outward spillover and integration zone for Shanghai's urban functions. This circle should focus on the optimization of cross-boundary commuting facilities, equalization of public services, and ecological-environmental co-governance. The second circle is defined mainly by intercity railways. It begins from Shanghai's intercity hub stations and reaches surrounding districts and counties within about sixty minutes, with an approximate radius of 200 km. It includes areas with strong functional ties to Shanghai and should emphasize industrial chains, supply chains, innovation chains, and talent-chain coordination. The third circle is defined mainly by high-speed rail. It begins from Shanghai's high-speed railway hub and reaches surrounding cities within about ninety minutes, with an approximate radius of 300 km. This is the spatial scale for day-to-day business and exchange. It is also the circle through which Shanghai and metropolitan regions such as Nanjing, Hangzhou, Hefei, and Ningbo connect and integrate. This layer should emphasize cross-regional strategic coordination, high-level factor allocation, major infrastructure connectivity, and the integration of the Yangtze River Delta urban agglomeration.

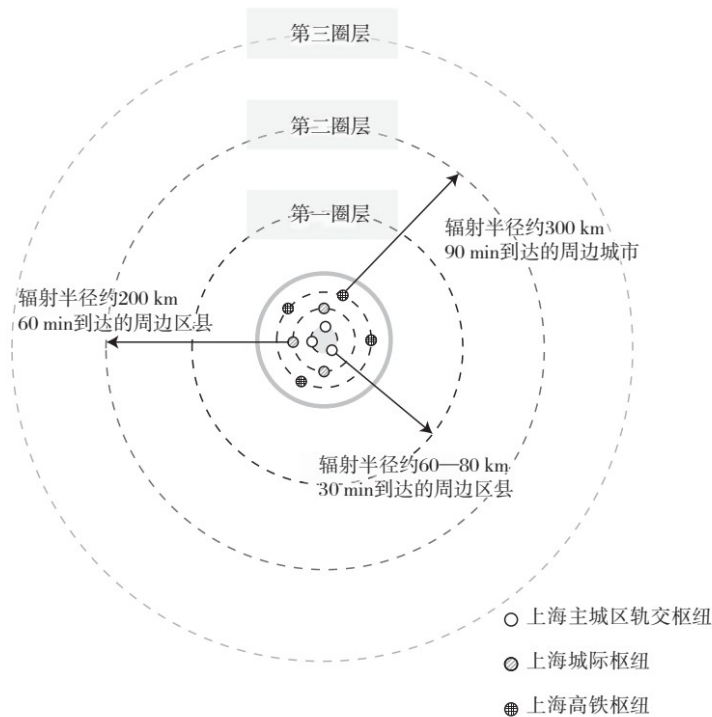


Fig. 2 Diagram of the regional coordination model in different circles

3.3 Adhering to Bounded Planning and Focusing on Key Strategic Issues Across Regions

As a special plan within the national territorial spatial planning system, metropolitan territorial spatial planning should focus on cross-administrative problems that member cities jointly face and on major regional tasks that require coordinated completion. Its content should be limited and targeted, with emphasis on key issues and action guidance. The development stages, strategic positions, and

actual problems of different metropolitan regions vary considerably. Planning content and key tasks should therefore be shaped around two core orientations.

First, planning should focus on the strategic mission borne by the metropolitan region. The core city of a metropolitan region is usually a national or regional central city and carries major national strategic functions. Spatial planning should strengthen the strategic carrying capacity of the whole region and identify key spatial carriers able to support the implementation of national strategy. Second, planning should unify cross-regional coordination and sectoral projects closely related to member cities, especially major facilities and corridors in transport, ecology, energy, and information. Through planning, these elements can be spatially aligned, standards can be coordinated, and project schedules can be integrated, thereby avoiding inefficiency and resource mismatches caused by administrative fragmentation [40].

The Greater Shanghai Metropolitan Region embodies these orientations. It identifies strategic opportunity areas and development-potential areas with national strategic significance around Shanghai's "five centers" and Yangtze River Delta integration strategy. It clarifies their spatial carrying capacity and functional improvement pathways. It also proposes coordinated solutions for major transport infrastructure centered on high-speed rail, intercity railways, aviation, highways, and low-altitude networks, while coordinating key regional conservation elements such as ecological protection, cultural heritage, and security resilience. These arrangements construct a spatial framework for regional collaborative governance.

3.4 Focusing on Boundary Areas and Establishing a Penetrating Model of Spatial Control

Boundary areas where neighboring administrative jurisdictions meet are often the most concentrated zones of contradiction in metropolitan spatial coordination, and they are also the key units through which governance effectiveness becomes visible. Spatial conflicts are commonly expressed in mismatched construction land, unconnected road systems such as broken-end roads, and disordered development caused by inconsistent construction standards. Metropolitan territorial spatial planning, as a regional special plan, is constrained by local authority boundaries. Its content tends to be structural and demonstrative, making direct and detailed control difficult. For this reason, planning should play a penetrating role: within cross-boundary coordination units, control requirements should be deepened to the level of patterns, rules, and implementation guidance, thereby enabling refined governance at the implementation level.

In the Greater Shanghai Metropolitan Region, practice has drawn on experience from the Yangtze River Delta Eco-Green Integrated Development Demonstration Zone and related cross-boundary planning reports [37]. Around cross-boundary areas between Shanghai and neighboring cities, it establishes multiple cross-boundary coordination units based on county, city, and district administrative units. The planning guidance stresses joint layout, shared ecological baselines, shared development, and common standards. It promotes deep functional integration, ecological corridors, infrastructure interconnection, spatial layout optimization, and coordination of major public-service facilities, transport hubs, broken-end roads, neighboring facilities, important landscape interfaces, and other key governance elements.

3.5 Designing Multi-Field Policy Mechanisms Oriented to Implementation Needs

The establishment of the territorial spatial planning system aims to strengthen the foundational role of spatial planning and to promote the integration of different levels and types of planning. This requires stronger overall mechanism design for planning preparation and implementation [41]. As a special plan, metropolitan territorial spatial planning still faces the practical challenge of unclear transmission mechanisms within the current spatial planning system. Based on several metropolitan planning practices in which the authors have participated, four institutional and mechanism designs require particular attention.

First, a transmission system based on administrative logic should be constructed, as shown in Fig. 3. The implementation bodies of metropolitan territorial spatial planning remain the governments of member cities, while the content of the plan has evident regional integrity and structural characteristics. Therefore, the strategic requirements of the metropolitan region should be translated through city-specific chapters and related instruments into concrete spatial constraints and guidance for each city. Provincial natural-resource departments and metropolitan coordination mechanisms should also be strengthened to ensure the top-down transmission of planning intentions.

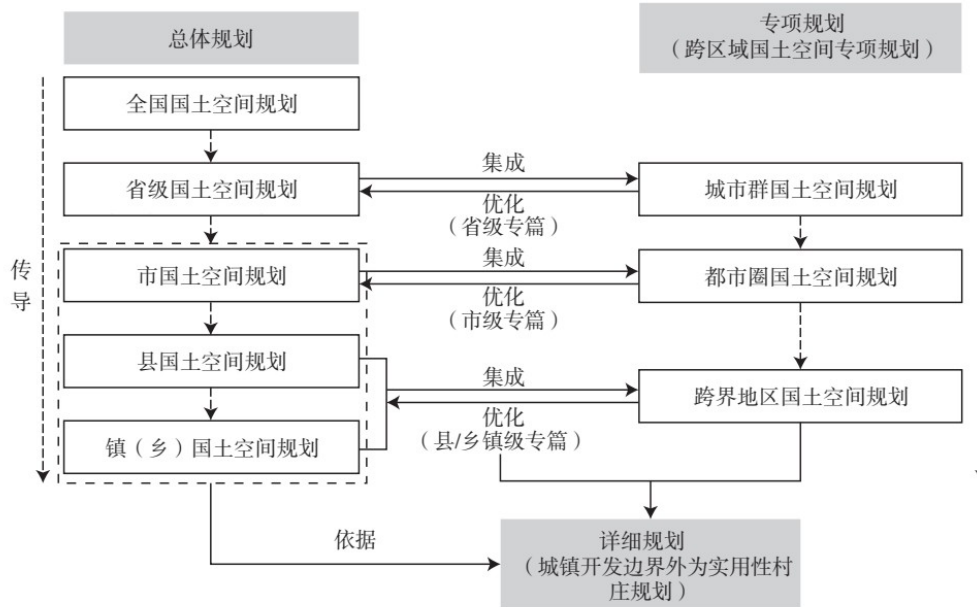


Fig. 3 Diagram of the multi-transmission system

Second, a coordination mechanism around major spatial actions should be established. Joint planning and implementation of major cross-regional spatial projects are key pathways through which the planning blueprint can become reality. Such actions should serve as core instruments for near-term metropolitan development. Through unified project layout and construction timing, they can be incorporated into member cities' five-year plans and territorial spatial planning systems, ensuring coordinated implementation of major cross-regional projects.

Third, standards in spatial governance should be connected. In response to inconsistent provincial and municipal construction standards, coordination should focus on transport, ecology, public services, and other key fields. The Greater Shanghai Metropolitan Region, for example, proposes unified

construction standards for intercity railways and suburban railways. In boundary areas, it also promotes ecological standards centered on water-environment governance and monitoring, as well as public-service standards oriented to the living circle, thereby providing technical support for high-quality integration.

Fourth, policy innovation for deep regional cooperation should be strengthened. Spatial policy is an important bridge through which metropolitan planning moves from technical documents toward governance practice. The Greater Shanghai Metropolitan Region has proposed policy recommendations such as multi-level consultation platforms, coordination mechanisms with neighboring provinces, and exploratory models of enclave economy cooperation. These policy tools can break administrative barriers and activate cross-regional cooperation.

4 Conclusions and Prospects

Cross-regional spatial governance is a major issue in China's promotion of new urbanization and coordinated regional development. Metropolitan territorial spatial planning is a governance tool with Chinese characteristics, yet its formal positioning and work focus are still under exploration. Based on planning practice in the Greater Shanghai Metropolitan Region, this paper develops an integrated understanding of metropolitan territorial spatial planning oriented to cross-regional governance and identifies four dimensions of innovation value.

First, the governance attribute of spatial planning should be strengthened. On the dual premises of administrative integrity and actor equality, a multi-scale collaborative governance framework suited to China's institutional context can be constructed. This framework can strengthen the spatial articulation of territorial spatial planning with national economic and social development planning and other regional plans. Second, the concept of bounded planning should be advanced. Metropolitan planning should follow strategic guidance, focus on key fields and strategic areas requiring metropolitan-level coordination, and improve the targeting and operability of planning by avoiding overly broad content and diluted priorities. Third, a penetrating planning and precision-governance model should be explored for cross-boundary areas. Under the guidance of the overall regional structure, management requirements for spatial conflict points in boundary areas should be deepened to the level of districts, towns, villages, or project carriers, while digital governance platforms should be used to improve the precision and monitoring efficiency of spatial coordination. Fourth, an implementation transmission mechanism should be preliminarily established for regional special plans. Through differentiated implementation in cities, coordinated actions, standards connection, and policy innovation, metropolitan planning intentions can be transmitted effectively to all levels and fields. This can promote the coordinated development and protection of spatial resources across administrative districts.

Metropolitan territorial spatial planning still requires further research and institutional breakthroughs in three areas. The first is planning-system integration. Further study is needed on how metropolitan territorial spatial planning can play its foundational role within a planning system guided by national development planning, based on spatial planning, and supported by regional and special plans. This includes the relationship between metropolitan territorial spatial planning and national economic and social development planning, as well as its binding force and legal status relative to provincial, municipal, and county territorial spatial master plans. The second is institutional supply for

governance-efficiency improvement. Current cross-regional coordination still lacks higher-level legal support. Key mechanisms for cross-regional fiscal sharing, ecological compensation, and cost sharing remain incomplete, making it difficult to support deeper interest coordination and sustainable cooperation. The third is monitoring, evaluation, and dynamic planning maintenance. Existing evaluation often focuses on project construction. It is necessary to establish an implementation-effect evaluation method oriented to spatial structural optimization, element-flow efficiency, public-service equality, and related governance outcomes, and to connect these evaluations institutionally with regular physical examination and assessment of territorial spatial planning. Addressing these issues through practical innovation will help establish metropolitan territorial spatial planning theory with Chinese characteristics and promote the modernization of regional spatial governance.

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